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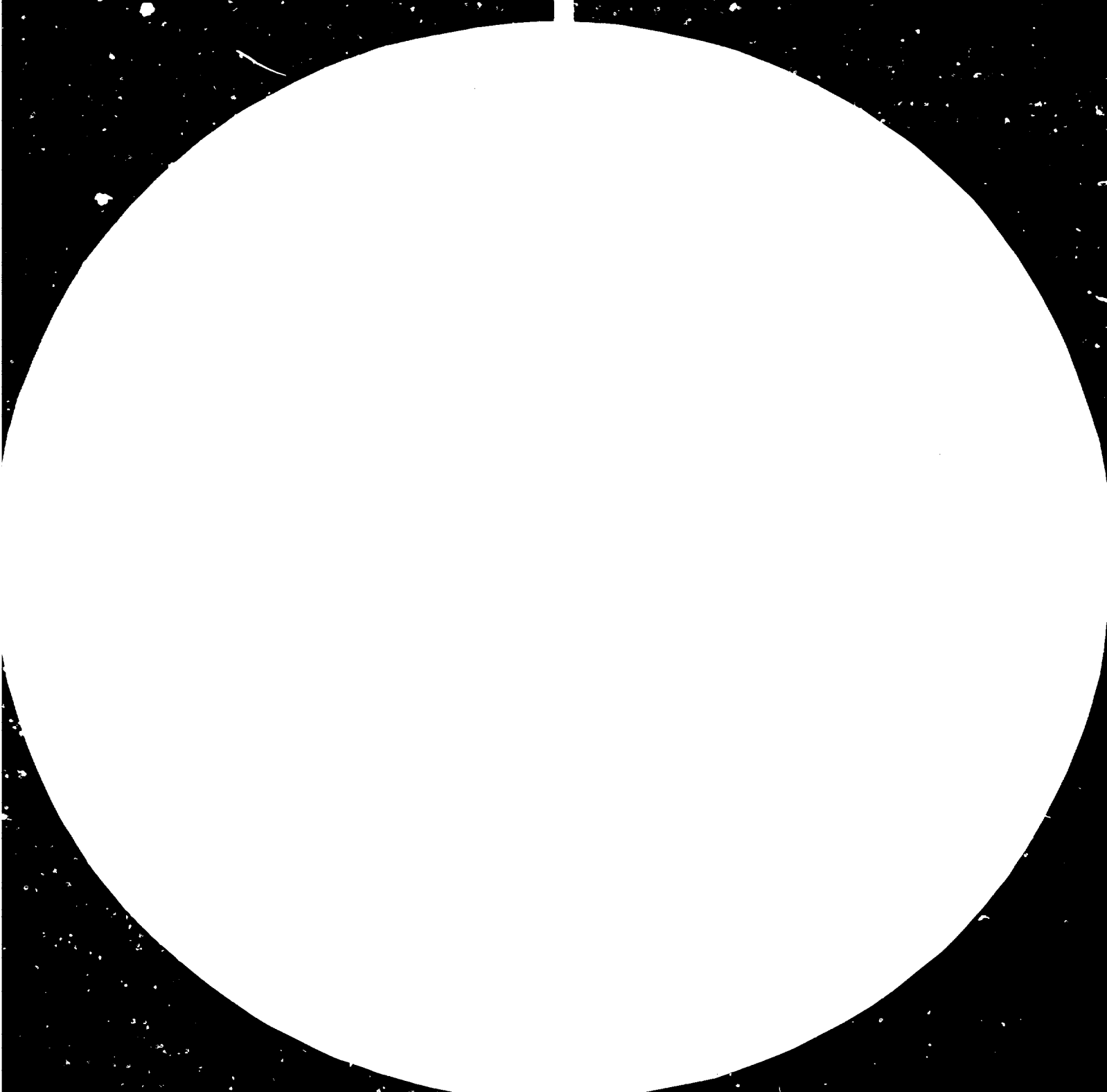
