TRANSMISSION NEWS

Ericsson LM

No 14 July 1977

FOR THE FIRST TIME?

8 Mb/s PCM on paper-insulated pair-cable

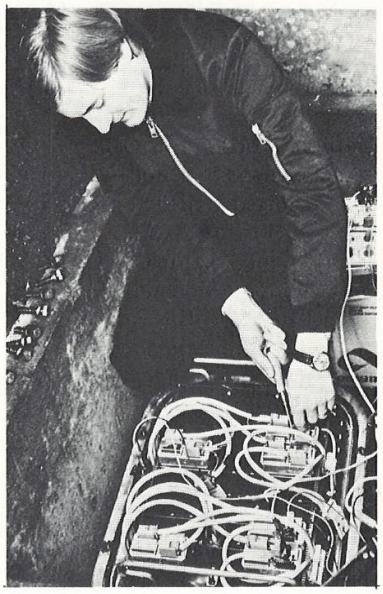
On the 1st of June this year two 8 Mb/s PCM systems were put into service on the island of Fyn in Denmark.

The systems are installed along an existing route connecting Svendborg – Ringe – Odense. Fifteen dependent repeater stations in the M5 mechanical design have been put into operation.

A number of 48 channel FDM systems have been in operation on this cable, an old 1.2 mm pair-cable, for a long time. These FDM systems are still in operation even after the PCM installation, and without any measurable degradation of their performance.

The contract for delivery of the 8 Mb/s-equipment was signed last year with FKT in Denmark (see Transmission News No 12, 1976).

FKT = Fyns Kommunale Telefonselskab



One of the dependent repeater stations between Svendborg and Odense during installation.

LM ERICSSON – FATME INTRODUCES 60 MHz COAXIAL LINE EQUIPMENT – trial route in Italy –

A field trial for the Ericsson Group's latest member of the new generation of transistorized coaxial line systems, ZAX 10,800, has just been completed in Italy. The trial route was a joint venture between L M Ericsson in Sweden and its subsidiary FATME in Italy.

The capacity of the new system is 10,800 channels. It is designed for use on normal-gauge coaxial cable (2.6/9.5 mm) with a nominal repeater spacing of 1.55 km.

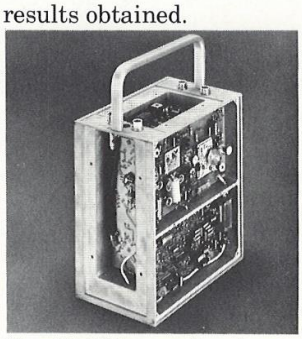
The equipment for the trial route consisted of terminal equipment and ten repeaters. Installations commenced in February this year and measurements have been carried out continuously from March until June.

The 60 MHz terminal equipment is engineered in FATME's version N1 of the M4 construction practice, i.e. the bay dimensions are 2600 × 600 × 225 mm. The 2-way intermediate repeaters are housed in the same type of dye-cast aluminium box as used for 12 and 4 MHz repeaters.

The 60 MHz repeaters are remote power fed by a constant DC-current of 280 mA and a maximum voltage of 1200 V, allowing a distance up to 150 km between power feeding stations. The "electrical" length of the trial route was 32 km as the line was looped in the 10th repeater station.

Results of the measurements show that applicable CCITT recommendations were met with ample margin. As examples can be mentioned that the noise in the worst channel was less than 1.5 pW/km, the near-end cross-talk attenuation (NEXT) was more than 95 dB and, furthermore, the induced hum was very low. The level deviations within the entire frequency band were as low as ±0.5 dB after only fixed equalization.

At the end of the trial period the Italian Telephone Administration, ASST, also made a series of measurements and confirmed the results obtained.



The 60 MHz repeater shown without covers.

FDM MULTIPLEX AND RADIO LINK EQUIPMENT TO THE CARIBBEAN

LM Ericsson has received a $0.8 million (Skr 3.4 million) order from Telefoondienst Eilandgebiet, Curacao.

The equipment ordered is for the large expansion of Curacao's telecommunications network currently taking place. 120- and 960-channel multiplex equipment will be installed for two radio links delivered from NERA.

The equipment will be put into operation during 1977.

MORE TWO-WIRE COAXIAL LINE EQUIPMENT TO ALGERIA

LM Ericsson has received an additional order from the Algerian PTT for two-wire coaxial line equipment. The order includes installation of two-wire coaxial line equipment as well as multiplex equipment for two routes with a value of about $0.9 million (Skr 4 million).

One route will have a 480-channel system, ZAX 480T, on a single-tube coaxial cable for overhead installation. The 50 km route will go between Mostaganem and Sidi-Ali. The other route, connecting Mostaganem with Bougirat has a length of 20 km, and will transmit 120 channels using ZAC 120 T on existing pair cables.

