IEEE P802.11

EXIRLAN - a multichannel, high speed, medium range IR-Local Area Network

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The basic idea

EXIRLAN is the Physical Layer of an **EX**pandable **I**nfra**R**ed **L**ocal **A**rea **N**etwork.
It covers the following requirements of a future oriented IR-PHY-layer:

* it should be able to coexist with other IR communication devices in the same room
* to avoid a limitation of the possible number of terminals, segmentation of the total room into subareas with one network server per subareas is required.
* transmission speed must compromise between achievable data rate and available bandwidth
* to allow medium range transmission distances (i.e. 30..80 meters) at acceptable cost and energy consumption, low-cost /high efficiency IR-emitters have to be used.

Implementation

EXIRLAN uses narrow-band technique with 8 different carriers. The 8 communication channels occupy the high end of the available bandwidth; in the demodulator, the modulated signal is mixed down to 0 MHz and demodulated in the baseband.
The low end of the total bandwidth is reserved for lowest cost, non carriered baseband transmission at reduced data rate; as in this band also most IR-devices can communicate that do not follow the EXIRLAN-standard, this band is refered to as "Coexistence Band".
To achieve maximum possible transmission speed for the narrow band channels, QPSK-modulation is being used; similar techniques such as FQPSK and derivatives are considered if suited IC's are available.
For the Coexistence Band, non-carriered pulse phase modulation (PPM) is being used.

Target specification

Number of bands: 8 narrow band channels, 1 baseband channel

Narrow-band channels:

*	Centre frequencies (SW selectable)	24.....10 MHz
*	Bandwidth/channel	2 MHz
*	Data transmission speed	1Mbit/s
*	Modulation	QPSK
		(change to FQPSK under consideration)

Coexistence Channel:

*	Frequency range	0,6.....5 MHz
*	Data transmission speed	19,2 or 115,2 Kbit/s(selectable)
*	Modulation	PPM
*	Pulse width	200 ns

General

IR emitting diodes

Cut-off frequency	30 MHz
Price/diode at medium quantities	0,40 US$

Communication distance 30..80 meters

HW-implementation: Mix of standard, semicustom and full custom IC's

Status of development

* Definition - and experimental- phase
* Undependently on the IEEE activities a consortium of semiconductor munufacturers and equipment manufacturers is being founded (additional members welcome).
* Fully functional HW available in Q2'94

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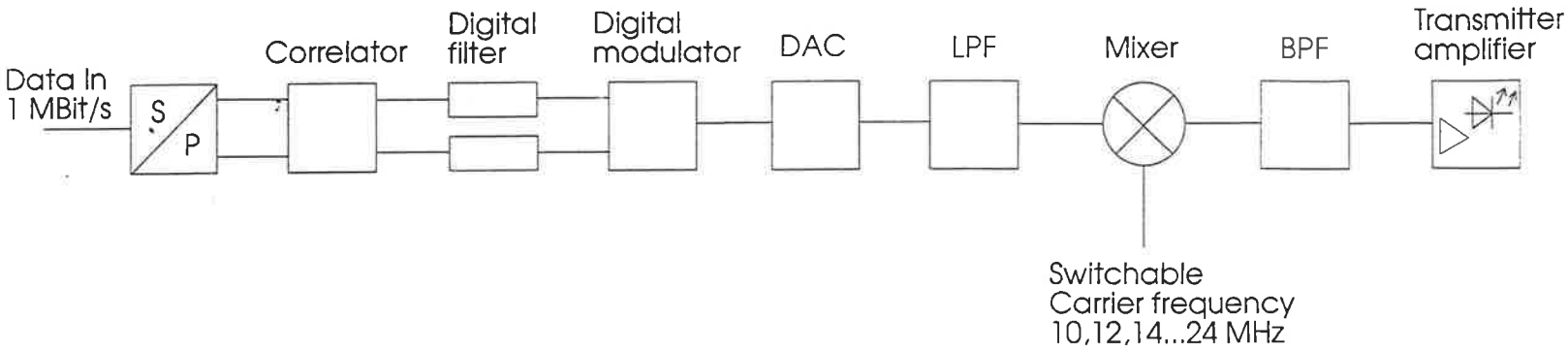
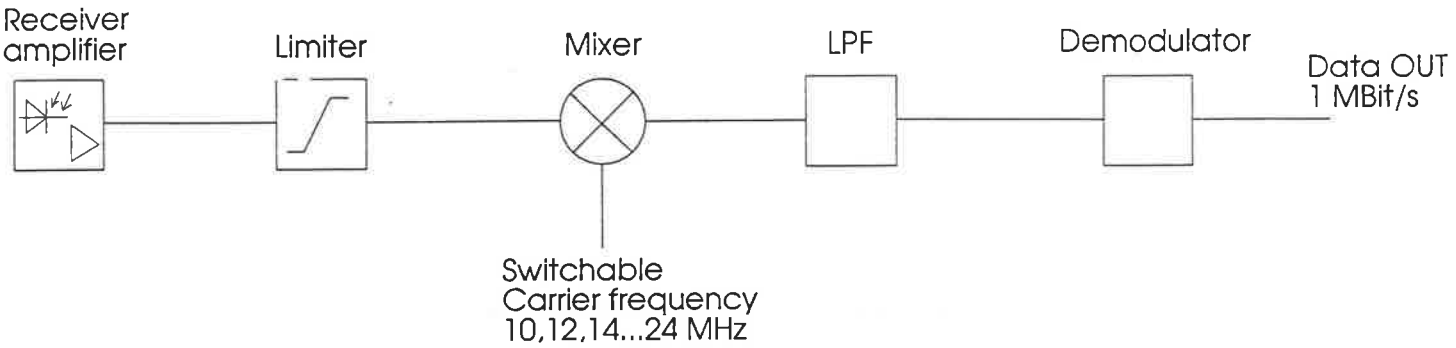
Transmitter:



Receiver:



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Frequency Scheme