

# **Bilder**

aus

## **Grundlagen der digitalen Kommunikationstechnik**

**Übertragungstechnik – Signalverarbeitung – Netze**

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### **Hinweis:**

**Die Verwendung der Bilder ist für den eigenen Bedarf unter Angabe der Quelle erlaubt. Eine kommerzielle Verbreitung ist nicht statthaft.**

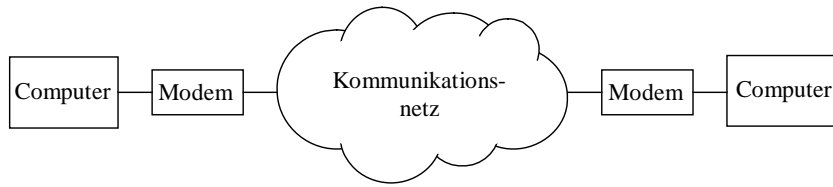


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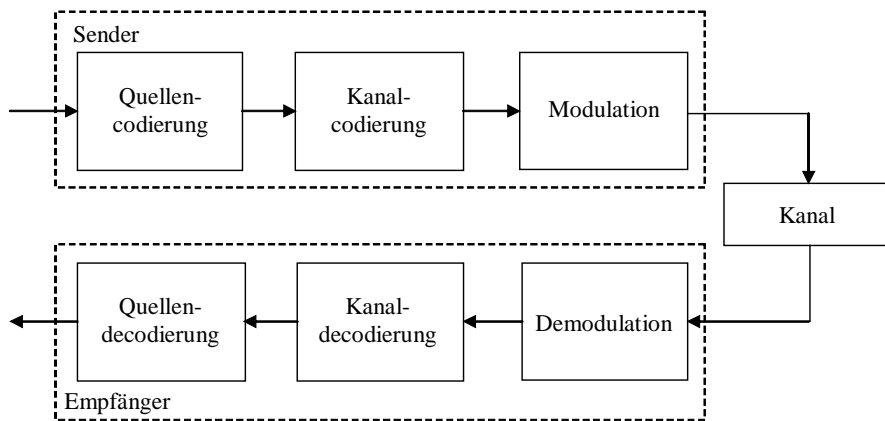


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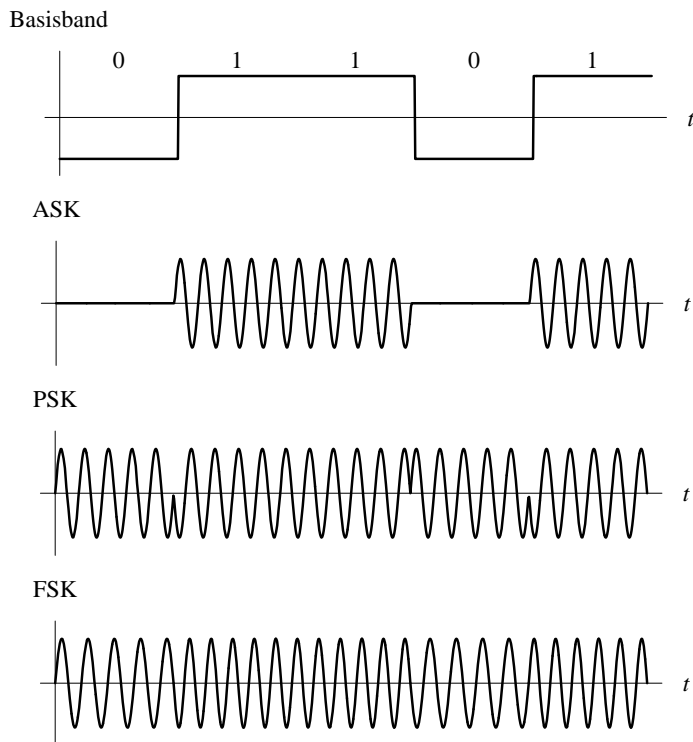


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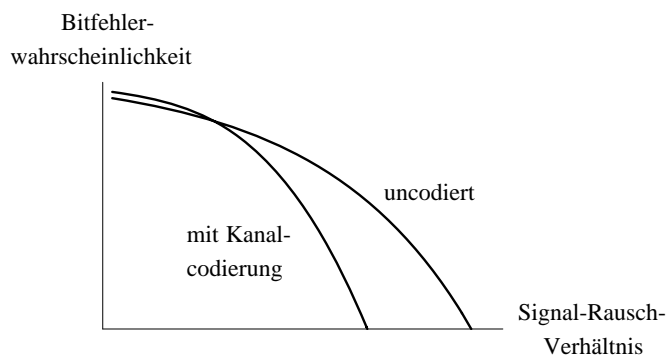


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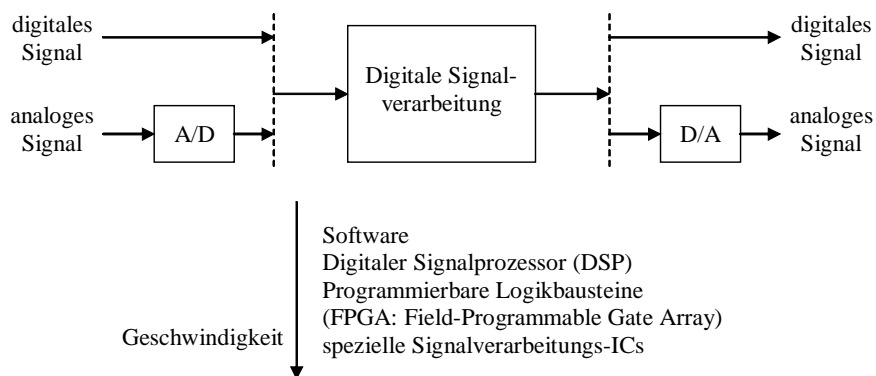


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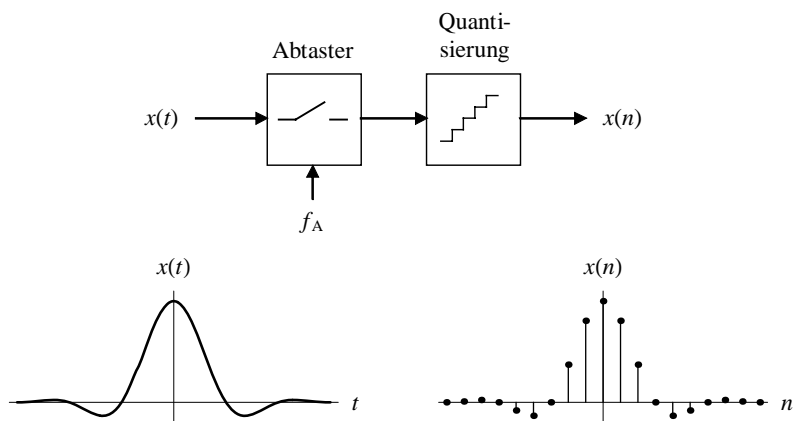


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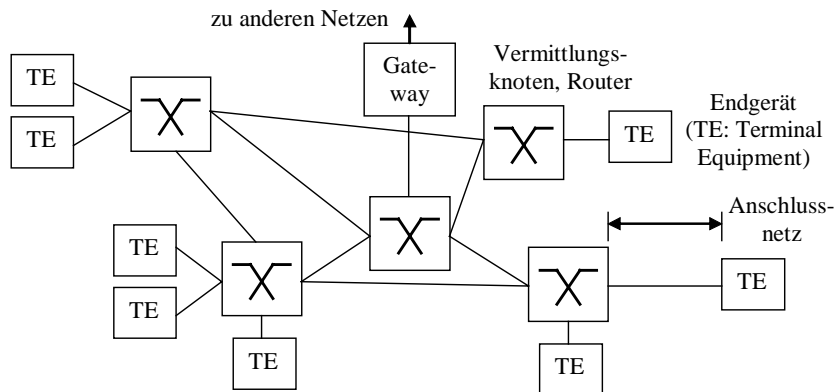


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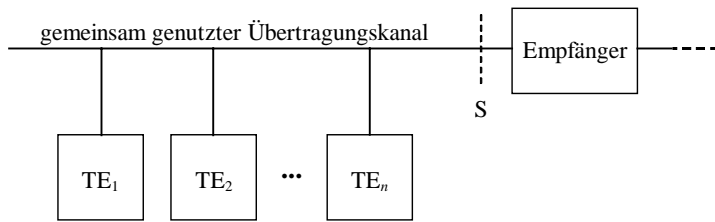


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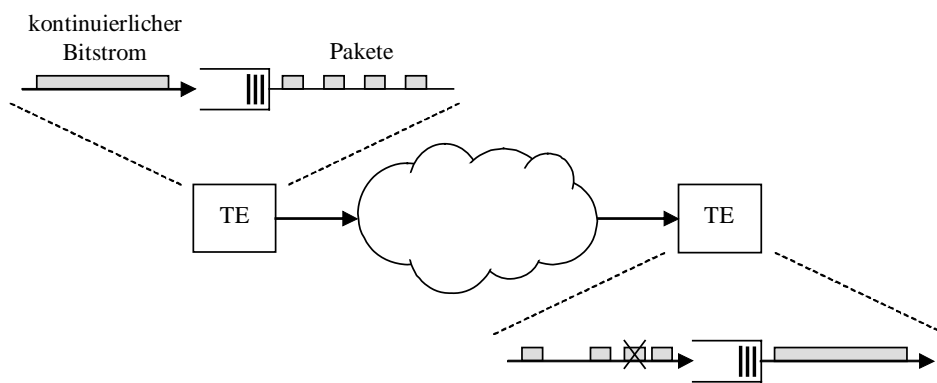


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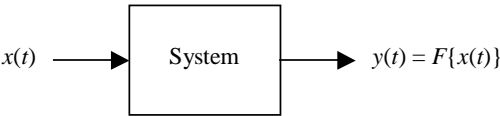


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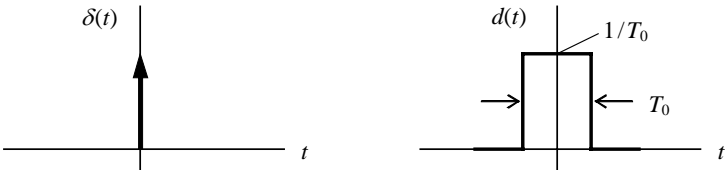


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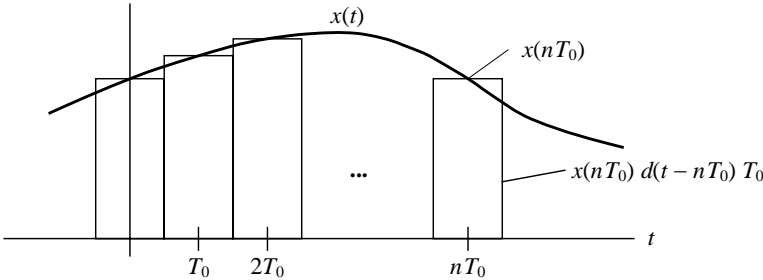


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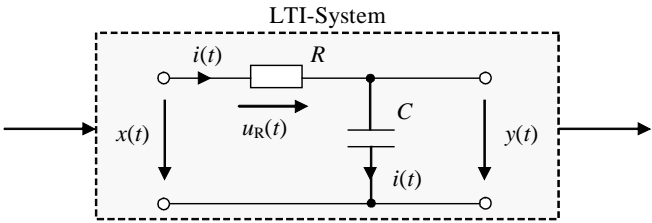


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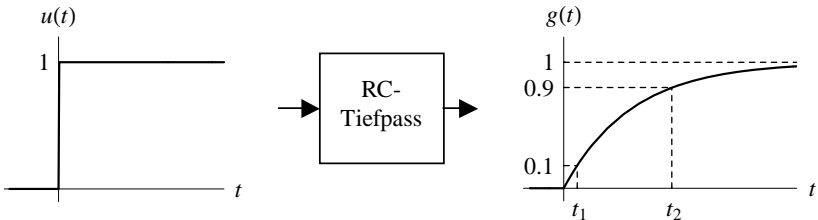


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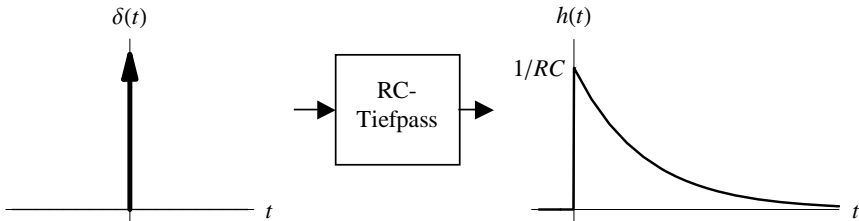


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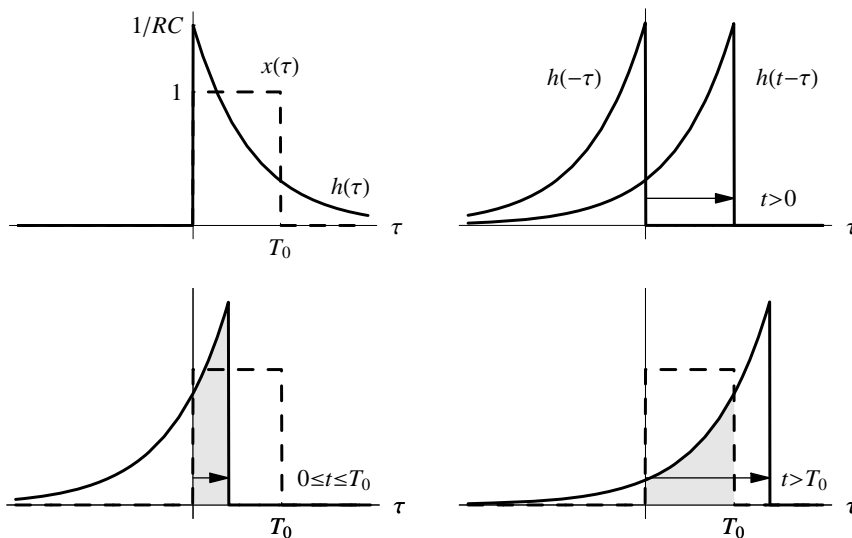


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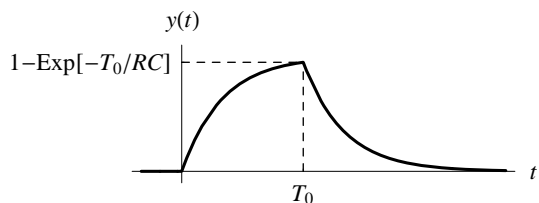


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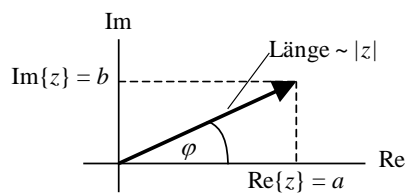


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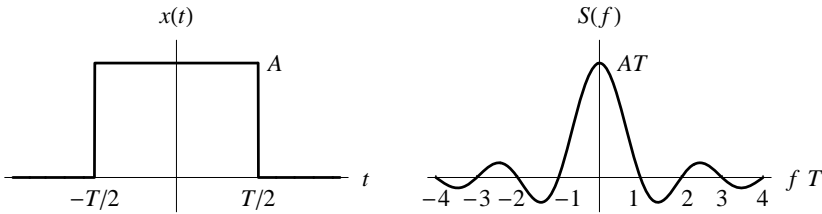


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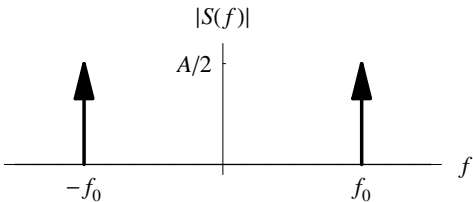


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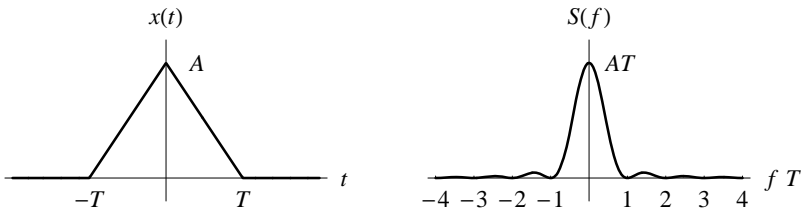


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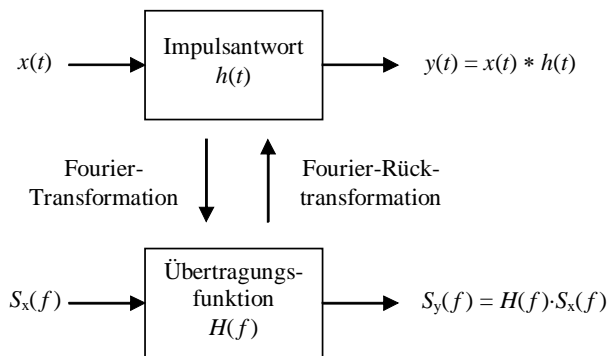


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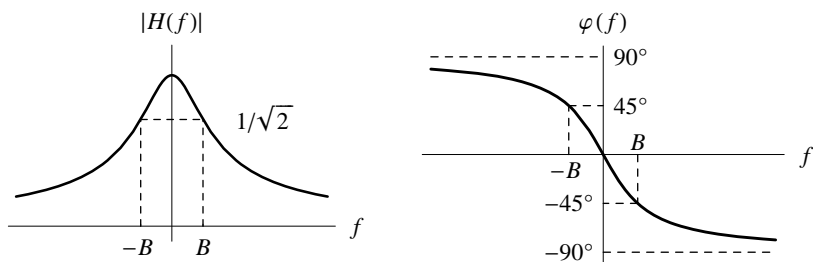


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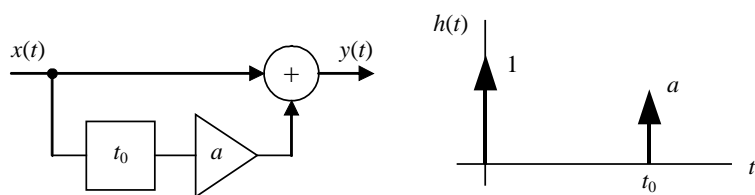


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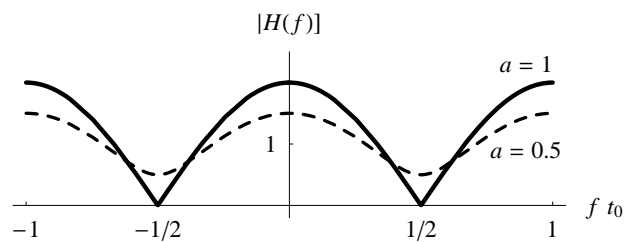


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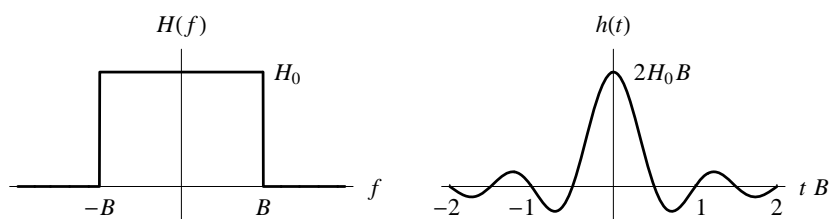


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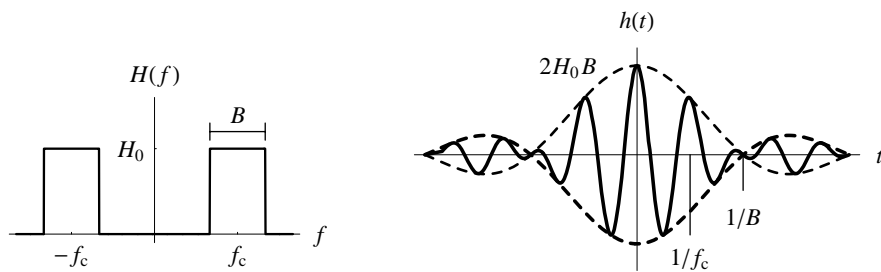


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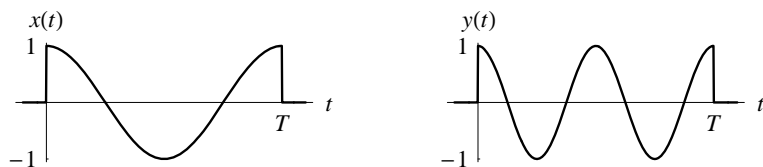


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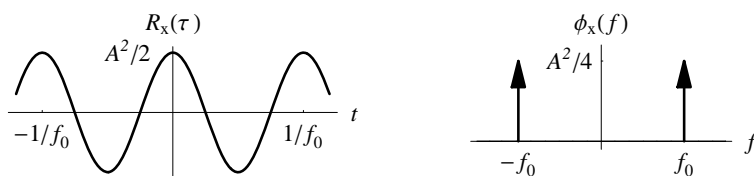


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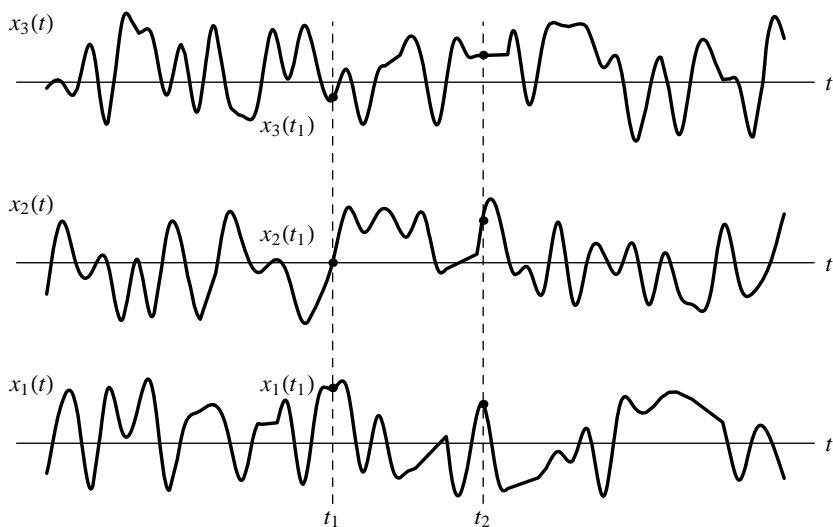


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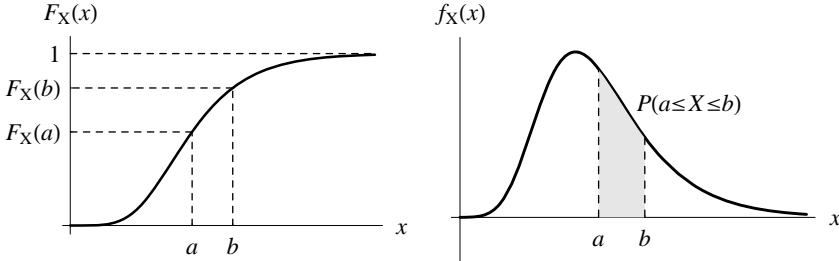


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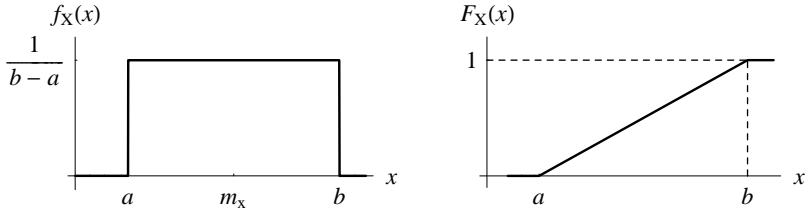


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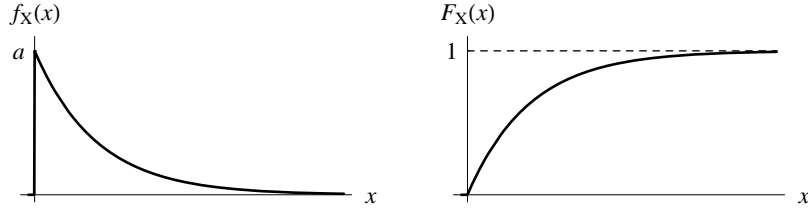


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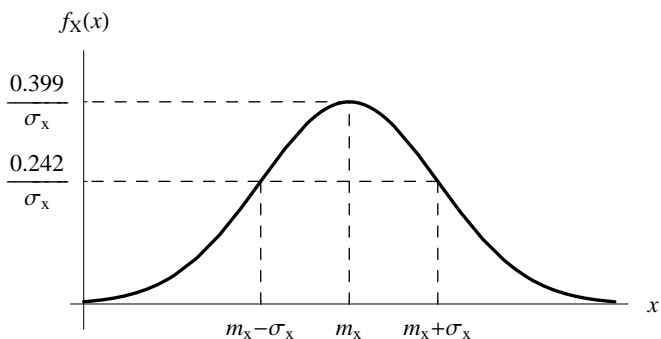


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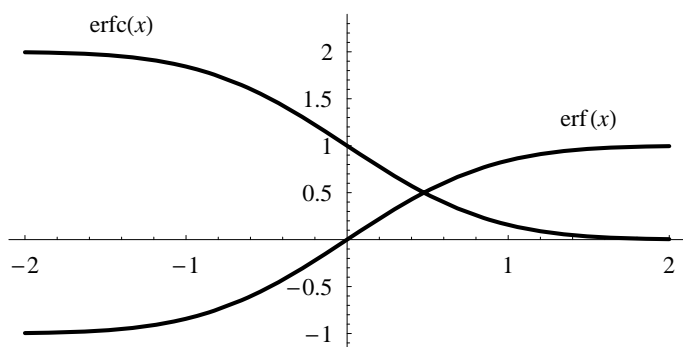


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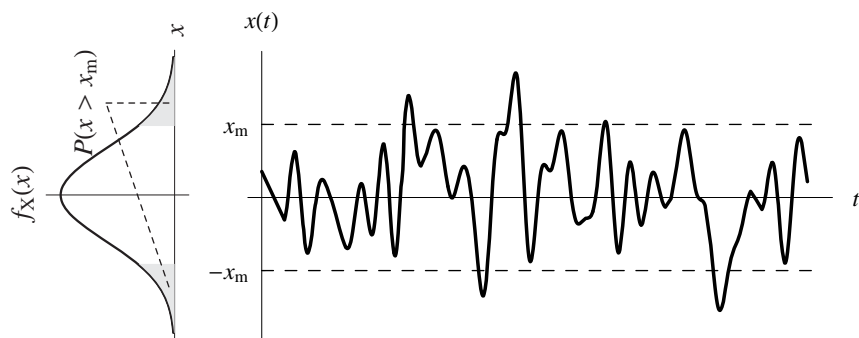


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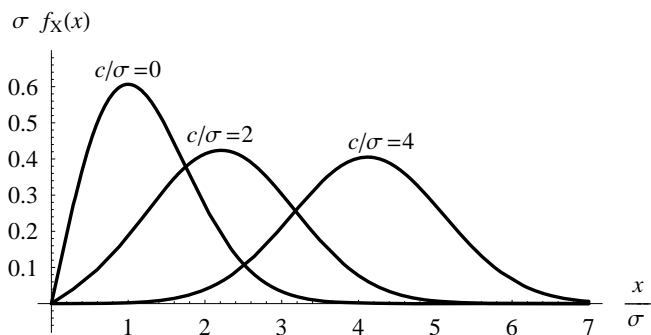


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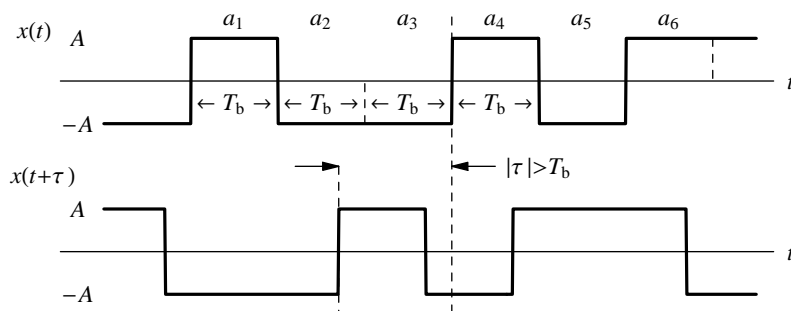


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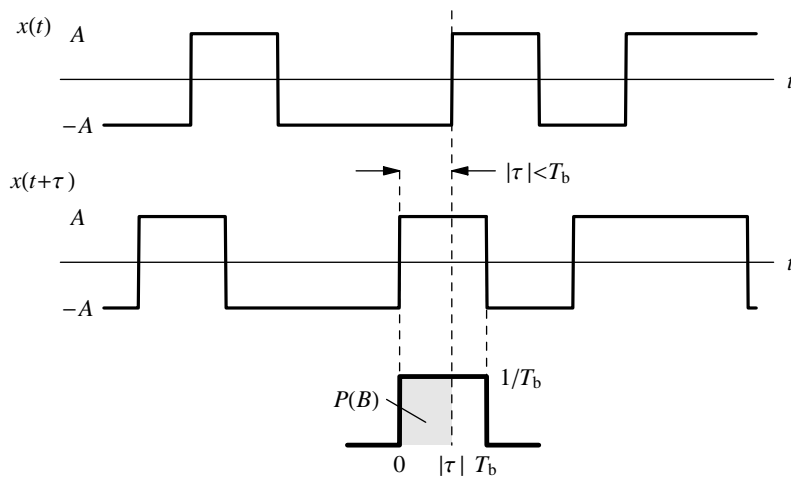


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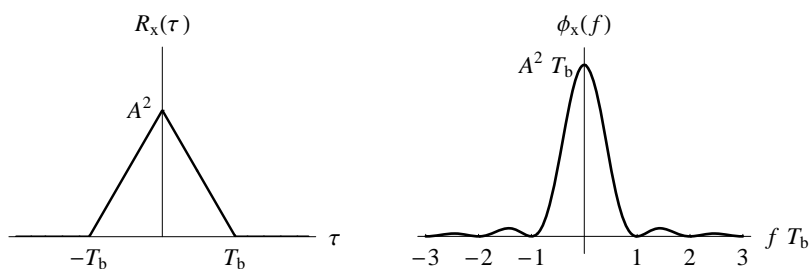


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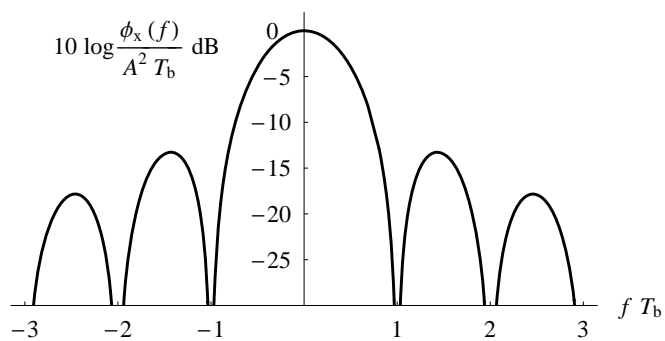


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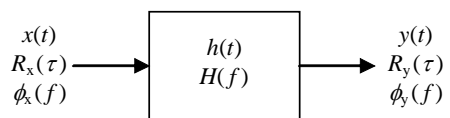


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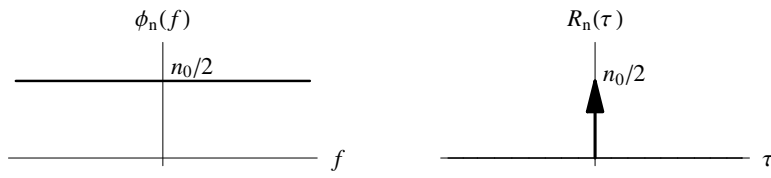


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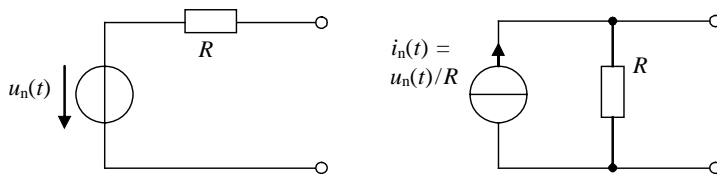


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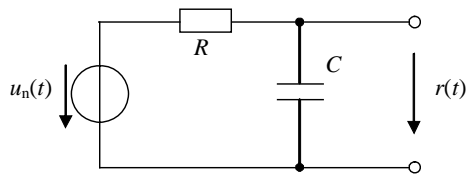


