

**ESTIMATES COMMITTEE**  
**(1973-74)**

(FIFTH LOK SABHA)

**SIXTY-SIXTH REPORT**

**DEPARTMENT OF ELECTRONICS**



**LOK SABHA SECRETARIAT**  
**NEW DELHI**

*April, 1974/Vaisakha, 1896 (Saka)*

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The Sixty-Sixth Report of the Estimates Committee (FIFTH LOK SABHA) - Department of Electronics.

Page	Line	For	Read
5	1	steady	steady
14	23-24	equipment	equipment
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253	7(from bottom)	more	move
261	5	compole	compete
263	16	specially	especially

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# ESTIMATES COMMITTEE

(1973-74)

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## INTRODUCTION

I, the Chairman, Estimates Committee having been authorised by the Committee to submit the Report on their behalf, present this Sixty-Sixth Report on the Department of Electronics.

2. The Committee took evidence of the representatives of the Department of Electronics and Ministries of Industrial Development and Finance on the 28th, 29th and 30th January, 1974. The Committee wish to express their thanks to these officers for placing before them the material and information which they desired in connection with the examination of the subject and for giving evidence before the Committee.

3. The Committee also wish to express their thanks to Col. Ramanand (Retd.), General Manager (Electronics), Hindustan Conductors Pvt. Ltd., New Delhi and Dr. Amarjit Singh, Director, C.E.E.R.I., Pilani for giving evidence and making valuable suggestions.

4. The Committee also wish to express their thanks to all the associations and individuals who furnished memoranda on the subject to the Committee.

5. The Report was considered and adopted by the Committee on the 24th April, 1974.

6. A statement giving the summary of recommendations contained in the Report is appended to the Report (Appendix-III).

7. A statement giving the analysis of recommendations contained in the Report is also appended to the Report (Appendix-IV).

R. K. SINHA,  
*Chairman,*  
*Estimates Committee.*

NEW DELHI;  
April 29, 1974.

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Vaisakha 10, 1896 (*Saka*).



## CHAPTER I

### DEVELOPMENT OF ELECTRONICS

#### A. Introductory

1.1. Electronics has assumed a very important role in development of modern technology, in the monitoring and control of production, and in industrial processes. It has become vital for the development of and applications of atomic energy, communications and defence.

1.2. Electronics in India began with the introduction of audio-broadcasting in the 1920s. However, significant development started in early 1950s with the setting up of two major factories with foreign collaboration viz. Indian Telephone Industries Ltd. (I.T.I.) to support essentially the telecommunications systems of the country and Bharat Electronics Limited (BEL) to meet the needs of Defence services in terms of equipments and provide a base for the manufacture of components.

1.3. Till fairly recently, however, not much had been done towards having an integrated development plan for the electronics industry in India. Piece-meal purchases were made by different user departments from wherever suitable equipments were available in foreign countries. This meant an increasing drain on the foreign exchange resources of India with no conscious, well-thought out strategy to promote the growth of the industry indigenously on systematic lines. Import of equipment from different countries, problems of large inventories, and chronic shortage of foreign exchange often lead to non-availability of components and spare parts, ultimately hampering the development of the industry. Whatever growth took place was brought about in a haphazard manner. A number of independent units, mostly with foreign collaboration, came into existence primarily to supply consumer items and systematic development did not start with a view to establish a modern sophisticated industry which should occupy a competitive position in the world. An overall view of the industry was taken for the first time by an Electronics Committee appointed by the Government of India at the suggestion of the Department of Atomic Energy, with Dr. H. J. Bhabha as its Chairman.

1.4. The Bhabha Committee was appointed by the Government of India in August, 1963 with the following terms of reference:--

- (a) to assess the total requirements of the country in respect of various items of electronic components and equipment;

- (b) to survey the existing and potential sources of supply and to recommend how best these sources can be tapped and capacity expanded;
- (c) to recommend measures for planned development of electronics, so that the country as a whole may become self-sufficient in this field in the shortest possible time and in the most economical manner.

1.5. A few days after the Committee had finalised its Report titled "Electronics in India" Dr. Bhabha died in an air accident. Thereafter, for advising the Government in the implementation of the recommendations of the Bhabha Report, a reconstituted Electronics Committee was appointed under the chairmanship of Dr. Vikram Sarabhai in June, 1966. Under the auspices of this Committee, a National Conference on Electronics was organised by the Government at Bombay in March, 1970. In the conference the importance of developing an integrated and self-reliant electronics industry in the country and the need for rapid progress in this regard was emphasised. In order to ensure the necessary balanced development of electronics in the country, the Government of India considered it necessary to set up an organisation, free from all non-essential restrictions or needlessly in-elastic rules, 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 were necessary for the country to attain self-reliance in the shortest possible time and in the best possible manner. After careful consideration the Government of India constituted a separate Department of Electronics and set up the Electronics Commission in February 1971 under the chairmanship of Professor M. G. K. Menon.

1.6. The Bhabha Committee estimated the requirements of electronics equipment for India over a ten year period (1966—75) to be of the order of Rs. 1650 crores at 1964 prices as against Rs. 26 crores of equipment produced domestically during 1964.

1.7. The representatives of the various ministries and organisations, who would be the major users of electronic equipment in the country, were requested to furnish the requirements of their respective organisations for electronic equipment and components during the ten years. The Committee was not in a position to make an independent assessment of the requirements; this was particularly true in respect of the Defence Ministry. The estimated requirements of electronic equipment for the public, such as industrial electronic equipment and test instruments, were fully discussed and final figures were arrived at. To arrive at the total demand for electronic equipment during the next ten years, the Committee by and large

simply adopted the figures provided by the various user ministries/departments and classified the requirements according to different types.

1.8. To meet the requirements of Rs. 1650 crores of equipment during the ten year period, the Committee proposed two alternative rates of growth for the industry, assuming that entire requirements will be met indigenously viz.,

1. *Linear growth*

Starting from the second year (1966-67), the industry should increase its capacity annually by Rs. 30 crores. This way the available capacity in 1975 would be Rs. 300 crores, needing Rs. 84 crores of components, including primary materials. The total investment would be of the order of Rs. 170 crores and total production over the ten year period would be nearly Rs. 1650 crores.

2. *Geometrical rate of growth*

The industry should be made to grow at the rate of 38 per cent per year. This way the equipment produced during the ten years will again be of the value of Rs. 1650 crores. However, capacity created in 1975 would be of Rs. 546 crores, needing an investment of Rs. 294 crores.

1.9. A detailed statement showing the requirement of electronic equipment in India during the period 1966—75 as estimated by the Bhabha Committee is given in the Table—1.

**TABLE—1**

*Targets set for production for electronic equipments, components and materials.*

*(All Figures in Rs. Crores)*

	1	2	3	4	5	6	7	8	9
EAP (1975)		73	59	57	50	26	33	7	84 28
TEP (1966— 75)		450	310	290	250	150	165	35	NA NA

**NOTE**

EAP (1975)—Estimated Annual Production by 1975.

TEP (1966—75)—Total Estimated Production from 1966—1975.

—Radio receivers and other consumer products.

2—Low power Radio Communication Equipment.

3—Microwave system and associated equipments including radar and radio navigational aids.

4—High power radio transmitters, industrial heating equipments, railway signalling and process control installation and other major industrial equipments

5—Electronic equipments for line communication system.

6—Computing, data processing and nuclear electronic equipment.

7—Test instrument.

8—Components.

9—Primary materials.

1.10. Actual production of electronic goods year-wise since 1964-65 is given in Table—2 below, sector-wise break-up of actual production can be seen at Table—3.

**TABLE—2**

*Manufacture of Electronic Equipments and Components*

*(Figures in Crores of Rupees)*

S. No.	Year	Entertainment equipment	Defence equipments byBEL and HAL	Tele-communication equipment	Other instruments computers	Total	Components	Total Electronics production
1.	1964-65	17.00	5.70	3.00	0.80	26.50	4.00	30.50
2.	1965-66	24.00	6.60	3.00	3.50	37.10	6.50	43.60
3.	1966-67	32.00	8.70	3.20	6.10	50.00	10.00	60.00
4.	1967-68	40.00	13.30	3.50	8.20	65.00	15.00	80.00
5.	1968-69	48.00	21.30	4.70	11.00	85.00	21.00	106.00
6.	1969-70	65.00	28.00	5.00	12.00	110.00	28.00	138.00
7.	1970-71	80.00	32.00	6.00	20.00	138.00	37.00	175.00
8.	1971-72	55.00	28.00	42.00	14.00	139.00	41.00	180.00
9.	1972-73	65.00	30.00	49.00	18.00	162.00	44.00	206.00

**TABLE—3**

*Annual Production (Sector-wise)*

	1968-69	1969-70	1970-71	1971-72	1972-73
(a) Public Sector	55.4	63.7	79.4	92.3	111.8
(b) Private Sector	50.6	74.3	95.6	87.7	94.2

**1.11. The Committee note that there has been a steady growth of the Electronics industry in India since Bhabha Committee made its recommendations in 1966. The total Electronics production has increased from Rs. 30 crores in 1964-65 to Rs. 206 crores in 1972-73 which amounts to about 7 times the production in 1964-65. Production of equipments has also risen from Rs. 26 crores in 1964-65 to Rs. 162 crores in 1972-73. Similarly the production of components has also shown an eleven fold increase during the same period.**

**1.12. In spite of these strides, however, the initial momentum of growth in the entertainment electronics has not been maintained from 1970-71 onwards. Having attained a level of Rs. 80 crores of production of entertainment equipments in this sector in 1970-71 it has dropped down to Rs. 55 crores in 1971-72 and Rs. 65 crores in 1972-73. Even allowing for the change in the mode of computation, it is obvious that the growth rate has slowed down in the last three years. The country is also lagging in the target put forth by the Bhabha Report regarding components. The production in this sector is likely to be less than the Rs. 84 crores envisaged in that Report.**

**1.13. In view of the fact that the industry occupies a key position in development of modern science and technology and is destined to play a vital role in the field of Atomic Energy, Communications, Defence, Education, Entertainment and Space Technology and in view of its increasing importance in monitoring and control of production processes in the key industries, the Committee feel that it is essential that a balanced and accelerated growth of this industry is ensured.**

**The Committee welcome the constitution of the Electronics Commission and the Department of Electronics to achieve these goals.**

### **B. Higher Take-off**

**1.14. It may be observed that many of the recommendations of the Bhabha Committee are well on the way of being accepted and implemented. Some of them have been discussed at appropriate places. One of the important recommendations made by the Bhabha Committee is as follows:—**

**“It is essential that action should be taken simultaneously to design, develop and produce the next generation of equipment indigenously. It should not be necessary to resort to any foreign consultancy after the first three or four years and many of the**

plants even in the first year are capable of being set up without reliance on imported know-how on the basis of the knowledge and expertise which already exist in the country."

1.15. The Committee wanted to know the extent to which this recommendation had been implemented so far, e.g., how far it had been possible to design, develop and produce the next generation of equipment envisaged in the recommendation, to what extent it had been possible to dispense with foreign consultancy.

1.16. It has been stated by the Department of Electronics that historically, most of the productive activity in the field of electronics, including that in the public sector, inevitably started with foreign technical collaboration or under license. Since then, a number of notable achievements, both way of dispensing with technical collaboration, as well as development of indigenous know-how, have taken place. So far the major effort in the sphere of professional electronics, and well-nigh the entire effort in the field of defence electronics and telecommunication, has been in the public sector; most of the striking achievements, therefore, have naturally been confined to the public sector.

*Bharat Electronics Ltd. (B.E.L.)*

1.17. B.E.L. went into production in 1956. At that time, the requirements of various government agencies were diverse in types, quantities were small, and the needs were immediate. Most of the production activity in B.E.L. therefore, started under licence to save time and foreign exchange. Since then, B.E.L. is stated to have come a long way in indigenising an appreciable part of its productive effort. Out of some 40 collaboration agreements which B.E.L. entered into with foreign agencies, about 20 have already expired and have not been renewed. The rest, with the exception of a few, will expire in the course of the next five years. B.E.L. now produces some 30 odd types of communication equipment developed under its own roof and 16 more are expected to be taken up for production shortly. Most of the communication equipment presently in production in B.E.L. are stated to have been indigenously developed. Some success is also said to have been achieved in the indigenous development and production of certain types of radars. A number of electronics tubes, ceramic capacitors, crystals etc. have also been developed and are being produced indigenously. Some of the other products by B.E.L. by taking indigenously developed know how from outside B.E.L., but within the country, are fibre glass components and accessories (with National Aeronautical Laboratory) electronic desk calculator (Jadavpur University) I.F.F. equipment (D.L.R.L.), IC (TTL), Semi-conductor Devices (TIFR).

1.18. B.E.L. has under way a substantial Research and Development programme. A number of development programmes are devoted to the development of communication equipment in HF, VHF, UHF and Microwave frequencies. In HF and VHF range, work has been undertaken on a new generation of communication equipment to replace those in use in the Army and Home Ministry. These are expected to go into production in the next one or two years. Separate groups also exist for development of radars, digital system and peripheral equipment, Broadcast and T.V. equipment etc. Some of the important development programmes in the field of components include development of integrated circuits, active discrete and monolithic filters, chip capacitors and a variety of electronics tubes. Taking into account the development programmes under way, the present complexion of equipments production in BEL is expected to change as follows:—

	<u>1972-73</u>	<u>1975-76%</u>
Licensed Production	52	33%
B.E.L. Design	35	59%
Partly B.E.L./Partly licensed	13	8%

#### *Electronic Corporation of India*

1.19. E.C.I.L. went into production in 1967. It was set up with some 300 personnel taken from Bhabha Atomic Research Centre (previously Atomic Energy Establishment, Trombay) who formed the nucleus of staff at ECIL and brought over the expertise accumulated over the years at Trombay. It is stated that right from the beginning E.C.I.L. started its production effort on the basis of know-how developed at AEET (Now BARC). Even today practically the entire production of E.C.I.L. is stated to be based on know-how either developed in-house or taken from B.A.R.C., or other laboratories/Research Institutions in the country. The only marginal exception has been the buying recently of certain designs for the manufacture of antenna systems; even here only such designs have been bought as were not likely to be developed in the country within the given time schedule.

Some of the new instruments recently introduced by E.C.I.L. are the 50 MHz fully transistorised wide band oscilloscope, the 400 channel analyser made to design evolved by BARC, the CCTV system, the ultra-sonic flaw detector and some medical instruments. The Corporation has also made recently excitation control equipment developed by CEERI, Pilani,

for diesel locomotives. It has also successfully developed and produced recently synchros and servo-motors, electrolytic solid tantalum capacitors, ceramic trim pots and silicon rectifiers. Development work on Automatic Train Control Equipment is at an advanced stage of completion. Major development activity going on at present is in the field of computers.

*Indian Telephone Industries Ltd.*

1.20 The Indian Telephone Industries, Ltd., was started as a departmental undertaking in July, 1948; it was incorporated as a public company in 1950. To begin with, the Company undertook the manufacture of Strowger type of telephone exchanges and equipment in collaboration with a foreign firm. The collaboration agreement expired over 12 years ago and was not renewed. Meanwhile the Company also took up the manufacture of long distance transmission equipment based on the know-how developed by the Company. A collaboration agreement for the manufacture of cross-bar telephone switching equipment was entered into in 1964. It is informally learnt from the Ministry of Communications that this agreement has also been terminated in May, 1973.

1.21. Some of the important contributions of the Tele-communication Research Centre/ITI are the design and development of open wire carrier systems, co-axial cable and microwave links, Automatic Telex Exchange, TCM, Digital Transmission System and so on. ITI has also designed for the Railways a supervisory remote control system, a vehicle actuated signalling system for road traffic control, and so on. Important projects in hand at I.T.I. include the electronic exchange, modern FCM system and a variety of sophisticated microwave equipments. The Overseas Communication service of the Ministry of Communications has also designed and developed among other things, a semi-Automatic Message Switching System, Telex Signalling Equipment, Data Modems and Equipment for telegraph circuits. It is claimed on this basis that well-nigh the entire production, now taking place in I.T.I. is on the basis either of modified purchased designs of indigenous know-how.

*Hindustan Teleprinters Ltd.*

1.22 This undertaking, the product-mix of which includes manufacture of teleprinters, teleprinter attachments and line units went into production around 1962. As in the case of other public sector undertakings, the company started the manufacture of teleprinters with foreign technical collaboration. It is informally understood from the Ministry of Communications that this agreement is already over. The Company has developed the second generation teleprinters on its own. Additionally, the company has also developed and produced a number of items, such as ruggedised version of the automatic tape transmitter, ruggedised version



of the tape perforator etc. to meet specific demand of customers. The Company has recently developed an electric typewriter as a result of the in-house R&D. The Company is at present engaged in developing certain peripheral equipments for computers like high speed tape readers and tape punches. Among other items currently under development are:—

- (i) A new version of the electro-mechanical teleprinter with built-in automatic tape transmitter and tape punch;
- (ii) An electronic version of the teleprinter; and
- (iii) 3 shift bi-lingual teleprinter.

1.23 In addition there are some major achievements, capacity in the area of defence electronics.

#### *Shortfalls*

1.24 It has been stated that the shortfalls in the area of defence equipments appear to be mainly in the field of high power systems and avionics, mainly because the designs of next generation of such equipments are based upon the next generation of sophisticated components, for which the base has not so far been established in the country, since its gestation period is very long and the demand is very small giving very low output to investment ratio.

1.25. In this connection it has been mentioned that the product range of the Hindustan Aeronautics (Electronics Division) is highly sophisticated. Upto 1972-73, licensed production constituted about 98 per cent of the factory's production. As a result of in-house R&D effort as well as productionisation of items developed by Defence Laboratories, this percentage is expected to go down to about 90 per cent by 1974-75 and about 75 to 80 per cent by 1977-78.

1.26. It has been stated that the main thrust in the past few years, had been in the design of systems with a view to effecting maximum saving in foreign exchange for the investments both in money and manpower. This will, in addition, give the competence to choose the immediate requirements of hardware from the best available sources, help to design indigenous hardware and to standardise their sub-systems and components to suit special requirements of the users. In the next five years, in addition to systems designs, efforts will have to be made to develop and produce sophisticated components of the next generation. Some work in this regard has already been in progress, e.g. development of active filters to be used in multiplex equipment in the place of passive filters currently being used; microwave integrated circuits; hybrid circuits, special purpose

tubes such as klystrons, magnetrons, TWTs; image-convertors and intensifiers; TR switches etc. Similar work in other components areas such as semi-conductor components like special purpose—transistors, ICs, MSIs, LSIs; passive components such as metal film resistors, tantalum capacitors, ceramic capacitors, special ceramic, microwave ferrites; relays, connectors, switches etc. as well as primary materials, required in small quantity but of high purity, is also in progress.

1.27 It has been stated by the Department that in a technologically fast-changing industry like electronics it would be difficult to venture a quantitative guess about the complexion of production of the various public sector undertakings five years hence. There is no doubt, however, that with the various steps which the Electronics Commission is taking the indigenous content of the electronics production as a whole by the end of the Fifth Five Year Plan should go up substantially.

1.28. Divergent views have been expressed on the subject of progress made in the development of electronics industry in the country since the submission of Bhabha Committee Report, in various memoranda submitted to the Committee and during non-official oral evidence. It has been stated in one of the memoranda:—

“The progress of Electronic Industry in the country both in the private and public sector is rather disappointing. Future seems to be in no way brighter, As a free country we had 25 years or more to establish this industry on a sound footing and bring it up to International level. But this opportunity was completely thrown away and we must confess that the country is now in a rather primitive stage as far as the real technology is concerned especially in the more sophisticated professional electronic field. During the same period and starting with a completely shattered economy and industrial base Japan has made such a spectacular progress that probably in a few years it is expected to out-strip even U.S.A. in this field. Personally I do not feel why India also could not have done much better. Excepting in a small section in the entertainment electronics, that is, manufacture of radio broadcast receivers and to some extent components required for this section the industry has done remarkably little in other directions including entertainment of electronics, such as T.V. Stereo Amplifiers, Tape Recorders and in every branch of professional electronics.

The Government's confused thinking, non-pragmatic approach throughout and rigid division between public and private sector responsibilities in this country have been the main cause for the extremely slow progress. In this particular industry a

fundamental mistake has been made by apportioning too much responsibility to the Public Sector. Even now more than 80 per cent of the responsibility for growth in this industry rests with the public sector units. Like radio receivers if more branches of the industry were left to the private sector, results would have been much better. With the same investment facilities and assistance the Government has been giving to the public sector units private sector would have shown much better results. In making this statement it should not be assumed that I am prejudiced against the concept of public sector. I only want to emphasise that this particular industry with its extreme fast changing technology is not strictly amenable to rapid growth in a public sector environment with its inevitable slowness, checks and lesser individual responsibilities. In a narrow sector, that is, in the radio manufacturing industry the private sector was allowed certain fundamental latitude and it should be admitted it did show reasonable achievements. Probably it is the only section in electronics which showed result much beyond the level anticipated in the Bhabha Committee's report and that too with all obstacles and difficulties always associated with the poor economy of the country in general."

1.29 Similar views have been expressed in another memorandum submitted to the Committee. It has been stated that:—

"The progress has not been commensurate with investment made. Although we are fairly well-off in consumer electronics, we are lagging behind other countries in the production of specialised components and professional electronic equipment. The progress in the public sector has been disappointing considering their resources and liberal foreign exchange allocation.

The total export from the Indian Electronics Industries in 1970-71 was only US £ 4 million. This is a very small figure compared to the total investment made and is roughly 1/60th of the production in United States in that year."

1.30 An eminent Scientist, however, stated during evidence before the Committee that in so far as the setting up of new plants was concerned the trend was not to give trunk jobs to outside organisations. For instance, the Bharat Electronics at Ghaziabad and I.T.I. at Naini were not being set up with outside consultancy as a whole and were based on indigenous effort.

1.31. As regards equipment, the witness was of the opinion that for computers, loco controls, television receivers, test instruments etc., and

for many things development had been done within the country and had been done quite effectively.

1.32. The Secretary, Department of Electronics stated during evidence that Consumer Electronics is quite a heterogenous field. The main items are radio; T.V., Sound equipment and tape recorders. As regards the radio sets, the country is well-off which means to say that there is definite know-how in the country to make these and there is no difficulty to make radio sets of any type. Practically all the components required to make radio sets are essentially available in India. The pack value of imported components for a radio has been brought down to an absolutely trivial figure, namely, 25 paise per set.

1.33 As regards Television sets, as far as the basic know-how is concerned, the design of the set is fully available in India. A large number of components required are also made in India, excepting two or three devices, one of which is the deflection components. One of the main items which will continue to be imported is the large picture tube. The glass is also an imported item. But there is no capability today either in terms of know-how or at all levels including transmission as well as receivers, in the area of colour television.

1.34 As far as sound equipment is concerned, there is quite a good base for that item of the industry in terms of know-how, production and components.

1.35 There is no tape recorders industry today. It is only an assembling operation putting together several rather complex items. Some efforts are being made to build up this industry on the basis of indigenous know-how.

1.36. The representative was of the view that our ultimate objective is to get on as rapidly as possible to the contemporary level. So, it is not a question of basing ourselves wholly on the indigenous know-how. We are not a closed country in that sense. We benefit as much as possible from what could be obtained outside, but in a way which does not lead to a situation that we are on crutches ever after. That is to say, whatever we take from outside must be on the basis that we have further capability to absorb it and develop it further.

He added:—

"I would not say that the progress in the public sector is disappointing. Of course there are a lot of defects which we need to rectify and we are getting on to that job. If one expresses the view that the progress in the public sector is disappointing, it

might give an indication that the progress in the private sector in contrast is more spectacular.”

1.37 He stated that as against the consumer area, the professional area was the toughest and it was being handled in the public sector. It was not as though that private sector could not come into many of these professional areas. Computers were permissible for the private sector, but nobody had really gone into it except totally hundred per cent foreign firms in India. Medical and industrial electronics was another professional area where private sector had not entered. He stated:—

“We would like them to come in as much as possible and we are trying promotional activities. We would be delighted if they come into the professional areas.”

1.38 In this context the following remarks of late Dr. Sarabhai during the Electronics Conference are reproduced below:—

“The second point I would like to make is the question of pace-setting. I believe that it is the supreme duty of the public sector in the country to act as a pace-setter—pace-setting in terms of quality and price—and not take shelter behind the monopolistic situation in which it finds itself.”

1.39 The representative of the Department offered the following comments in this regard during evidence:—

“I do see a valid point in the criticism relating to the monopolistic attitude in the public sector. There is always a tendency to carve out areas and say this should be entirely our responsibility in a particular Ministry and in a particular undertaking. So, I am in agreement with this view that one should not allow, whether in the public sector or the private sector, a situation to develop in which a firm has a totally monopolistic situation.”

1.40. The representative of the Department of Electronics, however, pointed out that there are some areas where it is not possible to have competition because the investment is large and the technology involved is too sophisticated. As in the case of production of large scale integrated circuits a large investment is required and it also needs some of the very best people and it must be done in one place with a high degree of efficiency and there is scope only for one plant in such an area. This particular plant has been proposed in the Fifth Plan in public sector. Since this is just one plant for the whole country it will have to be in Public Sector

and that is the only way for Government to exercise control. This is necessary in order to ensure that the consumer does not pay a price for this position. But, wherever, it is possible to have a competition, it is necessary to do that rather than allow a single public sector unit.

1.41 The Committee feel that generally an effective development work has been done in the field of electronics in the Public Sector Undertakings and sophisticated equipments and components are being manufactured within the country with indigenous know-how. For example, B.E.L. has come a long way in indigenising an appreciable part of its components. Out of 40 collaborations, 20 have already expired and have not been renewed. Most of the remaining collaborations will also expire in the next five years. The variety of equipments being manufactured by B.E.L. is increasing and most of them have been developed indigenously. B.E.L. is understood to have substantial programmes for R&D also. A number of sophisticated defence items for army, air-force and navy have also been produced in B.E.L., factories. In the field of components also, they have programmes for development of integrated circuits, discrete and monolithic types. The entire production of E.C.I.L. on the other hand is based on the know-how developed indigenously either in house or in B.A.R.C. with the exception of a small element in antenna systems.

1.42. As regards Indian Telephone Industries the collaboration for manufacture of strowger type of telephone exchanges has expired 12 years ago and the collaboration agreement for crossbar telephone switching equipment entered into in 1964 has also been terminated in 1973. The Telecommunication Research Centre/I.T.I. has also important contribution to its credit like development of open wire carrier system, coaxial cable and microwave links, automatic telex exchange and remote control equipment for Railways etc. Some more development and manufacturing projects are in hand. Similarly Hindustan Teleprinters which started the manufacture of teleprinters with foreign technical collaboration in 1962, has since terminated the collaboration and has developed a second generation teleprinter and electric type-writer on its own.

1.43 In Defence area also, there is some progress in the field of antenna and troposcatter equipment and multiplex equipment etc.

1.44. In satellite communication system also some equipment for the Earth Satellite Station at Arvi is being imported. However, all the equipment required for the Satellite Instructional Television Experiment (SITE) will be produced with indigenous know-how. Some competence is also reported to have been acquired in the radar area although of relatively simple types and in the next generation of transponders. Some headway is also being made in the signalling equipment for the Railways.

1.45. Whereas on a general view, the Committee recognise that an impressive developmental work has been carried out in manufacture of sophisticated equipment in the field of electronics in the Public Sector Undertakings, there has been insufficient progress in the field of defence electronics. In high power systems and avionics even after ten years of production under foreign collaboration, the value of licenced production which was 98 per cent till 1972-73 will come down to 90 per cent only by 1974-75, as a result of the development of indigenous know-how.

1.46 While the Committee realise that the progress in the highly sophisticated fields has necessarily to be slow, it has to be recognised that this is really the most vulnerable area from the point of view of defence. It is, therefore, of urgent importance that the next few years are devoted towards development and production of sophisticated components of the next generation particularly in this strategic field and in systems design.

1.47 The Committee recommend that an integrated, well-coordinated and time-bound programme may be drawn up for achieving self-reliance in these strategic fields.

1.48 The Committee agree that there are certain areas in electronics which due to their strategic importance, economies of scale and sophisticated technology are to be earmarked to the public sector. The Committee would like the Government to remind the public sector units of their responsibility to set-up ancillary industry and to extend every assistance to the small scale sector in the interest of broad-based development.

### C. Integrated Development

1.49 The Bhabha Committee had stated in its Report in 1966:--

“The Committee consider it of the greatest importance to stress that the electronics industry has to be considered as a whole and developed in an integrated and interlocked manner. If the public sector interest is to be considered and the interest of the Indian tax-payer, who after all foots the bill for all military equipment, it is essential that all equipment, whether for civilian or military use, should be produced in the most economical manner possible, and this requires that the production of this equipment should be organised according to technologies and economies of production, as is done in the highly industrialised countries. If the separation of civil and military production is not required by security considerations even in the technically most advanced countries, it clearly cannot be justified in India. It also follows from technological considerations

that production in the public sector cannot be separated from production in the private sector, and for the optimum development of the industry it is necessary to plan it on an integrated basis taking the public and private sectors together."

1.50 Commenting on these observations of the Committee Dr. Vikram Sarabhai had observed in his opening remarks to the Electronics Conference in March, 1970 that:—

"Today the vast majority of our production of professional equipment is conducted under monopolistic conditions with no competition even amongst independent public sector companies. In spite of the electronics industry being intensive in skilled personnel and our paying salaries much below those in other foreign countries advanced in electronics, we rarely match the price of imported goods."

1.51. It has also been observed in a memorandum submitted to the Committee:—

"Before coming to the subject of public sector, it can be said that no integrated approach has been followed in development of electronics industry in India. A number of units came into existence with foreign collaboration to produce electronic components and equipment without considering the necessity of a particular know-how, economic scales of production, suitability of their application in India or for export and without any long term strategy for marketing, keeping in view the fast changing pattern of the industry all over the world.

1.52. Asked if the development of electronics industry has been on a three-tier basis as envisaged in the Bhabha Committee Report before the presentation of the Fifth Plan, the representative of the Department of Electronics stated that the approach had been that of licensing project by project. He stated:—

"In the past and until recently, the approach has been essentially what we call the licensing approach and by licensing approach I mean, any one can file an application to make a product, whether it is in the public sector or private sector; a few routine aspects are looked into such as capacity already licensed, production demand estimates etc. and a license issued or rejected. One has never really tried to carry out a balanced promotional approach, whereby you say that there are these areas which need to be licensed, these products to be made, can we find the right people, can we direct the right people



into these, and get them made. This has been, in essence, the philosophy of the Bhabha Report, namely, that you should have materials to make components and you should have components to make final pieces of equipment and unless you have a balanced system covering all the three tiers, you are unlikely to have balanced growth of the electronics industry. In the Fifth Plan, what we are now trying to do is to set up in the public sector those areas which are unlikely to be set up in the private sector as also to advertise for general purpose, for the public as well as the private sectors, so that people can go into those areas where there is really need, so that people are stirred to go into those areas, which will enable you to get a balanced growth of the industry as a whole rather than, on the basis of *ad hoc* licensing, accept or reject basis."

1.53. The witness agreed with the Bhabha Committee view that one should get items made on the basis which is nationally most desirable, namely optimum production at least possible cost. He stated that there was no question of constraints in the development of electronics industry in an integrated and interlocked manner taking the Public and private sectors together. The only constraint in the legal sense is the Industrial Policy Resolution. The Industrial Policy Resolution clearly demarcates the areas like strategic areas like Defence or Telecommunication which are at present reserved for the public sector. All other sectors are available for the public as well as private investment without any constraint whatsoever. There are enormous areas like industrial electronics, components computers available for private sector investment but these areas have not been made use of. The big industrial groups in the country dealing with major areas of industrial growth like Tatas, Birla, Kamani, DCM etc. could have profitably made use of electronics for the sake of much higher reliability, efficiency and speed in industrial processes. But the major effort has not yet started. Even in areas which are reserved for public sector the restrictions is on final products. These do not apply to intermediate steps. It was stated that the private sector capacity in electronics is still very weak. The efforts of the Department of Electronics are directed towards this end so as to make sure that the base of the industry is spread wide enough.

1.54. The Committee note that no integrated approach has been followed heretofore for the development of the Electronics Industry taking the Public and Private sectors together and on three tier basis i.e. equipments, components and raw materials as recommended by the Bhabha Committee. The approach up till now essentially has been that of licensing project by project without attempting a balanced and integrated approach, resulting in uneconomic and imbalanced growth of the industry and continued dependence on foreign collaborations in various sectors. The Committee

note that in Fifth Plan a balanced approach is proposed to be followed taking into account the different factors of growth. The Committee hope that with the setting up of the Electronics Department/Commission and the dynamic approach the Electronics industry will now be developed in integrated manner and on more systematic lines.

1.55. The Committee also note that the private enterprise has been reluctant to come forward to participate in a big way in most sectors in Electronics industry except in the consumer electronics even though no restraints exist in most of these sectors except in the strategic fields of Defence and communications under the Industrial Policy Resolution. The Committee understand that even in these fields the restraint is in regard to the end products only and not on the components and sub-assemblies etc. There are enormous areas and wide opportunities in this field for the private entrepreneurs like industrial and medical electronics, components, computers etc. but they have shown little interest in these areas. The Committee would like Government to examine this matter in all its aspects to see how best the resources and capabilities both in the public and private sectors could be utilised in the interest of achieving planned production.

#### D. Public Undertakings and the Electronics Department

1.56. The Committee wanted to know if in view of the possible parallel developments in the matter of telecommunication, defence and other spheres and in view of the probability of Central resources being spent on the same effort at different levels, it was desirable to bring all the public undertakings engaged in electronics activity under one umbrella.

In a note furnished to the Committee in this connection it has been stated by the Department of Electronics that the existing system has the following drawbacks:—

- (i) Attachment of Public Undertakings to user administrative Ministries leads to a relationship between the two, whereby the undertaking tends to be far from being autonomous. This relationship atleast in some of the undertakings, has been one of the major inhibiting factors in free commercial decision making by these enterprises, adopting a dynamic, forward looking approach and choosing of lines of growth best suited to their role as major manufacturers of sophisticated electronics equipments and components.
- (ii) Requirements of other users receive secondary priority giving rise to other user's claim for a separate captive industry.
- (iii) Pricing policies tend to be more favourable to the administrative ministry at the expense of others; particularly where the particular enterprise enjoys monopoly or near monopoly.

1.57. Disadvantages in bringing all the undertakings in the electronics and the Telecommunication fields under the Department of Electronics are stated to be as follows:—

- (i) This might lead to a monolithic structure which will not be conducive to an optimum performance of the different undertakings.
- (ii) This may give rise to personnel problems such as adoption of uniform pay structure, common authorities, promotion policies and other personnel policies etc.

1.58. The Department of Electronics feel that since that Department is also a Government Department with a manner of functioning characteristic of Government and operating with constraints that Government departments face, no special advantage was likely to accrue from bringing all the undertakings under one department even if it is the Department of Electronics. It has been suggested that with a view to promoting healthy competition, encouraging diverse design activities in same or similar areas, and promoting innovative managerial practices, it is advisable that the new industrial undertakings, as and when they are created are floated as independent companies and not as parts of their parent undertakings; existing undertakings may mother such activities at early stages but must have the courage to allow them to go away at the appropriate time as independent entities carrying out their own future. There is a tendency today to argue that all telecommunication factories of India will be set up by and only by Indian Telephone Industry (ITI). This would be totally wrong. In the view of Department of Electronics BEL, HTL, ECIL and new PSU as well as joint Sector ventures with majority public sector should all operate in this area so that a competitive situation develops; this would be in the interests of I.T.I. itself. It is only through such measures that the overall quality of performance of each undertaking can be raised to its optimum level and to the maximum national advantage. The full potential of these important objectives cannot be realised under a monolithic structure in attempting to bring them together under one administrative Ministry.

1.59. It has been suggested that the Department of Electronics as a nodal Ministry should have adequate say in and control over the vital aspects of the operations of these undertakings viz:—

- (i) framing of the objectives of the undertakings.
- (ii) Determination of their product-mix, including diversification.
- (iii) Complexion of the Board of Directors.
- (iv) Appointments to the Board of Directors and to senior management positions like Managing Directors and General Managers.

- (v) Personnel and remuneration structure|policy.
- (vi) Policy and follow up relating to development of ancillaries.
- (vii) Pricing Policies.

1.60. It has been stated that the department is being consulted now in respect of items (i) and (ii) above only and that too partially in the initial stages and in case of large operations. As things stand today, it has no power to compel the public undertakings to take up production of certain items even in cases where it feels that a particular unit has the competence to do so and that such production by it would be in the larger national interest. The department being responsible for the development of the electronics industry as a whole, must be in the picture fully and should have certain operational powers.

1.61. According to the Department an appropriate pattern under the present Government structure would be to have a joint structure of power and responsibility involving the present administrative Ministries|Departments and Department of Electronics.

It has been suggested further that:—

“It may also be worthwhile establishing appropriate institutional arrangements to ensure that the public sector undertakings in telecommunications and electronics sectors function in an integrated, cohesive and mutually efficacious manner, and in furtherance of the over-all objectives and direction of growth laid down by the Electronics Commission from time to time. Some of the problems of common interest to the public undertakings, and possible solutions to these could also be discussed and performance of the different undertakings periodically reviewed under the auspices of such a forum. It is, therefore, suggested that a Standing Management Board to be chaired by the Chairman, Electronics Commission and comprising Secretaries of the concerned administrative Ministries and fulltime Chairman|Managing Directors of the public undertakings may be set up for the purpose. To be effective, the board should meet once every quarter.”

1.62. The Committee feel that there is some force in the argument that attachment of the Public Undertakings to user administrative Ministries affects the free commercial decision making by them adopting a dynamic approach most suited to their role as manufacturers of sophisticated equipments/components and treatment of other user's requirements on secondary priority. Pricing policies also tend to be more favourable to the administrative Ministry at the expense of others particularly where these enterprises enjoy monopoly and in fact this is true of most of the undertakings in the electronics field. The Committee feel that while there is

need to allow full autonomy and decision making powers to these undertakings in the interest of their healthy development, it is also necessary that there is close coordination among these enterprises to avoid duplication of efforts and to conserve scarce financial and foreign exchange resources as well as for an overall integrated development of the industry. The Committee consider that for this purpose it would be desirable if there is an organisational mechanism which can periodically appraise the functioning of the public undertakings producing electronics items and could provide them overall guidance in regard to the policies followed by them as well as their future developments. In such a set up it would be appropriate if the Department of Electronics has an important say.

1.63. The Committee note that the Department of Electronics is consulted only initially and in case of large enterprises in matters such as framing of objectives of the undertakings and in the determination of their product mix and diversification. The Department has, however, no say in matters like complexion of the Board of Directors, appointments to the Board of Directors and to senior management positions like Managing Directors and General Managers, Personnel and remuneration structures/policy, policy and follow up relating to development of ancillaries, and pricing policies.

1.64. The Committee also note that the Department has at present no power to direct the public undertakings to take up production of certain items even where it is in larger national interest to do so. The Committee further note that the Department of Electronics is represented on the Board of Directors of BEL and Instrumentation (Kotah) only. It has no Director on the Board of Directors of Indian Telephone Industries, Electronics Corporation of India Ltd., Hindustan Aeronautics Ltd., Hindustan Teleprinters Ltd. and Hindustan Cables Ltd.

1.65. While the Committee appreciate that the Department of Electronics is being consulted in some matters such as framing of the objectives of the undertakings and determination of their product-mix, including diversification, they feel that it would also be desirable if this Department which has an overall responsibility for the development of electronics in the country has an effective say in formulation of policy and follow-up relating to development of ancillaries and pricing policies of these undertakings.

1.66. The Committee would, therefore, suggest that a suitable machinery may be evolved as the one suggested by the Department of Electronics like a standing Management Board, with the Secretaries and Directors of the Ministries/Public Undertakings on it, to ensure that all

these public undertakings function in an integrated manner in furtherance of the objective of rapid development and growth of electronics industry in the country.

1.67. The Committee find that though the Department of Electronics is charged with the responsibility for development of electronics in all the fields it does not have at present under it any manufacturing unit in the public sector. The Committee consider that it is largely due to historical reasons as the Department of Electronics has been set up only very recently.

1.68. The Committee recommend that Government should review at the highest level the question of placing units which are charged with the responsibility for manufacturing electronics under the department of Electronics in the overall interest of development and for these units being used as centres of growth for an accelerated programme of development of electronics industry in the Fifth Plan.

#### E. Application Groups

1.69. It has been suggested by an eminent scientist in the field of electronics in a memorandum submitted to the Committee that in order that the Electronics Industry may move in an integrated fashion some of the major users such as Defence, Department of Atomic Energy, Department of Space, Department of Communications etc. should have "application groups". These groups should be constantly engaged in the following tasks:

- (i) Technological forecasting for the needs of users, keeping in view the new technological trends;
- (ii) Analysing major systems into sub-systems, equipment, components and raw materials;
- (iii) Monitoring the progress of specific products through various stages of the innovation chain starting with development through batch production or full scale production. A similar group may be constituted with the specific purpose of identifying items with a large potential for exports and similarly sponsoring its development and production in the country.

1.70. Elaborating his suggestion for setting up of application groups the scientist stated during evidence before the Committee:

"For a proper scientific approach, we need a proper technological forecast and this forecast can be done by the scientific and engineering profession. But, there are certain portions which have

to be done by the users and the people who are close to the users, and this is what I mean by application groups. In other words, a small group of scientists and engineers, who are well aware of technical developments in the electronics field and who are also closely associated with the users' needs whether that is in the field of telecommunications or defence or railways or All India Radio. These people are like the people on the watch tower. Their job is to keep looking ahead—3 years, 5 years or even 10 years—and keep on generating these technological forecasts.”

1.71. The representative of the Department of Electronics stated in this connection during evidence that it is entirely desirable to have in the various areas, where electronics is used, and used not as a solitary piece of equipment but as a system, systems groups of their own, under various concerned agencies, which will try to find out what the optimal system is, what the configuration of equipment is which will meet their needs and how this will change, as technology changes and so on. He stated that to some extent this is already happening and is being done, though not in a completely organised way or in very specific organisation charts.

For instance, for the air defence system there is a systems group, in the Defence Ministry known as Radar and Communications Project Office (RCPO) which is concerned with the total spectrum of the air defence electronics system. The job of this system group is to implement the air defence system for which certain specifications have been laid down and moneys have been allocated, and one has to take it through the various stages. This programme lies in the systems area because some equipment is imported, some is manufactured here, some is based on Indian research and development and some is based on know-how brought from outside and this is being translated into production here and they have to monitor it through various stages of production to find out whether it meets the original statement of work up to the element of handing it over to the user. Apart from that, they also have within this group a futuristic cell whose job is to try to find out what is happening elsewhere in the world.

1.72. The representative of the Department added that there are other small groups concerned with other similar plans in defence, for example, in the Army, Navy etc. In the application of computers, particularly for defence purposes, there is already a group which is concerned with the development of a system language, along with the indigenous computers being manufactured in Hyderabad by ECIL.

1.73. The representative suggested that in the non-defence areas, for instance, in the Ministry of Steel, there should be a systems group set up,

which may be a part of their research and development group which exists at Ranchi. In the setting up of these groups, if any assistance is required from the Department of Electronics, that will be provided. This particularly relates, of course, to the computer area. But some of these will grow with time in other areas also; there is need for example, in the radar area, not only to take into account the defence radar requirements but also the total spectrum of radars needed for civil aviation, meteorology, shipping etc. The Committee were informed that there was a plan to set up a National Radar Council which will take into account the totality and go into the futuristic elements like modularity, standardisation etc.

There have been discussions concerning the space programme also and a specific group within the space programme was also being set up precisely for this purpose. The representative also agreed to the desirability of setting up such group in the Railways also for their two types of requirements viz. the signalling and safety equipment and microwave communications and other computer based developments in the future.

1.74. Giving a concrete suggestion in the matter representative stated:—

“My concrete suggestion is that wherever electronics is used in a large system as a configuration, I think the individual Ministries and the departments should be encouraged to set up systems groups. I would think that some of it does not happen partly because there has been a tendency to expect this to be supplied to them readymade, either a computer company supplies it or a manufacturing company like the BEL supplies it and so on, but even for them to know what they need in a real form, it is important to have a group. Sometimes, the need for such groups and the need to spend money on such groups is not recognised by Finance. This is also a fact because it is not a direct type of need. If you say that you want an officer to instal a particularly piece of equipment or to operate it, these are direct financial commitments, and the reasons for this are very clear, but if you say that you want to set up a cell which will keep looking into the futuristic technology of improvement and so on, the normal reaction is to say that it is not necessary and it is a luxury and we could cut it down. But one really has to insist upon it because it is quite vital to cutting down long-range costs. So, I would support the need to have in all the major Ministries concerned with Electronics systems groups which deal with their total needs. We shall be very happy to assist them.”

1.75. The representative, however, cautioned that these groups were not easy to create. He felt that it was easy to build up equipment than to



get a good system engineers who understood the concept of a total system and enmesh it optimally. There is something that has to be grown carefully.

1.76. The Committee feel that in order that the electronics industry could move in an integrated manner, it is essential to have system groups in every major user department like Defence, Atomic Energy, Space, Communications, Steel and Railways etc. who are in a position to perform the following tasks on a continuous basis:—

- (i) Technological forecasting for the needs of users, keeping in view the new technological trends;
- (ii) Analysing major systems into sub-systems, equipment, components and raw materials;
- (iii) Monitoring the progress of specific products through various stages of the innovation chain starting with development through batch production or full scale production.

1.77. The Committee note that such groups/cells are already being introduced to some extent, such as Radar and Communication Project Office and the National Radar Council. Some other Ministries are also moving in the matter. The Committee recommend that such groups should be set up in all the major user industries with a view to helping the Ministries as also the supplier undertakings in monitoring the progress of the specific products through various stages of innovation chain and analysing the major systems into sub-systems, equipments, components and raw material as also keep an eye on the futuristic requirements of the Ministries concerned. The Committee would, therefore, urge the Electronics Commission to provide the necessary initiative in this regard and help the Ministries/Departments to set up such groups in a systematic way. The Committee would also urge the Ministries/Departments concerned to initiate necessary steps in this direction in their own interest and in the interest of the future of the industry as a whole.

#### F. Assessment of requirements

1.78. Among the Important functions of the Electronics Commission are to call upon the important users to present their short and long term requirements of equipment, with their specifications, with a view to determining the appropriate systems and technologies involved and to make a comprehensive assessment, in both technical and financial terms, of national needs for all electronic products and integrate such needs into a single overall framework.

Detailing the achievements of the Commission in this regard it has been stated in a written note that the Electronics Commission has,

on the basis of a continuously interactive process, been obtaining information from important users concerning their short and long term requirements of equipment with their specifications. This has been done in many ways. From time to time, I.P.A.G. has been sending questionnaires to various users. It has, however, been pointed out that as it is not mandatory for the user/manufacturee to reply to questionnaire, the data collected by the I.P.A.G. is normally on a sample basis. Hence the I.P.A.G. has to depend heavily on DG.T.D. for such information. Many a times, it becomes necessary for the I.P.A.G. officers to visit the various industries and collect such information through discussions. Also, I.P.A.G. has constituted (and in specific areas earlier on, the Department of Electronics had also constituted) Technical Panels, on which members representing important users as well as R & D units and production agencies were duly appointed.

1.79. A major exercise by way of compilation and examination of the short and long-term requirements of electronic equipments of the important users, including the question of systems and technologies involved, was conducted through the Task Force on Telecommunication and Electronics Industry set up by Government under the Chairmanship of Prof. M.G.K. Menon, Secretary, Department of Electronics, to work out proposals for the Fifth Five Year Plan. The members of the Task Force were drawn from major user agencies like the P&T, Ministry of Defence, Railways, All India Radio etc., from major production agencies like ECIL, BEL and ITI in the public sector, and R & D agencies like CEERI (Pillani) and TRC (Ministry of Communications). The Task Force constituted the following seven working Groups, technical support to which (as also the Task Force) was provided by the Information, Planning and Analysis Group of the Electronics Commission:

- (i) Working Group on Consumer Electronics.
- (ii) Working Group in Mass Communication.
- (iii) Working Group on Telecommunications.
- (iv) Working Group on Aerospace Electronics and Communication.
- (v) Working Group on Radar and Defence Systems.
- (vi) Working Group on Computers, Control and Industrial Electronics.
- (vii) Working Group on Instruments and Instrumentation.

1.80. The findings of the Evaluation Teams like those on Bharat Electronics and Indian Telephone Industries also helped in the process. Based on all of this work, a programme for the development of electronics during the Fifth Five Year Plan period was submitted to the Planning Commission. Further, a 10 years profile for electronics has also been drawn up.

1.81. It has been stated that apart from the global, integrated exercise outlines above, both one-time as well as standing mechanisms have been instituted/are being instituted sector-wise to ensure coordinated efforts in this regard on a continuing basis.

1.82. Recognising the crucial part electronics plays in Defence, it has been felt necessary for some time to establish an appropriate institutionalised arrangement for maintaining a close and continuous liaison and mutual inter-action between the Electronics Commission and the various Defence agencies. Accordingly a Defence Electronics Committee, chaired by the Chairman, Electronics Commission, and comprising of Defence Secretary, Secretary, Defence Production, Scientific Advisor to Raksha Mantri and three service chiefs has been recently constituted to ensure that the requirements of the defence services are concurrently taken into account by the Electronics Commission while framing its strategies for the over-all development of electronics in the country.

*Defence Electronics:*

1.83. Electronics plays an important role in the field of Defence, not only in terms of complete electronic equipments, but also as part of weapon systems, communication systems and so on. Secretary Department of Electronics is a Member of the high power Radar and Communication Board (RCB) as well as a Member of the Steering Committee of the RCB—a structure specifically created by the Ministry of Defence for the implementation of the ADGES Plan. The Department is also represented on the Steering Committee set up by the Ministry of Defence for the implementation of the Plan AREN.

1.84. The Department of Electronics is also fully associated with the Technical Coordination Authorities constituted by the Ministry of Defence for monitoring the various developmental projects, both in the area of Plan ADGES as well as Plan AREN. The Department is also kept in the picture regarding other electronic requirements of the armed forces. It has been stated that the Department's association with these agencies, set up by the Ministry of Defence, has been useful both in terms of understanding the requirements of Defence, as regards these two major Defence Plans, as well as for providing the necessary feed-back to the relevant authorities in Defence of the work being done by the Department in furtherance of meeting the Defence needs in respect of these two plans.

1.85. Another major area in which the Department proposes to establish continuing institutional arrangements for liaison and coordination is the one of Radars, which are needed not only by the Defence services but also by a variety of civilian organisations (like Civil Aviation, Meteorology Space etc.), for surveillance, tracking, navigation, guidance, control etc. A

National Radar Council (NRC) to be chaired by the Chairman, Electronics Commission and comprising representatives from the major agencies concerned with the development, production and use of Radars, both in the Defence and civil sectors, is proposed to be set up shortly for the purpose. The proposal has been agreed to by Ministry of Defence and by Electronics Commission; and the paper is being sent to the Cabinet for approval. The NRC will function under the overall guidance of the Electronics Commission. A small Project Office located in the Department of Electronics, will service and assist the NRC in discharging its coordinating and integrative functions outlined above.

1.86. The Department was actively associated with the high-level Committee on Telecommunication Capacity Planning, set up by the Ministry of Communications under the chairmanship of Shri M. S. Pathak, Member, Planning Commission, to prepare a perspective plan for stepping up of indigenous capacity for manufacture of all types of telecommunication equipments. The findings of the Telecommunication Research Review Committee, under the chairmanship of Prof. M. G. K. Menon, have helped, *inter-alia* identify the areas in which the present R&D effort is lacking or inadequate, especially in the context of the international designs and technology in this field, and the various measures necessary to build up R&D facilities designed to meet indigenously the country's requirements of telecommunication equipment, based on contemporaneous technology, to the extent possible. The Department was also associated with the Committee set up to recommend the type of equipment to be manufactured at the second switching factory in the public sector.

1.87. As regards continuing mechanisms, for the purpose, it has been stated that a senior technical officer in the Department has been charged with the responsibility of maintaining continuous liaison with the concerned user agencies as well as the development and production agencies in the tele-communication field and oversee the follow-up action in critical areas. For instance, the Department has taken the lead and is currently engaged in arranging coordination meetings with the concerned agencies to work out concrete steps to speed up the programme of indigenous development and production of microwave equipment required in volume by the P&T and Railways. Earlier, the Department took the initiative to accelerate the development-production cycle in respect of UHF communication equipment required by the Indian Oil Corporation and P&T; the current efforts by the Indian Oil Corporation and P&T; the current efforts at indigenisation of this equipment alone should result in the manufacture of this equipment worth about Rs. 6 crores over the next five years.

### **Computers**

1.88. A number of Evaluation Committees were set up by the Department for carrying out an analysis of the largely concentrated computational

demands for various applications in different locations of the country; Bangalore, Calcutta, Delhi, Kanpur and Madras.

1.89. Sector-wise studies relating to specific or special requirements of computational needs of different sectors such as the agriculture, education, defence, meteorology, etc. have been made in consultation with the concerned users. The Department has also been concerned with the planning of a joint Reservation System for Air India and Indian Airlines. The Department has also carried out a study of the requirements of computer facilities for a typical large steel undertaking. A systems approach for planning and meeting the computer requirements of the Steel Sector is being evolved in consultation with the Ministry of Steel. Similar studies in other industrial areas are being planned.

1.90. Among the other efforts made so far in the direction of estimating computational requirements of various kinds and the determination of systems and technologies to be adopted, mention may be made of the Technical Panels on Electronic Desk Calculators and Mini computers as well as a number of IPAG studies especially those dealing with various techno-economic aspects relating to indigenous production of mini computers and programmable calculators and the one on the economics of regional computer centres.

#### *Other Areas*

##### *Railways:*

1.91. The Department of Electronics provided technical support to the Technical Group constituted by the Ministry of Industrial Development, to consider whether there was need for importing know-how for the manufacture of Automatic Train Control (ATC) Equipment in the country. The Department of Electronics is actively monitoring the programme of indigenous development and production of the ATC equipment, through the Electronics Corporation of India—a wholly owned central public undertaking. A meeting between Secretary, Department of Electronics and the Chairman, Railway Board, was also held in July, 1973, to discuss the Railways' requirements of various types of electronic signalling equipment, with particular reference to the manufacturing programme required to meet the Railways' needs of Electronic Axle Counters, Last Vehicle Control Device, Central Train Control Equipment and Automatic Train Describer. The Department has also obtained the future requirements of the Railways regarding various types of electronic signalling equipments, with a view to initiating the necessary promotional measures in this field so as to meet the Railways' increasing requirements in the vital field of safety devices. Institutional arrangements for maintaining continuous liaison and dialogue with the Ministry of Railways on this subject will be considered in the light of electronic component of the 5th Five Year Plan Programme of the Railways.

