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Optical main distributor

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None

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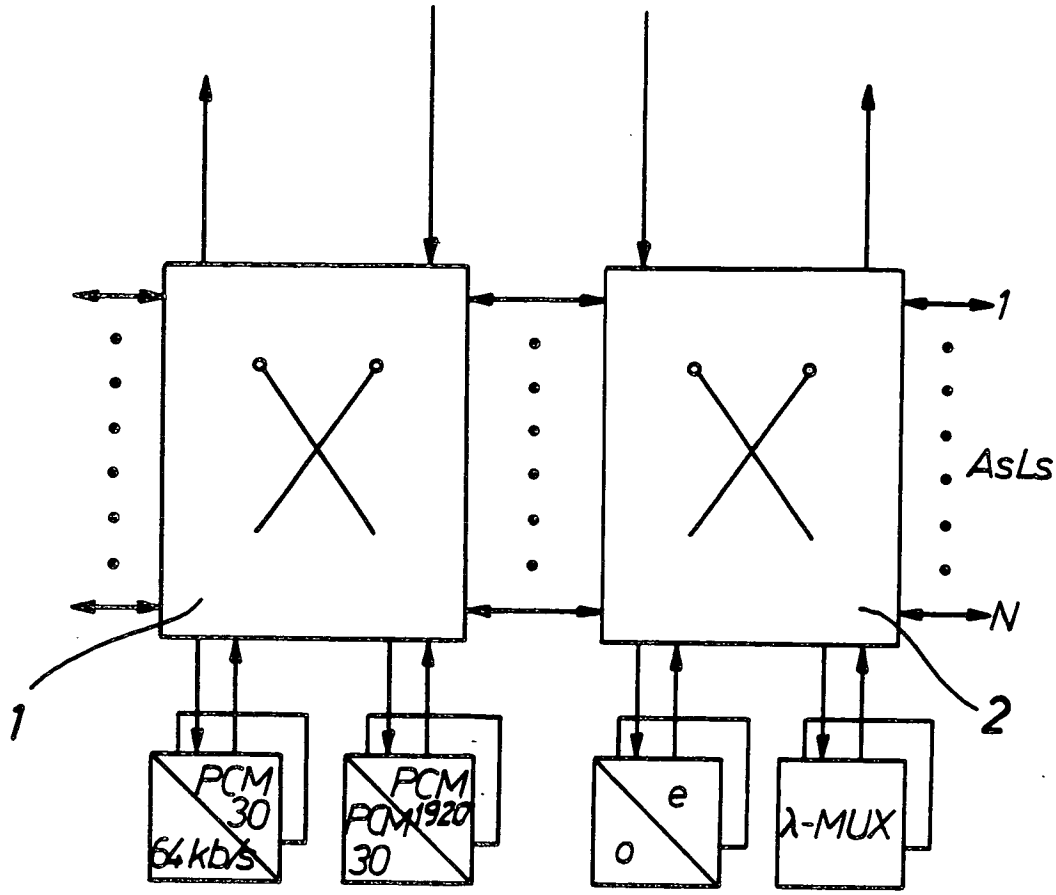