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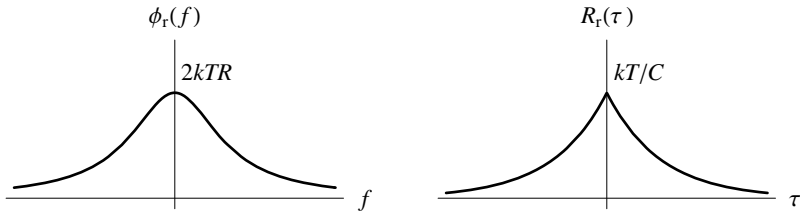


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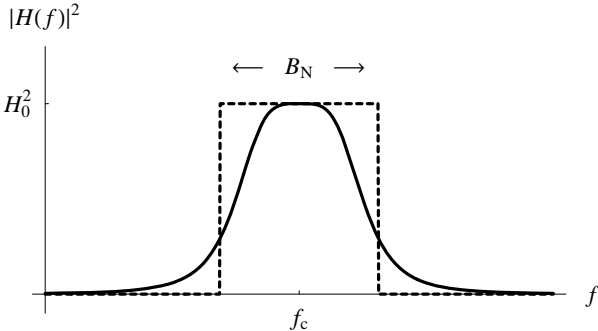


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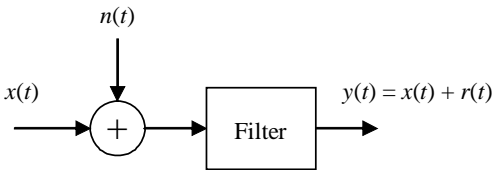


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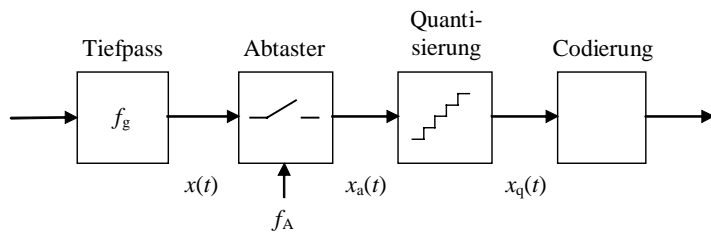


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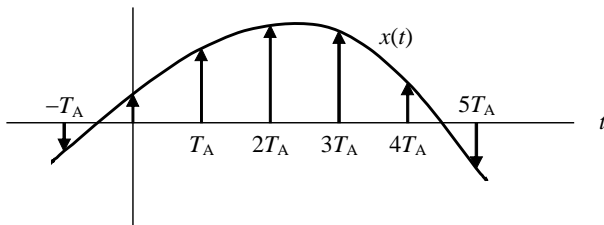


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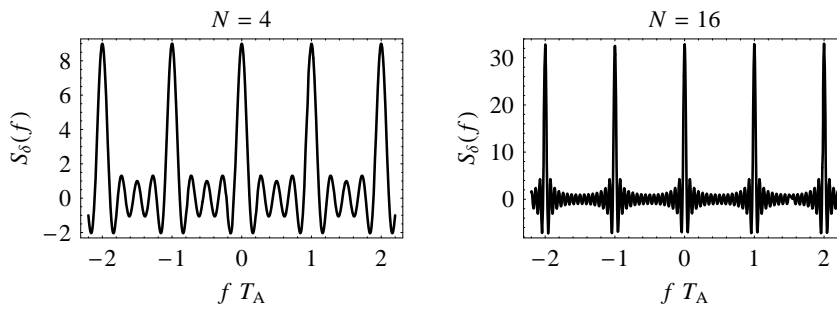


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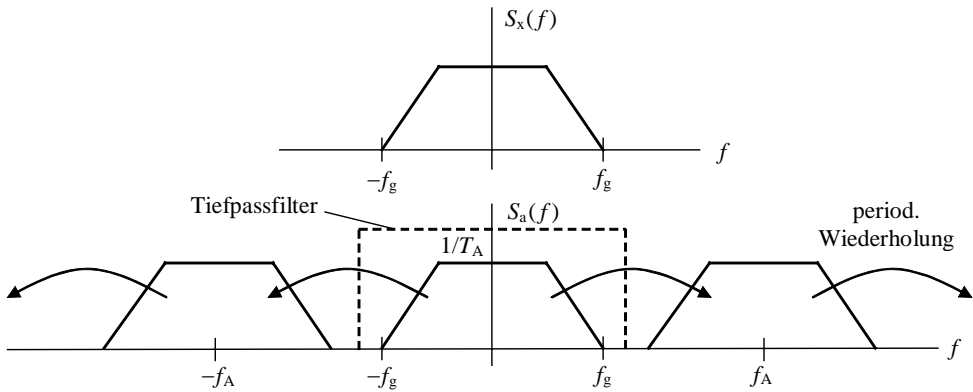


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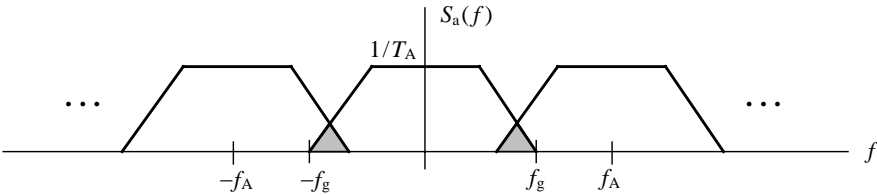


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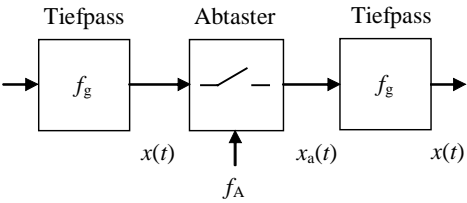


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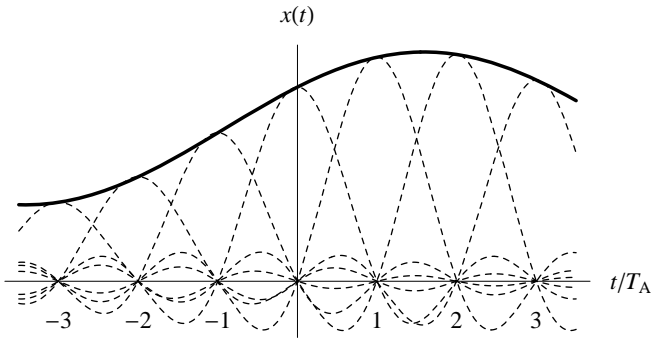


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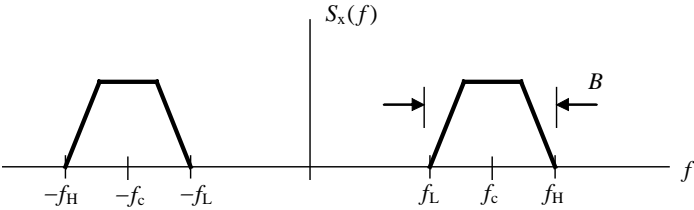


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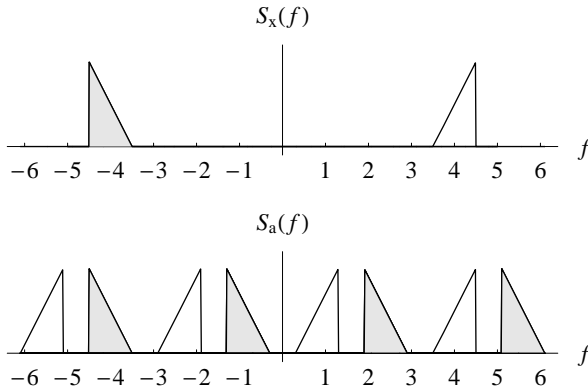


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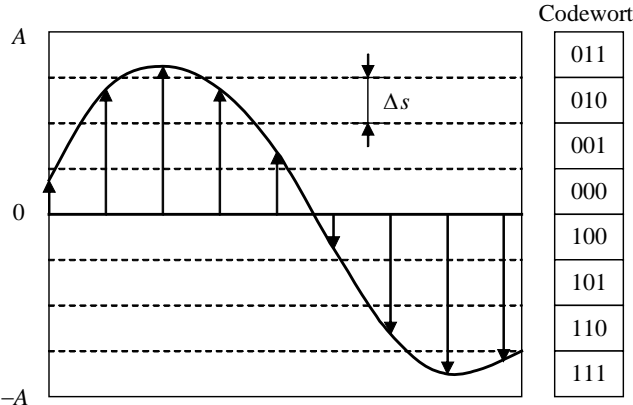


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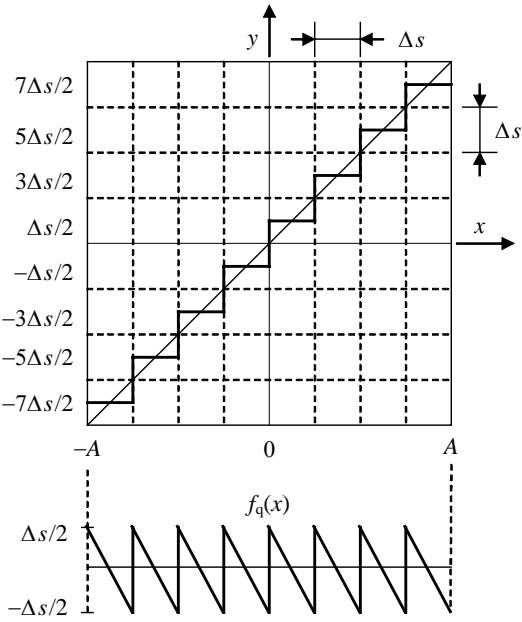


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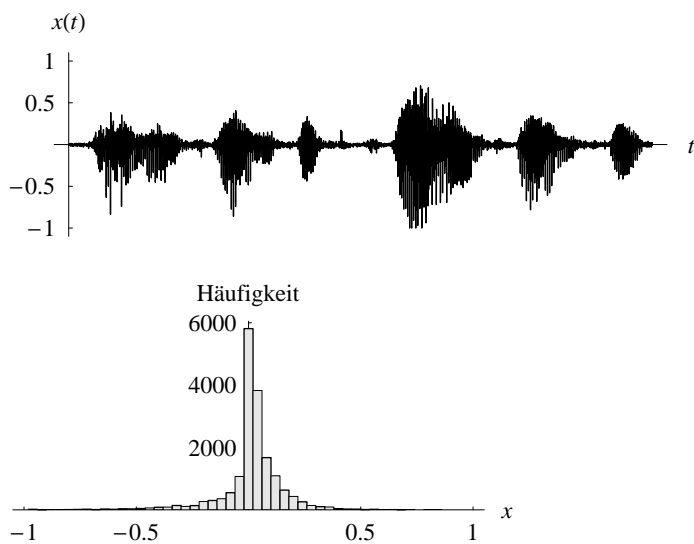


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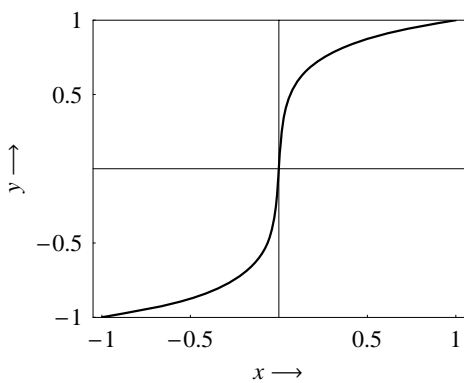


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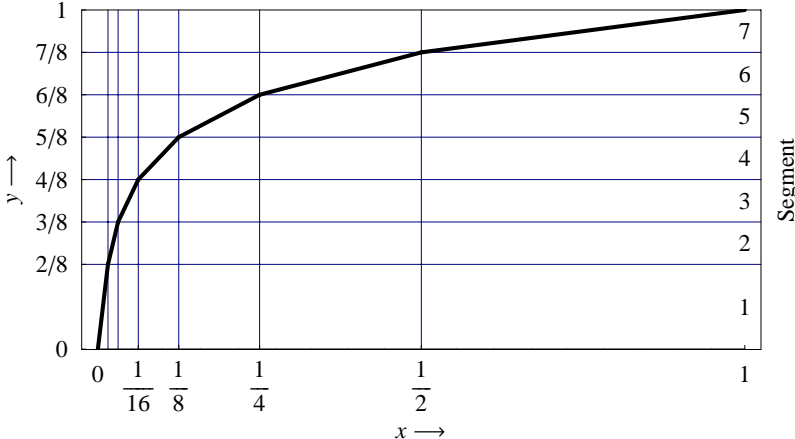


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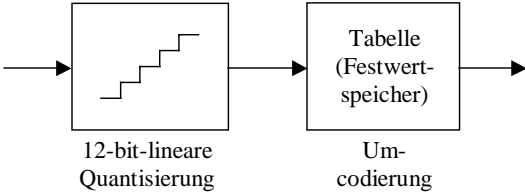


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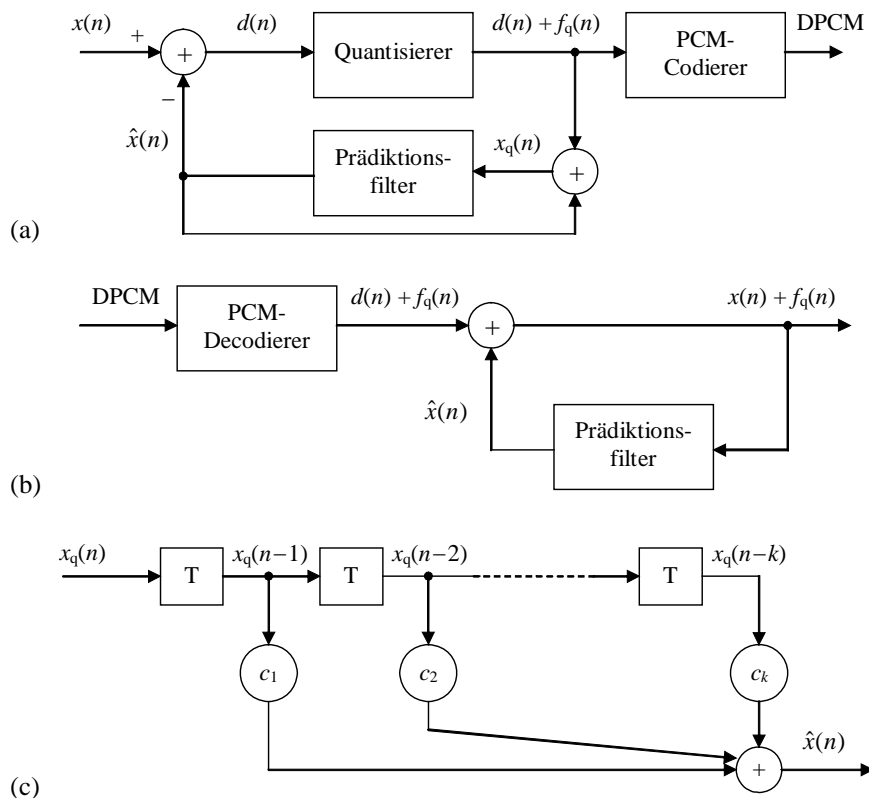


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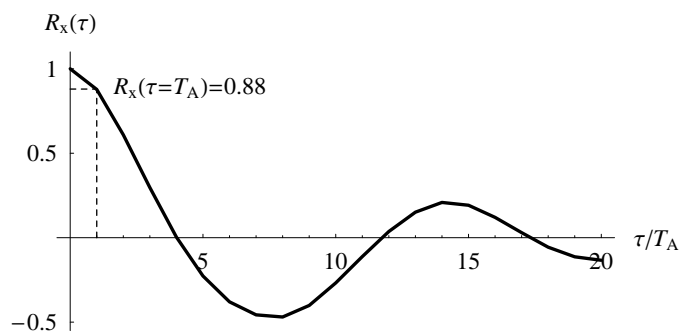


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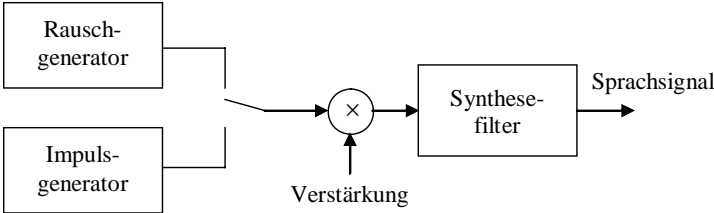


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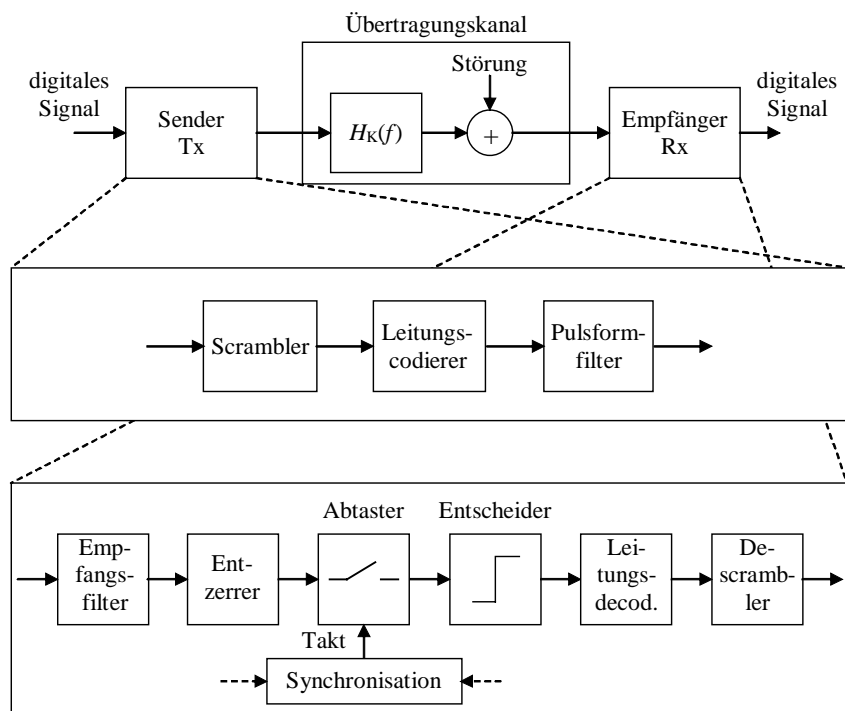


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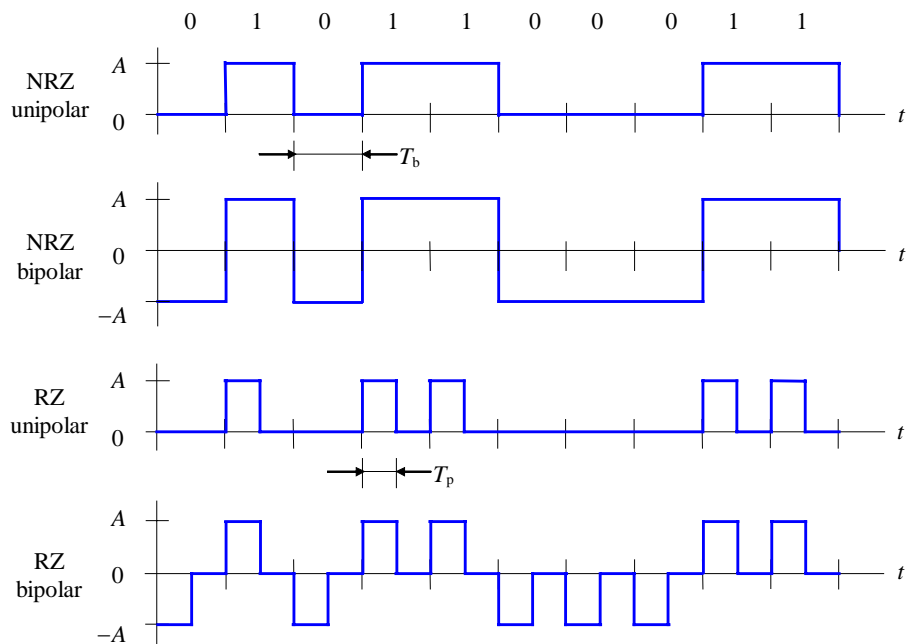


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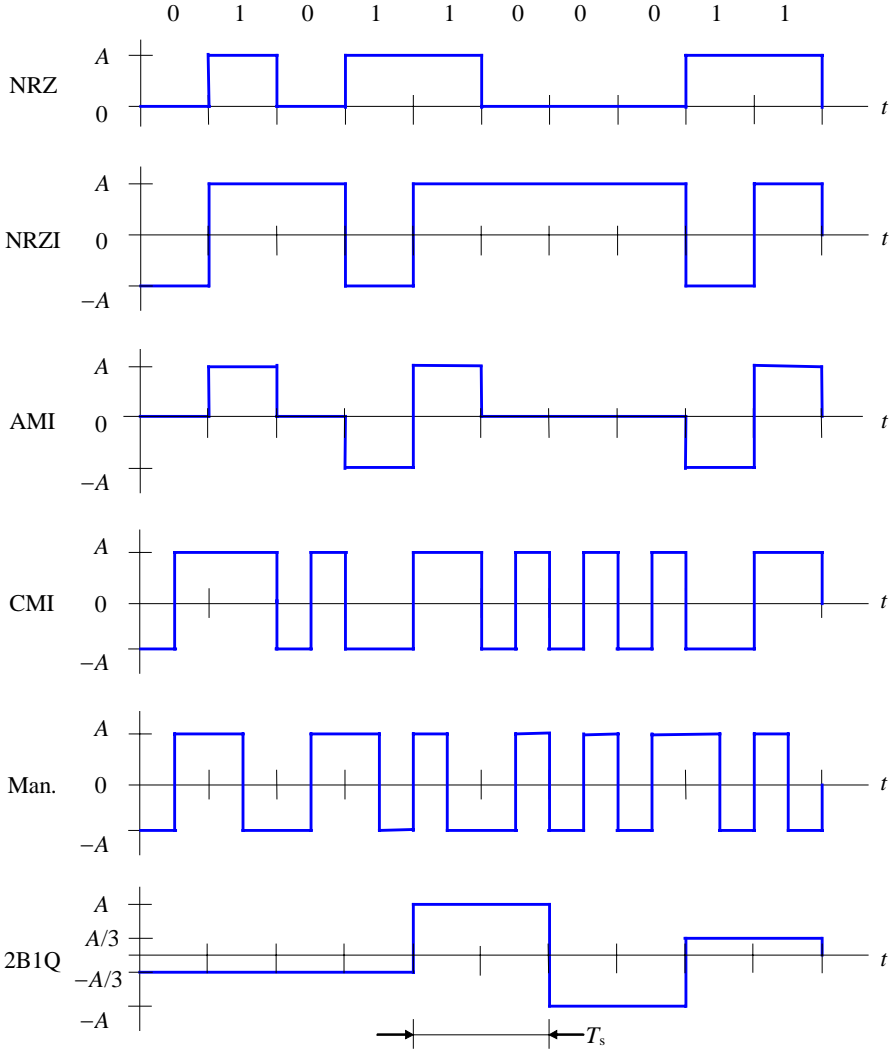


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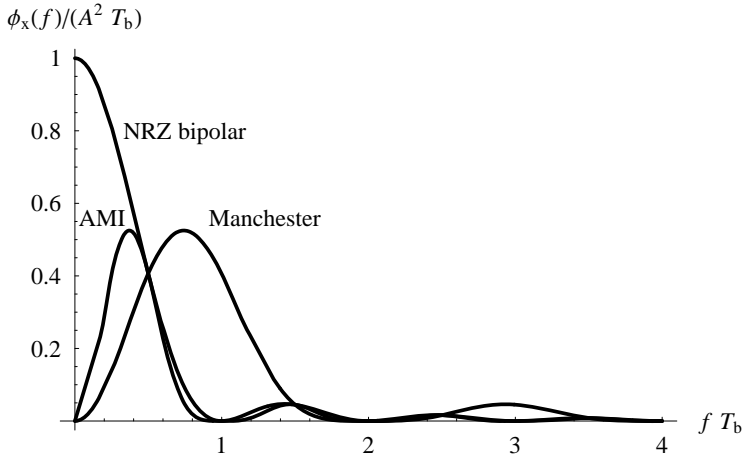


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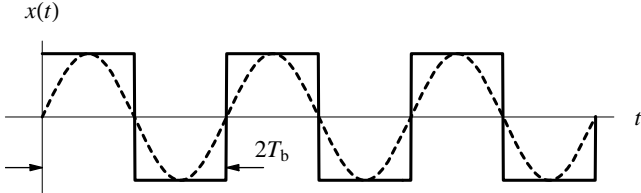


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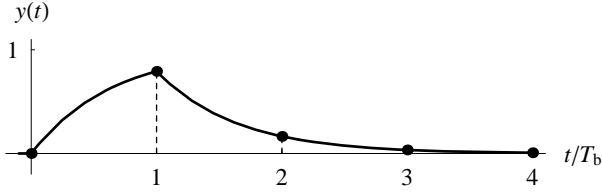


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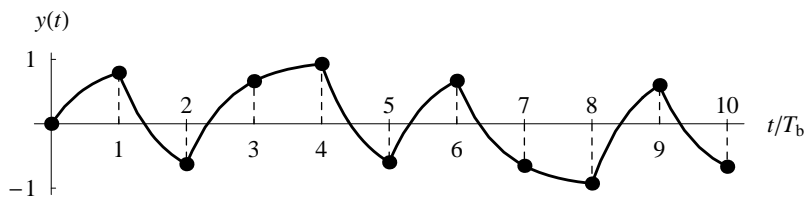


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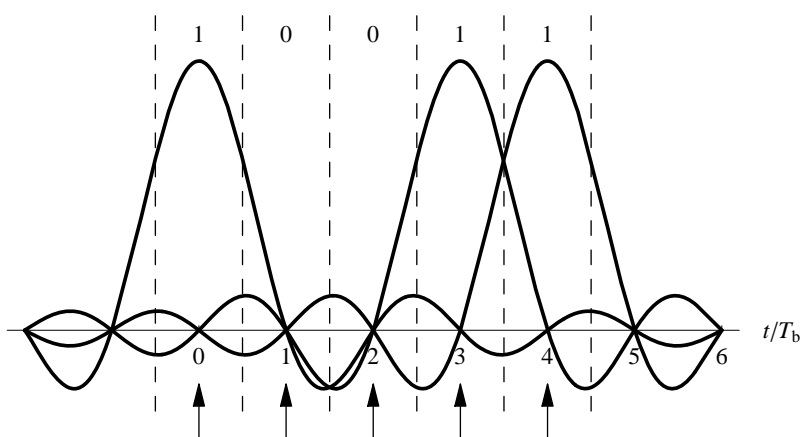


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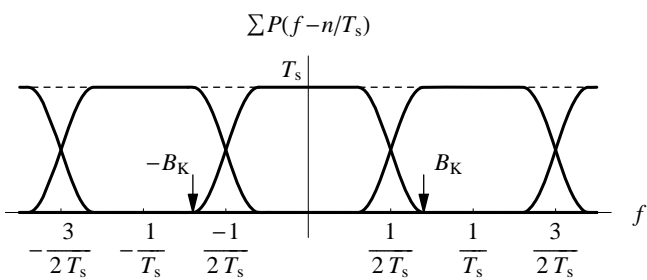


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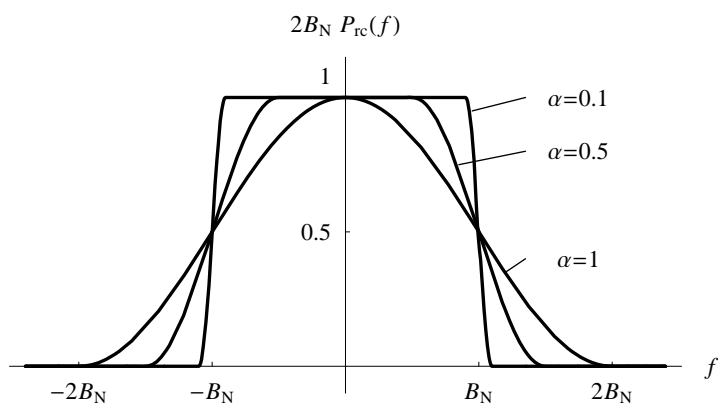


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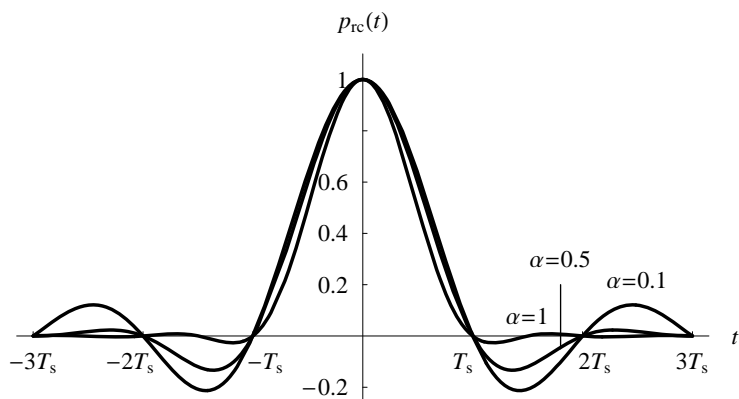


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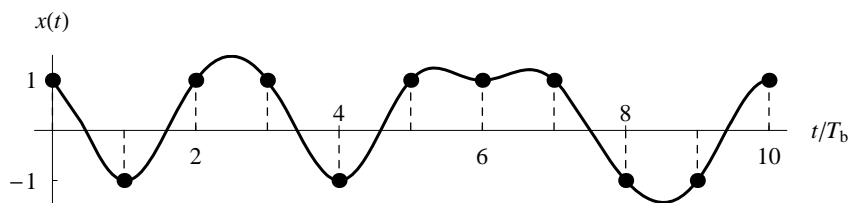


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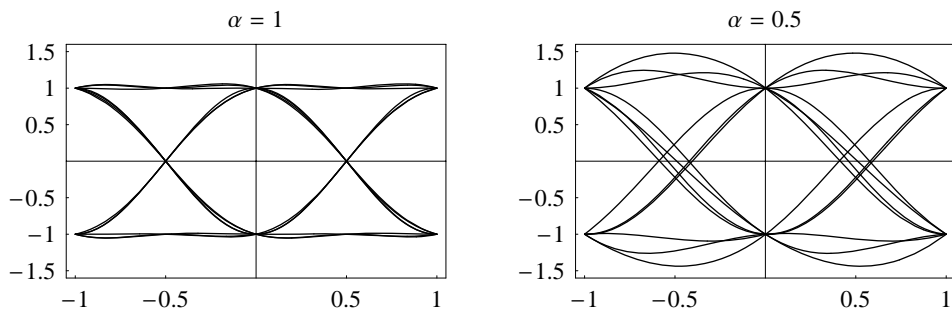


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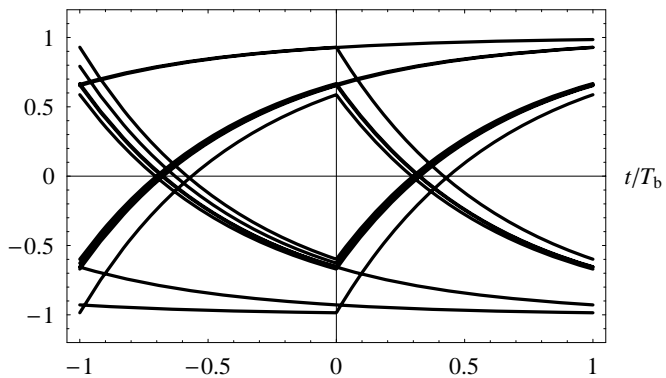


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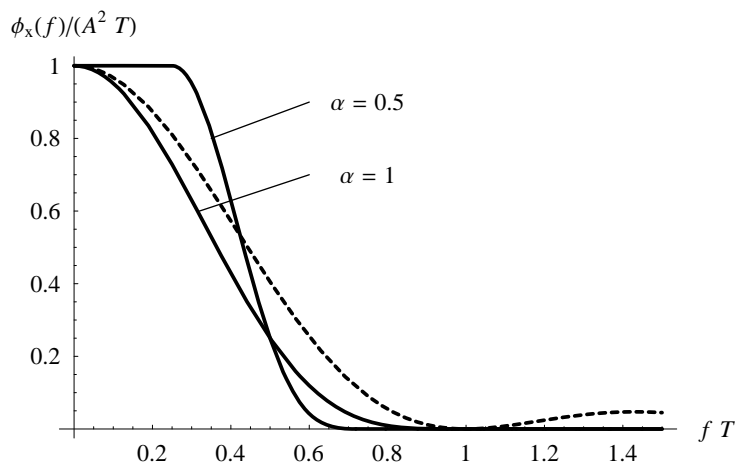