***Ministry of Home Affairs:***

1.92. The Department of Electronics has been associated with the techno-economic analysis regarding the establishment of production facilities to meet Home Ministry's requirements of wireless sets for Police, BSF and other para-military forces over the next five to ten years.

***Mass Communications:***

1.93. A preliminary meeting to discuss the requirements of the All India Radio in the field of transmitters and the question of initiating the necessary steps towards achieving self-reliance in this field as early as possible was recently held with the officers of Ministry of I&B, A.I.R. and B.E.L. It is proposed to consider the question of having some kind of an inter-departmental Standing Committee to monitor the programmes in the area of Mass Communication.

***Space:***

1.94. The Space programme consists broadly of two segments, the ground segment and the space segment. A characteristic feature of our space programme in relation to the ground segment has been to meet the requirements of electronic equipments for the purpose through indigenous development and production of the systems involved. The critical area in this sphere is the one of high reliability components and major test instruments, for which we depend largely on imports. It is proposed to examine this problem in detail and initiate suitable measures to develop and produce such components and instruments indigenously to the extent techno-economically feasible. There have been several discussions with the Space Commission concerning this matter. As regards the space segment of the space programme, a Task Force was constituted recently to look into this aspect in its totality (INSAT Task Force). The report of the Task Force has been submitted to the Planning Commission.

***Atomic Energy:***

1.95. The electronic requirements in this sector are largely in the sphere of different kinds of power-reactor, monitoring and control instruments. Most of these instruments have been developed indigenously by the Bhabha Atomic Research Centre of the Department of Atomic Energy and productionised by the Electronics Corporation of India Ltd. This aspect is monitored by the Department of Electronics mainly through the production programme of ECIL.

1.96. It will thus be seen that instead of using the powers vested in the Electronics Commission by the Cabinet, to call upon important users, the

Electronics Commission has been conducting its work through an interactive process, to elicit the maximum cooperation from all agencies concerned. The fact is that the requirements of the various agencies cannot be explicitly stated by them. It is related to the priority given to a particular agency within the overall national framework and consequent availability of resources to it, including the component of foreign exchange. Technology, cost effectiveness, increasing degree of indigenisation etc. are all factors which ultimately go into any statement of requirements and the manner of their fulfilment. The Department of Electronics believe that this can only be achieved through a continuous interactive process, of the type the Electronics Commission has been engaged in.

1.97. It has been stated that it is not mandatory for the user/manufacturer to reply to the questionnaire. The data collected by the I.P.A.G. is normally only on a sample basis. Hence the IPAG has to depend heavily on DGTD for such information. Many a times, it becomes necessary for the IPAG officers to visit the various industries and collect such information through discussion.

1.98. Asked whether arrangements for collection of information through the DGTD were satisfactory, the representative of the Department of Electronics stated that there could be further improvement in this regard. He said that the DGTD obtains information on a mandatory basis and consolidates it. Such consolidated information is then made available to other Departments and Ministries of Government. The representative stated that it would be desirable to institute a system whereby even the basic information obtained by the DGTD on a mandatory basis can be made available to other agencies, since it would not be desirable for a number of agencies to collect such information independently.

1.99. The Committee appreciate the interest and zeal with which the Electronics Commission have been collecting the information in regard to the long-term and short-term requirements from important users of equipments with specifications on the basis of a continuously interactive process. They also note the efforts made in this direction by constituting a Task Force on Telecommunications and Electronics under the chairmanship of the Chairman, Electronics Commission and with Members drawn from user agencies. Based on this exercise, a programme for the development of Electronics during the Fifth Five Year Plan has been prepared and a 10-year profile for electronics drawn up. Furthermore, both one time as well as standing mechanisms have been and are being instituted sector-wise to ensure coordinated efforts in this direction in areas like Defence, Telecommunications, Computers, Railways, Home Affairs, Mass Communications, Space and Atomic Energy through meetings, panels and other efforts.

1.100. The Committee note that since information collected by I.P.A.G. from user agencies by means of questionnaires etc. is not mandatory, they have to depend heavily on the D.G.T.D. The Committee note, however, that the information obtained by D.G.T.D. which is on a mandatory basis, is available to other departments only in a consolidated form. Since it may not be desirable to obtain information through a number of agencies, the Committee recommend that ways and means may be found after mutual discussions to make available the requisite information to the IPAG and if necessary, to other user Ministries also to meet their requirements. The Committee need hardly emphasise that the meaningful information thus made available to the IPAG will help them in making a more scientific and realistic assessment of electronics in the country which is a pre-requisite for sound planning.

### G. Statistics

1.101. The Committee desired to know the number of electronics industrial units Sector-wise in each State—Small Scale, Large Scale and Public Sector, the value of their production the value of import content in the the production for each year since 1965-66 and the measures taken to reduce the import content in the production of electronics equipment and goods etc., in the country since 1965-66 and the success achieved therein.

1.102. It has been stated by the Department of Electronics that 'the subject of Electronics has been the responsibility of the Ministry of Industrial Development till Bhabha Report was submitted in January, 1966. Subsequently, it became a part of the Ministry of Defence Supplies till June, 1970, when a separate Department of Electronics was set up in the Cabinet Secretariat. The Electronics Commission was itself set up only in February, 1971 and the Department of Electronics was then brought under it. Thus till 1970, the Department of Defence Supplies in the Ministry of Defence was concerned with the growth and development of electronics. The detailed information as asked for by the Estimates Committee is not readily available with the Department and it may perhaps be difficult at this stage to compile such detailed information. Information as is available with the Department is given in Table 2.

1.103. It has been further stated that the import content in the manufacture of electronic equipments and components has been systematically brought down in recent years. In the field of Radio, for instance, the import being allowed per receiver is almost negligible (25 paise per set) which is being hardly utilised by any manufacturer. Even in the case of the TV Receiver, the imported pack-value allowed has been substantially reduced this year to Rs. 60 per set; this is besides the import of material per picture tube (of the order of Rs. 100) produced exclusively by BEL.



at Bangalore. The pack-value allowed for most of the other entertainment equipment is similarly being constantly reviewed, keeping in view the availability of indigenous components.

1.104. In the field of components, efforts are being made to progressively reduce the value of the imported material which is currently of the order of 20 per cent to 25 per cent. In transistors, the import per piece has been brought down from 50 paise to 20 paise, which represents 5 to 10 per cent of the cost of these items. In magnets, the increasing switch to ferrite magnets (whose import content is small) from cast alloy permanent magnets will reduce the import requirements for this purpose. Components required for Tape recorders such as recording and erase heads, tape decks and micro-motors are being encouraged for indigenous production. It must, however, be pointed out that sometimes, the quantities required for this purpose are comparatively small due to the limited demand in the country and it may be desirable to import small quantities rather than set up expensive manufacturing facilities for the same. Hence, in some areas, complete indigenisation may neither be feasible nor desirable.

1.105. Asked to furnish the value of complete electronics equipment imported each year since 1965-66 in the various sectors of electronics industry such as consumer electronics, communications, Defence Computers etc. it has been stated by the Department of Electronics that the Statistics on the import of electronic equipment since 1965-66 is available only in the form of consolidations from the "monthly statistics of the foreign trade of India" published by Department of Commercial Intelligence and Statistics (Calcutta). These import figures are not only incomplete but also consolidated in terms of categories which do not differentiate between electrical, electronic and electro-mechanical equipment. The primary documents received at various customs offices in the country are, after the above type of consolidation, reclassified and finally stored ship-wise. The retrieval of detailed information from the existing documents is a logistically complex job requiring, for electronics data alone, considerable effort both in terms of manpower and time on the spot, at all customs offices. Part of this work has been taken up by the I.P.A.G. in the customs offices of Bombay and Delhi for collecting, on a regular basis for the current data.

1.106. The Committee have been informed that I.P.A.G. Cells at Madras and Calcutta are being set up for collecting, in addition to other tasks, the data from customs offices. So far, it has not been possible for the relevant files to be made available in the customs offices to the personnel of the I.P.A.G. nor have customs offices allowed so far, the primary documents to be taken over to our office on a routine basis. It has been stated that this is a basic problem that has to be tackled at the source itself through either of the two possible approaches.

(i) Photocopying all the documents giving access to them in a centralised manner, to all the interested ministries (ii) Computerising the source documents over a period of ten years and bringing out detailed consolidated reports in different sectors as required by the respective ministries.

As an interim measure I.P.A.G. has taken up the issue with customs offices and D.G.C.I. & S. for reclassifying electronic items as required by the Electronics Industry. Till these measures are fully implemented precise data about the import of electronic equipments cannot be obtained.

1.107. During evidence the representative of the Department of Electronics stated:—

“Our import substitution is on the basis of projections. We know what we need in respect of defence equipments, communication equipments, mass telecommunications equipments and so on. We know what the capability today is. We know what can be produced, we know what capabilities are there. So difference between these two would be there and the question is how is it to be met. So, we are making efforts to see that difference is brought down to the minimum as fast as possible. We mean substitution on a futuristic basis rather than on the basis of previous numbers. They are not available, they are not reliable and they do not give us a clear indication of what is needed for future.”

1.108. Asked to state the difficulties being faced in this regard he stated:—

“The responsibility for these areas vests in different departments. Foreign exchange comes under Finance. Import licence comes under Commerce. When things come by air or ship, they come into various ports, etc., and that again gets handled by Customs. All statistics is maintained in Calcutta. Payments are made through Reserve Bank of India. Then comes the basic problem of classification.”

1.109. Another representative of the Department of Electronics further elucidated the point as follows:—

“Information input is extremely important. I do not have means of knowing, for instance, how many capacitors of a particular type are imported. Certain things are imported under some other names and here the question of classification comes in. This is an essential thing which is to be attended to. Customs office get information and this information should be computerised.

1.110. The Committee note that the Department of Electronics have no information regarding the number of units engaged in Electronics production in different States and sectors i.e. small scale, large scale etc. and the value of their production. It need hardly be emphasised that this is the basic information for a proper assessment of the real status of the industry in different sectors and in different parts of the country as also of the precise overall picture of the industry in the country and its requirements. The Committee suggest that adequate arrangements should now be made for the collection of such information on a regular basis.

1.111. The Committee note that detailed information about the electronic items imported in the country is not available with the Department of Electronics. They note that the 'Monthly Statistics of Foreign Trade of India published by the Directorate of Commercial Intelligence and Statistics, gives import data in broad terms only (e.g., computers, components, instruments etc.). It does not give detailed information about imported items like diodes, digital, voltmeters, integrated circuits etc. Moreover from the existing statistics regarding imported electronic items, it is not always possible to differentiate between electrical, electronic and electro-mechanical equipment. The Committee note that the I.P.A.G. is attempting to collect the detailed information about the import of the electronic items by deputing their staff at the various custom offices.

1.112. The Committee need hardly emphasise that for a purposeful planning, for the development of electronics industry, it is absolutely essential that detailed information regarding the electronic items imported at present, is available. In the opinion of the Committee, such a detailed information would be very useful as it would enable intending entrepreneurs to decide about the starting of an industry to produce an item which is being imported at present and thus would help import substitution efforts in a positive way. The Committee recommend that effective measures should be taken by Government immediately to ensure that detailed information about imported items not only in the electronics field but in other fields also is available to the public, to enable them to go in for import substitution in a meaningful manner.

1.113. The Committee would also like Government to ensure that there is no delay in the publication of the 'Monthly Statistics of Foreign Trade of India' containing detailed and meaningful information. The Committee would like Government to take all necessary measures to streamline and rationalise the compilation and timely publication of this information.

1.114. The Committee understand that a number of parties/undertakings have been importing items in false names or misleading names and at times, it is not possible even to know what has really been imported. This

**underlines the need for giving training of a specialised nature to the custom staff to identify and correctly tabulate the sophisticated items.**

### UPDATING BHABA COMMITTEE REPORT

1.115. One of the functions of the Information, Planning and Analysis Group is to periodically update Bhabha Committee Report on Electronics and to evolve viable organisational mechanism of implementation.

1.116. Indicating the action taken in fulfilment of this function, it has been stated that the IPAG is continuously engaged in analysing, sectorwise, the various aspects of the Electronics industry. These studies have been brought out in the form of 40 analysis and 19 information reports. The IPAG has also constituted several technical panels which deal with estimates of demand, technology forecasts, indigenisation aspects etc., of various items in electronics. The IPAG has also been responsible for coordinating the work of the Task Force VII on Telecommunication and Electronics, of the Steering Group on Engineering Industries, set up by the Planning Commission. This work has been brought out in the form of a report, which deals with national plans and policies. All of these activities constitute the first step towards updating the Bhabha Committee Report and more generally in evolving an overall national and contemporary strategy for electronics. It has been stated that as policy making at Electronics Commission is a continuous (evolutionary) process, the Commission will be updating such data periodically.

1.117. It has been stated that in evolving a strategy for the development of electronics in various areas the Electronics Commission will give considerable weight to the Reports of the Technical Panels. After the Electronics Commission has examined the Reports of these Panels and taken decisions that are necessary, it is planned to put out documents that will be publicly available which will be of use to the industry.

1.118. It has been stated further that the Technical Panels set up by the Department of Electronics have been extremely helpful in arriving at view-points in the Department on the applications pending before it. Thus, for instance, in the field of Semi-conductors a large number of applications were received for manufacture of Integrated Circuits and Silicon Rectifiers. These were kept pending for the recommendations of the Panels constituted by the Department of on Semi-conductor Devices. The Panel after making an exhaustive study of this area, made broad recommendations as to the likely demand for such devices in the near future and the pattern in which further licencing needs to be done including availability of indigenous know-how. Based on these recommendations all the applications pending in this area were disposed of in a very short time. Similarly, in the field of Ferrites, a Panel had been set up which made

thorough study of the existing status of Ferrite technology in the country and the areas in which further development needs to take place. In the light of these recommendations a number of applications received for this area were disposed of an efforts are being made to ensure that further research and development takes place in areas identified by the Panel.

1.119. Again, a Panel constituted by the Department of Electronics reviewed the area of Electronics Desk Calculators, made an assessment of the likely demand for this product and provided the broad guidelines under which licensing needs to be done both in the organised as well as the small scale sector. Based on these recommendations all pending applications have been processed with suitable recommendations made to the Licensing Committee or approvals granted in the Small Scale Sector.

1.120. Panels which have been set up on the production of Picture Tubes in the country as well as on the Mini-computers have submitted their reports and applications pending for these items are now being pro- it did not come under the perview of the Bhabha Committee Report.

1.121. Asked if I.P.A.G. had brought out in a single volume any report containing the electronics industry the Committee were informed that practically all the documentation towards updating the Bhabha Committee had been completed somewhat like Bhabha Committee, particularly to analyse all material components, equipments for the different sections, investments, outputs, employment etc. Since however, Fifth Plan was still under discussion and on which Parliament had yet to take a final decision, it was decided to wait till this session of Parliament. The representative stated that apart from that, updating was being done area by area even though it did not come under the perview of the Bhabha Committee Report.

1.122. The Committee note the efforts made by the Information, Planning and Analysis Group of the Electronics Commission towards formulating plan for the electronics industry on a long term basis by analysing various aspects of the Electronics Industry in different sectors by updating the Bhabha Committee Report. The Committee also note that practically all the documentation towards updating the Bhabha Committee has been completed somewhat like Bhabha Committee but the information has not so far been consolidated in a single volume pending a decision by Parliament on the Fifth Plan. The Committee hope that the whole analysis will be consolidated and published at an early date.

1.123. They also note that the Reports produced by the technical panels appointed for the purpose have proved of practical utility as in the light of the information contained therein it has been possible to dispose of various licensing applications.

## H. Development of Electronics Industry in States

1.124. It has been stated in a note furnished by the Department of Electronics that one of the important tasks of the Electronics Commission is to encourage the development of electronics on an equitable basis throughout the country. In many areas of electronics, production can be set up in different parts of the country without an elaborate infra-structure; it is, therefore, considered that it can be used as a tool for the development of backward areas. The State Governments have, therefore, been advised to embark on the development of electronics in each State in a comprehensive planned manner; and to set up for this purpose, appropriate planning committees or Boards to advise them. Chairman, Electronics Commission had written to the head of each State (Government/Chief Minister) on these lines. Individual officers of the Department of Electronics have been designated for the different States in India so that they may keep in close touch with the corresponding Officers in the State Government and provide them with meaningful advice and guidance. Secretary, Department of Electronics has so far visited West Bengal, Gujarat, Kerala, on an extensive basis and Uttar Pradesh, Rajasthan, Karnataka and Tamil Nadu on a partial basis in this connection.

### *Kerala*

1.125. One of the earliest States to take advantage was the Government of Kerala which set up a high level committee to advise the State Government on specific measures to be taken for the development of electronics in Kerala. The Committee submitted its recommendations in 1972 and a member of the Department of Electronics served on the Committee. As a result of the recommendations made by this high level Committee, separate Kerala State Electronics Development Corporation has been set up in Kerala. The new Corporation has recruited technical staff both from the private and public sector and is now currently implementing the number of letters of intent which had been issued earlier; it is also investigating new avenues of growth. A functional Electronics Estate is being set up near Trivandrum and a proposal for Testing and Development Centre from the State is also being processed.

### *West Bengal*

1.126. The Government of West Bengal have also shown keen interest in this regard. A state Electronics Development Committee was constituted and seminar was organised in November, 1972, in which the Secretary and Senior Officers of the Department of Electronics participated. As a result of the discussions a separate Electronics Development Corporation has just been set up as a subsidiary of the West Bengal Industrial Development Corporation. A number of projects are proposed to be implemented

by the new Corporation and the proposal for Testing and Development Centre at Calcutta is also under consideration.

### *Uttar Pradesh*

1.127. Another State Government which has taken keen interest in the growth of Electronics is the Government of U.P. which has constituted a Steering Committee on which Department of Electronics is represented. The Steering Committee is now formulating proposals for the establishment of Electronic Development Corporation in the State. Meanwhile a functional electronics estate is also being set up at Panki near Kanpur and number of schemes have been approved for the establishment of the estate. The proposal for Testing and Development Centre is also under consideration. In addition, the U.P. Hill Development Corporation is setting up an electronic complex at Bhimtal in the Hill area for which manufacture of T.V. Receivers has already been approved. A proposal for setting up Testing and Development Centre in this complex is also being considered by the State Government.

### *Tamil Nadu*

1.128. The Government of Tamil Nadu, has already set up a special Estate in Madras for instrumentation and electronics under the name of Vikram Sarabhai Electronics Estate. The establishment of Testing and Development centre has already been approved and more than Rs. 5 lakhs have been released for the purpose.

### *Rajasthan*

1.129. The Government of Rajasthan have also evinced keen interest in the establishment of separate electronics estate near Jaipur and Pilani. The proposal for a Testing and Development Centre at Jaipur is being formulated by the State Government.

### *Bihar*

1.130. The Government of Bihar has engaged a high level consultant to formulate a comprehensive electronic programme for that State. The report of the consultant is now under consideration of the State Government in consultation with the Department of Electronics.

### *Punjab*

1.131. The Government of Punjab is also actively interested in the development of an electronics estate near Chandigarh.

**Maharashtra**

1.132. The proposal for the establishment of Testing and Development Centre at Poona in Maharashtra has already been approved by the Department.

1.133. The proposals of other State Governments are now in the state of formulation and are being discussed with them. With the increase of technical staff in Department of Electronics over the next four months, the tempo now built up as well as experience gained, from the efforts in a few States, it is expected that there will be significant development of these activities (formulation of State Plans, setting up of the Functional Electronics Estates and Testing and Development Centres, setting up of State Electronics Development Corporation in each State etc.) to speed up the development of electronics on a wide geographic basis.

1.134. It is expected that during the Fifth Plan period, at least 8 to 10 Testing and Development Centres would be set up in different States. An allocation of Rs. 3 crores has been made for Testing and Development Centres in 5th Plan of Department of Electronics.

1.135 It has been stated that the Department has, been encouraging the State Governments to establish new electronics units outside the main metropolitan areas. In fact as stated earlier, one of the important policy angles of the Department of Electronics for the grant of new approvals whether in the organised sector or the small scale sector is the willingness of the party to move to comparatively backward areas or regions in the State. Applicants who are willing to do so are being given preference in comparison to those who want to stay in the main metropolitan area. In some cases such as TV Receivers, Tape Recorders, Electronic Desk Calculators etc. no new approvals whether in the organised or small scale sector are being accorded for location in the State headquarters or the major metropolitan areas, whilst a few such approvals are still being given if the parties intend to go to the backward areas. Electronic units will receive the same incentives for location in the backward area as other industrial units; such as capital subsidy, lower rate of interest etc. The Department has, therefore, taken a consistent policy angle of persuading entrepreneurs to go, as far as possible, to backward areas except where it is recognised that such location would be unsuitable from the point of view of significant exports, internal marketing or intra-structure needed for the specific product/process.

1.136. The representative of Department of Electronics stated during evidence that the development of electronics had been really at a few locations originally like Delhi, Bombay, Bangalore and Hyderabad. It has,



therefore, been the objective of the Department to see how far the industry can be encouraged to come up in other areas using licensing as an instrument. Where everything else is equal, entrepreneurs willing to set up industries in new areas like West Bengal, M.P., Kerala etc. are preferred for issuing licences. Small Scale Industry also gets preference. As a result of these efforts there had been a certain amount of encouragement given to the State Governments to set up more infrastructural facilities, without which the entrepreneurs will find it difficult to establish electronic estates in new area.

The representative further stated during evidence that the decision of the Electronics Commission to give a grant of Rs. 25 lakhs to each State provided the State in turn gives 25 per cent in the shape of land, buildings etc. had found a good response from a number of States. Tamil Nadu had started an estate for a testing and developing centre. U.P., West Bengal, Maharashtra and Gujarat had also been sanctioned similar centres.

1.137. On the question of development of Electronics Industry in the North Eastern Zone the representative of the Department of Electronics stated that there were problems in the development of industries in this region. Transport was a big problem. Demand within that region was also limited. Possibility of establishing one economic zone for the entire North-eastern zone could be considered. The Department of Electronics was also trying to identify the specific items which could be promoted in this area. If certain infra-structure facilities like a T.V. Station could be set up, some small industries could also come up around.

1.138. The Secretary, Department of Electronics accepted the suggestion that a Public Sector Unit could be set up in the region and small ancillary industries could be grown around it.

1.139. Asked if any schemes had been received from Bihar the representative stated that some officers of the Department had visited Bihar and he also planned to visit Bihar to see what could be done.

1.140. The Secretary, Department of Electronics stated that in case of electronics it was not desirable to have mammoth factories, the factories should not consist of more than 2000 men. Moreover, too many factories in the same place created a lot of problems including management problems. Bharat Electronics and I.T.I., both at Bangalore, have 12,000 and 15,000 workers, respectively in their factories. To some extent, they were also locating new units at other places. He informed the Committee that the Department had suggested a larger number of units for some very specific purposes, components and equipments etc. He assured that the factories will be located on a wide spread basis. There would then be a maximum

growth of ancillaries associated with them. It was however pointed out that the decisions as to their locations depended on the best economies of situation. Availability of water, power, various types of gases at reasonable prices had to be ensured. Otherwise they might not produce things competitively and would be burdened with unfavourable condition from the very beginning.

1.141. It has been stated in a memorandum received by the Committee that:—

“It is not very realistic to think in terms of developing electronics in a backward area. The electronics industry, unlike agro-industries, requires a well developed infra-structure.

The labour required in an electronics industry should possess certain minimum qualifications such as ability to understand instructions for simple operations such as assembly, dexterity in hand operations, etc. There are hardly any jobs of the so-called mazdoor type. Therefore, it really does not help the backward area, from the angle of direct employment, to start an electronics industry there as most of the labour involved will have to be brought from other areas. Besides, the modern and advanced electronics industry is not so labour intensive as to help the employment problem of backward areas materially.”

Apart from this, marketing of the products produced as well as procurement of raw materials and components require proximity to more industrially developed areas. It will be thus extremely difficult to start from scartch an absolutely new electronics unit in a backward area. Such a unit may well not be economically viable.”

1.142. In this connection the representative of the Department of Electronics stated during evidence:—

“I would say, there is some sort of confusion in defining the word ‘backward’. Backward is used by different agencies in different sense. Planning Commission designates some districts as backward and 15 per cent capital subsidy is given. Financial institutions have defined a much larger number of backward districts where there is rebate in interest rates. When we talk of backward, what we mean is this. We require certain type of infra-structural things. It does not require very much of power but it does require certain type of semi-skilled labour and also technological inputs. This is what I wanted to say

so that when these factors are present changes of success of electronic units which are not to be successful. Electronics is largely concentrated in Bombay, in Delhi, Ghaziabad, Faridabad, in Bangalore, in Hyderabad. Nagpur for instance is not a backward area in any sense of the word, but for electronics, it is backward. Kerala for instance, it has high literacy. But Trivandrum is a backward area so far as electronics is concerned. That is because nothing is produced which really sells in the country. Our attempt is to put in on a more geographical basis in areas where very little electronics exists today."

1.143. Table 4 gives the percentage contribution of various States towards the total electronic production of the country.

TABLE—4

*Percentage share of different States in Electronics Production*

State	Production in 71-72 (Rs. in crores)	% of Total production	Production in 72-73 (Rs. in crores)	% of Total production
1. Mysore	65.5	36.40	82.0	39.69
2. Maharashtra	30.87	16.69	36.55	17.69
3. Andhra Pradesh	9.0	4.86	11.0	5.32
4. West Bengal	5.0	2.70	6.0	2.90
5. Tamil Nadu	4.0	2.16	5.0	2.42
6. Rajasthan	5.0	2.70	6.0	2.90
7. Haryana	2.0	1.08	2.5	1.21
8. P&T factories at Jabalpur Bombay and Calcutta.	5.0	2.70	7.0	3.39
9. Small Scale Sector in the Entertainment Electronics	25.0	13.51	30.0	14.52
10. Miscellaneous	33.6	18.16	20.0	9.68
<b>TOTAL :</b>	<b>185.0</b>	<b>100.0</b>	<b>206</b>	<b>100</b>

*Sources :* Annual reports of various companies.

1.144. The Committee are glad to note that the Department of Electronics has taken initiative in a number of the States to encourage development of electronics industry. In Kerala a separate Kerala State Electronic

Development Corporation has already been set up and proposal for a functional Estate near Trivandrum is under consideration. In West Bengal Electronics Development Corporation has already been set up and a Testing and Development Centre is being considered. In U.P. a proposal is being formulated for the development of an Electronic Development Corporation. In Tamil Nadu also a special functional Estate in Madras for instrumentation and Electronics is being set up in the name of Instronics Estate. Similarly proposals of Electronics estates are being considered in Rajasthan at Jaipur, in Punjab near Chandigarh and in Maharashtra. In Bihar also a comprehensive development programme for Electronics is being formulated in consultation with a high level consultant. As many as 8 to 10 Testing and Development Centres are expected to be set up during the Fifth Plan period for which Rs. 3 cores have been allocated.

1.145. The Committee have no doubt that sustained efforts will be made by the Department to assist the remaining States to set up electronics industries in their areas so that the electronics industry is dispersed all over the country. The Committee are of the view that in the States where these centres/estates are not feasible due to inadequacy of infrastructural facilities, a suitable central place may be selected for development of the centre to cover the contiguous areas forming a block for the development of the electronics industry in these areas.

1.146. As regards allocation to be made in Fifth Plan for this purpose, the Committee feel that the position may be reviewed at the time of mid-term appraisal of the Plan and additional funds made available, if considered necessary, according to the progress made in the development of the electronics industry.

1.147. The Committee note that, apart from these efforts of encouraging the development of electronics in the States, the Department is also keen to develop backward areas and to spread the electronic base, out of the metropolitan or industrial areas where the industry is at present mostly concentrated. The Committee further note that the Department is using licensing as an instrument in achieving this policy and preference is given to those applicants both in the organised and small scale sector who want to set up new units outside these areas.

1.148. The Committee would in this connection like to stress that is the Fifth Plan period, particular emphasis should be laid by Government on the development of backward areas and areas outside metropolitan and industrial cities by providing special incentives and concessions for setting up industries, particularly in the small scale sector in those areas to narrow down regional imbalances to the extent possible.

**1.149. The Committee would like to suggest that Government should take positive initiative in the development of the electronics industry in such areas by setting up Public Sector units in electronics so as to encourage ancillary industries to grow round them.**

### I. Ancillaries

1.150. It has been suggested to the Committee that "in the case of professional electronics, be it in the area of telecommunications, air-craft, defence, space or computers the pace will be considerably accelerated, if as much as possible of the task is passed on to ancillaries with suitable supervision regarding quality. In this manner with a given amount of capital, managerial scale and available factory space, it would be possible to set up the productions by several-fold, while simultaneously broadening the base for production.

1.151. The position as to the quantum and value of electronic equipment being manufactured in the different public sectors through ancillary undertakings is given in the succeeding paragraphs.

#### *Bharat Electronics Ltd., (BEL)*

1.152. BEL has some 11 ancillary units operating in such areas as, carpentry, electro-mechanical components, non-ferrous castings, rubber mouldings, tool room jigs and fixtures and coil winding and transformers. Out of the total value of 1174 lakhs (Rs. 853 lakhs imported and 321 lakhs indigenous) on account of purchased components and raw materials used in production during 1971-72, total value of orders placed by BEL during 1972-73 on those units during that year amounted to Rs. 31.62 lakhs.

#### *Indian Telephone Industries Ltd. (ITI)*

1.153. ITI had 20 ancillary units supplying simpler components, spare parts, accessories, etc., to the company during 1972-73. Components and assemblies valued at about Rs. 120 lakhs were ordered on them during that year. Another 21 ancillary units were expected to go into production during 1973-74. The value of items earmarked for the ancillaries in 1973-74 was about Rs. 150 lakhs.

#### *Other Public Sector Undertakings*

1.154. ECIL purchase in one year Rs. 75 lakhs worth of goods from Small Scale Manufacturers in Hyderabad comprising of sub-assemblies, mechanical fabrication, casting, turning, press jobs, moulding, sheet metal

work, windings, T.V. Cabinets, T.V. chasis, etc. This constitutes 30 per cent of their total indigenous purchases. They are having discussions with a sub-committee comprising of IDBI, State Finance Corporation, Director of Industries, Andhra Pradesh, Industrial Development Corporation, Electronics Small Industries Associations, etc. to explore further possibilities of manufacture through ancillary industries. It has been stated that basically ancillary industries have not been able to take up manufacturing components and the sub-assemblies for ECIL in larger volume because of wide variety of products and technologies handled in ECIL in small batches.

1.155. HAL (Hyderabad) also has some 6 ancilliary units engaged in such areas like carpentry, tool room, general machine shop, sheet metal shop etc.

1.156. Instrumentation (Kota) also has an ancillary development programme and sub-contracts components, tools etc. to the ancillaries. The value of items off-loaded to the ancillary units was expected to have been of the order of about Rs. 40 lakhs during 1972-73.

1.157. The representative of the Department stated during evidence that "there is a definite Government policy in this matter and in fact a directive has been issued to the public sector units that they should do their best to identify first the various components and sub-assemblies that could be farmed out and also designate a very senior officer, who would interface with the entrepreneurs. In so far as the electronics are concerned, the ancillary development has been fairly satisfactory. The Electronics Corporation of India at Hyderabad has been a focal point for a large number of sub-contracts to the ancillary units in and around Hyderabad and an industrial area has been set apart for this purpose. So is the case with Bharat Electronics and I.T.I., Bangalore. Both these units have gone round encouraging entrepreneurs and have farmed out components and sub-assemblies as far as possible."

1.158. In private sector also, certain companies like Phillips, I.B.M. etc. are stated to have a large number of sub-contractors. In the case of new units at Ghaziabad and the I.T.I., Rai Bareilly and Naini, entrepreneurs have been encouraged.

1.159. Stating the difficulty being felt in this regard the representative suggested that there should be some type of meaningful identification, on what are the parts which can be really subcontracted. The State Governments must take a certain amount of responsibility for the quick delivery and the ultimate quality of these products. In this respect there had been some type of disinclination on the part of some large undertakings. These undertakings have feeling that the quality of products and punctual delivery are not always satisfactory. In the case of a unit engaged in dealing

with professional equipment where tolerances are much more precise it may be more difficult to farm out an item. The representative of the Department stated that keeping these things in view there has been a fairly satisfactory progress in regard to the ancillary development in electronics.

1.160. Facilities generally available to the ancillary units from the parent companies include provision of sheds at a concessional rent, a minimum guaranteed load, technical guidance, test facilities provision of critical and scarce raw materials, as far as possible, and so on.

1.161. The Evaluation Team set up by the Department of Electronics to go into the production programmes of B.E.L. had the following comments to make in this regard.

“The company has made little progress in farming out production to ancillaries, except buying a few unsophisticated components and getting some sub-assemblies fabricated from outside. There is a desire to do practically everything in-house. Basically the management does not seem to trust the ancillaries very much. While the difficulties faced by the company in this regard are no doubt there, it is necessary to make vigorous efforts to nurse and develop the ancillaries. It is time that established concerns like BEL start thinking in terms of speciality production of certain selected components through ancillary agencies. It is primarily the responsibility of the company itself not only merely to identify such components, but also to take the necessary initiatives to locate, suitable parties and help them stand on their legs to fulfil at least the requirements of such items as are economically viable for the ancillaries to undertake. Establishment of good ancillaries would also release capacity in the factory for more difficult jobs.

We have a feeling that development of ancillaries is often looked upon by the public enterprise as some kind of a social obligation imposed by a Government directive and therefore accepted with misgivings and reluctance. We would like to particularly emphasise that ancillary development is a sound economic proposition and in the ultimate commercial interests of the public enterprises. There are initial teething troubles in all new ventures. The managements of public enterprises must realise that unless they nurse the ancillaries with care, understanding and imagination, they will be depriving themselves from reaping the full economic potential of ancillary

development. Expert Supervision, technical assistance, provision of common service facilities, supply of scarce raw materials, firm orders, protection against unfair rejections and prices, are some of the important measures in the proper nursing and promotion of ancillaries.”

1.162. The evaluation Team set up by the Department of Electronics to go into the programmes of I.T.I. commented in this regard as follows:—

“We are convinced that ITI will not be able to deliver the goods unless it embarks on a big programme of farming out components, assemblies and sub-assemblies to outside manufacturers. This will help streamlining of production methods, better production planning, and control and will free capacity for equipments manufacture without sizeably adding to the plant and machinery and manpower. The efforts so far undertaken in this direction are woefully inadequate considering the dimensions of the problem and the enormous potential for subcontracting.

We have a feeling that development of ancillaries is often looked upon by the public enterprises as some kind of a social obligation imposed by a Government directive and therefore accepted with misgivings and reluctance. We would like to particularly emphasise that ancillary development is a sound economic proposition and in the ultimate commercial interests of the public enterprises. There are initial teething troubles in all new ventures. The managements of public enterprises must realise that unless they nurse the ancillaries with care, understanding and imagination, they will be depriving themselves from reaping the full economic potential of ancillary development. Expert supervision, technical assistance, provision of common service facilities, supply of scarce raw materials, firm orders, protection against unfair rejections and prices, are some of the important measures in the proper nursing and promotion of ancillaries. In the planning of new telecommunication industrial units (including those at Naini and Rai Bareilly), greater emphasis should be placed on subcontracting and development of ancillaries from the initial stage itself.”

1.163. The Committee note that although production of some items is being farmed out to ancillary units by some Public Undertakings the progress in this regard is far from satisfactory. There has been some disinclination on the part of some large undertakings to farm out components,



assemblies and sub-assemblies to outside agencies and a tendency exists to do everything in-house. The main reasons for this situation are stated to be untimely deliveries and lack of consistency in quality. Difficulty also arises in the case of undertakings dealing with professional equipment where tolerances are very rigid. In such cases these undertakings find it difficult to farm out the items to the ancillary units.

1.164. The Committee agree with the views expressed by the Evaluation Teams set up to go into the production programmes of B.E.L. and I.T.I. that ancillary development is not only a social obligation but also a sound economic proposition, in the ultimate commercial interests of the undertakings themselves, as among other things this minimises the capital risk involved and releases energy in terms of highly skilled manpower who could be more usefully engaged in other important production programmes. Moreover additional capacity for equipment manufacture becomes available without sizeably adding to the plant and machinery and manpower. The Committee endorse the suggestions made by the Evaluation Teams for the development of ancillary industries on sound lines. They hope that these suggestions will be implemented at an early date. The Committee recommend that energetic measures should be taken to identify suitable items at present being manufactured in Public Sector Undertakings and organised private sector Undertakings which could be farmed out to ancillaries profitably with a view to accelerate the growth of ancillary industries around electronic undertakings.

### J. Small Scale Sector

1.165. It has been stated by the Department of Electronics that the growth of small scale industry in India during the last 10 years has been quite impressive. The units are turning out products of high sophistication and are even able to enter the export market. The Department of Electronics has been providing active assistance to the small scale sector in electronics in view of the capability that this sector has clearly demonstrated in regard to its ability to utilise both indigenous and imported know-how, to develop and to produce a range of electronic items, such as Radios and Television Receivers, Electronic Desk Calculators, Sound Equipment, components etc. The Department of Electronics believe that the development of the small scale sector will have a noticeable impact on the growth of real entrepreneurship, particularly amongst technically qualified persons; and can also be hoped to lead to the development of backward areas. The Department holds periodical meetings with the Development Commissioner, Small Scale Industry to approve applications from the small scale sector and 212 units have been approved for various items such as components, T.V. Receivers and Electronic Desk Calculators so far.

1.166. The Department does not regard its function to have been completed only with according approvals. It has on hand a follow-up assistance programme under which individual applicants are provided with all possible help in regard to various procedures that have to be fulfilled to implement the schemes. A separate officer has been assigned for this work in the Department.

1.167. The Department has also been holding consultations with the Development Commissioner, Small Scale Industries and DGTD regarding items particularly suitable for development and production in the small scale sector, which could be considered for reservation for this sector or if this is not possible, then at least for significant licensing and promotional support in the small scale sector.

1.168. As a result of these discussions 8 items pertaining to electronics have been recently reserved for exclusive production in the small scale sector. These are the following:

- (i) IF Transformers.
- (ii) Air Trimmers.
- (iii) Assembly of Loudspeakers.
- (iv) Hearing aids.
- (v) Electronic Flash Guns.
- (vi) Amplifiers for entertainment and P.A. Systems.
- (vii) Low Cost Radio Receivers (below Rs. 200/-).
- (viii) Transistor Headers.

1.169. The criteria for reservation are as follows. Firstly there is the existing pattern of production both in the large and small scale sector in regard to particular items. Secondly, the quality of the products made in the small scale sector needs to be assessed both from the point of view of consumer equipment as well as for professional electronics. Thirdly, the capital investment required for making an item should fall below Rs. 7.5 lakhs which is definition for small industry. Lastly, the skills required for the manufacture of product also needs to be assessed before agreeing to reservation.

1.170. On the above basis, the eight items mentioned above have already been considered suitable for reservation. In respect of IF Transformers 60 per cent of the production is already in the small scale sector and the production techniques are considered simple and capital investments low. Air Trimmers are again a simple item which can be very well done in the small scale sector with little capital investment. The assembly of Loudspeakers is already being done in the small sector which counts for about 25 per cent of the production of this item. In the cases of Hearing aids almost the

entire production is within the small scale sector and manufacture is being done on an assembly basis. In the case of Electronic Flash Guns also the production in the country of about 10,000 in number is in the small scale sector.

1.171. Amplifiers for public address systems and for entertainment are primarily being done in the small scale sector. In fact, this item is also being exported by small scale entrepreneurs. Transistor Headers is a comparatively simple item which does not require large investment.

1.172. In the case of Radio Receivers there have been persistent demands from the small scale manufacturers that low cost receivers should be reserved for that sector. In fact, as much as a third of the total production (of radios of all types) in the country is now already in the small sector. That sector has been responsible for bringing down the price of Radio Receivers in the last five years which has made the popularity of Transistor Radios possible. Being essentially an assembly operation, the radio receiver industry is ideally suited for development in the small scale sector and has high labour intensive aspects and the investment of machinery and equipment is comparatively small. The reservation of radios costing below Rs. 200/- is, therefore, expected to give considerable fillip to the radio industry particularly in the semi-urban and rural areas.

1.173. The Department considers it too early to forecast the impact of the decision regarding reservation on the industry, since this has been taken only very recently. The Department of Electronics as well as the Development Commissioner, Small Scale Industries will keep a close watch on the progress made by all small units in the reserved items so as to review the policy from time to time. It is also expected that more items may qualify for such reservation in future. It has been stated that in regard to non-reserved items consistent encouragement is being given for the establishment of small and medium units by technical entrepreneurs.

1.174. During evidence, the representative of the Department of Electronics confirmed this approach and stated that the particular items which can be made of good quality and where the capital investment is likely to be small are reserved for the small scale sector. In fact this sector has already a dominant share in the production of these items. Rather, the situation has only been regularised. The representative stated that the transistor radio and low cost radio are the items where the small scale units are really the pioneers and probably one of the important points made during the electronics conference held in Bombay in early 1970 was that the scope of the small scale industry must be broadened, permitting them economic capacities of all items including professional equipment. The representative stated during evidence that the scope of the small scale industries had been quite broadened. They make quite sophisticated items;

there is no restriction on the small scale industry except their own capability. He stated that they have been given the greatest support that can be thought of.

1.175. The Committee wanted to know as to what action is taken, to ensure quality of items produced in the small scale sector as well as their availability in adequate quantities in time. The representative of the Department of Electronics stated:

“The Ministry of Industrial Development, are considering the proposal whereby raw materials required are assured in a much more liberal sense to the small scale units in the reserved areas because, basically in these areas, it is not so much the technological strength but the actual availability of raw materials which has become a bottleneck. For the small scale units, they are given raw material quotas on a different basis from that of the organised sector.”

He however, stated that:

“Even in the small scale sector, they are supposed to get their quota according to their capacity. In actual practice, unless these capacities are actually determined by the State Directorate of Industries in consultation with the Development Commissioner, they do not get it in the same way as the organised sector. In actual practice, small scale units still suffer from a disadvantage in the matter of allocation of raw materials. One of the things which the Industrial Development Ministry is doing is that the items, for which there is reservation for the small scale sector, obviously, they should be able to avail of the full benefit of getting the raw materials on the basis of their requirements.”

1.176. The Committee note that the small scale industry has attained considerable growth in the electronics field and these units are turning out items of high sophistication. They have been able to bring down prices and even enter the export market in items like radio, T.V. receivers, sound equipment etc. The Committee also note that the scope of the small scale industry is being broadened and consistent encouragement is being given for the establishment of small and medium units by technical entrepreneurs. The Committee further note that there is no restriction on the small scale industry except their own capability and a great deal of support was available to them from the Department.

1.177. The Committee are, however, concerned to note that the actual availability of raw materials, according to their capacities, has become a major bottleneck in the rapid growth of more electronics items in the small

**scale sector. Unless these capacities are actually determined by the State Director of Industries in consultation with the Development Commissioner, Small Scale Industries they do not get quota in the same way as before. In actual practice they continue to suffer in the matter of raw materials. The Committee understand that the Ministry of Industrial Development is looking into the matter. Considering the vast potential of the small scale industries in solving the gigantic problem of unemployment, and their suitability for the production of electronics goods the Committee cannot but too strongly stress the need for full utilisation of this potential efficiently by removing the existing constraints like shortage of raw materials and other inputs at the earliest.**

#### **K. Allocations for Fifth Five Year Plan**

##### *The Objective*

1.178. The basic aims of the Fifth Five Year Plan for Electronics and Communication have been laid down as follows:

- (a) To develop the infrastructure for production and development to such an extent that by the end of Fifth Plan period, the industry will be completely self-sustaining and the import of capital equipment and raw materials is brought down to the lowest limit which is economically viable.
- (b) To develop a full-fledged industry spread over all parts of the country that will accelerate the process of capital formation of all the states of the Indian Union. It is acknowledged the world over that this industry has the maximum capital formation ability.
- (c) To develop an industry spread over the public sector, organised private sector and small scale sector in such a proportion that the direct and indirect employment of technical, skilled and semi-skilled manpower, is maximised without effecting a diseconomy of scale.
- (d) To develop an industry that can ably support the defence preparedness of the country by promoting the philosophy of custom manufacture of critical items as well as components and equipments whose demand is above the scale of diseconomy calculated on the basis of scarcity of foreign exchange.
- (e) To promote the right kind of application of Electronic equipments like computers, control systems, television etc. which have a development catalysing overtone on the national economy.

*Factors favouring the industry*

1.179. The arguments in favour of a sustained growth of this industry are stated to be the following:

- (a) It is a labour intensive industry which provides more employment on the investment.
- (b) For a given foreign exchange investment, the complementary rupee investment is very high in the long run.
- (c) Capital formation ability of the industry is the highest among all sectors.
- (d) Technological competence for total self-sufficiency can be achieved within a five-year framework.
- (e) The industry is by and large location independent and can be sustained even in backward districts of every state of the country.
- (f) The size of the industry can be anywhere from a few workers to a few thousand workers, thereby allowing technocrat entrepreneurs with limited resources to enter the field and grow.
- (g) The public sector and the private sector can complement in parts and supplement in parts in a natural and homogeneous way, thereby strengthening the mixed economic framework of the country.
- (h) The industry represents a very high export potential for India in view of its labour intensiveness.
- (i) It is one of the most vital industries assisting the defence preparedness of the country. It is also a sector which would be strategically disadvantageous to depend on imports.
- (j) It is the basic industry which has helped the continuous increase of productivity of process industries as well as facilities large-scale production.
- (k) The growth of any implies a commensurate growth in its communication facilities. The industry is at the core of this activity.
- (l) The industry is well known for its ability to provide 'techno-economic multipliers' like, for example, community broadcasting, television-based education programmes for rural India, computer aided design of sophisticated equipments, nationwide computer-based information to assist the planning process, etc.

**Statistical Outline:**

1.180. (a) A total outlay of Rs. 202 crores (Total Profile—Table 5) during the Plan period is expected to result in a total production of Rs. 2,300 crores and a terminal year production of Rs. 640 crores.

(b) An outlay of Rs. 117 crores (Difference Profile—Table 6) during the plan period belongs to areas not covered by other ministries. This represents a production value of Rs. 1346 crores and a terminal year production of Rs. 430 crores.

(c) For the total profile, the investment in Public and Private Sectors are respectively 134 and 67 (1:0:5). For the Difference Profile, they are 50 and 67 respectively (1:1:3).

(d) Additional employment to 3.6 lakh persons will result, from this investment (2.6 lakh direct +1.0 lakh indirect). Capital to labour ratio for the industry is, on an average Rs. 6,500 per person.

(e) Foreign exchange investment as a per cent of 5-Year production is as follows:—

Total profile :	Per cent
Total profile : Capital + Raw material . . . . .	24
Capital inv. only	10
Raw material only	14
<b>Difference Profile :</b>	
Capital + Raw material	17
Capital inv. only	9
Raw material only	18

(f) The ratio between soft currency and hard currency requirement:

<b>Total Profile :</b>	
Capital + Raw-material . . . . .	1:1:5
Capital only . . . . .	1:1:8
Raw-material only . . . . .	1:1:5
<b>Difference Profile :</b>	
Capital + Raw Material . . . . .	1:1:7
Capital only . . . . .	1:1:9
Raw-material only . . . . .	1:1:5

(g) The foreign exchange required for raw material and components for the terminal year as a percentage of terminal year production is as follows:—

	Per cent
Total profile . . . . .	10
Difference Profile : . . . . .	4

(h) From the present level of Rs. 7 crores per year, the export from local production will increase to Rs. 23 crores by the terminal year. This represents only 5 per cent of the annual production. However, the output of the EPZs have not been taken into consideration here.

The Difference Profile assumes an average of 20 per cent growth. It should be noted that since 1960, the country has experienced a 20 per cent growth on an average.

1.181. It is claimed that in view of the projected investment pattern, the infrastructure, during the beginning of the Sixth Plan, would be so strong that not only the industry can find resources within itself but also represent a net inflow of foreign exchange.



**TABLE 5**  
**TOTAL PROFILE**  
**Investment and Production**  
*Civilian Electronics and Communication*

(In Rupees Crores)

	Capital Investment			Production	
	Private	Public	Total	Plan period	Terminal Year
1. Consumer Electronics	5.6	1.0	6.6	507	120
2. Medical Electronics	6.9	1.4	8.3	69	23
3. Instruments	12.2	1.4	13.6	155	46
4. Computers & Calculators	13.2	12.4	25.6	186	54
5. Control & Indl. Electronics	3.9	6.6	10.5	65	23
6. Components	17.1	25.2	42.3	524	} 183
7. Materials	6.3	11.0	17.3	80	
8. General Facilities	0	10.0	10.0	10	3
9. Telemetry and Two-way communication	2.2	3.0	5.2	34	} 19
10. Civii Navigation	0	2.2	2.2	9	
11. Mass Communication (I & B Ministry)	0	9.0	9.0	52	17
12. Telecommunication (Commn. Ministry)	0	51.0	51.0	610	153
<b>TOTAL</b>	<b>67.4</b>	<b>134.2</b>	<b>202.0</b>	<b>2301</b>	<b>640</b>

TABLE 6

## DIFFERENCE PROFILE

## Investment &amp; Production in Electronics &amp; Communication

(Activities which are not included in the plans of (a) Ministry of Communication, (b) Ministry of Defence, (c) Ministry of I. & B., (d) Ministry of I.D., (e) Ministry of Civil Aviation, (f) AEC, and (g) Space Commission).

(Rs. in crores)

	Capital Investment			Production		Export from local production.	Total addl. Man-power ('000)
	Private	Public	Total	Plan period	Terminal Year		
1. Consumer Electronics	5.6	1.0	6.6	507	120	3.00	16
2. Medical Electronics	6.9	..	6.9	64	23	..	17
3. Instruments .	12.2	..	12.2	138	41	7.0	30
4. Computers and Calculators.	13.2	8.7	21.9	142	43	20.0	36
5. Control and Indl. Electronics.	3.9	1.8	5.7	29	10	..	6
6. Components .	17.1	17.5	34.6	356	} 123	15.0	42
7. Materials .	6.3	9.0	15.3	70		..	15
8. General Facilities .	..	10.0	10.0	10	3	..	12
9. Telemetry, Two-way Commn.	2.2	2.0	4.2	30	13	3.0	7
<b>TOTAL :</b>	<b>67.4</b>	<b>50.0</b>	<b>117.4</b>	<b>1346</b>	<b>376</b>	<b>75.0</b>	<b>181</b>

**TABLE 7**  
**R & D PLAN**

(In Rs. Crores)

Grand Total Investment		
	Description	
2.5	Consumer Electronics	
2.5	Mass Communication	
4.0	Computers and Controls	
4.5	Control System and Industrial Electronics	
1.5	Instruments and Instrumentation	
7.5	Components	
4.5	Materials	
*27.0	Total (excluding Plans of Defence Ministry and Comm. Min.)	
25.0	Tele-Communication	
52.0	Total (excluding Plan of Defence Ministry)	

\*Out of the Rs. 27 crores, a sum of Rs. 7 crores is expected to be raised from the resources from within the industry.

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1.182. In regard to allocations made in the field of Electronics for the Fifth Plan period, it has been represented to the Committee by an eminent scientist in the field of Electronics that:—

“I feel that investment is really very small in comparison to what we contemplate in other areas of industry and I think this figure of 200 crores by itself is an obvious proof of the high priority that we should give to this industry, because with the relatively small investment, we generate support for our own industry in several fields—chemical, steel, textile, and paper. It has been a sociological impact. We want to have national integration, family planning and various things taken right to the people living all over the country without necessarily going through the written words. Because of all these things, I personally feel that this should acquire a high priority.”

1.183. The representative of the Department of Electronics explained during evidence that various possibilities of the rate of growth in the electronics industry were suggested by the Task Force VII of the Planning Commission headed by the Chairman, Electronics Commission. These possibilities were based on the experiences of some other countries in the world. Based on the study of the growth pattern in various countries in the world, it came out significantly from the analysis that three countries in the world, namely, the U.S.A., U.S.S.R., and Japan had shown almost an identical accelerated growth rate. All other countries had proceeded on a certain point in the matter of normal growth rate. Whereas it is not possible to pinpoint exactly the reasons why these three countries *viz.*, USA, U.S.S.R. and Japan have had this growth rate, the reasons broadly appear to be that the two of the countries namely U.S.A. and U.S.S.R. require the electronics on a significant basis for their security purpose, for their missile programmes, for the space programme and associated computers, communications and other programmes. These programmes had received a significant thrust and the electronics had consequently grown. Japan on the other hand has no electronics problem for the defence sector. They have, therefore, aimed at an aggressive thrust in export programme. Japan's maximum rate of growth in electronics coincided with their biggest thrust on export field. The representative further stated:

“We really need that possible accelerated growth more than what these countries have done. Today we can follow a development strategy to make such an accelerated growth possible here like that we see elsewhere in the world. But such a growth rate would have to depend quite significantly on exports, which means significant import element also. When you really talk of exports, very often you have the following situations. You might even want to import all the components,

assemble them and export them. Then you earn in foreign exchange at the end point when you sell the equipment at the price that you paid plus everything else you have done. But the Planning Commission at that stage took the view that we must minimise investment on account of the resources position and that one cannot base one's strategy entirely on the possibility of very heavily export-oriented drive. They had asked us to produce a plan for electronics which would relate more significantly to Indian requirements and can be linked with exports, rather than that be the 'prime thrust. Our plan is now related to this and it is for above Rs. 200 crores."

1.184. The representative also referred to the major programme proposed for television which is based on the Satellite. The Task Force VII of the Planning Commission had examined the possibility of using satellite in combination with the terrestrial network for a significant television programme. The purpose would be to carry developmental message in a variety of areas, education, agriculture, health, family planning etc. not only to urban centres which would normally be covered by terrestrial network but the remote parts which would not normally have been covered for a long time. The Task Force Report envisaged an investment of over Rs. 400 crores for this one area alone. Of this, a hundred crores was in software, 60 crores in space segment and the remaining 250 crores in the ground segment. Ground segment would have consisted of TV Station, broadcast, local rediffusing transmitters, T.V. Sets and so on. This programme has not been accepted by the Planning Commission for the present. The witness stated that if such a plan had been accepted, it would have implied Rs. 200 crores in electronics as end products in the Fifth Plan period itself on just one area. Since this has not been accepted, it cuts down the whole area relating to mass communication relating to T.V. as an area from the whole development of electronics.

