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## Summaries

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### Transmission of Digital Two-Wire Duplex Signals in the Subscriber Loop

C.-H. Gremaud, Lausanne

A bidirectional digital system was designed for transmission of 128 kbit/s or 144 kbit/s on a symmetrical wire pair. The realization is based on a hybrid terminating set and echo cancellers. The transmission code and mode consider the compatibility with the high frequency radio broadcasting on the same wire. An experimental model and its test with installed wire at the laboratory indicates the influence of different parameters as well as provides useful results on the system characteristics.

p. 95...103

### Telepac: Why to Connect and what Equipment to Link

J. Pitteloud, Berne

Telepac is the Swiss public switched network dedicated to the transport of data. Its structure allows to select either centralized or decentralized information processor. It offers a very safe transfer of data. Its operation is ensured by the PTT. Telepac utilizes the proven packet switching technique based on international standards. The users can share dynamically the resources of the network at a high performance rate. Telepac offers some of the new benefits at an interesting price in areas such as change of transmission rate, of topology or automatic reconfiguration of the teleinformatics network. In the first chapter the article presents the essential characteristics of Telepac. The following chapters deal rather with telecommunications aspects and inform more precisely on the large range of equipment connectable to Telepac.

p. 104...111

### Design and Performance of M-ary PSK and QAM Digital Radio Equipment

K. Leuenberger, Berne

Besides the basic design of modern digital radio equipment, the author treats in this article the main characteristics of terrestrial digital radio-relay systems especially applied to M-ary PSK and QAM. In both modulation systems, the demodulation is carried out by a reference carrier which is recovered at the receiver. Unlike the PSK system, the QAM contains phase

and amplitude modulated signals. In the near future the QAM shall be also used in the PTT digital long-haul network at a transmission rate of 140 Mbit/s. At the end, the article discusses possible degradations during transmission, their causes

## News Items

### Telephone

At the end of 1983, there were 478 (1982: 468) **subscriber lines** and 790 (1982: 771) **telephone stations** per 1,000 inhabitants (Swiss population: 6.468 million).

In 1983, the **local subscriber line** was extended by 329,548 wire-pair km and the **junction line** by 27,126 wire-pair km. The installed **coaxial cable** went up to a conduit run of 1,412 km and the **glass fibre cable** of 306 km. Switzerland was connected with 16,768 telephone circuits to foreign countries, of which 1481 to overseas.

Between **Switzerland and El Salvador**, 6 permanent **satellite circuits** came into operation via Leuk earth station. Thus, 32 countries can be reached over Leuk.

At the end of 1983, **satellite circuits** increased by 60 to 680 at the **Leuk earth station**. Further, 175 permanent circuits were leased from foreign European countries.

Swiss PTT concluded a contract with the Nippon Electric Corporation (NEC) for **delivery of equipment** including antenna for the **Eutelsat earth station in Leuk**. Several Swiss firms are participating in this project directly under the PTT or as subcontractors to NEC.

### Teleinformatics

The **national telegram traffic** increased by 2.4 pc, whereas **international traffic** showed again a decreasing trend of 10 pc in 1983.

The **burofax service** was extended from 24 to 33 countries and it transmitted 48,000 A4 pages during the last year.

The **telex service** was available to 689 (1982: 602) subscribers.

**Telex terminals** rose to 556 (1982: 537) per 100,000 inhabitants. About 38 pc of the lines were connected to the new **electronic exchange** and 42 pc of the subscribers were equipped with the **electronic telex SP 300** in 1983.

and their elimination, for example, by application of adaptive equalizers. (A later article yet to be published will be especially directed to the transmission techniques and the realizable spectral efficiency of digital microwave systems.)

**Automatic message switching system (SAM)** connected 48 (1982: 43) customer networks with 4,458 (1982: 3,694) message terminals at the end of the last year. The system processed 50 pc more messages than in the previous year.

In 1983, the number of **leased circuits** on trunk routes for data transmission increased by 16.2 pc; 85 pc of all the fixed connections had their origin in Switzerland. At the same time, the number of data terminals increased by 17.8 pc in the switched telephone network, by 27.3 pc in the leased circuits and the total number of terminals reached 29,567. 65 pc of the **modems** were employed in the leased circuits.

At the end of 1983, 135 terminals were in operation with **Euronet** and 171 terminals with **Telepac** (national packet switching network) in Switzerland.

## Radio, Television

Since 2 January 1984, a **French TV programme «TV 5»**, has been in operation on an experimental basis, broadcasting daily between 19.00 to 22.00 hours, for community distribution over **Eutelsat ECS-F1** telecommunications satellite. The programme is produced without commercials by the French, Belgian and Swiss television agencies.

**Radio receiver licenses** rose to 368 (1982: 363) and **television receiver licenses** to 324 (1982: 320) per 1,000 inhabitants at the end of the last year.

At the end of 1983, there were 7,208 subscribers in the **national car telephone system**. At the same time, there were 8,987 terminals (almost maximum capacity) for **car radio paging system** which is a one-way selective call service enabling drivers to be reached over the public telephone network.

## Miscellaneous

In 1983, Swiss PTT ordered **telecommunication equipment** worth around 1,380 million francs, which is about 200 million francs less than in 1982.