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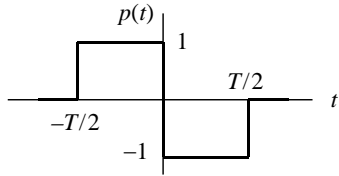


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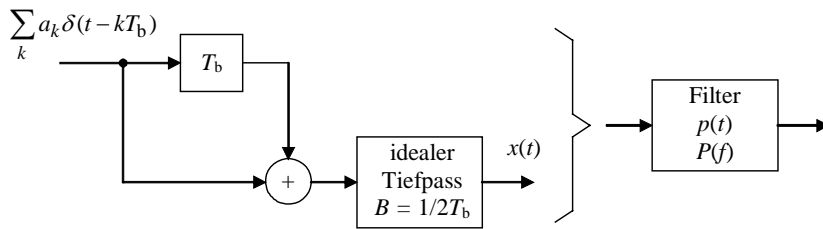


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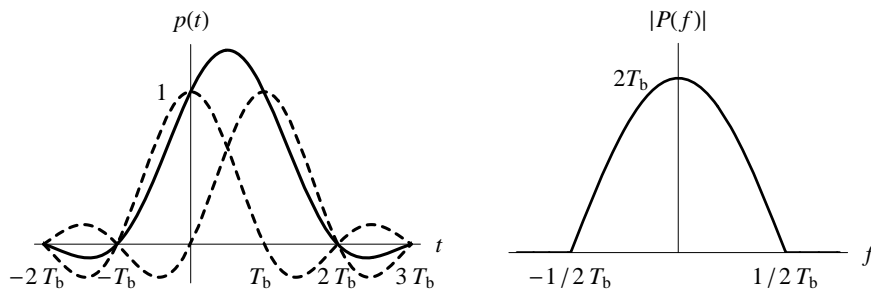


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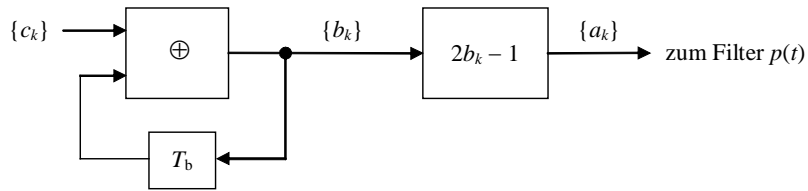


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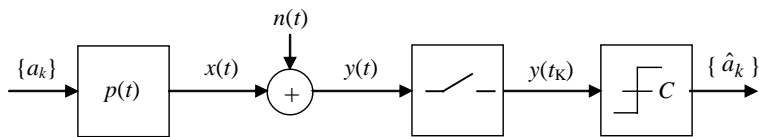


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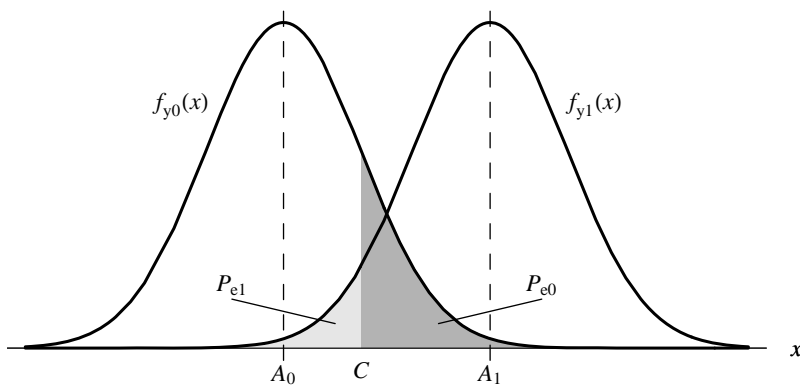


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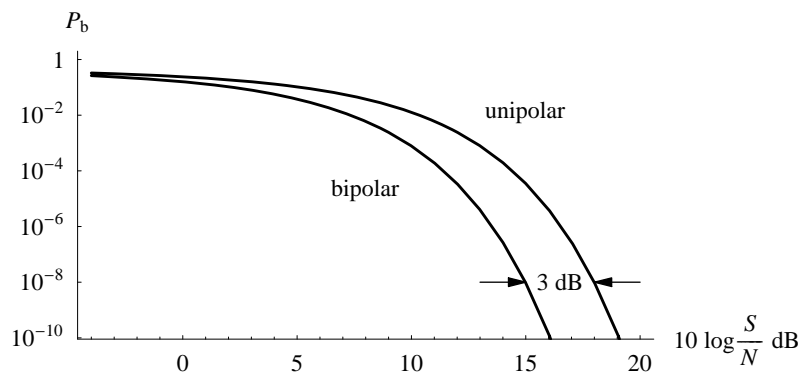


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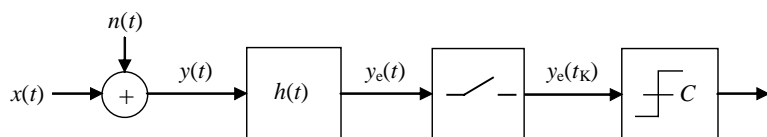


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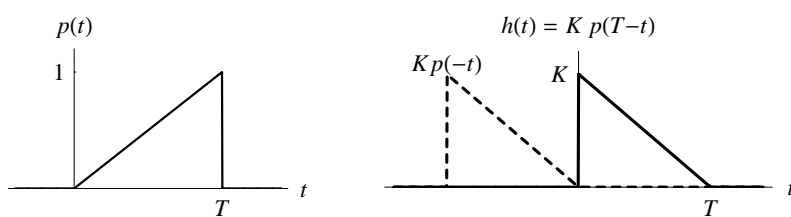


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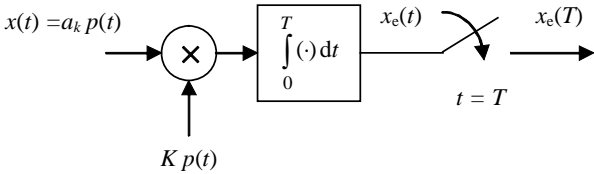


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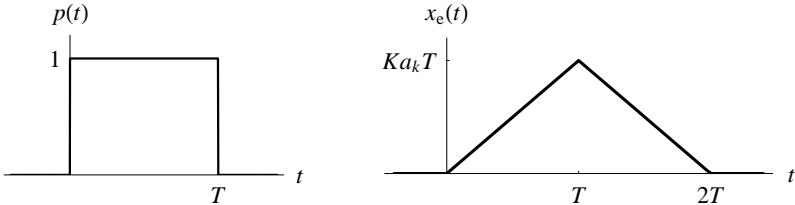


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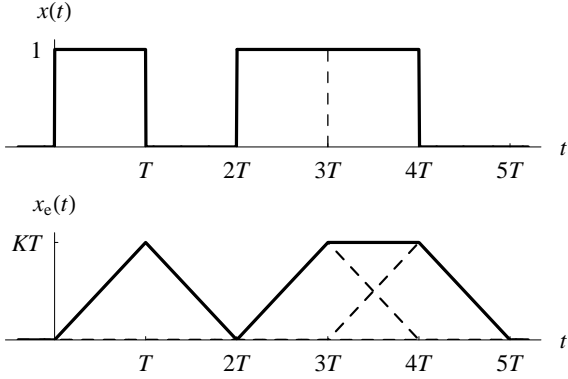


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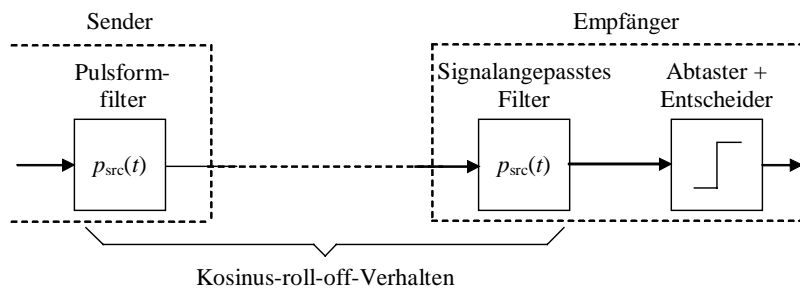


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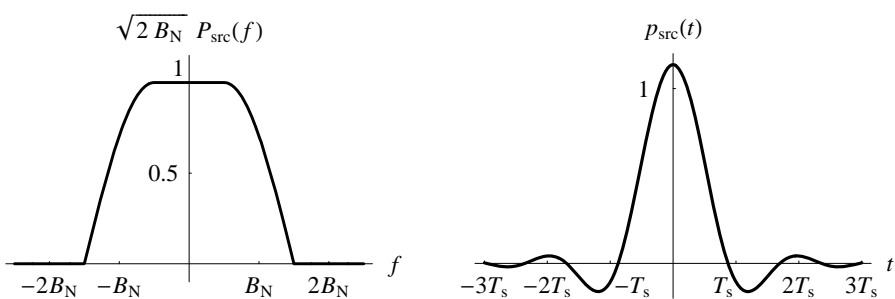


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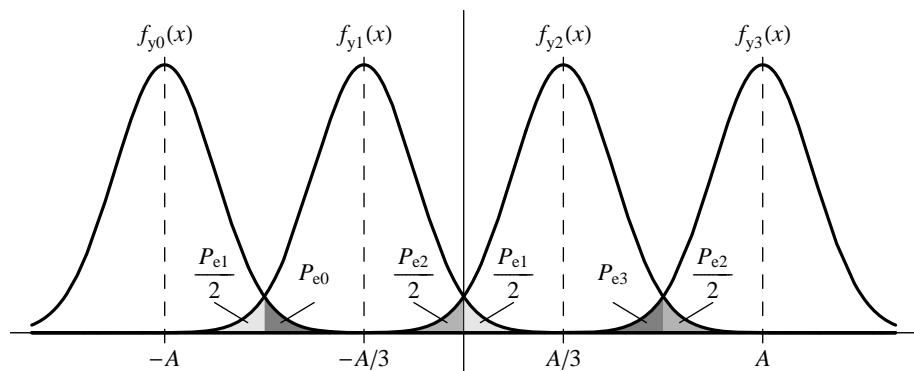


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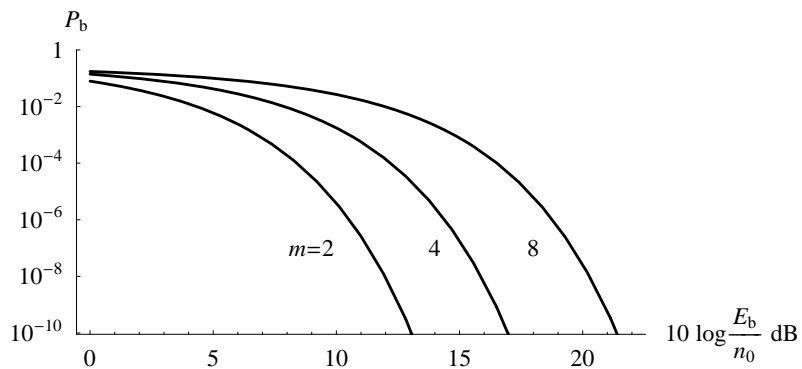


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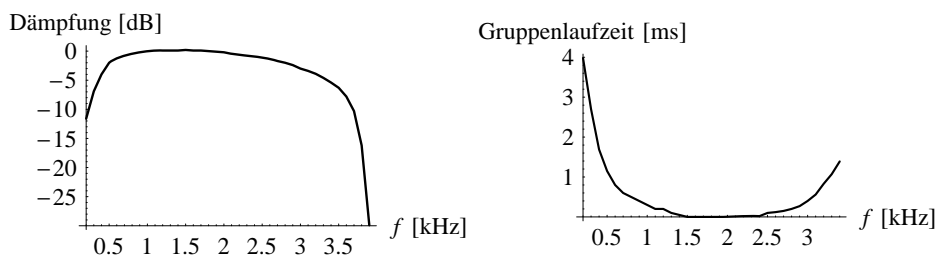


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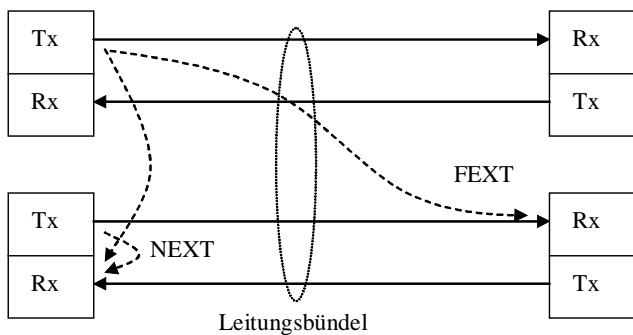


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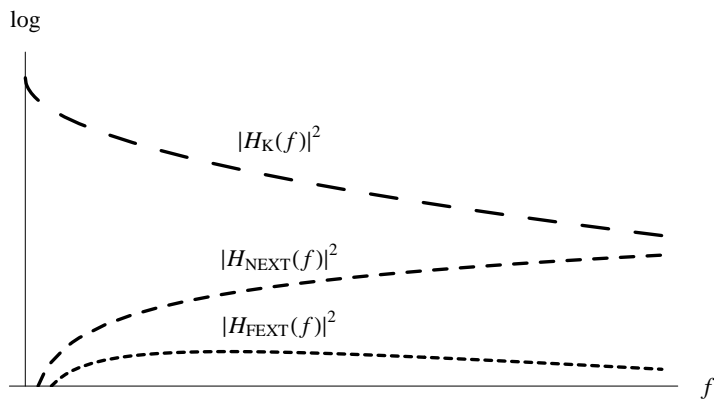


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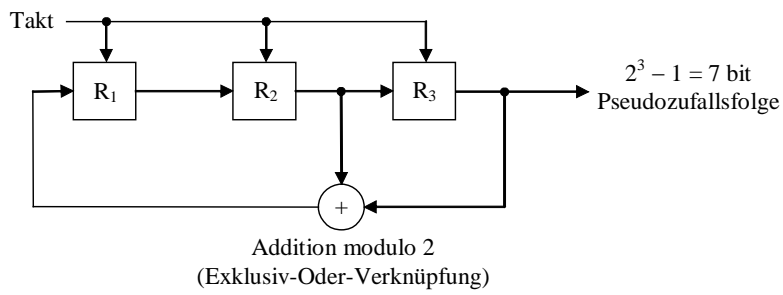


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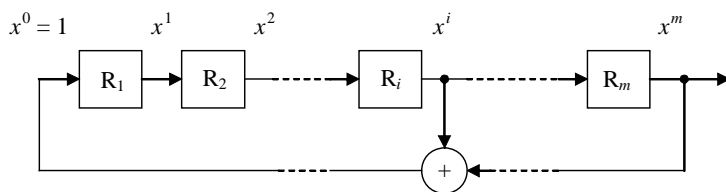


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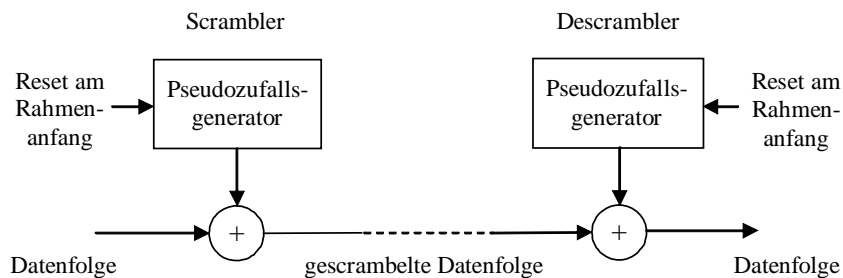


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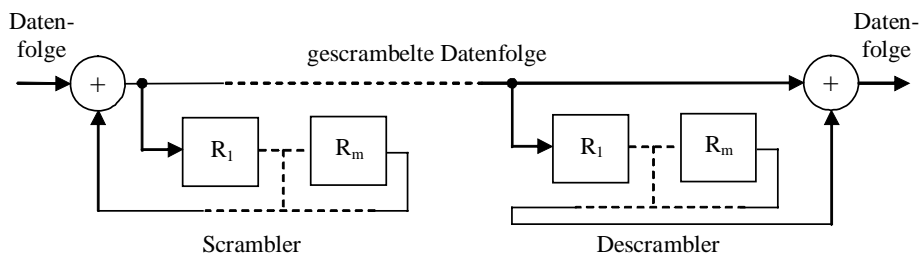


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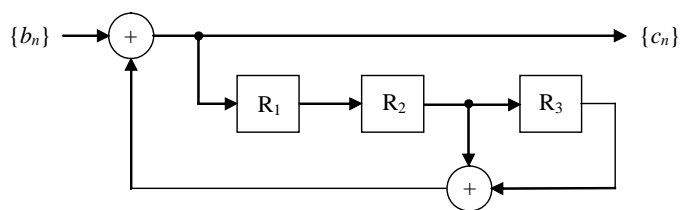


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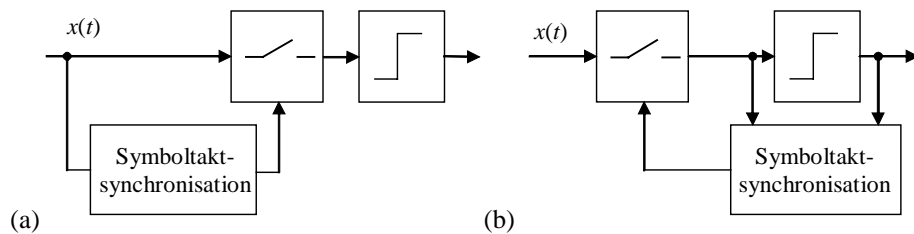


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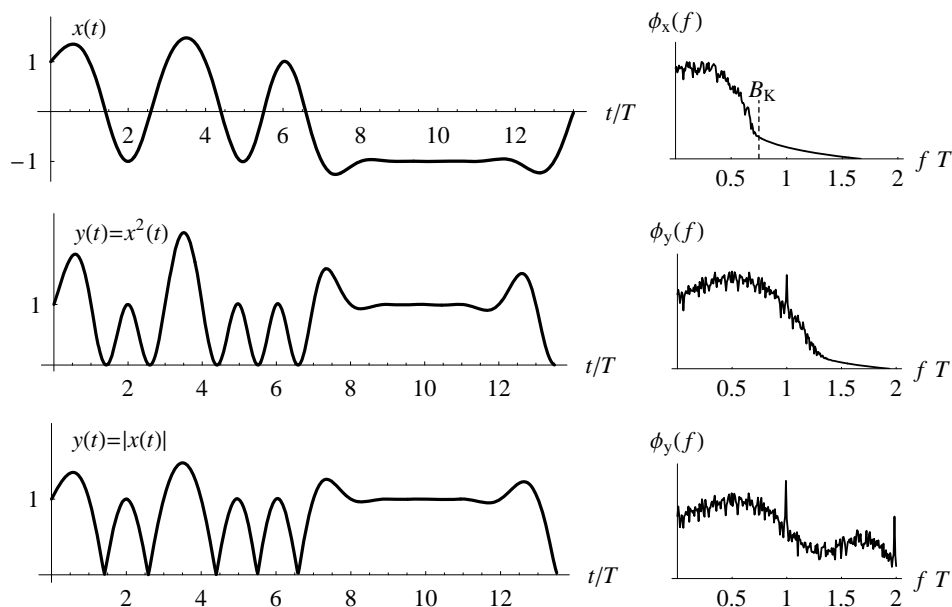


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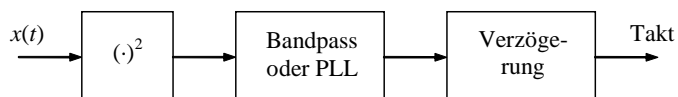


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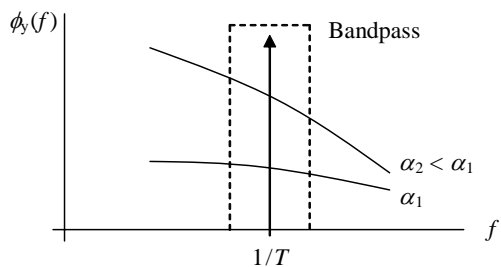


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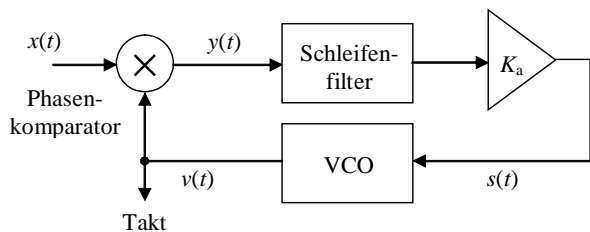


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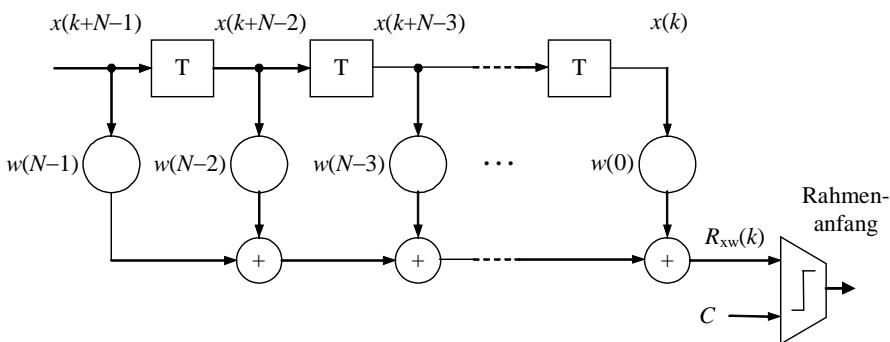


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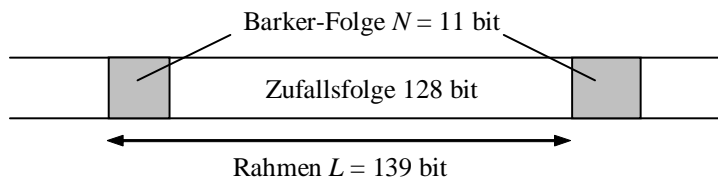


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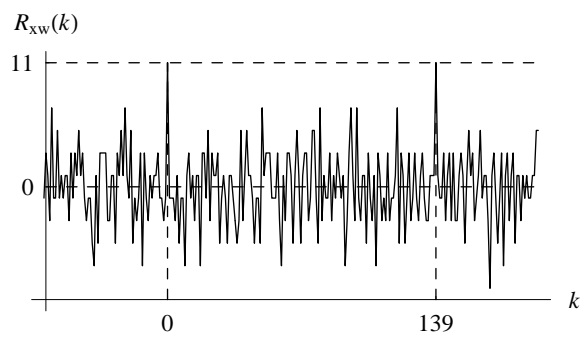


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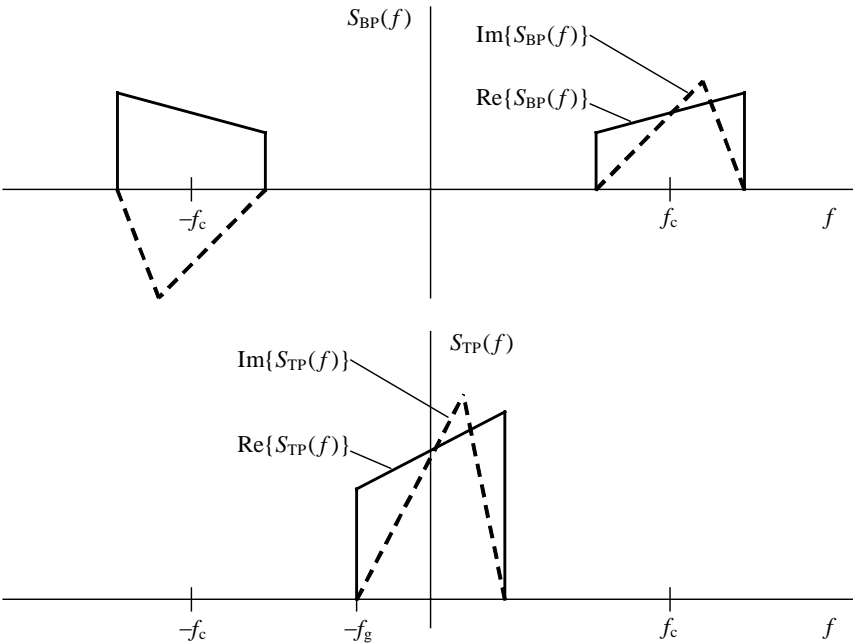


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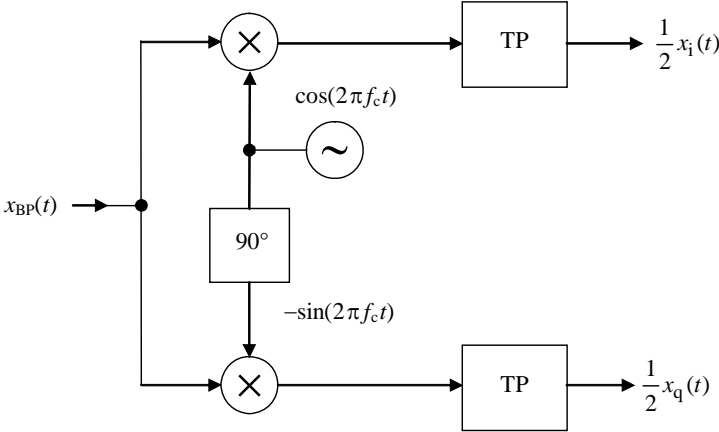


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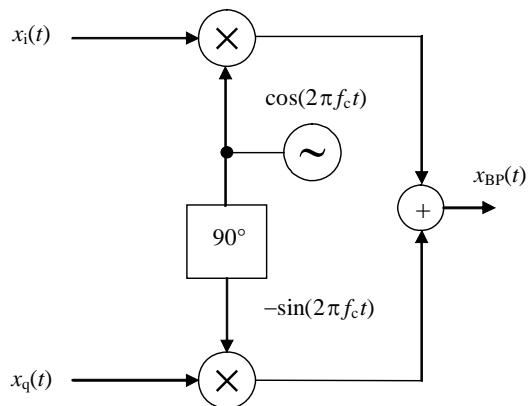


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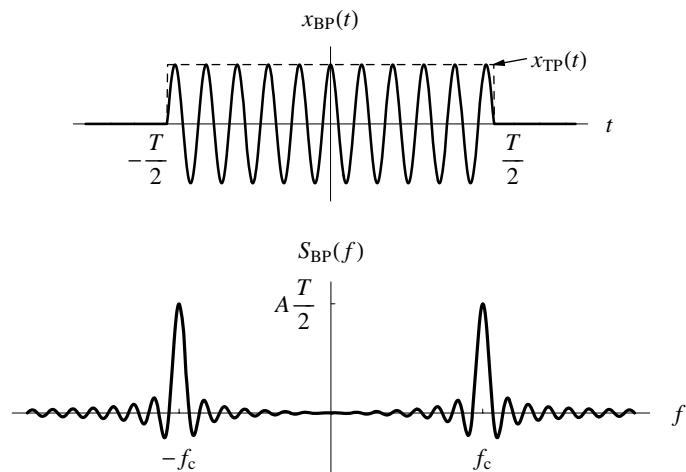


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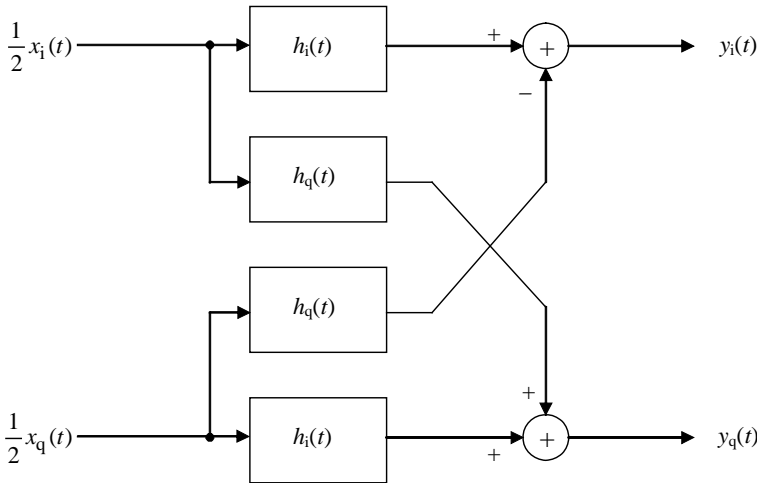


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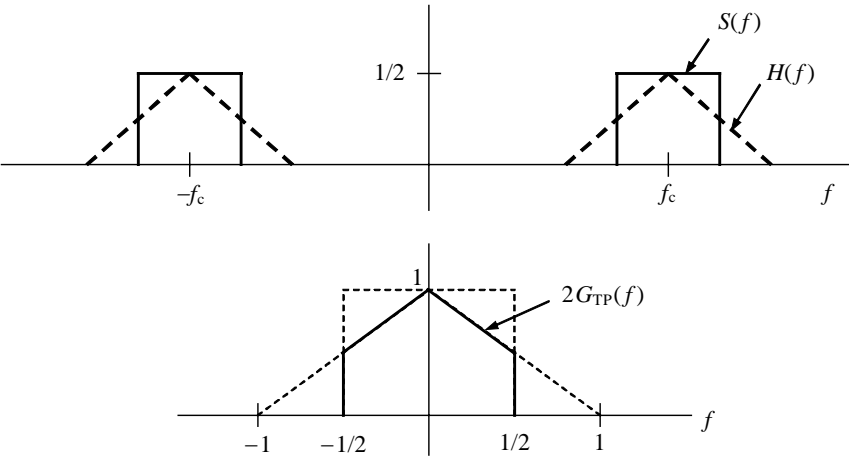


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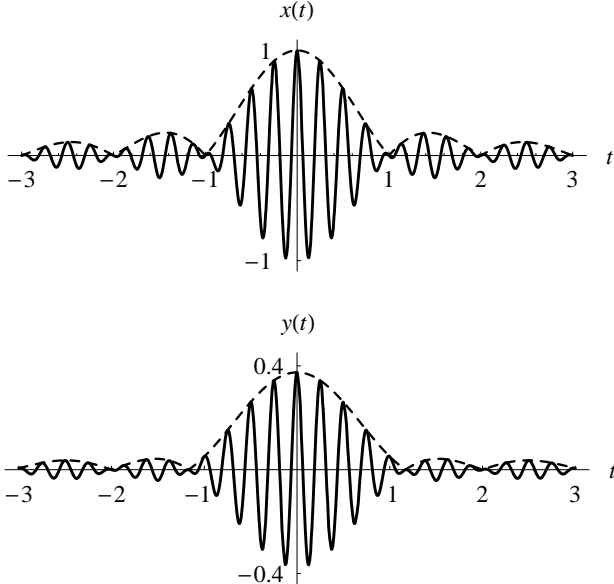


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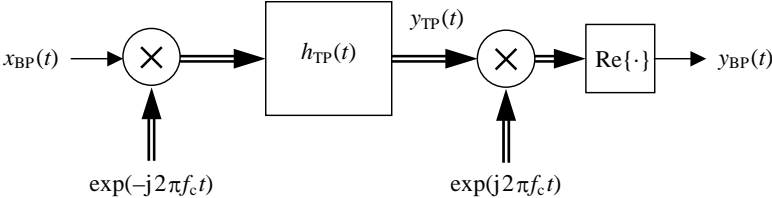


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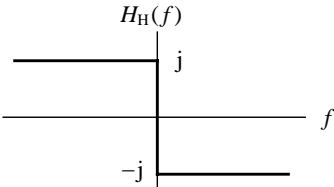


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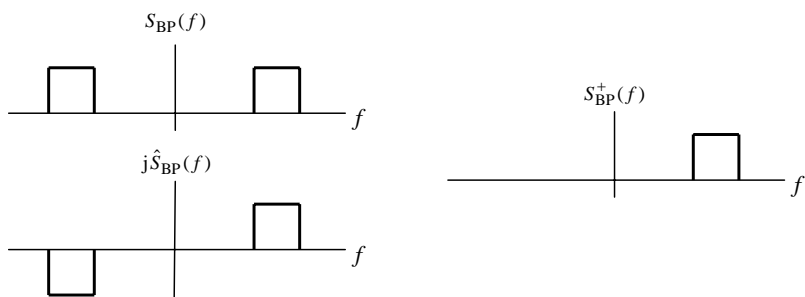