The delivery, which will take place at the turn of the year 77/78, also includes training equipment for ZAX 120 T which will be installed in the university at Oran.



Stretching of the coaxial cable for ZAX 120 T outside Mascara in Algeria. The installations were completed in the beginning of 1976.

VF signalling equipment to Turkey

LM Ericsson has received an order from the Turkish PTT for VF signalling equipment. The equipment has a value of ca $114.000 (Skr 0.5 million) and the equipment is to be delivered during the first half of 1978.

$ 2 million order from Jordan

LM Ericsson has signed a contract with the Royal Jordanian Air Force for delivery of transmission equipment and cable for a total value of $2.3 (Skr 10 million).

The equipment ordered includes coaxial line systems ZAX 120 T and 480 T as well as multiplex equipment for 120 and 480 channels.

Delivery will begin during 1977 and be completed in the middle of 1978.

ZAX 120 T to West Germany

A contract has been signed with Überlandwerk Unterfranken Elektrizitätswerk for delivery of a two-wire coaxial line system, ZAX 120 T. The system will be installed between Würzburg and Frankenwarte, a distance of 4.5 km. A terminal station is also included in the order.

$ 0.9 million order from USA

LM Ericsson has signed a $0.9 million contract (Skr 4 million) with USTS, a specialized common carrier company in the USA, for delivery of FDM multiplex equipment.

Two years ago LM Ericsson signed a $5 million (Skr 22.1 million) contract with USTS for FDM multiplex equipment to be used on their route New York – Houston. The capacity of this route will now be enlarged by the equipment now ordered.
Delivery is to take place during the second half of 1977.

USTS = United States Transmission System

FOR THE SECOND TIME –

PCM symposium in Stockholm

For the second time* the Transmission Division gathered representatives from the Nordic telecommunications administrations for a PCM-symposium in Stockholm. Almost 100 specialists from Denmark, Finland, Iceland, Norway and Sweden took part in the symposium during May 3rd to 5th.

The program for the three days was comprehensive, but allowed nevertheless vivid discussions. Unfortunately only a few of the lectures and contributions can be mentioned here.

Mr. A. Waldorrf, Denmark, opened the symposium with a contribution about some philosophies concerning a future IST-network (Integrated Switching and Transmission). Mr. S. Uitti, Finland, described in his turn the future plans for introduction of PCM in a regional telephone network in Finland. Mr L. Kindahl, Sweden, continued by talking about PCM in the subscriber and local networks. After this an animated debate followed concerning which new services a digitalisation of the local network will offer the subscribers. Several of the representatives for the Nordic telecommunications administrations agreed on the subscribers uncertainty concerning which new services they really wanted. According to Mr. M. Grönberg, Sweden, economical factors must be the motive for a digitalisation of the local network, not new services.

Digital sound program transmission

Mr. K Rønning, Norway, presented Norway's plans for introducing digital sound program transmission. After this, Mr. G. Pettersson, LM Ericsson, described the digital sound program transmission equipment being developed by the Transmission Division.



The delegates during the symposium.

Low-capacity PCM system

Mr. A. Olsson, Sweden, talked about the prerequisites for low-capacity PCM and Mr. W. Widl, LM Ericsson, introduced in his turn a digital low-capacity system to an interested audience. A Nordic standardisation of such a system was discussed. Ten channels appeared to be a convenient system capacity for all the countries except for Denmark – due to its special network structure.

Flexible alarm philosophy

Mr. H. Hamacher, LM Ericsson, presented the Transmission Division's flexible-alarm philosophy. In the following discussion Mr. H. Brœin, Norway, said that standardized routines for point-to-point connections now exist, and that larger digital networks will soon be available. This means that the telecommunications administrations now are starting to realize that they should have thought more about alarm philosophy. He even gave the manufacturers credit for having thought "...further ahead than both we and CCITT."

Overvoltage protectors

Mrs. T. Mathisen, Norway, talked in her lecture about experiences with overvoltage protectors on 1st order digital line equipment. She reported the very comprehensive experiments and follow-ups that had been carried out in Norway. In the discussion afterwards it turned out that these experiments have formed a valuable contribution to the development of repeaters which can withstand lightning. At LM Ericsson, for instance, such construction changes have been made so that the repeaters designed according to the Norwegian specifications now are a lot more resistant against lightning.

"Mini" container for PCM

Mr. Ö. Mattsson, LM Ericsson, introduced a "mini" PCM container. The new container houses two 2 Mb/s repeaters connected to the stub cable by a plug- and jack connection. The "mini" container, which is made of stainless steel, is mainly designed for location in tunnels, or mounting on a pole. Direct burial in the earth is possible if certain measures are taken.