1.185. The representative of the Department pointed out that electronics is not something which you grow for itself, you grow it for some other purposes. You require on-line process control for steel, cement and fertiliser plants. The more plants you have, the more on-line control you want. If you have larger T.V. programme, you require more T.V. sets. Electronics is a means to achieve this total end system. It is meant for defence, mass communication, T.V., industrial, metallurgical, chemical and other operations.

1.186. Regarding provisions made for telecommunications during the Fifth Plan period, the representative stated:

"We have said during the various discussions that a decision has to be taken on how much investment you want for tele-communication. It is a very important infra-structure for development. Telecommunication is a very paying enterprise. If

you take the Telecommunication part of the P. & T., you will find that it has been very profitable as an undertaking. Telecommunication is something which should be grown more rapidly, but for whatever reasons, the Planning Commission has taken a view that the telecommunication which will be provided in the Fifth Plan would be so much and no more. I would say, we should have more of it."

Answering a specific question, the representative stated:

"I think, there should be a larger allocation, because in my view the allocation made is a minimal allocation. I personally also think that we require in electronics, without question, a larger investment in R&D than what has been provided for by the Planning Commission and I will give a specific reason for it. The total amount asked for even in the second proposal—not the first proposal which we put up to the Planning Commission was relatively a small amount, that is Rs. 27.00 crores for R&D. Even that has been reduced to Rs. 20.00 crores. Now, I personally think that this is not the right position."

He however, clarified:

"But let me also explain. We requested the Planning Commission for higher allocation. After the first two years of the Plan—during the mid-term appraisal they said that they would certainly consider and reallocate the finance depending on how we are growing. In fact it is not a closed door. They are willing to consider our performance. They said that they would consider our case."

1.187. The representative stated that it has been found from experience that many of these numbers given in the profiles do not turn out to be correct ultimately for a variety of reasons including implementation. He stated:—

"The reason may be that the situation has changed in respect of technologies or priorities got changed. These numbers must be regarded as an overall gross direction in which one is going. One should not treat any one of these numbers like 350 crores or 180 crores etc. in each sector as being absolutely fixed just now and unchangeable. We would like to keep them flexible both for investment as well as for the directions in which we go because technology keeps changing and we do not want to be stuck up with a certain profile and a certain manner of investment. We should have the flexibility whereby we ensure the maximum return."

Asked if the Planning Commission appreciated this view, the representative of the Department of Electronics stated during evidence:

"I am afraid, not because they at the present moment would like to deal with figures which are rather concrete. This arises from the fact that a large part of the exercise they do arises from industries, cement, steel, power etc. whereas electronics is an industries, cement, steel, power etc. whereas electronics is an industry where the technological changes demand that there is flexibility."

The representative of the Department added:

"If the answer is to be in the form yes/no, I would say 'no'. But it is really a matter of continued dialogue. It is not that people concerned are unreasonable. They have no experience of this industry and one has to explain it to them. In a certain sense what the Electronics Commission is doing for electronics is somewhat analogous to what the Planning Commission is doing for the whole country. We are planning for the electronics industry in all its facets—materials, equipment, defence, communication etc. These may be implemented by various people, under the jurisdiction of different ministries. The Planning Commission is planning for the totality whereas we are planning for one small facet. In the total complex, I cannot really say that we should have a higher priority than, say, steel or power or cement etc. It has to be looked at from the national context. Other items like agriculture, education, etc. have their own priorities.

It is for the Planning Commission to prescribe the overall priorities. The administrative factors which stem from the general principles laid down by Parliament are looked at by the Cabinet and so on. The remaining part of the Planning process, monitoring and implementation should be left to the Department concerned. As far as Planning Commission is concerned, it can take the view of the Department of Electronics as to what allocations can be made on a year to year basis so that there should be flexibility about it."

The representative of the Department of Electronics added:

"In fact, the frustrations that we have are not so much in the planning process. They arise far more about the manner in which the industry should grow. There is a total inter-locking today involving many Ministries, the Ministry of Industrial Development, the Ministry of Commerce, the D.G.T.D. the

Department of Economic Affairs and all that. The things, just do not move. They should lay down only certain broad guidelines. The Economic Department could say that royalty payment will be between 2—5 per cent. But after that, they should leave it to us to decide what should be an acceptable royalty for a particular item.

They do not come in the picture. Similarly, in the case of foreign collaboration, they could say that this much must be the out-flow and inflow of foreign exchange. After that, they do not come into the picture.

It is there that the frustration takes place. The Planning Commission deals with overall planning. They can say that this is the priority and this is the allocation. Within that, it is for us to do. Within the allocation given to the Department of Electronics, whether we want to spend a little more on R&D or on some other item, that should be left to us.<sup>b</sup>

1.188. Tables 1 and 2 show the first and second proposals for investment in electronics and communication industry during Fifth Five Year Plan submitted by the Department of Electronics in July 1973 and September, 1973 respectively. The major difference between the two is that the second proposal deals with only civilian electronics and communication. Table 3 indicates the break-up of actual allocations made by the Planning Commission.

Table 1: July, 1973 Proposal  
(All figures in Rs. crores.)

	Total capital in- vestment 1974—79
1. Consumer electronics . . . . .	13.5
2. Mass communication . . . . .	2.1
3. Medical electronics . . . . .	14.7
4. Instruments . . . . .	23.2
5. Computers . . . . .	59.3
6. Control and Industrial electronics . . . . .	26.0
7. Components . . . . .	55.0
8. Materials . . . . .	30.0
9. Communication and navigation . . . . .	131.5
10. Defence electronics . . . . .	78.1
<b>TOTAL . . . . .</b>	<b>432</b>



Table 2 : September, 1973 Proposal  
(All figures in Rs. crores.)

	Total Capital Investment 1974—79
1. Consumer electronics . . . . .	6.6
2. Medical electronics . . . . .	8.3
3. Instruments . . . . .	13.6
4. Computers and calculators . . . . .	25.6
5. Control and industrial electronics . . . . .	10.5
6. Components . . . . .	42.3
7. Materials . . . . .	17.3
8. General facilities . . . . .	10.0
9. Telemetry and two way communication . . . . .	5.2
10. Civil navigation . . . . .	2.2
11. Mass communication . . . . .	9.0
12. Telecommunication . . . . .	83.1
TOTAL . . . . .	233.7

Table 3 : Final allocations actually made by the Planning Commission.

(All figures in Rs. crores)

	Total Capital investment 1974—79
1. Consumer electronics . . . . .	6.6
2. Medical electronics . . . . .	8.3
3. Instruments . . . . .	13.6
4. Computers & calculators . . . . .	25.6
5. Control & industrial electronics . . . . .	10.5
6. Components . . . . .	42.3
7. Materials . . . . .	17.3
8. General facilities . . . . .	10.0
9. Telemetry & two way communication . . . . .	5.2
10. Civil navigation . . . . .	2.2
11. Mass communication . . . . .	9.0
12. Telecommunication . . . . .	51.0
TOTAL . . . . .	208.6

1.189. It has been stated by the Department of Electronics in a note furnished to the Committee that the Planning Commission also felt that investments with specific reference to a massive export drive should be postponed until a sufficient base had already been created and export credibility established at a sufficient level.

1.190. The reductions effected are in the tele-communications sector and these are broadly as per the cuts in the plans of the Ministry of Communications viz. reduction from the outlay of Rs. 1208 crores to 1048 crores which included cut of Rs. 60 crores in long distance communication projects.

1.191. Asked to indicate the specific areas in which larger allocations were really essential in the interests of the development of the industry and the extent of increase required, the Department of Electronics have urged additional funds to be invested during the Fifth Five Year Plan for the following activities.

1. *Funds for the Electronics Commission.*—(a) *Standardization:* A panel on "Standardization in Electronics" set up by the Electronics Commission has recommended a sum of Rs. 8 crores to be spent on standardization. A sum of Rs. 3 crores for the same had been approved by the Planning Commission, to be spent by the Department of Electronics. It is to be noted that there are units under other ministries which are involved in this area. It is proposed that all standardization activities may be coordinated by the Electronics Commission and the sum of Rs. 8 crores as suggested may be approved for the same. It is essential to have in the country primary and secondary standards for calibration of test and design instruments.

(b) *Research and development:* A sum of Rs. 20 crores for investment in laboratory oriented R&D to be spent by the Electronics Commission had been approved by the Planning Commission. It is proposed that an additional sum of Rs. 7 crores be approved for the same as earlier asked for by Electronics Commission.

(c) *Export processing zone:* It is suggested that a second electronics export processing zone be set up under the Electronics Commission and a sum of Rs. 5 crores be allotted for the same. This is in view of the increasing importance of role of export in country's economy.

(d) *Regional computer centres:* For promoting development catalysing applications of computers as well as to benefit by the lower per unit cost of large system, the concept of regional computer centres was proposed. For this, an investment of Rs. 3.6 crores was approved by the Planning Commission to be spent by the Electronics Commission. An additional sum of Rs. 3 crores is proposed for the same.

(e) *Semiconductor complex for special SC devices:* A sum of Rs. 7 crores has been approved by the Planning Commission for this complex.

It is proposed that an additional investment of Rs. 5 crores is recommended for the same. These larger instruments appears to be necessary on the basis of the detailed technical feasibility report prepared since the figures were originally submitted to the Planning Commission. Most of this amount is proposed to be spent on sophisticated equipment useful for research and development on frontier areas and production of high technology devices, within the complex. The growth of the semiconductor industry will form a strong tier for the growth of electronics in India.

(f) *Passive components production*: An additional sum of Rs. 4 crores is suggested to be spent, of which Rs. 2 crores be reserved for private sector investment and Rs. 2 crores for public sector.

(g) *Test and Development facilities*: A sum of Rs. 3 crores had been approved for this. An additional sum of Rs. 2 crores is suggested to be spent for the same.

(h) *Semiconductor devices production*: An additional sum of Rs. 3 crores is suggested to be spent on the production of semi-conductor devices.

2. *Funds for other Ministries*: (a) *Ministry of Communication*: The P&T Department had drawn up a Tele-communication Plan with an outlay of Rs. 1,208 crores which included Rs. 318 crores for long distance transmission. The approved outlay is for Rs. 1048 crores including Rs. 271 crores for long distance transmission system. It is to be noted that an investment in tele-communication sector helps a corresponding reduction in investments in the transports sectors. It is recommended that the cut of Rs. 47 crores in long distance transmission projects be restored. Tele-communication is a highly profitable undertaking for Government to invest in and other returns.

(b) *Mass communication*: (Ministry of Information and Broadcasting). It is suggested that the plan outlay for TV coverage during the Fifth Plan period be increased from Rs. 72 crores (proposed by the Transport Division of Planning Commission) to about Rs. 110 crores. The INSAT programme proposed by the Department of Space should be pushed through in the interests—of mass communication, use of the TV as a powerful audio-visual medium for the developmental messages, growth of long haul internal tele-communication remote Sensing platforms and growth of the electronics industry. This programme can be phased so that the investments during the Fifth Plan period can be reduced to Rs. 130—150 crores.

1.192. It has been stated by the Department that the July 1973 proposal envisages a total electronics production (including defence

electronics) of Rs. 968 crores in 1978-79, the 1972-73 production being Rs. 206 crores thus indicating an overall growth rate of 319 per cent over six years.

1.193. The September 1973 proposal envisages a total civilian electronics production of Rs. 716 crores in 1978-79, the 1972-73 production being Rs. 176 crores indicating an overall growth rate of 307 per cent over six years.

1.194. The approved proposal envisages a total civilian electronics production of Rs. 640 crores in 1978-79, the 1972-73 production being 176 crores indicating an overall growth rate of 260 per cent over six years.

1.195. The Committee note that the Fifth Plan proposals for the Department of Electronics envisage an investment of Rs. 202 crores which is expected to generate a total production of Rs. 2,300 crores during the Plan period. The Committee note also that these allocations will provide additional employment to 3.6 lakh persons. The annual production of electronic equipment and components which is around Rs. 200 crores at present is expected to go up to more than Rs. 650 crores by the end of the Plan period. Apart from that Rs. 20 crores have been allocated for Research and Development during the Fifth Plan.

1.196. The Committee, however, note that there has been a difference of opinion between the Planning Commission and the Department of Electronics in regard to allocations in the various fields. The major differences have been in regard to the allocations in the field of Telecommunications and mass communication. Other fields of difference are the activities relating to standardisation, research and development, Export Processing Zone, Regional Computers, semi-conductors, passive components and test and development facilities.

1.197. The Committee are greatly impressed with the potential of growth of electronics industry and would in particular like to draw attention to its employment potential, high capital formation capability etc. and would like Government and the Planning Commission to see that requisite funds are made available to this industry in the interest of achieving the targetted rate of growth. The Committee would like to be informed of the concrete measures taken by the Planning Commission/Government in implementation of the above recommendation.

## CHAPTER II

### CONSUMER ELECTRONICS

2.1. Consumer Electronics forms the backbone of Electronics Industry even in advanced countries and offers the widest scope for employment opportunities and for providing visible benefits of rising standard of living. It is only through the sales of consumer electronic products that substantial complementary investment can be made in professional electronics which is so vital for the overall growth of the Electronics Industry.

2.2. The following products have been identified to fall within the scope of consumer electronics:—

- (i) Radio Receivers.
- (ii) TV Receivers (including closed Circuit Television system).
- (iii) Tape Recorders (Audio and Video).
- (iv) Audio Amplifiers and P.A. System.
- (v) Record Players and Record Changers.
- (vi) Microphones and Loudspeakers.
- (vii) Hearing-aids.
- (viii) Miscellaneous devices (such as Electronic musical instruments, electronic watches, electronic toys etc.).

2.3. The present total production in the Consumer electronics field according to the estimates available todate is given in the table below:—



2.4. It has been stated in the Task Force Report that these figures are much less than the estimates made in the euphoric years of the late sixties but are considered to be more realistic based on the trends noticed in the past few years. There are in fact counter tendencies such as the slump in the radio market, the difficult seasonal conditions and rising cost of living which tend to inhibit increase in production. Further, the penetration of the rural markets which at one time was expected to increase production considerably has not yet materialised. Even in exports the industry has yet to show significant gains. The Task Force has, therefore, taken the base level for Fifth Plan at Rs. 80 crores which is not very different from the value of Rs. 73 crores in the Bhabha Committee Report.

#### A. Recession in Consumer Electronics

2.5. The following figures will give an idea of the growth of consumer electronics industry since 1964-65 the year (prior to Bhabha Committee Report).

	Rupees (in crores)
1964-65 . . . . .	17.00
1965-66 . . . . .	24.00
1966-67 . . . . .	32.00
1967-68 . . . . .	40.00
1968-69 . . . . .	48.00
1969-70 . . . . .	65.00
1970-71 . . . . .	80.00
1971-72 . . . . .	55.00*
1972-73 . . . . .	65.00

} \*The mode of computation is based on ex-factory value and not on retail prices as was done earlier.

2.6. Production statements for Radios, T.V., Tape Recorders, Amplifiers and P.A. Systems in different sectors during the last few years are given below:—

*Production of Radio Receivers*

(in Million Nos.)

Year	Organised Sector		Total	Small Scale Sector
	Valve set	Transistor set		
1951	..	..	0.083	..
1955	..	..	0.081	..
1960	..	..	0.268	..
1961	..	..	0.326	..
1962	0.291	0.047	0.338	..
1963	0.288	0.119	0.408	..
1964	0.286	1.184	0.470	..
1965	0.304	0.279	0.583	0.31
1966	0.284	0.428	0.712	0.39
1967	0.236	0.616	0.852	0.45
1968	0.243	1.132	1.375	0.75
1969	0.215	1.523	1.738	0.85
1970	0.245	1.525	1.770	0.90
1971	0.199	1.783	1.982	1.04

*Production of T.V.*

Year	Large Scale Sector	Small Scale Sector	Total
1970	5,352	9,054	14,406
1971	7,800	8,207	16,007
1972	14,072	15,893	29,965
1973	27,815	46,687	74,502



*Production of Tape Recorders*

Production (Largely in small scale) . . . . . 36,000

*Production of Amplifiers & P. A. Systems*

Year	Large Scale Sector	Small Scale Sector	Total
1971	5,943	50,000	55,943
1972	3,700	80,000	83,700

2.7. It has been stated in the Report of the Task Force-VII of the Planning Commission Steering Committee on Engineering Industries that the growth rate in consumer electronics field has been somewhat uneven. In the mid-sixties, the growth rate was faster than the one originally assessed in the Report of the Bhabha Committee. But since 1969, there has been a slowing down of the growth rate due to variety of factors.

2.8. It has been represented to the Committee in this connection that:—

“It would be reasonable to ask the department what steps it has taken to stand the unprecedented depression in the consumer goods market which has overtaken an industry during the last three years. True, this may depend upon the economic situation, allocation of funds for mass media like Radio and TV and also the actual implementation of those plans. But it cannot be denied that there is certain lack of initiative. The Department should be more mission-oriented to see not only that it is a purely controlling agent, but also feel responsible for the achievement of the targets.”

2.9. Asked to analyse the reasons for the recession which the consumer Electronics Industry is undergoing currently and the specific initiative taken to overcome this state of affairs by the Department of Electronics, the representative of the Department of Electronics stated during evidence that it was desirable to consider the various categories, independently and examine them, separately so that one does not use a common umbrella for all. He divided the consumer Electronics into four categories viz., Radio, T.V., Sound equipment and Tape recorders.

2.10. Stating the position as regards T.V., the representative stated:—

“There is no indication whatsoever that the TV industry has any crisis at the present moment. In fact, TV sets are being manufactured and sold. As far as the manufacturers with

established reputations are concerned, they have no problems and then sets are not available in the market, some have been able to export this item. If there is a problem with regard to TV, it is due to fact that the manner in which AIR, TV transmitters were to come up, has been somewhat behind for variety of reasons and there is essentially a reduced investment for this sector in the 5th Plan.

As far as sound systems are concerned, it is very well-established. There are very fine equipment being produced and people are exporting them. I would not say that the sound system is facing any crisis.

As regards tape-recorders, we have no real industry. We have to face the fact. What exists mainly consists of assembly operation of items which happen to be imported on replenishment licences. The various components required for the tape-recorders are imported and put together in the form of tape-recorders. In any case the tape recorder industry in that sense of the word may not be regarded as a very high priority area from the point of view of allowing a very large import of components in this country. So, we have to depend, for the tape-recorder industry on making these basic components—notably the motor and mechanical parts in the country itself and there are serious efforts being made in this respect.”

2.11 With regard to the radio industry, the representative of the Department of Electronics stated the following position:—

“First of all, it is delicensed industry. . . . the pack value in the case of the radio is only 25 paise. The foreign exchange therefore in a radio is so small that anyone sitting around this table can, without any permission from any licensing authorities, assemble and sell radio sets. The only control on production of radio sets applies to foreign equity firms and it would apply also to the large houses because they come under M.R.T.P. So, we must remember that there are no other curbs, there are no restrictions on radio manufacture in the country. Even with regard to the so-called foreign equity firms, there are no restrictions so far. The real problem is not of licensing, it is not a problem of production but the problem is of selling the product.

Now, I would also mention that the figures which are often quoted with regard to the production of radio sets cannot always be taken at face value because radio sets are produced in the organised sector and in the small scale sector. As far as

organised sector is concerned, the figures are available through DGTD. As far as the small scale sector is concerned, there are no such production returns available with anybody. It is largely a guess work. But we do have some monitoring of what they have produced from the total number of components produced which ultimately go into the radio set. So from the component sales area we know roughly what is the production of radio sets.

One has to remember that as far as radio production is concerned and this is what people are talking about—there was a period of a few years when it grew very rapidly and suddenly and that sudden growth has not been maintained and the truth particularly lies in the fact that any item of this nature—consumer item—will be sold on the basis of the buying power in the market and the fact of the matter is that during the last two or three years, the buying power in the country has gone down. Normally you would expect the people to spend on the items of consumer goods rather on radio sets. Buying power has gone down and therefore the demand is reduced. In fact, I have been given to understand by reliable people in the radio industry that they have seen indications of growth except for the current state of inflation and what has happened in the last 12 months.

The other point is that the radio set is bought by the consumer for a purpose and that purpose is really to listen to programmes with interest. There are two features involved in this. One is about the power of the transmitter. You must have high power transmitters in India so that even a simple set will pick up the programmes. The second point is the quality of what goes on in the air. Here again, the basic complaint is that enough entertainment value is not found in the Programmes which are put across by All India Radio on the high power transmitters. Now, this is a matter on which Information and Broadcasting Ministry should take a decision and we from the Electronics Department cannot interfere.”

2.12 It has been represented in a memorandum received from a leading electronic firm in the organised sector that the growth rate in the consumer Electronics which was a little over 20 per cent till 1970 is not likely to attain this level in future years and is expected to be considerably lower for the following reasons:—

1. Restrictions on installed capacities.
2. Many items are reserved in the small scale sector, while that sector has so far not lived upto the expectations placed on it.

3. The unsophisticated television programmes do not stimulate demand of T.V. Sets.

2.13 In another memorandum it has been represented to the Committee that:—

“Consumer Electronics has been an area where very encouraging growth was recorded in the period prior to 1969. This part of the Industry was growing at a rate well over 25 per cent per year at that time and it led to a number of beneficial results. The investments in the Industry were increasing, competition was brisk, employment opportunities were high and engineer utilisation was continuing to improve. Besides this, the activity of components manufacture grew phenomenally due to the ready market provided by Consumer Electronics.

Unfortunately, a series of policy restraints were imposed since 1968. Because of its fast growth and luxury-status, electronics became a target for a number of levies and taxes with disastrous effect. Products such as Radios, Amplifiers, and now TV, became increasingly difficult for the common man due to disproportionate excise, sales tax, annual wireless receiver fee, and the like. Undeterred, the Finance Ministry even began to levy excise on components that go into Consumer electronics equipment. This unrealistic approach resulted in a decline in growth from the original 25 per cent to a nominal 5 per cent or less for the last two years. This has been far from adequate.

In addition to the above, a number of other events added to the decline: an artificial rivalry between small-scale and large-scale; radical decision regarding the licensing for TV receivers; delay in processing applications; stagnation in broadcasting activity; etc., which served other purposes than a normal healthy growth of the industry. It is plain to see that whatever social objectives may be expected from such approaches, even they cannot be served unless the industry thrives and becomes buoyant. For example, the revenue sought to be derived by increasing the burden on Consumer Electronics has in fact turned back on itself due to the lack of growth of the industry which partly resulted from these excessive levies themselves. Instead of serving as a growing source of revenue, Consumer Electronics has stagnated.

In developed nations, Consumer Electronics provides the strong base on which a more advanced industry can be built. It provides the ready money, the guaranteed market and export outlets needed to make the rest of the industry grow. Instead of

wisely nurturing it, we have relegated it to the status of an unwanted step-child."

2.14. The representative of the Department of Electronics stated that there is no question of restrictions on capacities restraining the growth of consumer electronics, He stated:—

2.14 The representative of the Department of Electronics stated that houses coming under the M.R.T.P. Act, and the foreign equity firms. There is no restriction on the organised or small scale sector producing any number of sets. I do not, therefore, understand as to how the problem of restriction on installed capacity is mentioned here. Further, even the largest firms, viz. Phillips, Murphy and Bush who have the significant chunk of the Indian radio market and who have established foreign brand names; are producing at the moment well below their installed capacity. As far as television sets are concerned, it is true that we have certainly not allowed foreign equity or collaboration. TV sets are made today essentially either in the public sector—both Central or State small-scale sector and to a very limited extent in the organised sector, including two firms which come under the M.R.T.P. Act. But it is entirely an Indian effort. In the small-scale sector, we have allowed 2,500 sets per entrepreneurs who, even with this capacity, are doing extremely well. I do not think that in the case of TV sets, one could say that there has been a restriction on installed capacity which has affected their operations; they have not produced, because they are not able to sell at the required rate, whereas the two consortia in the small-scale sector are producing almost to installed capacity. But there are problems. We must remember that a TV set costs, even ex-factory, around Rs. 1,500. If you say that there should be a production of 10,000 sets, it means a turnover of Rs. 15 crores. If these people are to be expanded beyond that level, would they really be in the small-scale sector? These questions are under discussion, in order to make sure that the capacity is distributed equitably within the sector: but at the present moment I would say that even in the case of installed capacities, it is not proving in any sense to be a constraint on the over all growth rate."

2.15 Asked if the large houses were not manufacturing radios to the extent of installed capacity because they were not in a position to sell or they do not manufacture so that they could maintain the high price line for

their trade marks the representative of the Department of Electronics stated:—

“It is a little difficult to say, because I would normally think that if they deliberately under produce, then it will be possible for the other producers to make and sell and the people would buy. But there are certain features in the whole marketing system, if you look at it. For example, there are traders and retail outlets which sometimes come under the control of these very specific brand names, which means that if a particular trader is selling a brand name radio set, he is not allowed to touch any other. Suppose a small scale man goes to him and tells him ‘I have also got these sets; will you sell them for me? You can take your commission’, he will say ‘NO’, because that is one of the conditions under which he has been made an agent for a particular firm, these restrictive trade practices which also need to be looked into. But that is something which we do not essentially deal with. This is what the M.R.T.P. Commission does, not on the monopoly side but on the restrictive trade practices side, they should now look into it. So, there do exist certain limitations in the trade outlets for the small-scale industry. But I would say that it is largely a problem of purchasing power and the ability to push these products into the market in the current situation. This is the overall view, but I think that some of the other factors which do play a role are not insignificant.”

2.16 The representative of the Department of Electronics added that no curbs have been placed on sound equipment. Similarly the licensed capacity is enormous in respect of tape recorders. What is actually restricting it is that they cannot be produced on account of the imports involved. Promotional activities in this respect are being taken to ensure that this position is rectified.

2.17 On the question whether the growth rate in consumer electronics has been affected by the policy of reserving many items for the small scale sector, which sector has not so far lived upto the expectations placed on it, the representative of Department of Electronics stated during evidence:—

“I think this is a very general and sweeping statement. I would say that the small scale sector is a very broad one in which there are people with little competence as also with very great competence. Certainly, all the firms which have come up and

are doing well, are doing as well as any other I know of in the organised sector. I can give a large list. I do not think that it is correct to say that the small sector has not lived up to its expectations. People who are unable to fulfil such expectations are there; but this is part of the total game. Very often, they are swallowed up by bigger firms. But what are important, are the successful ones. I personally feel that the small sector has been a great success in India and I do not think one can say that that sector's performance is one of the reasons why the Electronics industry is not growing."

2.18 In the opinion of the representative of the Department of Electronics there was no rivalry between the small scale and the large scale sector. It is basically competition as it prevails in almost any other product.

2.19 The representative stated that there is, at present, a craze in India for foreign goods. A basic decision was, therefore, taken that in an area like TV which was relatively sophisticated where it could really be said that India could make the items and sell them without the need to have a single brand name attached to them which comes through a foreign firm or foreign collaboration or foreign equity participation, there was no need for any foreign equity or foreign participation or foreign collaboration.

Secondly, T.V. sets being essentially an assembly operation, it is certainly an area which can be done by the small scale sector. Indeed, the Small Scale Sector could have great advantages arising through their much lower overheads as opposed to the large scale sector unless it be a large scale firm like the Zenith Corporation of U.S.A. where they have a totally automated TV production set up. In India this pattern could not be adopted in view of the labour and employment situation here.

Thirdly by setting up one factory at one place making 1,00,000 sets there could be no real growth in the country. But by spreading out the factories all over the country people start making things, technicians to get working on these all over and this experience thus spreads out.

Then, in order to help in this effort further, it was decided that the State Public Sector, the State Industrial Development Corporation should operate in this area because again it would mean distribution on an equitable basis throughout the country. Thus, each State would essentially have this area developed either through the Small Scale Sector operating in the States or through the State Industrial Development Corporation.

Apart from this, the only other sector is the Central Public Sector i.e. ECIL at Hyderabad. The consideration for licensing ECIL were that they were already working in the T.V. area in order to make TV sets under the agreement concluded by the Government of India with N.A.S.A. (U.S.A.) for the so-called SITE (Satellite Instruction TV Experiment). They have experience in closed circuit TV and were producing a range of products whose assembly to a great extent involved the same type of assembly operations.

2.20. Asked how far complaint regarding unsophisticated programmes was responsible for lack of growth in demand for T.V. sets the representative of the Department of Electronics stated:—

“With regard to the third point, viz., “sophisticated television programme,” it really concerns the Ministry of Information and Broadcasting. I can make one basic suggestion. If you really want meaningful soft-ware for TV which could be used as an important audio-visual medium for national development, it cannot be done under the Governmental Patterns which operate. We would have to organise a completely different set up, with its own innovative practices and choose the very best people in our midst for the development of these programmes.”

2.21. The representative of the Department of Electronics informed the Committee that attempts have been made to analyse the question of penetration of rural radio market. In the 5th Plan proposals of the Department of Electronics it was suggested that there should be projects costing relatively small amounts to carry out surveys on pilot basis and that a Governmental agency should be set up which would study the rural sales of Radio sets and, if successful, it could be done on a bigger scale. The Planning Commission is stated to have considered it to be a project of low priority as in their view Government could not allot resources to marketing agencies.

2.22. During evidence the representative of Department of Electronics informed the Committee that there is no excise duty on components. There is certainly customs duty on import of components and excise duty on materials that go into the components, for example, some particular chemical and so on which ultimately goes into the production of components. The representative of the Department of Electronics felt that there is need for rationalisation of the whole levy structure. There are certain items that are used in a wide spectrum of Industry. It is, therefore, difficult to distinguish because in a certain context it may be good to levy and in the context of electronics it may not be appropriate. This will have to be examined to find an administrative way in which there could be



a differential between the two situations. Sometimes it can be done purely in terms of the type of the product for example, in electronics it may be that the product required is of extremely high priority.

2.23. Regarding Television receiver fee the representative of Department of Electronics felt that it was not heavy considering the value of entertainment derived. But the administrative procedure involved in the collection of this fee particularly in the rural areas might act as a handicap.

2.24. The National Advisory Committee on Electronics have in their recent meeting reported the following reasons contributing towards recession in the consumer electronics industry:

- (a) One of the reasons for the recession of the consumer electronics industry is an erosion in buying power. While this depends upon the general economic growth in the country this difficulty could be reduced, if steps are taken to bring down the cost of production of consumer electronics equipments.
- (b) A primary factor is to realise that consumer electronics equipment is only one part of the mass communication system. Any hold-back in the other parts e.g. programme generation (of sufficient quality), transmission at satisfactory signal levels, distribution of radios, all have a part to play.
- (c) Coverage of Radio and TV signals should be defined in terms of adequate signal strength and choice of stations. This was being implemented through the programme of enhanced transmission undertaken by AIR. It was confirmed by their representative that when the present plan of commissioning high power and other transmitters is completed, a field strength of 1.4 mv/m will be available to 90 per cent of the population. If this is indeed so, and if this applies to at least four programmes at one location, it can give a big boost to the entertainment electronics industry. The transmission of Vividh Bharti Programmes on high-power stations was recommended. The Electronics Commission should take up the matter with the J & B Ministry.
- (d) It was estimated that various taxes, excise, etc. contribute as much as 40 per cent of the price paid by the customer for entertainment equipment. This situation has been worsening year after year as additional levies become imposed. It was recommended that the WRS licence fee which is an annual burden for Radio should be removed since its collection as well as the real benefits to the resources remains questionable.

(e) The cost of a receiver depends upon the following:—

- (i) the performance demanded from it is very high under Indian conditions at present. [See Point (C)]
- (ii) The cost of the components that go into it.
- (iii) The adoption of new technologies such as ICs (Monolithic or Hybrid), Ceramic filters, and other techniques should be examined for bringing down the cost. (To begin with, this might mean import of sophisticated components.)
- (iv) The correct proportion and balance of various components should be readily available.

Quite clearly affective steps should be taken to bring down the cost of entertainment grade components. Steps to ensure the fullest utilisation of the existing capacity and the enhancement of successful units towards economic levels of mass production should be taken. The difficult position regarding imported and other materials which go into components is a big hurdle in achieving this goal and some steps are needed.

- (f) Major advances in rural marketing are necessary to create a wider dispersion of radios and other consumer electronic equipments. The attention of large manufacturers of consumer electronics equipments is drawn to this important requirement and visible efforts in this direction are anticipated.

**2.25. The Committee note that there has been a slowing down in the growth of consumer electronics during the last three years for a variety of reasons, such as:—**

1. Erosion of buying power in the country during the last few years.
2. High cost of entertainment grade components and materials.
3. Difficulty in receiving satisfactorily the more attractive programmes of all India Radio such as Vividh Bharati on the high power transmitters throughout the country.
4. Enough entertainment value is not found in the All India Radio Programmes.
5. Unsophisticated programmes on T.V.

**2.26. The Committee feel that with a view to remove stagnation in consumer electronics, effective measures should be taken to lowering down the costs of these items and to make the radio and T.V. programmes popular, entertaining and instructive.**

2.27. The Committee note that cost of components that go into production of certain consumer grade electronic items is high on account of certain components being imported. The Committee feel that indigenisation of production of these components will go a long way to reduce their cost for which determined efforts are needed. The Committee are of the view that a developmental plan should be drawn up and intensive efforts made to accelerate the pace of research and development in this field so as to enable indigenous production of these items in the shortest possible time.

2.28. The Committee feel that positive measures towards penetration of the rural market for radio at this stage is called for urgently by continuously reducing the price of radios so as to invigorate the development of small scale sector in the electronics industry. The Committee, therefore, suggest that a pilot project may be launched to survey, study and suggest as to how best sales could be augmented in the rural market.

2.29. The Committee recommend that the Department of Electronics may take up with the Ministry of Information and Broadcasting the transmission of A.I.R. programmes of better quality on high power transmitters so that these could reach the larger rural audiences with a view to exploiting fully the vast potential of this market.

2.30. The Committee need hardly stress that every endeavour should be made to accelerate the growth and development of consumer electronics in the country as they provide a strong base for the development of sophisticated and advanced electronics industry.

### B. Production of TV Sets

2.31. According to the information furnished by Government in reply to Unstarred Question No. 3867 on the 20th March, 1974 it has been stated that 80 units have so far been licensed/approved for manufacture of TV sets in the organised and Small Scale Sector. Out of them 71 units are in the Small Scale Sector and 9 units are in the organised sector. Out of them 26 units were in commercial production during the Calendar year 1973. Their names and numbers may be seen in the table below. It was stated in the Task Force Report that by 1974 the total production of TV receiver is expected to be 1,00,000 nos. as against a licenced/approved capacity of about 2,80,000. In their exercise, the Department of Electronics had projected a likely figure of 5,000,00 sets per annum as the demand by the end of the Fifth Plan. In this regard the representative of Department of Electronics stated during evidence that the figure of 5-lakhs TV receivers by the end of the Fifth Plan is related to the original programme of the All India Radio for setting up of T.V. broadcasting stations in various parts of the country. He stated that since the proposals

of the All India Radio for the Fifth Plan have been quite seriously cut down on account of the resources position the broadcasting net work to be created by it will be at a much slower rate in the Fifth Plan than originally contemplated. The representative of Department of Electronics further stated that the fact that production of 1,00,000 T.V. sets are expected to be made by 1974 as against the licensed capacity of about 2,80,000 T.V. sets is not a bad figure at all compared to the ratios prevailing for many other industrial projects between licencing and production. Secondly in the case of T.V. sets licence means that the licence can produce only upto that number for which he is licenced i.e. he can get necessary clearance for import of components. But what he will make will be according to the take off. It is not as if one should try always to produce upto the licenced capacity.

PRODUCTION FIGURES OF TV SETS DURING THE YEAR 1973

Sl. No.	Name of the Unit	Total production
1	2	3
<i>Small Scale Sector</i>		
1	M/s. D. T. Gandhi, New Delhi.	101
2	M/s. Eskay Electronis (Pvt.) Ltd., New Delhi	4,046
3	M/s. Televax (India), Delhi.	300
4	M/s. Udyog Bharti (P) Ltd., Delhi.	125
5	M/s. Western Electronics, New Delhi.	5,831
6	M/s. Televista Electronics (P) Ltd., New Delhi.	15,483
7	M/s. Bharat Television (P) Ltd., Hyderabad.	1,841
8	M/s. Mac Electronics, Ahmedabad.	1,034
9	M/s. Television & Components (P) Ltd., Naroda.	3,544
10	M/s. Acharya Electronics, Nagpur	175
11	M/s. Polestar Electronics (P) Ltd., Bombay	10,089
12	M/s. Bombay Television (P) Ltd. Bombay	384
13	M/s. Hi Beam Electronics, Madras	} 312
14	M/s. B.L.R.S., Madurai-7	
15	M/s. Krish Electronics (P) Ltd., Madras.	
16	M/s. Beltek Electronics (P) Ltd., Gurgoan.	732

1	2	3
17	M/s. Video Electronics, Ghaziabad.	396
18	M/s. Ultravision (P) Ltd. Kanpur.	990
19	M/s. Television Combine, Jaipur.	132
20	M/s. Lark Television (P) Ltd., Ludhiana.	102
21	M/s. Nabco Electronics (P) Ltd.,	268
22	M/s. Punjab State Industrial Development Corporation, Chandigarh.	802
	TOTAL	46,687
	<i>Large Scale Sector</i>	
23	M/s. J. K Electronics, Kanpur	7,914
24	M/s. Telerad (P) Ltd., Bombay	10,557
25	M/s. E.C.I.L., Hyderabad	9,036
26	M/s. Radio & Electricals Mfg. Co., Bangalore.	308
	TOTAL	27,815
	GRAND TOTAL	74,502

2.32. It has also been represented to the Committee that:—

“In the consumer electronics the current practice of giving small quantity licences for finished equipment such as radios, television sets etc., is not conducive towards lower prices. Small sector can profitably supply few components of sub-assemblies to centralised units who could then operate on mass production basis.”

2.33. It has been stated by the Department of Electronics that for Radios there is no licensing as such since all the components required for production are available within the country and the pack value is negligibly small. Licensing in the case of Radios applies only to “large houses” and foreign equity Companies. In regard to T.V. sets it was initially decided to approve a capacity of 2500 sets per annum in the small scale sector which in terms of value amounts to as much as Rs. 50 lakhs. The Department is however, aware that with the keen competition that is now building up in this area and considerable marketing efforts that would need to be undertaken (as also after sale servicing facilities), it may not be economically viable to restrict production to these figures. It has, therefore, been decided that where a unit has reached the approved capacity in any calendar year, it will be enhanced to 5,000 sets which would mean a gross turn-over of a crore of rupees and such a production cannot be regarded

as small. In the case of the organised sector and of small scale consortia, larger capacities have been given.

2.34. In regard to the Components, it has been stated that the Department of Electronics is well aware that a large volume of production is necessary for producing high quality, low-cost items to meet the internal demand as well the considerable export enquiry that exists for these items. The Department, therefore, proposes to encourage increasingly in future the production of components in the organised sector on a large volume basis, while production of equipment through assembly operations will be encouraged in the small scale sector by technically qualified entrepreneurs.

#### *Prices of T.V.*

2.35. As regards price of T.V. receivers it was stated in the Report of the Task Force VII of the Planning Commission steering Committee on Engineering Industries that:—

“One point, however, which needs to be mentioned is the high price of TV receivers in the domestic market. While this is a consequence of the present low volume of production, the popularity of TV will largely depend upon how soon the price can come down to a more realistic figure. There is no reason why by the end of the Fifth Plan period a TV set of 19” width should not be retailed for a value around Rs. 1,200 which would certainly bring it within the reach of a much larger segment of the population than what is possible now.”

2.36. The Committee wanted to know the considerations for which the price of 19” TV set was expected to come to Rs. 1200 by the end of the Fifth Plan as stated in the Report of the Task Force VII of the Planning Commission. The representative of the Department of Electronics stated during evidence:—

“This particular statement was based on an offer by a fairly well-established company about a year ago which had suggested they would be willing to bring down the prices in a phased manner in a period of three years. We had asked for detailed costing, because sometimes people make these offers in their over-anxiety to get a licence. The costing has not come. This offer was made at that time when there was a hope that it should be possible to bring down the prices due to increased competition. But unfortunately with prices going up generally, today I do not see much prospect of this offer materialising. In fact, very recently the TV manufacturers have increased the price by

Rs. 300 due to the increase in the price of the picture tube as a result of imposition of excise duty. Government really have very limited powers to control prices in this regard. They can do so only under the Essential Commodities Act, but we are not sure whether an item like TV would be considered as coming within the purview of this Act.”

2.37. It has been stated in reply to Lok Sabha Unstarred Question No. 5546 answered on 3rd April, 1974 that increase in the sale price of T.V. sets in January-February, 1974, has been of the order of Rs. 250 per set.

2.38. There is at present no statutory control on the price of TV sets. It may, however, be pointed out that the above increase has been due to the general increase in prices of most components, both indigenous and imported, which are used in the manufacture of T.V. Receivers. In addition, the price of the picture tube which is manufactured at Bharat Electronics, Bangalore, has gone up by Rs. 140 per tube due to a change in the categorisation in regard to the levy of Customs Duty on the import of the Glass Bulb. This has significantly contributed to the over-all increase in price of the T.V.

2.39. Recent increase, proposed in the Budget for 1974-75, from 10 per cent *ad valorem* duty to 20 per cent on a T.V. set will further escalate its price.

2.40. It was stated by the representative of the Department during evidence that 'if our volume of tube production can be expanded to a large volume, there can be some hope of some reduction in price.' The Committee wanted to know the production programmes planned for picture tubes as also glass shells in the country.

2.41. It has been stated by the Department of Electronics that the production of picture tubes is at present being done in the public sector. Bharat Electronics Limited at Bangalore has a licensed capacity for picture tubes around 1,00,000 nos. per annum. Recently an expansion of the capacity upto 2,00,000 per annum has also been approved, although the letter of intent has not yet been converted to an industrial licence. BEL is producing picture tubes in collaboration with Nippon Electronic Company, which is a reputed manufacturer in Japan.

2.42. In 1972 to obviate a possible shortage of picture tubes an *ad hoc* import of 50,000 tubes from Hungary was arranged through BEL. Order was placed on the basis of quotations received from a number of countries and since BEL was already in the production of picture tubes, it was decided by the Department of Electronics to channel import of picture tubes through them.

2.43. The ex-factory price of picture tubes was around Rs. 350 in which import content of about Rs. 100 exists. The bulk of import is for the glass shells obtained from abroad. Recently, due to the change in the categorisation of the picture tubes, there has been increase of around Rs. 150 in the final cost of the picture tube and this in turn has raised the cost of T.V. Receiver by the same amount.

2.44. The Department of Electronics has for some time been considering that in an area like picture tubes it would be desirable to induct few more parties in the private sector who could undertake the production of picture tubes on a restricted basis. It was felt that if the location of these units was chosen carefully, a considerable amount of transportation charges by having to send picture tubes from Bangalore to locations as far away as Amritsar could be avoided. It was, however, realised that such a limited production of picture tubes would have to be undertaken on a semi-automatic basis, and that the entrepreneurs should be carefully selected so as to have the necessary technical background for making picture tubes.

2.45. On this basis, two parties, one, Asian Electronics and the other, group of young engineers from abroad, were selected for setting up picture tube production at Nasik and Ghaziabad respectively with a capacity of 20,000 and 40,000 Nos. per annum. Recently the capacity of Asian Electronics was also enhanced to 40,000 Nos. per annum. Both the parties are taking active steps for setting up these units at Nasik and Ghaziabad respectively.

2.46. Recommendations have also been sent to the Licensing Committee for setting up two more units, one at Kanpur and the other at Calcutta in order to take care of the demand for picture tubes that is already existing or is likely to arise in the near future. In Uttar Pradesh, the total production of TV sets will be around 40,000 and hence it is considered desirable to set up a unit for the production of picture tubes. A similar consideration would hold for Calcutta. On this basis a party of young engineers from the IIT, Kanpur, supported by the State Industrial and Investment Corporation (PICUP) has been selected at Kanpur while in West Bengal the Industrial Development Corporation has been chosen for this purpose.

2.47. After all the four projects materialise, there will be a total capacity for 3,60,000 Nos. of picture tubes in the country of Bangalore, Nasik, Ghaziabad, Kanpur and Calcutta. It is believed that quantitatively this should entirely take care of the demand for picture tubes within the country in the Fifth Plan period. Although this demand was assessed at one time to be 5,00,000 nos. per annum, this figure has since been pruned



due to the change in the programme of All India Radio for extending the TV services in the country in the Fifth Plan period. The latest assessment for this purpose is around 3,00,000 Nos. per annum. It is believed that the five units mentioned above will be able to satisfy the likely demand for picture tubes in the country in the next few years.

2.48. Regionally also, the locations are evenly spread out and should be able to cater to the main demand points in the country. Thus, Bharat Electronics will take care of the demand in the Southern region as well as a part of the Bombay demand. Nasik will cater to the Bombay and Gujarat region, Ghaziabad for Delhi and Punjab, Kanpur for U.P. and Calcutta for Bengal area.

2.49. It has been represented to the Committee that:—

“BEL, it is gathered, buys the TV picture tube glass shell for less than Rs. 100 and sells a finished picture tube around for Rs. 500. Recently Government had licensed one Indian engineer from Canada who had estimated the C.I.F. price of a finished picture tube 19” to 24” at Rs. 150. If this is true, is BEL making 300 per cent profit? TV manufacturers have to buy from BEL and because it is a Public Sector Unit it should not rob the public with 300 per cent profit or is it to make up its losses incurred on other products.”

2.50. It has, however, been stated in written note furnished by the Department that for the manufacture of T.V. tubes, BEL is given foreign exchange around Rs. 100 per tube for importing glass shells and other raw materials. To this has to be added customs duty on imports. BEL have costed the production of their final picture tube on the lines followed generally in the Public Sector companies and the profit margin indicated by them appears to be reasonable. They take into account depreciation, overheads on labour etc. on this specific item only and not on all that the Public Sector Undertaking products. It would, therefore, be incorrect to say that the prevailing prices of TV tubes are either due to unreasonable profit margin of BEL or for making up losses incurred by them on other projects.

2.51. As regards Glass Shells for the picture tubes, the Department of Electronics had set up a Panel for recommending the viable capacity for such on items and the likely cost involved. The Panel have made a recommendation that a viable capacity of 8,00,000 nos. per annum was required for putting up a plant for Glass Shells which might cost around Rs. 10 crores (At the existing prices, the cost will be nearer Rs. 15 crores today). Taking into account the likely demand within the country of

5,00,000 tubes per annum and the possibility of exports, the Panel had suggested the setting up of one unit for the manufacture of Glass Shells in the public sector. The know-how for such a plant has to be imported from abroad. The Committee have been informed that no final decision has been so far taken on this proposal since the assessment of demand within the country has been meanwhile drastically scaled down. In the new circumstances, it is doubtful whether the likely demand within the country plus the possibility of exports would justify the setting up of a Glass Shell plant in the country. It has also been estimated that to set up a plant at half the capacity (400,000 per annum) would increase the cost of production of the Glass Shell by as much as 60 per cent. Advantage would be reduction in import bill for glass shells but at a high internal price. In the circumstances no final decision has been taken about the feasibility of setting up a Glass Shell Plant in the country.

2.52. It has been stated by the Department that while it was difficult to give a precise figure it would be seen that the cost of T.V. Glass Shell at full capacity of such a plant was estimated to be around Rs. 70 while at half the rated capacity it is likely to be around Rs. 115. There is thus an increase of Rs. 45 which is more than 60 per cent of the cost of Glass Shell at the full capacity, as already stated.

2.53. Asked how the prices of T.V. in India compared with international prices the Committee were informed during evidence that T.V. Prices in India are certainly higher than in Western Europe, Japan and U.S.A. They are comparable to prices in the East European countries. Roughly black and white set in India costs as much as a colour T.V. set in the West.

2.54. The Committee note that TV is currently selling at a high price costing around Rs. 3,500 and that there is a tendency for the cost of the TV to increase rather than to decrease. There has been an increase of the order of Rs. 250 per set during January-February, 1974 and there has been further increase of the cost of the TV set after February, 1974 due to recent increase on Excise Duty on TV Set.

2.55. The Committee feel that if the marketing base for the T.V. has to be broadened by making it available within the reach of common man, intensified research and developmental efforts will have to be made for greater indigenisation of components to bring down the manufacturing cost and to achieve a breakthrough as has happened in the case of radio. The Committee would, therefore, like the Department of Electronics to take effective steps to improve its technology and to reduce its manufacturing cost.

2.56. The Committee would also like the Department of Electronics to intensify research and development for the production of transistorised

**T.V. sets.** They would further urge that effective steps should be taken to produce ruggedised T.V. sets so as to reduce their maintenance costs as also their frequent breakdowns.

2.57. The Committee note that one of the major elements contributing to the high price of TV set is taxation i.e. customs duty, excise duty, sales tax etc. They note that the excise duty on TV sets has been increased from 10 per cent ad valorem to 20 per cent ad valorem this year itself. The Committee recommended that Government may examine the question of rationalisation of customs duty on imported material needed for the manufacture of TV receivers, excise duty and sales tax on TV in the interest of making available moderately priced indigenous TV sets to create a large market for TV sets.

2.58. The Committee note that increase in the price of TV set is also due to increase in the price of picture tube manufactured by BEL by Rs. 140 per tube due to change in the categorisation in regard to the levy of customs duty on the import of glass bulbs.

2.59. The Committee also note that Government have taken some steps towards increasing the production of picture tubes in BEL from 100,000 nos. to 200,000 per annum. Government have also been considering for some time to bring in four more parties to produce picture tubes to cater to different regions at Bangalore, Nasik, Ghaziabad and Kanpur. This will not only meet the increase in demand for this item but will also reduce transportation charges from far off stations and thus reduce TV prices to some extent.

2.60. The Committee also note that the question of production of glass bulbs, the main component on picture tubes, indigenously is also under consideration of Government and no decision has been taken in the matter so far in view of the high internal cost of production resulting from setting up capacity equal to half the economically viable capacity although it may reduce the import Bill. The Committee desire that Government may take up a suitable decision in this regard as early as possible keeping in view the need to reduce the costs of TV sets so as to make them comparable to those prevailing in other countries.

2.61. The Committee have no doubt that with concerted measures by both the Government and industry, it should be possible to drastically reduce the price of T.V., particularly when the labour costs in the country are far cheaper compared to those in other countries.

2.62. In this connection the Committee would like to mention that the question of reduction in the price of T.V. sets has also been dealt with in paras 3.172 to 3.175 of their 64th Report on Television.

## CHAPTER III

### PROFESSIONAL EQUIPMENTS

#### A. Telecommunications

3.1. The Working Group on Telecommunication of Task Force VII of the Planning Commission had outlined the following objectives to be achieved in the field of Telecommunication during the Fifth Plan period:—

- (i) A rate of expansion of existing manufacturing facilities which would nearly double the output of telecommunication equipment at the end of the Fifth Plan period.
- (ii) To ensure a substantial Research and Development base in the industries so that equipment manufactured is of current technology and stabilised designs meeting the users requirements, are available in time for production.

3.2. The Group had made the following recommendations to achieve the objectives outlined above:—

- (1) There is clear need for augmenting total production capacity in the existing manufacturing units in the Fifth Five Year Plan. This is best achieved by setting up new plants and by achieving optimum production to installed capacity in the existing units by working two shifts per day. The Committee does not favour a third shift, in a precision engineering industry for manufacture of telecommunication equipment as practicable.
- (2) While setting up the new units an attempt should be made to group products requiring like means of manufacture and thus reduce the large diversified lines of products now being manufactured and also to reduce the impact of obsolescence on the means of production.
- (3) New Units to be set up while being viable in size should not employ more than 5 to 6000 people in any one unit so as to be compact, well managed and efficient unit. This would also ensure strategically that any adverse development like labour unrest, power breakdowns etc., would not seriously affect the total production of communication equipment in the industry as a whole.

- (4) The export market potential should be explored and production units which are entirely export oriented should be set up taking advantage of special facilities available for importing capital machinery, transfer of know-how etc. This would result in substantial gain in expertise, sophistication in design etc., which could be passed on to other manufacturing units from time to time.
- (5) Most advances in communication technology have always followed similar advances, innovations, discoveries in the field of component manufacture. Discrete components have been rapidly giving way to products of integration in almost all fields of communication technology with the result that such integration is an essential part of design, assembly and manufacture in one production unit. It is, therefore, desirable that facilities for manufacture of integrated circuits etc., should be an in-house facility in the major manufacturing units of telecommunication equipment. The Committee recommends that while facilities for manufacture of discrete components could be distinct and separate from the manufacture of communication equipment, the facilities for manufacture of hybrid circuits, special purpose ferrites, wave guides and accessories, micro strips etc., should be provided in the manufacturing plants for tele-communication equipment. Where the captive consumption of integrated circuits is substantial and an economically viable unit of manufacture for integrated circuits could be set up as an in-house facility, facilities for such a unit should be provided by Government in the form of licensing, purchase of capital equipment etc.
- (6) It is a well known fact that most of the major manufacturers in the world of Tele-communication equipment either own or control units manufacturing the components that they use. Examples are M/s. Philips, Siemens, the ITT Group, the GTE Group, the Sumitomo Group etc. This has given the designers access to components of high accuracy, consistency and reliability resulting in reduced costs and competitiveness. The Committee feels that component manufacturers in the country look mostly to the entertainment electronics field for customer and the special requirements of professional electronics do not receive much attention. The Committee recommends that the manufacture of components for the professional field of electronics be licensed in the public sector during the Fifth Plan either in existing units manufacturing communication equipments or in new units, purchase of know-how be permitted to such units as a one-time acquisition to ensure con-

temporary technology as also on R & D base for further research and development. The possibility of joint sector approach in such field would be particularly appropriate.

- (7) Telecommunication manufacture is a precision industry where large volumes of components are to be manufactured to precision and at reasonable cost. Traditionally this has been a fertile field for automation resulting in lower costs, high quality and reliability and reasonable freedom from the effects of industrial unrest etc. Capital machinery required for automation of these manufacturing processes are today to be imported. The Committee recommends that urgent action be taken by the larger manufacturing units of telecommunication equipment to set up special units for designing and manufacture of special purpose machines. In most cases, this requires only adaptations of standard machine tools. Till this is achieved, a more liberal policy may be followed in allowing import of such special purpose machinery.
- (8) It has been brought to the notice of the Working Group that gestation period in setting up new manufacturing plants is substantially large due to procedural delays in securing of licences, acquisition of land, availability of foreign exchange for capital imports, inadequacy of tooling capacity etc. In view of the vital role played by the manufacturing industries in the field of telecommunication, it would be desirable that the shelf of projects put up to the Planning Commission by the constituent manufacturing units should be reviewed for clearance as one integrated proposal and clearance given before the commencement of the Fifth Plan period. A list of such projects should be prepared by each constituent unit and submitted to the Planning Commission before the end of June, 1973 so that clearance would be available before 31st March, 1974."