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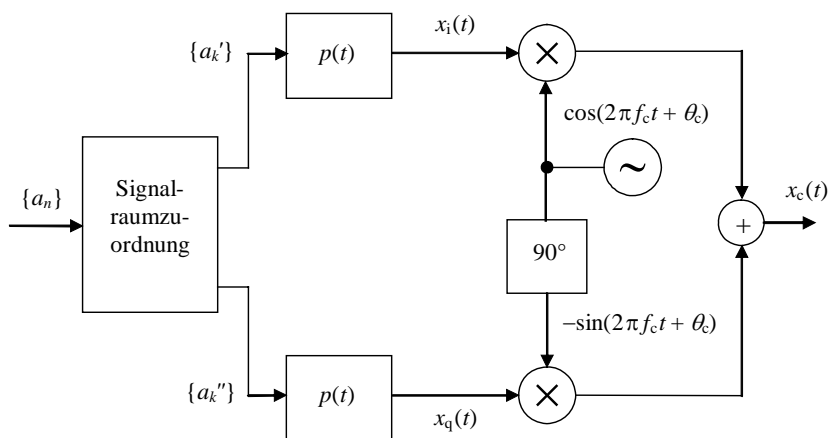


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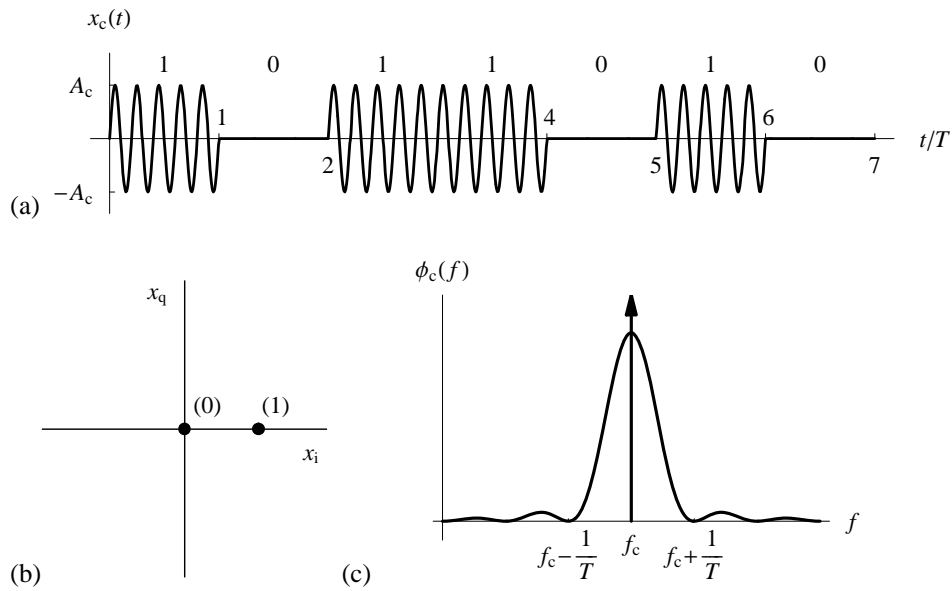


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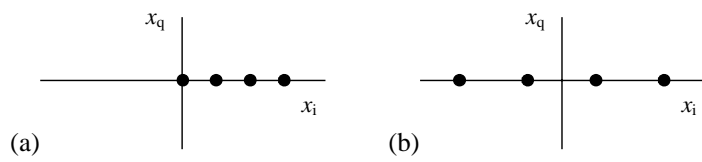


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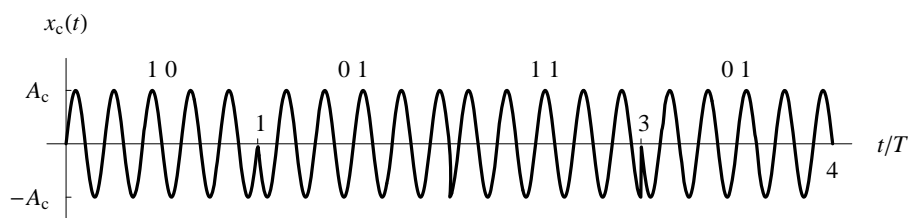


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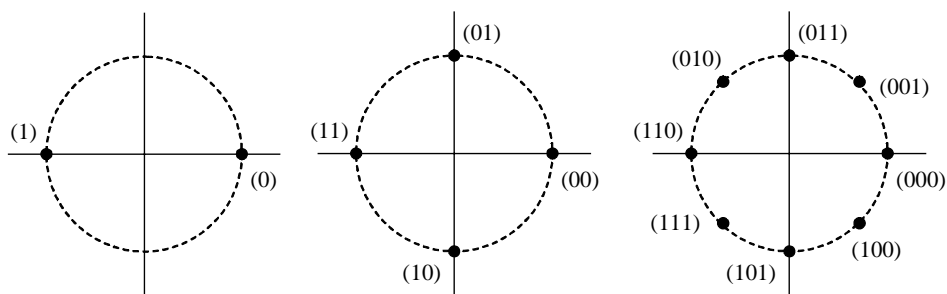


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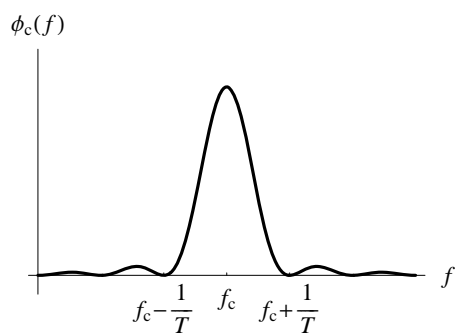


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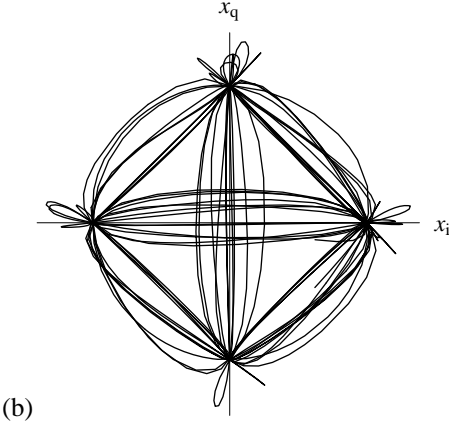
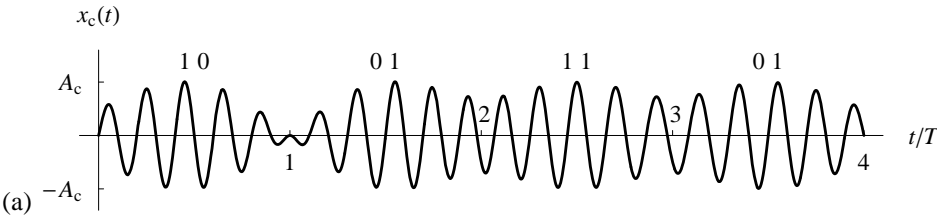


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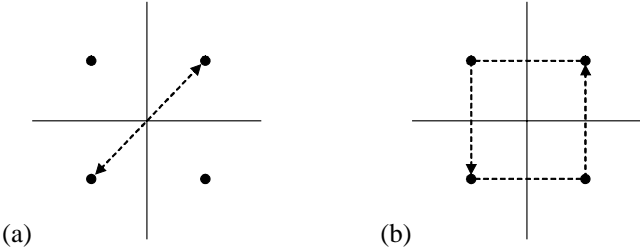


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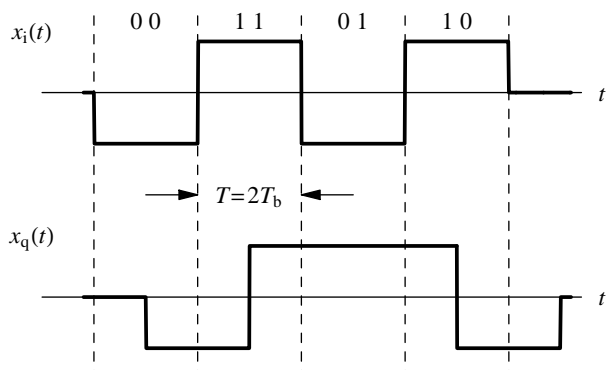


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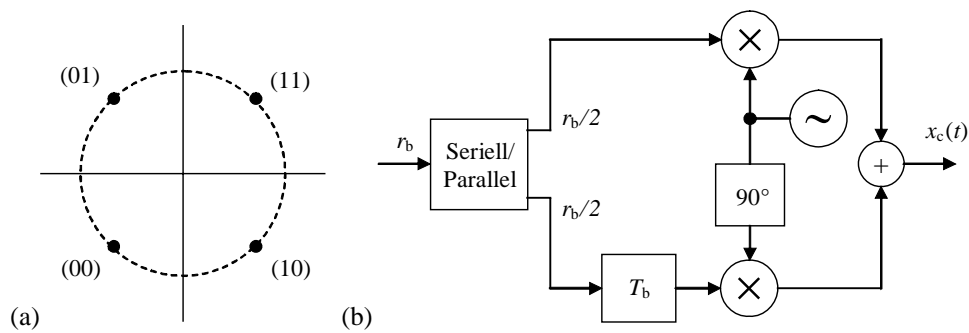


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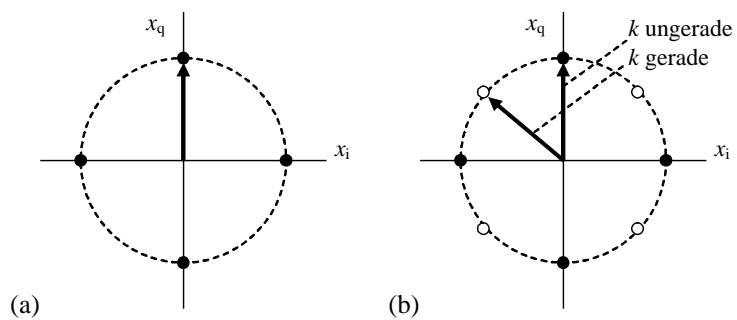


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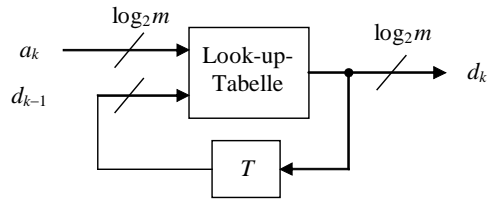


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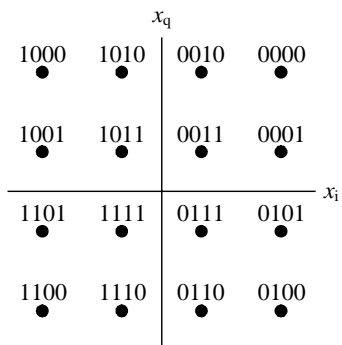


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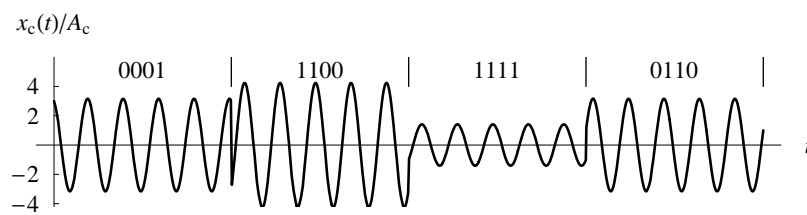


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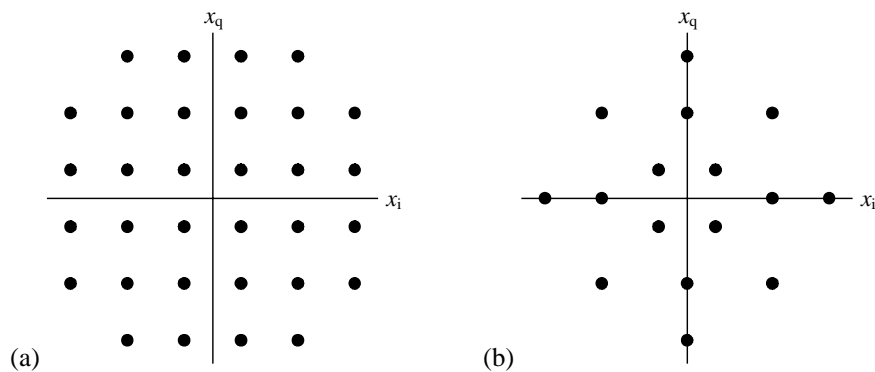


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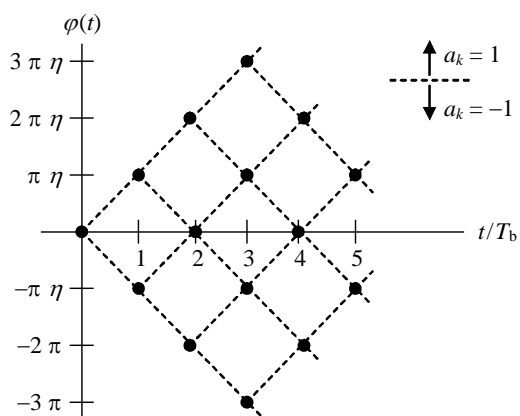


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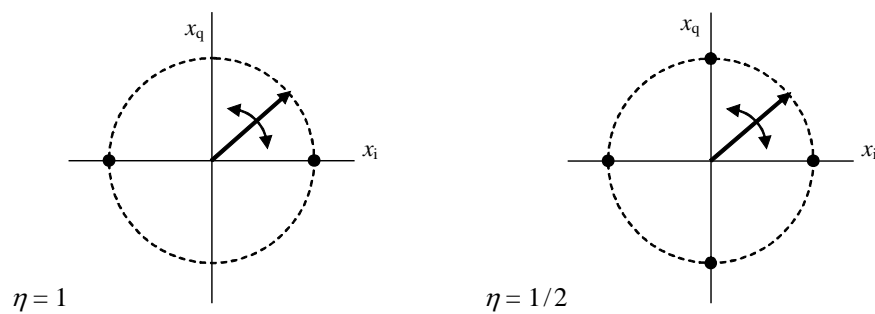


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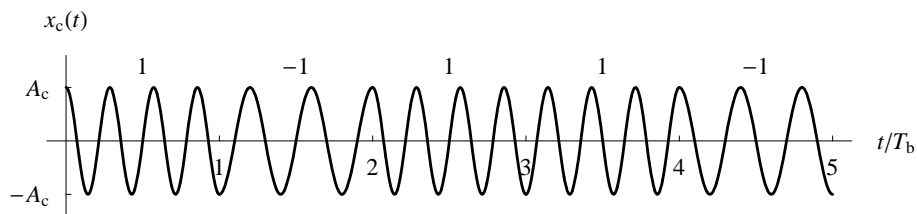


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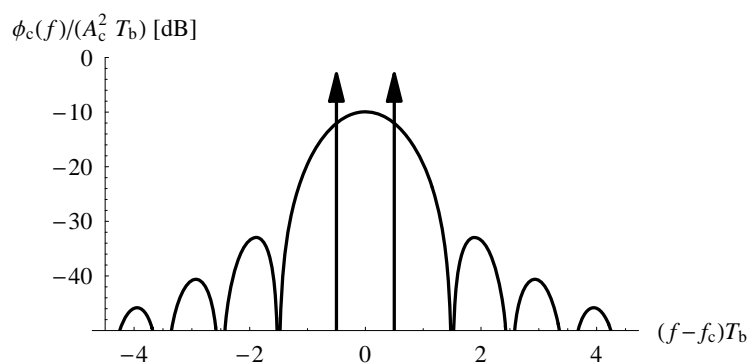


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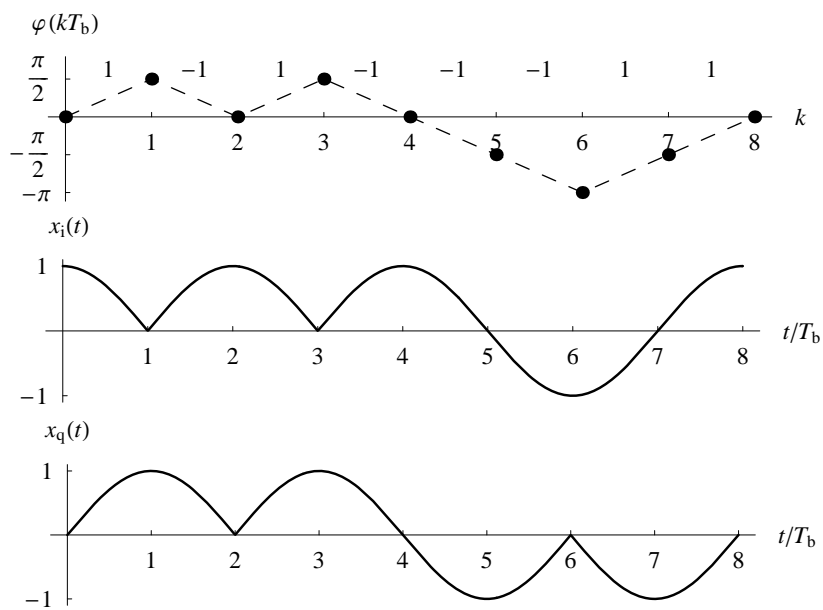


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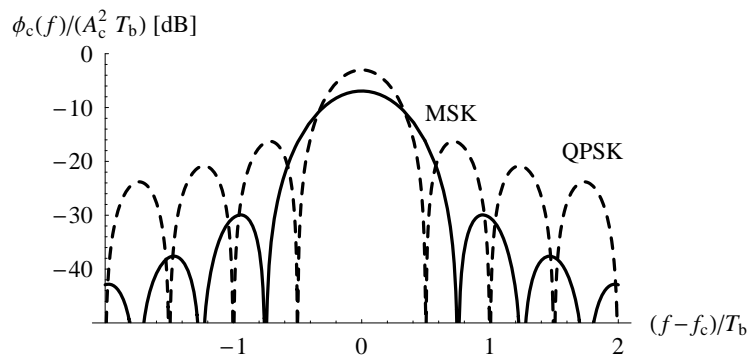


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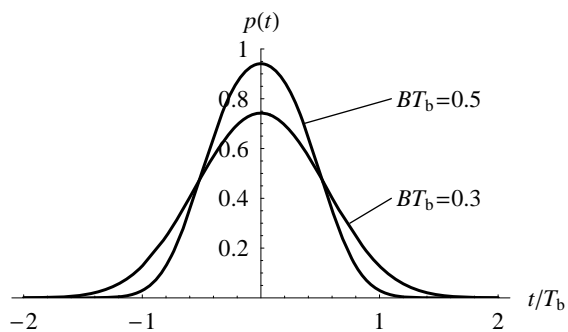


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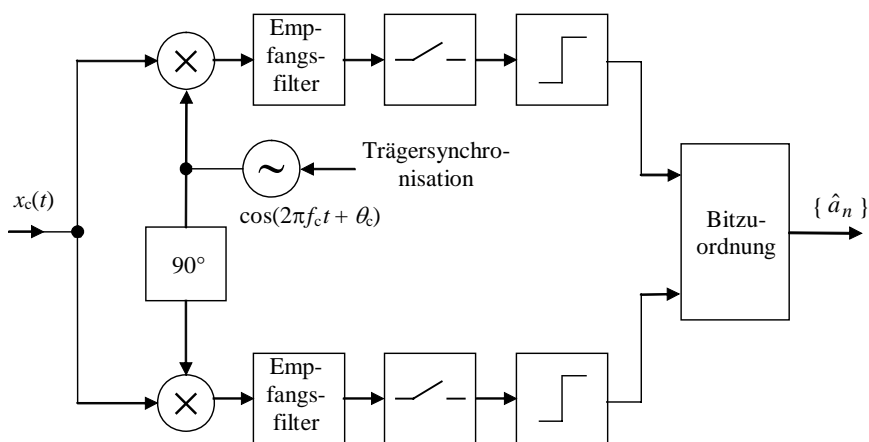


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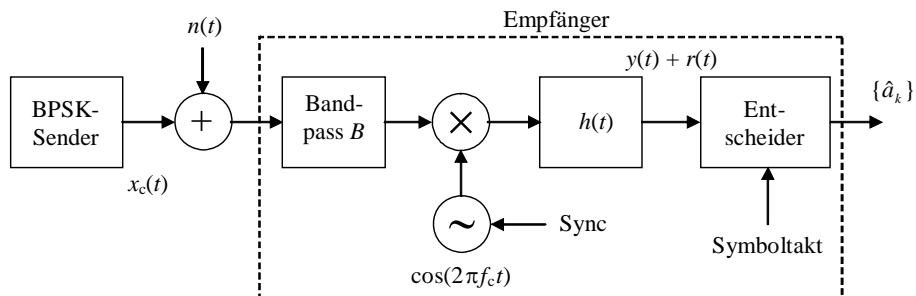


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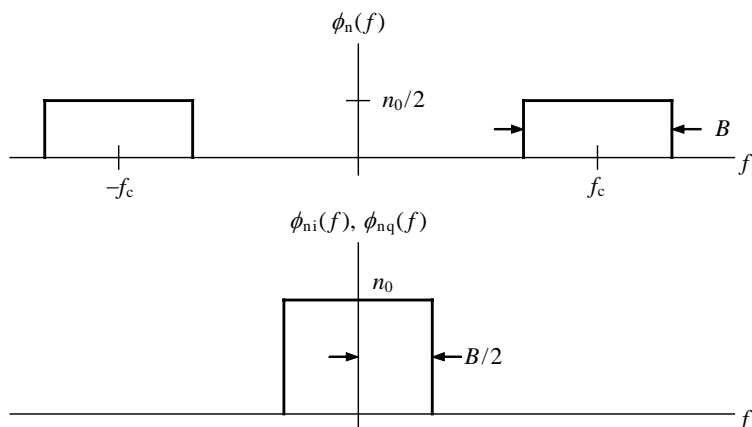


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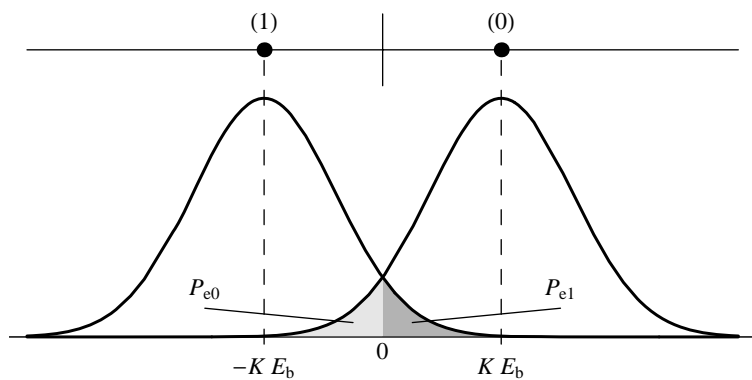


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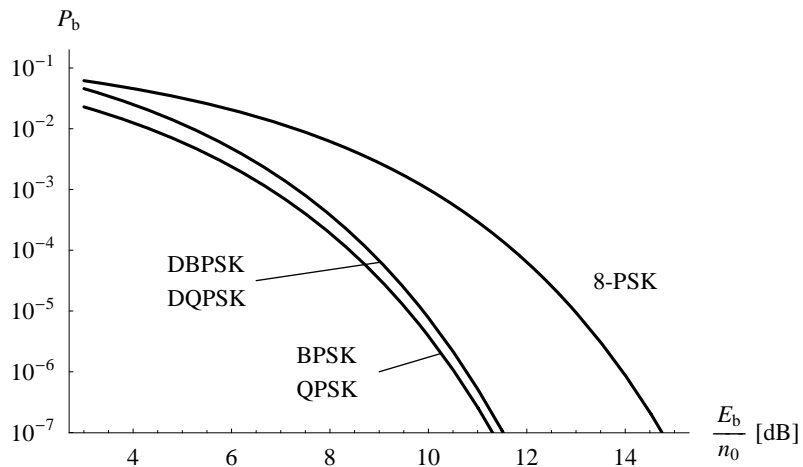


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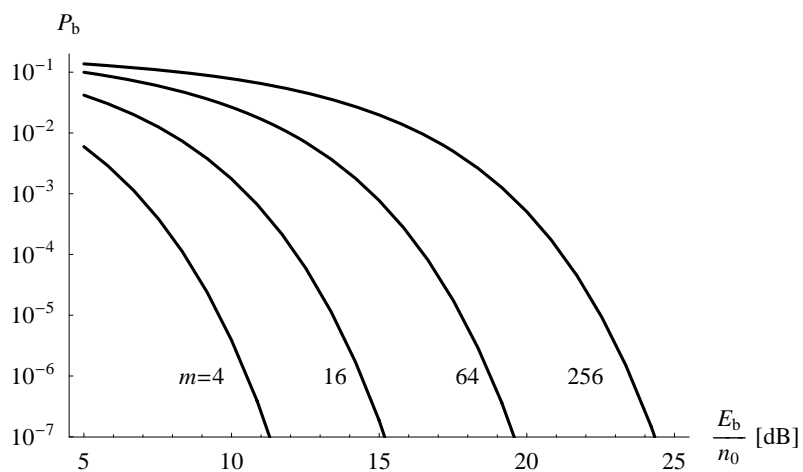


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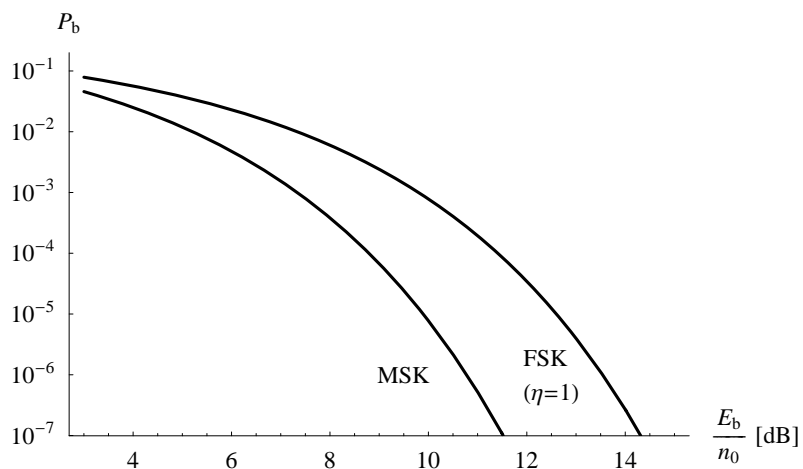


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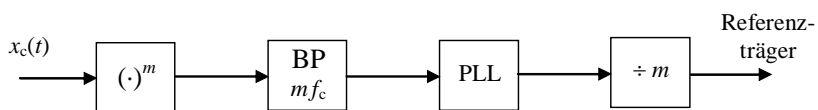


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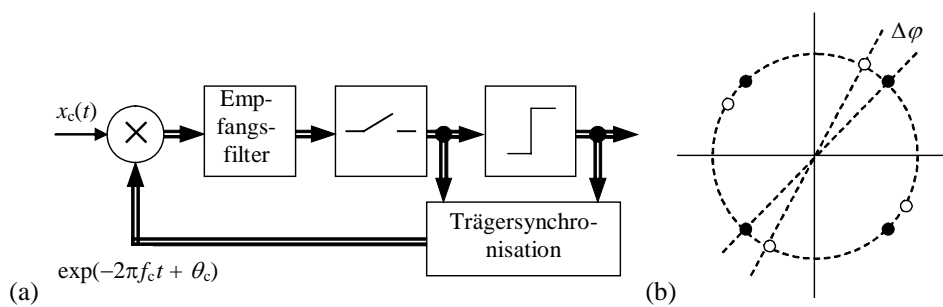


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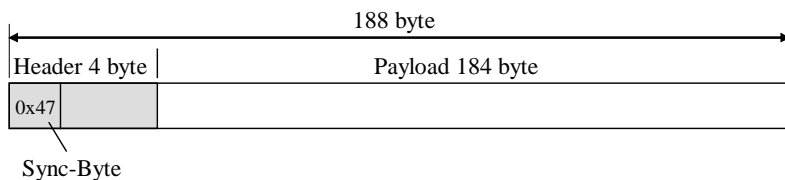


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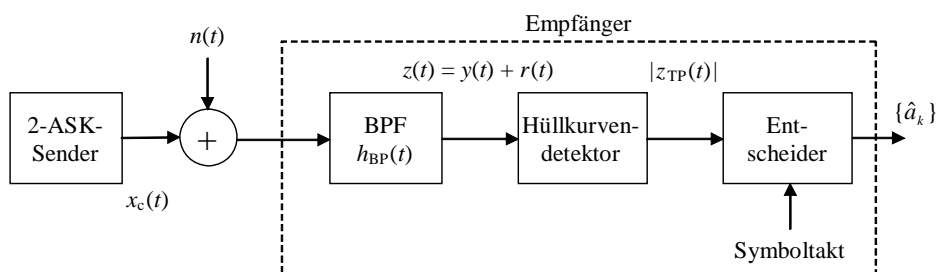


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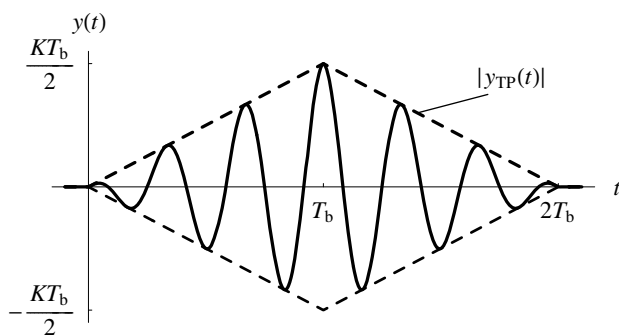


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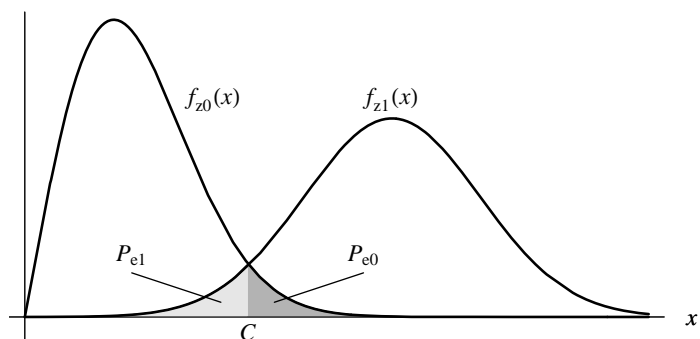


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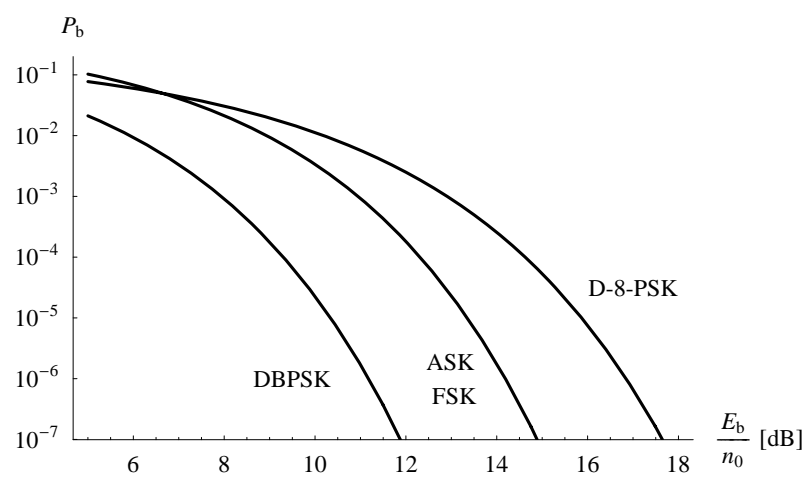


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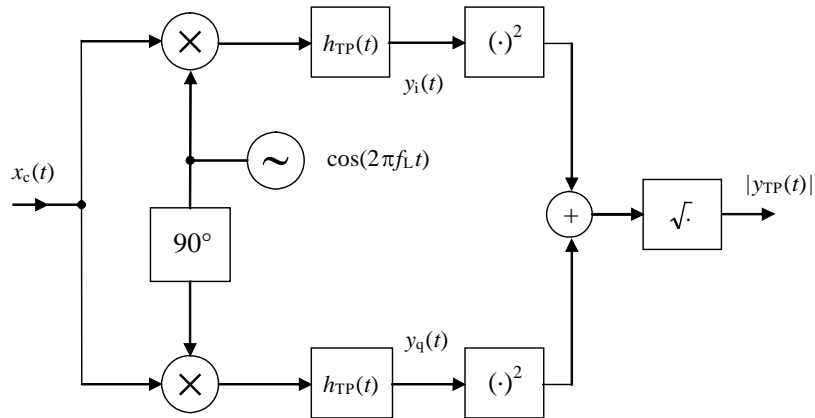


