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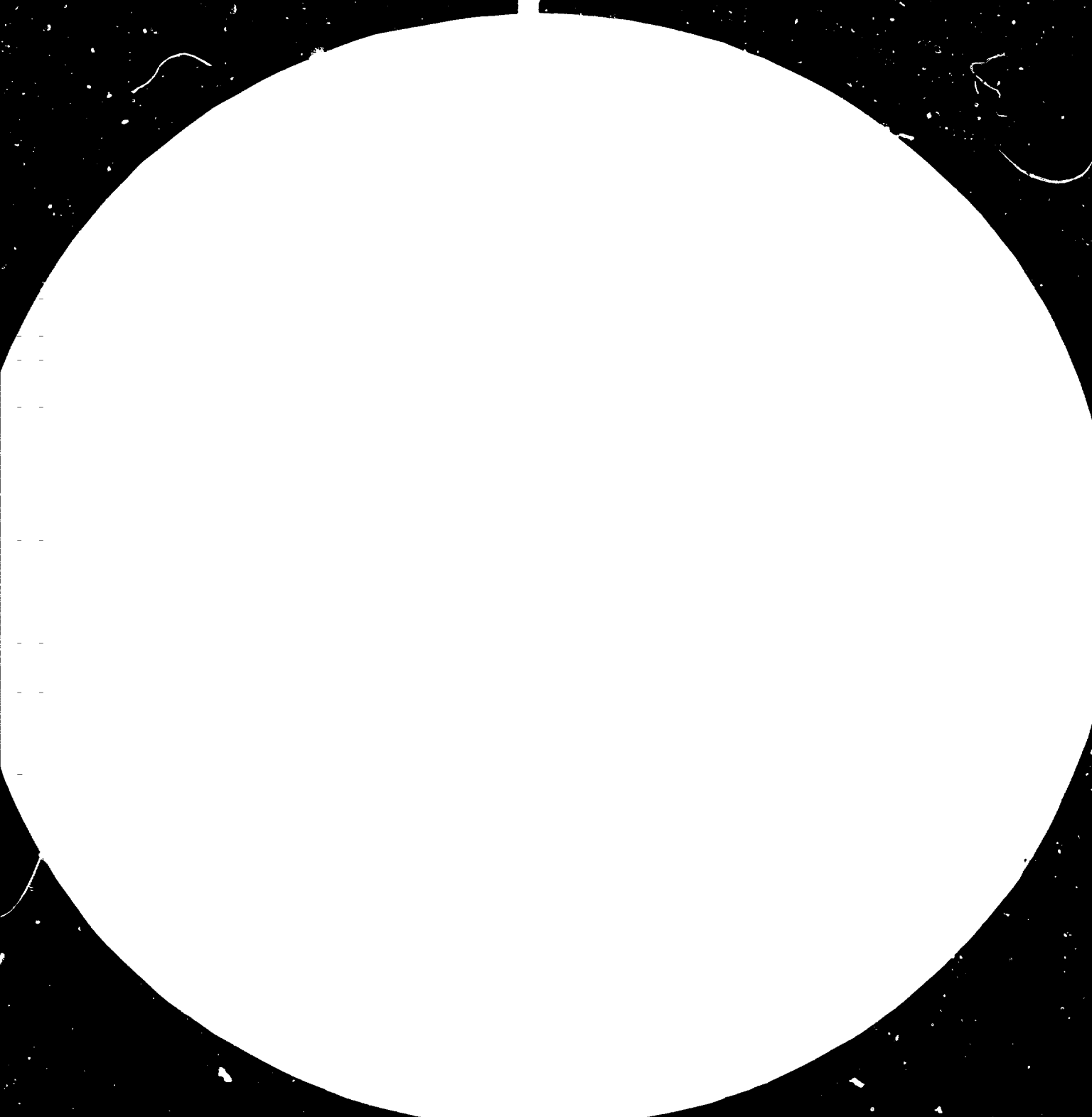
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United Nations Industrial Development Organization

UNIDO/ECLA Expert Group Meeting on
Implications of Microelectronics
for the ECLA Region

Mexico City, 7-11 June 1982

TELECOMMUNICATIONS AND MICROELECTRONICS:

SOME OBSERVATIONS *

Country monographs: Argentina, Guyana, Peru

by

E. Galli, ** M. Welch *** and R. Herrera ****

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   ** Consulting Engineer, Communications Area, Suburban Services Electrification, Línea General Roca, Buenos Aires.

   *** Assistant Director-General (Engineering), Guyana Telephone Corporation, Georgetown.

   **** Head, Electronics Division, Institute of Industrial Technological Research and Technical Standards (ITINTEC), Lima.

A.   Telecommunications and microelectronics represent a phenomenon of such scope that it cannot be discussed merely in technocratic terms; its implications for the economy, society and culture call for a comprehensive approach based on the specific policies that every Latin American nation finds it necessary to formulate. Considering the tradition in the region of undertaking concerted projects, we believe that these policies can be co-ordinated in pursuit of the objective of having a sizable proportion of Latin America's microelectronic requirements met by its own industry within the next 20 years. This seems a realistic goal, since the market created by infrastructural requirements in the telecommunications data and consumption areas is large and likely to endure for a fairly long period. This fact makes it possible to propose a technological strategy appropriate to the proposed objectives and thus avoid being drawn into a headlong race for technological goals that is best left to highly developed countries.

The inference is that, if the Latin American countries act with speed and prudence, a microelectronics industry scaled to the genuine needs of the various nations can be developed in the region.

The following recommendations are proposed in pursuit of this objective:

1.   The need for a framework of co-ordination:

In order to promote and carry out a Latin American microelectronics programme, there must be a proper framework for the co-ordination of activity. It would seem logical to suggest that this kind of framework could be found within some Latin American or international organization willing and able to conduct an enterprise of this nature.