3.3. The Department of Electronics has informed that the following measures are being taken to meet the telecommunication requirements of the country during the Fifth Five Year Plan:—

- (i) Augmentation of the existing capacities for the manufacture of Strowger and Cross-bar types of switching equipment in ITI's existing factory at Bangalore from the present capacity of 2.5 lakh lines to 4 lakh lines;
- (ii) Setting up of a new factory under ITI at Rae Bareilly for the manufacture of Strowger switching equipment, which will have an ultimate capacity of 3 lakh lines when it reaches full production;

- (iii) A new factory for the manufacture of private automatic branch exchange and rural exchanges, which will have a maximum capacity of 60 thousand lines;
- (iv) Achieving full capacity of 5 lakh telephone instruments at ITI's second telephone instruments factory at Naini;
- (v) Augmentation of the capacities for the production of transmission equipment in ITI's Bangalore and Naini factories from the present level of about Rs. 8 crores a year to an optimum output of about Rs. 15 to Rs. 20 crores per annum;
- (vi) Setting up of two additional units for the production of transmission equipment;
- (vii) Setting up of a new unit for the manufacture of high precision, sophisticated measuring and testing instruments in the telecommunication field; and
- (viii) Augmentation of existing capacities and setting up new unit under the Hindustan Cables for the manufacture of different types of telecommunication cables.

3.4. The Committee have been informed that no proposals have been finalised for setting up entirely export oriented units in this field. One of the objective of I.T.I.'s Fifth Five Year Plan, however, is to improve export performance to reach the target of 10 per cent of production during the Sixth Plan period.

3.5. It has also been stated that I.T.I. is in touch with Hindustan Machine Tools Limited (HMTL) for its requirements of special purpose machines.

3.6. The proposals of the Ministry of Communications/Ministry of Industry, indicated above are stated to have been approved tentatively by the Planning Commission.

3.7. The Committee note that with a view to meet the demands in regard to Telecommunications, the manufacturing facilities in the country will have to be doubled during the Fifth Plan by setting up new plants and by achieving optimum production of installed capacity in the existing units and by ensuring a substantial Research and Development base in industries so that equipment manufactured is of current technology.

3.8. The Committee find that a number of new units are proposed to be set up with a view to augmenting existing capacities in such fields as switching equipment, exchanges, telephone instruments, transmission equipment, high precision measuring and testing equipment etc. The Committee hope that these measures will go a long way not only in

meeting the internal demands but also to enable exports to the tune of 10 per cent. of the production of these equipments as envisaged in the Sixth Five Year Plan.

3.9. The Committee however desire that for the purpose of speedy development of these units a well-chalked out plan should be drawn up for implementation within the shortest possible time. A periodic review of the performance in this regard should be undertaken to find out short comings and for taking suitable remedial steps.

#### B. Trans-receiver Sets

3.10. The Committee have been informed that the country now has the capability of meeting most of the requirements in the field of trans-receiver sets, required by the Armed Forces, Police and other para-Military Services.

3.11. It was stated by the representative of Department of Electronics during the course of evidence in this connection that the basic requirement of the Home Ministry was the two-way communication equipment, such as trans-receivers or what is familiarly known as walkie-talkie sets. They have so far been obtaining their requirements, except for sporadic cases of small imports, indigenously. Their requirement has been met by Bharat Electronics Limited. The representative of the Department of Electronics however added:—

“But the Ministry of Home Affairs have for quite some time a complaint that the Bharat Electronics is unable to meet their requirements on time and in right quantity. They attribute it mainly to the fact that the Bharat Electronics is under the Department of Defence Production and, therefore, they would normally give priority to defence requirements and that the requirement of the Home Ministry would figure low in priority. They do not get the treatment which enables them to get trans-receivers on time and in right quantities.

They have, of course, projected quite a significant requirement for the police services.

I have examined this. I can say quite clearly what my views are. I personally feel that the area of production of trans-receivers is a very important one. As you know, all over the world you can talk from one end of the room to another room. They are tiny little sets. They are also used in a very sophisticated form in all sorts of intelligence services and so on. But I say, even on a relatively routine basis, this is very much required.”



The representative further stated:—

“It is quite clear now that there should be a very significant growth in the production of this type of equipment in the country. This equipment can be fitted in jeeps, taxis, etc. or can be carried by persons. They can also have fixed systems in places like hospitals, airports etc. At the present moment the growth in this particular area has been extremely poor and restricted. The Department of Electronics has projected the need for more factories to produce this type of equipment. Under the Industrial Policy Resolution, tele-communication and equipment of this nature are reserved for the public sector. It essentially means licensing of public sector undertakings. We have given licences to State Industrial Development Corporations for this purpose, but they have not got off the ground yet. The only production at the moment is in Bharat Electronics; and capability exists in ECIL based on designs which we produce in the Vikram Sarabhai Space Centre at Trivandrum. We have projected the need to set up more factories in this area and if they cannot be successfully set up by the States, the Centre should be prepared to set up. We have said that, if such factories are set up, they will be able to cater to the requirement of Home Ministry. Therefore, it was included in the Fifth Plan; it was also included for urgent action in the Annual Plan for 1974-75. The Planning Commission has postponed it and said that setting up of such factories would be related to the needs of the Home Ministry, and if it turns out that it is necessary from that angle, then they will have it re-examined. So that is where it stands now. We are in the administrative process of trying to get something going in this area.”

3.12. The Committee note that the growth in the trans-receiver equipment area of professional equipments has been extremely poor and restricted. There has also been a complaint from the Ministry of Home Affairs who have a significant demand projection for trans-receivers that their requirements are not being accorded due priority because B.E.L., which is producing this equipment are affiliated to the Department of Defence Production and give preference to defence requirements.

3.13. The Committee understand that the proposal of the Department of Electronics for setting up factories for the manufacture of trans-receivers has been under the consideration of the Planning Commission. The Committee recommend that the whole matter may be re-examined and in case it is felt that more capacities are required for the manufacture of this equipment, expeditious steps may be taken to meet the requirements by creating the needed capacities.

### C. Mass Communications

3.14. Detailing achievements in the matter of indigenous manufacture of the equipment relating to Mass Communication being heretofore imported, the Department has stated that in 1970, a separate group for undertaking development of equipments required by All India Radio was formed at Bharat Electronics Ltd. Since then the development for a fully modern transistorised professional quality Audio Tape Recorder and Playback consoles has been completed and the first batch of the same produced and supplied to A.I.R. B.E.L. has also completed the development of Broadcast Studio Consoles and Announcers Consoles and a family of high quality solid state audio-amplifiers including Pre-amplifiers, Programme Amplifiers, Monitoring Amplifiers, One Amplifiers, Equalised Amplifiers, Regulated Power Supplies etc. The Company is now engaged, in developing Portable Tape Recorders, professional quality Turn Tables with associated electronics, Limiting Amplifiers, a new generation of Equalised Line Amplifiers and Remote Consoles. It is stated, that though the Broadcast Transmitters and TV Equipments are being made at BEL under licence, in view of the very substantial gaps in the know-how received, the best part of the attention of this group had to be devoted for the generation of know-how through development, for maximising the indigenous content of such equipment. For example, the development of major components like Modulation Transformers, Modulation Chokes, Combining Units, Audio Switchers, Video Switchers, TV Studio Sound Consoles, Video Demodulators, Aural Demodulators, Vestigial Sideband Filters, etc. has to be undertaken in order to maximise the indigenous content in the A.I.R. programme.

3.15. It has been stated that appropriate action is currently under way, in consultation with All India Radio, the Ministry of Information and Broadcasting and BEL for achieving self-reliance in the field of transmitters required by the All India Radio.

3.16. With regard to high power short-wave and megawatt transmitters, and Video Tape Recorders, for which know-how is not available in the country it was observed by the Working Group on Mass Communication of the Task Force VII that production planning has to be dependent on decisions regarding acquisition of know-how for manufacture and the lead time required for setting up production facilities. It was stated that if earliest decisions are not taken, import of complete equipment may have to be resorted to if the plan schemes are to go according to schedule. The Working Group had also observed that the question of setting up of any additional production facilities (in respect of certain items for which indigenous development/production could not be viable unless demand is generated from all sectors) would have to be viewed taking into account the overall perspective of requirements of various types of equipment

required by all the Sectors during the Plan period, availability of capacity in the existing manufacturing industries and based on this data, the necessary strategy for determining the additional production facilities that may have to be set up, should be evolved by the Department of Electronics and suitable steps taken. The investment profile would become clear at this stage only.

3.17. It has been stated by the Department that the Working Group on Mass Communication of Task Force VII based its analysis on AIR's shelf of projects for the Fifth Plan period. It has been pointed out that subsequently, the Planning Commission has made a drastic cut in the allocations for AIR and the total outlay has been pruned to about one-third of its original value. The Committee have been informed that no final decision has been taken as yet concerning the INSAT programme. Even if it is approved the allocation for it during the Fifth Plan period will be the absolute minimum possible. Consequently, the recommendation cited in the above question must now be de-emphasised to the extent of questioning the economics of indigenous production with the reduced scale of requirements. It has, however, been stated by the Department that apart from the size of requirement, the economic and/or strategic importance of the equipments (such as high power and megawatt transmitters) should be given due importance while assessing the viability of indigenous production. An in-depth analysis is being carried out taking into account in addition to the above, the existing facilities for production and the envisaged production plans of M/s B.E.L., Bangalore.

3.18. The Committee have been informed that preliminary studies indicate an overall requirement of mass-communication hardware to the tune of Rs. 50 crores during the Fifth Plan period and that it would be worthwhile setting up production facilities for the 'low volume, high cost' equipments required in this sector of the electronics industry.

3.19. The Committee have been informed by the representative of the Department of Electronics during evidence that as far as the Ministry of Information and Broadcasting is concerned, for radio and television, studio and transmission equipment are manufactured in Bharat Electronics, and this has essentially been on the basis of collaboration agreements which BEL entered into several years ago. The representative of the Department of Electronics elaborated:—

“there is real need in the country, if we are going to develop a very significant broadcasting system, to develop what would really be low cost radio and television studios and transmitters. I think we should get things started here and not necessarily look to the very sophisticated standards of transmission and operation which obtain in other countries. The general argu-

ments given is that these are expensive and we cannot afford them. But we should get the things started here. I think, some of the effort of our national laboratories can be diverted to this, to essentially produce low cost equipment which would be of great significance not only for India but for all developing countries which have low capital and have no needs for the over-sophistication which one normally encounters in advanced countries."

3.20. The Committee note that according to preliminary studies, an overall requirement of mass communication hardware in the country is to the tune of Rs. 50 crores during the Fifth Plan period. The Committee are of the view that in order to establish indigenous production of the items being imported, it is necessary that a developmental plan should be drawn up and intensive efforts made to accelerate the pace of research and development to yield the maximum results in the shortest possible time.

3.21. The Committee would like the Department of Electronics to prepare an integrated plan in consultation with the Ministry of Information and Broadcasting in regard to the indigenous production of radio and television studio and transmission equipment so that our country can become self-reliant in this sensitive area of mass media communication at the earliest. The Committee would like to be informed of the concrete measures taken in pursuance of the above recommendations within six months.

#### D. Computers

3.22. It has been stated that an estimate of the requirement of computers by categories (large, medium, small including Mini-computers) for various sectors of usage during the Fifth Five Year Plan in India have been made by the Working Group on Computers Control and Industrial Electronics of Task Force VII of the Planning Commission, Steering Committees on Engineering Industries. A summary of the total requirement of Computers of various categories is given below:

	1974-75	75-76	76-77	77-78	78-79
Large (more than Rs. 50 lakhs) .	3	3	3	3	3
Medium system (10 to 50 lakhs)	32	39	48	56	65
Small and Mini-computers (less than Rs. 10 lakhs)	60	120	160	230	290

3.23. No detailed estimates have, however, been made for the Sixth Five Year Plan period.

3.24. It has been further stated that assuming growth rates of 20, 19, 18, 17 and 16 per cent of computer requirements during the respective years of the Sixth Plan, the total production in the field of computers and calculators is expected to rise by 2-1/2 times that of Fifth Plan (to a total production estimated at Rs. 445 crores during the period).

3.25. The only indigenous computer manufacturing programme in the country is that of the Electronics Corporation of India Ltd., Hyderabad (a wholly Central Government owned public sector undertaking). Computer activities at E.C.I.L. commenced in the later part of 1969. The first indigenous system was the T.D.C.-12 that has been developed at the Bhabha Atomic Research Centre. Production engineering of this system was carried out at ECIL. The number of TDC-12 systems installed at the end of the year 1972-73 stand at 18. A new model called TDC-312 using integrated circuits instead of discrete components, but architecturally the same as the earlier TDC-12, has been evolved. A large machine, with a longer word-length, designated TDC-16 using third generation technology, is under development. Primary software development for this system is being carried out at the Tata Institute of Fundamental Research. It is expected that TDC-16s will be marketed during 1974. Development work on a medium large computer with a 32-bit word-length and one micro-second cycle time, using third/fourth generation technology is in progress. This machine is meant for time-sharing, multi-programming, and large scientific and business applications. The system design of this machine is in an advanced stage. It is expected that the first of these machines will be ready during 1975-76.

*Peripherals and Components for the indigenous Manufacturing Programme:*

3.26. It has been stated that the present indigenous computer manufacturing programme is largely based on imported peripherals (input-output equipment) and components (such as, semi-conductor devices, ferrite-core memories etc.). It is clear that steps have to be taken to get a large part of these essential elements (of the computer systems) manufactured in India.

(a) *Peripherals:*

The Committee has been informed in a written note by the Department of Electronics that:—

“Peripherals equipment from a variety of sources have been brought into the country for being tested out with indigenous computer systems, to assess which of these would be the most

suitable for manufacture in the country in terms of economic viability and technology involved. In view of the complex electromechanical technology involved, the need for heavy tooling, and the urgency with which these are required, several of these will have to be manufactured on the basis of outright purchase of know-how/licenced production."

(b) *Components:*

"The Department of Electronics has taken the initiative in calling for proposals for setting up facilities for stringing memory cores to make up memory planes and stacks needed for indigenous computer systems. Aspects relating to semi-conductor devices have been dealt with separately by the Panel set up by the Department on semi-conductors."

*Software:*

3.27 The Electronics Commission recognises that the area of computer software is one that needs to be developed rapidly for various reasons. It has been stated that a great deal of software has to be generated for computer applications in the country for a variety of purposes, particularly using indigenously manufactured systems. Software development and data preparation offers the possibility of providing significant employment particularly for mathematically trained scientists and engineers. With properly forged links with groups abroad and when the necessary software tools have been obtained and mastered here, there should be adequate potential for export of software. It is stated that in view of these aspects the Department of Electronics will make every effort to make computer time available to software groups on existing systems in the country; and on a guaranteed basis provide it on the proposed Regional Centres when they are set up; and under certain terms and conditions even allow the import of computers specifically for software export. Import of three computer systems—one from USA and 2 from Soviet Union primarily for development of software and export from India have been approved.

3.28 It has been stated that the Electronics Commission has been concerned with the building up of manufacturing capabilities in the country towards achieving self-reliance in the field of computers as rapidly as possible. By the end of the Fifth Five Year Plan, it is anticipated that the country will be self-reliant with regard to the total requirements for electronic calculators and mini-computers and also with regard to nearly 90 per cent of the medium sized computers. There would, however, still remain the requirements for large sized computers and some sophisticated peripherals and components which will continue to be imported even after

the Fifth Plan period. The country is also expected to be largely self-sufficient with regard to development of software for the various ranges of computers.

3.29 It has further been stated that the research and development activity in the field of computers is at present confined to medium and small computers, as on examination it has been found that R&D investment in the range of the very large computers is beyond our means at the present stage; in any case it should be taken up after a basis infrastructure relating to small and medium computers has been built up.

3.30 The Committee wanted to know as to when the basic infrastructure will be available and when the country could hope to be upto date with world technology in the field in view of the first moving nature of the Electronic industry.

3.31 The Committee were informed during evidence that the country will be self-sufficient with regard to small and medium sized computers by 1973. However, for the purpose of larger applications such as those required for national planning for simulation and various other studies, which will contribute to national development, large sized computers will be required. These will be provided on a planned basis in the form of regional computer centres, which are being established under the aegis of the Department of Electronics. The requirement for these large computers will by and large be very few of the order of two to three systems every year over the next five years. It is, therefore, the intention that the requirement of these large computers will be essentially met by imports till such time the base is generated in India and the country will be in a position to get into the area of large computers after 1978.

3.32 The Secretary, Department of Electronics emphasising the importance of computers in the Electronics scene stated that the computers were not important just because they represent modern technology but also because they have a tremendous impact on a variety of highly sensitive and strategic areas like defence and also on industry commerce and so on. The Electronics Commission is seized of this matter and has tried to ensure to maintain and develop significant progress and growth in the area. The basic efforts are, therefore, being supported.

3.33 The representative of the Department of Electronics stated during evidence that the small computers TDC-12 and TDC-16 are needed in a large variety of uses and the capability exists in these computers. The main thrust has, therefore, been on the development and production of these computers. New concepts are being developed.

3.34. The representative further stated that there were certain problems in regard to the development of large computers. The number required was small. As such it had to be considered whether it was worth making big investments, not only in rupees but also in manpower, design production etc. Secondly in very large systems all technologies have to be developed in a very well-proven, running basis and that is what is being attempted in the coming years. Therefore, before going in for large investments the concentration is stated to be on achieving self-sufficiency in small and medium size computers.

3.35 The representative pointed out further that since the computers are made by a number of countries like U.S.A., France, U.K. and Soviet Union, there is no problem regarding depending on a single source. He added:—

“One appeal which I would like to make in general and which the Estimates Committee might like to endorse—is that in the case of the electronics industry, if you consider the total out-flow in terms of foreign exchange, whether for production of even for the import of specific items, it represents an extremely small element in the total kitty. In fact, mistakes on our part in other sectors are of much greater magnitude that they more than cover the total electronics bill. Electronics should be given a liberal deal, so far as the allocation of foreign exchange is concerned. In the case of a very large computer system, it will cost Rs. 1 crore. This amount is very small when compared to other projects which involve thousands of crores. On, the other hand, the use of computer costing Rs. 1 crore in designing projects, buildings or petro-chemical complexes would enable you to have very large savings in capital costs of the plant as well as in operational costs, efficiency and product costs. Therefore, I think the catalytic effect of this import is of such enormous significance that we should not grudge this small expenditure. I would like to emphasise this.”

3.36 Asked if an assessment as regards the idle capacity of computers in India in different regions and according to sizes has been made and if so, how it is proposed to be utilised fully in view of huge foreign exchange involved, it has been stated by the Department of Electronics in a written note that an analysis of the utilisation of computers installed in India have been carried out by different committees, such as the Evaluation Committees set by the Department of Electronics for the different Regions, Delhi Region, Kanpur Region, Bangalore Region, Madras Region; during 1971-72 by the Marketing and Economic Research Bureau



(MERB), (Economic Import of Computers in India"—a Survey Feb. 1971) the Information Planning and Analysis Group (IPAG) (Study on "Computerisation in the Bombay-Poona Region"); the National Institute for Training in Industrial Engineering (NITIE) (Computer Utilisation Manufacturing Industry in India"—1972 a report prepared for UNIDO), the Committee on Automation and others. The average utilisation of the majority of systems in India is stated to be well over two shifts. The MERB Report states that "Though two shifts a day are regarded as a very high degree of utilisation, many responding institutions have indicated that they are planning to increase it further: 25 per cent of the installations have working for three shifts" (1971). Amongst such installations on 3 shifts operation are the two largest system, CDC-3600 of TIFR Bombay, and the IBM 7044 system at IIT Kanpur, which bore the brunt of the larger applications in the country till the installation of the computers at IISc, Bangalore, SSTC Trivandrum; Delhi University, Delhi; PRL, Ahmedabad; and India Meteorological Department, New Delhi. About 40 per cent of computers were used for more than two shifts. About 10 meter hours per day on a two-shift basis is considered as a reasonably high level of utilisation. This is based on metering of actual use of the computer rather than just the time it is on. One third of computers were utilised for less than five meter hours per day, one fifth between five and ten meter hours a day and the rest were being used for more than ten meter hours a day. On the basis of the total meter hour used by the installations, one of the sample survey shows that the average utilisation in the manufacturing sector amounts to 84 per cent on a two shift basis.

3.37. Majority of commercial installations operate for  $1\frac{1}{2}$  to 2 shifts. This is determined by factors like: Maintenance contract tied to one or two shifts, volume of in house work etc. In some cases labour laws in specific commercial establishments seem to preclude multiple shift operations.

3.38 The high utilisation, both in terms of computer hours of usage as well as the scope of the applications have been recognised by computer experts from abroad, including the U.N.D.P. Mission for the Regional Computer Centres in India. Considerable difficulties are now being experienced in obtaining computer time by application groups in the major regions as Calcutta, Bombay, Delhi, Bangalore and Hyderabad. Some time is available on the recently installed systems at IIT, Madras, PRL, Ahmedabad and IMD, Delhi. The Department of Electronics directs various agencies including entrepreneurs engaged in software export activities to such centres. The available capacity on installed systems in the region is taken into consideration whilst permitting import of computers.

3.39. In order to utilise fully the available capacity of computers installed in the country in view of the large foreign exchange already made,

the Electronics Commission has already formulated the following policies:—

- “(a) All users should first attempt to meet their in-house requirements through computers available in the Indian market and additionally draw on the facilities offered by Regional Computer Centres.
- (b) Computers other than those available in the market through Indian manufacturing programmes, will be regarded as expensive items of import. Accordingly, requirements for in-house computers facilities, involving import of such system will have to be considered on the merits of the case as seen in terms of the relevance of such applications to the national development programme and related priorities.”

3.40. It is stated that these policies will not only encourage the use of indigenous computers but force the users to search for the available time on the existing installations.

*Foreign Equity Firms:*

3.41. The Committee were informed during evidence by the representative of the Department of Electronics that the negotiations have been going on with the two foreign computer manufacturing firms I.B.M. and I.C.L. A team of experts was appointed for the purpose. I.B.M. took the stand that they would operate only on the basis of cent percent foreign equity. That is their policy all over the world and they would not make an exception in our case. I.B.M. have been told that they will be allowed manufacturing activities based on hundred per cent export. On that basis they have a programme to manufacture 129 key punches. In the opinion of the Department, however, this is nothing more than an assembling operation. I.C.L. are stated to have to more or less fully agreed to the national policies of India. The objective ultimately is to bring it to minority position as further expansion takes place.

3.42. It has been stated by the Department of Electronics that for dealing with immediate problems pertaining to manufacturing programmes of companies with foreign equity, import applications for computers etc., the Electronics Commission has approved of the following guidelines in the field of computers:—

- “(a) All manufacturing programmes for computer systems in the future will be based on terms and conditions as generally applicable to all other manufacturing programmes in the country.

- (b) Manufacturing programmes with majority foreign collaboration will be generally accepted only on a 100 per cent export basis.
- (c) All users should first attempt to meet their in-house requirements through computers available in the Indian market and additionally draw on the facilities offered by Regional Computer Centres.
- (d) Computers, other than those available in the Indian market through Indian manufacturing programmes will be regarded as expensive items of import. Accordingly, requirements for in-house computer facilities, involving import of such systems, will have to be considered on the merits of the case as seen in terms of the relevance of such applications to national development programme and related priorities."

*Price Structure of Computers:*

3.43. As regards price structure of computers the representative of the Department of Electronics stated during evidence that computer manufacture which is essentially that of the Electronics Corporation of India has just started. It is too early at this stage to really deal with the costing aspects. He added:—

"What I would like to say is that we are fully aware of the need to examine the costing and make sure that it is reasonable from the point of view of national usage, and this is particularly important, because we do provide a significant amount of money in the form of both loan and grant to the ECIL for the whole development programme, and since we provide this money, I think we have also a responsibility to ensure that what comes out of it is meaningful in the national context including the price structure. We will be going into this. At present, the prices are rather high. This really is the consequence of the fact that all the peripherals are imported and their heavy duty which adds to the price structure."

3.44. The Committee note that the present indigenous computer manufacturing programme is largely based on imported peripherals and components. In this connection the Committee note that efforts are in hand to manufacture peripherals on outright purchase of know-how/licensed production. Simultaneously some initiatives have been taken for setting up facilities for manufacturing the components required for computers within the country.

3.45. The Committee note that it is anticipated that the country will be self-sufficient in respect of requirements for electronic calculators and mini-computers and also with regard to nearly 90 percent of the medium sized

computers by the end of the Fifth Plan. The Committee, also note that the requirements in respect of large sized computers and some sophisticated peripherals and components will continue to be imported even after the Fifth Plan. The Committee further note that in view of the difficulties regarding small requirements and large investments required for large sized computers concentration is for the present on small and medium size computers. However, the Committee hope that long range requirements in regard to large sized computers will be kept in view and necessary infrastructure and indigenous capability will be built up gradually to take care of the growing industrial needs.

3.46. The Committee are glad to note that an assessment as regards idle capacity of computers in India has been made by the Evaluation Committee set up by the Department of Electronics for different regions. It was found that 25 per cent of the installations are working three shifts, about 40 per cent of computers are used for more than two shifts and on the whole the average level of utilisation of computer capacity available in the country amounts to eighty-four per cent. and this has also been recognized by computer experts abroad. The Committee are also glad to note that with a view to ensure full utilisation of the computers available in the country, Electronics Commission has laid down a policy that all areas should first attempt to meet their in-house requirements through computers available in Indian market and additionally utilise the facilities available in Regional Computer Centres. The Commission has also laid down that the computers other than those available in the market through Indian manufacturing programmes will be regarded as an expensive item of import.

3.47. The Committee are confident that these measures will ensure full utilisation of computer capacities available in the country and will not allow an avoidable strain on country's foreign exchange resources.

3.48. The Committee find that at present the responsibility for computers is dispersed over various institutions and that there has been so far no integrated plan to intensify research in this area with a view to avoid overlapping to the extent possible. There is no denying the fact that with the growth of industrial development in the country, computers will have to be pressed into service in stages, keeping of course the overall national interest in view with particular reference to its impact on employment. The Committee consider that it is high time that Government entrusted the responsibility for research and development in computers to the Department of Electronics so that we have a meaningful long-term and well-thought out programme of their development and manufacture within the country. The Committee have no doubt that the Department of Electronics would keep in view the export potential of computer industry while drawing up programme for its development and manufacture.

### E. Industrial Electronics

3.49. It has been stated in a memorandum submitted to the Committee in regard to the Industrial Electronics that:—

“Unfortunately, there has been general sluggishness in the industrial structure as a whole. Factories prefer to plod on with their old plant and equipment rather than take the help of Electronics methods needing further investment. Whatever new manufacturing activities are being set up, these are brought in as complete plants from abroad. Thus the local Industrial Electronics activity is not yet able to serve the industry as it is capable of doing. The growth in this sector is around 10 per cent. or so and has no immediate prospects of an up-surge.”

3.50. In this regard the representative of the Department of Electronics during the course of evidence agreed with the view expressed in a memorandum submitted to the Committee that there has been a general sluggishness in the industrial structure as a whole. Factories prefer to plod on their old plant and equipment rather than take the help of the Electronics activity. Whatever new manufacturing activities are being set up, these are brought in as complete plants from abroad. Thus the local industrial Electronics activity is not yet able to serve the industry.

3.51. The representative, however, stated that one need not be pessimistic on this. There is a growing realisation that electronics could increase industrial efficiency. Part of the problem arises from the fact that many people who operate different industries have been trained in a particular pattern based on certain types of background and experience. These deficiencies had to be rectified by holding a series of discussions, seminars and by talking to people. A start in this connection has been made. It will take some time but it is hoped it will catch on rapidly. A journal of the Electronics Commission was stated to have been started recently in view of the deficiency. Interacting process had been started. In the case of Steel sector it has been done. In the oil sector it will be done. People will be attracted to it when they realise that it would mean lower costs.

3.52. The representative pointed out that another area in industrial electronics viz. Control engineering had not been given due importance. Since no other Ministry had taken up the responsibility in this regard the Department of Electronics had taken it up with the consent of the Planning Commission because this is well fitted in with the computer programme and other kinds of estimation. The idea of the monitoring body for this has been accepted by the Planning Commission and it is proposed to be started during the second year of the Plan period.

**3.53. The Committee note that there has been a general sluggishness in the industrial structure as a whole and that the factories prefer to plod on with their old plant and equipment rather than take the help of the Electronic methods. Whatever new manufacturing activities are being set up, these are being brought in as complete plants from abroad. Thus the local industrial electronics activity is unable to serve the industry.**

**3.54. In view of the great catalytic effect that the electronics have on the growth of the industry, the Committee suggest that the question of application of electronics methods in industry may be studied in depth with a view to popularise these methods for the rapid growth of industry in the country.**

**3.55. The Committee would like to impress that those who are entrusted with the responsibility of developing industrial electronics, should publicise their achievements and availability of equipments so as to enable industrialists to avail of them.**

#### **F. The A.D.G.E.S. Project**

**3.56. It has been stated that the Air Defence and Ground Environment System project, a data handling system is being developed for use with radar screens. The development of basic software and the designs of hardware for the system have been completed. The equipment is now being reengineered for its operation in a variety of environmental conditions and the first prototype for the evaluation of user trials will be ready in the second half of 1974.**

**3.57. It has been stated further that the ADGES project has had a number of very useful fall-outs. Most important among these are:—**

- (i) The TDC-16 computer, whose specifications were evolved in such a manner as to optimally meet the needs of the ADGES system as well as the national need for a flexible small computer, particularly for real-time process-control and scientific applications;**
- (ii) a microprogrammed double-precision floating-point multiply-divide unit which can be attached as a device to the TDC-16 computer, which can be offered as a very useful ancillary to the TDC-16 and increases the speed and power of the computer.**
- (iii) an inter-active textual display console using a closed circuit television monitor; a closed circuit television monitor;**
- (iv) a programme for plotting of printed circuit artwork using a**

graph plotter, which would be of help in fabrication of double layer and multi-layer printed circuit-boards; and

- (v) a series of versatile IC and digital card testers which can be used for complete off-line testing of IC's and digital circuit cards of a wide variety of types.

3.58. It has been stated by the Department of Electronics that the ADGES Plan as conceived in 1962 was to be implemented with equipment and systems capabilities to be obtained from abroad. Since 1967, the effort has been to implement this plan indigenously. It was decided in January, 1968 that the data handling project could be handled in principle by T.I.F.R. and studies to examine the detailed feasibility were initiated. In August, 1969 the project was allotted to T.I.F.R. for implementation but the user specifications were finalised in 1970 in terms of new needs and possibilities. The project was to be implemented in two phases. The first phase which demonstrates the capability of the required software has been completed and is ready for interaction with the user for debugging, simulation and training programmes etc. The second phase in which the hardware has to be developed indigenously to meet defence specifications is on schedule as required by the users.

3.59. The Committee wanted to know if the systems in use in any of the advanced countries have been examined to know the reliability and efficacy of the system being set up in India and how it compares with the system abroad and how it will compare when completed. It has been stated by the Department of Electronics that Scientists and engineers working on this project had a chance to know about the basic features of similar systems in operation in other countries where they have visited and held discussions. What is being developed indigenously is a total system and not just specific pieces of equipment. The final specifications of the system, which is a sophisticated tool, are governed mainly by the characteristics of other equipments with which it has to interface. Hence a direct comparison between indigenously developed system and those in operation abroad cannot be made. However, the Indian effort is expected to meet fully the requirements of the users and will be fully contemporary conceptually and operationally.

3.60. The representative of the Department of Electronics stated during evidence that "The important point is really the question of its being manufactured, delivered and tested under actual operational or field conditions. There is also the question of training the real personnel for it from the defence services etc. These studies are under way at the present moment. I can say, without mentioning the details in the system, that the progress has been extremely satisfactory. I think at the last Electronics Commission meeting, when the progress report on this subject

was examined, the Scientific Adviser to the Defence Minister, who is a Member of the Commission, essentially used the word that it is a very notable achievement."

He further added:—

"the people concerned with the project have certainly visited many countries, have seen many other systems and they know the operational characteristics of this, and they have been taken into account certainly in what one has planned here. It compares very favourably as a system...."

**3.61. The Committee note that although Air Defence and Ground Environment System Project as originally conceived in 1962, was to be implemented with equipment and capabilities to be obtained from abroad, it was only in 1967 that it was thought to implement this indigenously. Later on in August, 1969 it was decided to assign the Data Handling Project to T.I.F.R. for implementation but the user specifications were being finalised in terms of new needs and possibilities. The Committee further note that the project was to be implemented in two phases. Although the first phase which demonstrated the capability of required software, has been completed, the second phase in which the hardware had to be developed, is progressing. The Committee feel that the second phase for the development of indigenous hardware for the project requires expeditious completion and, therefore, desire that urgent measures should be taken to see that indigenous capability in this regard is developed expeditiously.**

### **G. Machinery Building Equipment**

3.62. It has been pointed out to the Committee that the growth of electronics industry will depend upon the capability created in the country for manufacturing production equipment such as winding machines, flow solder machines, lead-welding machines, etc., and also test equipments. Certain engineering industries like H.M.T. will have to be encouraged to take production of special machinery required for the electronics industry. All advanced countries like France, Japan and U.S.A. have special units making special purpose machines required for the electronics industry. It was not possible for individual users to develop and manufacture such equipments. A small cell in Electronics Commission will have to be created to look after this aspect.

3.63. The Committee were informed during evidence by the representative of the Department of Electronics that activity in regard to manufacture of special type of machinery, production equipment needed for electronics industry is very marginal though not totally non-existent.



During the Fifth Plan new units in public sector will be set up at an investment of about Rs. 2 crores. All the work may not be done by the units. It would be system capability; fabrication may be done outside. A delegation went to Soviet Union and Eastern European countries in 1972 and submitted its report on the extent of capability that existed in these countries. Trade and Technology Development Corporation would liaise with those countries and will arrange to get expertise and training on inter-change basis.

**3.64. The Committee note that progress in regard to the manufacture of production equipment needed for electronics industry in the country, is negligible and the industry has naturally to depend on imports. The Committee would like the Department of Electronics to take a lead in this key area by drawing up a workable plan for manufacture of production equipment in the country. The Committee need hardly stress that the requisite research and development support should also be made available for this programme. In the context of the projected industrial growth in the Fifth Plan, the Committee feel that concerted efforts should be made with the help of industry to develop this capacity within the country so as to save on imports and develop self-reliance.**

## CHAPTER IV

### COMPONENTS AND MATERIALS

#### A. Components

4.1. The growth of electronics industry depends to a large extent on the status of the component industry. The electronic components may be classified as: electron tubes, semiconductor devices (discrete devices and integrated circuits), resistors, capacitors, connectors, relays and switches and other (magnetic components, crystals, loudspeakers, PCBs, wires and cables etc.).

4.2. The Electronic Component Industry in India started in the early Fifties with about two small scale industries producing some resistors and capacitors. By 1955 some radio manufacturers had started making a few components like paper capacitors, band change switches, I.F. transformers, etc. essentially for their own use. The production of active components was initiated when Bharat Electronics, Bangalore started the production of receiving valves in 1961. The present status of component industry may be seen from the Table below:—

*Production of Electronic components in the years 1971-72, 1972-73 and expected production in the year 1973-74*

Components	(Rs. in crores)		
	1971-72	1972-73	1973-74
Electron Tubes	3.4	4.8	5.5
Semi-conductor Devices	6.8	6.7	7.0
Resistors	1.5	1.1	2.5
Capacitors	5.6	7.2	7.5
Connectors, Relays and Switches	2.7	3.4	5.0
Others	21.0	20.8	21.5
TOTAL	41.0	44.0	49.0

4.3. In 1960 nearly 90 per cent of the components requirements were met by imports while it is estimated that at present nearly 80 per cent of the requirements in consumer electronics are met by indigenous component industry. The production has increased from about 0.5 million rupees in 1960 to about 449 million rupees in 1973-74. It has, however, been stated in the Task Force VII Report that in regard to the production

of professional grade components the indigenous component industry appears to be still weak.

### *Electron Tubes*

4.4. The production of electron tubes in the country was started by BEL around 1960 and they are still the only major manufacturing agency in the country. Having started with receiving tubes, it now produces many other types of tubes viz., transmitting tubes, TV and CR tubes, magnetrons, X-Ray tubes and digital display tubes. While the production of many of these tubes is well-established it has been observed in the Task Force Report that there are a few types like travelling wave tubes, high power magnetrons, high quality CR tubes, photomultipliers, TV Camera tubes and gas lasers that need immediate attention. Efforts are now being made to produce these components.

### *Semi-conductors*

4.5. The production of semi-conductors devices was started in 1962 by semi-conductors limited. Now there are some more concerns like BEL, CDIR and ECIL producing semi-conductor devices, making mostly Germanium and Silicon discrete devices.

4.6. The Task Force VII has observed in their Report on the status of the semi-conductor industry as follows:—

“Even though our semi-conductors industry is ten years old, we have yet to make a real break-through in this area. Most of the efforts of making the discrete diodes and transistors are based upon using imported chips/design and little attempt has gone in developing these devices indigenously. EIL AND ECIL are now doing their own diffusion and CDIL has also recently started similar activity. However, most of the rectifier manufacturers depend entirely on the imported chips, the reason being that the processing demands a lot of R & D and capital investment.”

4.7. In the area of integrated circuits, it has been stated in Ten Year Profile of the I.P.A.G. that BEL has only recently started the production of TTL integrated circuits with the indigenous know-how, and will soon start the production of CMOS integrated circuits with RCA knowhow. It has also been stated that a few more firms are being licensed to produce integrated circuits. It was observed by the TASK FORCE Report in this connection that:—

“The urgency for India to go in for integrated circuits has been widely felt and some activities have, in fact, started. We

have already started using imported lower-level STs for electronic desk calculators and some ICs are also being used in other instruments. However, the transition from discrete devices to ICs is still slow mainly due to the non-availability for ICs in the country. With the growing demand of computers and other digital instruments and the need for improving cost/performance of other instruments, the development and production of ICs has become all the more important."

4.8. It has been stated by an eminent scientist in a memorandum submitted to the Committee that:—

"A basic philosophy which can be adopted for accelerating development of electronics industry is to employ current techniques. For example, (a) use of integrated circuits reduces the design time for equipment and also economises on manufacturing costs. Product diversification can be accelerated by making integrated circuits of standardised types of readily available; (b) Use of hybrid integrated circuits can reduce the multiplicity of inventory of electronic components which otherwise is required. This approach can be used where number of items to be produced is not large."

4.9. During evidence before the Committee also the above scientist laid great emphasis on this point. He pointed out that for monolithic circuits a very meagre investment had been made so far to the tune of Rs. 10--15 lakhs in comparison to international imports although from Indian Standards this was quite handsome. He felt that a massive investment was required to be made. A base had already been established and with necessary imports it could be taken to the desired stage.

4.10. The Department of Electronics while agreeing with the basic concept indicated above has detailed the following efforts put in this direction:—

"The development of semi-conductors, beginning with the invention of the transistor in 1948 by Shockley and its subsequent evolution, clearly demonstrated that the way to go is towards higher levels of integration/miniaturisation. There is a tremendous implicit "technological push" in this direction, which is evident from the fact that there has been a 60 per cent compounded cost/performance improvement every year in this area for the last 20 years. Since we in India have a substantial gap still to cover in this area in a technological sense, the Department/Commission has taken a liberal view in relation to the import of various types of integrated circuits for entering the very new and contemporary areas of electronics desk calculators and mini computers, in order to make the systems designers familiar with the use of these complex and new components. However, it is essential that the gap in relation to

indigenous capability in this area be filled in the shortest possible time. The new I.C. facility, which Bharat Electronics Limited, Bangalore is now in the final stage of setting up, will cover a significant portion of this gap with regard to certain standard families of logic and analogue integrated circuits. However, this would still leave a gap at the highest levels of integration, namely MOSLSI (Metal Oxide Semi Conductor Large Scale Integration). In recognition of this the Department has accepted the recommendation of the semi conductor panel to set up a special, Semi Conductor Production Corporation (SPC) for which a feasibility report is now in the final stages of preparation. SPC has been included in the Fifth Five Year Plan of Department of Electronics as approved by the Planning Commission. Expenditure on this will start in the year 1974-75 since the provision for this included in the Annual Plan of the Department for 1974-75 has also been approved by the Planning Commission. Work on thick and thin film micro circuits at BEL is being financed by the Electronics Commission. CEERI, Pilani will also get a significance support through UNDP for work on microwave solid state devices and associated areas."

### *Passive Components*

4.11. It has been stated in the Ten Year Profile for Electronics and Telecommunication that the production of passive components in the country has been keeping pace with the growth of consumer electronics and has reached a stage where it is possible to not only meet the domestic demand of consumer grade components but also export them. The profile, however, admits that production of professional grade components is still lagging behind.

### *Fifth Plan*

4.12. The estimated demand for electronics components during the Fifth Plan is given in Table I. This demand also includes the requirements for defence electronics. The total requirements will increase by nearly two and half times during the plan period. As would be seen from the Table below, the total demand will be around Rs. 160 crores by the end of the Fifth Five Year Plan. It has been pointed out in the Ten Year Profile of the I.P.A.G. that the profile does not consider the export requirements. As against the total demand of Rs. 160 crores for electronic components, the total production by 1978-79 is planned to be of the order of Rs. 132 crores. This will be able to meet the 85 per cent of the total demand of components. A detailed production plan for various components is given in Table II.

*Demand Production for Electronic Components for Fifth Five Year Plan*

(Rs. in crores) Table-I

Components	1974-75	1975-76	1976-77	1977-78	1978-79	1974-79
Electron Tubes	10.5	12.5	16.0	20.3	35.1	84.4
Semi-conductor Devices	13.9	17.3	22.5	29.0	37.1	119.8
Discrete Devices	11.6	14.0	17.8	22.2	26.5	92.1
Integrated Circuits	2.3	3.3	4.7	6.8	10.6	17.7
Resistors	4.5	5.5	7.0	8.7	10.4	36.1
Capacitors	5.8	7.2	9.2	11.4	13.8	47.4
Connectors, Relays and Switches	8.8	10.8	13.6	16.7	20.0	69.9
Others	30.0	36.2	43.7	48.4	53.6	211.9
Components, Total	73.5	89.5	112.0	134.5	160.0	569.5

TABLE III

*Production Profile of Electronic Components during Fifth Five Year Plan*

(Rs. in crores)

Components	1974-75	1975-76	1976-77	1977-78	1978-79	1974-79
Electron Tubes	6.5	8.0	11.0	14.0	19.0	58.5
Semi-conductor Devices	9.0	12.0	16.5	22.0	30.0	89.5
Discrete Devices	8.0	10.2	13.5	16.5	20.0	68.2
Integrated Circuits	1.0	1.8	3.0	5.5	10.6	21.3
Resistors	2.5	3.1	4.2	5.8	7.5	23.1
Capacitors	8.0	9.0	10.4	12.5	14.5	54.4
Connectors, Relays and Switches	6.5	8.2	10.2	12.5	14.5	51.4
Others	23.0	28.0	35.7	40.7	47.0	174.6
TOTAL	55.5	68.5	88.0	107.5	134.5	452.0

4.13. It is noticed that the estimated production of components falls short of the estimated demand of Rs. 117 crores. In addition as stated in the profile here may also be demand for export. The Committee wanted to know why it was not possible to meet the demand for components in full from indigenous production. The representative of the Department stated during evidence:—

“It takes time to build up a good component industry. It takes time to set up capacities and production of quality items, but we plan for them. You have to do it on organised and heavy investment basis. I say heavy in relation to electronics area. It will take time.”

4.14. Asked if adequate arrangements had been made for the import of components, during the Fifth Plan period, the representative stated:—

“This is done on the basis of periodical issue of import licences to firms. There is need for national stockpile of strategic items.”

4.15. The working group on Telecommunications (of Task Force VII) felt that component manufacturers in the country look mostly to the entertainment field for customers and special requirements of professional electronics do not receive much attention. The Group had therefore recommended that the manufacture of components for professional field be taken up in public sector during the Fifth Plan either in existing units manufacturing communication equipments or in new units.

4.16. To meet the demand of professional grade electronic components, the following units are proposed to be set up in the public sector during the Fifth Plan period.

(1) *Unit for Manufacturing Microwave Components.*—This unit will produce microwave components and instruments. The major users of these items are P. & T, Defence, Railways and Overseas Communication Services.

(2) *Unit for Manufacturing Control Components.*—This unit will produce control components like Servos, Synchros, stepped Motors, Gyros etc., and will cater to the needs of Defence, Atomic Energy Space, and a few other organisations.

(3) *Unit for Manufacturing Special Electron Tubes.*—This unit will produce tubes like phototubes, image tubes, high power rectifiers, discharge tubes and other gas filled devices like surge voltage protectors. There is considerable import of these costly tubes in professional areas.

(4) *Unit for Manufacturing Special Semi-conductor Devices.*—This unit will manufacture LSI circuits, LEDs, packages for semi-conductor devices etc. Presently, the production of these devices does not exist in the country. The entire demand is met by import only.

4.17. It has been stated by the Department of Electronics that these may not all be set up as separate independent public sector undertaking but may be part of existing units. All these areas relate to professional components, particularly these of high sophistication that have some relevance to telecommunications. There is a wide spectrum of professional components that will have to be manufactured. It is hoped to have some of this production, particularly of passive components and electro-chemical items like relays, connectors etc. set up in the private sector.

4.18. In a memorandum to the Committee it has been suggested that except a few large public sector units, primarily covering defence, communications and computer needs, all other electronic industries including the entertainment field should be encouraged in small scale private sector. The public sector units should not get into component manufacture. If they are already manufacturing components they should be asked to stop this work and pass it on to small scale entrepreneurs. The large public sector units should concentrate on system design and large scale fabrication.

4.19. The representative of the Department of Electronics stated as follows in this regard during the course of evidence:

“I would like to submit that the component production is quite a difficult and complex operation, particularly when one has to deal with large volumes and high quality items. Therefore, the suggestion that the public sector units should stop doing what they are doing and pass it on to the small scale entrepreneurs is not feasible. I am in agreement that anything that they are doing and could be passed on, should be passed on, but it is they who have to define, what can be passed on. To have quality production and getting it in sufficient numbers is very important.

The Public Sector units should not, however, consider that it is their responsibility to set up component production for all the items that they ultimately manufacture as an equipment. The effort should be to get this done outside, particularly in areas where public sector units have no expertise. If, however, it has men and expertise and background, that should be done.



As regards the last point, one of the important areas is certainly of system design. Systems can be very large systems, relatively small and very small systems, but it is there that the public sector undertakings should certainly concentrate and should carry the main responsibility with regard to development. I would say that the public sector should be asked to carry major responsibilities in the systems area, large scale fabrication area. They can pass on whatever is possible and which in their opinion can suitably be done by the auxiliaries, but they should not do so on the general bureaucratic principle that everything can be passed on."

#### *In-house Components Divisions*

4.20. In another memorandum submitted to the Committee it has been suggested that:—

"much greater autonomy should be given to the principal system-oriented companies, mostly in the public sector, in order to achieve faster growth. Further, judging from the trends abroad, it is seen that almost all major system manufacturers have also in-house specialised components divisions. There are fairly independent units but are under the overall management of the system companies. Such an arrangement is quite feasible in our country as well and should be encouraged. For example in the Communication Industry, in-house development of specialised crucial components such as ferrites special integrated circuits, and hybrid circuits should be encouraged."

4.21. The Department of Electronics have however stated in a note furnished to the Committee that:—

"It would not be quite correct to say that almost all major systems manufacturers abroad have in-house specialised components divisions. For instance, while in the computer field IBM has such divisions, certain other major companies in the computer field, like Control Data Corporation (CDC) and Digital Equipment Corporation (DEC) do not have such divisions but buy their components from outside, CDC and DEC do make sub assemblies and major peripherals in-house ICL, major UK computer manufacturer has no semi-conductor production in-house. It is also important to note that very often the systems manufacturers go in for their own components divisions not so much from the technical advantage of vertical integration but to use their hold over the components manufacture as a leverage to manipulate the equipments market. Vertical integration has relevance in cases where the component and system are very intimately related. Even in

an area like semi-conductors where there is such a relationship, the biggest component manufacturers in the world (Fairchild, TI, Motorola, North American Rockwell Phillips, Intel AMI) to give some examples are not manufacturer of major systems groups for their components.

The approach of the Department of Electronics to this question is pragmatic, flexible and suited to our own local conditions. In cases where the systems manufacturers have already developed competence for the purpose and the items involved are technologically sophisticated, and/or promote genuine vertical integration, the Department of Electronics would, not, subject to provisions of industrial policy in force, MRTP etc., prevent the systems manufacturers from setting up components divisions of their own. In the interest of dispersal of Industry, promotion of small and medium entrepreneurs including ancillary development, the need to introduce competition and generate maximum possible employment opportunities, the Department would prefer that production of components should not as a general rule, be undertaken by the major systems manufacturers, except where there are overwhelming techno-economic considerations justifying such a course."

**4.22.** The Committee note that there has been an impressive increase in indigenous production of electronics components during the last ten years. Whereas in 1960, 90 per cent of the requirements of components were met from imports, nearly 80 per cent of the requirements of components are now being met indigenously. Production of components has increased from 5 lakh rupees in 1960 to about 449 lakh rupees in 1973-74.

**4.23.** The Committee, however, note that as against the demand of components worth Rs. 569 crores during the Fifth Five Year Plan, the indigenous production will be worth Rs. 452 crores thus leaving, a gap of Rs. 117 crores which will be met by imports. In addition there will also be demand for export which has not been taken into account in this assessment. The Committee wish to point out that the increase in the indigenous production of components compared to the total requirements at the end of the Fifth Plan will be marginal i.e. about 5 per cent. Whereas currently 80 per cent of the requirements are being met indigenously, by the end of the Fifth Plan indigenous production will meet 85 per cent of the requirements.

**4.24.** The Committee feel that in the interest of accelerating the pace of developing electronics industry in the country, it is imperative that we have an integrated approach towards the development of component industry in the country. The Committee note that the profile of the Five Year Plan prepared by the Task Force and IPAG has already identified

the areas, such as micro-wave components, control components, special electronic tubes, semi conductor devices which need to be developed on urgent basis. Besides, there is the important area of system designing in which the country has to make significant development. The Committee are inclined to agree with the view of the Department of Electronics that it would be better if the capacity for manufacturing the above components are developed in the existing undertakings, with suitable expansion/installation of balancing equipment etc., so as to minimise the time taken for development. The Committee have no doubt that in accordance with the Government's policy of developing ancillaries and small scale industries, a systematic effort would be made to farm out the manufacture of components to these units in a planned and systematic manner. It should also be ensured that components produced come up to the standard quality and meet the requirements in full.

4.25. In a separate Chapter on Research and Development, the Committee have stressed that meaningful and integrated plan of Research and Development is prepared in the interest of attaining self-reliance at the earliest. The Committee consider that research and development efforts need to be specially intensified in the area of manufacture of components. The Committee need hardly stress that where technology is not developed in the country for undertaking large scale manufacture, the question of purchasing know-how as has been done by the other countries which have achieved phenomenal progress in Electronics, should be considered urgently so as not to lose any further time in the establishment of capacity for manufacturing these components within the country which provide the essential base for expansion of electronics industry.

4.26. The Committee note that indigenous industry is still lagging in the production of professional grade components. They urge that strenuous efforts should be made to achieve self-reliance in this field to the extent possible by concentrating on items which require urgent attention. Efforts will also have to be made to identify such areas on a continuous basis and remedial measures taken from time to time.

4.27. The Committee feel that in the semi-conductor industry also, a lot of R & D and capital investment is called for immediately to attain a real break-through. The Committee welcome the setting up of the Semi-Conductor Production Corporation during the Fifth Plan period and hope that this Corporation will lend the semi-conductors industry an integrated approach and lead the industry to the goal of self-reliance at the earliest.

4.28. The Committee while noting that integrated circuits technology has brought in its train great advantages like economics in design time, inventories and costs, the transition to the new technology is slow. The Committee desire that concerted efforts may be made to accelerate the

pace of development in this field and to create indigenous capability in this regard in the shortest possible time by drawing up a well-chalked out plan for the purpose.

### B. Standardisation

4.29. It was recommended in the Bhabha Committee Report (1966) that "to effect economy in financial outlay and technical effort, standardisation is a necessity." While furnishing action taken on this recommendation it has been stated by the Department of Electronics that realising the importance of standardisation, the I.P.A.G. carried out an analysis which was brought out in the form of a report, "An approach to standardisation in the Electronics industry." The I.P.A.G. will be setting up shortly, a Technical Panel to suggest the "Guidelines for Standardisation in electronics industry."

4.30. The Committee wanted to know whether there had not been undue delay in prescribing guidelines for standardisation in Electronics industry and if so, what were the reasons therefor. The representative of the Department of Electronics stated during evidence that:—

"Until relatively recently, since a significant part of the electronic industry was based on items made abroad, produced under licence or under collaboration, there has not really arisen the question of standardisation because they are based on certain types of components which are already specified for the types of equipment under production.

The Second point is that when you start to have an indigenous production programme which is then not based on standardised components or specified components corresponding to foreign design of the equipment, of course, one can use standard components, that is, if indigenous production is made and somebody here does designing of indigenous equipment, then in his design, he can incorporate essentially standardised items so that you can have a certain set of components produced, covering a wide range of specifications and then restrict the use only to those, because they can be made in the country, and then you enforce standards and so on.

So, the point that I want to make is that standardisation becomes particularly relevant from the viewpoint of a large indigenous production, because if you are making something entirely on the basis of foreign design and foreign components of their equivalent Indian components, the question of standardisation does not arise on any significant basis. Therefore,

standardisation really relates to the growth of a significant indigenous design and production stemming from that. This is a basic feature. For this, it is certainly useful to know what the production complexion will be which is what we know now, and therefore, simultaneously with it we have now gone ahead, with the process of standardisation."

4.31. It has been represented to the Committee that:—

"In our opinion the I.S.I. and the Defence Organisation are both doing admirable work in the areas of standardisation. Reams of documents exist which can form the basis of standards for the electronics industry. Further, the International Electro-Technical Commission has its own standards which have been formed as a common platform between all nations. It is a pity that all these standards remain on paper only. It is time that strong executive effort was put behind this activity to ensure that it becomes implemented in industry. There is no doubt that considerable savings in cost can result at all levels of industry by a sensible execution of standardisation policy. It is our view that a background already exists, what is needed is to put it into effect."

