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## Summaries

p. 44...52

### An Introduction to Integrated Circuits

E. R. Hauri, Berne

This is a survey of integrated-circuit technology. The author outlines the development of the various techniques, explains some of the main terms and gives examples of the degree of integration and the selection of the appropriate technology for certain applications.

p. 53...60

### Principles for the Design of Linear and Microwatt Circuits

H. Rüegg and W. Thommen, Zurich

It is shown how, by taking full advantage of standard technology for linear integrated circuits, new design principles can be developed. Special mention is made of active components replacing passive ones, and transistors being used as voltage-controlled elements in current-driven sources. Operational amplifier circuits and a binary divider stage are the examples quoted respectively from the fields of linear and microwatt technology.

p. 61...67

### Monolithic Integrated MOS Circuits

F. Leuenberger, Neuchâtel

Having compared current technologies for the fabrication of integrated MOS circuits on the one hand and bipolar integrated circuits on the other, the author briefly surveys dynamic logic MOS circuits. He then deals with complementary MOS circuits, whose power absorption changes in proportion to frequency. Details are given of the advantages of a more recent MOS technology using as control electrode a polycrystalline silicon layer. Further improvement in power dissipation and cutoff frequencies is discussed and illustrated by complementary MOS circuits in dynamic logic circuits, as well as MOS transistors fabricated on an insulating substrate reducing stray capacitance.

p. 68...73

### Thick-film Hybrids

F. Winiger, Zurich

The advantages of hybrids over monolithic and printed circuits are shown and the principal fields of application mentioned. Having commented on hybrid design, the author describes thick-film technology, giving details of its application and limits and quoting some examples.

p. 74...78

### Thin-film Hybrid ICs

Hp. Herren, Berne

After briefly outlining the various types of integrated circuit, the author enters into the processes of thin-film hybrid production.

p. 79...83

### Fully Integrated Switching Elements for Space Division Systems

P. Marti and M. Lamoth, Bevaix (Neuchâtel)

In view of the numerous requirements regarding the coupling element of conventional telephone switching systems, a fully electronic solution does not seem economically feasible. The article shows that, by shifting some of the problems involved, electronic switching elements, even of the integrated type, can nevertheless be used. Having explained the transmission requirements, the author presents two solutions, one with discreet components, the other using ICs, which both meet PX specifications.

p. 84...85

### A Digital Telephone Set

J. Zaugg and E. Faivre, Solothurn

In addition to ordinary conversations, discrete signals from various sources will in future have to be transmitted over telephone lines. In a uniform communication system this can only be satisfactorily achieved by the use of digital exchange lines and subscribers' sets. The integrated-circuit technology for the design of such equipment is already available.

## News Items

### Posts

A «60 Years of Pro Juventute Stamps» special exhibition showing a collection of postage-stamp designs and prints is being held at the Berne PTT Museum from December 1972 to March 1973.

### Telephone

During the second half of 1972, **International Subscriber Dialling** was made available in a further 105 Swiss exchanges with more than 160,000 connections.

A **microwave telephone link with 1260 channels** has been opened between **Berne and Basle**.

Between **Martigny and Sion** a **6MHz small-type coaxial cable system**, which forms part of the Lausanne-Sion main link, has been put into operation.

With a view to the possible introduction of the **Hasler HS 68 telephone switching system**, Swiss PTT last year conducted a **first series of equipment trials**. A second series, beginning this summer, will include built-in test facilities.

## Telegraph, Telex

At the new **Wengen** (Bernese Oberland) **post office, a telephone and telegraph counter** with 6 attended telephone booths has been provided for use during the tourist season.

**Public telex booths** are now available in **20 Swiss towns**.

**Semi-automatic telex service to Madeira** has been opened via Zurich-Lisbon.

Radio-Suisse Ltd has opened two **direct telex channels with Bangkok**, replacing the indirect Thailand route via Tokyo.

## Radio, Television

An additional two **VHF radio transmitters**, one each for the German and French spoken Swiss programmes, came into operation on 15 December 1972.

In December 1972 the **Swiss TV transmitter network** was extended by 18 installations in 15 different locations. It now comprises 290 stations with 446 transmitters and transposers, 290 forming the first chain, 106 the second and 50 the third chain.

At the beginning of December an **additional colour studio** was opened in the new **Zurich-Seebach TV building**. It will be used for the production of current-events programmes.

The **fixed microwave network for TV reporting** has been extended by links Jungfrau-Joch-Albis (Zurich) and Piz Corvatsch (Grisons)-Albis.

A **separate microwave network** linking the Zurich, Geneva and Lugano studios with the Zurich-Albis control centre has been provided for **Swiss TV News**. Over this network the TV news will be relayed to the regional studios in colour from February 1973. It will also be used for national and international programme exchanges between studios.

## Miscellaneous

The PTT Research and Development Division is testing two **microwave systems of the latest type** using 2700 telephone channels in the 6.8 GHz band and 1800 channels in the 11 GHz band respectively. Subsequent field trials are to provide data on some basic transmission problems.

An **experimental pneumatic tube installation of 65 mm diameter** has been completed by the PTT Technical Centre at Berne. It will be used for a number of trials, including equipment and component tests.

«**Rationalization and Economization**» was the theme of a **competition** launched by the PTT Suggestions Committee in 1972. Of the 1600 entries, 144 (or 9%) were adopted and their authors awarded. The savings resulting from these suggestions will amount to 200,000 Swiss francs annually.

The new **INTELSAT body**, which supersedes the 1964 consortium, will take up its activity on 12 February 1973.