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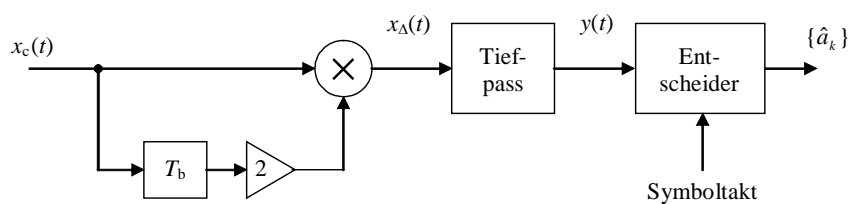


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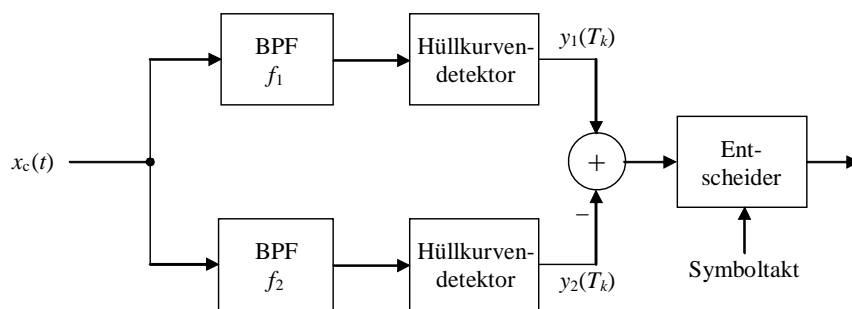


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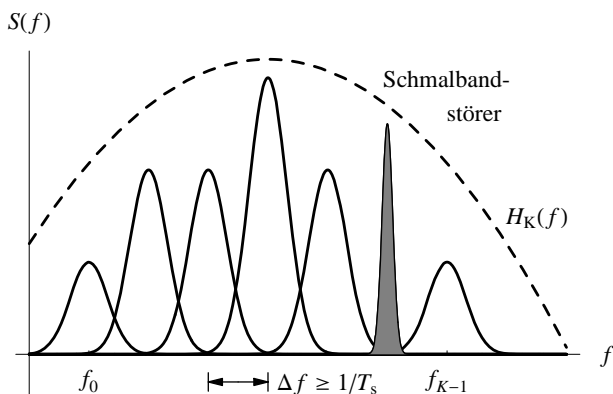


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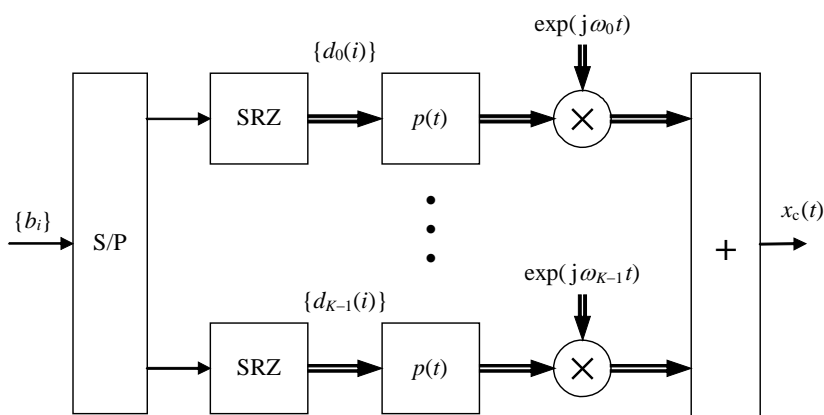


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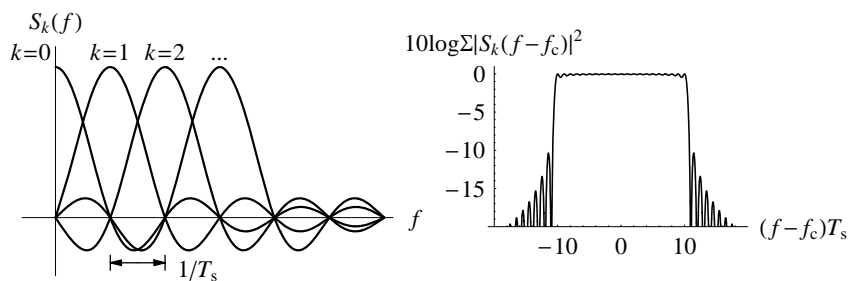


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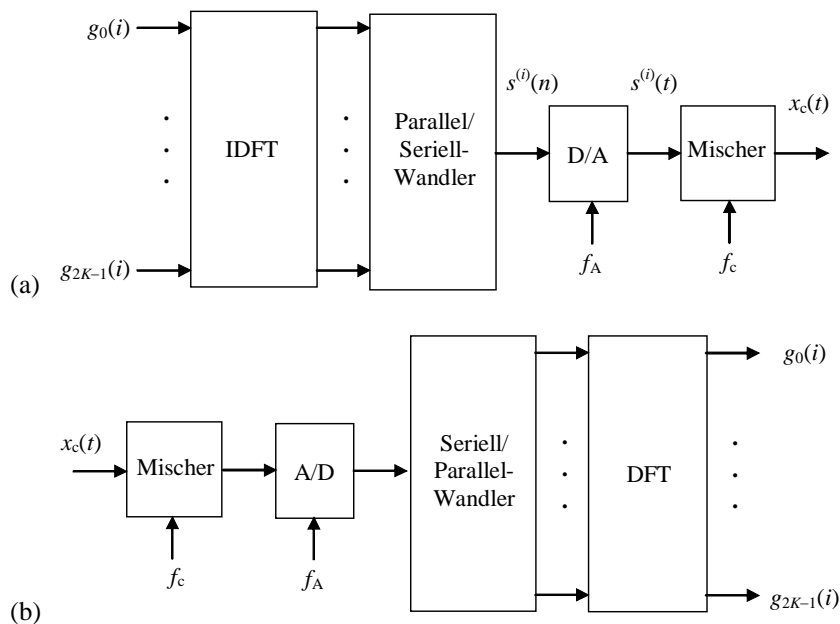


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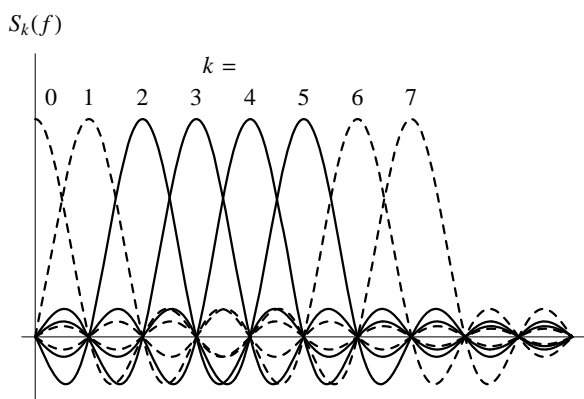


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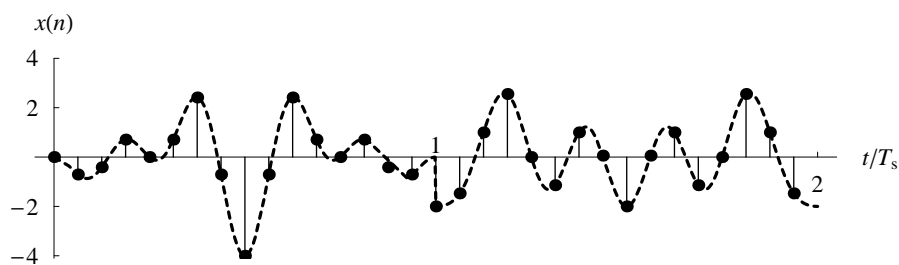


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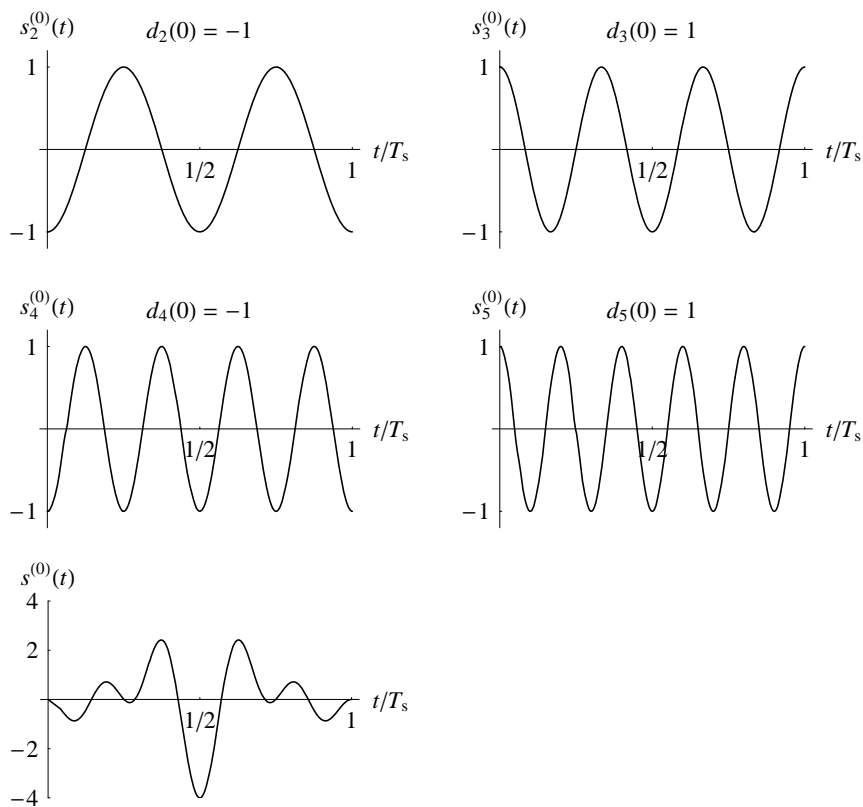


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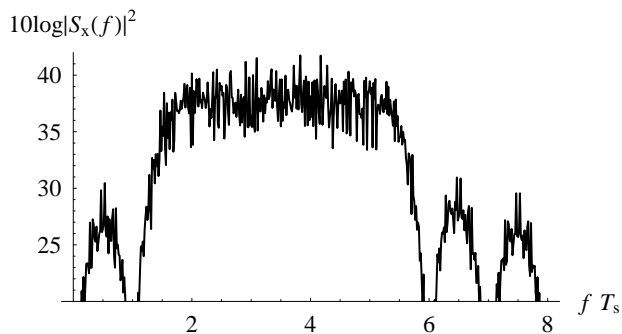


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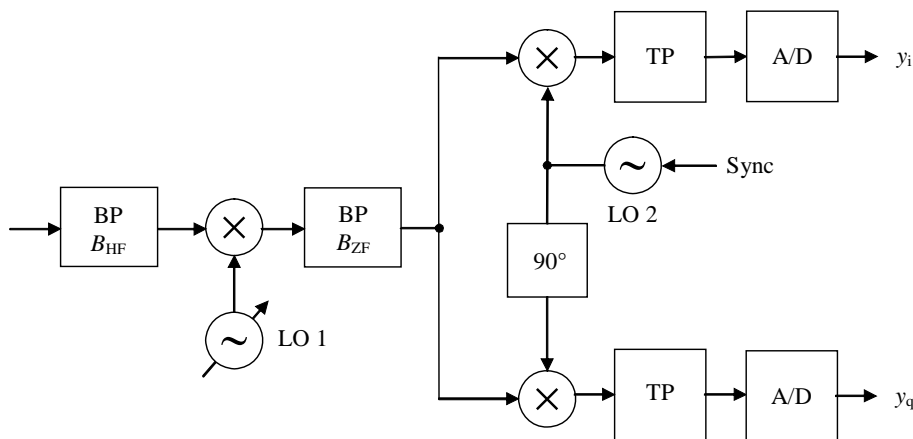


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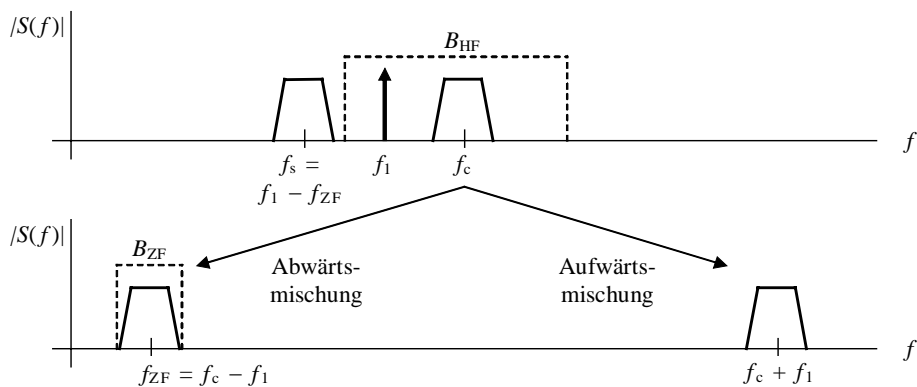


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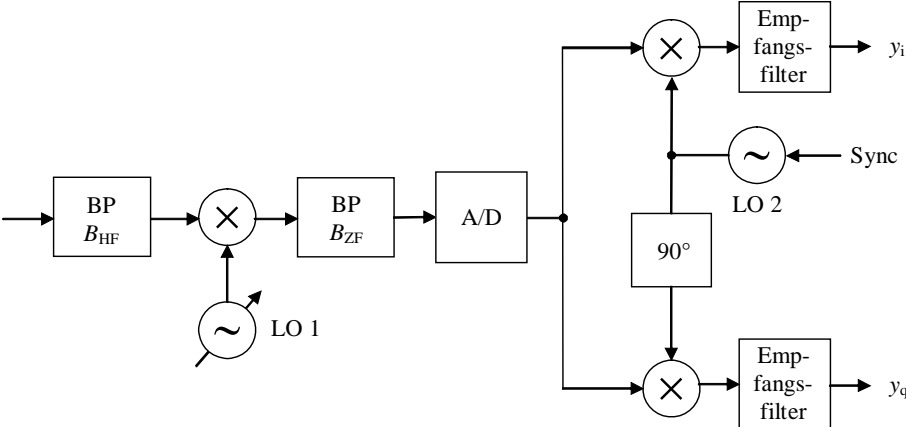


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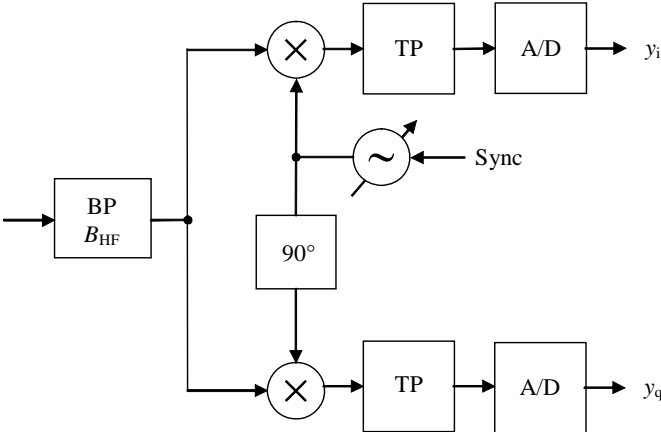


Bild 5-61

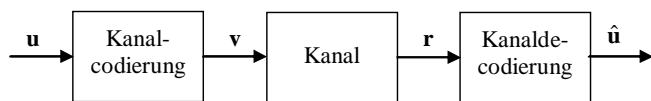


Bild 6-1

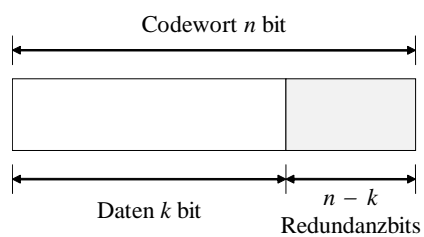


Bild 6-2

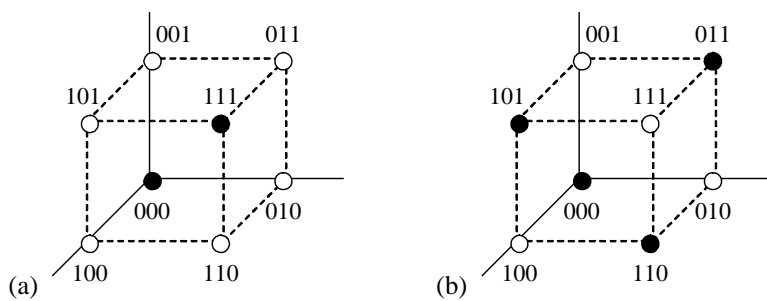


Bild 6-3

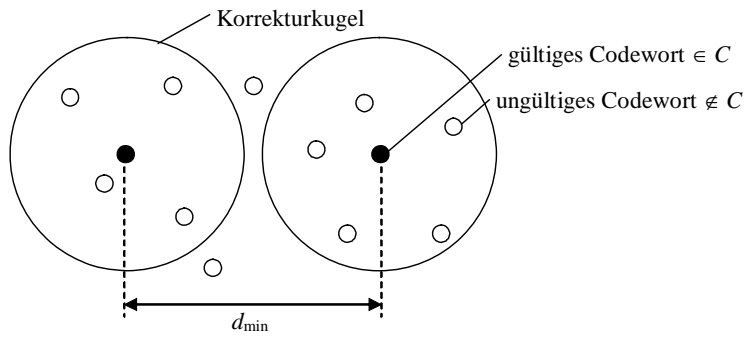


Bild 6-4

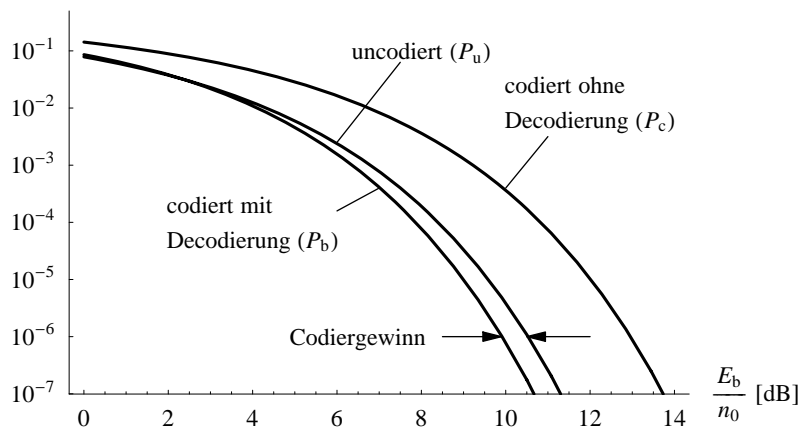


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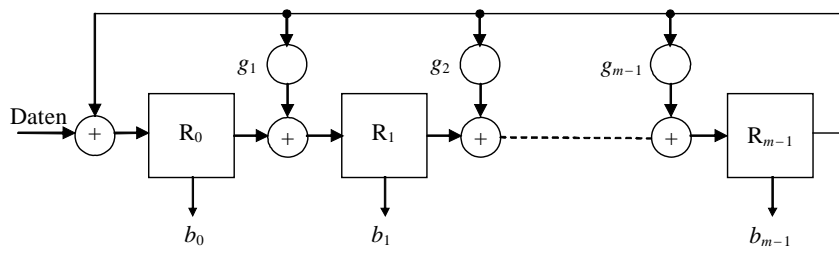


Bild 6-6

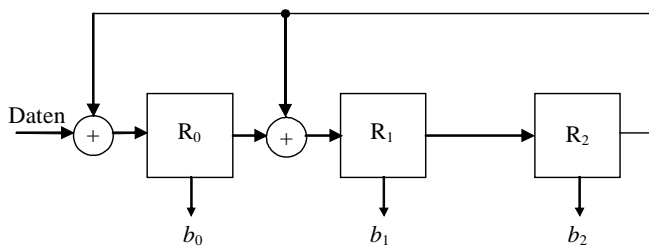


Bild 6-7

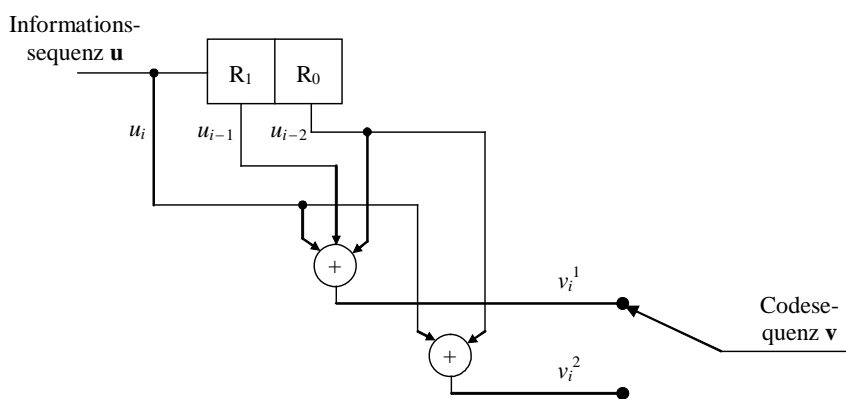


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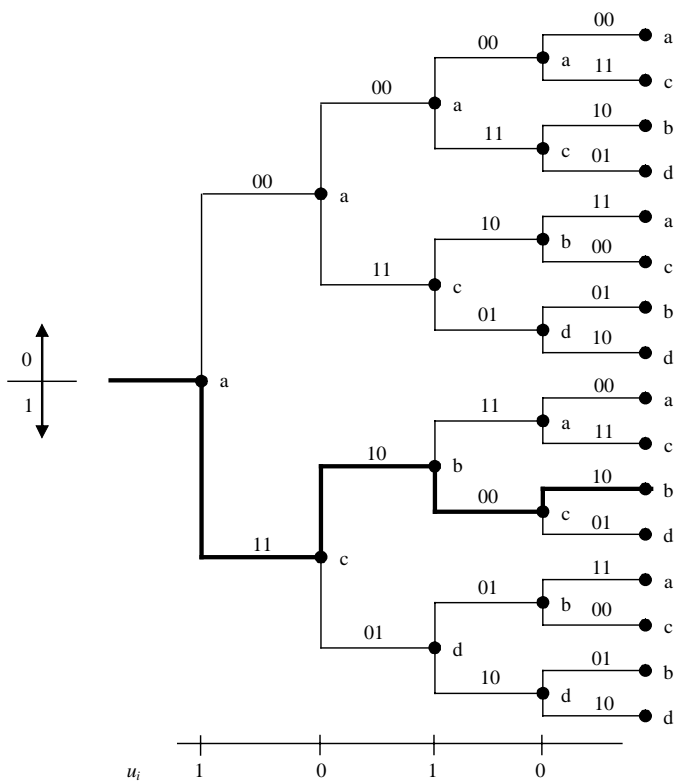


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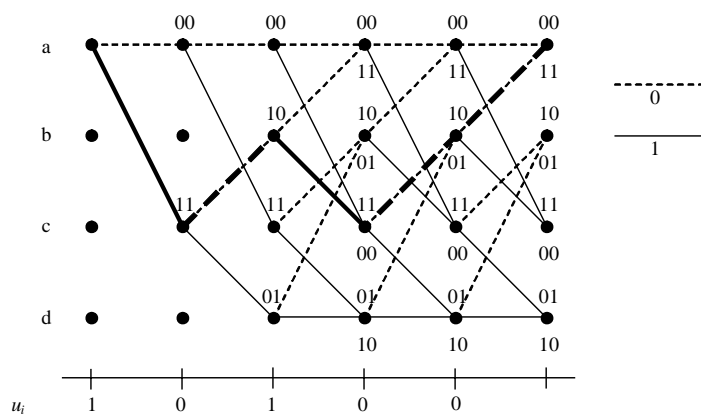


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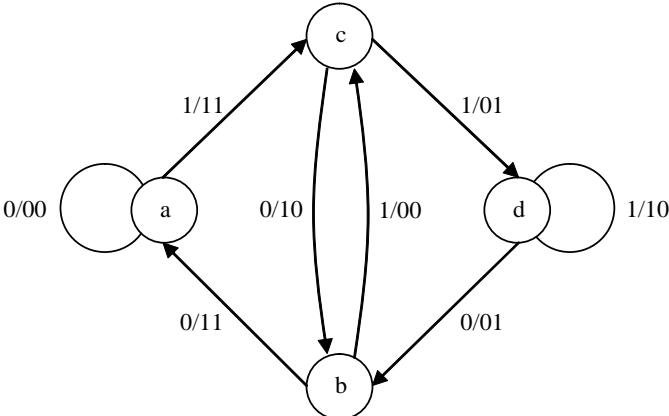


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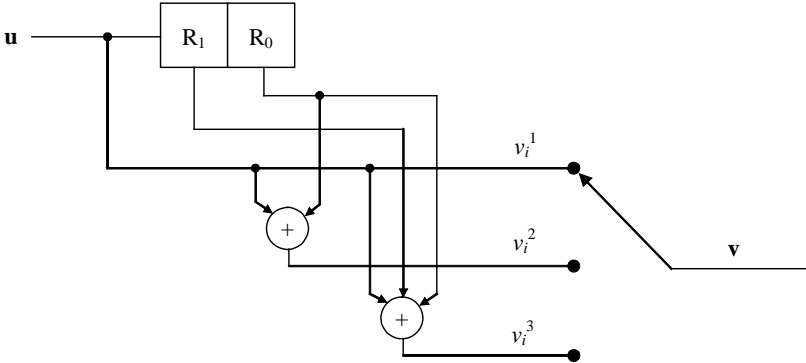


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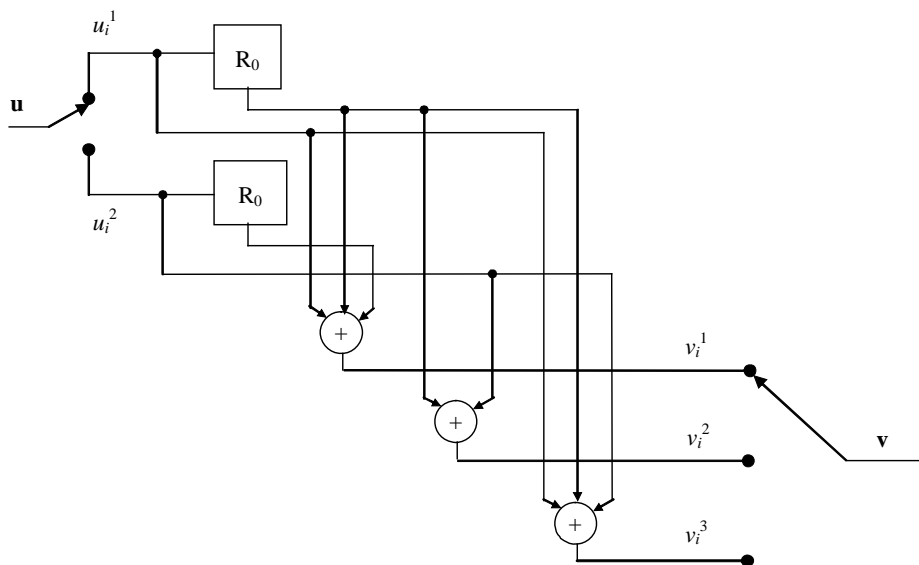


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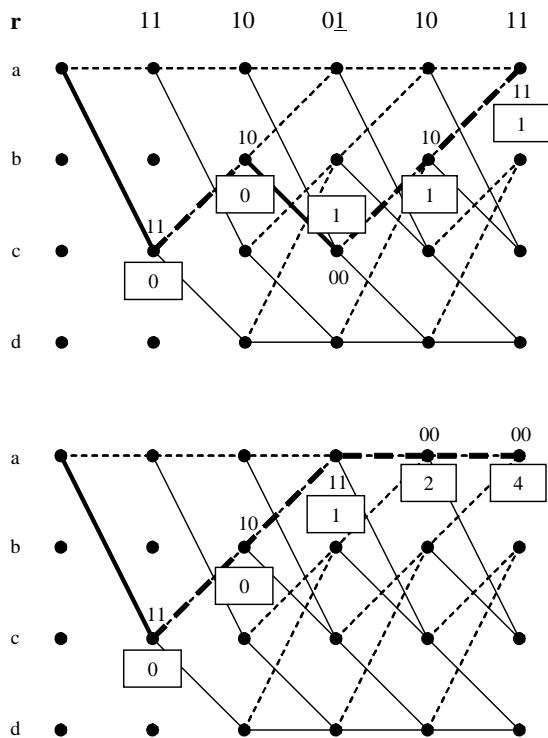


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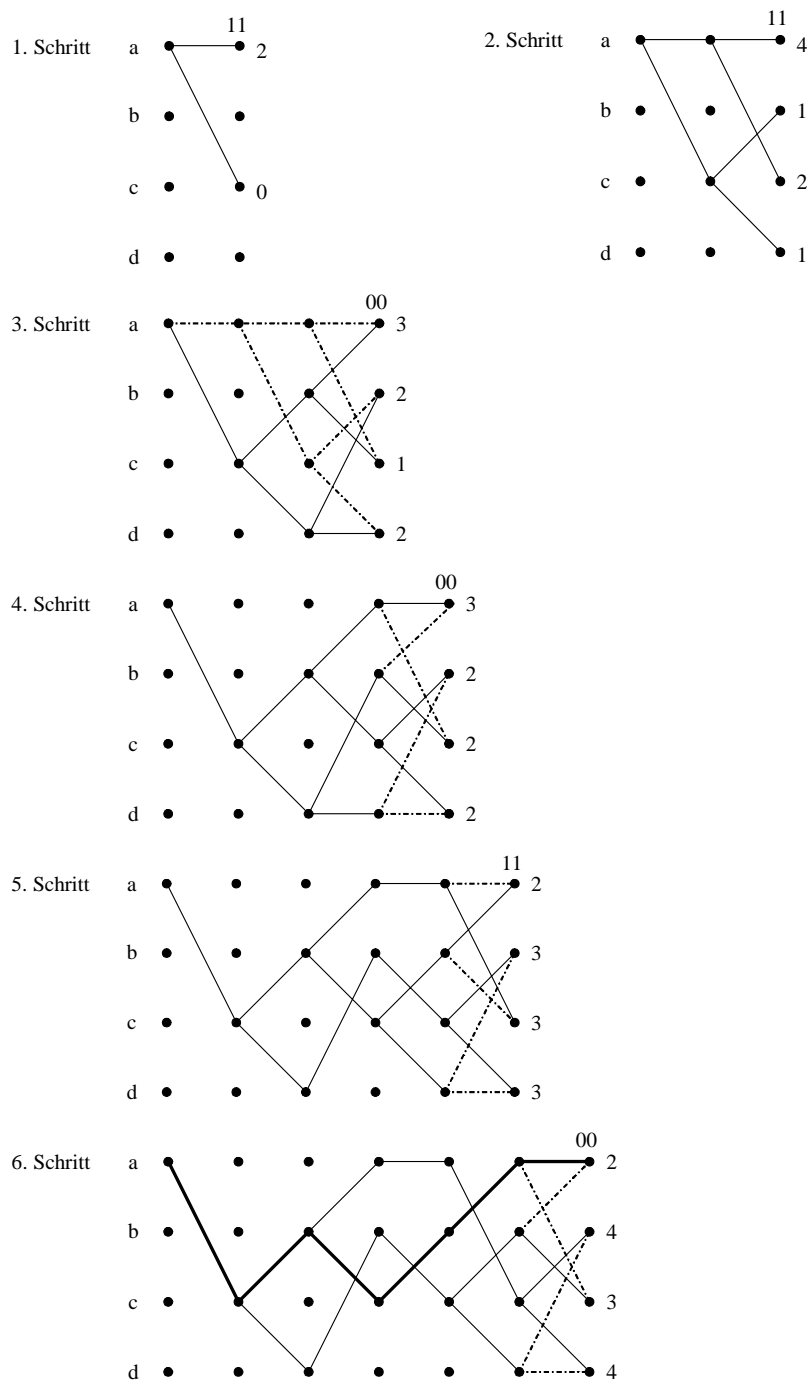