4.32. It has also been suggested in a memorandum to the Committee that the components have to be standardised not only comprising to I.S.I. but according to DIN, IEC or MIL specifications. This will help to enter the export market with confidence.

4.33. It has been further suggested in another memorandum to the Committee that in the process of formulation of a new standard, we should emphasise on interchangeability of components and on performance requirements. Interchangeability and performance requirements do not change with the time to a great extent. Standardisation on absolute specifications is not desirable because specifications do change rapidly with the change in technology. Standardisation on rapidly changing phenomenon curbs the advancement of technology.

4.34. Asked, how far standardisation efforts in India conformed to these suggestions, it has been stated by the Department of Electronics that so far, standardisation in the field of electronics has been carried out extensively by the Indian Standards Institution and the various specialised standardisation agencies set up by the Ministry of Defence. The Indian Standards Institution follows standardisation practices which are being followed uniformly the world over for the whole broad range of electronic components and equipments. In formulating ISI standards, details regarding dimensions and tolerances as well as the methods of fixing various

items are being given due consideration and therefore, there is automatically a great deal of emphasis of inter-changeability of components. This philosophy also has extended to performance specifications with the result that preferred values and ratings are being adopted wherever necessary.

4.35. It has been stated by the Department that the standardisation efforts by various agencies under Ministry of Defence are primarily made at laying down specifications which will ensure that various items would be suitable for use under special conditions of operation which are of interest to the defence services.

4.36. It has been stated by the Department that in future also, standardisation in electronics would need to fulfil the requirements as outlined above. At the same time it is recognised that absolute specifications should not be standardised to the extent of inhibiting electronics technology. It has been stated by the Department that these points would be duly taken into account by the working Group on Standardisation which has been set up by the Electronics Commission to go into the whole question of standardisation in electronics.

4.37. The representative of the Department of Electronics stated during evidence that:—

“For defence organisation, there are certain types of standards already laid down, for example, one talks about standardisation not only according to the I.S.I. but according to DIN, IEC or MIL specifications. There are joint services specifications or JSS adopted commonly by all the services. Apart from that, in the I.P.A.G. also, there have been two information reports where a classification scheme has already been dealt with. Now, the next step is to go through the standardisation, and this is in the process of being completed, and it will be completed in the course of the next few months. So, I would really say that these are all things to be done in a sort of connected way.

When we discuss the production complexion and the type of items which go into it, the standards are related to what had already been laid down under JSS. These are what we call parallel inter-locking activities. It is not something which one can do long before hand and specify in a mandatory form. They have to go along with the whole process of indigenous design and production based on that.”

The representative added:—

“Actually, there are several categories of entrepreneurs who come up. One class is that which produces fairly broad spectrum of items of relatively low quality or sophistication, as one might say, like resistors, capacitors and so on which are used in the entertainment industry. These are made, by and large, because they are interested in a certain market which needs certain types of resistors or capacitors. This market already exists in the form of equipment of standard consumer type, such as radio, TV etc. which need these things.

The second category consists of those who would make it really from the point of view of an ancillary or something related to professional equipment, and there they have to tailor themselves quite critically and go through the whole procedure.

For instance, if an entrepreneur is going to make a component which ultimately goes into defence equipment, he should really know what the details of that component are and it has to correspond to the JSS, and it has to go through the CIL testing and has to be approved and so on. Therefore, he is already in touch with or in contact with the end-product areas. I think, at the present moment, they are not really having a problem.

But I can tell you where our problem is. We do not want, for instance, in areas like relays, connectors and a variety of other things where you can have various types, manufacture covering an enormous spectrum of physical specification, so that ultimately we may not find ourselves in a situation where we do not have large-scale production of a certain number of standard types where you would have had some economies of scale in production. It is really from the point of view of such elements such as economies of scale in production that this type of standardisation is of value today. I think the point is to make sure that the ultimate large-scale production is of standard types so that we have a large viable production and then it would become possible to restrict the production to those types only. That is really the problem now.”

4.38. It has also been pointed out to the Committee by a leading firm in electronics in the organised recognised sector that at present, apart from the Indian Standards Institution, there are a number of standardisation

organisations such as LCSO (Electronics Components Standardisation Organisation) and various defence standardisation organisations for the Army, Navy and Air-Force. This results in duplication on of effort and also in the creation of conflicting standards on the same subject, thereby reducing their usefulness. Having a single coordinating body will avoid the above difficulties and will also result in a reduction in the cost of standardisation. The representative of the Department of Electronics in this regard stated during evidence:—

“As far as defence services are concerned, they have essentially one basic standardisation which is for all the wings of the defence forces, namely the JSS or joint services standard. Therefore, there is no confusion as far as they are concerned. They adopt a very basic pattern. As far as the ISI is concerned, it operates on a rather different footing and the needs to which they cater are completely different and therefore there is very little overlapping on which there is any serious problem. So, I do not think that on account of the different needs and the catering to these needs one is really dealing with any problem of either duplication of effort or of conflicting standards. I do not think that this is a problem at the moment.”

**4.39. The Committee note that I.S.I. and the Defence Organisation are doing considerable work in the areas of standardisation but most of this work remains on paper only because until recently a significant part of the electronics industry in the country was based on items, produced under licence or collaboration. In view of the large diversification achieved in the production of electronics items in the country, the Committee feel that urgent measures are called for to evolve definite policies for standardisation of electronics components and equipment to the maximum extent possible at the earliest in the interest of economy and large production. The Committee note that Electronics Commission propose to set up a Technical panel on standardisation to go into the whole question of standardisation in electronics. The Committee hope that adequate care will be taken while formulating standards to see that these standards conform not only to I.S.I. but as far as possible, to DIN, IEC and MIL specifications also so that electronics items produced in the country are accepted in the international markets and result in larger exports. Emphasis is also to be laid on the interchangeability of components and on performance requirements.**

**4.40. The Committee are not happy to note that the problem of standardisation did not receive the special attention of Government all these years that it deserved. The Committee note that it has now been decided**



to set up a Technical Panel to suggest the guidelines for standardisation in electronics industry. The Committee desire that this panel should draw up standards by a specified time so that these are available for implementation during the course of the 5th Plan. The Committee need hardly stress that there should be arrangement for review of the standards from time to time in the light of experience gained within the country and latest developments in the field in other countries.

### C. Materials

4.41. As the quality and reliability of a device depends upon the quality of the materials which go into the making of the device, the electronics materials have become an integral part of the electronics industry. Various metals and alloys, ultrapure materials, chemicals and plastics and glasses, ceramics and other insulators are required by the industry.

4.42. The Bhabha Committee had examined the problems of production of primary materials in depth and had laid great stress on the necessity of achieving self-reliance in this field at the earliest. The Bhabha Committee had expressed the following views in this regard:—

“The Committee has little doubt that with a determined effort the technical knowledge for producing practically all the primary materials required for the electronics industry can be developed in the country and indigenous production established within two to three years.”

The Bhabha Committee had recommended:—

“Where a lack of mineral resources does not make it impossible, it should be the definite policy to make the country self-sufficient in primary materials within five years, and in important materials within three years. Where the primary source for some particular material is not known at present, an intensive geological search for it should be made. In the meantime, the material should be imported in crude form and processed to the high refined form required in the electronics industry in order both to save foreign exchange and to develop the necessary technological competence. Where interest is lacking on the part of private manufacturers, Government organisations should be asked to take up specific projects towards this end.”

4.43. The Ten Year Profile for Electronics evaluates the progress made in the field of primary materials in the following words:—

“Although the importance of the availability of raw materials for the growth of the electronics industry has been stressed now and then, the development and production in this area is not very significant. As against the estimated requirement of about Rs. 16.0 crores worth of materials for the year 1973-74, the estimated production of the raw materials would be around Rs. 9.90 crores only. The major areas in which successful production has been started are low grade chemicals, some phenolic moulding compounds, some plating chemicals etc. where purity and quality control conditions are not stringent. While some development/production efforts are being started in the areas like electronic grade chemicals, semi-conductor materials, epoxies, OFHC Copper etc. the imports are still being continued.”

4.44. The Committee wanted to know the precise action taken in implementation of the recommendation of the Bhabha Committee Report, the representative of the Department of Electronics stated during evidence:—

“I would like first to indicate that the action which we have taken with regard to the materials area is that we have asked for a total investment of Rs. 17.3 crores for the production of electronic materials in the Fifth Plan period. This is roughly broken down into Rs. 11 crores for the public sector and Rs. 6.3 crores in the private sector. This, I think, is the major thrust for producing electronic materials in this country. That is the major action we have taken in order to ensure that the country proceeds on the pathway to self-sufficiency with regard to the materials.”

4.45. The Table below gives the demand, production and investment as envisaged during the Fifth Five Year Plan. The table also gives similar figures for the Sixth Plan.

*Fifth and Sixth Plan Profile for Materials*

	Fifth Plan (Rs. in crores)	Sixth Plan (Rs. in crores)
Demand . . . . .	190.0	350.0
Production . . . . .	80.0	180.0
Investment	17.3	37.0

4.46. It is noticed from the Table above that as against estimated demand of materials to the tune of Rs. 190 crores during the Fifth Plan, production is estimated worth only Rs. 80 crores. Similarly during the

Sixth Plan as against the demand for Rs. 350 crores worth of materials, production is estimated to be of the value Rs. 180 crores only.

4.47. The Committee wanted to know if there were any definite programmes to reduce the import bill in this regard. The representative of the Department, however, clarified that as regard this table "there is probably a slight ambiguity in the way it is shown, because Rs. 80 crores that we are talking of as far production, is essentially for special electronic materials, whereas Rs. 190 crores that we are talking about includes all the materials required for the manufacture of components and equipment, and this therefore, takes into account some of the materials that would otherwise be available nationally from our other investment programmes in other areas which already exist or are going to take place. Therefore, the clarification I would like to give is, it is not as though Rs. 190 crores Rs. 30 crores, is all the import bill, because this Rs. 80 crores represents the production arising out of our own new investment of 17.3 crores and of special electronic materials, whereas Rs. 190 crores represents the total requirement in the field.

4.48. The representative stated that "the second part of this will also be met through other investments that are occurring in the country. In that sense, with this particular investment, I hope that there will be a basic reduction in the foreign exchange bill."

4.49. The representative added further that the problem with materials again is the problem of viability and of economies. As for example one single item so vital for the semi-conductor industry are the transistor diodes which are essentially based on silicon of extraordinary purity. But the fact is that manufacture of silicon of that purity of semi-conductor grade of the right type cannot be set up in the country unless it is supported by a demand of a certain value. It cannot be set up on an economically viable basis without that level of demand. For example in Europe that there was a silicon plant in West Germany, the largest in the world. Such a plant cannot be set up in India in the present conditions. There should be sufficient off take in the country on a guaranteed basis and export possibilities. One cannot put in very heavy investment on the technology required unless one has the guaranteed internal market.

The representative added:—

"What we are trying to do is to ensure that all the items which are needed in a relatively small quantity from a large number of chemicals, various types of plastics and so on, are indeed made in India. For that, we do not have to base ourselves on imports."

4.50. Asked how long this import will continue the representative stated that many of items such as chemicals of various grades, plastics etc.

will be substituted but in the semi-conductors area silicon will continue to be a problem unless a sufficient demand level is reached in the country. Till then it will be worthwhile to import and stockpile the required quantities.

4.51. Asked if the demand for the Sixth Plan were sufficient and the projections made were correct in view of the developments that are taking place in the world and the energy crisis etc. the representative stated that in all these cases there is linkage. The demand for materials is related to the ultimate demand for equipment for computers, defence, communications etc. It had, however, been seen from experiences that the numbers do not turn out to be correct for reasons including implementation, change of technology and of priorities. Those numbers, the representative pleaded, must be required as an overall gross direction in which one is going. He added:—

“We would like to keep them flexible both for investment as well as for the directions in which we go because technology keeps changing and we do not want to be stuck with a certain profile and a certain manner of investment. We should have the flexibility whereby we ensure the maximum return.”

4.52. The representative of the Department of Electronics stated in reply to a question that the Planning Commission did not appreciate this position as they were at the moment interested in concrete figures as in the case of heavy industries, cement, steel, power etc. The representative stated that whereas it was for the Planning Commission to prescribe the overall priorities, the administrative factors which stem from the general principles laid down by Parliament, are looked by Cabinet. The remaining part of the planning process, monitoring was to be left to the Department concerned. “As far as the electronics is concerned, it can take the view of the Department of Electronics as to what allocation can be made on year to year basis so that there should be flexibility about it.”

4.53. The Committee note that while the demand for material in the 5th Plan is likely to be of the order of Rs. 190 crores, the production to be achieved in the electronics field under the auspices of the Department of Electronics with a proposed investment of about Rs. 17 crores, is expected to be of the order of Rs. 80 crores. The Committee have been informed that the balance requirement of Rs. 110 crores or at any rate a large portion thereof, is expected to be met by production in other sectors where investment and expansion would be taking place. The Committee are not quite convinced with this and feel that since raw materials are the essential base for the development of electronics, it is imperative that there is a detailed systematic and well-coordinated integrated programme so as to ensure that the entire demand for materials for electronic

industry which is estimated at Rs. 190 crores, is met to the largest extent by developing indigenous capacity, but where that is not possible, by well-regulated and planned imports.

4.54. Government may also examine the question of having adequate buffer stock with a view to ensure easy availability of materials and to obviate losses resulting from escalating prices and other factors, till an adequate demand level for materials is reached to justify the setting up of a plant for the production of these materials in the country.

#### D. Procurement of Raw materials and Components

4.55. It has been suggested that "Procurement of raw material and components from local sources is straight-forward and does not require special attention except overall survey of the total requirement and identification of existing gaps, followed by remedial steps. Procurement of components and raw materials from abroad can be done where practical, by pooling of requirements and bulk purchases. On a statistical basis, it would be desirable and feasible to maintain a national stock pile of components and raw materials which may be required on a continuing basis, so as to cut down procurement delays for individual purchases."

4.56. The Committee wanted to know how procurement of components and materials was organised in the country and how far the setting up of a national stockpiles for materials and components would be feasible and whether any arrangements had been made in this regard. The representative of the Department of Electronics stated during evidence:—

"...As far as the point of procurement of materials, components and equipment is concerned, in the case of electronics also, it is the same problem of procurement as in the case of all other industries. The procurement is from what is available within the country, within various quotas of steel and so on. Similarly, the procurement from abroad is based on the normal pattern of import licences which are issued to the industry. I personally think that the position is in a highly unsatisfactory state. I do not think it is in the best interest of industry as it stands at the moment. What happens today is that in the case of foreign exchange, the allocations are made. Sometimes, for a particular project a particular firm gets an allocation of so many lakhs of rupees of free foreign exchange and the remaining portion in yen credit or whatever it is or some part of it in rupee credit. If they have got a rupee credit of, say, Rs. 10 lakhs—it is not a small firm but a major public undertaking—they have come to me and said, "You take

away our rupee credit which is lying with us. What are we do with it”?

We must recognise that the whole purpose of giving a licence and allocating a credit or foreign exchange is to enable a firm to get what it wants, whether it is material or components or any equipment at the best possible price. But this is not kept in mind. Sometimes, it turns out to be that a particular project is more easily available from U.K. But the firm has been given an Italian credit or French credit. The item may be available there but at a higher price. So, this is not satisfactory.”

4.57. With regard to rupee credit countries the representative stated:—

“All these socialist countries, the USSR and East European countries, have got schedules as to what they will produce next year. If we want anything from them, we must tell them much in advance what we want. It is not like that in Western countries. You can send a letter or a cable and you get a reply back, whether they can supply or they cannot supply or they give a time schedule for delivery and quotation. In the case of socialist countries, they want to know well in advance what we want and they want to know the quantity and all that. It is much easier, if one is talking of rupee credit, to find out what are the products made in those countries which we can really make use of and what are our demands for such items, then pool those requirements together and inform before hand the country concerned, Hungary or Rumania or USSR or Poland or East Germany or Czechoslovakia, that in this area we require roughly this quantity and then obtain from them. Having obtained against rupee convertible currency, hold them in India, and instead of giving rupee licences to people, make them available from the stock against releases which are permitted. I do not think that, as far as electronics is concerned, where you deal with a large number of different types of items, continuously changing item, where the requirements in that sense are small, one can really deal with any of these countries—East European countries and Soviet Union—except on this basis. It is also not desirable, so far as the other countries are concerned, to enter into multiple credits and obtain things.”

The representative added that:—

“Even in regard to West European countries, USA, Japan etc., it is clearly desirable to obtain things in bulk because you get much

better terms for bulk purchases. I can also tell you that when one uses credits, very often the prices are very artificial and are very high. I have some cases where we have managed to get at much lower prices by going out on global tender. Though on credit they had originally offered much higher prices, on global tender they offered the same item at a much lower price. Then you manage to use the same credit."

4.58. With regard to stockpiling of material and components the representative stated:—

"There are two types of stockpiles, one is what one would regard as strategic stockpile and the other is the conventional stockpile. Both are important. I think that both these will be looked after, including the other point I have mentioned about procurement from East European and Soviet Union areas by the Electronic Trade and Technological Development Corporation."

#### Electronics Trade and Technology Development Corporation

4.59. It has been stated that the Electronics Commission has approved a proposal to set up an autonomous Corporation called the Electronics Trade and Technology Development Corporation. This proposal has been included in the Fifth Five Year Plan of the Department of Electronics and is proposed to be implemented in the first year of the plan itself.

4.60. The proposed Corporation is not a manufacturing unit. The functions and objectives of the Corporation would be following:

- (a) to maintain full and up-dated information regarding developments and production in the electronics field abroad with special reference, initially to East European countries and USSR;
- (b) to have techno-commercial negotiations with organisations abroad on a continuing basis, so as to identify/locate/modify/standardise etc., components, materials and equipments for use in India on satisfactory commercial terms;
- (c) to bulk the present and future requirements of such electronics items, project these requirements to the counter-part agencies abroad, arrange to procure the items and stock the items on warehousing basis, wherever necessary to satisfy the production and technology needs of the electronics industry and other users in the country. This is important in the current context of long times of delivery and lack of availability of many items, this bulk purchasing if done properly can

also yield advantages of low prices and purchase from the best source of credit it is not however the intention that this would constitute canalisation in any sense.

- (d) to identify items exportable from India and arrange production of such items in India and wherever necessary promote joint production for exports;
- (e) to locate appropriate know-how from favourable sources and obtain the same for use in the country; and
- (f) to monitor the progress of inter-governmental co-operation/trade agreements in the field of electronics.

4.61. The representative informed that the proposal for the setting up of the Electronic Trade and Technology Development Corporation had been welcomed by all the Ministries and Departments and the Corporation likely to be set up soon.

**4.62. The Committee note that import of components and materials for electronics is at present organised on the same basis as for other industries. The Committee note that under these arrangements it is often not possible to make the maximum use of foreign exchange allocations to individual firms as sometimes the required materials/components are not available in the country in respect of which the foreign exchange allocation is available. Also the prices charged in individual cases are much higher than those charged on bulk purchases particularly as compared to those obtained on global tender basis. The problem is particularly significant in case of purchases required to be made from East European countries which, in view of their planned economies, are required to be intimated of the requirements well in advance.**

4.63. The Committee welcome the proposal for setting up of Electronic Trade and Technology Development Corporation to handle the procurement of materials from within the country and for imports from abroad and stockpiling these materials to avail of the benefit of bulk purchase and to relieve the entrepreneurs of their individual efforts in this behalf and above all to ensure timely availability of the special grade materials suitable for electronics industry. The Committee would like Government to consult the trade and industry while setting up this corporation so as to have the benefit of their views and experience.

4.64. The Committee would however like to stress that the proposed Corporation should be organised in such a manner that it has the minimum staff so that its overheads and administrative costs are kept to the minimum and the materials supplied by it to the electronics industry are at the most competitive prices.



## CHAPTER V

### RESEARCH AND DEVELOPMENT

#### A. Coordination

5.1. The major organisation|agencies|Ministeries or Departments of Government concerned with R&D in the field of electronics are:-

5.2. CSIR laboratories, (*viz.*, Central Electronics Engineering Research Institute, Pilani, National Physical Laboratory, Delhi, Regional Research Laboratory, Hyderabad, National Aeronautical Laboratory, Bangalore, Central Scientific Instruments Organisation, Chandigarh, National Institute of Oceanography, Goa, CGCRI, Calcutta, National Metallurgical Laboratory, Jamshedpur, Central Electro-Chemical Research Laboratory, Karaikudi, National Chemical Laboratory Poona), Ministry of Defence etc; (Defence R&D Laboratories like Defence Electronics Research Laboratory, Hyderabad, Defence Metallurgical Research Laboratory, Hyderabad, DRDL, Hyderabad, Himalayan Radio Propagation Unit, Dehradun, Electronics and Radar Development Establishment, Bangalore, Solid State Physics Laboratory, Delhi; Bharat Electronics, Bangalore and Ghaziabad, HAL, Hyderabad); Department of Space (Vikram Sarabhai Space Centre including SSTC and TERLS, Trivandrum, Indian Scientific Satellite Project, Bangalore, Space Applications Central, Ahmedabad, PRL, Ahmedabad, Department of Atomic Energy (Bhabha Atomic Research Central, Trombay, TIFR, BOMBAY, SINP, Calcutta, Electronics Corporation of India Limited, Hyderabad); Ministry of Communications (Telecommunication Research Centre, New Delhi, Indian Telephone Industries, Bangalore, HTL, Madras, Telecommunication Workshops Jabalpur, Bombay) O.C.S. Poona; Ministry of Railways (Railway Designs and Standardisation Organisation, Lucknow), Ministry of Information and Broadcasting (All India Radio), educational institutions (all Indian Institutions to Technology, Birla Institute of Technology and Science, Pilani, Indian Institute of Science, Bangalore, Jadavpur University, Roorkee University, Raman Research Institute, Bangalore, Institute of Radio Physics, Calcutta, Andhra University, Waltair etc.).

5.3. Asked how coordination among these organisations is maintained it has been stated by the Department of Electronics that the above mentioned laboratories function under different ministries and departments. The Electronics Commission is attempting to evolve a strategy for R&D in

Electronics on a national scale by bringing their various institutions together, as was done for example at the R&D Seminar held in Delhi in January, 1973; where more than 200 persons from various National Laboratories, Universities, and other educational institutions. Public and private sector undertakings etc. participated. Following upon this, the Technology Development Council was set up by the Electronics Commission with broad representation from all the above-mentioned organisations. The Department of Electronics is the modal point in Government for the field of Electronics. Recognising this and the capabilities that the Department of Electronics has now assembled together for planning, analysis etc., the Planning Commission has made use of the Department of Electronics| Electronics Commission in analysing the plans of various Ministries| Departments of Government in the field of Electronics. In working on these the Department of Electronics has attempted to cut out avoidable duplication but ensuring where necessary, multipronged efforts.

5.4. The National Advisory Committee on Electronics set up by the Electronics Commission could also be of use in coordinating the various activities.

5.5. Asked if separate areas of activity in Research and Development field of electronics, had been earmarked for different laboratories/institutions to avoid overlapping it has been stated by the Department that right from the time when an R&D organisation is set up, the areas which would come under its purview are broadly defined. In the case of different laboratories|institutions engaged in a similar type of development work, the trend has been to discuss amongs themselves the areas which should explicitly be pursued by individual laboratories.

5.6. The Technology Department Council of Electronics Commission hopes to identify the competence and strengths of each of these laboratories and to assign to them further areas of activities that could move forward rapidly from the existing base; and further to coordinate their activities.

5.7. The representatives of the Department of Electronics stated during the course of evidence that the Technological Department Council has about 40 Scientists on it from different organisations associated with its working. There is thus an understanding of what is going on in these organisations. The Council is responsible for R&D in the Electronics area. Activities of the major public sector undertakings were stated to have been studied to find out how they were progressing. On the basis of these studies they have been supported as in the case of I.T.I. or BEL although it is not the direct responsibility of the Department of Electronics but the Ministry of Communications, Ministry of Defence etc. Officials of

the Commission were also stated to have toured extensively and seen the research and development work going on in the field of telecommunication. There was thus a sort of interlocking of the activities through information collected in a variety of ways by the Electronics Department.

5.8. The representative further stated:—

"I would however say that we must recognise one feature, that is, the Department of Electronics is not really concerned with trying to look at every bit of research and development going on in the country, because a lot of things are going on in Universities etc. If somebody is doing an experiment with Rs. 10,000, we should let him do it without any interference but it is those who are doing research with crores of rupees that we should examine because we want to ensure that it is spent in a sensible direction. We must really look at things which are important and try to concentrate on them rather than bothering about a large amount of relatively small activities. Actually, with regard to the whole question of coordination and finding out what development work is being done, these powers are vested in the Electronics Commission by virtue of the decision taken by the Cabinet. But though we have these powers we don't just want to go round asking people to submit formal returns to us. We would like to do this in a more friendly and inter-active way of trying to find out from them and trying to encourage them where they can be encouraged and supported, and guide them into more effective areas. So, we have taken an approach which is somewhat different from using the mandatory powers that have been given to us through a specific decision of the Cabinet."

5.9. The representative of the Department was of the view that in order to avoid unnecessary duplication or non-productive duplication in Research and Development and to avoid investment in areas which are not priority areas, there must be one overseeing agency in every aspect of science and technology. In the case of Electronics, it is the Electronics Commission. The Commission has necessary means of finding out who is doing what. The Commission is keen that it is done in such a manner that the investment is truly productive.

5.10. The Committee are convinced that in the interest of achieving best results and investment of resources it is imperative that the Department of Electronics/Electronics Commission should be considered as the nodal authority for coordinating an integrated programme for research in this vital field of Electronics. The Committee note that Government are

already thinking on the above lines and have set up Technology Development Council as an advisory body to the Electronics Commission having scientist representatives from all leading research institutions, like national laboratories, universities, educational institutions, industry etc. The Committee would like this Council to prepare a profile for R&D in electronics during the next three years/five years as also a programme for each of the years of the 5th Plan. The Committee suggest that highest priority should be given in research for such areas where at present we are dependent on imports so as to achieve self-reliance at the earliest and save precious foreign exchange. The Committee need hardly stress that overlapping of research projects should be avoided as far as possible. The Committee would also like the research and development effort to be closely linked to the requirements of production so that the processes and know how developed can be put to use in the interest of expanding manufacture within the country. The Committee would further suggest that there should be a time bound and expense bound research programme so as to have a regulatory system for research.

5.11. The Committee would also suggest that a review of the progress made in R&D in electronics industry should be made after two years or so in order to improve upon the performance in the remaining years of the Fifth Plan.

#### B. Allocations for Research and Department

5.12. It has been stated by the Department of Electronics that out of total allocation of Rs. 642.62 lakhs for the Department of Electronics for the year 1973-74 a sum of Rs. 385.10 lakhs was meant as grant for R&D projects and Rs. 64.90 lakhs as loan for R&D Projects. At the instance of the Ministry of Finance, to enforce economy during the financial year 1973-74, the total allocation was reduced to Rs. 250 lakhs from Rs. 646.62 lakhs and subsequently at the time of finalising the Revised Budget Estimates for 1973-74, the total provision was restricted to Rs. 180 lakhs. Out of this amount, a sum of Rs. 106.03 lakhs (Rs. 80.75 lakhs as grant and Rs. 25.58 lakhs as loan) was earmarked for R&D projects. The sum of Rs. 106.03 lakhs included provision for spill-over projects amounting to Rs. 45.47 lakhs as detailed below:—

(i) Klystron project	Rs. 5.47 lakhs
(ii) ADGES Project	Rs. 30.00 lakhs
(iii) Evaluation of Computer Peripherals	Rs. 10.00 lakhs
	<u>Rs. 45.47 lakhs</u>

5.13. The balance of Rs. 60.56 lakhs was proposed to be released to the new Projects identified and approved by the Electronics Commission.

The Commission had approved the following new projects for financing. The total cost of purchase of capital equipment of projects Nos. (i) to (v) and the total project cost including capital and revenue expenditure of projects (vi) and (vii) are also indicated against each. The actual release during 1973-74 was proposed to be made on the basis of actual requirements of each Project and from within the Budget provisions:—

	Rs. in lakhs
(i) Project for Mask Design and fabrication of integrated Circuits	79.00
(ii) Project for development facilities for thick/thin film Hybrid micro-circuit and their manufactur.	44.12
(iii) Project for R&D activities on materials	17.50
(iv) Project for development of Computer peripherals	8.00
(v) Project for development of Digital and Microwave Communication equipment	15.00
(vi) Project for the design and development of a mini computer system	3.525
(vii) Project for the development of a time averaging computer	2.37

In addition to the above, the sanctioning of the following projects which have been identified as deserving support are also under consideration:—

	Total Project Cost (Rs. in lakhs)
(i) Project (for the development and manufacture of miniature serve components	5.9
(ii) Project for the development of an image forming radar	23.94
(iii) Project for development of Aluminium Ceramics	9.37
(iv) Project for development of liquid Crystalline materials and display system	10.00
(v) Project on Mischemical Cabalt Permanent Magnets	14.31
(vi) Project on Development of high frequency cathode Ray tubes	4.00
(vii) Project on Development of 400 Watt S. Band Carcinotrema tube.	9.17
(viii) Project on development I. C. Moduless	11.00
(ix) Project on design and development of special semi-conductor devises and customised Intergated circuits.	43.26

5.14. Asked why a total allocation of Rs. 646.62 lakhs during 1973-74 were reduced to Rs. 180 lakhs the representative explained:—

“that this figure of Rs. 646.62 lakhs was essentially a theoretical figure. It was already being reduced to a ceiling of Rs. 250 lakhs once the whole governmental spending based on the new economy measures had come into force. So, really speaking, I do not think we need even look at the figure of Rs. 646.62 lakhs. We could, of course, have got that amount if the schemes had already been sanctioned and if they needed the amount, but not from the viewpoint of fresh sanction. So, really speaking, it is Rs. 250 lakh total ceiling that has now been reduced to Rs. 180 lakhs out of which Rs. 106 lakhs is for R&D. I think it is correct to say that this is due to our holding back R&D Projects.”

5.15. Explaining the reasons for holding back these projects the representative stated:—

“I would like to explain why this is so. Normally, when you select an R&D project, it is not for a short period of one or two years; it goes on for several years. Therefore, if an amount of Rs. 20 lakhs or 30 lakhs is to be sanctioned in a particular year for R&D, that project is likely to consume not just Rs. 30 lakhs, but may be Rs. 3 crores. Therefore, while approving the R&D budget we are not concerned with spending money in that financial year; it is necessary to take into account the total expenditure. But it has to be a meaningful expenditure in the sense one could get production of an item which is needed and so on.

Secondly, in the early stages, much preparatory work has to be done by the R&D to come to very definite conclusions. Our whole objective in the Department of Electronics would be to ensure that we get the maximum return in terms of productive output at the end from factories in the form of production of services. Therefore, we do not want just to collect a set of schemes, see that they appear reasonable, and finance them. We said we will look into what is needed in electronic equipment etc., where is the know-how coming from, how much has to be imported, what is the element of indigenous know-how which can be supported and so on. We went into this exercise of what is needed to be properly supported. We do not want to embark on an expenditure which would be a large expenditure without considering its continuing effects over the next few years. It is for that reason, as a conscious measure, the financial stringency being what it is that we did not want to take all projects which might involve some expenditure and

not give us returns which we would expect. Therefore, it is with real conscious effort that we have held back expenditure until we were sure of what we wanted to do. In 1971-72 the expenditure was Rs. 349 lakhs, mainly for one single commitment connected with the data handling system. For 1972-73 it was 100 lakhs, for 1973-74 it was Rs. 106 lakhs and for 1974-75 it will be Rs. 765 lakhs. Now we are really set to take off and consume all that is necessary."

**5.16.** Asked if the new projects for 1974-75 had been selected the representative stated:—

"Out of a total amount of Rs. 7.65 crores, Rs. 4.65 crores will be on projects already selected on which some initial expenditure has already taken place. The remaining Rs. 3 crores will be for new projects for the selection of which the working group are already at work. There are a lot of projects under examination. They will be sanctioned during the next two or three months."

**5.17.** Asked if the Research and Development Projects proposed to be undertaken during the Fifth Plan have been identified, the Department of Electronics stated in a written note that the Research and Development projects to be undertaken during the Fifth Plan have been identified and the investment required has been appointed over the planned period. The profile would call for much more investment than what has been allocated to it. Consequently, TDC has been entrusted with the task of assigning priority to the projects from time to time for the optimal utilization of the available funds. A list of R&D Projects identified to be undertaken during the Fifth Plan period may be seen at Appendix I.

**5.18.** The Committee note that out of Rs. 450 lakhs earmarked for R&D for the 1973-74, the allocation was reduced to Rs. 106 lakhs as a measure of economy which the Department would be able to utilise. The Department has candidly admitted that they had held up several R&D schemes as they wanted to examine them in depth for several of these schemes would have involved continued expenditure of a high order and it was imperative to make sure that the results would be commensurate with the investment. While the Committee can understand this approach they cannot but express regret that the Department of Electronics and other authorities concerned did not prepare in detail schemes for undertaking research and development so that those schemes which were considered to be of priority nature could have been taken up for implementation straightaway. The Committee understand that the Department of Electronics is now ready with schemes which would cover an outlay of

**Rs. 765 lakhs for 1974-75. The Committee need hardly point out that it would be increasing the outlay more than seven fold and that this would call for a determined and coordinated effort. The Committee would therefore like the Department of Electronics and all others concerned to make concerted effort to see that priority schemes for research and development are at least now taken up without further delay and ensure that targets set are achieved.**

### **C. Design and Development Groups**

5.19. It was recommended by Bhabha Committee in their Report in 1966 that "In order to develop a self-reliant and largely self-sufficient industry capable of meeting Indian needs and of competing in the world market, the establishment of purposeful design and development groups is an absolute necessity. This is so vitally important a matter for the healthy development of the industry that it deserves to be examined at greater length". It has been stated in a note furnished to the Committee that:—

"The National Seminar on 'Research and Development in Electronics' and the follow up of seminar by setting up of Technology Development Council by the Electronics Commission goes to show that the Commission is concerned with implementing this action guideline whole-heartedly."

5.20. During evidence the representative of the Department of Electronics expressed the need for powerful design and development groups within the industry as well as outside. He informed the Committee that this has been considered by every panel that has been constituted in this area. The semi-conductor panel, apart from recommending the production establishment, has also recommended a semi-conductor research corporation which will have a fairly large systems and design group. In the decision taken by the Cabinet in respect of the setting up of a switching factory at Rai Bareilly, on the recommendation of Department of Electronics, the Cabinet accepted that there should be a powerful design and development group in the Ministry of Communications which would go into all aspects of Switching Systems. The same thing has been done in the case of production of radar and communication systems for defence. The representative stated therefore that this concept of creating R&D in the form of systems design groups is being implemented within the industry as well as outside.

**5.21. The Committee note that recognizing the role of powerful design and development groups in the growth of a self-sufficient and a self-reliant industry capable of meeting Indian needs and competing in the world market, the Department of Electronics have taken follow up action on the recommendations of the Bhabha Committee Report on the subject, by setting up the Technology Development Council to look after these aspects**



and that recommendations to the effect have been made by the various panels constituted in the area. With the setting up of the Council, the Committee hope that expeditious steps will be taken to establish design and development groups in all important sectors of the industry to lend it adequate strength to become self-reliant.

#### D. Research by Industry

5.22. It has been represented in a memoranda submitted to the Committee that:—

“A very serious lacuna exists which gives a set-back to local R&D effort. This is the simple fact that, due to our controls and licences an industry which develops a new product after years of research has no advance assurance that it will be allowed to put it into production. When lakhs of rupees have been spent on the research any blocking or delay in getting into production is a serious deterrent to taking such risk.”

5.23. The Committee were informed during evidence that Nayudhamma Committee was going into the question of advance assurance to the industry to productionising the processes developed in the laboratories. The representative of the Department of Electronics stated:—

“I believe that it has to submit its report soon, but as I think it is quite clear that you cannot expect the industry to proceed with R&D unless they see some future prospects in that area which is of relevance to them. I think we have to bear this in mind.”

The representative added:—

“I think it is perfectly true that it is meaningless for an industry to invest large sums of money to undertake a major programme and then find that it is going to be plagued at the end of it by not having a licence to go into production. So, I think one would have to define before hand what their programme of research would be; it could be done by the concerned department. They could given some sort of written documentation in an appropriate form; that they would then be given a licence to a certain extent, which may not be for the total but for a certain fraction of the demand. That is the only way to encourage them to spend money on R&D.”

5.24. The Committee note that no advance assurance is at present available to the industry for the commercial production of a new product,

which may be developed after long research involving considerable amount of expenditure. It has been urged before the Committee that this acts as a serious inhibiting factor in intensifying local R&D efforts by the industry and needs to be looked into. The Committee agree with the views of the Secretary of the Department of Electronics that while it may be difficult to provide a definite assurance in advance to an entrepreneur for the issue of a licence, it should be possible for the concerned Department to indicate broadly the areas in which R&D can be undertaken which could then be taken into consideration for the grant of a licence at a subsequent stage. The Committee would like Government to take an early decision on the above suggestion and to publicise it so as to encourage intensified research by the industrial units.

### E. Testing Facilities

5.25. As regards test facilities the Bhabha Committee (1966) had recommended in its report as follows:—

“The development of electronic components and equipment requires appropriate and well equipped test facilities. It may not be possible for all small units to provide such test facilities themselves. The establishment of test facilities in each area of the country in which the electronics industry is established is an urgent necessity. The Committee considers that such centralised facilities should be available as early as possible in the industrial centres such as Bangalore, Bombay, Calcutta and Delhi.”

5.26. Asked to state the progress made in this regard the representative of the Department of Electronics stated during evidence that there was a reliability evaluation in the Bhabha Atomic Research Centre at Bombay. Rupee funds for this laboratory are provided by the Department of Atomic Energy but the foreign exchange is released by the Electronics Department. At Delhi there is National Physical Laboratory which is meant to be the basic place for standards. For this laboratory, the initial phase was financed by C.S.I.R. and the Department of Electronics and the second phase is to be financed by the Department of Electronics. In Bangalore, no particular effort was made to set up a centre because Bangalore already has extensive testing facilities. In Calcutta nothing really has been set up because it is still not a large centre of electronics in that sense.

5.27. The representative, however, stated that testing centres will be set up at all these centres and apart from that, the Department had taken the view that there should be a centralised testing and developing facility on the functional Industrial Estates. The Electronics Department has

decided to finance such centres which will be largely in the small scale in industrial estates sponsored by each of the States, upto a value of Rs. 25 lakhs and upto a ceiling of 75 per cent of the total cost.

5.28. The representative pointed out that a reliability laboratory has to cater to wide range of sophisticated testing facilities and for this purpose it is essential to have testing facilities of a major type. ECIL was stated to have made a request for finances for enlarging its capability to make these available as general facilities. This request was stated to be under consideration.

5.29. It has been represented to the Committee that it should be mandatory for all manufacturers of professional components and equipment to get their equipment tested for various specifications at CIL or other test centres suggested above. There should be a certain amount of uniformity in testing and it cannot be achieved unless a single organisation like the CIL undertake to do the job.

5.30. The representative stated that the buyers in large scale area particularly in the professional area such as I.T.I. and B.E.L., insist on mandatory testing. The suppliers have to produce certificates to these organisations to the effect that the products have been duly tested.

5.31. It has been represented to the Committee that "on the one hand industries have been informed that they should build up R&D facilities within their own premises while on the other they are not provided with the necessary equipment to build up such activities. Similarly on the one hand substantial R&D facilities have been created under the CSIR, BARC and other such Government bodies but these very institutions are extremely possessive and restrictive in allowing the use of their facilities to the industries at large. We do not see any reason why public financed institutions having advanced facilities should refuse their use especially when such advanced equipments remain heavily under-utilised." It has been suggested in this connection that such institutions should be called upon to perform testing and analytical tasks at a fair nominal charge and their budget should be dependent on such services atleast to the extent of 15 per cent. The representative of the Department of Electronics stated during evidence that:—

"When we provide facilities to major organisations, we are making it conditional that facilities built out of such funds will be regarded really not as personal or institutional but national. It must be made available to other people on a reasonable basis. You do find a situation where an individual institution may turn out to be different or possibly may not offer facilities very easily. The other point which I mentioned a little while

ago, is that we do not want to use the services of very high quality personnel for testing where highly sophisticated equipments are not tested. So, very often when simple equipments are required to be evaluated the institutions do not take interest. On the other hand, they are always happy to do things when the job is really challenging or more difficult. So, these are problems. We should not put these tasks on institutions which have taken other jobs to perform—for facilities B.A.R.C. whose job is really not to provide test facilities for electronics in Bombay; we should set up separate establishments and institutions where we can arrange these facilities more easily. Because B.A.R.C. is meant to be the primary laboratory in the country for doing applied advanced research and development in all facts like generation and utilisation of nuclear power, use of isotopes and so on.”

**5.32. The Committee note that testing facilities which are developed in the national institutions like BARC and CSIR or elsewhere are not easily available to the industry for testing of their equipment, as these laboratories are engaged in important and sophisticated type of research. The Committee would like Government to review systematically the testing facilities available in Government laboratories/organisations as well as outside with a view to specify those where the facilities for testing of electronic equipment would be available readily to the manufacturers. The Committee need hardly point out that where in a particular region or area the testing facilities are not easily and readily available a well-co-ordinated plan should be drawn up in consultation with the industry to develop such testing facilities. The Committee need hardly point out that such testing centres should broadly be run on no profit no loss basis.**

#### *Testing Facilities in States*

5.33. The Bhabha Committee Report had clearly indicated that “the development of electronic components and equipments require appropriate and quality testing facilities. It may not be possible for all small units to provide such testing facilities themselves. The establishment of testing facilities in each are of the country in which the electronics industry is established is a urgent necessity.”

5.34. The Electronics Commission has recently taken upon itself the task of formulating comprehensive plans for the growth of electronics in each State. Small and medium entrepreneurs, particularly those who are technically trained, are being encouraged to set up units for the manufacture of electronic equipments and components. An important bottleneck in this regard has been the fact that testing and development facilities are not readily available in most States and entrepreneurs are compelled to

depend upon such facilities at distant locations. Various State Governments have also been representing that a number of small scale electronic units which have started manufacturing activities, find it difficult to arrange for their own independent testing and development facilities.

5.35. Another important factor has been the growth of the export market in electronics in a variety of areas. Export markets are dependent upon quality control of the product and it becomes necessary to install a greater awareness of quality consciousness amongst the entrepreneurs, manufacturing electronic products.

5.36. The Electronics Commission therefore decided at its meeting held on 11th October, 1972, that, for the purpose of providing testing and development facilities to entrepreneurs, and also to install a greater awareness of quality consciousness, State Governments may be assisted to set up electronic testing and development centres. The pattern of financing is that broadly grants-in-aid are given to each State Government to meet 75 per cent of the total capital cost of the proposed centre subject to a maximum of Rs. 26 lakhs per centre. Remaining cost is to be borne by the State Governments themselves in the shape of land, buildings and other elements of the infrastructure. State Governments also have to undertake the responsibility for operating these centres through qualified technical personnel. The location of such centre was left to the State Governments; where functional electronic estates are already in operation, it was suggested to the State Governments that these might form desirable locations for such centres.

5.37. The broad objectives of such a centre are to provide testing facilities which may not be possible for each of the individual units to set up. These include type testing of components and equipment in accordance with I.S.I. standards, as well as batch testing of such items under actual production. Electronics being a sophisticated technology, complex and capital intensive equipment is needed for the purposes of such testing; but if each unit were to have its own, the capacity utilisation factor would be very low. It is, therefore, considered difficult and unnecessary for small and medium scale entrepreneurs to set up such facilities by themselves. The testing centres will also provide certificates of performance that would be acceptable to purchasing agencies both at the State and Central levels.

5.38. In addition to the testing facilities, the centre will also undertake development work relevant to the immediate requirements of the industrial units. This will be from the point of view of whether the products conform to the standards specifications provided by the Indian Standards Institution or to specialised standards laid down by Defence, Railways etc. Where an item does not conform to such specifications,

it will be the responsibility of the Testing and Development Centres to advise the parties suitably so that the product could be improved. Hence, both the development and testing are regarded as being inter-related to each other from the point of view of ultimate acceptability by the user.

5.39. Suitable guidelines for the formulation of proposals have been prepared by the Department of Electronics and circulated to all the State Governments.

5.40. The Department feel that the response from the State Governments has been quite heartening.

5.41. Progress made in this regard in different States is indicated in the following paragraphs:—

#### *Tamilnadu*

5.42. The Government of Tamil Nadu has recently set up a special Estate in Adyar Near Madras for electronics instrumentation and the Department of Electronics has released 2 instalments of Rs. 5 lakhs and Rs. 1.33 lakhs for this scheme.

#### *Uttar Pradesh*

5.43. The U.P. Government had submitted a scheme to the Department for setting up Testing and Development Centre in the Electronic Estate at Kanpur. The proposal has been approved by the Department and financial sanction for the first phase of the project has also been given for the purchase of indigenously available equipment. The State Government have intimated that their plans for construction of building etc. will be ready soon and till then, the Centre would operate from a temporary accommodation.

#### *Maharashtra*

5.44. The Maharashtra Government had proposed to set up a Testing and Development Centre to be run in close coordination with Poona Engineering College. This proposal has been approved and the State Government has taken steps to set apart operational space to house the equipment and activities of centre. It is expected that the Centre will start functioning immediately with the use of a number of items of test equipment which the Government of Maharashtra is making available from Poona Engineering College.

#### *Gujarat*

5.45. The proposal of the State Government to set up a testing and development centre at Makarpura Industrial Estate near Baroda has been approved by the Department. The State Government's proposal is to

house the Centre in new building yet to be constructed. In the meanwhile they would start operating the Centre on a reduced scale in temporary accommodation, no sooner they start receiving various items of equipments for the Centre. In order to enable them to procure equipment without any delay Department of Electronics has helped them to identify a large number of indigenously available equipments which would be of immediate use in the Centre. These items have been included in the Phase-I of the project for which funds have already been sanctioned.

### *West Bengal*

5.46. The State of West Bengal had submitted schemes for setting up a Testing and Development Centre at Calcutta. The scheme has been discussed with the State Government and is expected to be approved shortly.

### *Kerala*

5.47. The proposal received from Kerala has been examined in financial terms and has been found to be generally within the guidelines laid down by the Department. A detailed technical discussion will shortly be held with the Kerala Electronics Development Corporation.

5.48. Punjab, Bihar, Andhra Pradesh, Meghalaya and Rajasthan have also indicated their willingness to set up Testing and Development Centres in their States. Punjab and Andhra Pradesh have sent draft schemes while the schemes from Bihar, Rajasthan etc. are still awaited.

5.49. The likely expenditure which was proposed to be incurred on the scheme for setting up Testing and Development Centres during the year 1973-74 was as follows:—

Name of the State	Amount in Rupees	Amount in foreign exchange
	Rs. in Lakhs	
1. Tamil Nadu	1.33	Nil
2. U. P.	6.49	Nil
3. Gujarat	5.80	Nil
4. Maharashtra	4.59	Nil
5. West Bengal	5.00	
	23.12	

5.50. The finally approved provision under this head for the Department of Electronics for the financial year 1973-74 was Rs. 22 lakhs which was expected to be fully utilised.

5.51. The Department of Electronics has demarcated specific States in the country, amongst individual officers of the Department. They, in turn, hold detailed discussions with the State Departments and State agencies for the purpose of formulating suitable proposals in this regard. During the Fifth Plan period it is expected that as many as 12 such centres will be set up for which provision of Rs. 3 crores has been made for the development of electronics. It is hoped that these Centres will provide a valuable facility to small and medium entrepreneurs so as to make them quality conscious which is vital to the growth of electronics both within the country and abroad.

5.52. As against the current thinking of the Department of Electronics regarding setting up of testing facilities in the States by the State Governments, it has been suggested that Government should encourage the establishment of cooperative testing facilities to be set up by the Small Scale Units jointly and that the capital needs of such a facility should be provided by the Electronics Commission. The recurring expenditure and operation should be managed by the cooperating small scale units.

5.53. The Department of Electronics are of the view that a suggestion that this may also be done in the cooperative sector is a welcome one but in practice, it may be difficult to implement. It is well-known that small scale entrepreneurs are even more individualistic than in the large scale sector and it is difficult to get them together to operate in a cooperative sector. There is also a danger that cooperative associations provide facilities only to members of the society which may leave out some of the electronic units in the area. For these reasons, the Department at the moment is not considering actively to set up testing and development facilities in the cooperative sector. It would, however, consider each case on its merits and if suitable proposals come from cooperative associations of small entrepreneurs supported by the State Governments, the Department would be glad to consider their applications.

5.54. The Committee are glad to note that the Electronics Commission have comprehensive plans for growth of electronics in each State and to this end, they have decided to set up a testing and development centre in each State, to make available these facilities to the entrepreneurs particularly in the small scale sector. The Committee hope that these facilities when created, will give a powerful boost to the electronic industry in the States and inculcate a greater awareness towards quality consciousness. This will also remove an important bottleneck in the way of the new units



coming up and will enable the entrepreneurs to enter the export market with confidence.

5.55. The Committee, however, note that while these schemes are being formulated in a number of States, a testing and development centre has so far been initiated only in Tamil Nadu. The Committee note that the Electronics Commission propose to help in setting up 12 such centres in the country during the Fifth Plan. The Committee would like Government to carefully evaluate the experience gained of setting up a development centre at Tamil Nadu before setting up the centres elsewhere in the country. The Committee need hardly point out that there are already plethora of agencies which are trying to provide services to the small scale industry. The Committee feel that if development and testing facilities are to be provided on decentralised basis for electronic industry, it should be done in close cooperation with the industry and State Governments and the scheme should be such as to be self-financing i.e., run without profit and loss. In fact, it may be more appropriate to encourage the industry to set up such facilities by organising themselves in cooperatives.

#### F. Foreign Assistance in Planning of Factories

5.56. It was stated by the Bhabha Committee in their Report in 1966 that no foreign assistance should be sought in planning construction and operation of electronics factories.

5.57. It has been stated by the Department that it has been possible to follow the guidelines laid down by the Bhabha Committee in respect of planning and construction of electronic factories. The Electronics Corporation of India Limited (ECIL) was planned and constructed entirely on the basis of indigenous effort. The new units of I.T.I. at Naini and Rai Bareilly and the Ghaziabad unit of Bharat Electronics Limited have also been similarly planned and constructed through indigenous effort. As regards the private sector also no foreign assistance is now either being sought or permitted in the planning and construction of factories. Foreign collaboration when permitted is for specific technology relating to processes, circuits, production engineering etc.

5.58. The Committee are glad to note that it has been possible to follow the guidelines of the Bhabha Committee Report in the matter of planning and construction of the new factories in electronics field with indigenous effort and some of the important factories like the Electronics Corporation of India, ITI at Naini and Rai Bareilly and Ghaziabad unit of Bharat Electronics Ltd. have been planned and constructed without any foreign assistance. The Committee hope that no such assistance will henceforward be needed and the new factories will continue to be planned and constructed with indigenous effort.

### G. Manpower

5.59. One of the functions of the Department of Electronics is to assess the qualitative and quantitative needs for manpower in the various sectors of the industry, such as research and development, production, marketing, maintenance etc. and take necessary steps to make such manpower available on time. In this regard, the representative of the Department of Electronics stated during evidence that some detailed studies have been started in this regard. He pointed out that manpower estimates available in the foreign countries could not be transplanted in India because degree of automation in operations of plants in other countries is very different. In India it is principally a manual labour oriented industry. This has, therefore, to be studied in more detail. Existing patterns of manpower available in the country in various types of electronics industries is also required to be studied. The Studies in relation to the Fifth Plan requirements in the field of electronics had been just finalised and, it is now proposed to take necessary steps on the subject. The representative assured that the first step in this direction will be completed in the next three months.

5.60. It has been represented to the Committee that in some institutions conducting degree courses on electronics, the electronics subjects are confined to one or two papers in an otherwise electrical engineering course. The depth of training in some cases is very shallow and the subject covered somewhat outmoded. With the exception of the Indian Institutes of Technology and a few leading colleges the training in the majority of others is not of a nature to foster and develop electronics in the country.

5.61. It has further been suggested that a greater emphasis is needed in the study-in-depth of Electronics solid state physics electronics as well as in the practical aspects of the science.

5.62. The representative of the Department of Electronics stated during evidence in this connection:—

“With due regret, I must agree that the comments given in this paragraph are correct. But this is for a number of historical reasons. In this country, there are technical institutions which come under the purview of different Universities, technical institutions which come under the purview of the Directorates of Technical Education of different States, technical institutions that come under the purview of a system like the I.I.Ts., technical institutions that are autonomous like the Indian Institute of Science, the Birla Institute of Technology and Science etc. There is no centralised mechanism to evolve a common syllabus for all these institutes. I.I.Ts. do have a forward looking curriculum; they keep on updating their syllabus. This is possible

for them, because the mechanism to frame the syllabus rests with the particular institute. This facility does not exist with a large number of institutes in the country. I am referring to the institutes that are affiliated to Universities."

He stated further:—

"It is a laborious process to make any changes in the curriculum. It takes about one and a half to two years. I am aware of certain instances where the changes are being resisted by certain institutes. For example, I would refer to certain regional engineering colleges. There are people with advanced qualifications and they are capable of introducing new concepts into education, but at the same time they have to follow the same syllabus as is followed in other engineering colleges affiliated to that particular University. I am aware of cases, where changes have been proposed by the representatives from the regional engineering colleges, but have been turned down by the representatives from the remaining affiliated colleges."

5.63. The representative, however, pointed out that it would be unfair to say that the syllabus is outdated or that the educational institutions are not turning out the type of graduates that the industry needs. The engineering colleges and educational institutions could not be expected to turn out the graduates who could readily fit into the industry. The representative was of the view that industry must accept the responsibility to train them for an additional year or two. The best approach would be to provide for a mechanism, where the members of the teaching profession and engineering colleges could interact with the scientific community at large more effectively within the country. Specifically there must be a mechanism to enable the teachers in the engineering colleges to periodically visit research institutes and industries within the country in order to enable them to gain familiarity with what is going on and with the latest trends. Only through such interaction and other similar processes, one can hope to bring changes in the educational system. Just by framing a uniform syllabus for the whole country, we are not going to achieve the objective. The teachers could also attend Conferences where they can interact with the remaining technical community. The representative stated that there were many educational institutions in the country but few of them had resources to provide for its faculty to travel even a couple of hundreds of miles to visit another engineering institute or research institute in the country.

