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## **Electronic switching for telephony**

by A.E. Bachmann

**Summary.** After a short survey of the present stage of development of automatic telephony in Switzerland the requirements to be met by new switching systems are specified. Reference is made to the first practical realizations abroad and to the emerging field of purely digital switching and transmission techniques, which take full advantage of microelectronics in the form of integrated semiconductor circuits. Finally, the impact of the new techniques on the Swiss PTT and the supplying industry is described.

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## **Introduction of electronics into automatic telephone switching**

by H. Briner

**Summary.** Electronic components and circuits are increasingly being used in automatic switching. They are introduced by stages, as dictated by technical and economic requirements. This development is demonstrated by some examples. Its impact on the work methods and the equipment of the automatic telephone laboratory is described.

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## **Aerials with non-parabolic reflectors**

by W. E. Debrunner

**Summary.** After a short introduction the general theory of geometric optics for reflectors of any shape is explained and illustrated by an example. The needed transformations of practical primary source patterns to optimal aperture illuminations are determined. The evaluation of the characteristics of these transformations shows that a system of non-parabolic reflectors capable of further extension exists and can be used with advantage.

To p. 228...231

## **Standardization and multiple use of PTT microwave antennas**

by R. Wilhelm

**Summary.** Antenna units in the Swiss PTT radio link network account for about 20 per cent of the total system installation cost. It seemed worthwhile therefore to standardize the antenna equipment now being in use. A further reduction of costs has been achieved through the use of

existing antennas in different frequency bands. At the same time, considerable savings resulted at station sites where space is at a premium, and also in view of further extensions of the system.

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## **The Swiss national motorcar paging network**

by E. Wey

**Summary.** The article describes the layout and technical planning of the Swiss national motorcar paging network. After an introduction, details of the different parts of the network – calling centre, modulation line, transmitters, receivers – are given. The article also contains information on the major systems and their range, the limit up to which they can be extended and the reliability of calls. The number of subscribers can be seen from a small statistical table appearing at the end.

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## **Load measurements on carrier frequency telephone systems**

by G. Fontanellaz, H.-K. Pfyffer and H. Emmenegger

**Summary.** An apparatus permitting the measurement of the load conditions of carrier frequency telephone systems is described. By way of illustration the measuring results in regard of the system load of a secondary group are compared with the recommendations of the CCITT.

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## **Measuring methods and equipment used in the testing of data transmission systems**

by G. Fontanellaz and J.-J. Jaquier

**Summary.** The study of data transmission systems requires measuring methods and testing equipment other than those employed for conventional telephony. The article describes the testing installation used at present by the Research and Testing Division of the PTT, specifying the criteria which have decided the choice of the equipment. The tests have been automatized as far as possible in order to rationalize the work of the experimenters. For the objective study of the transmission equipment a number of simulators are being used which enable transmission conditions similar to those found on actual telephone lines to be reconstituted in the

laboratory, in a clearly defined and reproducible way. Several measuring instruments and simulators have been specially designed for the testing installation described in the article.

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## **New telephone station**

by E. Seemann

**Summary.** Although the currently used PTT telephone station, model 1950, has comparatively good transmission properties, it does no longer meet the requirements of efficient production. Recent technological progress makes it possible for the station to be improved considerably. More particularly, the replacement of the granular carbon microphone by a more stable converter is envisaged, while an automatic attenuation equalizer operating as function of the supply current will create more evenly balanced level conditions.

To p. 257...258

## **The colour slide as a means of testing colour television systems and receiving sets**

by K. Bernath

**Summary.** In connection with the efforts undertaken in Europe to standardize colour television systems, the standard colour slide has proved to be the most important aid for the comparison of the systems. Besides the American NTSC test picture series, which has proved its worth but has been unavailable for quite a long time, a standard slide series of the Swiss PTT is being widely used in Europe. The development of this picture series is briefly outlined. The last section of the article gives examples illustrating the use of the device.

To p. 259...260

## **Measuring of impulsive and quasi-impulsive interferences on television reception with the CISPR measuring set**

by J. Meyer de Stadelhofen

**Summary.** The quality of television pictures which are impaired through impulsive and quasi impulsive interferences depends not only on the signal to noise ratio at the input of the receiver but also on the absolute value of the wanted signal. Statistical analysis showed that the weighting of the CISPR measuring set No 2 is

correct for the situation of prime interest, i.e. where the wanted signal is just sufficient to produce a picture with about no white noise and where simultaneously the interference is well perceptible but not objectionable.

To p. 261...263

**A simple method of measuring signal interspersions in television receiving sets**

by H. Brand

**Summary.** Leading ghosts often appear on the screen of a TV-receiver in the vicinity of powerful television transmitters. They are caused by direct radiation upon installation components and receivers. The greater part of these injected signals is due to the inadequacies of the symmetrical receiver input and the connecting cable, which are partly unshielded and permit the pick up of waves travelling on the surface of the screen. The article describes a simple method of measuring these effects. From the measurements undertaken it would appear that, given a neat coaxial technique, an improvement of about 30 dB could be achieved.

To p. 264...268

**Are stray alternating currents a corrosion hazard?**

by K. Vögtli

**Summary.** Two aspects of the problem of alternating current corrosion are given special emphasis: firstly the fact that stray currents from a.c. plants are of frequent occurrence and are very difficult and costly to suppress completely; secondly the old controversy as to whether stray alternating currents do cause corrosion at all. Our own experiments corroborate practical

experience, according to which alternating currents represent a corrosion hazard for cables buried in the ground in exceptional cases only.

To p. 269...275

**Holes burnt into lead covered cables by lightning**

by H. Meister and W. Utz

**Summary.** The holes burnt through the lead sheaths of unarmoured cables at the points where lightning has struck are not caused by high surge currents, but by comparatively weak currents of longer duration such as often occur in the wake of surge currents. Tests have shown that lead covered cables with thermoplast sheath are far more exposed to lightning hazards than cables with sheaths on a paper-bitumen-jute basis.

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**Determination of the optimum float voltage of tubular batteries**

by Th. Gerber

**Summary.** The tests concern stationary tubular batteries having been in float operation under uniform external conditions at constant element voltages of 2.15...2.40 V for five years. The optimum voltage is determined by the analysis of the behaviour of the float currents with regard to time. It appears that at this voltage no full discharges are necessary to maintain capacity constantly at its maximum value.

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**Conductors with high bending fatigue strength for operators' telephone sets**

by W. Fierz

**Summary.** The bending fatigue strength of cables or single conductors is largely

dependent on the construction of the conductors and on the copper alloy used. The article describes bending fatigue tests on line cords of operators' telephone sets. It is shown that the texture of the wires and the copper alloy used have a decisive influence on the resistivity against continuous bending stresses.

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**Simulation of vehicle vibrations on a vibration tester**

by P.M. Wiedmer

**Summary.** Through experiments the approximate behaviour of vibrations in a cross-country laboratory-van on roads of varying standard has been established. These motions can be simulated on a vibrator with narrow band noise and without frequency scanning, whereby a very simple vibration test for mobile equipment is obtained.

To p. 286...288

**Postal Regulations (Postordnung A1); modification of the provisions governing the mailing of dangerous substances**

by M. Wüthrich

**Summary.** First, the reasons which have given rise to a modification of the current prescriptions are stated. Then the general principles of the Post Office Act, and the newly revised Order of Implementation are explained. The bulk of the article is formed by comments on the recently revised Detailed Regulations, the main emphasis being on the regrouping of dangerous substances and on articles admitted under certain conditions only.