Fig.1

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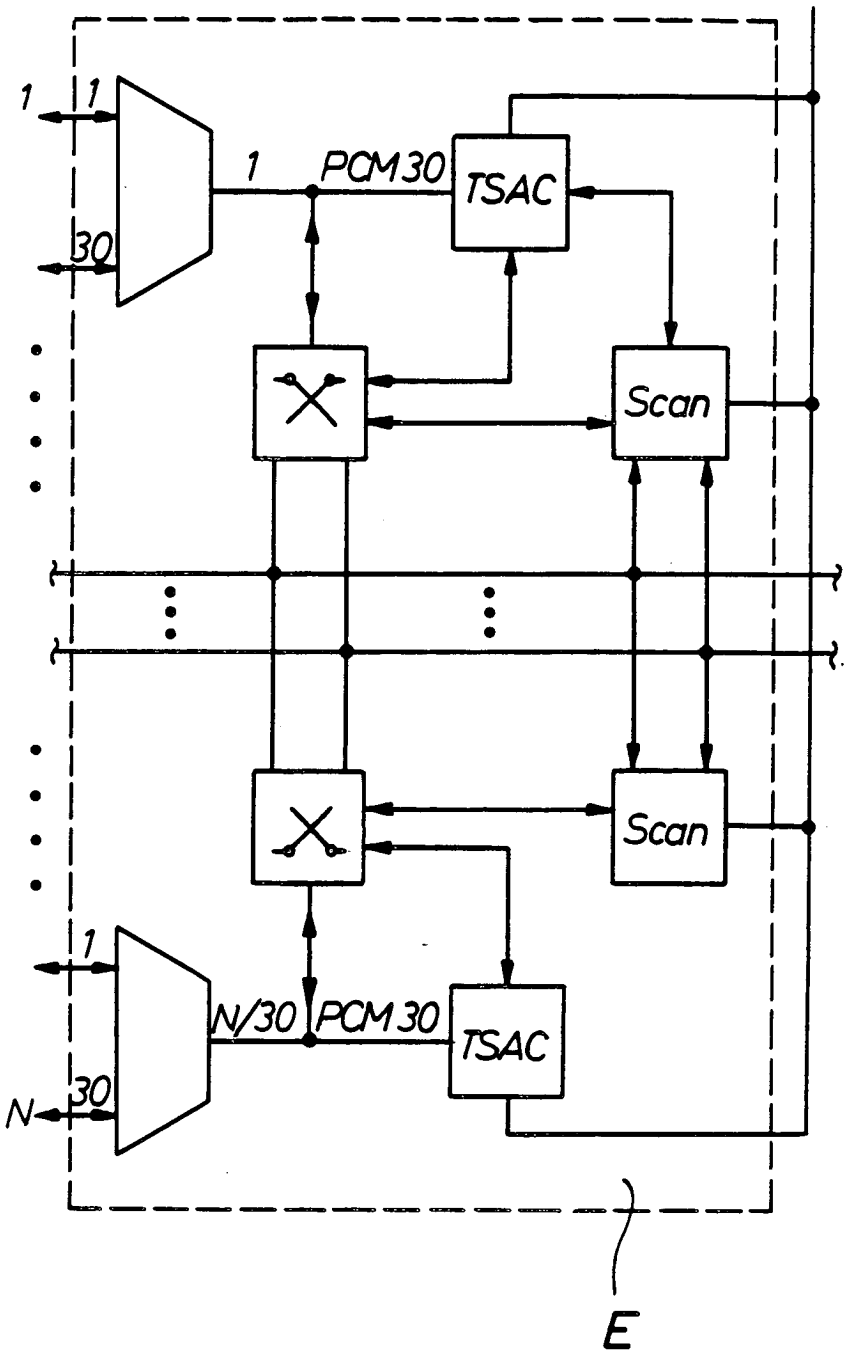