5.64. Regarding curriculum, the representative stated that "one cannot really copy the curriculum from other countries. This has to be related to the needs here and the particular set up. Instead of making a statement that greater emphasis should be on solid state physics, and subjects of this nature as in advanced countries, in the Indian environment, the emphasis would have to be more on subjects like engineering economics, production engineering, standardisation and test procedures which are primarily technology oriented and have more practical emphasis."

5.65. The Secretary, Department of Electronics expressed the view that it has to be recognised that in an area like electronics where it primarily depends on the skill of personnel at the engineering level, the technicians level etc. it is vital to ensure that people of the right quality and right enterprise are available. The training of personnel coming out from various institutions is inadequate except in certain specialised cases. In places other than I.I.Ts. and some other specialist institutes of science the training is largely deficient. The deficiency can, however, be set right by imparting training during his career. In the area of Science and Technology for which a large amount of money has been allotted and which relates to the whole industrial sector, efforts are being made to analyse the type of manpower coming out, the training given and the needs of the country in various sectors. As regards electronics a number of centres were being started and the existing ones being developed in the country to create nucleating points.

5.66. The Committee were informed that there were various schemes which were being started such as at the Indian Institute of Science in Bangalore under support from Swiss Government for certain specified fields in electronics. This particular centre will start in at least another two years.

5.67. The National Advisory Committee on Electronics also examined the various aspects of training and manpower requirements for the electronics industry in the future years. It was recognised that more accurate data in regard to the requirements of the Industry (including that of Defence) should be obtained from several sources. Specific areas in which a considerable amount of shortage of manpower is expected were identified as Systems' Analysis and Computer Software, Semi-conductor Technology and Digital Communication. It was recommended that steps may be taken to include the Electronics Industry under the Apprenticeship Act to enable training facilities to be provided to a large number of students.

5.68. The need for upgrading courses at the Universities and other Training Institutions was discussed and it was felt that greater facilities might be provided to these institutions in respect of equipment as well as

resources. There was also need to upgrade the quality of the teachers which could be taken up by the Department of Electronics with the Ministry of Education who are already operating a Quality Improvement Programme. The need for updating the curriculum in Electronics at most of the academic institutions was also discussed and a suggestion was made for classifying these institutions on the basis of their performance. Particular attention was drawn to the serious gaps in manpower at the middle-technician level which is likely to be bottleneck for the growth of the Industry.

5.69. It has been represented in a memorandum submitted to the Committee that while academically brilliant engineers are to be found in our Defence (R&D Establishments, the CSIR Laboratories etc.) hardly any high grade electronic equipment for professional use has been developed in the country. One of the reasons is possibly that these Scientists have not been exposed to the hardware problems of the industry. The development is being carried out in isolation. This should be remedied by allowing these Scientists to work for some time in the public sector industries.

5.70. The Department of Electronics are of the view that it is not correct to say that "hardly any high grade electronic equipment for professional use has been developed in the country." Numerous indigenous achievements in this regard in the spheres of defence electronics, communication and other professional areas have already been referred to earlier in this Report. To quote a few, almost the entire production of ECIL, which produces a number of sophisticated electronic equipments including computers, is based on indigenous know-how generated either in-house or other laboratories/research institutions in the country. The entire transmission equipment being produced in I.T.I. is based on similar indigenous efforts, either in-house or in association with the Telecommunication Research centre (TRC). Almost all communication equipments presently in production in BEL, have been indigenously developed. Even in as sophisticated a field as Radars, BEL has developed either itself or in collaboration with defence laboratories, Battlefield Surveillance Radar, Storm Warning Radar, Cyclone Warning Radar etc. on the basis of indigenous know-how. Instances of this nature, though comparatively few, are also not lacking in the private sector, especially in the field of test and measuring equipment.

5.71. The Department, however, agree to the view that success in productionising the equipment has been easier where R & D and production is either under the same roof or where close links have existed between the R & D organisation and the production agency. Some of the examples of the latter kind are: Cooperation between BEL and

Jadavpur University in the case of electronic desk calculator; Cooperation between BEL and Defence Electronic Research Laboratory (DERL), for IFF equipment; Cooperation between Tata Institute of Fundamental Research (TIFR) and BEL in the case of Semi-conductor devices; the close association between Bhabha Atomic Research Centre (BARC) and ECIL in a number of electronic items under production in ECIL; and cooperation between Telecommunication Research Centre (TRC) and Indian Telephone Industries (ITI) in the case of telecommunication equipment. Similarly, Hindustan Aeronautics (Hyderabad) is planning to productionise items as for the Navy, Rural Communication VHF sets for the P&T etc., on the basis of know-how generated in Defence Laboratories/TRC.

5.72. The Department of Electronics have stated that the research institutions (e.g. TIFR, NPL and CEERI) which have necessary facilities to build up industrial prototypes, or have pilot plants for specific purposes, have been able to develop products whose ultimate productionisation in industrial terms does not present too many problems. Research Institutions which do not have such facilities should, therefore, concentrate either on conceptual or futuristic research, or alternatively, if they want to undertake product-oriented research, must establish links with an appropriate production agency in advance.

5.73. It has been stated that in cases where close links have been established between the R&D Organisation and the production agency it has not been unusual for the scientists to spend some time in the production agency. The cases of scientists actually joining the production agencies on a long-term basis and then coming back to the R&D organisation are also not unknown but these have been far too few. The Department feel that the solution to the problem does not lie in the adoption of a stereotyped system of sending scientists to production agencies just to get themselves acquainted with production problems of a general nature. General exposure to factory environment and problems already forms a part of most of the academic engineering courses leading to the award of degrees. What is really necessary in the case of product-oriented R&D is, that close links should be established between the R&D and production agencies right in the beginning of such projects to afford the necessary facilities to the scientist(s) for getting fully conversant with likely production problems at the production agency and in reverse to enable production agencies to appreciate the design problems and end objectives. Wherever found necessary the scientist(s) could actually go over (on such terms as deputation) to the production agency after the development is completed and remain there till production problems of producing the item in numbers are successfully resolved.

**5.74. The Committee feel that in a country like ours with its resources and manpower and pressing problem of creating employment opportunities, electronics provide an ideal field. The Committee are convinced that our country can have a very notable breakthrough in increasing the range and values of electronic equipment to be manufactured for meeting the external and internal demand in the Five Year Plan. It is, therefore, of utmost importance that the manpower requirement for research, development, manufacture and support of this programme should be identified in detail and a well-coordinated and integrated programme drawn up to provide the requisite training facilities. In particular they feel that there is need for imparting training to skilled artisans who constitute the backbone of production programme as also of supervisors at various levels. The facilities for higher education in electronics in the leading Indian institutions should be continuously improved and expanded in order to provide the requisite number of engineers of high grade to sustain and take forward the programme of development. The Committee would like the Department of Electronics to play an effective role in working out these requirements in depth and will urge that Government should stress upon all other concerned Departments including the Ministry of Education to give the requisite support so as to develop the training facilities to meet the manpower requirements in a systematic and planned manner.**

#### **H. Schemes for the return of highly qualified scientists, engineers and technologists from abroad**

**5.75. It has been stated that the Department has been feeling the need of a special scheme to facilitate return from abroad of highly qualified, scientists, engineers and technologists whose services could be utilised in the field of electronics. The detailed manner in which the scheme would be operated is yet to be worked out but the thinking in the Electronics Commission is on the following lines.**

**5.76. It has been stated that the hand-picked Indians at present working abroad, who are desirous of returning to India, would be selected by a high level Board on the basis of their experience and capabilities to function as nucleating points around whom specific development work could be grown. The scheme would be looking for men with high qualities of leadership, initiative, self reliance and extensive experience and not for the much larger numbers who have qualified and are engaged in a general way in technical areas abroad. Most organisations have problems in the recruitment of specialists with their existing staff structures and procedures. This scheme is expected to function as a buffer or a bank, where the specialists could be located till they could be assigned to specific Institutions or projects on a regular basis. There would be no restrictions about the salaries to be paid to them which would generally be in the higher brackets around Rs. 1500 to Rs. 2500 per month depending upon**

the capability and experience of a particular person. The scheme would work broadly on a pattern similar to the Scientists Pool of the CSIR. But there would be some basic difference. In the CSIR Scientists Pool, the scientists are paid around Rs. 500—800 a month and thus the Pool functions more or less as a means of payment to Scientists/Technologists from abroad who wanted to return and would take some time to fix themselves up. On the other hand in the scheme envisaged by the Department, persons would be hand-picked on the basis of their qualifications and experience so that specific tasks in Institutions and Projects could be assigned to them. After the details of the scheme are worked out, the following measures will be taken:—

- (i) Advertisements will be inserted in important foreign technical journals inviting attention to large possibilities over the future in the field of electronics in India.
- (ii) When the applications for jobs are received, from Indians working abroad, decisions on them would be taken quickly and suitable persons would be offered positions in the first instance.
- (iii) The Scientists, Engineers and Technologists would have to be interviewed abroad and they should not be asked to come to India for this purpose.

5.77. The budget provision of Rs. 10,00,000 was made for 1973-74 with a view to cover expenditure for a scheme to attract to India the highly qualified manpower in the field of electronics who are currently abroad and who wish to return to India. In the context of the imperative need for indigenisation in the field of electronics and for stimulating R&D efforts, it had been decided to evolve such a scheme.

5.78. It has been stated in a written note furnished to the Committee that the scheme for return to India by highly qualified manpower in the field of electronics has not yet been finalised. The details of this scheme are being worked out in consultation with prospective employers in India for such a highly qualified personnel. It has been stated that the first steps in connection with the implementation of this are expected to be taken during the next financial year.

5.79. Asked why the scheme for return to India from abroad of the highly qualified people had not been finalised and implemented the representative stated:—

“I had actually made this proposal to have a scheme which is somewhat different from the Pool Scheme of the C.S.I.R. The C.S.I.R. normally sends details of the Pool Officers in the various institutes in the country and asks whether we would



like to provide them with a post; and they sometimes get absorbed here. The Pool Scheme is essentially a means of supporting them until they get a job. But this scheme is different. We get people at a higher level. It is not merely a sort of small post whilst they are looking around for a job but taking on a post for a very specific task. That was the real objective. Our objectives was to select people who will be paid high salaries. Our intention is to pay them about Rs. 1500 to 2500 whilst the average level in the Pool Scheme is Rs. 500 to Rs. 600."

He added:—

"Secondly one of the main problems that arises in this case is that ultimately they have to work; we can take them, but a large part of this work which is to be done is really research, development and production which has to be at the particular locations where the facilities exist or can be built up. It is the way, we are doing at the present moment. We can identify, what sort of manpower is needed for a particular job. What happens is that at senior level, people go back. The whole scheme will fall. They do not have concrete things to do. Rather than incur this possibility of having people to go back, we thought, we will do so when our schemes come through and specific locations have been found. This is the main reason, why we did not implement this."

**5.80. The Committee note that the Department of Electronics have under consideration a special scheme to facilitate return from abroad of highly qualified, scientists, engineers and technologists whose services could be utilised in India. The scheme would be applicable to men with high qualities of leadership and initiative. The intention is to identify the jobs on which the selected scientists who will be paid high salaries ranging from Rs. 1500 to Rs. 2500, will be required to work.**

**5.81. The Committee also note that a budget provision of Rs. 10,00,000 was made for 1973-74 with a view to cover expenditure for the scheme. The Committee, however, find that the scheme has not yet been finalised. Since with the growth of Electronics industry, larger and larger number of factories are coming up, more and more testing and development centres are being established for which more and more highly qualified scientists will be required with extensive experience to provide leadership and take initiatives at proper levels, this scheme merits**

early finalisation and implementation. The Committee hope that the Department of Electronics will move in the matter more speedily and identify such personnel to bring them back to the country with suitable assignments.

5.82 The Committee would like the Department of Electronics to very carefully go into the working of CSIR Pool Scheme so as to avoid the difficulties and shortcomings which were experienced in the implementation of that programme. The Committee feel that it is not the number of persons who are attracted back but the quality, innovative character and dedication of spirit of the people who return which will determine the success of the programme and its impact on the development of the electronics industry. The Committee cannot, therefore, over-emphasise the need for selecting the best persons available on merits and to proceed in the matter with caution so as to avoid the shortcomings and difficulties which have been set the CSIR pool scheme from its very inception.

## CHAPTER VI

### INDUSTRIAL LICENSING PROCEDURES

6.1. Among the responsibilities of the Electronics Commission and the scope of work of the Commission and the Department of Electronics laid down in accordance with the Government of India Resolution dated the 1st February, 1971, the Department of Electronics is, within the framework of accepted national policies, the authority of the Government to exercise regulatory control and supervisory function with regard to the import of items, industrial licensing, foreign collaboration and capital goods import. Proposal for the import of high value items relating to electronics by all Ministries-Departments and institutions in the country are also subject to a procedure of scrutiny or *post facto* review by the Electronics Commission.

6.2 For purposes of discharge of these responsibilities the Commission has evolved the following broad guidelines for processing licensing applications:—

- (i) to encourage highly skilled and technically qualified entrepreneurs, including scientists or technologists returning from abroad, to set up production units in various sectors of electronics;
- (ii) to encourage dispersal of industries on a wide and equitable basis throughout the country; and to give special preference to locations in areas where the basic infrastructure exists but where development of electronics has been negligible;
- (iii) to persuade large scale units to enter those areas which are technologically sophisticated and which require intensive R & D back-up; have long gestation periods; or involve exports or demand appreciable marketing capabilities.
- (iv) to assess carefully the technological capabilities of each party and to make suitable recommendations on that basis; the capability is evaluated not just from records on paper but through discussions and by visits of experts to units already set up (if any) by the parties.

6.3. In a preliminary note submitted to the Committee the Department had indicated the need to reduce the considerable procedural delays that occur at every stage before an application fructifies into an industrial licence and leads finally to production. This has been particularly a matter of concern to the Department in view of the rapidly changing nature of the electronics industry and the large number of qualified technical entrepreneurs who are coming from abroad with a view to promoting new industrial ventures in electronics.

6.4. The procedure of applications involving industrial licences, capital goods and foreign collaboration has been recently streamlined by the Ministry of Industrial Development. The same procedure applies to cases involving electronic items.

6.5. According to the procedure, all applications for industrial licences are received by the Secretariat for Industrial Approvals located in the Ministry of Industrial Development. One copy of the application is sent to the administrative Ministry to whom comments from all the concerned departments are sent in 30 days. Copies of these comments are also sent to the Secretariat for Industrial Approvals (SIA). The administrative Ministry in turn is expected to take the comments of other departments under consideration and formulate their view which is to be communicated to the Secretariat within 15 days of the receipt of the comments from the other departments. Irrespective of whether this view is sent or not, the Secretariat puts up the cases to the Licensing Committee by that time. This would imply that roughly 45 days after the application has been received by the Secretariat for Industrial Approvals, the case goes to the Licensing Committee for the issue of letter of intent.

6.6. In respect of applications for capital goods, the procedure had been streamlined a few months back whereby applications are received by the CCI&E and then transmitted to the D.G.T.D. who scrutinises them from the indigenous angle and essentiality. D.G.T.D. in turn sends its comments to the Capital Goods Committee in the Ministry of Industrial Development, marking a copy of its comments to the administrative Ministry. Then cases are brought up before the Capital Goods Committee the administrative Ministry is expected to make its comments at the meeting itself.

6.7. In respect of foreign collaboration, same procedure as regards the licensing applications is being followed. Thus the case will come before the Foreign Investment Board roughly within 45 days of its receipt by the Secretariat for Industrial Approvals irrespective of whether administrative

Ministry has formulated its views or not.

6.8. The present procedure also provides for composite applications which involve issue of the letter of intent, approval for foreign collaboration and/or the clearance of capital goods. In this case, soon after the earlier cited 30 days time has elapsed, a Screening Committee will meet chaired by Joint Secretary of the administrative Ministry. All the concerned departments are represented on this Screening Committee. The recommendations of the Screening Committee are then put up to the Project Approval Board consisting of Secretaries of the Ministry of Industry, Economic Affairs, Science and Technology, the D.G.T.D., the D.C.S.S.I. and the Secretary of the administrative Ministry. After the clearance of the Project Approval Board, the relevant composite approvals for all aspects are given straightway.

6.9. It is the view of the Department of Electronics that under the current procedure, definite deadlines are provided for processing each application and the long delays that were experienced earlier are likely to be avoided. The procedures described, apply to the field of electronics also.

6.10. The Committee were informed that the new procedure on disposing of applications for licences had come into force with effect from the 1st November, 1973. All the applications received after this date are being processed within the specific time-limit of 30 days of their receipt by the departments concerned after giving their views. Then after a period of 15 days that is within roughly 45 days from the receipt of applications, they may appear in the agenda of the licensing Committee. The Committee were assured that these deadlines were being followed in the Department of Electronics. Unless there are very special reasons for it in which case very specific points are required to be discussed with the entrepreneurs, the time limit is kept up.

6.11. The details of the applications pending with the Department for (i) Grant of industrial licences; (ii) Approval to foreign collaboration; (iii) Import of Capital goods; indicating the number of applications which are pending for more than two years; more than one year but less than two years; more than six months but less than one year; more than three months but less than six months are given as under in the tabulated form together with the reasons for the pending. The date of the oldest application in each of the above categories is also indicated together with the reasons therefor.

Information as in January, 1974

## \*Industrial Licence application (pending)

More than two years	More than one year by less than two yrs.	More than six months but less than one year	More than three months less than six months	Less than three months	The date of the oldest application in each category and reason thereof
1	2	3	4	5	6
Nil	Nil	24	22	12	1. Nil 2. Nil 3. 11/CLP/73 General Electronic, dated 11-1-73, New Delhi.  Item : Tape Recorder 4. 1477/CLP/73 Tape Recorder. dt. 5-7-73 Shiva Electricals, Calcutta. 5. 2210/CLP/73 P. C. Boards dated 10-10-73 Andhra Pradesh I. D. C. Hyderabad.  (All the pending applications are being processed and will be disposed of in the next one or two months.)

\*It has been stated by the Department of Electronics at the time of factual verification that :—

"the latest position (as on 27-4-74) is that only 5 applications are pending with the Department. All these relate to the mini Computer area and are awaiting a policy decision by the Electronics Commission on the Report drawn up by a Technical Panel appointed by the Department of Electronics. As soon as the Electronics Commission formulates a policy in the matter, the pending applications will be cleared."

## (ii) \*Applications for Foreign Colaboration (Pending)

1	2	3	4	5	6
Nil	Nil	4	5	3	1. Nil 2. Nil 3. FC-FiB-2 (1821)/73 dt. 22-373 Shri T. R. Chaudhry, Bombay Electronic Bobbi Feeler and control Equipment Precision registers

\*It has been stated by the Department of Electronics at the time of factual verification that:—

"The latest position (as on 27-4-74) is that no applications are pending with the Department of Electronics."

1	2	3	4	5	6
					4. FC-FIB-2 (1988)/ 73 dt. 16-7-73 Dignitronic Ltd., New Delhi.
					5. FC-FIB -2 (2983)/ PVC 73, dt. 4.10.73, Major VSR Swamy, Condensers. Bangalore.
					(All the pending applications are being processed and will be disposed off in the next one or two month.)

*\*(iii) Applications for import of Capital Goods (Pending)*

1	2	3	4	5	6
2	Nil	1	Nil	Nil	1. Philips India Ltd, Calcutta C. G. application dated 1-12-70 received from D. G. T. D. on 13-4-71 for the manufacture of Electronic Components.  (The application was kept pending report of negotiating team. As the report has recently been submitted the application is being examined.)
					2. Nil
					3. M/s English Electric Co. of India, Ltd, Madras. C. G. application for Rs. 1,48,400/ for the manufacture of Electronic components.  (The application is being examined by the D.G. T. D. after the party has furnished the detailed specifications of the Equipment)

\* It has been stated by the Department of Electronics at the time of factual verification that:—

“The latest position (as on 27-4-74) is that no applications are pending with the Department of Electronics.”

6.12. Asked why in spite of the simplified procedures, delays were taking place, the representative of the Department of Electronics stated during evidence that the time-bound schedules which have been applied, apply to applications received after, 1st November, 1973. The applications received prior to that date are stated to have been kept as backlog. The representative, stated that the Department was faced with a big backlog but the present position was that all backlog upto the end of 1972 had been cleared. In 1973, 58 applications are stated to be belonging to the period prior to 1st November, 1973. The Committee were assured that all these applications are expected to be cleared by the end of February, 1974. After that there would be no backlog.

6.13. Asked if there is any special drive to clear these applications the representative of the Department of Electronics stated during evidence:

“We had a large number of applications in semi-conductor devices and so on. These applications were kept pending for some time because the Department had constituted panels in these areas. It was necessary to draw up broad guidelines on which these applications were to be processed. Once these guidelines are available, then, of course, it becomes a comparatively easy matter to apply those guidelines. Therefore, in the later half of 1973, we had cleared a large number of applications which enabled us to come to this position which is fairly satisfactory. Probably, in a month's time, we could see that there would be no backlog at all.”

6.14. The Committee were informed during evidence that the small industries below Rs. 7½ lakhs of capital do not require licences in the field of electronics. All other small scale industries are normally getting their approval for licences from the Director of Industries at the State Level. Only in the electronics field, there is a certain amount of approval required from the Development Commissioners' Office. This is because of the fact that electronics is comparatively a new area. Therefore a proforma has been prescribed and approvals are granted in meetings held every fortnight.

6.15. The representative of the Department however, explained that the applicant did not require any imported raw material, no approval would be necessary. But, in case he requires foreign exchange, the approval will be necessary.

6.16. Asked if there were any small scale industrial units in electronics which do not require any foreign exchange, the representative stated that there are not many items of this type. By and large, certain amount of control has to be exercised by the Government agencies because there



is a certain amount of foreign exchange involved. In cases where no approval is necessary the applications are not kept pending.

6.17. The Secretary, Department of Electronics stated during evidence that with a view to avoid necessary frustration arising from delays in granting licences and to allay the feeling that there was no interest in real growth and real development the Department was working on the basis of a method. Panels had been set up in different areas to lay guidelines and with the help of the Reports of these Panels it was easy to deal with appreciations. This, in the opinion of the representatives of the Department of Electronics was a more national basis and on this basis it had been possible to clear all applications prior to November, 1973 although pending these reports the Department had essentially to wait during 1971 and part of 1972.

6.18. The representative further stated that efforts are also made to meet the entrepreneurs and explain the position to them although it is not possible to do this in case of every single individual who comes from so many parts of the country.

#### *Sub-Committee*

6.19. At the time of the formation of the Electronics Commission the question of setting up of a Sub-Committee of the Licensing Committee was considered for the purpose of processing applications in the field of electronics. The Licensing Committee is a statutory body set up under the Industries (Development and Regulation) Act. Hence, ultimately all approvals connected with industrial licensing would need to be provided by that Committee. However, it is possible for a sub-committee to be set up under the Licensing Committee which would deal with applications in the electronics area. The Department, however, felt that there was no need to take out electronics from the general purview of the Licensing Committee and that this could be done, if after watching the progress of the licensing cases, it turned out that by mixing up cases in electronics, with a large number of other areas, delays were being caused. After the new SIA procedures have been introduced for speedy clearance, it may not be necessary to set up a separate Sub-Committee as the views of the Department are given considerable weightage by the Licensing Committee and its recommendations are almost invariably accepted by it. The Committee have been informed that there have been so far no delays due to other members of the full Licensing Committee making comments or requesting for re-examinations of recommendations who are not directly concerned with cases in electronics.

**6.20. The Committee note that the long delays caused in the disposal of applications for licences have been obviated to a large extent with the**

introduction of new procedures from 1st November, 1973. The Committee are informed that all licensing applications are being disposed of within the deadline of 45 days prescribed in this behalf.

6.21. The Committee also note that the Department of Electronics appointed panels such as the panel for the semi-conductors industry to provide guidelines for formulating clear cut policies for disposal of applications in specific fields of electronics. These guidelines provided a rational basis for processing of applications objectively. The Committee suggest that such guidelines should be evolved in all other important fields of electronics to facilitate speedy disposal of licensing applications in future.

6.22. The Committee further note that in spite of the revised procedures, 58 applications were still pending with the Department of Electronics (as in January, 1974). These cases, the Committee note, belong to the period prior to the coming into force of the revised procedures. The Committee desire that special efforts may be made to clear this backlog of pending license applications without delay.

6.23. The Committee note that so far no specialised sub committee has been set up to process exclusively the applications for licences for electronics industry. In view of the fact that electronics is a highly specialised field for which the Department of Electronics provides the nodal Ministry, the Committee would like Government to consider the advisability of having a sub committee for this purpose. At any rate, the Committee need hardly point out that in the interest of proper and timely disposal of licensing applications, the responsibility for scrutiny and giving clear recommendations on applications for licenses should be squarely put on the Department of Electronics.

#### *Letters of Intent*

6.24. The Committee have been informed that a large number of letters of intent are pending with department for a long time which have not been acted upon.

6.25. Asked to state what action had been taken to review these cases it has been stated by the Department that in order to find out specifically why action has not been taken in many cases, to implement letters of intent/approvals, a comprehensive review exercise was done during 1973. Officers of the Department of Electronics dealing with both large and small sectors, as well as the officers of the DGTD, DCSSI, CCI&E, visited various State Capitals and held separate meetings with the letters of intent holders in the organised sector. The State Director of Industries in each case was actively involved in this exercise. In fact, the meetings

were convened by the State Director of Industries to whom lists were sent in advance of the parties in each State. Such exercises were conducted at Chandigarh (for Punjab, Haryana and Chandigarh), Simla (for Himachal Pradesh), Kanpur (for U. P.), Calcutta (for West Bengal, Bihar, Orissa and Assam), Hyderabad (for Andhra Pradesh), Bangalore (for Mysore and Kerala) Madras (for Tamil Nadu), Bombay (for Maharashtra) and Ahmedabad (for Gujarat). It has been stated that at these review exercises the attempt was not merely to find fault with the parties but to ascertain in each case as to why particular letters of intent/approval was not acted upon. In some cases the State Director of Industries was advised how to process the cases. In other cases, it was clear that the parties themselves were not actively interested in the project. As a result of this review a clear picture of the progress made by each of the parties all over the country is now available to the Department of Electronics which will enable it to take suitable action in regard to extension of the validity of the letters of intent or cancellation.

6.26. The position revealed as a result of this review has been indicated in the statement against each case. The letters of intent revoked or withdrawn as a result of this review are as under:—

Years of letter intent	No. of letters of intent revoked	No. of Letters of intent withdrawn
1969	..	1
1970	7	7
1971	2	1
1972	1	3

6.27. It has been stated by the Department of Electronics in this connection that in some cases it was found that all the parties could not appear for a variety of reasons and the Department had requested the concerned State Directors of Industries to send similar progress reports in respect of units that could not appear. The Directors of Industries of Delhi, Maharashtra, Karnataka and Tamil Nadu have sent such reports and other State Directors have been reminded to expedite them.

6.28. In respect of those units which have not taken any steps for the implementation of their schemes, action has been initiated to issue show-cause notices for cancellation of the approvals. This has been done in the case of approvals for T.V. receivers, Tape Recorders and Record

Changes. Further, in the letter of approval (which is only for the small scale sector) a clause has been inserted stating that such an approval will be valid only for a period of one year. In the case of the organised sector such a clause is already in effect for some time. The information regarding the progress of individual units which has now been compiled is being utilised to recommend suitable applications for the extension of the validity of the letter of intent whenever they are made by the party.

6.29. On the basis of the information received from the parties as well as the State Director of Industries, units have been categorised into three categories viz., category (A) those, who have commenced production or are about to do so, category (B) these units who are likely to go into production and category (C) units who have not taken any steps and therefore unlikely to go into production. A total picture of the position in regard to various areas categorised as above is shown in the enclosed statement.

Production	Organised			Small Scale		
	A	B	C	A	B	C
Television	61.9	28.7	9.52	25%	61%	13.5%
Tape Recorder	—	86%	14%	50%	33	17
Record Player	73%	27%	—	12.5%	45	42.5
Electronic Desk Calculator	3.92%	96.08	—	9%	13%	18%
<i>Capacitor</i>						
Electrolytic	60%	21%	19%			
Plastic Film	14.4%	46.6%	39.9%			
Ceremic	13.8%	60.7%	25.5%			
Potential meter	11.8%	40%	48.2%			
Carbon Film Resistors	32%	10.7%	57.3%			

6.30. During evidence the representative of the Department of Electronics stated that a very personal knowledge of the parties concerned was obtained. The representative stated that the concentration was on category (b) i.e. those who have commenced production or are about to do so, who would be helped to go into production. In regard to category (c) the representative stated that a larger number of letters of intent issued would leave the impression that the whole demand was going to be produced. However, a large number of applicants fell in this category.

6.31. The Committee note with concern that a large number of letters of intent are lying unimplemented in electronics for a long time, some of them belonging to the year 1969. The Committee also note that the Department of Electronics conducted a comprehensive review recently of all these letters of intent by holding meetings with the applicants in the State capitals in cooperation with the State authorities concerned. The Committee feel that while a broad picture of the real capacity likely to be implemented is not available with the Department, the exercise has been only partially successful as a large number of the applicants were absent. The Committee understand that this is being followed by obtaining information through State Directors of Industries. Show Cause Notices have also been issued to those who have taken no action to implement the letters of intent.

6.32. While the Committee appreciate these efforts towards ensuring implementation of the letters of intent, the Committee urge that a procedure may henceforward be evolved so that a periodic review of the situation is conducted at regular intervals so as to ensure that desired capacities in various categories are created in time and according to plans. In this connection, the Committee would like to draw the attention of Government to their recommendation contained in para 52 of their Fiftieth Report on Industrial Licensing.

*Import Licences for materials*

6.33. It has been represented to the Committee that:—

“According to the present policy it looks, that one can never reach the peak capacity licensed. During the first year the allotment of raw material has to be an advance allotment based on the phased manufacturing programme to commence production. From then on it is on actual consumption basis. When one consumes 50 per cent of the holdings, he is permitted to apply for the import of raw materials. There also for the criteria is of opening LCs beyond 50 per cent of previous allotted licensed values. Based on this application one gets the licence after the usual gestation period of 4 to 6 months, a licence to import raw material which you had actually consumed at the time of making the application (i.e. around 50 per cent of your actual requirement). Thus you will never get 100 per cent Raw material sanctioned because you apply after crossing 50 per cent and you get only that much. Therefore, in any one year you can never reach your licensed capacity. The Government in its wisdom laid down that you must consume at least half of your holdings of

Raw material but they never saw that it takes 6 months to get a licence, nor give us 100 per cent. They only give the amount of actual consumption."

6.34. The representative explained during evidence that:—

"Every entrepreneur, as soon as he gets the capital goods and is about to instal it, gets an initial raw material licence from the CCIE for a six-monthly period. He gets another six-monthly licence for raw materials. So, for one year he gets a licence. Once there is a certainty that he is about to go into production, after that DGTD will give it on the basis of consumption. If it is in the priority sector, as in the case of electronics, he can go to the D.G.T.D. every quarter and rotate his licence, so that he can go up to even 125 per cent of his capacity. On paper it seems there is no limit to the raw material he would get. But in practice, this requires a certain amount of agility, alertness etc. because there are time lags and unless he is agile and well-versed in pushing the application through, he may find himself without adequate raw material. So, a certain amount of streamlining of procedures may be required so that a man is not starved of raw materials at a critical time."

o.35. It has also been represented that some licence amount is allocated to rupee areas. Delegations have gone to these areas and come back empty handed as far as electronic grade raw materials go. It is argued that there is no point in insisting on RPA licence when it will be unfruitful. It takes 3 to 4 months to change an PRA licence to GCA licence. In the meantime for want of raw materials a unit faces the danger of closure. The Committee wanted to know how far flexibility to import electronics grade material from any country could be allowed by liberal CGA licences ensuring at the same time to make purchase from the RPA sources if things are available there.

6.36. The representative of the Deptt. of Electronics explained during evidence that:—

"So far as import licence procedure goes, in electronics it is the same as any other industrial sector. There is difficulty for the man who gets licence for which a part of the licence is in the rupee payment area. Out of Rs. 100, Rs. 25 is for the rupee payment area. 25 per cent he does not utilise and he gets only 75 per cent. Next year if it is based on consumption, that is to say, Rs. 75 worth consumed, he gets import

licence for Rs. 75 out of which 75 per cent is given for non-rupee and 26 per cent for rupee area. This is what happens. The man therefore, faces difficulty. Value of the licences is thus reduced. Of course the CCI&E has issued public notices saying that where a man is not utilising part licence he could come to him and can get this rectified. There are lot of difficulties in procedures and delays occur at every stage. One solution would be where you have a procedure whereby the issue of import licence would be more directly related to the work of the Department in electronics."

6.37. As has already been stated the Department is planning to set up a separate Corporation with a view to helping entrepreneurs to obtain from the East European countries raw materials and components which are available there. It has been stated by the Department that the difficulty faced by entrepreneurs is due to the fact that production in these countries is on a forward planning basis and unless requirements are intimated well in advance and bulked it is difficult for the manufacturing organisations in those countries to incorporate them into their production schedule. If the proposed Corporation comes into effect it could compile adequate information on the availability of materials in those countries so that RPA licences which are now being given to the entrepreneurs could be fully utilised. It has been stated by the Department, however, that the question of allowing more liberal free foreign exchange at the present state seems remote in view of the difficult foreign exchange resource position of the country.

6.38. The Committee note that according to the existing procedure for import licences, the entrepreneur gets raw materials on six monthly basis. It is difficult for him to properly plan his production unless he goes on approaching the licensing authorities and keeps close liaison, which is difficult for a small scale industrialist.

6.39. The Committee also note the problem at present being faced by the entrepreneurs in regard to the foreign exchange allocation which is partially for GCA countries and partially for RPA countries. It becomes difficult to obtain supplies from RPA countries which have forward planning economies and require advance information in regard to the requirements.

6.40. The Committee understand that these problems will be largely solved after the constitution of the proposed Electronic Trade and Technology Development Corporation which will stock raw material for issue to entrepreneurs. The Committee, however, recommend that Government may also examine the feasibility of granting raw materials licences

**for a period of 12 months instead of six months in view of the fact that the time involved in obtaining replenishment licences and importing materials is very long.**

### *Applications for Raw Materials*

6.41. It has been represented to the Committee that the applicants are required to make one consolidated application for the year. It is usually seen that the application made in March-April gets cleared and the licence is received not before August-September. By the time this licence is received and status obtained, it takes further 6 to 8 months to receive the materials. This upsets the production for want of imported materials atleast twice in the year i.e., near about September, October and March-April. It has, therefore, been suggested that a quick process may be evolved to recommend import licences for raw materials. Licences should be granted quickly or an *ad hoc* licence for six months be granted to serve as buffer to the applicant to take care of the delays in the issue of licence.

6.42. Asked to state the feasibility of the suggestion it has been stated that it is true that under the current import policy for priority items (as is the case for electronic components) the import application can be made once quarterly while in the case of non-priority items (such as Radios and T.V.) applications are only made once a year. It is also true that there is a considerable time lag between the filling of the application and the receipt of the import licence and further delays before the material is actually received. However, this need not be a particularly severe handicap if the party is vigilant enough to file his application in time and keeps necessary stock of raw materials for production meanwhile. What is required is a careful follow-up pending applications so that no production bottlenecks arise due to the lack of raw materials for components. In cases, where there is a particular difficulty, cases are taken up by the Department of Electronics and referred to the Hard cases Committee. The proposal to provide *ad hoc* licence for six months may not be acceptable in view of the difficulty foreign exchange situation at the current moment. The Department of Electronics is analysing the problem encountered by industry with regard to import controls and plans to discuss shortly, possible solutions with CCI&E and Ministry of Commerce. At present Department of Electronics does not come directly into the picture except when particularly difficult cases are brought to its notice; this so far is wholly the responsibility of the Ministry of Commerce (CCI&E). But Department of Electronics feels that it could play a useful direct role in this if allowed to.



6.43. NACE, in a recent meeting while endorsing speedier processing of applications in the procedures recently initiated, felt that composite applications by entrepreneurs should be encouraged, if necessary, through meaningful guidance by the Department of Electronics. It was also suggested that an officer of the CCI&E might be located in the Department of Electronics to expedite the issue of import licences and to avoid time lost in shuttling files between departments.

6.44. The Committee note that under the import policy for priority items (as in the case of electronic components) the import applications can be made once quarterly while in the case of non-priority items (such as Radios and TV) applications are made only once a year. There is also a considerable time lag between submission of applications and receipt of import licences and further delays occur before the material is actually received. This position, in the opinion of the Committee, can be considerably improved if the Department of Electronics is in a position to play a more direct role in the whole procedure. The Committee desire that this aspect of the procedure may be reviewed and a suitable procedure evolved. In this regard the suggestion of the National Advisory Committee on Electronics with regard to locating a CCI&E officer in the Department of Electronics to expedite the issue of import licences deserves careful consideration with a view to minimise the time involved in the movement of files between Departments and granting of import licences.

#### *C. G. Licences*

6.45. It has been represented to the Committee that:—

“If one examines many of the electronic component projects the imported capital goods generally is less than Rs. 20 lakhs. If that being so, Government should consider raising the limit of CG from Rs. 10 lakhs to Rs. 20 lakhs thereby only registering would be sufficient and manufacturing licence is avoided. Any one wanting to make professional grade component or can give export commitment, should be allowed to set up, a unit by mere registering upto a limit of Rs. 20 lakhs CG.”

6.46. However, it may be stated in this connection that Government have recently announced the liberalisation of their earlier procedure for registration of new units. In the new procedure, the earlier limit of capital goods for the registration proposes has been completely removed. Thus all units whose total investment does not exceed one crore of rupees

can register themselves provided the value of raw materials and components is not greater than 5 per cent of production irrespective of the value of the capital goods employed. It has, however, been stated by the Department of Electronics that this, has not helped the electronic applications considerably since it was found that in almost all cases, import of raw materials exceeds the 5 per cent ceiling prescribed in the procedure. Thus, although the capital goods restriction has been completely removed, the ceiling on raw materials which is necessitated by the need to restrict recurring foreign exchange acts as handicap in the automatic registration of most units. In the light of the present position, it is difficult to see how this can be removed completely. It might also be added that to make electronic components of high quality and reliability and at low cost, mass production techniques and large volumes are largely necessary. The number of manufacturers will, therefore, not be too many for the major part of the effort to produce electronics components.

6.47. The Committee note that in the recent liberalisation of the procedure for the purpose of registration of new units, the capital goods limit has been completely removed and all units whose total investment does not exceed Rs. one crore can register themselves provided the value of imported raw materials and components is not greater than 5 per cent irrespective of the value of capital goods employed.

6.48. The Committee, however, note that in almost all such cases of electronics units, import of raw materials exceeds the 5 per cent ceiling prescribed in the procedure.

6.49. Since this will act as a handicap in automatic registration of most electronic units, the Committee feel that this might create a serious bottleneck in the production of components of high quality and reliability and at low cost where mass production techniques and large volumes of production are necessary. The Committee feel that the number of these units is not likely to be large. They recommend that suitable remedial measures may be taken to ensure that production in electronic items is not hampered on this account.

#### *Procurement of Materials*

6.50. It has been represented to the Committee that the Electronics industry is experiencing great difficulties in procuring materials such as plastic moulding powders, non-ferrous materials, etc. which are canalised for import through Government agencies. These materials normally are not made available on time by these agencies and often the prices are higher than when imported directly. Either the agencies in question do not know the exact sources of supply, or where sources of supply are known the time taken for importing material is far too long.

6.51. It has, therefore, been suggested that companies receiving actual user licences for more than Rs. 5,00,000 per year be allowed to import directly as per their exact requirements, if necessary under a Letter of Authority issued in their favour.

6.52. It has been stated by the Department of Electronics that it is known to the Department that the manufacturers of electronic items have special problems in getting their requirements of canalised items. These special problems arise because of the fact that an electronic industry needs a variety of chemical plastics and alloys, mostly of a special nature of interest to an electronic industry alone and also mostly in a very small quantity.

6.53. It has been stated that whenever individual problems are brought to the notice of the Department of Electronics, the same are dealt with on their merits, and proper technical advice is given to the other concerned Department/Ministries. However, the industry has also made a joint representation to the Department bringing out the broad nature of this problem. It is the view of the Department that these problems can be tackled effectively once the proposed Electronics Trade and Technology Development Corporation starts functioning. As the proposal for setting up this Corporation has reached an advanced stage, the Department hope that the problems of the industry as highlighted in the representation would be reasonably resolved shortly. The Department of Electronics is also consulted about changes of the Import Trade Control Policy that could be of help in resolving these difficulties.

### *Steel*

6.54. It has been represented that procurement of steel is a great bottleneck whether it is imported steel or indigenous steel. The import of steel is allowed only through HSL and the experience mentioned under (ii) above holds good in the case of import of steel through HSL as well. Even local steel against the specific allocations from SPC is not supplied in full quantities and in time. It is suggested that a certain part of the indigenously produced steel be earmarked for this very important industry in the country.

6.55. The Department of Electronics has stated in written note furnished to the Committee that the supply of steel through the Hindustan Steel Limited is admittedly difficult due to the large demands for it. The units in the electronic industry therefore suffer the same handicap as is being suffered by other units in the industry. However, in respect of the electronic units there is an additional difficulty that their requirements are for specialised items of high purity and comparatively small quantity. Canalising agencies such as Hindustan Steel are often reluctant to handle these small volume demands and it becomes necessary for the electronic units to

obtain a 'no objection certificate' to enable them to import steel on their own. The Department of Electronics is aware of this difficulty and has therefore suggested a special Electronic Trade and Technology Corporation for the benefit of the electronic units which would take up the responsibility for importing such items as are required by them in small quantities by bulking their demands. It is expected to help the electronic units in meeting their small volume demands for specialised items. Changes are also proposed in the Import Trade Control Policy to partly help resolve their difficulties.

6.56. It has been represented to the Committee that:—

“Some items are channelised through STC or MMTC because the import policy says: no one seems to have examined what types of commodities STC imports, whether they are of electronic grade quality or not; whether it would be economical for STC to import if the demand is small and such aspects. When one goes to STC they will gladly give you an authorisation letter to import but charge you their commission. Why should an entrepreneur pay higher price (STC commission added) by channelised imports.”

6.57. The Committee were informed during evidence that the actual users are allowed to import directly only after obtaining letter of authority from S.T.C. STC charges 1 per cent commission which is on the value of licence. This is charged to meet the expenses incurred by STC towards large administrative work relating to scrutinising of documents and to avoid over invoicing etc.

6.58. The representative, however, pointed out that the agency system was not serving the real purposes which it supposed to do. The representative stated that the real purpose of the agent is to give the fullest possible information on the widest possible basis to all potential users concerning the product. The agent should also have the technical expertise on the use of the particular component. Apart from that, he deals with the whole process of ordering and obtaining it for the user. He provides in the case of equipment the very best and baked up information on various aspects. For these reasons he is kept as an agent and is given commission. In India, however, a system had been developed where the agent is **nothing** but a letterhead and collects information from the various sources. The representative was of the view that this was a waste of money and there should be some control on it. Instead of getting the information direct it has to be obtained on payment through an agent. The result is

that these items cost more on account of commission. Commenting on the role of S.T.C. as an agent the representative stated:—

“STC is acting as an agent in that particular case and here also by providing the same service on invoicing and on quotations. Really speaking, they are not providing the technical service. In my view electronics is a difficult area. The agents who have no organisation of their own should not be allowed to perform the agency function unless of course they provide you with the technical services. I think there should be some sort of a control on the agency system which does not exist at present.”

6.59. He expressed the view that the agents must be registered in some form and there must be reasons why a particular person or group wants to act as an agent.

6.60. He expressed a hope that in the electronics trade, the Electronics Trade and Technology Corporation will be allowed to import. In the case of electronics items, these may not be channelised through the S.T.C. and the M.M.T.C. as they perform at present. This is a new production; this is not meant for the channelised imports; it is meant to provide the service already mentioned.

6.61. The Committee note that electronics industry is experiencing special difficulties in regard to import of canalised items such as plastic moulding powders, non-ferrous metals, steel etc. because of the special nature of their requirements and also because their requirements are small. The State trade organisations are reluctant to import the same and are not in a position to provide the technical service expected of such organisations in view of electronics being a new subject.

6.62. While the setting up of the Electronics Trade and Technology Development Corporation will largely solve most of the problems relating to import of special materials required by the Electronics industry, Government should examine these difficulties and take necessary measures to help solve these problems including changes where called for in the Import Trade Control Policy.

*Imposition of Ban on import of raw materials*

6.63. It has been represented to the Committee that Government sometimes imposes a ban on imports of certain raw materials hopefully anticipating indigenous production. India is producing the entertainment grade types of diffused wafers for the transistor industry. It has, however, been pointed out that there are atleast 200 types of these wafers required for

professional grade transistors, and semi-conductors devices. The indigenous development is expensive as their demand is small and costs are bound to be higher than imports. By stopping imports of wafers and permitting equipment manufacturers to import, finished products like transistors, diodes, FETs, ICs the portion of indigenous effort in assembly, encapsulation accountable in rupees, is lost to the State. Moreover each imported wafer has certain test devices which when carefully studied give insight to the technology used. It has, therefore, been suggested that the import of wafers should be banned by stages and not wholesale.

6.64. The Department of Electronics has stated in this connection that the Semi-Conductor Panel had made a specific recommendation in this regard, namely, to ban the import of chips/diffused wafers. The reason was that the import of piece parts (chips/package etc.) in terms of F.E. value was not too different from the cost of the imported finished devices. Further these imports did not add to the technological capability of the device manufacturer, they provided some employment but the finished device was much more expensive than the corresponding imported ones. This resulted in very high prices for the local equipment manufacturer and we did not stand to gain in any way. The policy of allowing wafer imports had militated against the integrated development of the semi-conductor industry. Consequently, with the exception of the public sector, there is very little evidence of a sound base developing in this area.

6.65. It needs to be explained that in a technological sense there is no significant difference between diffused wafers for professional devices or those for entertainment devices. Different types of devices are designed with different objectives, depending on usage. Very often the major difference between the two types lies in the fact that professional devices are packaged in hermetically sealed metal headers whereas entertainment types are packaged in plastic encapsulation. Also the acceptance level for professional devices is generally more rigid resulting in lower yields.

6.66. The view presented to the Committee cannot, therefore, be considered tenable/acceptable. The Department in conjunction with the semi-conductor industry is taking specific measures to significantly reduce such imports.

#### *Ban on certain chemicals*

6.67. Regarding the ban on ceramic beads, club beads, hails, silicon crystal and epoxy compound, it has been represented that the entrepreneurs are asked to get non-availability certificates from public sector undertakings or from private manufacturers. This often results in long correspondence and delays and items are ultimately imported. This shows that the sponsoring authorities do not have up-to-date information. If they were studying the manufacturing return sent each month by various firms, they would not be asking the NA certificate.

6.68. The Department of Electronics has stated in this connection that those items all evidently relate to the semi-conductor industry. Both the material specifications and the mechanical specifications in this area are extremely stringent. The question of gathering data on the various input materials and piece parts for the manufacture of semi-conductors is handled by different Directorates in the D.G.T.D. As such collating and gathering the data from the G returns etc. furnished by manufacturers of different areas is a fairly complex problem and as such the D.G.T.D. has to take recourse to obtaining non-availability certificates from various local manufacturers before clearing these items. In order to save time and in view of the specialised nature of this area, the Department has suggested that clearance with regard to materials/components in the semi-conductor area could be directly handled by the Department of Electronics.

6.69. It has been stated in this that there are numerous types of metals and chemicals which are used in electronics industry. As far as name of the item goes, most of them appear to be available in the country. But in a number of cases, the specifications are so critical that indigenous firms are unable to meet the requirements of electronic industry. Keeping all these difficulties in view, specific appendices were introduced in ITC Policy Book. These appendices include such items which were otherwise banned for import but are permitted in the case of electronic industry. From time to time these lists are being updated as and when some new items come to light depending upon the requirements. Here and there we do come across some difficulties where firms are asked to approach the indigenous firms in the first instance so that a suitable case is built up for the removal of the ban in that particular case. But this is a continuous exercise which is being done regularly depending upon the newer requirements of this growing electronic industry.

*Ceramic beads, club beads and nails*

6.70. Regarding these items it has been stated that these items are the piece parts of headers used in the manufacture of semi-conductor devices. Some of the types of headers are being manufactured by M/s. ECIL, a public sector undertaking and in addition a few small scale entrepreneurs have also started the manufacture. There had been complaints that the semi-conductor devices manufacturers do not approach them for their requirements, as they had been importing these items in the past. In such cases, it is required to bring both the parties together before arriving at a decision. The Committee have been informed that in a case pertaining to a reference from M/s. Hindustan Conductors Ltd., Nadiad, who are engaged in the manufacture of semi-conductor devices while sending the Department's recommendations on their regular import application, on 18-4-1973, these items were deleted and the party was asked to get in touch with M/s. ECIL so as to know if they can meet

part of their requirements. The Department of Electronics is also stated to have got in touch with M/s. ECIL for expediting the issue. After getting the position sorted out, reinstatement was ordered on 28-5-1973. It has been pointed out that this more or less coincides with the issuance of import licence by the office of CCI&E as they do take 3 to 4 weeks, after recommendations from the Department are sent. The Department, therefore, feels that there is hardly any delay which was involved in this case.

### *Silicon Crystals*

6.71. As regards silicon crystals the Committee have been informed that M/s. ECIL are licensed to manufacture this item and they are already in production. They had informally informed Department that none of the semi-conductor manufacturers approached them for their requirements. Keeping this fact into view, some of the parties were asked to approach M/s. ECIL for getting their requirements. This was also done with the intention to know the truth in the claims made by M/s. ECIL. This again is stated to have been done at the time of sending the Department's recommendations for import licence so that parties can contact this firm and refer the matter back to the Department so as to coincide with the issuance of the import licence by the office of the CCI&E. Simultaneously the Department also took the matter with M/s. ECIL. Ultimately it came out that the material manufactured by M/s. ECIL is suitable for part of their requirements, but the diameter size of their crystal does not match with the equipment installed in the country. After considering the points of both the parties, import was immediately permitted. In the meantime, parties were asked to find a *via media* as to how best silicon crystals manufactured by M/s. ECIL can be used in their manufacture as BEL do not find problem in using small diameters. It has been stated that this is being still pursued but the import of silicon crystals has not been stopped on this account, till a final solution is found.

6.72. It has been represented to the Committee that since no proper fee-back is received either from the Ministry of Industry or D.G.T.D. or from the Department of Electronics. Progress of the IDR application is unknown to the applicant for a few years unless it gets approved or gets rejected. It has therefore been suggested that the Government's thinking at various levels for the applications should be known to the applicant. In certain cases especially for the components, when the applicant makes one consolidated application for a number of components, and due to various reasons the Government decides to licence a few components out of the entire list, the entire project gets upset and needs major reshuffling. If the applicant has been kept in confidence without, of course, any commitments on the Government's thinking he can probably either give better suggestion or probably well in time readjust his project and fall in line with the Government's policy.



6.73. Dwelling upon the feasibility of this procedure and its usefulness to the entrepreneur it has been stated by the Department that this is, in fact, being followed by the Department of Electronics who as far as possible, invites the applicant for personal discussion and clears up a number of points with him. It has, however, been explained that in the procedure now being followed, it has become difficult to do this in all cases. Since there is a definite time ceiling on the presentation of the recommendations of the Department to the Licensing Committee after the receipt of the application, there is not adequate time for parties to be invited, particularly if they are far away from Delhi, and to make recommendations on that basis. However, advantage is taken of the officers going round several States to meet individual applicants and clarify and specific points that may arise during the processing of an application.

6.74. Even after a final decision has been taken, it is increasingly being followed that the applicant is invited for discussion so as to explain the reasons for rejection and also to advise the manner in which he may file a separate application in a more meaningful manner. It is also expected that the new proposed guidelines for industrial Licensing which the Ministry of Industrial Development proposes to bring out would help potential applicants, informing them to Government's policies both for licensing and foreign collaboration. The Department also proposes in consultation with the Information, Planning and Analysis Group of the Electronics Commission, to bring out policy papers in greater depth, in a number of areas so that applicants are made aware of various aspects of Government's policy, as well as full technical details, enable them to file an application that can be viewed favourably by Government.

6.75. The Committee note that in certain items relating to semi-conductor industry, due to bans imposed on import of ceramic beads, club beads, halls, silicon crystal and epoxy compound, the entrepreneurs are required to obtain non-availability certificates from Public Sector Undertakings or from private manufacturers.

6.76. The Committee also note that collating and gathering the data from the returns furnished by the manufacturers of different areas is a complex job as the material and mechanical specifications in respect of these items are extremely stringent and these items are being dealt with in various directorates in D.G.T.D. and as such D.G.T.D. has to take recourse to obtaining non-availability certificates from local manufacturers before clearing these items. The Committee further note that although Import Trade Control appendices indicating banned items are being updated continuously there may be cases where such difficulties do arise.

**6.77. The Committee recommend that the whole problem of obtaining non-availability certificates may be reviewed in detail in order to find workable solutions to the difficulties faced by entrepreneurs in this regard.**

**6.78. It has been urged before the Committee that as the Department of Electronics have now built up considerable expertise in the field of Electronics, the relationship of the DGTD (and the DGSSI) with the Department of Electronics, needs to be reviewed in order to avoid overlapping of functions and duplication of effort. The Committee would like Government to examine this matter at the earliest.**

## CHAPTER VII

### EXPORTS

7.1. Value of exports of electronic items from India during 1970-71 was Rs. 4.97 crores in 1971-72 Rs. 5.27 crores and in 1972-73, Rs. 6.79 crores (the values include re-exports).

7.2. The world trade in electronic industry in the year 1971-72 amounted to US \$ 4 billion. Assuming a 25 per cent increase in two years which is quite normal in a field such as electronics, the present trend can be stated to be a world trade of approximately US \$5 billion per annum. against which the export from India including re-export is stated to be \$ 8 m.

7.3. The following table will indicate India's position in world trade *vis-a-vis*, Japan, Hongkong, Singapore, South Korea and Taiwan in regard to exports of electronics.