Mr. H. Axelsen, Denmark, talked about special cables for 8 Mb/s PCM and Mr. S.O. Edvardsen, also Denmark, told the audience about the Fyn's telephone administration's experience of 8 Mb/s PCM on existing paper-insulated pair-cables, see also separate article, p. 1.



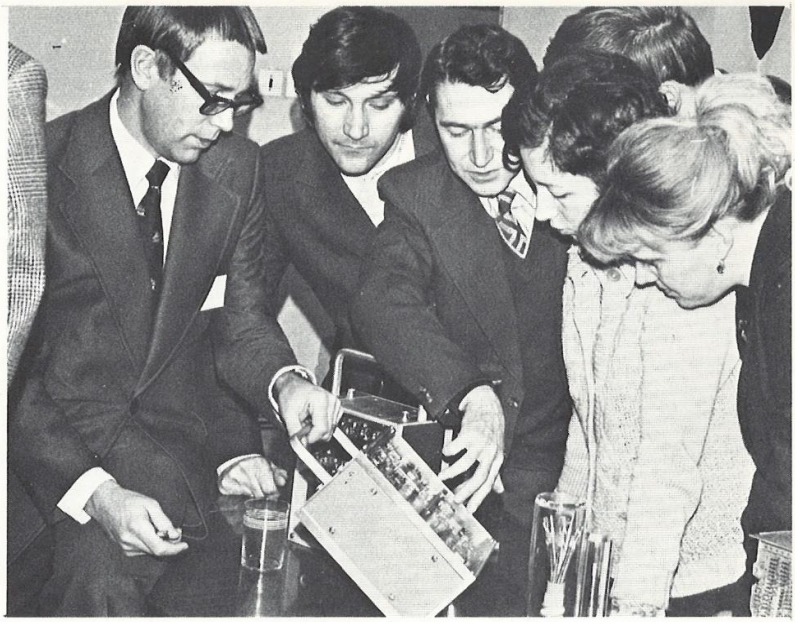
Some of the delegates discussing the small PCM container.

As the conclusion of the symposium, Mr. U. Johansson, LM Ericsson, accounted for an investigation concerning the economy in digital optical-fiber systems in comparison with conventional transmission systems.

* **The first symposium was in Södertälje during 10th to 12th September 1975.**

Symposium in Moscow...

LM Ericsson's 60 MHz terminal and line equipment was presented in the USSR at a symposium in Moscow January the 18th and 19th. Almost 100 delegates from different institutions and organizations at the Telecommunications Ministry in the USSR attended the symposium which also included a series of lectures on LM Ericsson's two- and four-wire line systems as well as FDM and PCM equipment in the M5 mechanical design. Some of the systems were shown at an exhibition in connection with the symposium. A few months later L M Ericsson also participated in the exhibition Swijaz -77 where the product program was shown in more detail.



A demonstration at the symposium

...in Alger

A symposium on PCM was held in Alger on the 23rd of February in conjunction with the putting into operation of a test route for PCM in Algeria. A group of specialists from the Transmission Division presented the 30-channel PCM system on pair cable for some 30 delegates from the Algerian PTT.

Coaxial Line Entrance System ZAX 2700 enters the North American Market

Among L M Ericsson's telecommunications equipments is a full range of coaxial line entrance systems, available with special combinations and designs suitable for almost any traffic management. Saskatchewan Telephone Company in Canada and United Inter-Mountain Telephone Company in USA, have now ordered their first coaxial line entrance systems ZAX 2700. Three such systems will be delivered to each company.

The installations will be carried out by L M Ericsson during 1977.

2 Mb/s PCM installed in Malaysia

A 25 km trial-route for PCM was in 1976 installed at the island Penang in Malaysia. The route is equipped with one 2 Mb/s PCM-system using partly existing overhead-cable, see the picture to the right, partly existing conduct cable. To manage an earlier step-by-step system signal-matching was performed on site.

Since September last year the route is in service.



Installation of overhead-cable.

Orders from Argentina

L M Ericsson has received an order from ENTEL in Argentina for some 50 echo suppressors. The equipment will be installed in the middle of 1977 in a station outside Buenos Aires. This station serves for international satellite communications.

From Argentina LM Ericsson has also received an order for two two-wire systems (ZAX 120 T) and multiplex equipment with a total value of $0.3 million (Skr 1.3 million).

Delivery will be during 1978.

ENTEL = Empresa Nacional de Telecomunicaciones

Telefonaktiebolaget LM Ericsson
TRANSMISSION DIVISION, S-126 25 STOCKHOLM, Sweden