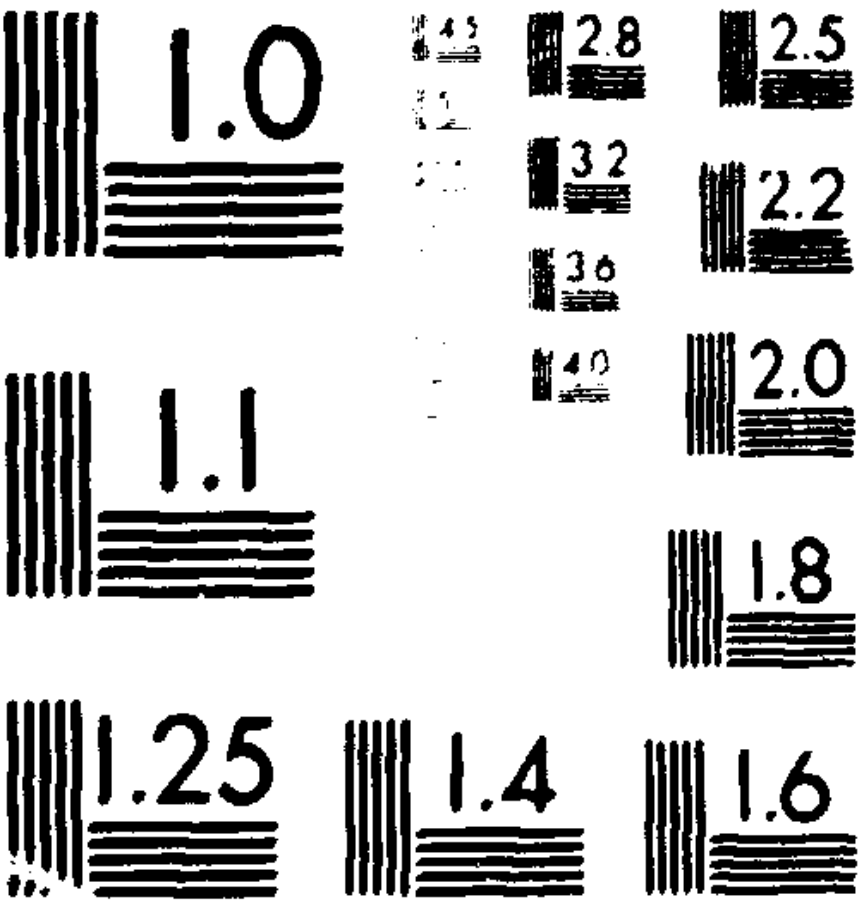
UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org