Fig. 2

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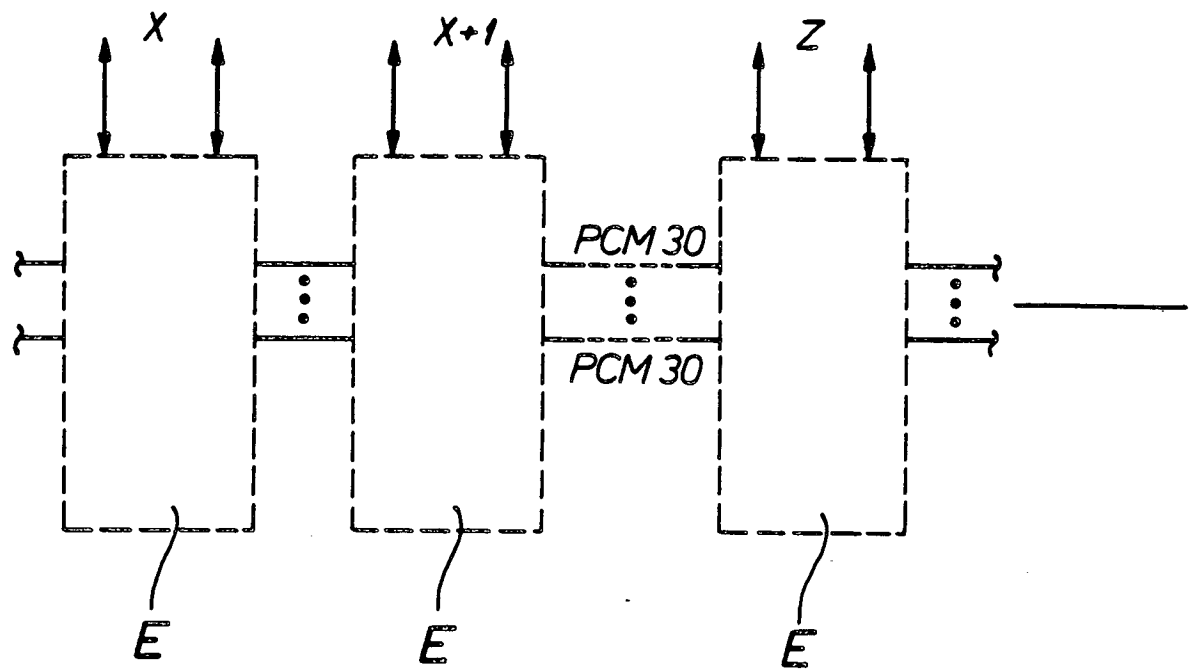

Fig.3

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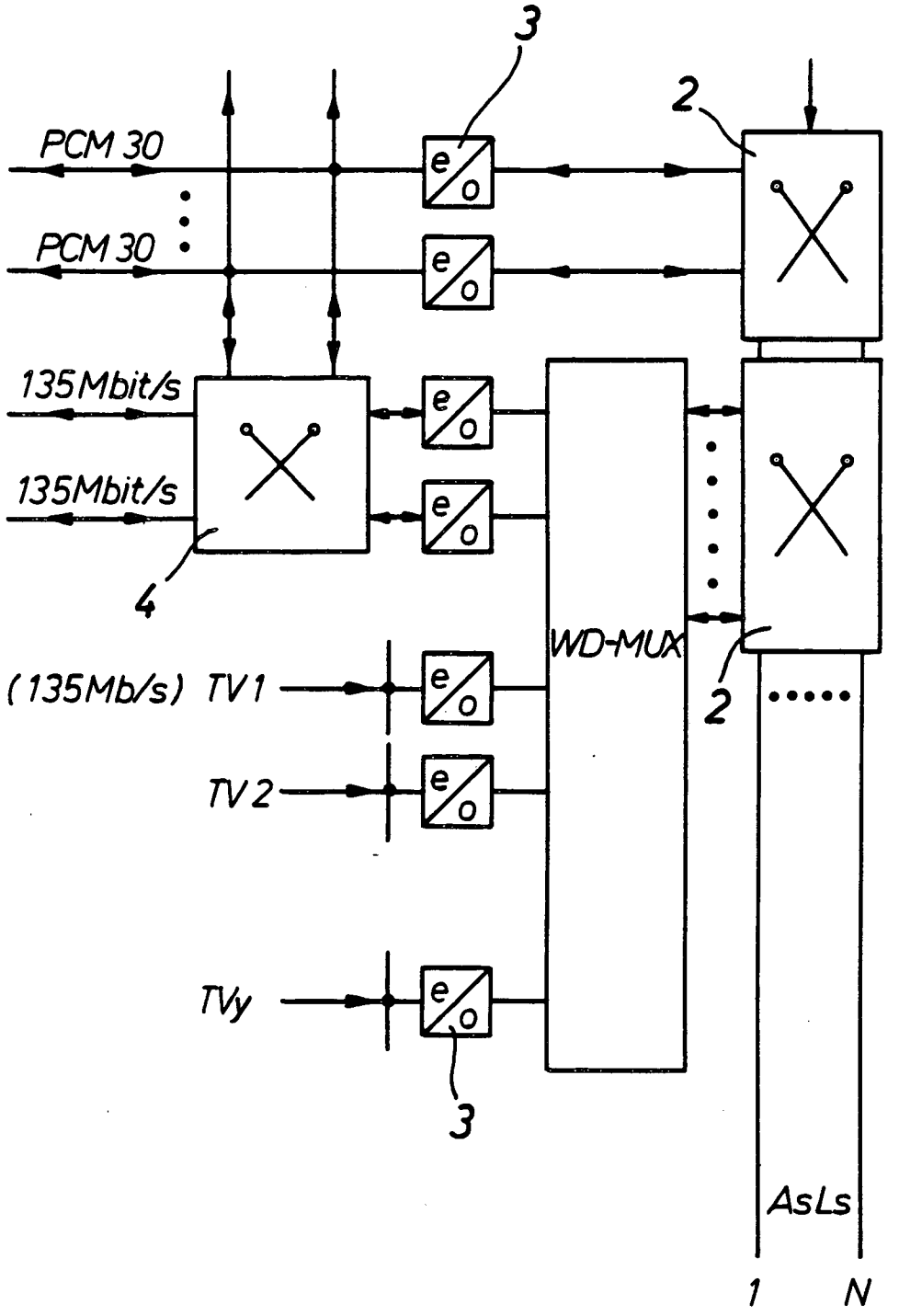