India	Japan	Hongkong	Singapore	South Korea	Taiwan
US\$8 Million (1972)	US\$2400 Million (1970)	US\$200 Million (1970)	US\$54.9 Million (1970)	US\$142 Million (1970)	US\$180 Million (1970)

7.4. It has been stated by the Department of Electronics that there has been a spurt in electronics exports during the last three years due to the institution of R.E.P. Licences and the provision of an attractive shopping list against these. During the year 1972-73 radios have constituted the single major item of exports; the main exporters of radios have been the subsidiaries of foreign companies, followed by several units in the small scale sector who have made a significant contribution; there have also been some exports of other items in the entertainment field of communication equipment and components.

#### *Measures for export promotion*

7.5. It has been stated that the basic approach being made in the field of export promotion is to continuously pin-point export possibilities to each manufacturer through discussions with them on various formal and informal occasions in the Department of Electronics as well as during

visits to various factories. In such promotional work, a constant effort is made to:—

- (a) locate new parties who have the potential of becoming part of the electronic exporters' group in the country; and
- (b) identify new products exportable from India, taking into account the status of the existing manufacturing base from time to time.

7.6. During the past one year, as a result of such efforts to pin-point new potential exporters and exportable products and follow-up action by way of advice and persuasion the following new items have been added to the list of electronic items which can figure significantly in exports:—

- (a) Electronic Desk Calculators
- (b) Car Radios
- (c) Tape Recorders: Tape mechanism
- (d) Relays and Switches
- (e) Electronic medical apparatus
- (f) Flexible antennae wire
- (g) Mica Capacitors
- (h) Analytical instruments

7.7. It has been stated by the Department that these new items of exports, started primarily by a new group of exporters, are expected to contribute substantially to export in the next year itself, since approvals of samples and execution of trial orders are being done at a satisfactory pace. It is estimated that, while established exporters in conventional electronic items are likely to contribute about 9 crores by way of exports in the year 1974-75 (as against about Rs. 7.5 crores in 1973-74), the new items listed above are expected to account for about Rs. 1.5 crores. Thus, the Department hope that the product and party oriented export promotion measures now being adopted, are likely to contribute substantially to the growth of exports in future. The Committee have been informed that on a year to year basis, export planning and targetting is not being done at governmental level in view of the fact that in a fast changing area such as electronics in the world market and with the rapidly changing phase of the indigenous electronics industry, the actual product-mix in exports is bound to undergo rapid changes from year to year. Regular meetings are arranged with the industry to explore ways to enhance exports and remove delays and bottlenecks that may be holding up the export drive. It is

the view of the Department that India today can export as much as it can produce of quality electronic products. The problem according to the Department of Electronics is that the production of such items is insufficient for internal demand and significant exports. The remedy therefore is to enhance quality products in general and this is what is being done. The Department feel that the export base needs to be considered to represent a bona-fide business proposition for the electronics industry as a whole; at present, the items are limited and the efforts sporadic. The Department of Electronics is concerned with a stable long range pattern of exports. A further element is to ensure quality in all exported products so that India's reputation in this regard is maintained. This is also being dealt with presently.

7.8. It has been pointed out during the National Advisory Committee on Electronics meeting held recently that it is paradoxical that in the face of a very sluggish home market, the industry has failed to throw up a surplus for exports. The main hurdle in this respect is stated to be the inadequate base of components which are in short supply for the existing level of requirements for home as well as export markets. As the home market is limited by demand and not production, the exportable surplus thus created will out of necessity be used for promoting exports. It has been suggested that immediate steps should be taken to double the production of components as a crash programme.

7.9. It has been represented that the limiting factors are capacities and even flow of raw materials. The existing production capacities should be extended and regularised at the earliest and due recognition should be given to units which have resources to expand at short notice. It has been urged that full support should be extended for the timely supply of raw material on the following basis:—

- (1) Raw material licences to be issued for 100 per cent licenced capacity based on current international prices.
- (2) Raw material licences to be issued for 18 months' requirements in view of long delivery periods from suppliers.
- (3) Licences to be issued for free foreign currency areas or from credits with such countries where material is available on reliable basis.
- (4) There should be priority import releases of canalised items.
- (5) Spares for machinery already installed be permitted to the extent of 5 percent of the present value of machinery installed.

7.10. From the qualitative angle, the entire production has to meet the export standards in respect of quality and specifications, as it is not conceivable to produce components in some batches that meet the stringent international standards and the other batches that are good enough for the home market.

7.11. It has been stated in the Guidelines issued by the Department of Electronics for the Electronics Industry that currently exports in the electronics sector are of the order of Rs. 5 crores primarily of Radios and Tele-communication equipment. However, there is still a large unsatisfied demand for low cost Transistor Radios (of the AM/FM Type) Car Radios (as well as T.V. Receivers) in the advanced countries where due to rising cost of production, it may be possible to find a good market for these items. There is also likely to be demand for Data Processing equipment and more sophisticated instruments which can be produced in a country like India where technological skills exists alongwith comparatively low wage levels. It has been stated however that it is in the field of components that a considerable export market from abroad lies. There is an almost 'unlimited' demand for components of such Resistors, Capacitors and Semi-Conductor Devices in almost all the advanced countries in the world. This market is available both for consumer as well as professional electronic components. However, the scale of production in this regard is sometimes too small in the country to be able to produce the goods at international competitive prices. In such cases, it is possible to conceive of a large volume of production with a relatively small proportion going for the internal market so as to be able to tap the world demand for these items. Hence proposals with substantial export-orientation (of more than 60 per cent) can be considered in almost all areas of components by suitably qualified entrepreneurs provided there is adequate demonstration both of the capacity in producing quality items as well as their ability in marketing it.

7.12. The following items are considered to have a good export potential:—

*List of Items having export potential*

1. Antennas and Antenna hardware
2. Capacitors
  - (a) Electrolytic
  - (b) Ceramic
  - (c) Plastic film
  - (d) Paper
  - (e) Tantalum
3. Connectors, plugs and sockets

4. Loud speakers
5. Microphones
6. Fixed Resistors
  - (a) Carbon film
  - (b) Wire wound
  - (c) Metal Film and Metal Oxide
7. Variable Resistors
8. Variable Capacitors
9. Semi-conductor devices including Integrated Circuits
10. Receiving Valves and tubes
11. Crystals
12. Relays
13. Printed Circuit Boards
14. Transformers, Coils and Chokes
15. Electronic calculators
  - (a) Desk Top
  - (b) Pocket size
16. Transistor radios AM/FM
17. Auto Radios
18. Cassette Tape Recorders
19. P.A. and Hi-Fi Equipment
20. T.V. Receivers including portable
21. Oscilloscopes
22. Digital instruments
23. Battery Eliminators
24. Power Supplies.

7.13. It has been pointed out in a memorandum furnished to the Committee in this connection that in the present high wage structure in continental countries, U.S.A. and Japan, it has become very opportune to make a thrust into export field. It has been suggested that till the Export Processing Zone starts operating, there are possibilities of taking a big share of the existing market, especially in the consumer electronics field. It has been suggested that the Department of Electronics should organise 2 or 3 small groups of industrialists who should immediately proceed to prospective countries and lay foundations of business exchange. Export policy should also be so directed as to maintain high percentage

and to make them more alluring wherever possible to make major breakthrough. In subsequent years, this export incentive can be revised according to the prevailing circumstances.

7.14. A working Group of the N. A. C. E. has also drawn up an export strategy indicating short-term/long-term measures for export promotion including measures relating to utilisation of idle capacity, making essential raw material available to the industry, licencing procedures, fiscal and other measures.

#### *Export Targets for Fifth Plan*

7.15. It has been stated that during the Fifth Five Year Plan two types of exports are planned viz. exports through local production and exports through free Trade Zones. The following table gives the exports through local production (taking into consideration a natural growth of the electronics industry) and the Santacruz E.P.Z. The exports from local production takes into account the present level of exports of Rs. 7 crores (1973-74).

	74—75	75—76	76—77	77—78	78—79	Total 7—79
	(In Rupees crores)					
1. Exports from local production	9	11	14	18	23	75
2. Santacruz E.P.Z.	8	25	40	50	50	173
Total	17	36	54	68	73	248

#### *Export Promotion Zone*

7.16. In the year 1971-72, an Indian Electronics Delegation was sponsored jointly by the Department of Electronics and T.D.A. to explore the manner in which India's share could be increased in the rapidly growing world trade for electronics. The main recommendation arising out of the Delegation's Report was to set up an export Processing Zone at Santa Cruz, Bombay, for giving a special boost to the export of electronics goods from the country. In November, 1972 Government accepted this recommendation. The Santa Cruz Export processing Zone project is being implemented by the Ministry of Commerce. The Department of electronics is constantly reviewing electronic items suitable to be made in the Zone. Department of Electronics is represented on the S.C.E.P.Z. Authority which considers policy aspects as well as Board which deals with detailed implementation aspects.



7.17. It has been stated that the Export Processing Zone has created a considerable interest among Indian technologists abroad as well as the business community in India, especially those who are not in electronics but who have significant marketing expertise. This would bring two new groups, having competence of their own, into the electronics exporting community in India and, thereby fulfill one of the important objectives in our export planning.

7.18. It is stated that another significant factor which emerges from the analysis is that, many parties will be depending on their own individual marketing efforts and will not be tied to a sole buyer abroad. The Department, therefore, hope that, the E.P.Z. would make a significant contribution to electronic exports in the following ways:—

- (a) A rapid rise in exports;
- (b) Broad-basing and enlarging the exporting community, thereby imparting inherent strength to our future export efforts; and
- (c) Promote marketing efforts by Indian companies and, thereby help project the Indian image in the export markets; which is an important factor in the long term growth of exports.

7.19. The Department feel that the projects which envisages foreign collaboration are expected to bring in advanced technology (through foreign collaboration), in the following areas:—

- (a) High quality printed circuits including multilayer type.
- (b) Integrated circuits.
- (c) Silk screen process for professional grade mica capacitors.
- (d) High quality metal-oxide film resistors, including high value types.
- (e) N-Channel Mass memories.
- (f) Magnetic memories.
- (g) High quality (but not Hi-Fi) loudspeaker cones.
- (h) Liquid crystal displays.

7.20. In some cases of foreign collaboration, the main advantage to be derived through such collaboration is said to be in regard to export marketing of the products, the items covered being wire wound resistors, electrolytic capacitors, automatic door openers, plastic film capacitors. T.V.

Receivers and power semi-conductors devices. Even in cases where foreign collaboration helps to bring in advanced technology, some additional advantage in terms of export assistance is also expected to be realised.

7.21. Regarding foreign investment as a factor by itself, the Committee have been informed that the proposals so far approved envisage foreign equity participation upto a maximum of 55 per cent. The primary role of such investment in approved cases is to provide effective participation in the management so as to ensure smooth transfer of technology, quick commencement of manufacture and dependable offtake of the products in the foreign market. Foreign investment as a primary means of providing large amounts of finance as basic capital, or in terms of foreign exchange, for the projects, has not arisen so far; electronics is very low in its requirements of capital investment for a given level of production. The view taken by the Department of Electronics is that foreign investment is being attracted to the extent required by Indian promoters of export-oriented units in the E.P.Z. so as to ensure inflow of technology, manufacturing know-how and export marketing assistance as needed. There are however proposals involving foreign equity as high as 100 per cent with significant export commitment that are still under examination.

7.22. Regarding the construction schedule for the Export Promotion Zone it has been stated that construction of factories by Government will be confined, as now proposed, to only one standard design factory (SDF) which will house 30 to 40 independent manufacturing units in one multi-storeyed construction. Additionally Government also is undertaking the construction of peripheral walls and administrative buildings needed in the Zone. Tenders for the start of construction work on Government account have already been called and construction work is expected to commence immediately; this is being executed through Maharashtra Industrial Development Corporation. It is expected that the work on the construction of self-designed factories by parties who are being allotted plots of land in the Zone will also start simultaneously. At the same time, various clearances required for the import of capital goods, by the parties are being given. It is, therefore, expected that production and exports from the Zone would commence by the middle of the First Year of the Fifth Plan period. A target of Rs. 50 crores has been fixed for exports from the zone when it is in full operation.

7.23. It has been stated by the Department that proposals have started coming in for setting up of manufacturing units in the E.P.Z. At present about 60 applications have been received, many of which are bonafide and technically sound as a result of the fact that, during the period when proposals for E.P.Z. were under consideration by Government, the parties

have been carrying on continuous discussions with the Department of Electronics for over an year before submitting their applications. 30 proposals have so far been accepted, 20 rejected and 10 are stated to be still under consideration.

7.24. Asked to state the specific measures taken to ensure that the targets of exports from this zone from 1974-75 onwards are fulfilled it has been stated by the Department that a simplified procedure has been laid down for giving all the necessary approvals, viz., approvals or letters of intent, capital goods clearance and approval of foreign collaboration expeditiously in one single forum, the Santacruz Export Processing Zone Board. Further, frequent meetings are being held with the parties whose project have already been approved, in order to assist them through any unexpected procedural difficulties which they might encounter and also to minor the progress made by them, on their own part, in implementing the proposals. It is hoped that the first exports from the Zone will take place during 1974-75.

7.25. It has been represented to the Committee that the progress regarding the Free Processing Zone, it still very poor and it is of utmost importance that proper delegation of power is given to the Development Commissioner of the zone. The working of the High Power Body has not been smooth and there are still delayed in giving clearances. It has, therefore, been urged that some positive action to expedite decision is very much necessary.

7.26. The Committee are disappointed to note that India's position in world export trade of electronics is very low. As against world export trade in Electronics being of the order of US \$5 billion, India's share is about US \$8 million only. Even compared to exports of electronic items by small developing countries like Singapore, South Korea and Taiwan which have been exporting to the tune of US \$54.9 m., US \$142 m., and US \$180 m. respectively, India's performance of exports in these items is poor. It is all the more distressing to note that while India has good export potential of quality items, the exports suffer as a result of bottleneck in production. There is large unsatisfied export demand for low cost transistor radios, car radios, data processing equipments and other more sophisticated instruments which can be produced in India. There is also 'unlimited' demand for components such as resistors, capacitors and semi-conductor devices in almost all advanced countries in the world.

7.27. The Committee note that according to the Department foreign collaboration in fields like High Quality printed circuits including multi-layer type; integrated circuits; Silk Screen process for professional grade

mich capacitors; High quality metal-oxide film resistors, including high value types etc. etc. will bring advance technology and will be helpful for exports of these items. The Committee see no objection to enter into foreign collaboration in fields where advance technology is required in the interest of boosting up the exports from the country. They would, however, like to emphasise that the indigenous technology should be utilised to the maximum extent possible and where indigenous know how is not available foreign knowhow may be imported in the minimum areas possible and efforts made to indigenise the foreign knowhow by intensive research and development effort with a view to reach self-reliance in the shortest possible time.

7.28. In this connection, the Committee would also like to state that Japan has made big strides in the exports of electronics items and has been exporting electronic items to the tune of \$2400 millions as far back as in 1970. They have been able to do so by importing foreign technology and by adapting it to local conditions and improving upon it by local research and development efforts. The Committee would like the Department of Electronics to learn from the example of Japan with a view to enter in the export of electronic items in a big way.

7.29. The Committee strongly recommend that with a view to avail of the opportunities available presently in the foreign market in view of the distinct advantages that India has on account of comparatively low cost technical skill available in the country as compared to the high wage structure in all the advanced countries, no time should be lost in taking concerted measures to remove all hurdles standing in the way of export drive. Urgent steps should be taken towards full utilisation of the existing capacities and for expansion of capacities in all commodities identified to have export potential. All such capacities should be licenced readily. Further, intensive efforts should be made to locate new parties who have the export potentiality and to encourage and assist them to produce exportable items of requisite quality and quantity within the shortest possible time. The Committee need hardly emphasise that no amount of export drive for electronics will be of any avail unless a sound production base is built up in the country.

7.30. The Committee also recommend that the list of items having export potential should be periodically reviewed with a view to add to the list the new exportable items by identifying them taking into consideration the existing manufacturing base in the country. This list should also be publicised widely.

7.31. The Committee note that one of the hurdles in pushing up the production of electronics items for exports is the inadequate base of components which are in short supply for the existing level of requirements for home as well as export markets. The Committee recommend that a crash

programme may be undertaken to increase the production of components to meet the existing as well as future requirements.

7.32. In this connection the Committee would like to reiterate that the proposed Electronics Trade and Technological Corporation may be set up early so that it may be in position to undertake the task assigned to it without delay.

7.33. The Committee note that the National Committee on Electronics have recently made a number of recommendations as regards strategy of export both short-term and long-term. They have inter alia recommended immediate utilisation of idle capacity as well as provision of facilities for import of raw materials from preferred sources, and building of technological strength to be able to compete in the international market. The Committee desire that Government should examine the recommendations made by that committee urgently and take effective steps to implement the same so that the targets of importance laid down for the Fifth Plan could be achieved. The Committee would like to be apprised of the decision taken on recommendations of that Committee and action taken to implement them in due course.

7.34. As a sound institutional arrangement for a consistent and systematic export drive will be essential the Committee suggest that a standing working Group should be constituted immediately consisting of representatives drawn from the T.D.A. the Engineering Export Promotion Council and the Department of Electronics to keep a watch over the progress of imports and remove bottlenecks if any, in the achievement of export targets.

7.35. Recognising the need to increase India's share in rapidly growing world trade of Electronics, the Government of India decided in November, 1972 to establish an Electronic Export Processing Zone, at Santacruz. The Committee note that since the decision taken by Government in this regard in November, 1972, 60 applications have been received out of which 30 proposals have so far been accepted, 20 have been rejected and 10 are still under consideration. The Committee also note that construction work in the zone has yet to start. The Committee consider that the progress in regard to the setting up of the Zone has been very slow. They are doubtful if at this speed the targets for export amounting to Rs. 25 crores from the zone during 1974-75 could be achieved. The Committee therefore urge that effective and determined measures should be taken immediately to accelerate the progress of work in the zone and the functioning of the industries there.

7.36. The Committee also suggest that after assessing the success achieved by the SEEPZ in the export field. Government should consider the establishing of more such zones in the country.

## CHAPTER VIII

### ORGANISATIONAL SET UP

8.1. The Electronics Commission and Department of Electronics are the two agencies which have been entrusted with the responsibility of formulating and implementing Government's policy respectively in the field of electronics. The Electronics Commission is at the apex of the organisational set up.

8.2. The Electronics Commission is a high powered body set up by the Government of India *vide* Cabinet Secretariat Resolution dated the 1st February, 1971 (Appendix II). It has been vested with the full powers of the Government of India both administrative and financial for carrying out its work within the limits of the budget provision approved by Parliament. The specific responsibilities mentioned in the Government of India Resolution are:—

- (a) formulating policy in the field of electronics paying due regard to other general policies of Government.
- (b) preparing the budget of the Department of Electronics for each financial year and obtaining Government approval thereto; and
- (c) the implementation of Government policy in all matters concerning electronics through appropriate agencies of Government.

8.3. At the time of setting up the Commission, Government had drawn up the following broad list of items for which the Commission will bear responsibility:—

- (a) Call upon the important users to present their short and long term requirements of equipment, with their specifications, with a view to determining the appropriate systems and technologies involved.
- (b) Make a comprehensive assessment, in both technical financial terms, of national needs for all electronics products, and integrate such needs into a single overall framework.
- (c) Direct the promotional and regulatory measures required to ensure quality production of electronics equipments at satisfactory prices.

- (d) Design and implement policies and procedures for the provision of manufacturing technology for the electronics industry, through a mix of domestic design and development and imported know-how which will ensure that the industry develops on the basis of maximum self-reliance.
- (e) Survey, plan, initiate, financially support and monitor, an integrated national research and development programme, involving Government laboratories, public and private sector companies, and academic institutions, that exist as also those which may come into being in the future, aimed at generating all the know-how necessary for production programmes.
- (f) Take the lead in interfacing research and development with production, by amongst other measures:
  - (i) promoting the acquisition of technical capability and providing the finances, for the design and engineering of pilot plants and prototype production facilities based on locally developed processes and design;
  - (ii) taking special steps, such as provision of subsidies, to ensure that the high cost of limited volume production, which our needs often call for, is not allowed to become an obstacle to starting commercial manufacture of products, based on local know-how;
  - (iii) providing risk capital and industrial support for commercially exploiting electronics products devised by individual investors.
- (g)
  - (i) Survey, plan and approve, programmes in the public, private and small scale sectors, for the production of those materials, components, equipment and systems, the need for which has been identified by (b) above, and (e) and (f) or otherwise;
  - (ii) Take steps to assist in the fabrication of as much of the plant and machinery needed for approved production programmes, as the Commission deems possible;
  - (iii) Be responsible for operating all necessary industrial and import licensing policies and procedures, as far as the Electronics industry is concerned.
- (h) Make a determined effort to design and enforce the use of engineering and materials standards, suited to our conditions, even in cases where production is based on imported know-how.

(i) Assess the qualitative and quantitative needs for manpower in the various sectors of the industry, such as research and development production, market, maintenance etc. and take necessary steps to make such manpower available, in time.

(ii) Make every effort to generate as many employment opportunities as possible for any given investment, whether in manufacturing or in other sector of the industry, such as marketing and maintenance.

- (i) Take action to expand the fields of application of electronics in the national economy.
- (j) Advise Government on matters governing the issue by the Controller of Patents and Designs of patents affecting the industry in India.
- (k) Take all other steps which it deems necessary to promote a self-reliant Electronics Industry. The Commission shall, in pursuance of its responsibilities indicated above, be free to set up laboratories, companies or other facilities and operate them directly under its own management, if it deems that existing facilities administratively located in other ministries/departments are inadequate that no facilities of the desired kind are in existence in the country or for any other reason.

8.4. In addition, the broad scope of work of the Commission and the Department of Electronics was formulated as follows:

- (i) Within the framework of accepted national policies, the Department of Electronics will be the authority of the Government to exercise regulatory control and supervisory functions with regard to the import of items industrial licensing, foreign collaboration and capital goods import.
- (ii) Proposals for the imports of high value item relating to electronics by all Ministries/Departments and Institutions in the country will have to be subject to a procedure of scrutiny or post facto review by the Electronics Commission.
- (iii) All Ministries/Departments will make available to the Commission, as and when required in the course of its work, the technical features and performance characteristics of the electronics equipment in their use or on order at any time.
- (iv) The Commission has the authority to call for and examine the annual financial allocations for electronic items of the various



Ministries/Departments of the Government with regard to their R&D as well as industrial activities.

- (v) While it would be open to each Department/Undertaking or Institution to proceed, as upto now, with R&D work of limited application, it would be essential to dovetail major proposals; such as those relating to complete systems or assemblies, into the national efforts being organised by the Commission. As such all schemes whether current already or not, which relate to the development of complete systems, or assemblies, shall henceforth bear the general scrutiny of the Commission.
- (vi) The Commission might approve and launch schemes of special significance, after thorough scrutiny of their scope, work schedule, estimates, funding procedures, composition of R&D groups etc. such schemes approved by the Commission will ordinarily be sanctioned by the Government without subjecting them to a re-check of the contents within the ambit of the relevant Ministries/Departments or institutions concerned in the normal course. Depending upon the advice of the Commission, such schemes may also qualify for special consideration in the matter of purchase and import procedures, financing, building works etc. In appropriate cases, where the scheme is entrusted to an official agency, the expenditure may, in the first instance, be debited to the Department of Electronics and adjusted as deemed proper later.
- (vii) The Department of Electronics after obtaining instructions from the Electronics Commission, will cooperate with the Ministry of External Affairs in formulating Government policies regarding aspects of electronics having international implications. The implementation of the policies so drawn up would be in the hands of the various Departments/users in India in accordance with the allocation of Government business.

#### *Constitution of the Commission*

8.5. In accordance with the provision of the Government's Resolution dated 1st February, 1971—

- (a) The Electronics Commission shall consist of full time and part time members. The total number of members shall be not less than four but not more than seven.
- (b) The Chairman of the Electronics Commission will also be Secretary to the Government of India in the Department of Electronics.

- (c) A member of the Commission will be Member for Finance who shall also be ex-officio Secretary to the Government of India in the Department of Electronics in financial matters.

8.6. So far the Commission has been constituted thrice on 8th February, 1972, 21st November, 1972 and on 1st July, 1973. The present composition of the Electronics Commission (effective for 2 years from 1st July, 1973) is as follows:

1. Prof. M. G. K. Menon—Chairman.
2. Shri P. N. Dhar—Member.
3. Dr. B. D. Nag Chaudhuri—Member.
4. Shri A. S. Rao—Member.
5. Shri M. R. Yardi—Member.

8.7. Shri M. R. Yardi is Member (Finance) of the Commission. Shri P. N. Dhar is Secretary to the Prime Minister, Dr. Nag Chaudhuri is Scientific Advisor to Raksha Mantri, Shri A. S. Rao is Managing Director, Electronics Corporation of India Ltd. and Shri M. R. Yardi is Finance Secretary to Government of India. The Electronics Commission is non-representational in character i.e. members are not selected to represent specific Departments/Interests except the Member (Finance) who has a specific responsibility with regard to financial matters.

8.8. Between 8th February, 1971 when it was set up, till 31st December, 1973, the Electronics Commission has met 16 times.

8.9. The Committee welcome the setting up of the Electronics Commission with a view to ensure balanced development of electronics industry in the country. They note that the Commission is mainly responsible 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 field of electronics in the shortest possible time and in the best possible manner.

8.10. The Committee also note that since the setting up of the Commission in February, 1971, it has met 16 times.

8.11. The Committee are greatly impressed by the amount of work, especially planning, in the field of electronics which has been done in the Department of Electronics after its inception. The Committee recognise that in the crucial and strategic field of electronics, it is of great advantage that a scientist of an international standing and reputation heads both the Commission and the Department.

The Committee cannot help pointing out that the sheer volume of work involved is so large that it requires adequate administrative and organisational arrangements to ensure that there is follow-up of the approved policies and of the schemes selected for implementation.

8.12. The Committee note that Government's resolution setting up the Electronics Commission, provides for the appointment of one or more full-time members. At present, no such appointment has been made. The Committee have no doubt that Government would keep, under review, the volume of work and the nature of responsibility involved so as to provide the Chairman of the Commission who is also the Secretary of the Department, adequate time to concentrate on the main task of laying down and evolving policies and over-seeing their implementation.

8.13. The Committee would further like Government to keep the working of Electronics Commission under continuous review to see that the objectives underlying its set up are fully achieved and that the policies formulated are forward looking, comprehensive, meaningful and realising so that India attains not only self-reliance in her field of electronics in the shortest possible time but also builds up a viable industry not only to meet the internal requirements but to capture an increasing share of export markets.

*Headquarters of the Commission and the Department of Electronics*

8.14. The Headquarters of the Electronics Commission is in Bombay and the Commission has a staff of its own who constitute the Information, Planning and Analysis Group (IPAG) consisting of 23 Class I Posts and supporting non-technical staff. As in the case of the Department of Electronics, the Secretariat staff in the Electronics Commission are outside the purview of the Central Secretariat upto and including the level of Section Officers and Scientific Officers in the Electronics Commission are appointed on contract basis, usually for a period of 5 years.

8.15. It will be seen that whereas the Headquarters of the Electronics Commission are located at Bombay, the Department of Electronics is situated in New Delhi. The Committee wanted to know the considerations for locating the Headquarters of the Electronics Commission at Bombay. It has been stated that the Department of Electronics was constituted as an independent Department of Government with effect from 26-6-1970, the Cabinet approved creation of a post of Secretary to the Government for the Department following this, Prof. M. G. K. Menon, Director, Tata Institute of Fundamental Research was selected for appointment as Secretary to the Government of India, Department of Electronics. He was asked to submit proposals for an organizational structure which would facilitate the rapid development of electronics in India. He proposed the setting up of an Electronics Commission on the lines of

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the Atomic Energy Commission. The Electronics Commission was constituted and Prof. Menon took charge as Chairman with effect from 8-2-1971. He also took charge on that date as Secretary, Department of Electronics.

8.16. At the time of his selection and appointment, Government had taken note of the fact that Prof. Menon wished to continue his association with the Tata Institute of Fundamental Research, Bombay, as its resident head until such time as the work of the Department increased measurably to demand its fulltime location in Delhi. At the time of taking this decision, Government recognised that the Chairman of the Electronics Commission ought to keep close contact with an operating scientific institution in the field of electronics and that this would be best served by Prof. Menon continuing to be with the Tata Institute of Fundamental Research, Bombay. Prof. Menon also indicated that at the Tata Institute of Fundamental Research, he was engaged mainly in scientific activity and organizational matters related to this. Whilst in Bombay, he engaged in such work, he could also direct scientific activities needed by the Electronics Commission where independent data collection, planning, analysis etc. were required. For this, the Information, Planning and Analysis Group (IPAG) was set up under the Electronics Commission.

8.17. The Electronics Commission Headquarters housing the IPAG has specific responsibilities like the collection, collation and dissemination of information, preparing five year plan 10 year profile and annual plans of development and production for the electronics industry and making in-depth techno-economic analysis with respect to demand forecasting, technology forecasting, evolving policy guidelines etc. None of these functions require the housing of IPAG in Delhi, except for the collection of Information available at Delhi; for the latter purpose a small information cell of IPAG is located at the Department of Electronics, New Delhi, which also acts as the coordination cell between the Department of Electronics at Delhi and the Electronics Commission Headquarters at Bombay.

8.18. A decision was taken that all work of a day-to-day implementation nature will be carried out at Delhi by the Department of Electronics and all work of a long-term analytical nature will be carried out at Bombay by the Electronics Commission (IPAG). As Information, collation and dissemination involves the entire country, it was considered desirable to do this from a place which is nearer the centre of the country but also well connected by rail and air to all parts of the country. Other important considerations were: location with access to a large body of electronics specialists; location with access to a large computer on which a management information system can be developed; until recently

the only large computer system of its size in the country was located at TIFR (Bombay).

8.19. The location of the Electronics Commission in Bombay was therefore on the basis of what was felt to be the most convenient, practical solution which would enable a rapid take off in the activities envisaged. It was not meant to be a permanent hard and fast solution nor one based on rules and regulations.

8.20. The Department of Electronics in Delhi is concerned with day-to-day decision relating to the industry; with implementing various regulatory and promotional measures and in maintaining links with Parliament and various Government Departments, agencies and institutions at the Centre and in the States.

8.21. Financial implications of the locations of the two offices at two different places are indicated in the succeeding paragraphs.

8.22. It has been stated that additional expenditure will arise for the Department of Electronics on the following items on account of Commission's Headquarters being located at Bombay:

- (i) (a) T.A./D.A. of the officers of the Department of Electronics visiting Bombay for discussions with Chairman of the Commission/Secretary, Department of Electronics and other officials of the IPAG.
- (b) T.A./D.A. of the officers of the Electronics Commission coming to Delhi.
- (ii) Secretary's visits to Delhi for the work of the Department of Electronics.
- (iii) Rent of room reserved for Secretary, Department of Electronics at India International Centre and boarding charges.
- (iv) Telephone charges/Telex charges on the message sent to IPAG, Bombay.
- (v) Postal and other charges viz. telegrams etc. sent to IPAG, Bombay.

2. Expenditure on item (i) (a) and (i)(b) is given below:

Year	Expenditure for I(i) (a) in Rs.	Expenditure I (i) (b) in Rs.
1971-72	12,898	—
1972-73	24,034	2,342
1973-74 (Upto 9/73)	4,664	34,375
<b>TOTAL :</b>	<b>41,568</b>	<b>36,717</b>

3. Expenditure on item (ii) is given below:

Year	Expenditure (Rs.)
1971-72	29,931
1972-73	15,601
1973-74 (Upto 9/73)	9,890
	<b>55,422</b>

4. Expenditure on item (iii) is given below:

Year	Expenditure (Rs.)
1971-72	10,338
1972-73	19,844
1973-74 (Upto 9/73)	11,046
	<b>41,228</b>

8.23. It has been stated that it is not possible to quantify the financial implications in respect of item at (iv) and (v) above as no separate accounts have been kept for these items.

8.24. The Committee wanted to know the considerations for having a separate administration for the Electronics Commission and I.P.A.G. and the Department of Electronics when there is such a close linking in the work of the Electronics Commission and the Department of Electronics.

8.25. It has been explained by the Department of Electronics that the Department of Electronics and the Information Planning and Analysis Group of Electronics Commission have been assigned different roles.. While Department of Electronics is concerned with regulatory and promotional measures, maintaining links with other Government organisations and Parliament, day-to-day aspects of industry and associated decisions, the IPAG has been entrusted with the responsibility for long term planning related to the Electronics Industry, market research, commercial

intelligence activities, technology forecasting etc. IPAG also deals with Technology Development Council, allocation of finances for Research and Development work, and related aspects. An expenditure of Rs. 20 crores is envisaged on this head alone during the Fifth Plan period which is a significant administrative effort. The Information Planning and Analysis Group of the Electronics Commission is located in Bombay and it functions directly under the Chairman, Electronics Commission whose headquarters are at Bombay. It is stated that the information input from the Electronics Commission Headquarters to the Department is not of a day-to-day nature. It is designed to be in the nature of forecast plans, results of techno-economic analysis, policy guidelines and information in general. The Department are of the view that the distance becomes a consideration of relatively less significance.

8.26. For immediate information requirements, the IPAG Cell in Delhi which is housed within the Department of Electronics, directly assists the Department. In all administrative matters, Electronics Commission Headquarters Bombay has been made independent of the Department of Electronics considering the fact that the IPAG is located in Bombay and that it functions directly under the Chairman, Electronics Commission who is at the apex of the organisational structure of the Department and Commission. This administrative independence is only to facilitate the smooth working of the IPAG and for avoidance of frequent references to the Department in New Delhi regarding administrative matters with unnecessary movements of files.

8.27. The Committee note the circumstances under which the present Office of the Chairman of the Commission/Secretary of the Department of Electronics is located both at Bombay and Delhi. The Committee have a feeling that the projected growth of the electronics industry in the Fifth Plan is bound to generate problems both of administration and technical nature which would require close coordination with other Departments and organisations. The Committee have no doubt that Government would keep the present arrangements under continuous review, having regard to administrative, technical and financial requirements to see how far the present set up needs to be rationalised in the interest of smooth, efficient and economic functioning.

#### *Recruitment Rules for the Department*

8.28. It has been stated by the Department that so far only Recruitment Rules for posts of Staff Car Driver and Despatch Rider have been finalised. Action to finalise Recruitment Rules for other posts in this Department, both gazetted and non-gazetted, is under way.

8.29. It has, however, been stated that pending finalisation of the rules, direct recruitment to various posts in this Department has been to

being made generally in accordance with educational and experience requirements, age restrictions etc. prescribed by Government.

8.30. Stating the reasons for not framing the recruitment rules, the representative stated during evidence before the Committee:

“Recruitment rules are long range things, which define the total pattern of the special policy. We have been following a procedure, though recruitment rules as such are not there. Essentially we have given this sort of aspect a lower priority in the administrative pattern, because our biggest job would be to do all the things that we are asked to do with regard to research and development.”

8.31. The Committee have been informed that it is a general practice in the Department of Electronics to appoint scientific/technical officers recruited from the open market on contract basis. Some technical posts are also filled up on deputation basis by drawing scientific/technical officers from other departments/organisations of the Government. The following are stated to be the broad terms of contract agreement governing the appointment of scientific/technical officers in the Electronics Commission:

- (i) Appointments are made initially for a period of five years with the Government having the option of renewing the contract by a further period of five years.
- (ii) Government servants conduct rules are applicable as prescribed from time to time for the regulation of the branch of the public service to which the officer may belong, and shall, whenever required, proceed to any part of India or a place outside India and there perform such duties as may be assigned to him.
- (iii) The officer shall be eligible subject to the exigencies of the public service, for leave and leave salary under the rules contained in Appendix 10-B of the P&T compilation of FRs and SRs, Volume II as amended from time to time.
- (iv) If the officer is required to travel in the interest of the public service, he shall be entitled to TA on the scale provided for in the rules supplementary to the FRs framed by the Government from time to time in force and applicable to his case.
- (v) The officer shall be eligible for any concessions in relation to medical attendance and treatment that may be prescribed by Government.
- (vi) During his service under these presents, the officer shall be permitted to subscribe to the Contributory Provident Fund (India)



and be subject to the rules of that Fund from time to time in force.

(vii) The officer shall unless otherwise decided by the Government be entitled to receive in whole or in part, as may be authorised by the Government, the benefits of any improvement that may be sanctioned by the Government subsequent to the date of these presents in the terms and conditions of service of members of the branch of public service to which he may for the time being belong and the decision of the Government in respect of such improvement in the terms and conditions of service of the officer shall operate so as to modify to that extent the provisions of these presents.

(viii) In respect of any matter in respect of which no provision has been made in the contract agreement, the provisions of the Civil Service (Classification, Control and Appeal) Rules, any rules made thereunder and any rules made or deemed to be made under Article 309 or continued under Article 313 of the Constitution shall apply to the extent to which they are applicable to the service provided for and the decision of the Government as to their applicability shall be final.

8.32. The scales of pay on which scientific/technical officers have been appointed on a contract basis are given below:—

	Rs.
(i) Director	1400—1950
(ii) Senior Scientific Officer	700—1250
(iii) Junior Scientific Officer.	400—950

8.33. The details of officers appointed till 15th December, 1973 on contract basis in the Electronics Commission (IPAG) and Department of Electronics as furnished by the Department are given below:

**INFORMATION, PLANNING AND ANALYSIS GROUP**

Post	Number	Scale Rs.
1. Director (Technical)	1	1400—1950
2. Senior System Scientist	2	
3. Senior Scientific Officer	12	700—1250
4. Senior Market Analyst	1	
5. Senior Project Analyst	1	
6. Senior Technical Officer	1	400—950
7. Senior Scientific Officer	1	
8. Information Research Officer	2	
9. Technical Information Officer	1	
10. Technical Publication Officer	1	

## DEPARTMENT OF ELECTRONICS

Post	Number	Scale Rs.
1. Director (Technical)	3	1400—1950
2. Senior Scientific Officer	4	700—1250
3. Junior Scientific Officer	7	400—950
4. Special Officer (Conference)	1	(on consolidated pay of Rs. 1000/- per month)

The Committee have been informed that the Scientific/Technical Officers are appointed on contract basis by one of the following methods:—

- (i) on the basis of open advertisements;
- (ii) by locating other than through advertisement persons considered eminently suitable for particular posts;
- (iii) by promoting existing officers already working on contract basis on the basis of merit.

8.34. In the case of (i), the applications received in response to advertisements are screened by a Committee and after screening, the candidates are interviewed by an interviewing committee which may or may not include the members of the screening committee. Such committees are constituted by Chairman, Electronics Commission and Secretary, Department of Electronics and generally comprise of officials from other Departments as well as non-officials from scientific and educational institutions. The recommendations of the interviewing committee as to suitability of candidates for the posts in question, initial salary etc., are then placed before the Chairman, Electronics Commission and Secretary, Department of Electronics for the final approval. Offers of appointment are then sent to the candidates finally selected.

8.35. Method at (ii) above is taken recourse to when the post is required to be manned by persons with special qualifications. One of the following alternatives is adopted in such cases.

- (a) Persons located for particular posts are interviewed by a duly constituted interviewing committee and recommendations of the committee as regards pay scales, terms of appointment etc. are submitted to the Chairman, Electronics Commission and Secretary, Department of Electronics. Offers of appointment are sent to the persons who are finally selected by the Chairman, Electronics Commission and Secretary, Department of Electronics.

- (b) Persons are located by the Chairman, Electronics Commission and Secretary, Department of Electronics and thereafter a panel of eminent persons in the field is consulted before appointment is made. In one short-term (purely temporary) vacancy, a person was appointed on contract on an *ad hoc* basis without going through the process of consulting a panel.

8.36. So far as (iii) is concerned, cases of existing contract officers are referred to a selection committee constituted by the Chairman, Electronics Commission. So far such promotions have been made only in the office of Electronics Commission. The Selection Committee's recommendations are put up to the Chairman, Electronics Commission on the basis of which the promotions are made. On promotion, a fresh contract is entered into with the officer.

8.37. It has been stated that according to order issued by the Department in February, 1972, officers appointed in the Department on contract basis are eligible for HRA at Delhi upto 25 per cent of their basic pay and at Bombay, upto 30 per cent of basic pay, over and above the 10 per cent of their basic pay to be borne by them.

8.38. The Committee have been informed that the above orders have been issued in consultation with the Ministry of Finance and are on the lines of the facilities available to the employees of Public Undertakings in the terms of orders issued by Bureau of Public Enterprises. Officers employed on contract basis are at a disadvantageous position as compared to regular employees of the Government as because of their short-term appointments, they cannot expect to secure Government accommodation and do not have benefits like continuing appointments, pension etc.

8.39. The Committee note that the Recruitment Rules have not so far been framed by the Department of Electronics except in the case of staff car driver and Despatch Rider and that action to finalise Recruitment Rules for other posts in the Department is stated to be under way. The Committee feel that in the interest of smooth and efficient functioning of the Department, it is imperative that the Recruitment Rules for all posts in Electronics Commission and the Department of Electronics should be finalised expeditiously.

NEW DELHI;  
April 29, 1974.

R. K. SINHA,  
Chairman;

Vaisakha 9, 1896 (Saka).

Estimates Committee.

## APPENDIX I

(See para 5.17)

### I. *Materials and components*

1. Microwave Low Noise Transistors and RF and RF Power Transistors.
2. Gallium Arsenide/Phosphide based devices such as light emitting diodes, microwave diodes.
3. Lasers and Laser display.
4. Bipolar and Hybrid Integrated Circuits.
5. Very High Frequency CR Tubes.
6. Microwave tubes including klystrons and Travelling Wave Tubes.
7. Charge Couple Devices.
8. Amorphous Semiconductors.
9. Magnetic Bubble Memory.
10. Photo and Image Tubes.
11. Liquid Crystals and Liquid Crystal Display.
12. Carbon composition resistors and Hot moulded carbon track potentiometers.
13. Wire Wound Resistors—Professional grade.
14. Metal Oxide Resistors.
15. Ceramic Capacitors—feed through, high voltage, trimmers, multilayer.
16. Color TV Tube.
17. Electrolytic Capacitors for Profesional applications.
18. High Voltage tantalum capacitors.
19. Niobium Capacitors.
20. Piezoelectric Crystals.
21. Electro-acoustic Devices.
22. Magnetic Heads for video and audio tape recorders.
23. Special Fuses like quick acting and Time delay fuses and Surge Voltage protectors.
24. Solar Energy Converters.

25. High Capacity Batteries.
26. Fuel Cells (Hydrogen).
27. Gallium Arsenide/Phosphide and other Compound Semi-conductors.
28. Oxidic Crystals including Sapphire.
29. Ferrites including garnets.
30. Electrical Ceramics including high density alumina substrates.
31. High purity alloys for bonding wires, solders and brazing compositions.
32. Thick Film Materials.
33. Luminescent Materials.
34. Special Chemicals and Plastics including Photomask Chemicals.
35. Plastic Films—Polyesters, Polystyrene and Polycarbonate and their metallization.
36. Sealing Glasses and Glass shells.
37. Ferrous and Non-ferrous alloys like Special Steels, Nickel Silvers, Phosphor bronzes, etc.

II. *Consumer Electronics (to include entertainment, medical instruments and instrumentations)*

1. Medical electronics equipment for rural health schemes.
2. Development of portable ECGs and Cardiocograph.
3. Solid State 16/32 channel Electro-encephelograph.
4. Solid State Physiological Recorder.
5. Blood-flow Recording Systems.
6. Computerised Chemical Analysis of Body Fluids.
7. Transducers for Medical Electronics.
8. Development of low-volume, High-cost electronic instruments like Precision Oscilloscopes, X-y Recorders, Spectro-photometers, Q-meters etc.
9. Design and Development of High-volume, Lower-cost equipments like Signal Generators, Frequency Meters, Avo meters etc. with completely indigenous components.
10. Product development, with particular reference to export possibilities, for consumer items like Tape Recorders, PA Systems, Intercom sets, Stereo Sets etc.
11. A pilot project for penetrating the rural radio market by developing low cost receivers, generation of software that appeals to rural listners and involves a proper mix of entertainment and education, and marketing strategy.

12. Development of TV test instruments.
13. Development of AM/FM receivers.
14. Development of TV camera tubes.

### III. *Computers, Control and Industrial Electronics*

1. Development of mini computers.
2. Time averaging computer.
3. Minocomputer network project.
4. Cultivator Information Systems.
5. Science & Technology Information system.
6. Development of current based Instrumentation in the area of process control.
7. Development of hybrid computing facility.
8. Development of software tools such as simulation, testing aids, documentation aids and compiler generation.
9. Development of one line computer for ADGES project.
10. Development of TDC-32 computer.

### IV. *Radars and Sonars*

1. The development of systems like airborne radar systems, marine radars, phased array radars, radar ECM & ECCM, clutter elimination systems and laser radars and the related sub-systems and components.
2. Analytical and experimental studies on F.F.T. Analysis for passive sonar, Echo formation and Characteristics of target and non-target echoes, properties of transducers arrays and transducer material, hydro-dynamic studies on towed bodies domes and hull outfits, pattern recognition as adapted to sonar, bibliography and optical processing. Hardware oriented programmes such as adaptive array, beam forms, dome and housing gear normalisation, signal processing etc.

### V. *Communication, Navigation and Broadcasting*

1. 12 MHz and 60 MHz coaxial cable systems.
2. Studies on multimetric waveguide and optical fibre systems.
3. Installation, jointing and sealing techniques for cables and wires.
4. Redesign of Strowger and Crossbar switching systems.
5. Electronic Local, Trunk, Tandem, Telex and PCM Tandem Exchanges.

6. Digital Transmission Systems, Integrated switching and Transmission systems.
7. Ground Equipment for multiple access Satellite communication systems.
8. VHF/UHF fixed and mobile communication equipment.
9. Microwave systems—2, 4, 6, 7, 8, and 11 GHz.
10. VHF transmitter for civil aviation.
11. Low-noise readers, instantaneous communication receivers, in SSB and DSB modes.
12. Airborne VHF/UHF multi-channel communication equipment.
13. Doppler Navigation Systems.
14. Internal Navigation Systems.
15. I.C. versions of Transponders, radio, altimeter, radio compass, VHF/UHF RT set, HF SSB airborne ILS.
16. Further indigenisation of MW transmitters.
17. Design and development of FM transmitters.
18. Development of Shortwave transmitters.
19. Solid-state low power TV transmitters.
20. Indigenization of Band 1 and Band 3, TV transmitters.
21. Propagation studies in the TV bands.
22. Development of microwave instruments required for various purposes.

#### VI. *Electromechanical components*

1. Evaluation and development of peripherals like card readers, medium/high speed line printers, and magnetic tape drives.
2. Development of switches, connectors, relays like telegraph relays, fast acting relays, reed relays, relays required for railway signalling, telephone relays.
3. Development of gyres and synchros, and servo motors.
4. Development of fine techniques.
5. Development of telegraphic equipments like page type, tape type printing reperforators.
6. Development of different waveguides, feeds and microwave antennas.

## APPENDIX II

(See para 8.2)

Copy of the Resolution No. 26/7/70-EC dated 1st February, 1971, of the Cabinet Secretariat (Department of Cabinet Affairs), published in the Gazette of India (Extraordinary) Part-II, on 1st February, 1971.

The Government of India attaches the highest importance to the development of an integrated and self-reliant electronics industry in this country, as rapidly as possible. Electronics occupies a key position in modern science and technology. It has a vital role to play in the field of Atomic Energy, Communications, Defence, Education, Entertainment and Space Technology. It is assuming increasing importance in the monitoring and control of production process 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 vananguard 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.

2. In order to ensure the necessary balanced development of electronics in the country, the Government of India consider it necessary to set up an organisation free from all non-essential restrictions or needlessly in-elastic rules, which will 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.

3. After careful consideration the Government of India have decided to establish an Electronics Commission with full executive and financial powers.

#### 4. Constitution

- (a) The Electronics Commission shall consist of full time and part-time members. The total number of member shall be not less than four but not more than seven.



- (b) The Chairman of the Electronics Commission will also be Secretary to the Government of India in the Department of Electronics.
- (c) A member of the Commission will be member of Finance who shall also be ex-officio Secretary to the Government of India in the Department of Electronics in financial matters.

5. *Functions.*—The Electronics Commission shall be responsible.

- (a) for formulating policy in the field of electronics, paying due regard to other general policies of Government;
- (b) for preparing the budget of the Department of Electronics for each financial year and obtaining Government approval there-to; and
- (c) for the implementation of Government policy in all matters concerning electronics through appropriate agencies of Government.

6. Within the limits of the budget provision, approved by Parliament the Commission shall have the powers of the Government of India, both administrative and financial, for carrying out its work.

#### 7. *Chairman*

- (a) The Chairman, in his capacity as the Secretary to the Government of India in the Department of Electronics shall be responsible for arriving at decisions on technical questions and advising Government on matters of policy relating to electronics. All recommendations of the Commission on poliiy and allied matters shall be put up to the Prime Minister through the Chairman.
- (b) The Chairman shall have the power to over rule the other Members of the Commission, except that the Member for Finance shall have the right to ask that any financial matter, in which he does not agree with the Chairman, be referred to the Prime Minister and the Finance Minister.
- (c) The Chairman may authorise any Member of the Commission to exercise on his behalf, subject to such general or special orders as he may issue from time to time, such of his powers and responsibilities as he may decide.

8. *Member of Finance.*—The Member for Finance shall exercise the powers of a Secretary to the Government of India in the Department of Electronics in all financial matters concerning the Department of Electronics except in so far as such powers have been, or may in future be conferred on or delegated to the Department.

9. The Commission shall have power to frame its own rules of procedure. It may meet at such times and places in India as may be fixed by the Department.

#### ORDER

Ordered that a copy of the Resolution be communicated to all the Ministries/Departments of the Government of India and all the State Governments/Union Territories.

Ordered also that the Resolution be published in the Gazette of India for general information.

Sd. N. K. SREENTIVASAN,  
*Joint Secretary.*

### APPENDIX III

#### *Statement showing<sup>1</sup> the Summary of Recommendations*

Sl. No.	Ref. to Para No. of the Report	Summary of Recommendations
1	2	3
1	1.11	The Committee note that there has been a steady growth of the Electronics Industry in India since Bhabha Committee made its recommendations in 1966. The total Electronics production has increased from Rs. 30 crores in 1964-65 to Rs. 206 crores in 1972-73 which amounts to about 7 times the production in 1964-65. Production of equipments has also risen from Rs. 26 crores in 1964-65 to Rs. 162 crores in 1972-73. Similarly the production of components has also shown an eleven fold increase during the same period.
	1.12	Inspite of these strides, however, the initial momentum of growth in the entertainment electronics has not been maintained from 1970-71 onwards. Having attained a level of Rs. 80 crores of production of entertainment equipments in this sector in 1970-71 it has dropped down to Rs. 55 crores in 1971-72 and Rs. 65 crores in 1972-73. Even allowing for the change in the mode of computation, it is obvious that the growth rate has slowed down in the last three years. The country is also lagging in the target put forth by the Bhabha Report regarding components. The production in this sector is likely to be less than the Rs. 84 crores envisaged in that Report.
	1.13	In view of the fact that the industry occupies a key position in development of modern science and technology and is destined to play a vital role in the

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field of Atomic Energy, Communications, Defence, Education, Entertainment and Space Technology and in view of its increasing importance in monitoring and control of production processes in the key industries, the Committee feel that it is essential that a balanced and accelerated growth of this industry is ensured.

The Committee welcome the constitution of the Electronics Commission and the Department of Electronics to achieve these goals.

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The Committee feel that generally an effective developmental work has been done in the field of electronics in the Public Sector Undertakings and sophisticated equipments and components are being manufactured within the country with indigenous know-how. For example, B.E.L. has come a long way in indigenising an appreciable part of its components. Out of 40 collaborations, 20 have already expired and have not been renewed. Most of the remaining collaborations will also expire in the next five years. The variety of equipments being manufactured by B.E.L. is increasing and most of them have been developed indigenously. B.E.L. is understood to have substantial programmes for R&D also. A number of sophisticated defence items for army, air-force and navy have also been produced in B.E.L. factories. In the field of components also, they have programmes for development of integrated circuits, discrete and monolithic types. The entire production of E.C.I.L. on the other hand is based on the know-how developed indigenously either in-house or in B.A.R.C. with the exception of a small element in antenna systems.

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As regards Indian Telephone Industries the collaboration for manufacture of strowger type of telephone exchanges has expired 12 years ago and the collaboration agreement for crossbar telephone

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switching equipment entered into in 1964 has also been terminated in 1973. The Telecommunication Research Centre|I.T.I. has also important contribution to its credit like development of open wire carrier system, coaxial cable and microwave links, automatic telex exchange and remote control equipment for Railways etc. Some more development and manufacturing projects are in hand. Similarly Hindustan Teleprinters which started the manufacture of teleprinters with foreign technical collaboration in 1962, has since terminated the collaboration and has developed a second generation teleprinter and electric typewriter on its own.

1.43 In Defence area also, there is some progress in the field of antenna and troposcatter equipment and multiplex equipment etc.

1.44 In satellite communication system also some equipment for the Earth Satellite Station at Arvi is being imported. However, all the equipment required for the Satellite Instructional Television Experiment (SITE) will be produced with indigenous know-how. Some competence is also reported to have been acquired in the radar area although of relatively simple types and in the next generation of transponders. Some headway is also being made in the signalling equipment for the Railways.

1.45 Whereas on a general view, the Committee recognise that an impressive developmental work has been carried out in manufacture of sophisticated equipment in the field of electronics in the Public Sector Undertakings, there has been insufficient progress in the field of defence electronics. In high power systems and avionics even after ten years of production under foreign collaboration, the value of licenced production which was 98 per cent till 1972-73 will come down to 90 per cent only by 1974-75, as a result of the development of indigenous know-how.

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1.46 While the Committee realise that the progress in the highly sophisticated fields has necessarily to be slow, it has to be recognized that this is really the most vulnerable area from the point of view of defence. It is, therefore, of urgent importance that the next few years are devoted towards development and production of sophisticated components of the next generation particularly in this strategic field and in systems design.

1.47 The Committee recommend that an integrated well-coordinated and time-bound programme may be drawn up for achieving self-reliance in these strategic fields.

3 1.48 The Committee agree that there are certain areas in electronics which due to their strategic importance, economies of scale and sophisticated technology are to be earmarked to the public sector. The Committee would like Government to remind the public sector units of their responsibility to set up ancillary industry and to extend every assistance to the small scale sector in the interest of broad-based development.