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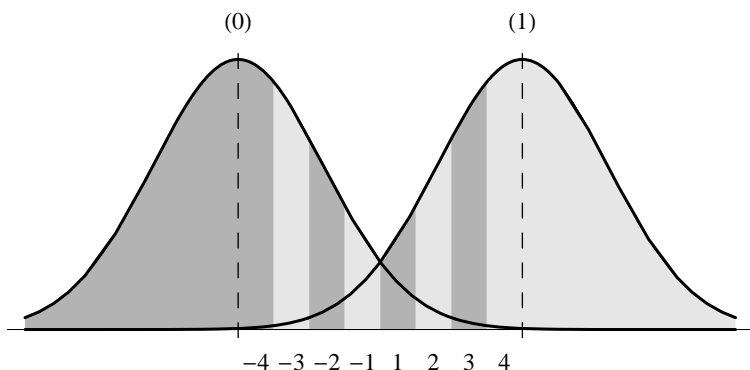


Bild 6-16

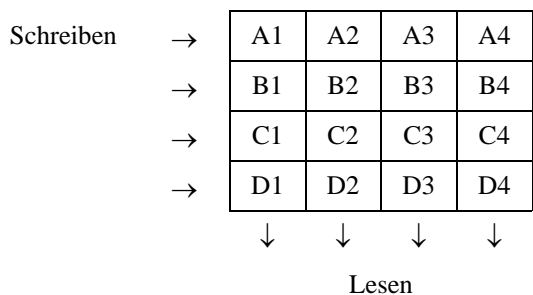


Bild 6-17

Zu übertragende Folge:

A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Gesendete Folge:

A1	B1	C1	D1	A2	B2	C2	D2	A3	B3	C3	D3	A4	B4	C4	D4
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Empfangene Folge nach dem Deinterleaver:

A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Bild 6-18

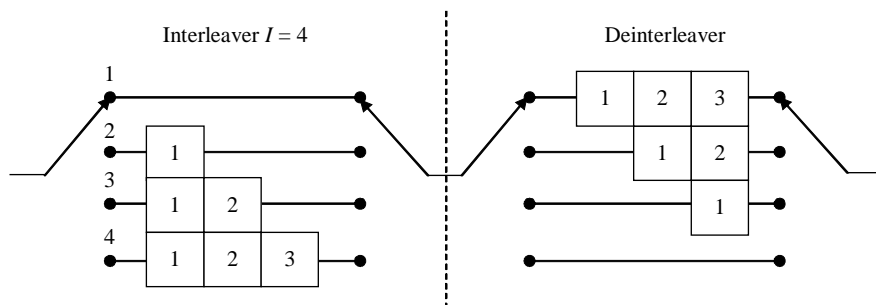


Bild 6-19

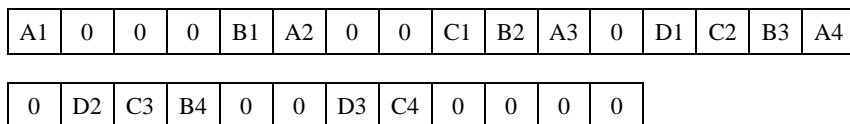


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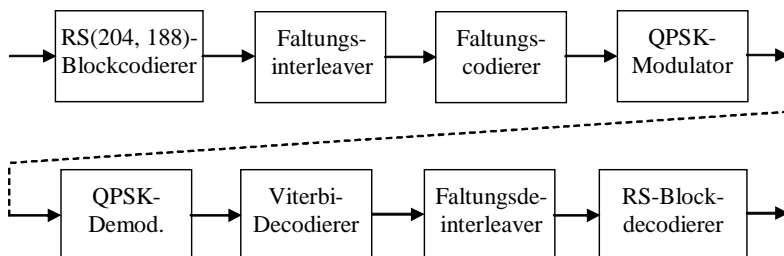


Bild 6-21

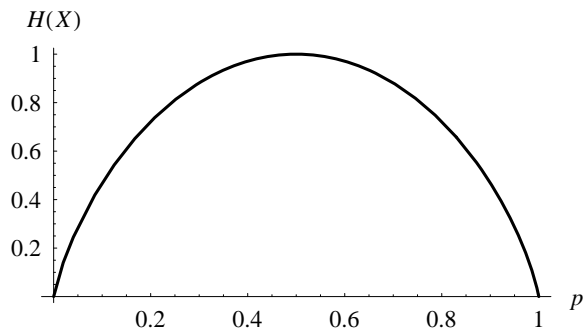


Bild 7-1

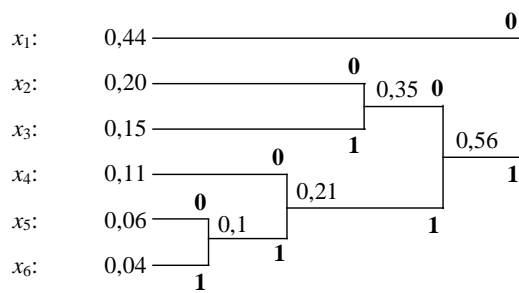


Bild 7-2

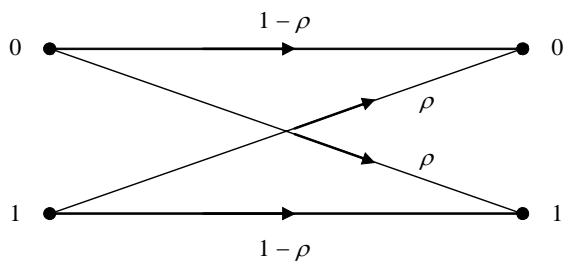


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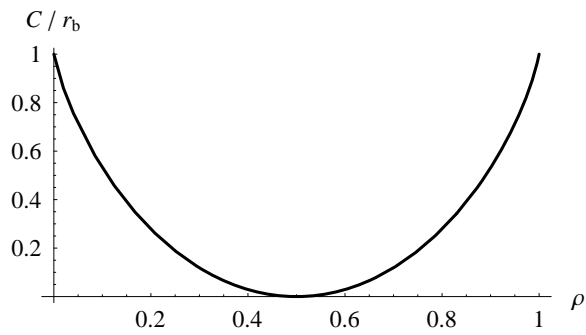


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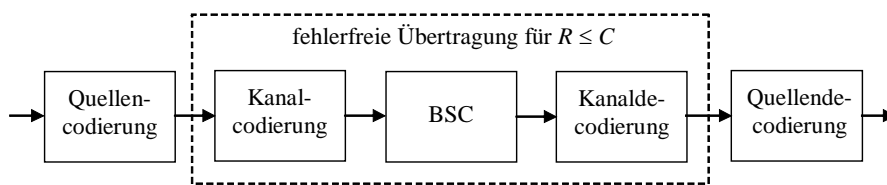


Bild 7-5

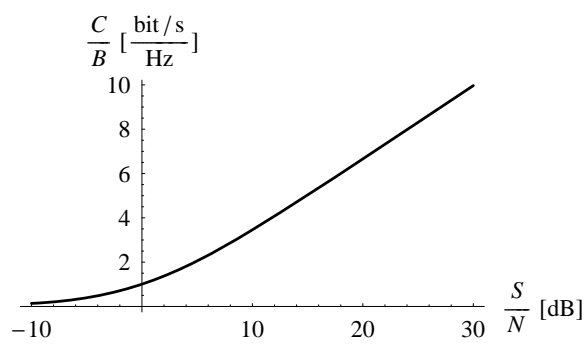


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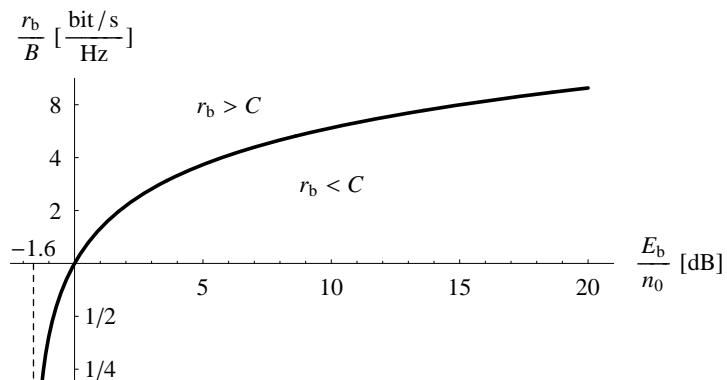


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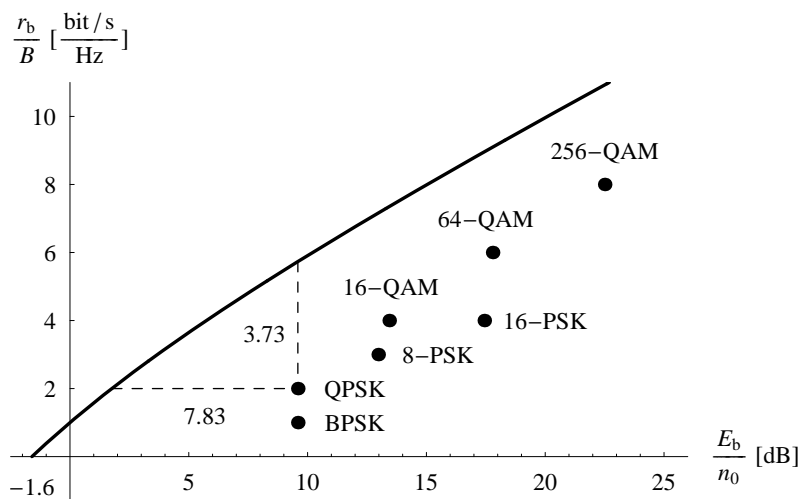


Bild 7-8

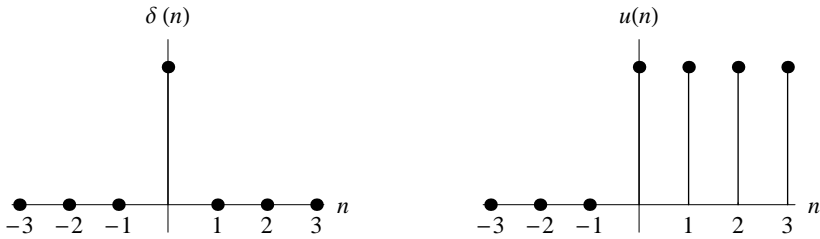


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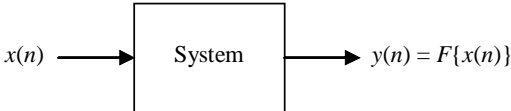


Bild 8-2



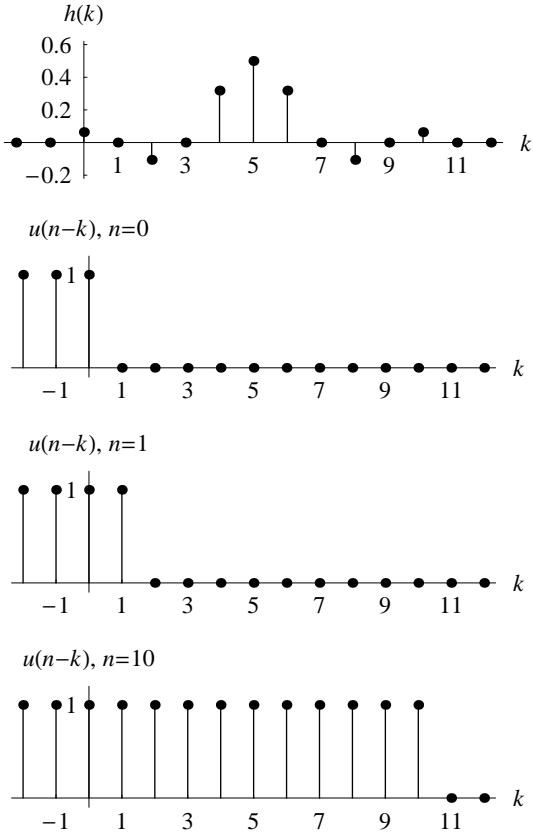


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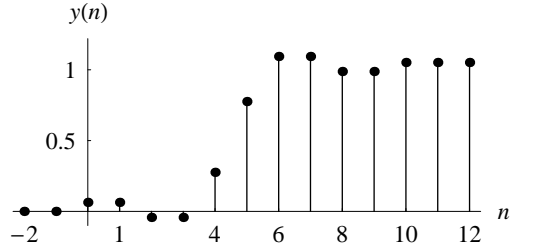


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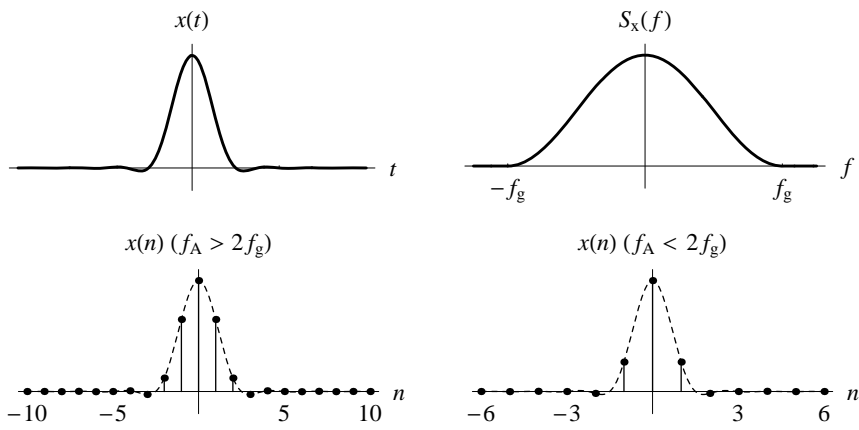


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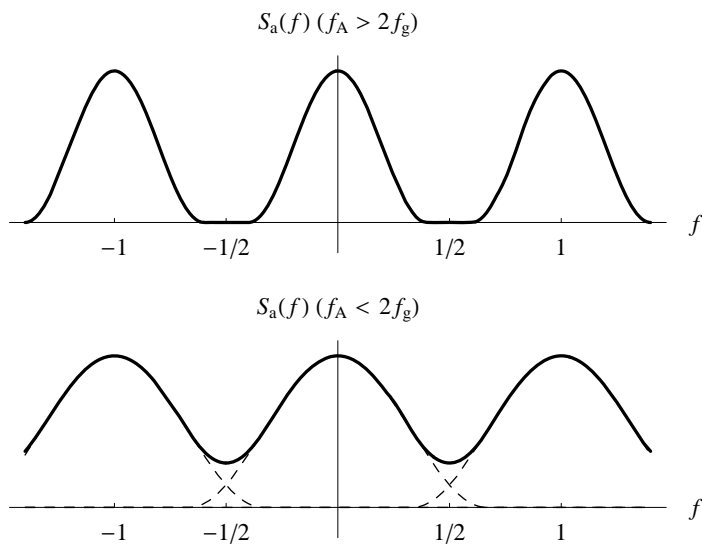


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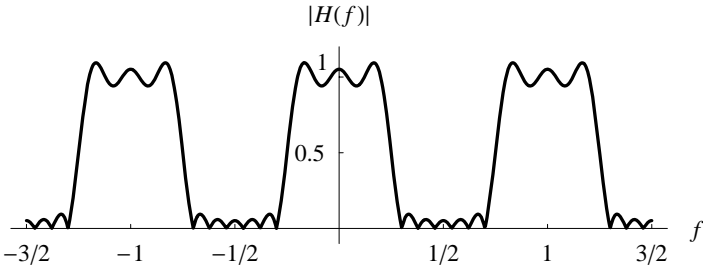


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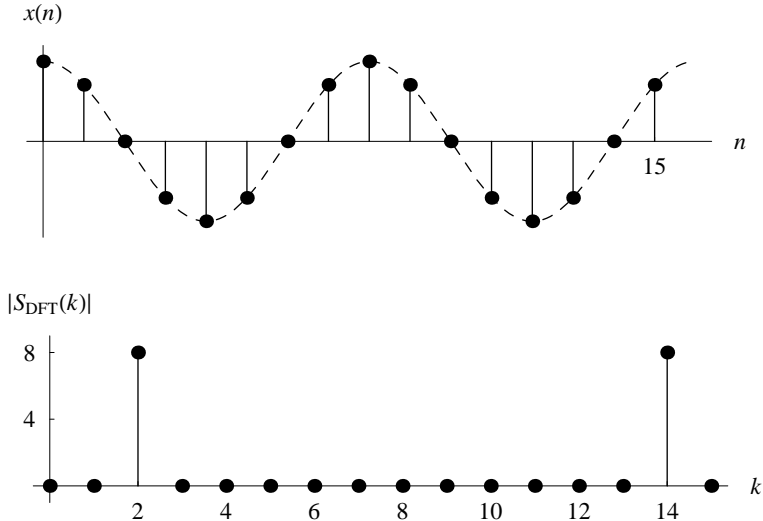


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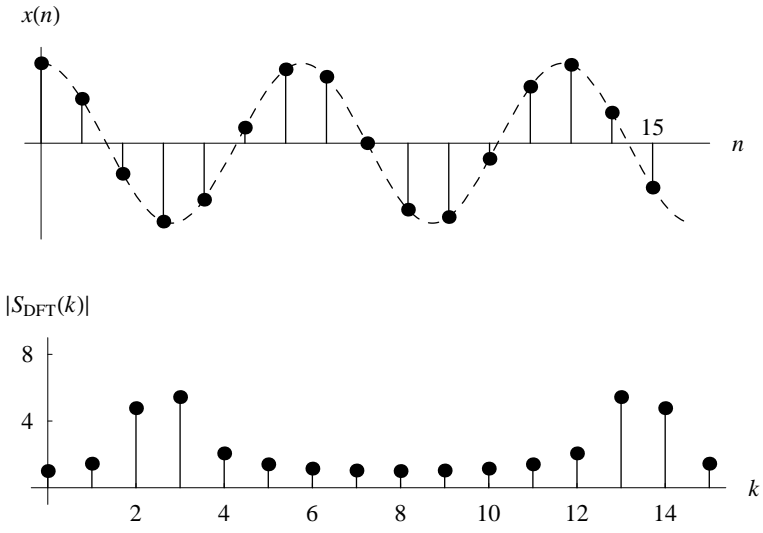


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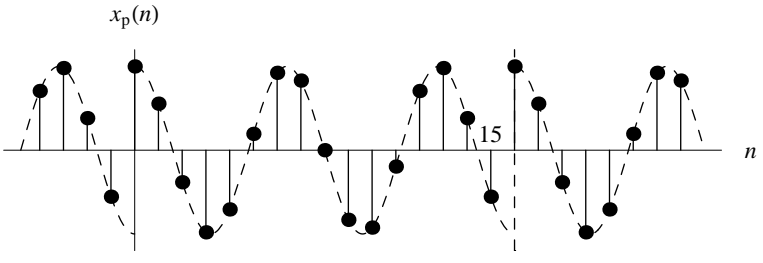


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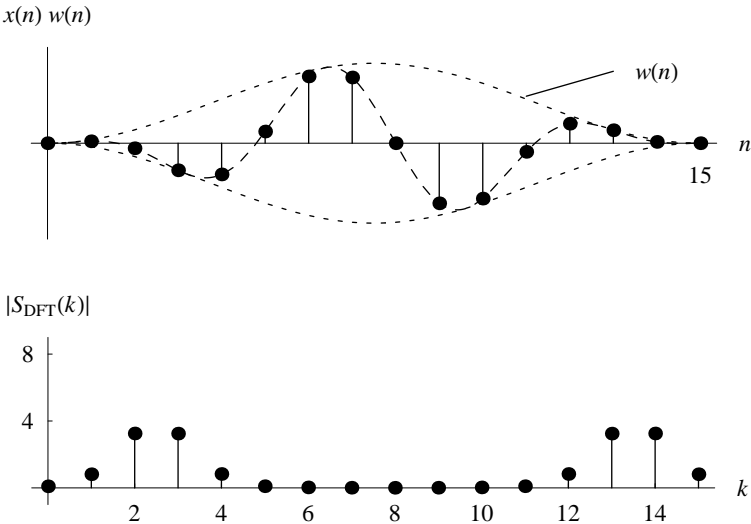


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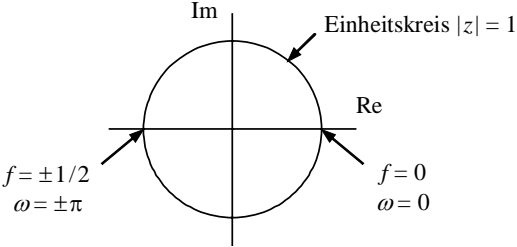


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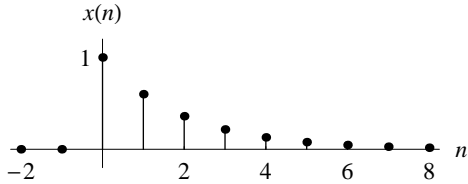


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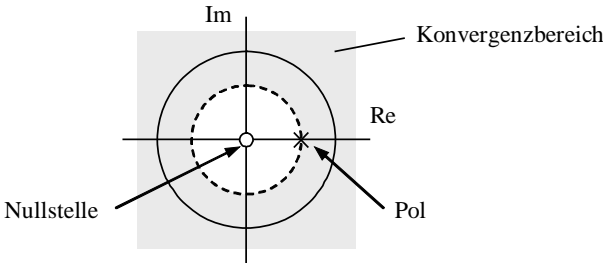


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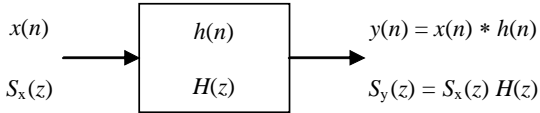


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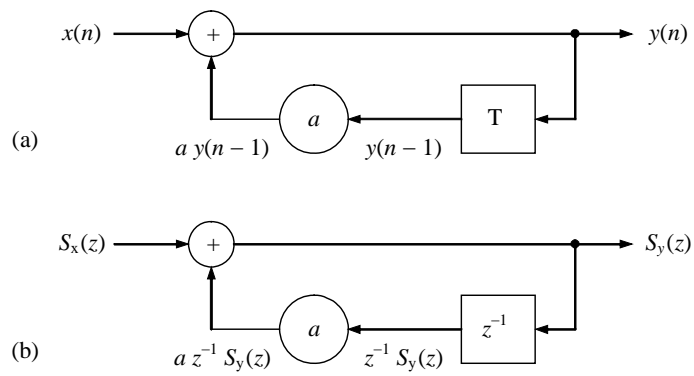


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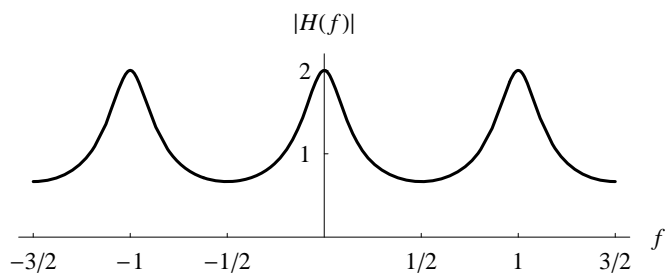


Bild 8-17

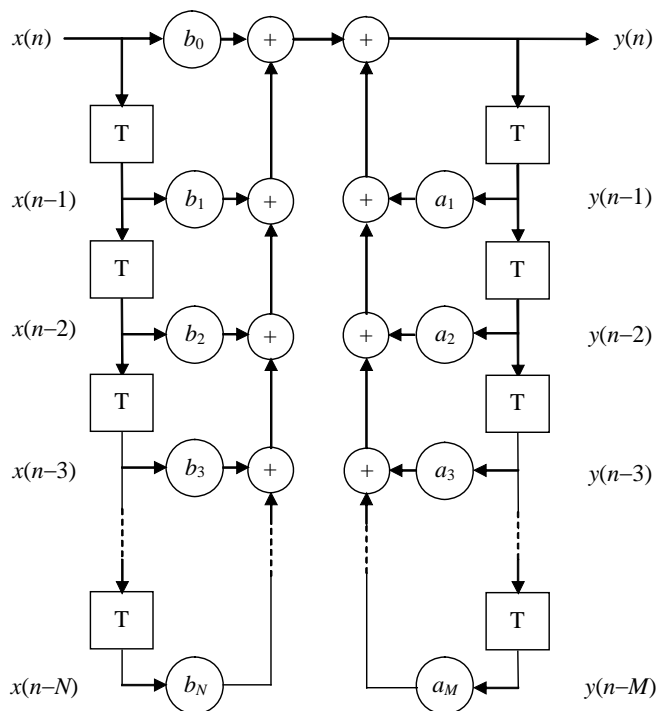


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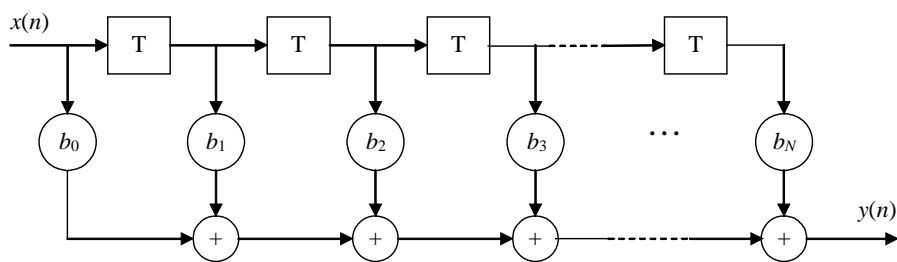


Bild 8-19



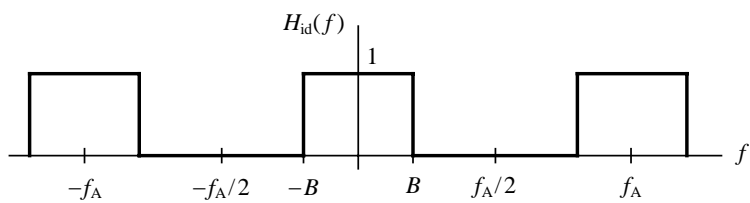


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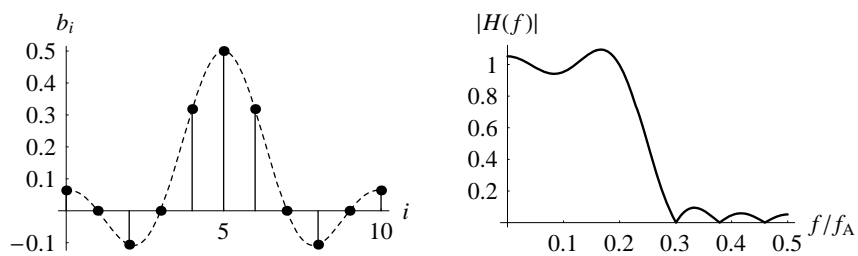


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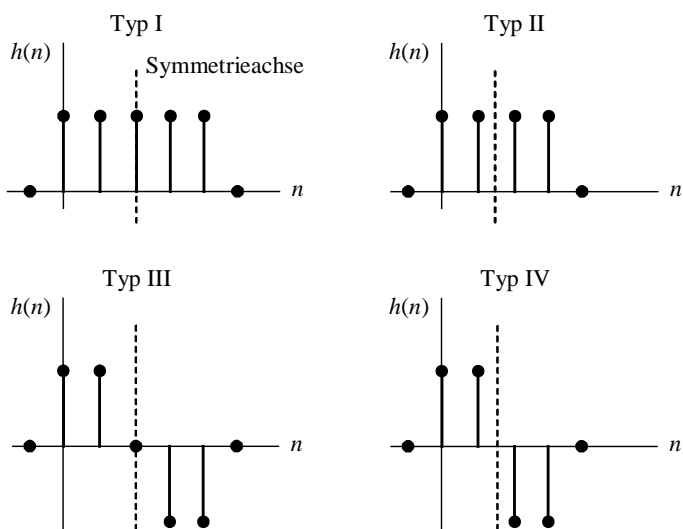


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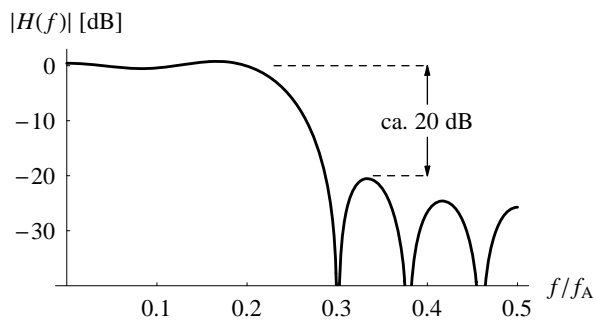


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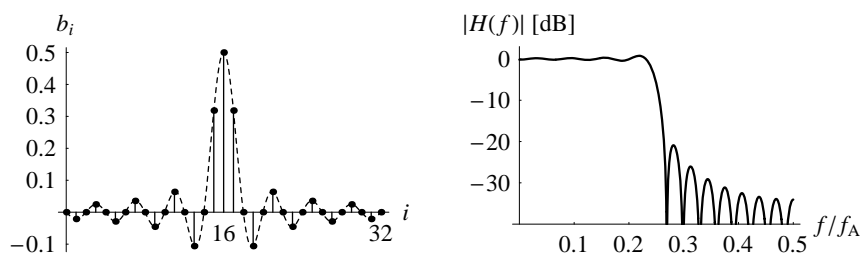


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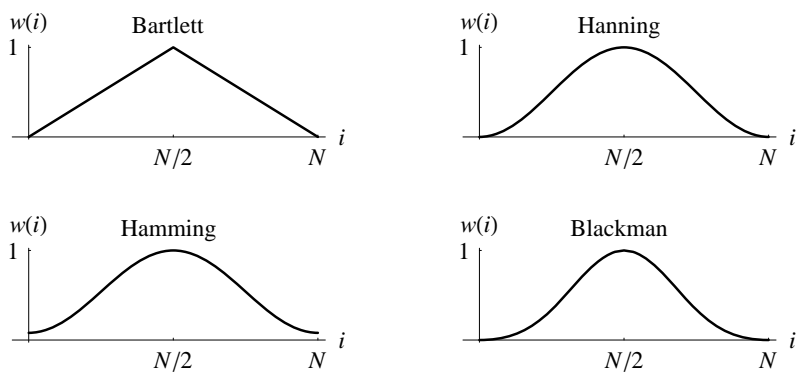


Bild 8-25

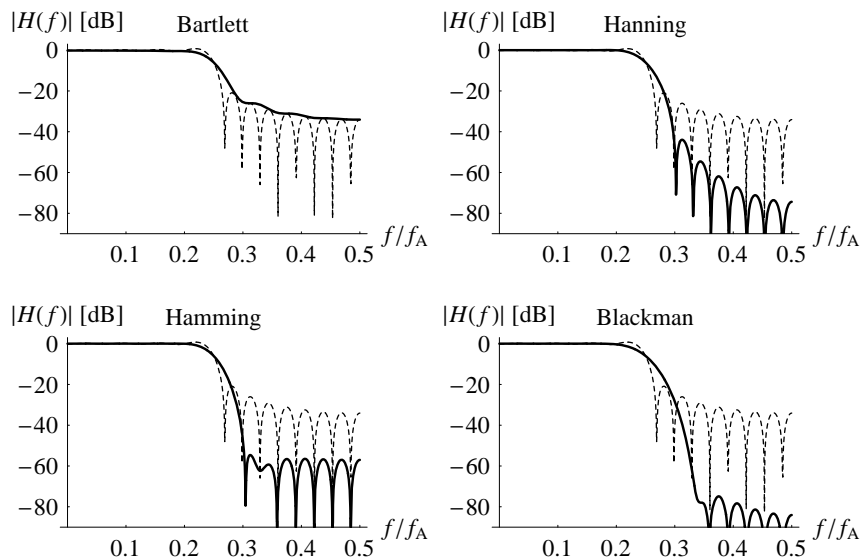


Bild 8-26

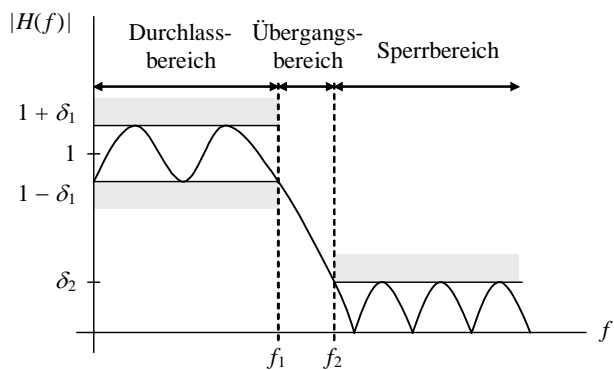


Bild 8-27

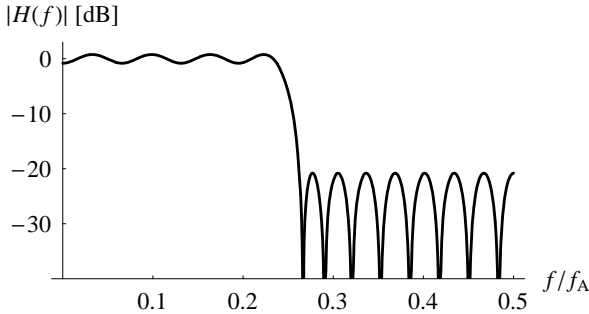


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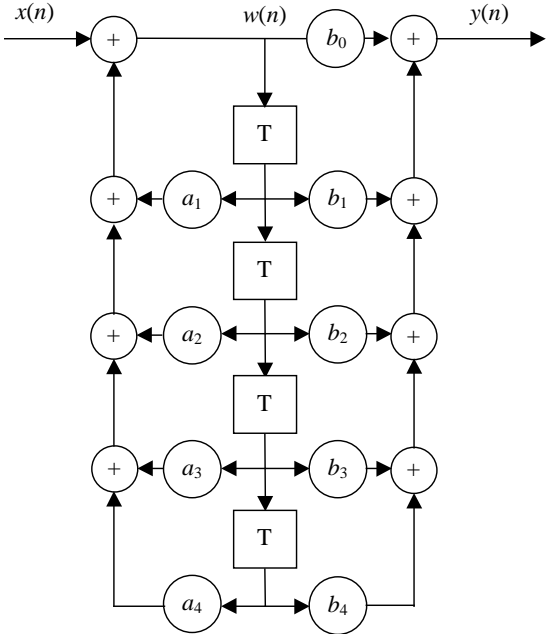