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THE MEXICAN EXPERIENCE IN THE ELECTRONIC INDUSTRY *

by

Gabriel Villela Pardo **

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** Project Promoter, NAFINSA (Nacional Financiera S.A.), Isabel la Catholica 51, Mexico 1, D.F., Mexico.

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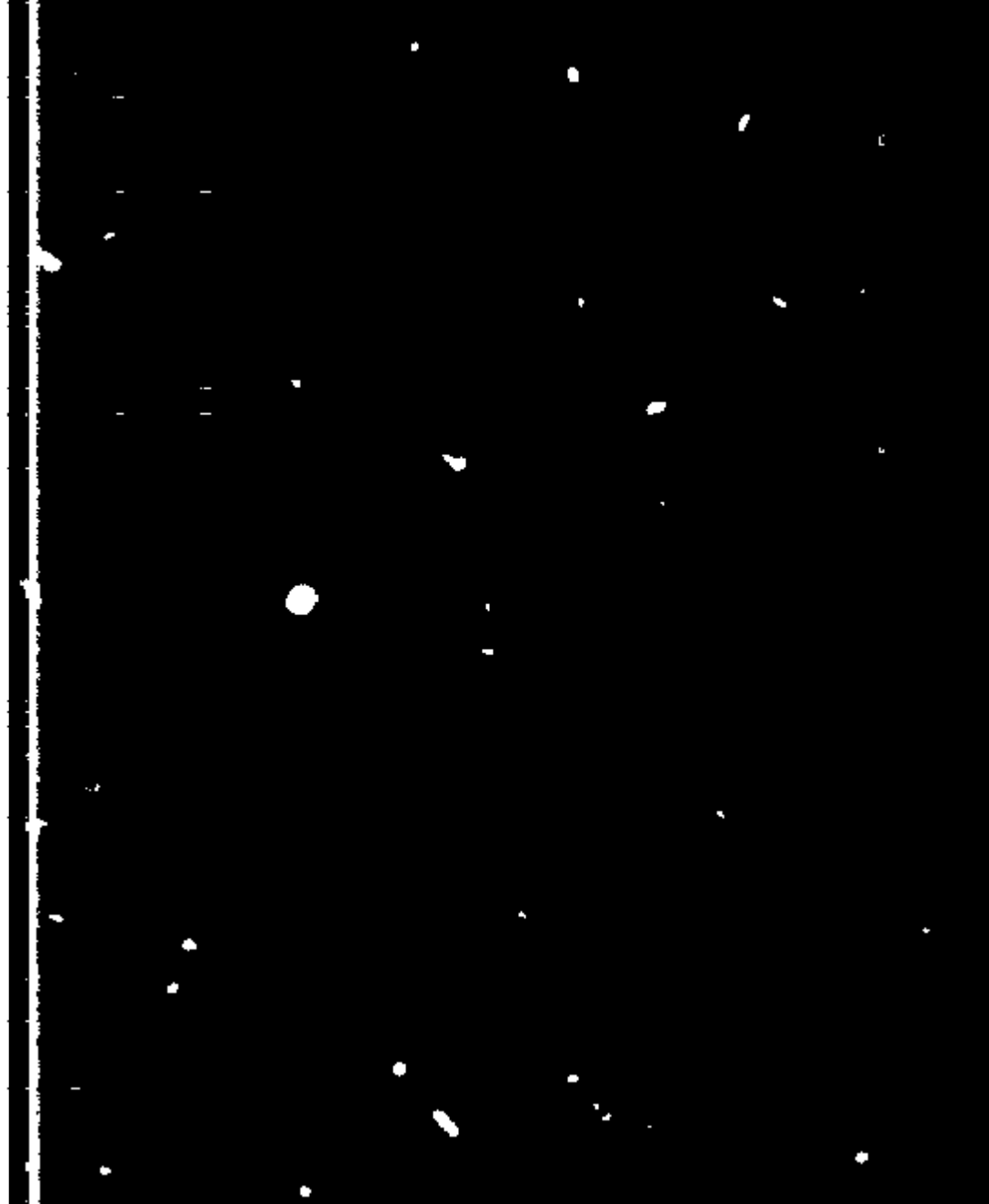
The electronic industry was born in Mexico with the assembly of home appliance consumer goods as radio sets, TV sets, etc., in the second and half of this century, by instaling in Mexico subsidiaries of the international ccmpanies.

During many years it was directed to the consumer goods, and side by side with this, was born the parts and components industry for these industries. Only in the late sixties, the professional electronic industry apears in Mexico with certain importance, and by means of an assembly industry.

The integration in the consumer goods has grown during all this period until today. I would like to centrate this lecture in the recent years, and I am sure that our friends from Philips know more about this item than I do.

In the middle of the sixties the government politics were to protect the national industry, and this, in the beginin started the development of the auxiliary industry and the growth of the final product manufactures.

However the extent of this protection instead of promoting a biggest growth in the industry, was the way to generate ineficiencies in it, causing that in general terms the manufacture of consumer goods is more expansive in Mexico than in the country of the parent company. At the same time, the quality is less and the possibilities of competition outside Mexico to. In the components industry the proliferation of workshops of very small size (families who produce resistences or



capacitors, or conectors in garages or back-yards in small quantities, without quality control, scheduling, etc.); the medium size industry, which have more administrative capabilities, but do not reach the international standards to overtake the economy scales needed to ensure a rational production.

All these things make that the consumer goods electronic industry in Mexico is now in a great problem, because after a very strong protection, now this has desappeared and the penetration of foreign manufactured equipment, almost at the same price and with a better quality in a competition the local industry can not afford.

Now, as for the professional electronic industry, the promotion program of Capital Goods Sector implemented by Nacional Financiera as an Agent of the Federal Government to foster the industrialization in Mexico, the Sector was divided in four big groups, which are:

- Understructure industry
- Special pourpose equipment manufacture
- Non special pourpose equipment manufacture
- Professional electronics

As you know professional electronic production accounts for about 3% of the gross national product in market economy countries; however its economic importance is much greater than would seen to be indicated by this figure because of this technological impact on all other industries and extensive use in society's activities in recent years.

Electronic equipment makes extensive use of rapidly advancing technologies. Nevertheless, such technological advances are found primarily in the components involved, since although the equipment is sophysticated, its design and manufacture are relatively simple. Moreover, often in the production and assembly of electronic equipment a certain kind of skilled labor is used wich is readily available in Mexico; this gives the country and advantageous position in terms of such production.