4 1.54 The Committee note that no integrated approach has been followed heretofore for the development of the Electronics Industry taking the Public and Private sectors together and on three tier basis i.e. equipments, components and raw materials as recommended by the Bhabha Committee. The approach up till now essentially has been that of licencing project by project without attempting a balanced and integrated approach, resulting in uneconomic and imbalanced growth of the industry and continued dependence on foreign collaborations in various sectors. The Committee note that in Fifth Plan a balanced approach is proposed to be followed taking into account the

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different factors of growth. The Committee hope that with the setting up of the Electronics Department|Commission and the dynamic approach the Electronics industry will now be developed in an integrated manner and on more systematic lines.

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The Committee also note that the private enterprise has been reluctant to come forward to participate in a big way in most sectors in Electronics industry except in the consumer electronics even though no restraints exist in most of these sectors except in the strategic fields of Defence and Communications under the Industrial Policy Resolution. The Committee understand that even in these fields the restraint is in regard to the end of products only and not on the components and sub-assemblies etc. There are enormous areas and wide opportunities in this field for the private entrepreneurs like industrial and medical electronics, components, computers etc. but they have shown little interest in these areas. The Committee would like Government to examine this matter in all its aspects to see how best the resources and capabilities both in the public and private sectors could be utilised in the interest of achieving planned production.

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1.62

The Committee feel that there is some force in the argument that attachment of the Public Undertakings to user administrative Ministries affects the free commercial decision making by them adopting a dynamic approach most suited to their role as manufacturers of sophisticated equipment|components and treatment of other user's requirements on secondary priority. Pricing policies also tend to be more favourable to the administrative Ministry at the expense of others particularly where these enterprises enjoy monopoly and in fact this is true of most of the undertakings in the electronics field. The Committee feel that while there is need to allow full autonomy and decision making powers to these undertakings in the interest of their healthy development, it is also

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necessary that there is close coordination among these enterprises to avoid duplication of efforts and to conserve scarce financial and foreign exchange resources as well as for an overall integrated development of the industry. The Committee consider that for this purpose it would be desirable if there is an organisational mechanism which can periodically appraise the functioning of the public undertakings producing electronics items and could provide them overall guidance in regard to the policies followed by them as well as their future developments. In such a set up it would be appropriate if the Department of Electronics has an important say.

1.63 The Committee note that the Department of Electronics is consulted only initially and in case of large enterprises in matters such as framing of objectives of the undertakings and in the determination of their product mix and diversification. The Department has, however, no say in matters like complexion of the Board of Directors, appointments to the Board of Directors and to senior management positions like Managing Directors and General Managers, Personnel and remuneration structures/policy, policy and follow up relating to development of ancillaries, and pricing policies.

1.64 The Committee also note that the Department has at present no power to direct the public undertakings to take up production of certain items even where it is in larger national interest to do so. The Committee further note that the Department of Electronics is represented on the Board of Directors of BEL and Instrumentation (Kotah) only. It has no Director on the Board of Directors of Indian Telephone Industries, Electronics Corporation of India Ltd., Hindustan Aeronautics Ltd., Hindustan Teprinters Ltd. and Hindustan Cables Ltd.

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1.65 While the Committee appreciate that the Department of Electronics is being consulted in some matters such as framing of the objectives of the undertakings and determination of their product-mix, including diversification, they feel that it would also be desirable if this Department which has an overall responsibility for the development of electronics in the country has an effective say in formulation of policy and follow-up relating to development of ancillaries and pricing policies of these undertakings

1.66 The Committee would, therefore, suggest that a suitable machinery may be evolved as the one suggested by the Department of Electronics like a standing Management Board, with the Secretaries and Directors of the Ministries/Public Undertakings on it, to ensure that all these public undertakings function in an integrated manner in furtherance of the objective of rapid development and growth of electronics industry in the country.

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1.67

The Committee find that though the Department of Electronics is charged with the responsibility for development of electronics in all the fields it does not have at present under it any manufacturing unit in the public sector. The Committee consider that it is largely due to historical reasons as the Department of Electronics has been set up only very recently.

1.68

The Committee recommend that Government should review at the highest level the question of placing units which are charged with the responsibility for manufacturing electronics under the department of Electronics in the overall interest of development and for these units being used as centres of growth for an accelerated programme of development of electronics industry in the Fifth Plan.

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1.76

The Committee feel that in order that the electronics industry could move in an integrated manner, it is essential to have system groups in every major user

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department like Defence, Atomic Energy, Space, Communications, Steel and Railways etc. who are in a position to perform the following tasks on a continuous basis:—

- (i) Technological forecasting for the needs of users, keeping in view the new technological trends;
- (ii) Analysing major systems into sub-systems, equipments, components and raw materials;
- (iii) Monitoring the progress of specific products through various stages of the innovation chain starting with development through batch production or full scale production.

1.77

The Committee note that such groups/cells are already being introduced to some extent, such as Radar and Communication Project Office and the National Radar Council. Some other Ministries are also moving in the matter. The Committee recommend that such groups should be set up in all the major user industries with a view to helping the Ministries as also the supplier undertakings in monitoring the progress of the specific products through various stages of innovation chain and analysing the major systems into sub-systems, equipments, components and raw material as also keep an eye on the futuristic requirements of the Ministries concerned. The Committee would, therefore, urge the Electronics Commission to provide the necessary initiative in this regard and help the Ministries/Departments to set up such groups in a systematic way. The Committee would also urge the Ministries/Departments concerned to initiate necessary steps in this direction in their own interest and in the interest of the future of the industry as a whole.

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The Committee appreciate the interest and zeal with which the Electronics Commission have been collecting the information in regard to the long-term

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and short-term requirements from important users of equipments with specifications on the basis of a continuously interactive process. They also note the efforts made in this direction by constituting a Task Force on Tele-communications and Electronics under the chairmanship of the Chairman, Electronics Commission and with Members drawn from user agencies. Based on this exercise, a programme for the development of Electronics during the Fifth Five Year Plan has been prepared and a 10-year profile for electronics drawn up. Furthermore, both one time as well as standing mechanisms have been and are being instituted sectorwise to ensure coordinated efforts in this direction in areas like Defence, Tele-communications, computers, Railways, Home Affairs, Mass communications, space and Atomic Energy through meetings, panels and other efforts.

1.100 The Committee note that since information collected by I.P.A.G. from user agencies by means of questionnaires etc. is not mandatory, they have to depend heavily on the D.G.T.D. The Committee note, however, that the information obtained by D.G.T.D. which is on a mandatory basis, is available to other departments only in a consolidated form. Since it may not be desirable to obtain information through a number of agencies, the Committee recommend that ways and means may be found after mutual discussions to make available the requisite information to the I.P.A.G. and if necessary, to other user Ministries also to meet their requirements. The Committee need hardly emphasise that the meaningful information thus made available to the I.P.A.G. will help them in making a more scientific and realistic assessment of electronics in the country which is a pre-requisite for sound planning.

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1.110

The Committee note that the Department of Electronics have no information regarding the number of units engaged in Electronics production in different States and sectors *i.e.* small scale large scale

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etc. and the value of their production. It need hardly be emphasised that this is the basic information for a proper assessment of the real status of the industry in different sectors and in different parts of the country as also of the precise overall picture of the industry in the country and its requirements. The Committee suggest that adequate arrangements should now be made for the collection of such information on a regular basis.

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1.111

The Committee note that detailed information about the electronic items imported in the country is not available with the Department of Electronics. They note that the 'Monthly Statistics of Foreign Trade of India' published by the Directorate of Commercial Intelligence and Statistics, gives import data in broad terms only (e.g., computers, components, instruments etc.). It does not give detailed information about imported items like diodes, digital voltmeters, integrated circuits etc. Moreover, from the existing statistics regarding imported electronic items, it is not always possible to differentiate between electrical, electronic and electro-mechanical equipment. The Committee note that the I.P.A.G. is attempting to collect the detailed information about the import of electronic items by deputing their staff at the various custom offices.

1.112

The Committee need hardly emphasise that for a purposeful planning, for the development of electronics industry, it is absolutely essential that detailed information regarding the electronic items imported at present, is available. In the opinion of the Committee, such a detailed information would be very useful as it would enable intending entrepreneurs to decide about the starting of an industry to produce an item which is being imported at present and thus would help import substitution efforts in a positive way. The Committee recommend that effective measures should be taken by Government immediately to ensure that detailed information about imported

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items not only in the electronics field but in other fields also is available to the public, to enable them to go in for import substitution in a meaningful manner.

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1.113

The Committee would also like Government to ensure that there is no delay in the publication of the 'Monthly Statistics of Foreign Trade of India' containing detailed and meaningful information. The Committee would like Government to take all necessary measures to streamline and rationalise the compilation and timely publication of this information.

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1.114

The Committee understand that a number of parties/undertakings have been importing items in false names or misleading names and at times, it is not possible even to know what has really been imported. This underlines the need for giving training of a specialised nature to the custom staff to identify and correctly tabulate the sophisticated items.

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1.122

The Committee note the efforts made by the Information, Planning and Analysis Group of the Electronics Commission towards formulating plan for the electronics industry on a long term basis by analysing various aspects of the Electronics Industry in different sectors by updating the Bhabha Committee Report. The Committee also note that practically all the documentation towards updating the Bhabha Committee has been completed somewhat like Bhabha Committee but the information has not so far been consolidated in a single volume pending a decision by Parliament on the Fifth Plan. The Committee hope that the whole analysis will be consolidated and published at an early date.

1.123

They also note that the Reports produced by the technical panels appointed for the purpose have proved of practical utility as in the light of the infor-

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mation contained therein it has been possible to dispose of various licensing applications.

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1.144.

The Committee are glad to note that the Department of Electronics has taken initiative in a number of the States to encourage development of electronics industry. In Kerala a separate Kerala State Electronic Development Corporation has already been set up and proposal for a functional Estate near Trivandrum is under consideration. In West Bengal Electronics Development Corporation has already been set up and a Testing and Development Centre is being considered. In U.P. a proposal is being formulated for the development of an Electronic Development Corporation. In Tamil Nadu also a special functional Estate in Madras for instrumentation and Electronics is being set up in the name of Instronics Estate. Similarly proposals of Electronics estates are being considered in Rajasthan at Jaipur, in Punjab near Chandigarh and in Maharashtra. In Bihar also a comprehensive development programme for Electronics is being formulated in consultation with a high level consultant. As many as 8 to 10 Testing and Development Centres are expected to be set up during the Fifth Plan period for which Rs. 3 crores have been allocated.

1.145.

The Committee have no doubt that sustained efforts will be made by the Department to assist the remaining States to set up electronics industries in their areas so that the electronics industry is dispersed all over the country. The Committee are of the view that in the States where these centres/estates are not feasible due to inadequacy of infrastructural facilities, a suitable central place may be selected for development of the centre to cover the contiguous areas forming a block for the development of the electronics industry in these areas.

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16	1.146	As regards allocation to be made in Fifth Plan for this purpose, the Committee feel that the position may be reviewed at the time of Mid-term appraisal of the Plan and additional funds made available, if considered necessary, according to the progress made in the development of the electronic industry.
17	1.147	The Committee note that, apart from these efforts of encouraging the development of electronics in the States, the Department is also keen to develop backward areas and to spread the electronic base, out of the metropolitan or industrial areas where the industry is at present mostly concentrated. The Committee further note that the Department is using licensing as an instrument in achieving this policy and preference is given to those applicants in the organised and small scale sector who want to set up new units outside these areas.
	1.148	The Committee would in this connection like to stress that in the Fifth Plan period, particular emphasis should be laid by Government on the development of backward areas and areas outside metropolitan and industrial cities by providing special incentives and concessions for setting up industries, particularly in the small scale sector in those areas to narrow down regional imbalances to the extent possible.
18	1.149	The Committee would like to suggest that Government should take positive initiative in the development of the electronics industry in such areas by setting up Public Sector units in electronics so as to encourage ancillary industries to grow round them.
19	1.163	The Committee note that although production of some items is being farmed out to ancillary units by some Public Undertakings the progress in this regard is far from satisfactory. There has been some disinclination on the part of some large undertakings to farm out components, assemblies and

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sub-assemblies to outside agencies and a tendency exists to do everything in-house. The main reasons for this situation are stated to be untimely deliveries and lack of consistency in quality. Difficulty also arises in the case of undertakings dealing with professional equipment where tolerances are very rigid. In such cases these undertakings find it difficult to farm out the items to the ancillary units.

- 1.164. The Committee agree with the views expressed by the evaluation Teams set up to go into the production programmes of B.E.L. and I.T.I. that ancillary development is not only a social obligation but also a sound economic proposition, in the ultimate commercial interests of the undertakings themselves, as among other things this minimises the capital risk involved and releases energy in terms of highly skilled manpower who could be more usefully engaged in other important production programmes. Moreover additional capacity for equipment manufacture becomes available without sizeably adding to the plant and machinery and manpower. The Committee endorse the suggestions made by the Evaluation Teams for the development of ancillary industries on sound lines. They hope that these The Committee recommend that energetic measures should be taken to identify suitable items at present being manufactured in Public Sector Undertakings and organised private sector Undertakings which could be farmed out to ancillaries profitably with a view to accelerate the growth of ancillary industries around electronic undertakings.

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- 1.176. The Committee note that the small scale industry has attained considerable growth in the electronics field and these units are turning out items of high sophistication. They have been able to bring down prices and even enter the export market in items like radio, T.V. receivers, sound equipment etc. The Committee also note that the scope of the small scale industry is being broadened and consistent en-



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couragement is being given for the establishment of small and medium units by technical entrepreneurs. The Committee further note that there is no restriction on the small scale industry except their own capability and a great deal of support was available to them from the Department.

1.177

The Committee are, however, concerned to note that the actual availability of raw materials, according to their capacities, has become a major bottleneck to suffer in the matter of raw materials. The small scale sector. Unless these capacities are actually determined by the State Director of Industries in consultation with the Development Commissioner, Small Scale Industries, they do not get quota in the same way as before. In actual practice they continue to suffer in the matter of raw materials. The Committee understand that the Ministry of Industrial Development is looking into the matter. Considering the vast potential of the small scale industries in solving the gigantic problem of unemployment, and their suitability for the production of electronics goods the Committee cannot but too strongly stress the need for full utilisation of this potential efficiently by removing the existing constraints like shortages of raw materials and other inputs at the earliest.

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1.195.

The Committee note that the Fifth Plan proposals for the Department of Electronics envisage an investment of Rs. 202 crores which is expected to generate a total production of Rs. 2300 crores during the Plan period. The Committee note also that these allocations will provide additional employment to 3.6 lakh persons. The annual production of electronic equipment and components which is around Rs. 200 crores at present is expected to go up to more than Rs. 650 crores by the end of the Plan period. Apart from that Rs. 20 crores have been allocated for Research and Development during the Fifth Plan.

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1.196. The Committee, however, note that there has been a difference of opinion between the Planning Commission and the Department of Electronics in regard to allocations in the various fields. The major differences have been in regard to the allocations in the field of tele-communications and mass communication. Other fields of difference are the activities relating to standardisation, research and development, Export Processing Zone, Regional Computers, semi-conductors, passive components and test and development facilities.

1.197. The Committee are greatly impressed with the potential of growth of electronics industry and would in particular like to draw attention to its employment potential, high capital formation capability etc., and would like Government and the Planning Commission to see that requisite funds are made available to this industry in the interest of achieving the targetted rate of growth. The Committee would like to be informed of the concrete measures taken by the Planning Commission/Government in implementation of the above recommendation.

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2.25.

The Committee note that there has been a slowing down in the growth of consumer electronics during the last three years for a variety of reasons, such as:—

1. Erosion of buying power in the country during the last few years.
2. High cost of entertainment grade components and materials.
3. Difficulty in receiving satisfactorily the more attractive programmes of All India Radio such as Vividh Bharati on the high power transmitters throughout the country.
4. Enough entertainment value is not found in the All India Radio Programmes.
5. Unsophisticated programmes on T.V.

2.26.

The Committee, feel that with a view to remove

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		stagnation in consumer electronics, effective measures should be taken to lowering down the costs of these items and to make the radio and T.V. programmes popular, entertaining and instructive.
23	2.27.	The Committee note that cost of components that go into production of certain consumer grade electronic items is high on account of certain components being imported. The Committee feel that indigenisation of production of these components will go a long way to reduce their cost for which determined efforts are needed. The Committee are of the view that a developmental plan should be drawn up and intensive efforts made to accelerate the pace of research and development in this field so as to enable indigeneous production of these items in the shortest possible time.
24	2.28.	The Committee feel that positive measures towards penetration of the rural market for radio at this stage is called for urgently by continuously reducing the price of radios so as to invigorate the development of small scale sector in the electronics industry. The Committee, therefore, suggest that a pilot project may be launched to survey, study and suggest as to how best sales could be augmented in the rural market.
25	2.29.	The Committee recommend that the Department of Electronics may take up with the Ministry of Information and Broadcasting the transmission of A.I.R. programmes of better quality on high power transmitters so that these could reach the larger rural audiences with a view to exploiting fully the vast potential of this market.
	2.30.	The Committee need hardly stress that every endeavour should be made to accelerate the growth and development of consumer electronics in the country as they provide a strong base for the development of sophisticated and advanced electronics industry.

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- 26            2.54.        The Committee note that TV is currently selling at a high price costing around Rs. 3,500 and that there is a tendency for the cost of the TV to increase rather than to decrease. There has been an increase of the order of Rs. 250 per set during January-February, 1974 and there has been further increase of the cost of the TV set after February, 1974 due to recent increase on Excise Duty on TV Set.
- 2.55.        The Committee feel that if the marketing base for the TV has to be broadened by making it available within the reach of common man, intensified research and developmental efforts will have to be made for greater indigenisation of components to bring down the manufacturing cost and to achieve a breakthrough as has happened in the case of radio. The Committee would, therefore, like the Department of Electronics to take effective steps to improve its technology and to reduce its manufacturing cost.
- 27            2.56.        The Committee would also like the Department of Electronics to intensify research and development for the production of transistorised T.V. sets. They would further urge that effective steps should be taken to produce ruggedised T.V. sets so as to reduce their maintenance costs as also their frequent breakdowns.
- 28            2.57.        The Committee note that one of the major elements contributing to the high price of TV set is taxation i.e. customs duty, excise duty, sales tax etc. They note that the excise duty on TV sets has been increased from 10 per cent *ad valorem* to 20 per cent *ad valorem* this year itself. The Committee recommend that that Government may examine the question of rationalisation of customs duty on imported material needed for the manufacture of TV receivers, excise duty and sales tax on TV in the interest of making available moderately priced indigenous TV sets, to create a large market for TV sets.

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29	2.58.	The Committee note that increase in the price of TV set is also due to increase in the price of picture tube manufactured by BEL by Rs. 140 per tube due to change in the categorisation in regard to the levy of customs duty on the import of glass bulbs.
	2.59.	The Committee also note that Government have taken some steps towards increasing the production of picture tubes in BEL from 100,000 nos. to 200,000 per annum. Government have also been considering for some time to bring in four more parties to produce picture tubes to cater to different regions at Banglore, Nasik, Ghaziabad and Kanpur. This will not only meet the increase in demand for this item but will also reduce transportation charges from far off stations and thus reduce TV prices to some extent.
	2.60.	The Committee also note that the question of production of glass bulbs, the main component on picture tubes, indigenously is also under consideration of Government and no decision has been taken in the matter so far in view of the high internal cost of production resulting from setting up capacity equal to half the economically viable capacity although it may reduce the import Bill. The Committee desire that Government may take a suitable decision in this regard as early as possible keeping in view the need to reduce the costs of TV sets so as to make them comparable to those prevailing in other countries.
	2.61.	The Committee have no doubt that with concerted measures by both the Government and industry, it should be possible to drastically reduce the price of T.V. particularly when the labour costs in the country are far cheaper compared to those in other countries.
	2.62.	In this connection the Committee would like to mention that the question of reduction in the price of T.V. sets has also been dealt with in paras 3.172 to 3.175 of their 64th Report on Television.

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3.7. The Committee note that with a view to meet the demands in regard to Telecommunications, the manufacturing facilities in the country will have to be doubled during the Fifth Plan by setting up new plants and by achieving optimum production of installed capacity in the existing units and by ensuring a substantial Research and Development base in industries so that equipment manufactured is of current technology.

3.8. The Committee find that a number of new units are proposed to be set up with a view to augmenting existing capacities in such fields as switching equipment, exchanges, telephone instruments, transmission equipment, high precision measuring and testing equipment etc. The Committee hope that these measures will go a long way not only in meeting the internal demands but also to enable exports to the tune of 10 per cent of the production of these equipments as envisaged in the Sixth Five Year Plan.

3.9. The Committee however desire that for the purpose of speedy development of these units a well-chalked out plan should be drawn up for implementation within the shortest possible time. A periodic review of the performance in this regard should be undertaken to find out shortcomings and for taking suitable remedial steps.

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3.12. The Committee note that the growth in the trans-receiver equipment area of professional equipments has been extremely poor and restricted. There has also been a complaint from the Ministry of Home Affairs who have a significant demand projection for trans-receivers that their requirements are not being accorded due priority because B.E.L., which is producing this equipment are affiliated to the Department of Defence Production and give preference to defence requirements.

3.13. The Committee understand that the proposal of the Department of Electronics for setting up factories

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for the manufacture of trans-receivers has been under the consideration of the Planning Commission. The Committee recommend that the whole matter may be re-examined and in case it is felt that more capacities are required for the manufacture of this equipment, expeditious steps may be taken to meet the requirements by creating the needed capacities.

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3.20

The Committee note that according to preliminary studies, an overall requirement of mass communication hardware in the country is to the tune of Rs. 50 crores during the Fifth Plan period. The Committee are of the view that in order to establish indigenous production of the items being imported, it is necessary that a developmental plan should be drawn up and intensive efforts made to accelerate the pace of research and development to yield the maximum results in the shortest possible time.

3.21

The Committee would like the Department of Electronics to prepare an integrated plan in consultation with the Ministry of information and Broadcasting in regard to the indigenous production of radio and television studio and transmission equipment so that our country can become self-reliant in this sensitive area of mass media communication at the earliest. The Committee would like to be informed of the concrete measures taken in pursuance of the above recommendations within six months.

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3.44

The Committee note that the present indigenous computer manufacturing programme is largely based on imported peripherals and components. In this connection the Committee note that efforts are in hand to manufacture peripherals on outright purchase of know-how/licensed production. Simultaneously some initiatives have been taken for setting up facilities for manufacturing the components required for computers within the country.

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The Committee note that it is anticipated that the country will be self-sufficient in respect of requirements for electronic calculators and mini-computers

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and also with regard to nearly 90 per cent of the medium sized computers by the end of the Fifth Plan. The Committee, also note that the requirements in respect of large sized computers and some sophisticated peripherals and components will continue to be imported even after the Fifth Plan. The Committee further note that in view of the difficulties regarding small requirements and large investments required for large sized computers concentration is for the present on small and medium size computers. However, the Committee hope that long range requirements in regard to large sized computers will be kept in view and necessary infrastructure and indigenous capability will be built up gradually to take care of the growing industrial needs.

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3.46

The Committee are glad to note that an assessment as regards idle capacity of computers in India has been made by the Evaluation Committee set up by the Department of Electronics for different regions. It was found that 25 per cent of the installations are working three shifts, about 40 per cent of computers are used for more than two shifts and on the whole the average level of utilisation of computer capacity available in the country amounts to eighty-four per cent and this has also been recognized by computer experts abroad. The Committee are also glad to note that with a view to ensure full utilisation of the computers available in the country, Electronics Commission has laid down a policy that all areas should first attempt to meet their in-house requirements through computers available in Indian market and additionally utilise the facilities available in Regional Computer Centres. The Commission has also laid down that the computers other than those available in the market through Indian manufacturing programmes will be regarded as an expensive item of import.

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The Committee are confident that these measures will ensure full utilisation of computer capacities

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available in the country, and will not allow an avoidable strain on country's foreign exchange resources.

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3.48

The Committee find that at present the responsibility for computers is dispersed over various institutions and that there has been so far no integrated plan to intensify research in this area with a view to avoid overlapping to the extent possible. There is no denying the fact that with the growth of industrial development in the country, computers will have to be pressed into service in stages, keeping of course the overall national interest in view with particular reference to its impact on employment. The Committee consider that it is high time that Government entrusted the responsibility for research and development in computers to the Department of Electronics so that we have a meaningful long-term and well-thought out programme of their development and manufacture within the country. The Committee have no doubt that the Department of Electronics would keep in view the export potential of computer industry while drawing up programme for its development and manufacture.

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3.53

The Committee note that there has been a general sluggishness in the industrial structure as a whole and that the factories prefer to plod on with their old plant and equipment rather than take the help of the Electronic methods. Whatever new manufacturing activities are being set up, these are being brought in as complete plants from abroad. Thus the local industrial electronics activity is unable to serve the industry.

3.54

In view of the great catalytic effect that the electronics have on the growth of the industry, the Committee suggest that the question of application of electronics methods in industry may be studied in depth with a view to popularise these methods for the rapid growth of industry in the country.

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- 37            3.55        The Committee would like to impress that those who are entrusted with the responsibility of developing industrial electronics, should publicise their achievements and availability of equipments so as to enable industrialists to avail of them.
- 38            3.61        The Committee note that although Air Defence and Ground Environment System Project as originally conceived in 1962, was to be implemented with equipment and capabilities to be obtained from abroad, it was only in 1967 that it was thought to implement this indigenously. Later on in August, 1969 it was decided to assign the Data Handling Project to T.I.F.R. for implementation but the user specifications were being finalised in terms of new needs and possibilities. The Committee further note that the project was to be implemented in two phases. Although the first phase which demonstrated the capability of required software, has been completed, the second phase in which the hardware had to be developed, is progressing. The Committee feel that the second phase for the development of indigenous hardware for the project requires expeditious completion and, therefore, desire that urgent measures should be taken to see that indigenous capability in this regard is developed expeditiously.
- 39            3.64        The Committee note that progress in regard to the manufacture of production equipment needed for electronics industry in the country, is negligible and the industry has naturally to depend on imports. The Committee would like the Department of Electronics to take a lead in this key area by drawing up a workable plan for manufacture of production equipment in the country. The Committee need hardly stress that the requisite research and development support should also be made available for this programme. In the context of the projected industrial growth in the Fifth Plan, the Committee
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		feel that concerted efforts should be made with the help of industry to develop this capacity within the country so as to save on imports and develop self-reliance.
40	4.22	The Committee note that there has been an impressive increase in indigenous production of electronics components during the last ten years. Whereas in 1960, 90 per cent of the requirements of components were met from imports, nearly 80 per cent of the requirements of components are now being met indigenously. Production of components has increased from 5 lakh rupees in 1960 to about 449 lakh rupees in 1973-74.
	4.23	The Committee, however, note that as against the demand of components worth Rs. 569 crores during the Fifth Five Year Plan, the indigenous production will be worth Rs. 452 crores thus leaving, a gap of Rs. 117 crores which will be met by imports. In addition there will also be demand for export which has not been taken into account in this assessment. The Committee wish to point out that the increase in the indigenous production of components compared to the total requirements at the end of the Fifth Plan will be marginal i.e., about 5 per cent. Whereas currently 80 per cent of the requirements are being met indigenously, by the end of the Fifth Plan indigenous production will meet 85 per cent of the requirements.
	4.24	The Committee feel that in the interest of accelerating the pace of developing electronics industry in the country, it is imperative that we have an integrated approach towards the development of component industry in the country. The Committee note that the profile of the Five Year Plan prepared by the Task Force and IPAG has already identified the areas, such as micro-wave components, control components, special electronic tubes, semi conductor

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devices which need to be developed on urgent basis. Besides, there is the important area of system designing in which the country has to make significant development. The Committee are inclined to agree with the view of the Department of Electronics that it would be better if the capacity for manufacturing the above components are developed in the existing undertakings, with suitable expansions/installation of balancing equipment etc., so as to minimise the time taken for development. The Committee have no doubt that in accordance with the Government's policy of developing ancillaries and small scale industries, a systematic effort would be made to farm out the manufacture of components to these units in a planned and systematic manner. It should also be ensured that components produced come up to the standard quality and meet the requirements in full.

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4.25

In a separate Chapter on Research and Development, the Committee have stressed that meaningful and integrated plan of Research and Development is prepared in the interest of attaining self-reliance at the earliest. The Committee consider that research and development efforts need to be specially intensified in the area of manufacture of components. The Committee need hardly stress that where technology is not developed in the country for undertaking large scale manufacture, the question of purchasing know-how as has been done by the other countries which have achieved phenomenal progress in Electronics, should be considered urgently so as not to lose any further time in the establishment of capacity for manufacturing these components within the country which provide the essential base for expansion of electronics industry.

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4.26

The Committee note that indigenous industry is still lagging in the production of professional grade components. They urge that strenuous efforts should

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- be made to achieve self-reliance in this field to the extent possible by concentrating on items which require urgent attention. Efforts will also have to be made to identify such areas on a continuous basis and remedial measures taken from time to time.

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4.27

The Committee feel that in the semi-conductor industry also, a lot of R & D and capital investment is called for, immediately to attain a real breakthrough. The Committee welcome the setting up of the Semi-Conductor Production Corporation during the Fifth Plan period and hope that this Corporation will lend the semi-conductors industry an integrated approach and led the industry to the goal of self-reliance at the earliest.

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4.28

The Committee while noting that integrated circuits technology has brought in its train, great advantages like economics in design time, inventories and costs, the transition to the new technology is slow. The Committee desire that concerted efforts may be made to accelerate the pace of development in this field and to create indigenous capability in this regard in the shortest possible time by drawing up a well-chalked out plan for the purpose.

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4.39

The Committee note that I.S.I. and the Defence Organisation are doing considerable work in the areas of standardisation but most of this work remains on paper only because until recently a significant part of the electronics industry in the country was based on items, produced under licence or collaboration. In view of the large diversification achieved in the production of electronics items in the country, the Committee feel that urgent measures are called for to evolve definite policies for standardisation of electronics components and equipment to the maximum extent possible at the earliest in the interest of economy and large production. The Committee note that Electronics Commission propose to set up a Technical panel on standardisation to go into the

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whole question of standardisation in electronics. The Committee hope that adequate care will be taken while formulating standards to see that these standards conform not only to I.S.I. but as far as possible, to DIN, IEC and MIL specifications also so that electronics items produced in the country are accepted in the international markets and result in larger exports. Emphasis is also to be laid on the interchangeability of components and on performance requirements.

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4.40

The Committee are not happy to note that the problem of standardisation did not receive the special attention of Government all these years that it deserved. The Committee note that it has now been decided to set up a Technical Panel to suggest the guidelines for standardisation in electronics industry. The Committee desire that this panel should draw up standards by a specified time so that these are available for implementation during the course of the 5th Plan. The Committee need hardly stress that there should be arrangement for review of the standards from time to time in the light of experience gained within the country and latest developments in the field in other countries.

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4.53

The Committee note that while the demand for material in the 5th Plan is likely to be of the order of Rs. 190 crores, the production to be achieved in the electronics field under the auspices of the Department of Electronics with a proposed investment of about Rs. 17 crores, is expected to be of the order of Rs. 80 crores. The Committee have been informed that the balance requirement of Rs. 110 crores or at any rate a large portion thereof is expected to be met by production in other sectors where investment and expansion would be taking place. The Committee are not quite convinced with this and feel that since raw materials are the essential base for the development of electronics, it is imperative that there is a detailed systematic and well-

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		<p>coordinated integrated programme so as to ensure that the entire demand for materials for electronic industry which is estimated at Rs. 190 crores, is met to the largest extent by developing indigenous capacity, but where that is not possible, by well-regulated and planned imports.</p>
48	4.54	<p>Government may also examine the question of having adequate buffer stock with a view to ensure easy availability of materials and to obviate losses resulting from escalating prices and other factors, till an adequate demand level for materials is reached to justify the setting up of a plant for the production of these materials in the country.</p>
49	4.62	<p>The Committee note that import of components and materials for electronics is at present organised on the same basis as for other industries. The Committee note that under these arrangements it is often not possible to make the maximum use of foreign exchange allocations to individual firms as sometimes the required materials/components are not available in the country in respect of which the foreign exchange allocation is available. Also the prices charged in individual cases are much higher than those charged on bulk purchases particularly as compared to those obtained on global tender basis. The problem is particularly significant in case of purchases required to be made from East European countries who, in view of their planned economies, are required to be intimated of the requirements well in advance.</p>
4.63		<p>The Committee welcome the proposal for setting up of Electronic Trade and Technology Development Corporation to handle the procurement of materials from within the country and for imports from abroad and stockpiling these materials to avail of the benefit of bulk purchase and to relieve the entrepreneurs of their individual efforts in this behalf and above all to ensure timely availability of the special grade materials suitable for electronics industry. The</p>

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		Committee would like Government to consult the trade and industry while setting up this corporation so as to have the benefit of their views and experience.
50	4.64	The Committee would however like to stress that the proposed Corporation should be organised in such a manner that it has the minimum staff so that its overheads and administrative costs are kept to the minimum and the materials supplied by it to the electronics industry is well at the most competitive prices.
51	5.10	The Committee are convinced that in the interest of achieving best results and investment of resources it is imperative that the Department of Electronics/ Electronics Commission should be considered as the nodal authority for coordinating an integrated programme for research in this vital field of Electronics. The Committee note that Government are already thinking on the above lines and have set up Technology Development Council as an advisory body to the Electronics Commission having scientist representatives from all leading research institutions, like national laboratories, universities, educational institutions, industry etc. The Committee would like this Council to prepare a profile for R&D in electronics during the next three years/five years as also a programme for each of the years of the 5th Plan. The Committee suggest that highest priority should be given in research for such areas where at present we are dependent on imports so as to achieve self-reliance at the earliest and save precious foreign exchange. The Committee need hardly stress that overlapping of research projects should be avoided as far as possible. The Committee would also like the research and development efforts to be closely linked to the requirements of production so that the processes and know how developed can be put to use in the interest of expanding manufacture within the country. The Committee would further suggest that there should

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be a time bound and expense bound research programme so as to have a regulatory system for research.

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5.11

The Committee would also suggest that a review of the progress made in R&D in electronics industry should be made after two years or so in order to improve upon the performance in the remaining years of the Fifth Plan.

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5.18

The Committee note that out of Rs. 450 lakhs earmarked for R&D for the 1973-74, the allocation was reduced to Rs. 106 lakhs as a measure of economy which the Department would be able to utilise. The Department has candidly admitted that they had held up several R&D schemes as they wanted to examine them in depth for several of these schemes would have involved continued expenditure of a high order and it was imperative to make sure that the results would be commensurate with the investment. While the Committee can understand this approach they cannot but express regret that the Department of Electronics and other authorities concerned did not prepare in detail schemes for undertaking research and development so that those schemes which were considered to be of priority nature could have been taken up for implementation straightaway. The Committee understand that the Department of Electronics is now ready with schemes which would cover an outlay of Rs. 765 lakhs for 1974-75. The Committee need hardly point out that it would be increasing the outlay more than seven fold and that this would call for a determined and coordinated effort. The Committee would therefore like the Department of Electronics and all others concerned to make concerted effort to see that priority schemes for research and development are at least now taken up without further delay and ensure that targets set are achieved.

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5.21

The Committee note that recognizing the role of powerful design and development groups in the growth of a self-sufficient and a self-reliant industry

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capable of meeting Indian needs and competing in the world market, the Department of Electronics have taken follow up action on the recommendations of the Bhabha Committee Report on the subject, by setting up the Technology Development Council to look after these aspects and that. In recommendations to the effect have been made by the various panels constituted in the area. With the setting up of the Council, the Committee hope that expeditious steps will be taken to establish design and development groups in all important sectors of the industry to lend it adequate strength to become self-reliant.

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5.24

The Committee note that no advance assurance is at present available to the industry for the commercial production of a new product, which may be developed after long research involving considerable amount of expenditure. It has been urged before the Committee that this acts as a serious inhibiting factor in intensifying local R&D efforts by the industry and needs to be looked into. The Committee agree with the views of the Secretary of the Department of Electronics that while it may be difficult to provide a definite assurance in advance to an entrepreneur for the issue of a licence, it should be possible for the concerned Department to indicate broadly the areas in which R&D can be undertaken which could then be taken into consideration for the grant of a licence at a subsequent stage. The Committee would like Government to take an early decision on the above suggestion and to publicise it so as to encourage intensified research by the industrial units.

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5.32

The Committee note that testing facilities which are developed in the national institutions like BARC and CSIR or elsewhere are not easily available to the industry for testing of their equipment, as these laboratories are engaged in important and sophisticated type of research. The Committee would like Government to review systematically the testing facilities available in Government laboratories/organisations as well as outside with a view to specify those

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where the facilities for testing of electronic equipment would be available readily to the manufacturers. The Committee need hardly point out that where in a particular region or area the testing facilities are not easily and readily available a well-coordinated plan should be drawn up in consultation with the industry to develop such testing facilities. The Committee need hardly point out that such testing centres should broadly be run on no profit no loss basis.

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5.54

The Committee are glad to note that the Electronics Commission have comprehensive plans for growth of electronics in each State and to this end they have decided to set up a testing and development centre in each state, to make available these facilities to the entrepreneurs particularly in the small scale sector. The Committee hope that these facilities when created, will give a powerful boost to the electronic industry in the States and inculcate a greater awareness towards quality consciousness. This will also remove an important bottleneck in the way of the new units coming up and will enable the entrepreneurs to enter the export market with confidence.

5.55

The Committee, however, note that while these schemes are being formulated in a number of States, a testing and development centre has so far been initiated only in Tamil Nadu. The Committee note that the Electronics Commission propose to help in setting up 12 such centres in the country during the Fifth Plan. The Committee would like Government to carefully evaluate the experience gained of setting up a development centre at Tamil Nadu before setting up the centres elsewhere in the country. The Committee need hardly point out that there are already plethora of agencies which are trying to provide services to the small scale industry. The Committee feel that if development and testing facilities are to be provided on decentralised basis for electronic industry, it should be done in close cooperation with the industry and State Governments and the scheme

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should be such as to be self-financing i.e., run without profit and loss. In fact, it may be more appropriate to encourage the industry to set up such facilities by organising themselves in cooperatives.

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5.58

The Committee are glad to note that it has been possible to follow the guidelines of the Bhabha Committee Report in the matter of planning and construction of the new factories in electronics field with indigenous effort and some of the important factories like the Electronics Corporation of India, ITI at Naini, and Rai Bareilly and Ghaziabad unit of Bharat Electronics Ltd. have been planned and constructed without any foreign assistance. The Committee hope that no such assistance will henceforward be needed and the new factories will continue to be planned and constructed with indigenous effort.

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5.74

The Committee feel that in a country like ours with its resources and manpower and pressing problem of creating employment opportunities, electronics provide an ideal field. The Committee are convinced that our country can have a very notable breakthrough in increasing the range and values of electronic equipment to be manufactured for meeting the external and internal demand in the Five Year Plan. It is, therefore, of utmost importance that the manpower requirements for research, development, manufacture and support of this programme should be identified in detail and a well-coordinated and integrated programme drawn up to provide the requisite training facilities. In particular they feel that there is need for imparting training to skilled artisans who constitute the backbone of production programme as also of supervisors at various levels. The facilities for higher education in electronics in the leading Indian institutions should be continuously improved and expanded in order to provide the requisite number of engineers of high grade to sustain and take forward the programme of development.

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The Committee would like the Department of Electronics to play an effective role in working out these requirements in depth and will urge that Government should stress upon all other concerned Departments including the Ministry of Education to give the requisite support so as to develop the training facilities to meet the manpower requirements in a systematic and planned manner.

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5.80

The Committee note that the Department of Electronics have under consideration a special scheme to facilitate return from abroad of highly qualified, scientists, engineers and technologists whose services could be utilised in India. The scheme would be applicable to men with high qualities of leadership and initiative. The intention is to identify the jobs on which the selected scientists who will be paid high salaries ranging from Rs. 1500 to Rs. 2500, will be required to work.

5.81

The Committee also note that a budget provision of Rs. 10,00,000 was made for 1973-74 with a view to cover expenditure for the scheme. The Committee, however, find that the scheme has not yet been finalised. Since with the growth of Electronics industry, larger and larger number of factories are coming up, more and more testing and development centres, are being established for which more and more highly qualified scientists will be required with extensive experience to provide leadership and take initiative at proper levels; this schemes merits early finalisation and implementation. The Committee hope that the Department of Electronics will more in the matter more speedily and identify such personnel to bring them back to the country with suitable assignments.

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5.82

The Committee would like the Department of Electronics to very carefully go into the working of CSIR Pool Scheme so as to avoid the difficulties and shortcomings which were experienced in the imple-

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mentation of that programme. The Committee feel that it is not the number of persons who are attracted back but the quality, innovative character and dedication of spirit of the people who return which will determine the success of the programme and its impact on the development of the electronics industry. The Committee cannot, therefore, over-emphasise the need for selecting the best persons available on merits and to proceed in the matter with caution so as to avoid the shortcomings and difficulties which have beset the CSIR pool scheme from its very inception.

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6.20

The Committee note that the long delays caused in the disposal of applications for licenses have been obviated to a large extent with the introduction of new procedures from 1st November, 1973. The Committee are informed that all licensing applications are being disposed of within the deadline of 45 days prescribed in this behalf.

6.21

The Committee also note that the Department of Electronics appointed panels such as the panel for the semi-conductors industry to provide guidelines for formulating clear cut policies for disposal of applications in specific fields of electronics. These guidelines provided a rational basis for processing of applications objectively. The Committee suggest that such guidelines should be evolved in all other important fields of electronics to facilitate speedy disposal of licensing applications in future.

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6.22

The Committee further note that inspite of the revised procedures, 58 applications were still pending with the Department of Electronics (as in January 1974). These cases, the Committee note, belong to the period prior to the coming into force of the revised procedures. The Committee desire that special efforts may be made to clear this backlog of pending license applications without delay.

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64	6.23	<p>The Committee note that so far no specialised sub-committee has been set up to process exclusively the applications for licences for electronics industry. In view of the fact that electronics is a highly specialised field for which the Department of Electronics provides the nodal Ministry, the Committee would like Government to consider the advisability of having a sub-committee for this purpose. At any rate, the Committee need hardly point out that in the interest of proper and timely disposal of licensing applications, the responsibility for scrutiny and giving clear recommendations on applications for licenses should be squarely put on the Department of Electronics.</p>
65	6.31	<p>The Committee note with concern that a large number of letters of intent are lying unimplemented in electronics for a long time, some of them belonging to the year 1969. The Committee also note that the Department of Electronics conducted a comprehensive review recently of all these letters of intent by holding meeting with the applications in the State capitals in cooperation with the State authorities concerned. The Committee feel that while a broad picture of the real capacity likely to be implemented is not available with the Department, the exercise has been only partially successful as a large number of the applicants were absent. The Committee understand that this is being followed by obtaining information through State Directors, of Industries. Show Cause Notices have also been issued to those who have taken no action to implement the letters of intent.</p>
	6.32	<p>While the Committee appreciate these efforts towards ensuring implementation of the letters of intent, the Committee urge that a procedure may henceforward be evolved so that a periodic review of the situation is conducted at regular intervals so as to ensure that desired capacities in various categories are created in time and according to plans.</p>

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In this connection, the Committee would like, to draw the attention of Government to their recommendation contained in para 52 of their Fiftieth Report on Industrial Licensing.

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6.38

The Committee note that according to the existing procedure for import licences, the entrepreneur gets raw materials on six monthly basis. It is difficult for him to properly plan his production unless he goes on approaching the licencing authorities and keeps close liaison, which is difficult for a small scale industrialist.

The Committee also note the problem at present being faced by the entrepreneurs in regard to the foreign exchange allocation which is partially for G.C.A. countries and partially for R.P.A. countries. It becomes difficult to obtain supplies from RPA countries which have forward planning economies and require advance information in regard to the requirements.

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6.40

The Committee understand that these problems will be largely solved after the constitution of the proposed Electronic Trade and Technology Development Corporation which will stock raw material for issue to entrepreneurs. The Committee, however, recommend that Government may also examine the feasibility of granting raw materials licences for a period of 12 months instead of six months in view of the fact that the time involved in obtaining replenishment licences and importing materials is very long.

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6.44

The Committee note that under the import policy for priority items (as in the case of electronic components) the import applications can be made once quarterly while in the case of non-priority items (such as Radios and TV) applications are made only once a year. There is also a considerable time lag between submission of applications and receipt



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of import licences and further delays occur before the material is actually received. This position, in the opinion of the Committee, can be considerably improved if the Department of Electronics is in a position to play a more direct role in the whole procedure. The Committee desire that this aspect of the procedure may be reviewed and a suitable procedure evolved. In this regard, the suggestion of the National Advisory Committee on Electronics with regard to locating a CCI&E officer in the Department of Electronics to expedite the issue of import licences deserves careful consideration with a view to minimise the time involved in the movement of files between Departments and granting of import licenses.

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6.47

The Committee note that in the recent liberalisation of the procedure for the purpose of registration of new units, the capital goods limit has been completely removed and all units whose total investment does not exceed Rs. one crore can register themselves provided the value of imported raw materials and components is not greater than 5 per cent irrespective of the value of capital goods employed.

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The Committee, however, note that in almost all such cases of electronics units, import of raw materials exceeds the 5 per cent ceiling prescribed in the procedure.

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Since this will act as a handicap in automatic registration of most electronic units, the Committee feel that this might create serious bottlenecks in the production of components of high quality and reliability and at low cost where mass production techniques and large volumes of production are necessary. The Committee feel that the number of these units is not likely to be large. They recommend that suitable remedial measures may be taken to ensure that production in electronic items is not hampered on this account.

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- 69            6.61            The Committee note that electronics industry is experiencing special difficulties in regard to import of canalised items such as plastic moulding powders, non-ferrous metals, steel etc., because of the special nature of their requirements and also because their requirements are small. The State Trading Organisations are reluctant to import the same and are not in a position to provide the technical service expected of such organisations in view of the electronics being a new subject.
- 6.62            While the setting up of the Electronics Trade and Technology Development Corporation will largely solve most of the problems relating to import of special materials required by the Electronics industry, Government should examine these difficulties and take necessary measures to help solve these problems including changes where called for in the Import Trade Control Policy.
- 70            6.75            The Committee note that in certain items relating to semi-conductor industry, due to bans imposed on import of ceramic beads, club beads, hails, silicon crystal and epoxy compound, the entrepreneurs are required to obtain non-availability certificates from Public Sector Undertakings or from private manufacturers.
- 6.76            The Committee also note that collating and gathering the data from the returns furnished by the manufacturers of different areas is a complex job as the material and mechanical specifications in respect of these items are extremely stringent and these items are being dealt with in various directorates in DGTD and as such DGTD has to take recourse to obtaining non-availability certificates from local manufacturers before clearing these items. The Committee further note that although Import Trade Control appendices indicating banned items are being updated continuously there may be cases where such difficulties do arise.

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6.77 The Committee recommend that the whole problem of obtaining non-availability certificates may be reviewed in detail in order to find workable solutions to the difficulties faced by entrepreneurs in this regard.

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6.78

It has been urged before the Committee that as the Department of Electronics have now built up considerable expertise in the field of Electronics, the relationship of the DGTD (and the DCSSI) with the Department of Electronics, needs to be reviewed in order to avoid overlapping of functions and duplication of effort. The Committee would like Government to examine this matter at the earliest.

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7.26

The Committee are disappointed to note that India's position in world export trade of electronics is very low. As against world export trade in Electronics being of the order of US \$5 billion, India's share is about US \$ 8 million only. Even compared to exports of electronic items by small developing countries like Singapore, South Korea and Taiwan which have been exporting to the tune of US \$54.9 m., US \$142 m., and US \$180 m., respectively, India's performance of exports in these items is poor. It is all the more distressing to note that while India has good export potential of quality items the exports suffer as a result of bottlenecks in production. There is large unsatisfied export demand for low cost transistor radios, car radios, data processing equipments and other more sophisticated instruments which can be produced in India. There is also 'unlimited' demand for components such as resistors, capacitors and semi-conductor devices in almost all advanced countries in the world.

7.27

The Committee note that according to the Department foreign collaboration in fields like High Quality printed circuits including multi-layer type; integrated circuits; Silk Screen process for professional grade mica capacitors; High quality metal-oxide film resis-

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tors, including high value types etc., etc. will bring advance technology and will be helpful for exports of these items. The Committee see no objection to enter into foreign collaboration in fields where advance technology is required in the interest of boosting up the exports from the country. They would, however, like to emphasise that the indigenous technology should be utilised to the maximum extent possible and where indigenous knowhow is not available foreign knowhow may be imported in the minimum areas possible and efforts made to indigenise the foreign knowhow by intensive research and development effort with a view to reach self-reliance in the shortest possible time.

7.28 In this connection, the Committee would also like to state that Japan has made big strides in the exports of electronics items and has been exporting electronics items to the tune of \$2400 millions as far back as in 1970. They have been able to do so by importing foreign technology and by adapting it to local conditions and improving upon it by local research and development efforts. The Committee would like the Department of Electronics to learn from the example of Japan with a view to enter in the export of electronic items in a big way.

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7.29

The Committee strongly recommend that with a view to avail of the opportunities available presently in the foreign market in view of the distinct advantages that India has on account of comparatively low cost technical skill available in the country as compared to the high wage structure in all the advanced countries, no time should be lost in taking concerted measures to remove all hurdles standing in the way of export drive. Urgent steps should be taken towards full utilisation of the existing capacities and for expansion of capacities in all commodities identified to have export potential. All such capacities should be licenced readily. Further, intensive efforts should be

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made to locate new parties who have the export potentiality and to encourage and assist them to produce exportable items of requisite quality and quantity within the shortest possible time. The Committee need hardly emphasise that no amount of export drive for electronics will be of any avail unless a sound production base is built up in the country.

7.30 The Committee also recommend that the list of items having export potential should be periodically reviewed with a view to add to the list the new exportable items by identifying them taking into consideration the existing manufacturing base in the country. This list should also be published widely.

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7.31

The Committee note that one of the hurdles in pushing up the production of electronics items for exports is the inadequate base of components which are in short supply for the existing level of requirements for home as well as export markets. The Committee recommend that a crash programme may be undertaken to increase the production of components to meet the existing as well as future requirements.

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7.32

In this connection the Committee would like to reiterate that the proposed Electronics Trade and Technological Corporation may be set up early so that it may be in position to undertake the task assigned to it without delay.

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7.33

The Committee note that the National Committee on Electronics have recently made a number of recommendations as regards strategy of export both short-term and long-term. They have *inter alia* recommended immediate utilisation of idle capacity as well as provision of facilities for import of raw materials from preferred sources and building of technological strength to be able to compete in the international market. The Committee desire that Government should examine the recommendations made by that committee urgently and take effective steps to implement the same so that the targets of imports laid down

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for the Fifth Plan could be achieved. The Committee would like to be apprised of the decision taken on recommendations of that Committee and action taken to implement them in due course.

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7.34

As a sound institutional arrangement for a consistent and systematic export drive will be essential the Committee suggest that a standing working Group should be constituted immediately consisting of representatives drawn from the T.D.A., the Engineering Export Promotion Council and the Department of Electronics to keep a watch over the progress of imports and remove bottlenecks if any, in the achievement of export targets.

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4.35

Recognising the need to increase India's share in rapidly growing world trade of Electronics, the Government of India decided in November, 1972 to establish an Electronic Export Processing Zone, at Santacruz. The Committee note that since the decision taken by Government in this regard in November, 1972, 60 applications have been received out of which 30 proposals have so far been accepted, 20 have been rejected and 10 are still under consideration. The Committee also note that construction work in the zone has yet to start. The Committee consider that the progress in regard to the setting up of the Zone has been very slow. They are doubtful if at this speed the targets for export amounting to Rs. 25 crores from the zone during 1974-75 could be achieved. The Committee therefore urge that effective and determined measures should be taken immediately to accelerate the progress of work in the zone and the functioning of the industries there.

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7.36

The Committee also suggest that after assessing the success achieved by the S.E.E.P.Z. in the export field, Government should consider the establishing of more such zones in the country.

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3.9

The Committee welcome the setting up of the Electronics Commission with a view to ensure balanc-

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ed development of Electronics Industry in the country. They note that the Commission is mainly responsible 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 field of electronics in the shortest possible time and in the best possible manner.

9.10 The Committee also note that since the setting up of the Commission in February 1971, it has met 16 times.

8.11 The Committee are greatly impressed by the amount of work, specially planning, in the field of electronics which has been done in the Department of Electronics after its inception. The Committee recognise that in the crucial and strategic field of electronics, it is of great advantage that a scientist of an international standing and reputation heads both the Commission and the Department.

The Committee cannot help pointing out that the sheers volume of work involved is so large that it requires adequate administrative and organisational arrangement to ensure that there is follow-up of the approved policies and of the schemes selected for implementation.

8.12 The Committee note that Government's resolution setting up the Electronics Commission, provides for the appointment of one or more fulltime members. At present, no such appointment has been made. The Committee have no doubt that Government would keep, under review, the volume of work and the nature of responsibility involved so as to provide the Chairman of the Commission who is also the Secretary of the Department, adequate time to concentrate on the main tasks of laying down and evolving policies and over-seeing their implementation.

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81	8.13	<p>The Committee would further like Government to keep the working of Electronics Commission under continuous review to see that the objectives underlying its set up are fully achieved and that the policies formulated are forward looking, comprehensive meaningful and realistic so that India attains not only self-reliance in the field of electronics in the shortest possible time but also builds up a viable industry not only to meet the internal requirements but to capture an increasing share of export markets.</p>
82	8.27	<p>The Committee note the circumstances under which the present Office of the Chairman of the Commission/Secretary of the Department of Electronics is located both at Bombay and Delhi. The Committee have a feeling that the projected growth of the electronics industry in the Fifth Plan is bound to generate problems both of administration and technical nature which would require close coordination with other Departments and organisations. The Committee have no doubt that Government would keep the present arrangements under continuous review, having regard to administrative, technical and financial requirements to see how far the present set up needs to be rationalised in the interest of smooth, efficient and economic functioning.</p>
83	8.39	<p>The Committee note that the Recruitment Rules have not so far been framed by the Department of Electronics except in the case of staff car driver and Despatch Rider and that action to finalise Recruitment rules for other posts in the Department is stated to be under way. The Committee feel that in the interest of smooth and efficient functioning of the Department, it is imperative that the Recruitment Rules for all posts in Electronics Commission and the Department of Electronics should be finalised expeditiously.</p>



## **APPENDIX IV**

(*Vide* Introduction)

*Analysis of Recommendations contained in the Report.*

**Recommendations for Improving Organization and Working:**

2 to 20, 22, to 33, 35, to 49, 51, to 81, and 83,

**Recommendations effecting economy:**

16, 21, 34, 50, 82,

**Miscellaneous:**