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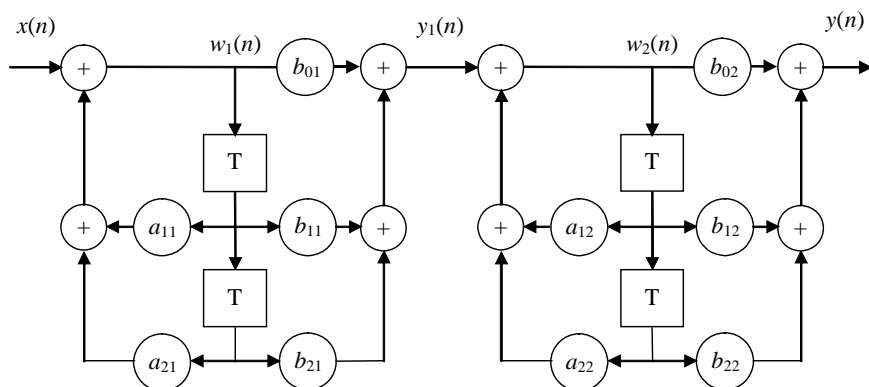


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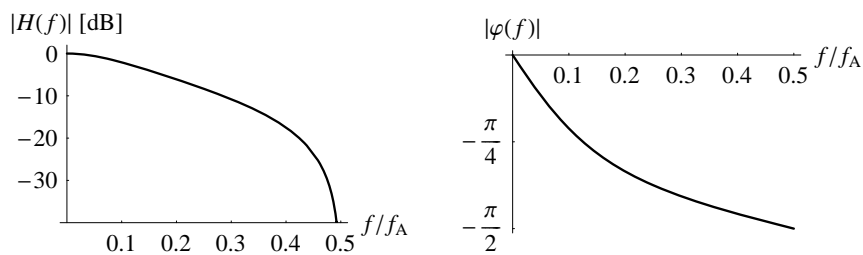


Bild 8-31

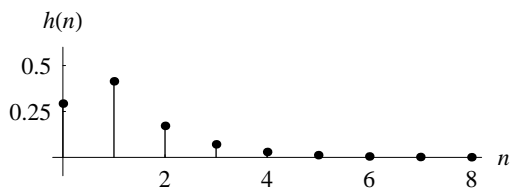


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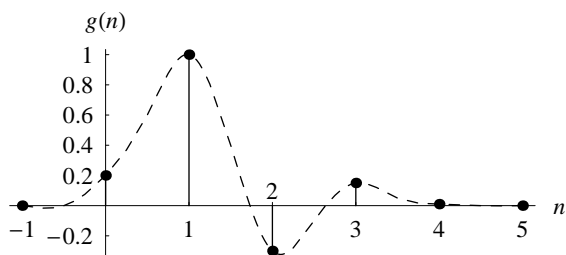


Bild 8-33

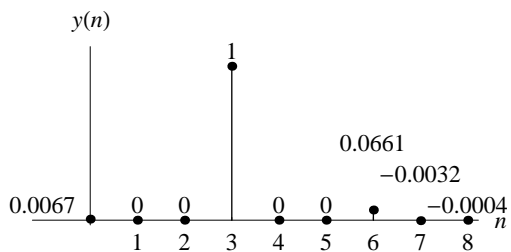


Bild 8-34

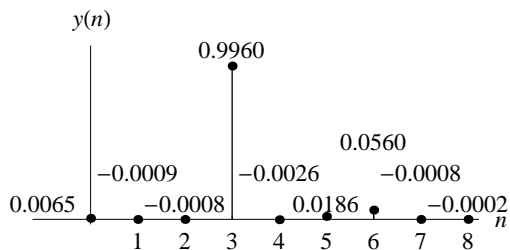


Bild 8-35

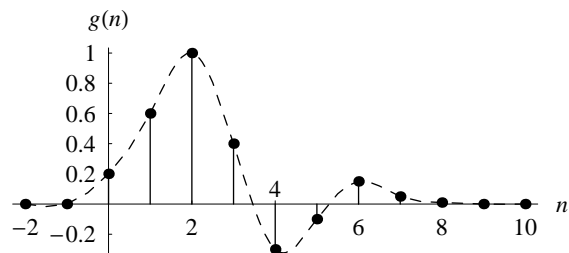


Bild 8-36

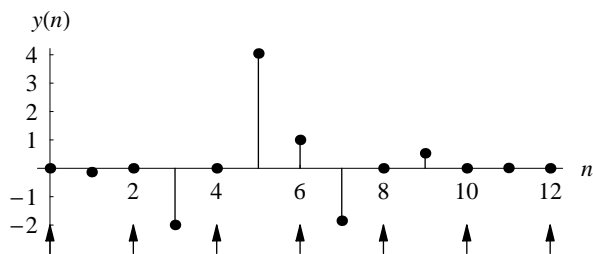


Bild 8-37

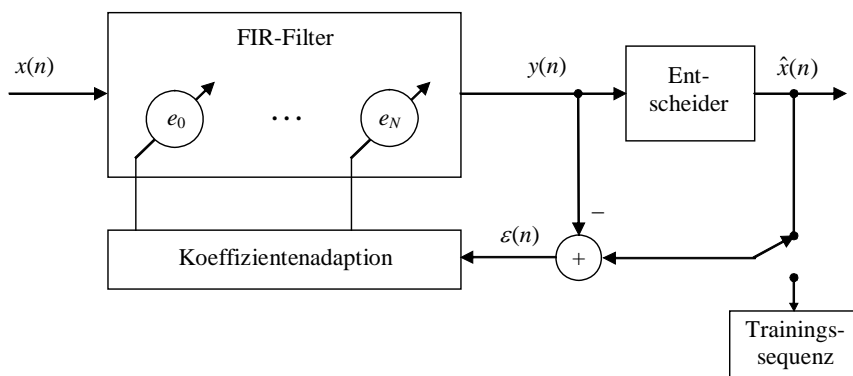


Bild 8-38

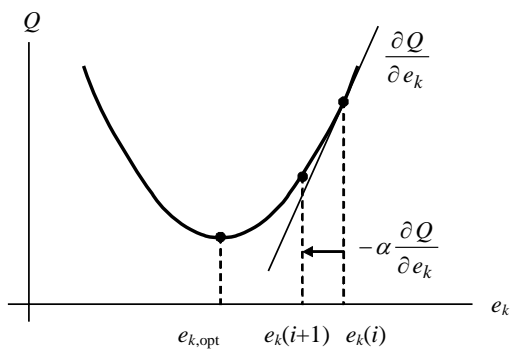


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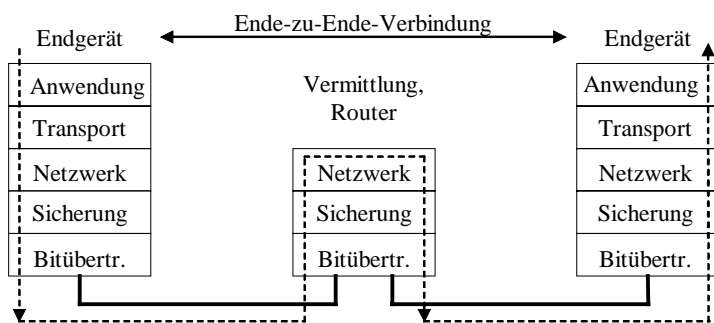
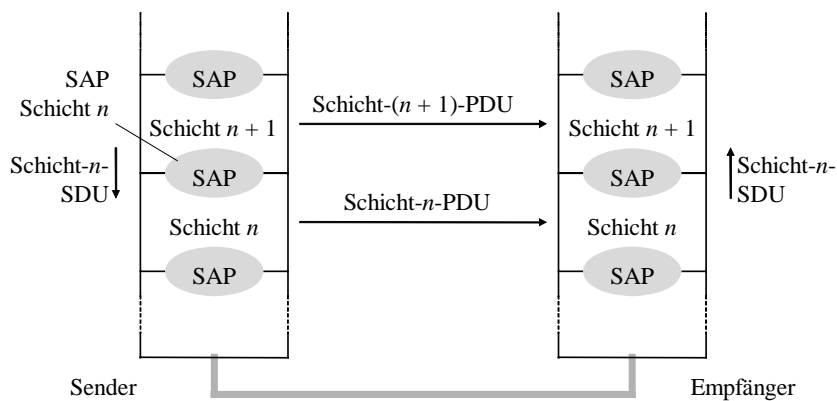


Bild 9-1



SAP: Service Access Point  
 SDU: Service Data Unit  
 PDU: Protocol Data Unit

Bild 9-2

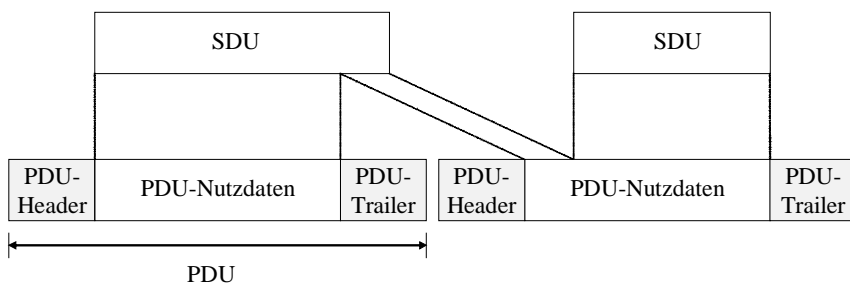


Bild 9-3



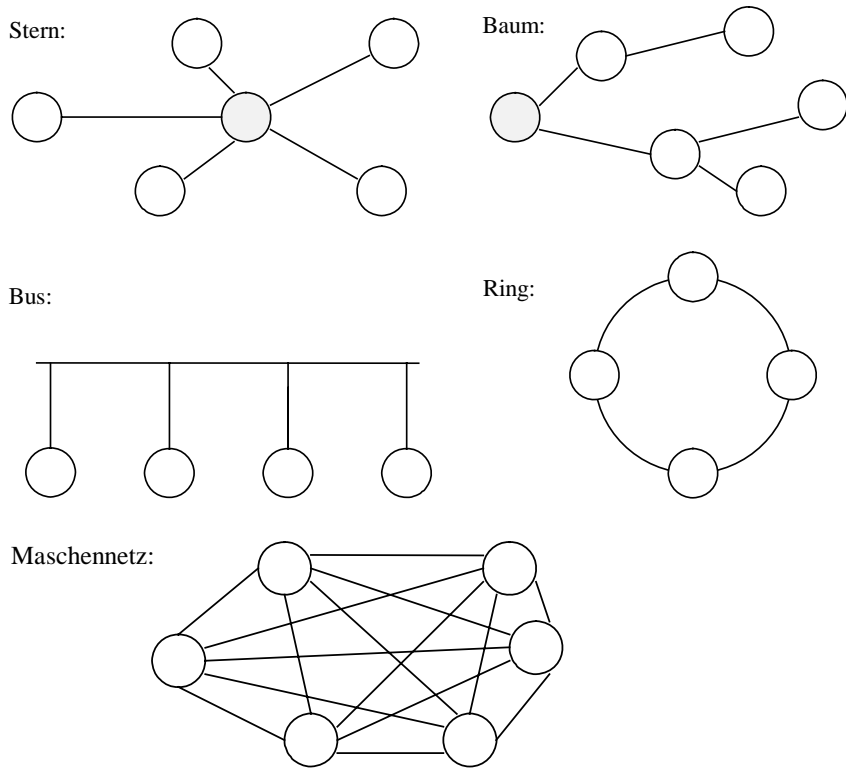


Bild 9-4

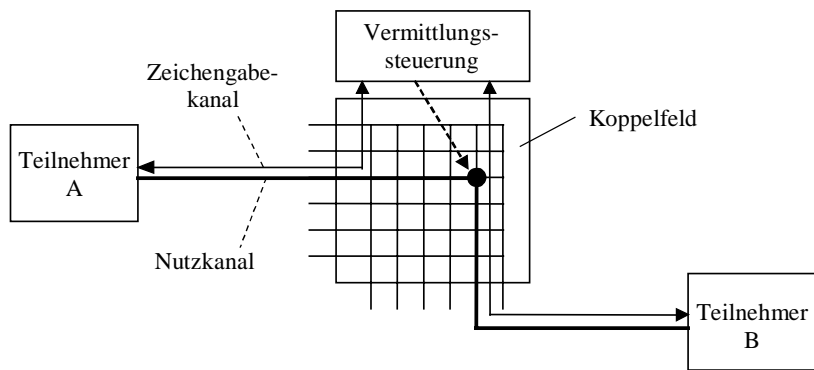


Bild 9-5

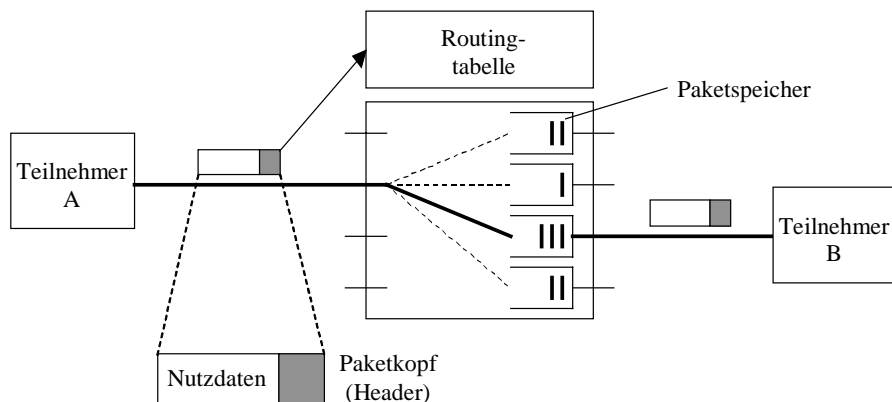


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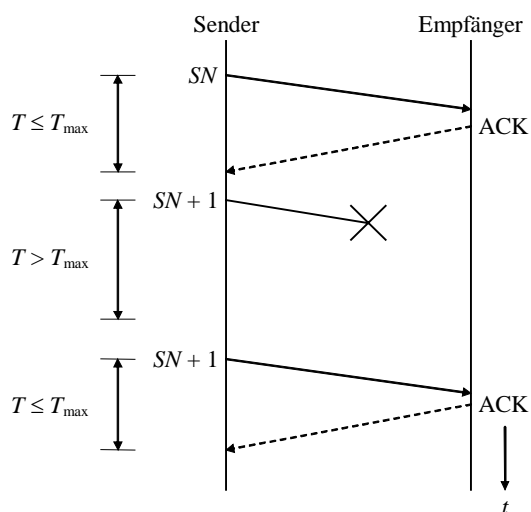


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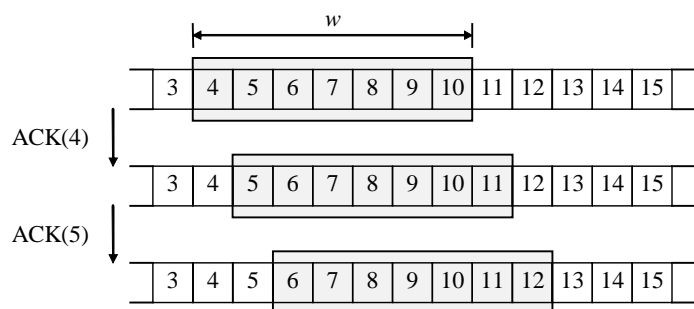


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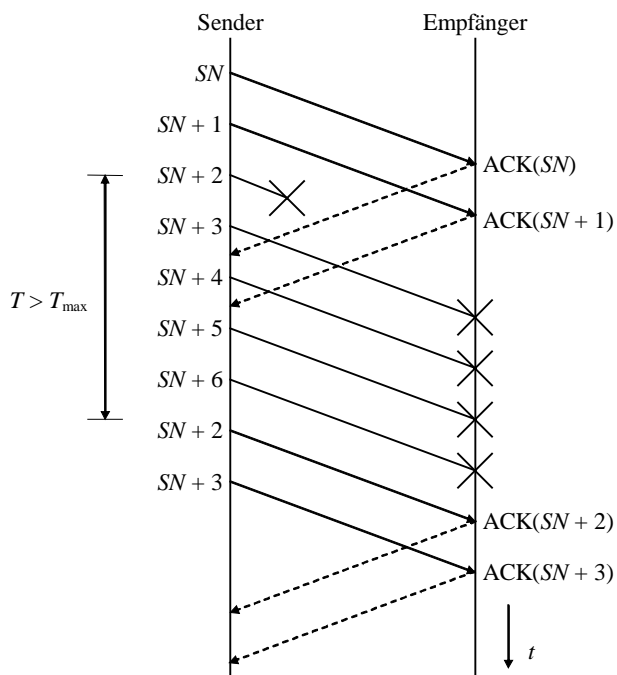


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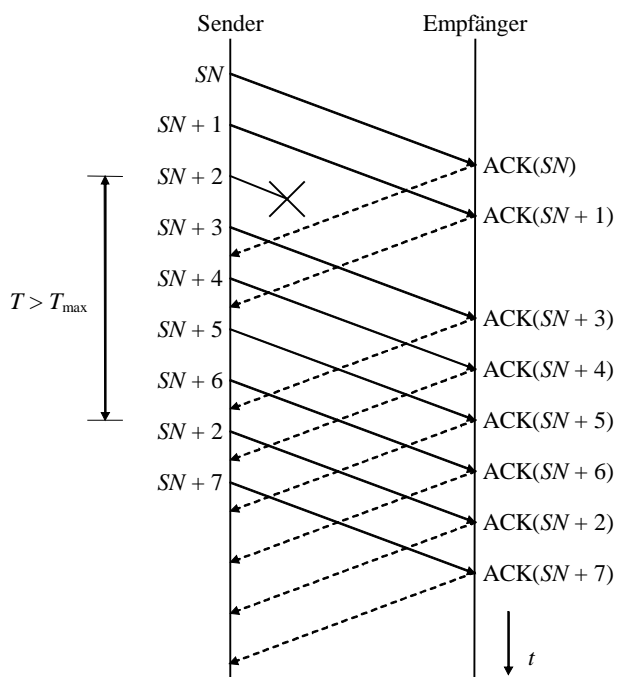


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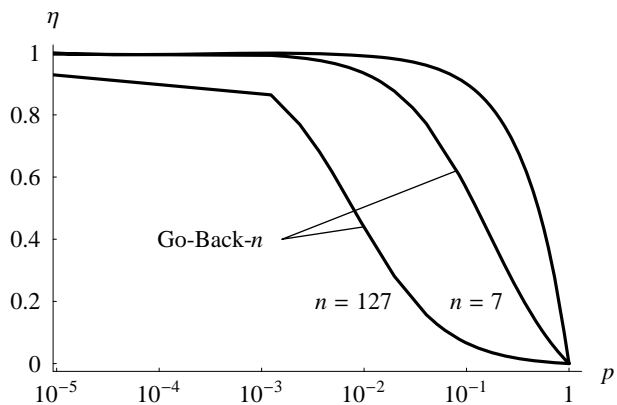


Bild 9-11

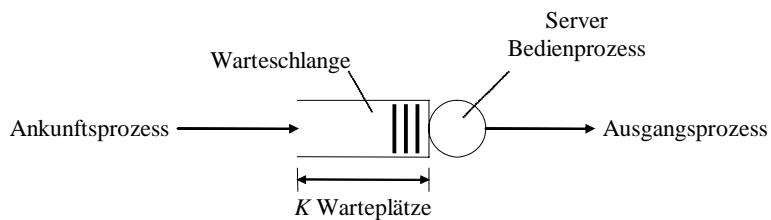


Bild 9-12

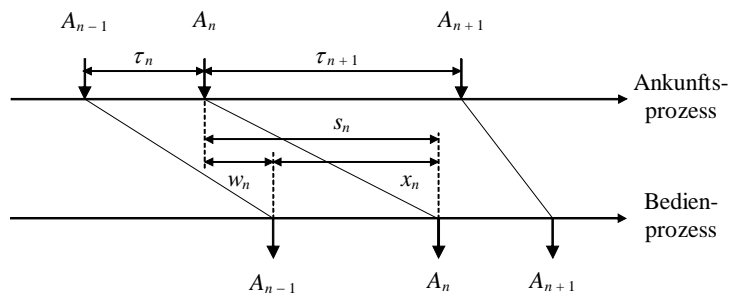


Bild 9-13

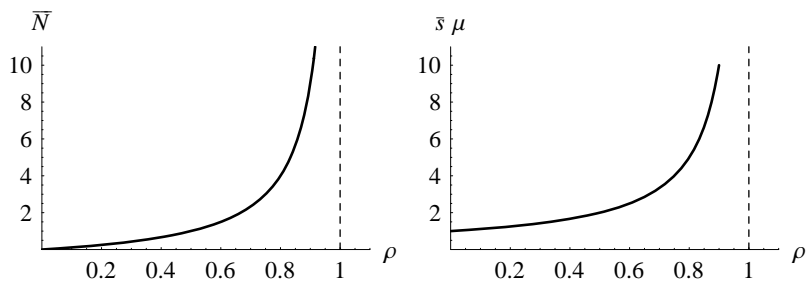


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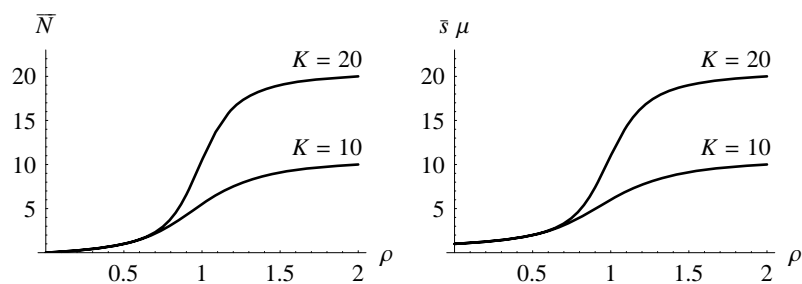


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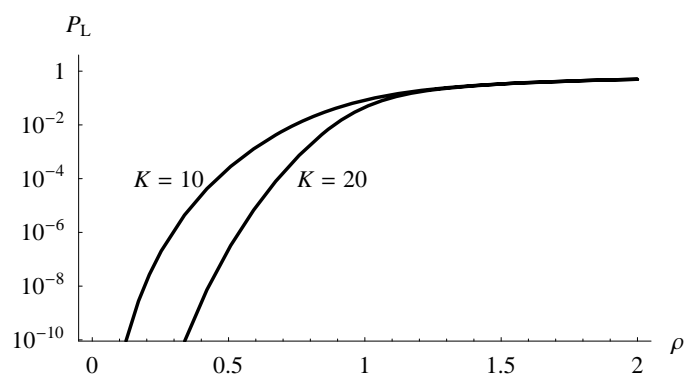


Bild 9-16

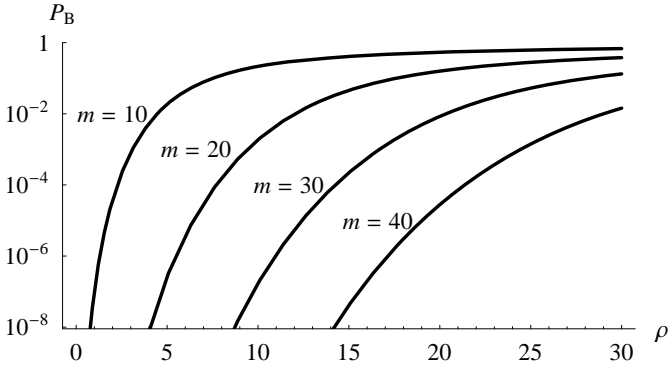


Bild 9-17

Kriterium Funktion	Geschwindig- keit	Genauig- keit	Zuverlässig- keit
Verbindungs- aufbau			
Informations- übermittlung	Paketlaufzeit Paketlaufzeit- schwankungen	Paketfehler- häufigkeit Paketfehlein- fügungsrate	Paketverlust- häufigkeit
Verbindungs- abbau			