Internal market studies related to professional electronic equipment reveal a growing demand which is increasing at a rate of 14% anually. In 1979 the total consumption of finished products was 420 million dollars, of which 70% were imported products. When components and parts are included, consumption figures reach 680 million dollars (see tables 1 and 2) for that year, with imports estimated at 321 million dollars.

The field of professional electronic was divided in six sectors: Telecommunication equipment, instruments and equipment for measurement and control, process control instruments, computers and calculators, biomedical equipment, electronic components and parts. The largest of these subsectors is covered by local production of telecommunications equipment while demand for measuring and testing equipment and electrobiomedical equipment is completely supplied by imports. The mexican made electronic products that are exported in greatest quantity are calculators and semiconductor components. The number and type of industries in electronics industry in Mexico in showed in chart 1.

The various parts and components used in the national electronics industry are found in chart 2, along with the number of enterprises dedicated to their manufacture. It is noteworthy that the supply of parts and components in

mainly directed toward consumer products and only a small portion is for professional electronics industry.

Market forecasts up to 1982 shows a slight increase in local production as compared with imports. It is expected that the average annual growth of internal production during the period 1980-1982 will be 17.2% while imports will grow 12.3% annually.

At the present, the professional electronics industry in Mexico employs approximately 6 000 persons. It is principally an assembly industry that is dependent on foreign firms for the design and technology of its products and their parts. The development of local industry has been hindered by the lack of an ample research and development base, by the scarcity of professional quality components and by the shortage of personnel with sufficient training to direct and supervise the industry. Nevertheless, there are sufficient electronic engineers and skilled industrial workers with the kind of abilities required for an electronics industry.

The public sector is the major consumer of professional electronic equipment in Mexico, it covers almost 80% of total consumption and thus has a significant influence in the market.

A series of recommendations could be made, they are concerned with several basic problems and are directed toward facilitating and improving the current situation in the electronic industry and furthering its promotion, growth and development, while at the same time improving the quality of national production so that the country may become less dependent on imports of foreign products and technology.

1. As long as the local components producing industry cannot manufacture components with professional quality levels, the purchase abroad of such items should be facilitated for local finished equipment manufacturers, service and repair shops and research and development organizations. For this reason it is suggested that requirements for import licenses for electronic elements and the parts used in professional equipment should be rationalized. Moreover, import taxes ought to be adjusted so as to provide adequate protection for the local components industry without causing excessive increases in the production costs of equipment manufacturers.

2. In order to stimulate the internal production of electronic components having the levels of quality and reliability needed for professional uses local producers should have access to the potential market that exists at present in the in-bond processing plants. The annual requirements of the plants in terms of components should be compiled along with the specifications of components that are currently imported so that local producers may have the oportunity of entering into this market competitively.

3. Training for specialized workers and production supervisors in the electronics industry should be promoted.

TABLE 1

SUMMARY OF THE MARKET FOR FINISHED PRODUCTS 1979-1982
(Consumption in million dollars)

I T E M	1979	1980 1/	1981	1982
Total finished products	420	477	544	621
Telecomumunication equipment	214	244	279	320
Instruments and equipment for measurement and control	13	14	15	16
Process control instruments	92	106	121	139
Computers and calculators	66	75	85	98
Biomedical equipment	37	38	44	48

1/ Proyected figures

Source: NAFINSA-UNIDO Joint Capital Goods Project.

TABLE 2

SUMMARY OF TOTAL MARKET (1979-1982)
(Consumption in millions dollars)