Fig.4

Optical main distributor

The invention relates to an optical main distributor according to the preamble of the claim 1.

At present there are no practicable solutions to join information streams of different services on an optical subscriber line.

The solutions which are presently known consider in the main distributor only metallic conductors and include only mechanic jumpers which are allocated in a fixed manner. Therefore the main distributors which are presently known are largely extended because they include a large amount of components which are allocated to the subscriber.

It is an object of the invention to provide an optical main distributor which includes only a few elements being allocated to the subscriber. Thereby the components in the main distributor are largely reduced according to the invention.

The above object is solved by the measures which are cited in the characterising clause of the claim 1.

The subclaims include further advantageous embodiments of each of the measures.

One of the embodiments is described by means of the figure.

Fig. 1 shows the basic construction of the optical main distributor;

Fig. 2 shows a coupling means;

Fig. 3 shows a sequential coupling means;
and

Fig. 4 shows the integration of narrow band and wide band services.

The optical main distributor which is shown in fig. 1 consists of two switching matrix networks 1 and 2.

Thereby the electric switching matrix 1 includes multiplexing means allocating a 64 kbit/s-channel to a PCM 30-system (pulse coded multi channel system including 30 channels) and, if additional wide band dialogue services are required, allocating a PCM 30-system to a PCM 1920-system within the time duration of a communication. A second optical switching network 2 which is connected after the first switching network controls a plurality of opto-electrical converters o/e as well as lambda-multiplexing means λ-MUX in the same manner. Thereby a lambda-multiplexing means is a device which distributes information on optical communication lines which are operated with different optical wavelengths. The sequentially coupled switching matrix networks operate on all optical terminal lines Asls as well as on the terminals of the different wide band and narrow band switching systems of each of the subscribers in the different switching stations.

The elements of the electrical and optical switching matrix networks 1 and 2 can be regarded to be available for the connection set-up procedure which can be allocated to the connection within the time duration of a communication by a computer and a marking control instruction, i.e. almost all elements of the optical main distributor are available independent of the subscriber and are not allocated to the subscriber as in present main distributors; the allocation is effected by a computer. Therefore jumpers no longer need to be re-arranged.

As it is shown in fig. 2 all offering trunk groups of a narrow band switching station X which are supposed to be in space-division multiplex are joined together in PCM 30-systems. By this measure the line numbers are reduced by the factor 30 and the information streams are handled within the time range which facilitates the employment of large scale integrated circuits.

For the outbound traffic a time slot detector (TSAC) and a scanner which is allocated to each of the PCM 30-systems detect which time slots of the PCM 30-system can be reserved. The TSAC time slot detector and the scanner are used for the inbound traffic to trace requests. The time slot detector TSAC provides the re-transmission of the contents of the reserved time slots from one switching matrix network from or to a serving trunk.