2.   This idea should be fostered in the various ministries, councils and/or planning commissions of the countries of the region.

3.   Within the co-ordinating agency, a working group should be set up to perform the following tasks:

    3.1   To identify the Science and Technology Councils or other equivalent bodies at the highest decision-making level in each country;

    3.2   To evaluate university or research-and-development centres capable of serving as centres of excellence for the programme;

    3.3   To study the feasibility of establishing and/or strengthening, in each country, a centre for computer-assisted design of components and equipment;

3.4 To evaluate the potential or installed industrial capacity; to analyse each country's industrial censuses; to analyse the various industrial specialities required by the microelectronics industry;

3.5 To determine the economic and financial requirements of industrial projects;

3.6 To promote intensive use of the purchasing power available to the public sector for the acquisition of domestically or regionally manufactured components, equipment and parts;

3.7 To propose a common policy in relation to the external sector;

3.8 To evaluate sources of financing and possible requirements from international organizations;

3.9 To put forward suggestions for making use of bilateral agreements on science and technology between Latin American countries;

3.10 To determine what international co-operation is required (South-South co-operation; co-operation with United Nations agencies, and with other bodies);

3.11 To analyse personnel requirements and make suggestions as to staff requirements in each specialized field; to seek and promote fellowships for further training at advanced centres in the most developed countries;

3.12 To study patents, marks, and technology transfers; to study the position of the Latin American countries in this area; to propose agreements, transfers, uses, etc., contributing to the attainment of the objective of manufacturing microelectronic items;

3.13 To propose legislation to speed up the programme;

3.14 To initiate detailed studies on the effects of microelectronics:

On manpower;

On the role of universities and R + D institutes;

On family consumption patterns and real investment (public and private);

On the intensive use of the intellectual assets available in Latin America and the protection of those assets as a national resource;

On Latin American society and culture.

4.   A Latin American Meeting on Microelectronics, to be officially attended
by the Ministers of Planning or equivalent officials and by representatives
of national R + D centres, should be held towards the middle or end of 1983 in
order to study the proposals of the working group and officially to adopt
an agreed programme.

This Meeting will determine which agencies are to be responsible for
general co-ordination and for co-ordinating the conduct of the programme in
each specialized area.

B.   Areas of application of microelectronics in telecommunications:

1.   Electronic switching of integrated telecommunication systems;

2.   Optical-fibre transmission of data;

3.   Possible digitalization of radio broadcasting, including the
transmission of programmes;

4.   Possible construction of Latin American telecommunication satellites;

5.   Increasing use of data terminals (in homes, offices, factories, etc.);

6.   Telecommunications with automatic translation;

7.   Individual use of remote data-processing facilities through portable
digital radio equipment giving access to national or international
networks;

8.   Possible application of remote control and telerobotics to long-
distance control of complete production processes (industrial,
administrative and household);

9.   Contribution to the region's military requirements for telecommunica-
tions and other specific applications and for the improvement and
modernization of existing equipment;

10.   Immediate application to improve the efficiency of existing equipment.

C.   Rural telecommunications are an essential means of bringing a sizable
portion of the Latin American population into active participation in economic
and social life. The countries of the region need to make such services much
more widely available, for they constitute a genuine instrument of national
development. Microelectronics can contribute to such efforts through the
enormous versatility of its components, which means that compact, reliable, and
inexpensive equipment can be provided here and now.

These systems may take different technical forms (physical circuits, HF and VHF links, etc.), but they can all be used to connect the public network either to small isolated communities or directly to outlets which may be remote from centres already provided with telecommunication services.

In many rural areas of Latin America, conditions differ greatly from those found in more developed countries; this means that systems and equipment should be designed accordingly, for they should provide an important field for the utilization of Latin American brainpower.

Advances in the control of telecommunication systems have changed the ideas of many administrations with regard to development planning. In the case of rural networks, priority has been given to more profitable subscriber groups: i.e., the emphasis is on social benefits and more extensive development of the infrastructure.

Rural area (typical situation)

(a) Some 100-400 km of main telecommunications system, normally transmitting in the HF or VHF band;

(b) No infrastructure (e.g. water, electricity or roads);

(c) No technical skills available in the area;

(d) No measurable impact on the public, which consists of low-income wage-earners;

(e) Rural areas may be close to one another;

(f) The areas of interest may not be the principal cities of the country.

Requirements

Rural traffic

(a) Capacity for inter-rural and inter-system connections;

(b) Minimum maintenance and remote counselling;

(c) Low power consumption;

(d) Public telephone service and emergency-call capability;

(e) Modular design with at least a 50-line capacity;

(f) Provision for the principal traffic modes (operator-assisted calls, facsimile transmission, etc.);

(g)   Short-number dialling;

(h)   Installation requiring little technical skill.

The answer

Through the use of microelectronics, the following specific requirements can be met:

(a)   Microprocessors can be programmed to meet traffic requirements, and decentralized control will provide a substantial traffic capacity with a minimum of equipment;

(b)   The translating and register functions of the microprocessor reduce the volume of equipment required and introduce a number-dialling capability;

(c)   Hybrid power-supply systems can be used in which solid electrolytic batteries are controlled by electronic devices;

(d)   Using LSI microcircuitry, a radio-relay station can operate in the RF/RF mode with 300 per cent redundancy, and distance is no problem;

(e)   Traffic booths designed with microelectronic components are very small and can be mounted on a post without major construction;

(f)   The equipment can be taken to places fully tested, and highly skilled technicians are not needed to install it;

(g)   The traffic modes required can be programmed, so all that is required to bring traffic-handling capacity up to date is more advanced software.