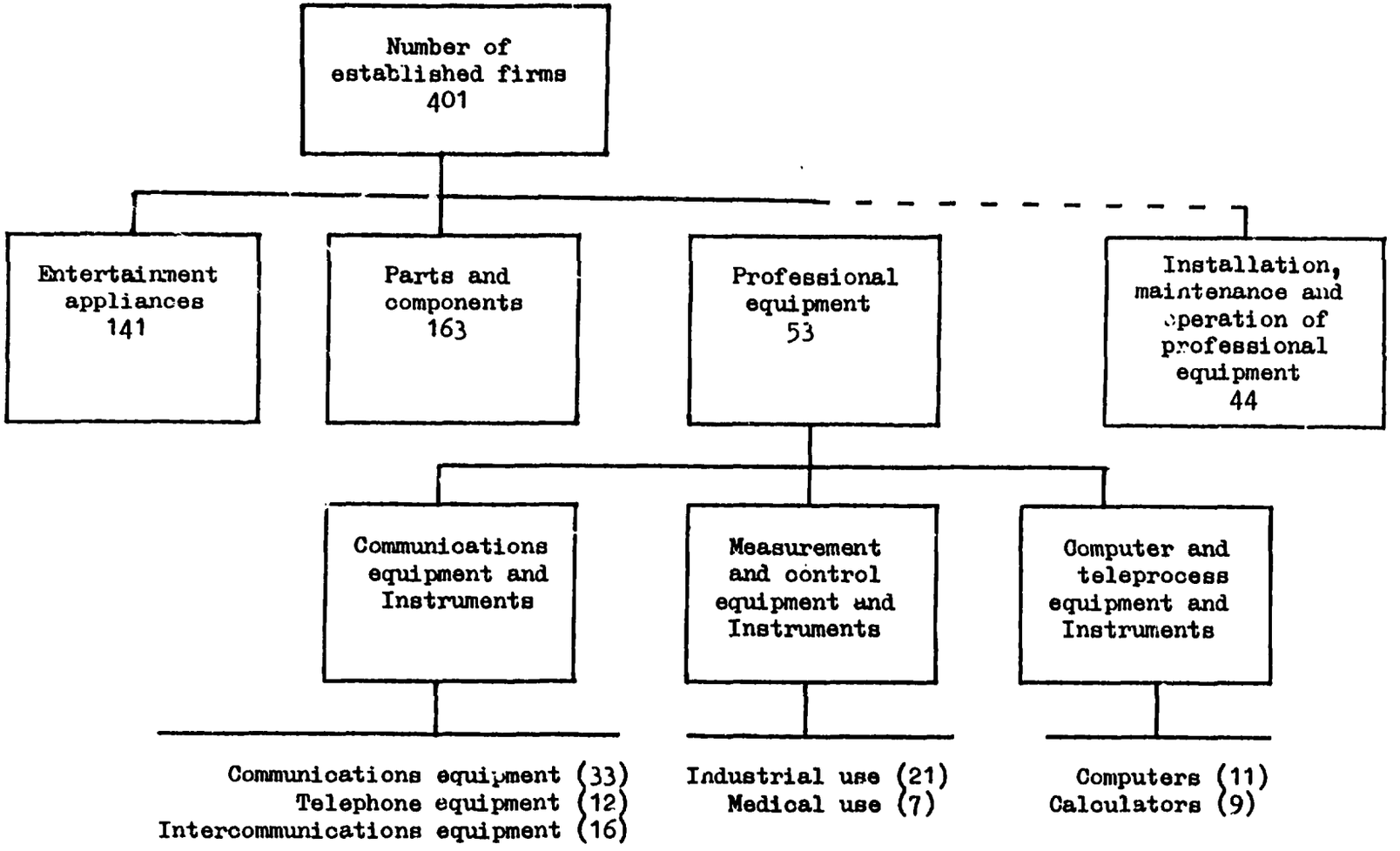
I T E M	1979	1980	1981	1982
Total professional electronic	680	754	835	927
Finished products	420	477	544	621
Electronic components and parts	260	277	291	306

1/ Proyected figures

Source: NAFINSA-UNIDO Joint Capital Goods Project.

CHART 1

PROFESSIONAL ELECTRONICS: PRESENT SITUATION OF DOMESTIC INDUSTRY



NOTE: The figures in the squares refer to the number of active firms.

SOURCE: Nacional Financiera, S.A.; NAFINSA-UNIDO Joint Capital Goods Project.

CHART 2

PROFESSIONAL ELECTRONICS: PARTS AND COMPONENTS USED BY DOMESTIC INDUSTRY

Wires and cables 5	Antennas 17	Quartz crystals 1	Resistences 10
Bases and sockets 8	Coils 16	Diodes 10	Breakers 16
Keyboards 3	Circuits 10	Power supplies 8	Transistors 15
Connections and plugs 11	Integral circuits 9	Fuses 3	Transformers 17
Chassis and cabinets 15	Capacitors 15	Ferrite cores 3	Electronic valves
Towers for antennas 4		Rectifiers 5	Deflection yokes

NOTE: The figures in the squares refer to the number of active firms.
Parts and components not numbered are not produced in Mexico.

SOURCE: Nacional Financiera, S.A., NAFINSA-UNIDO Joint Capital Goods Project.