There are two operational principles:

a) For one incoming request of a subscriber a PCM 30-system is reserved in which all further service requests are established in a defined manner, or

b) individual time slots are reserved on the serving trunk with optional reservation.

Both methods, however, require an identification word (not shown) accompanying the information within the duration of the communication. Thereby the method b) is advantageous because a high usage factor of the serving trunk is achieved. However, there can arise complications in the successive switching means which loop in the wide band services.

Fig. 3 shows that the coupling means being provided for a narrow band service can be connected serially to further coupling means E. Thereby it is possible to integrate in one PCM 30-system the informations of a plurality of narrow band switching stations.

The reservation of a PCM 30-system or of parts thereof during a communication is advantageous in that there exist at the end of the serving trunk information streams which are clearly assigned to a subscriber.

As it is shown in fig. 4 the information streams for the integration of wide band and narrow band services (BB- and SB-services) are supplied to electro-optical converters 3 so that the optical signals which are provided by the converters 3 can be supplied to an optical switching network 2 and afterwards to the terminal lines Asls the information streams are assigned to. One path in the switching network remains connected through during the communication so that also low speed elements can be used. The opto-electrical elements in this branch also serve to detect requests from the subscriber terminal lines Asls.

By integrating a plurality of dialogue services the narrow band signals of the PCM 30-systems can be mixed with wide band dialogue signals (e.g. video telephone). Thereby an information stream according to PCM 1920 is generated. This information stream can be supplied if

necessary together with further TV information to a wavelength multiplexing device set WD-MUX which is also not allocated to a subscriber. If a corresponding multiplicity of wavelength is used in this wavelength multiplexing device set WD-MUX a TV switching system is dispensible in the future.

It is necessary to allocate the wavelength multiplex because of its general employment temporarily to each of the subscriber terminal lines in the successive optical switching network 2. Therefore elements are necessary which remain switched through during the communication time.

The invention is further advantageous in that the mechanic connections between all elements no longer are to be moved so that predetermined damping conditions can be provided especially for the optical range. Thereby it is remarkable that an extension in the direction of a network with integrated services is possible without problems and that the operation of narrow band and wide band subscribers in parallel is saved in each case. The mechanical re-arranging of subscriber terminal lines as it is presently known can be fully avoided (this is also true for defective devices) also if the optical switching networks are extended with reserve fibres.

Claims

1. An optical main distributor which provides a junction between the local lines which join together from all directions of a local network communication switching means,
c h a r a c t e r i s e d i n t h a t
the optical main distributor comprises

an electrical switching network (1) allocating multiplexing means including 64 kbit/s-channels to a PCM 30-system and allocating a PCM 30-system to a PCM 1920-system for the duration of a connection, and

a second optical switching network (2) being connected in succession and controlling a plurality of opto-electrical converters (o/e) as well as a plurality of lambda-multiplexing means (λ-MUX) which are also allocated to a connection for the duration of a communication, whereby

a sequential switching of the switching networks (1, 2) is used to connect the optical terminal lines (Asls) with the terminals of different wide band- and narrow band exchange systems (BB, SB).

2. An optical main distributor according to claim 1, characterised in that
the elements of the electrical (1) and optical (2) switching networks are allocated to the connection during a communication by a marking control instruction of a computer.

3. An optical main distributor according to claim 1, characterised in that
each of the narrow band reservations are joined together in PCM 30-systems within a coupling means (E), the coupling means including

time slot detecting circuits (TSAC) being assigned to each of the PCM 30-systems and detecting the reserved time slots of the PCM 30-systems, and

scanning means (Scan) for detecting free serving lines on the serving trunk.

4. An optical main distributor according to claims 1 to 3, characterised in that
a plurality of coupling means (E) are serially connected.

5. An optical main distributor according to claim 1, characterised in that
electro-optical converters (3) are arranged in advance of the optical switching network (2) and converting the information streams (narrow band- and wide band dialogue services) from electrical to optical signals.

6. An optical main distributor according to claims 1 and 5, characterised in that
a wavelength multiplexing device set (WD-MUX) is arranged before the optical switching network (2) being supplied by information streams according to PCM 1920 which consist of TV-information.

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Optical main distributor

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