Bild 10-1

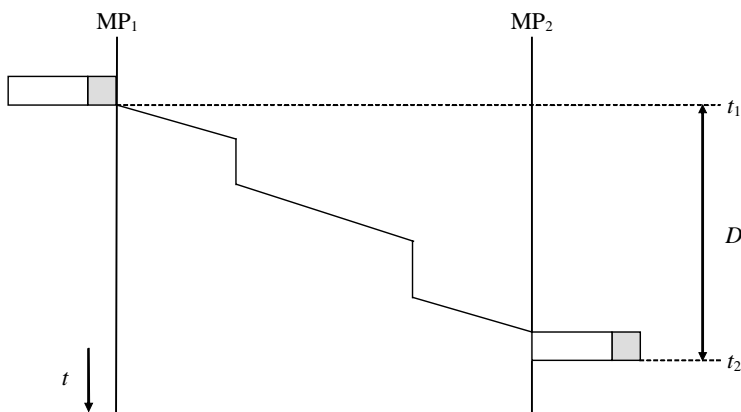


Bild 10-2

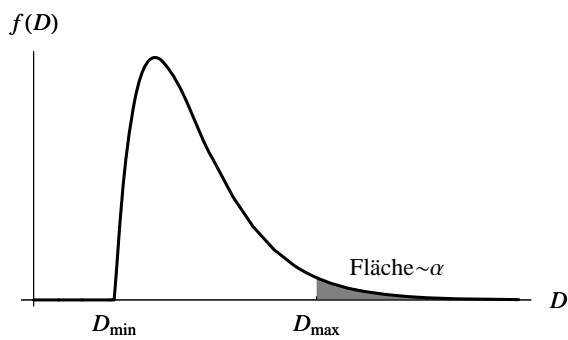


Bild 10-3

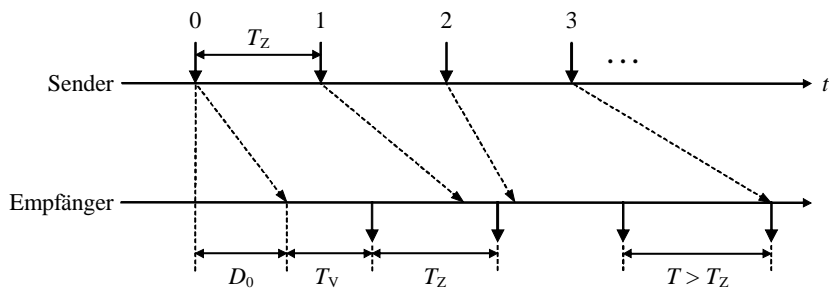


Bild 10-4

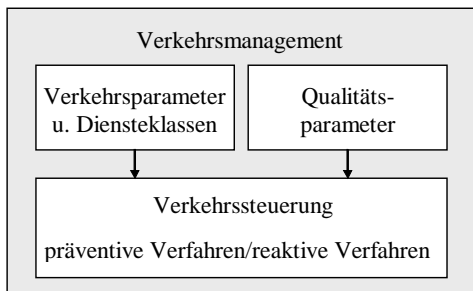


Bild 10-5

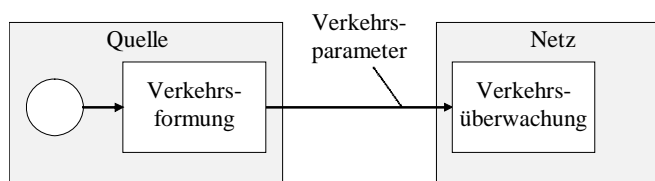


Bild 10-6



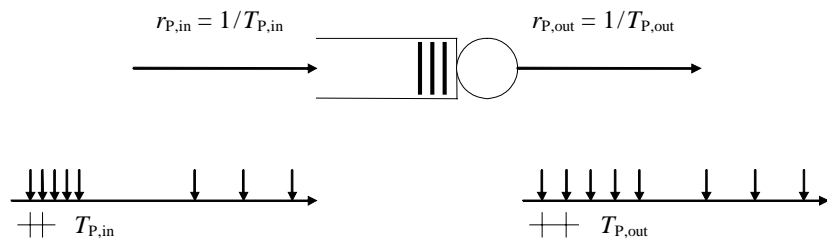


Bild 10-7

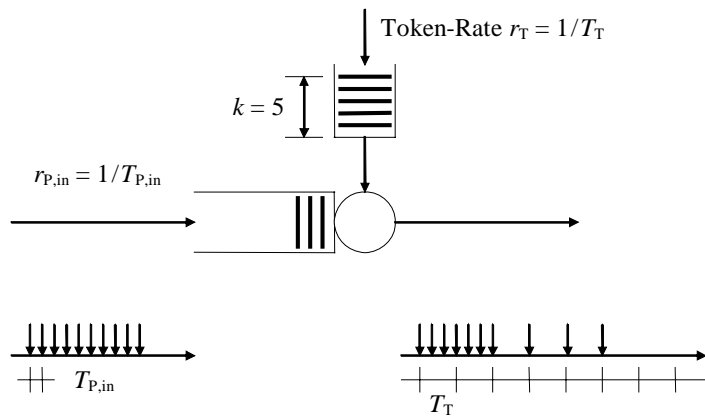


Bild 10-8

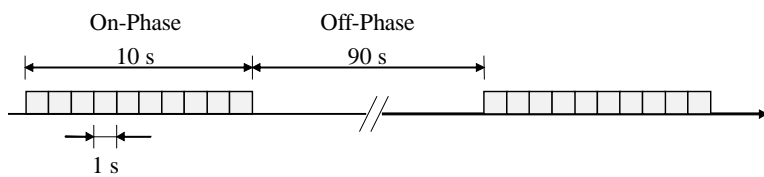


Bild 10-9

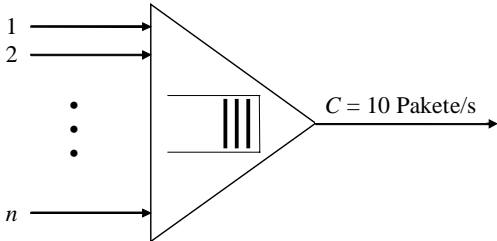


Bild 10-10

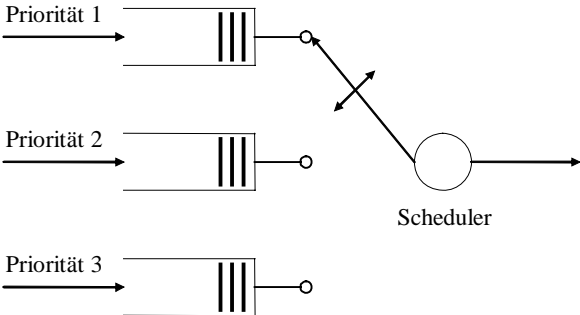


Bild 10-11

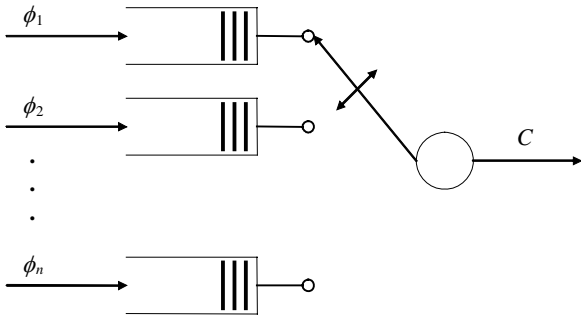


Bild 10-12

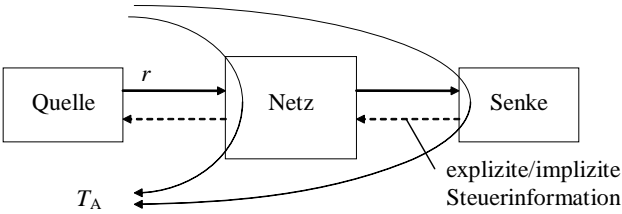


Bild 10-13

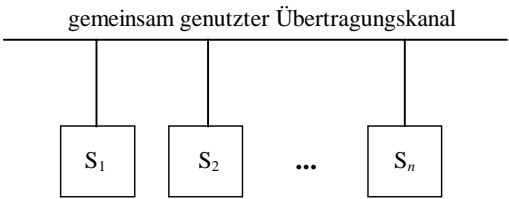


Bild 11-1

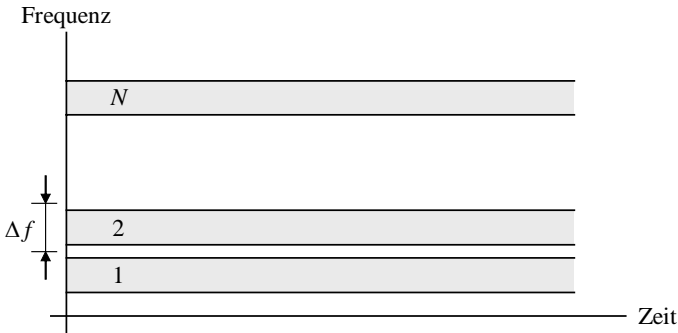


Bild 11-2

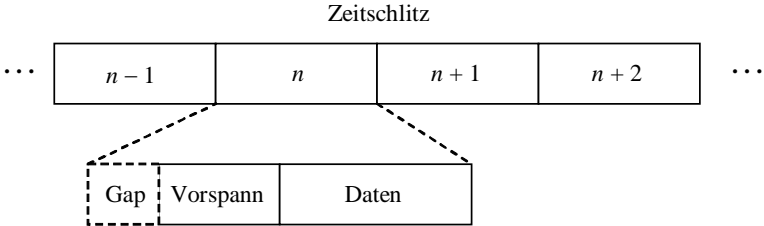


Bild 11-3

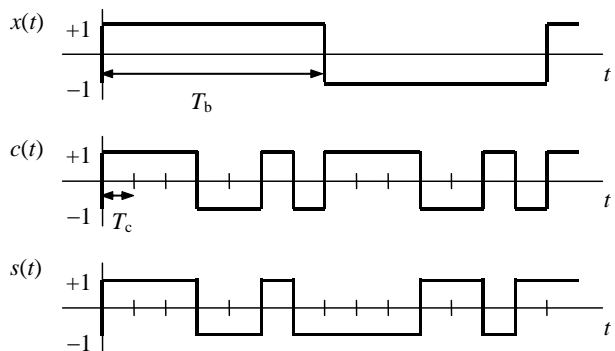


Bild 11-4

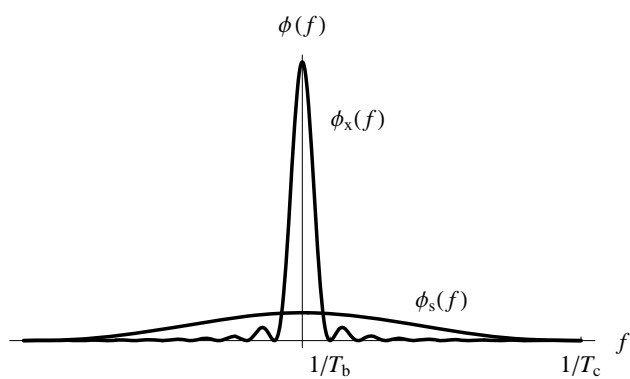


Bild 11-5

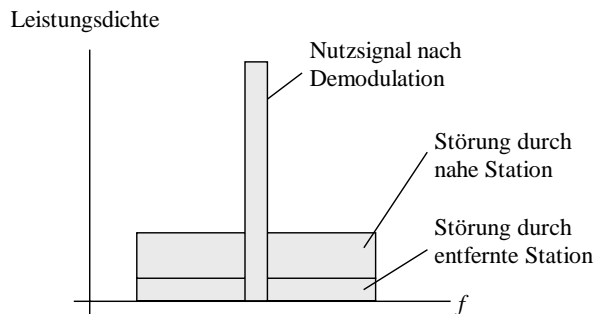


Bild 11-6

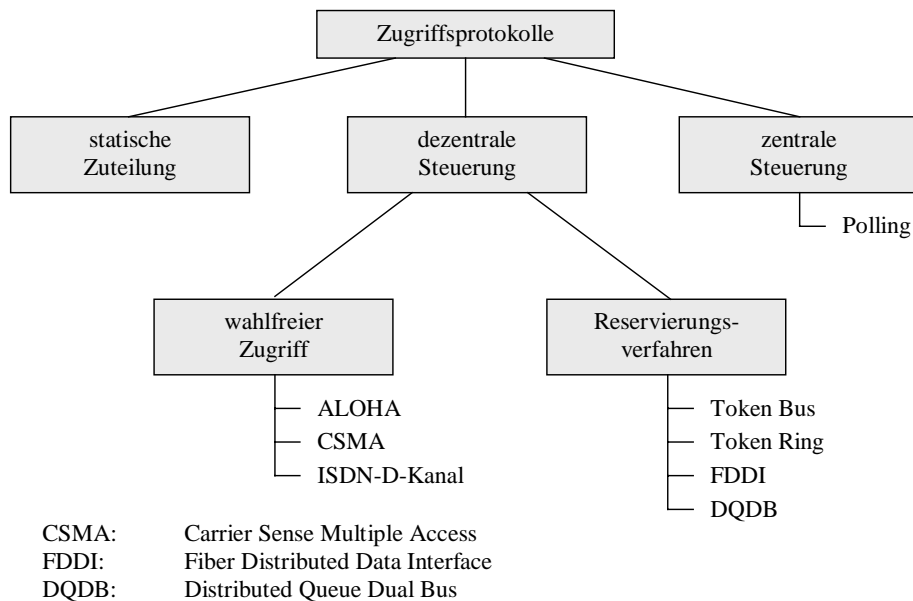


Bild 11-7

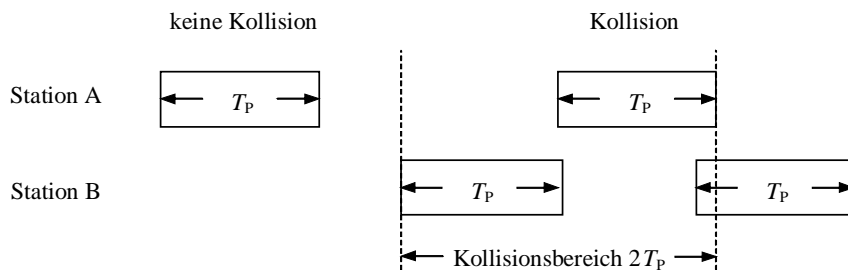


Bild 11-8

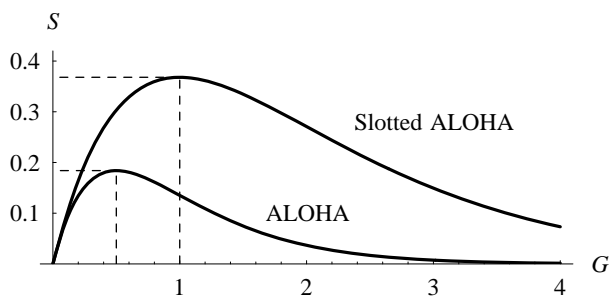


Bild 11-9

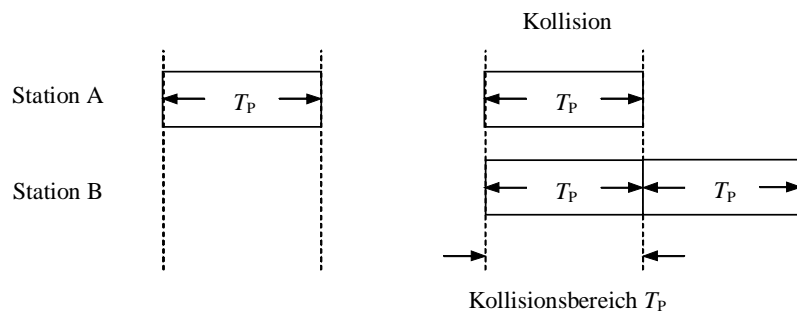


Bild 11-10

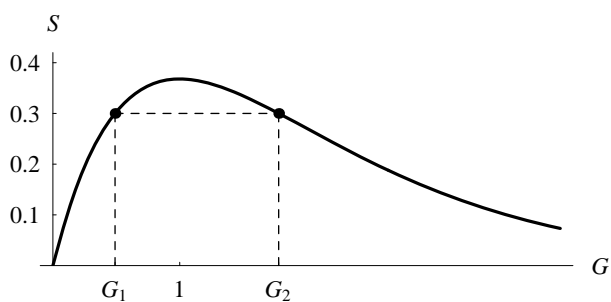


Bild 11-11

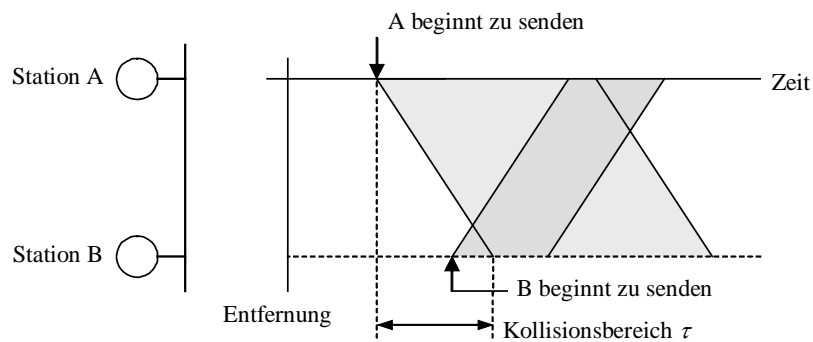


Bild 11-12

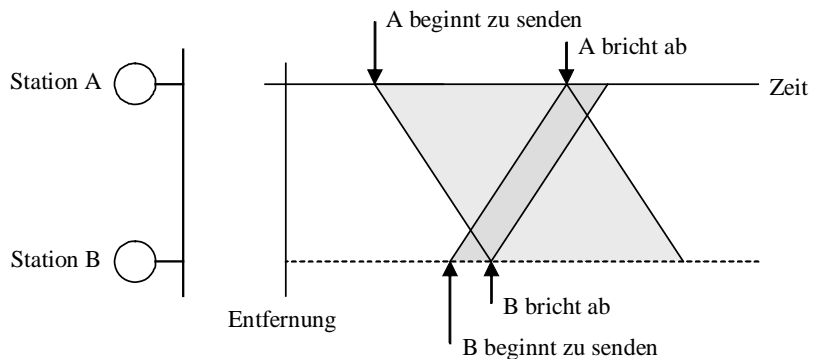


Bild 11-13

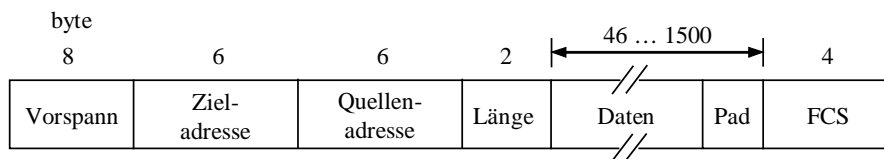


Bild 11-14

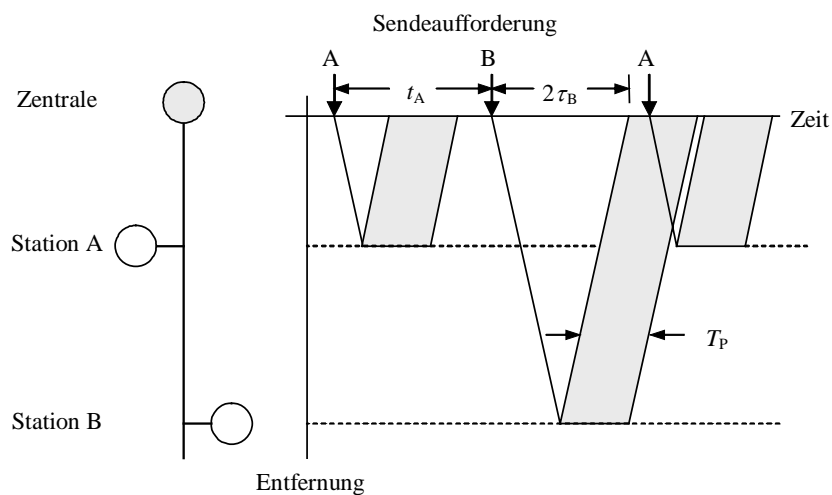


Bild 11-15



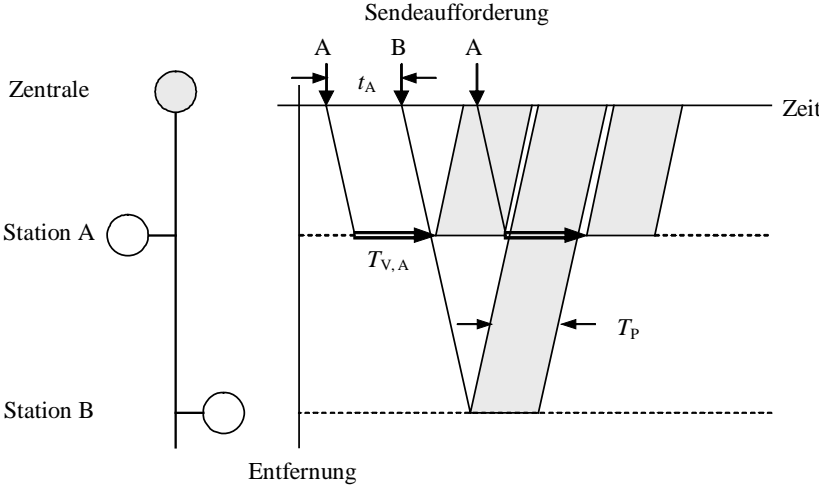


Bild 11-16

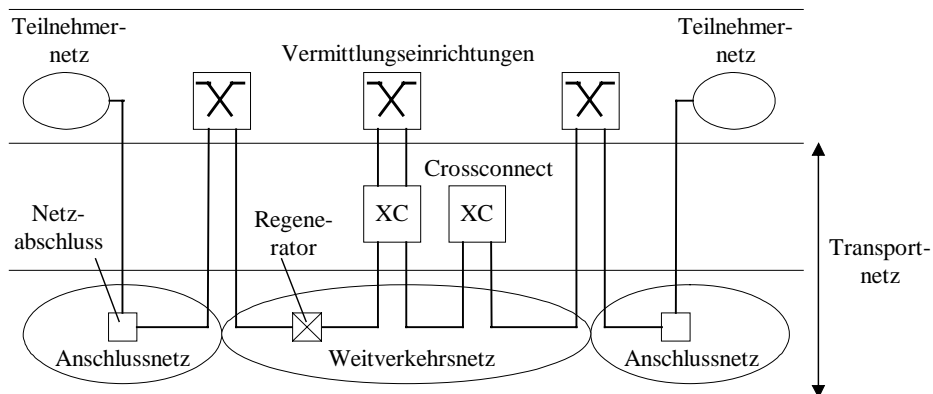


Bild 12-1

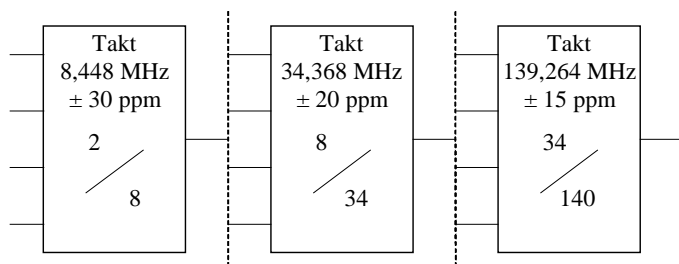


Bild 12-2

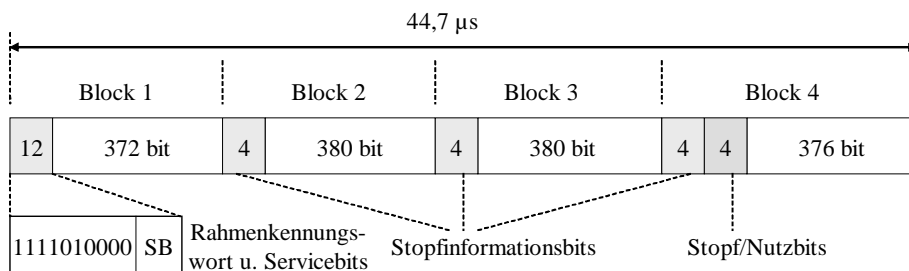


Bild 12-3

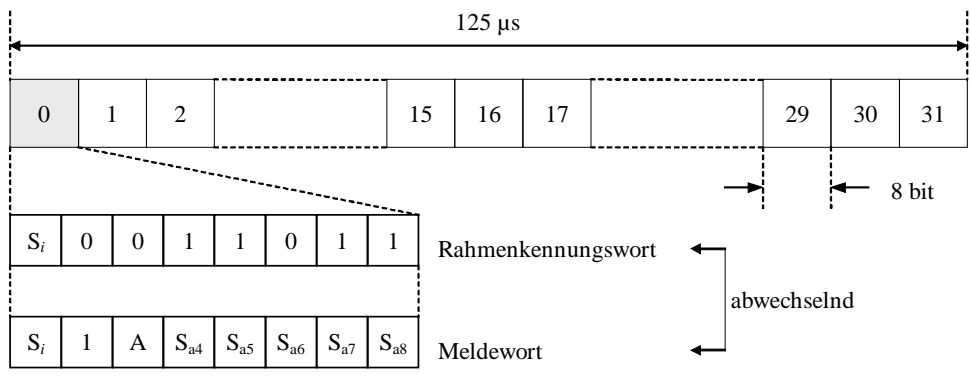


Bild 12-4

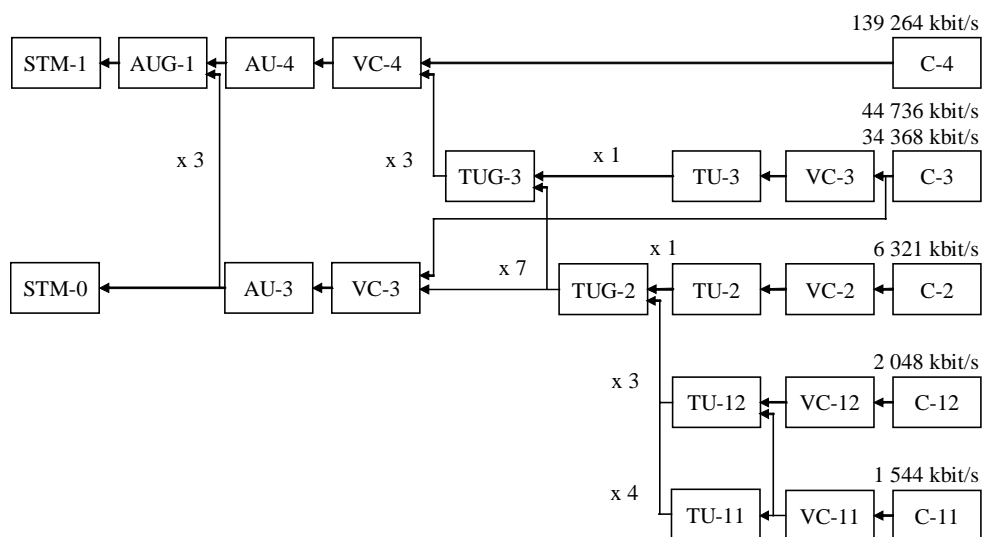


Bild 12-5

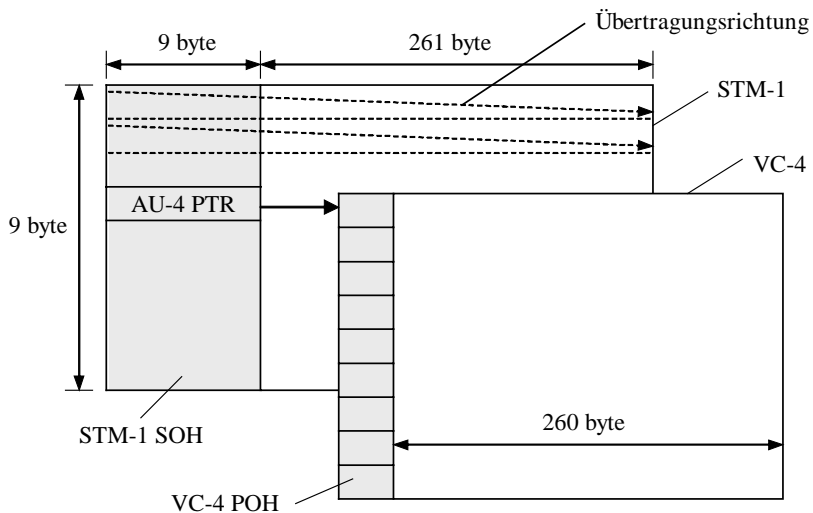


Bild 12-6

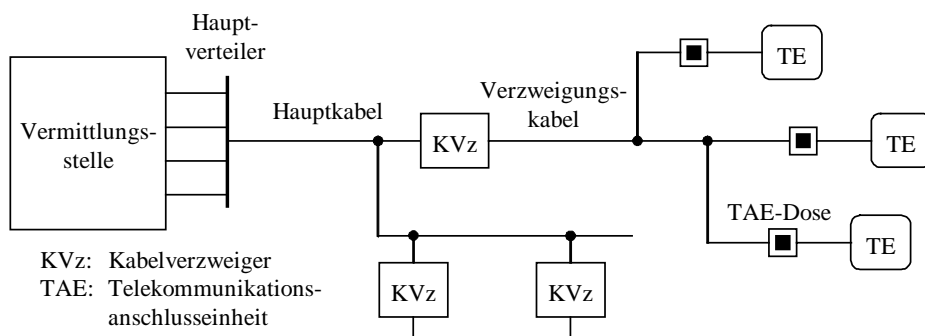
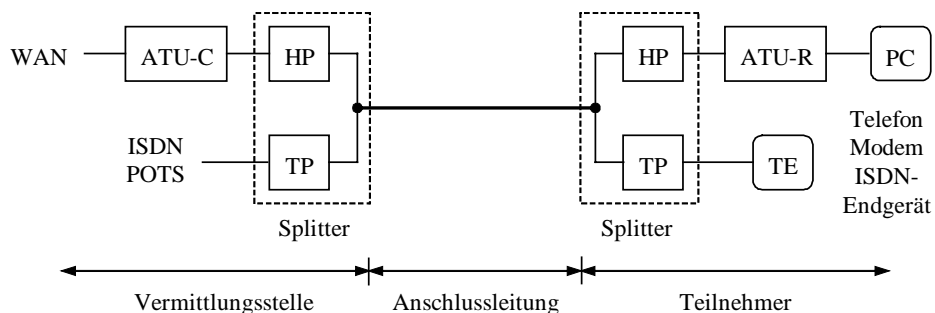


Bild 12-7



ATU-C: ADSL Transceiver Unit Central Office  
 ATU-R: ADSL Transceiver Unit Remote Terminal  
 POTS: Plain Old Telephone Service

Bild 12-8

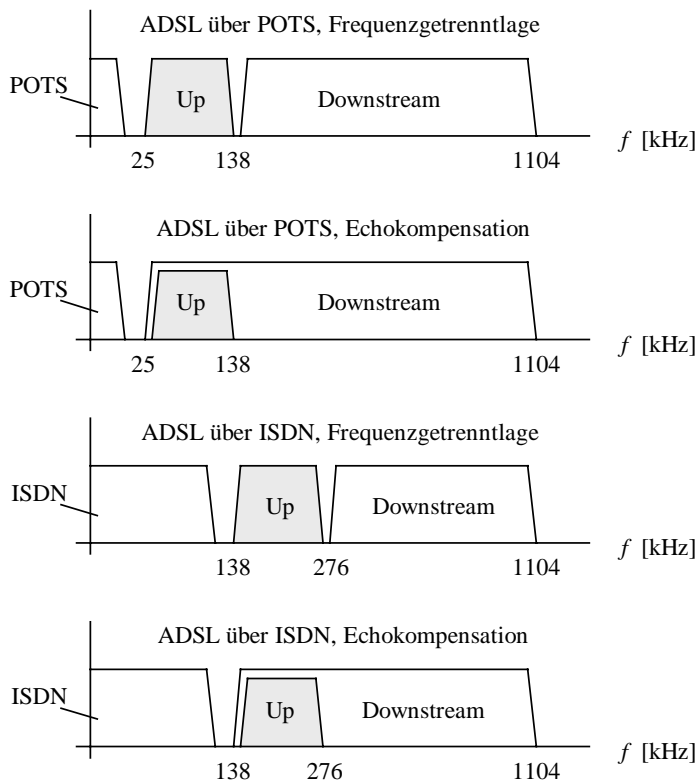


Bild 12-9

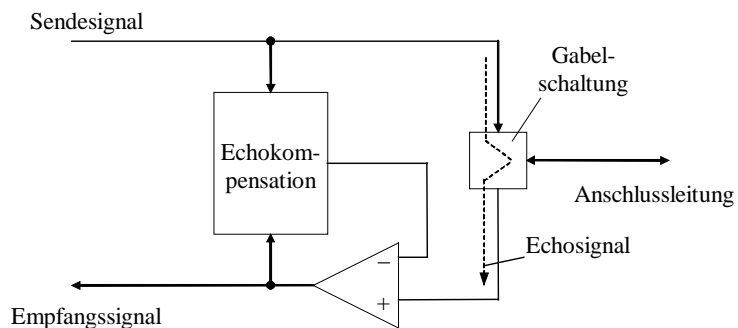


Bild 12-10

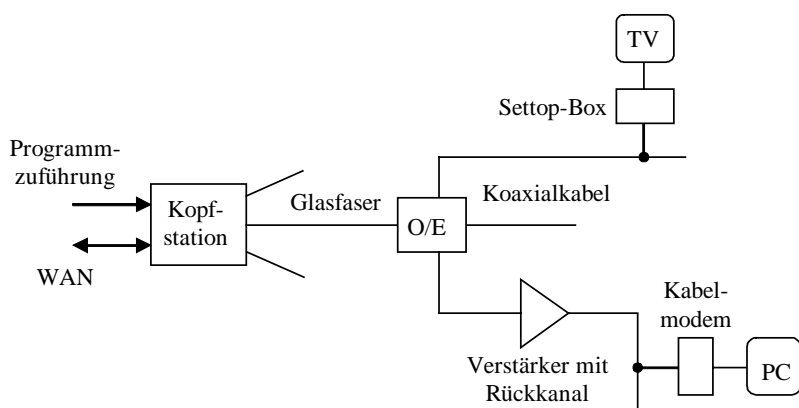


Bild 12-11

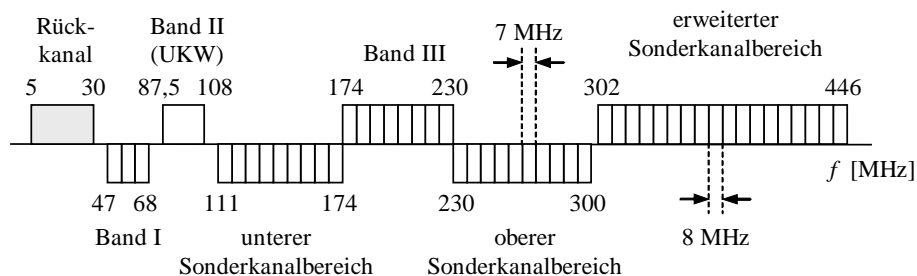


Bild 12-12

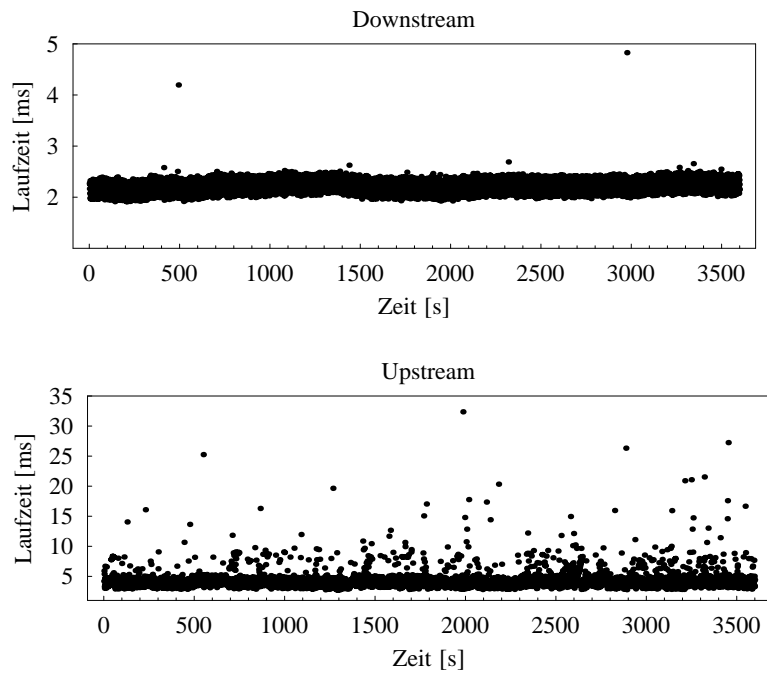


Bild 12-13

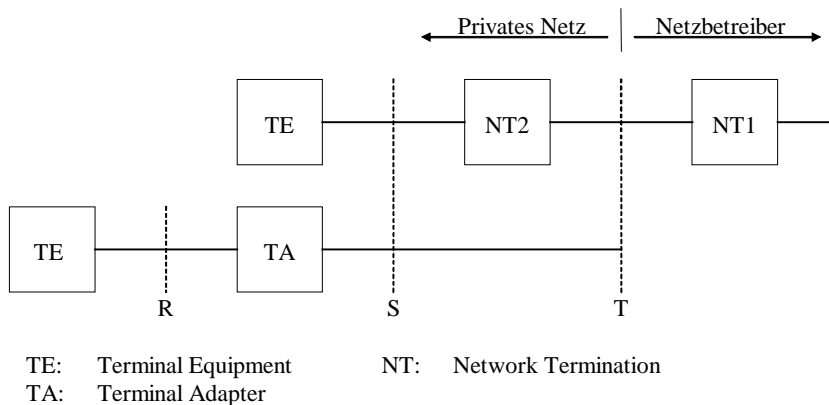


Bild 13-1

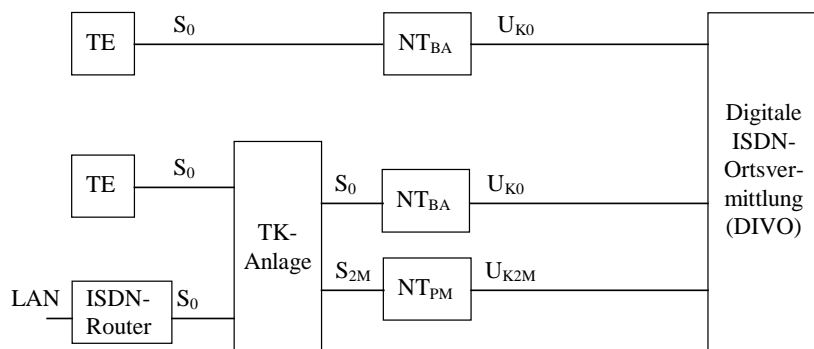


Bild 13-2

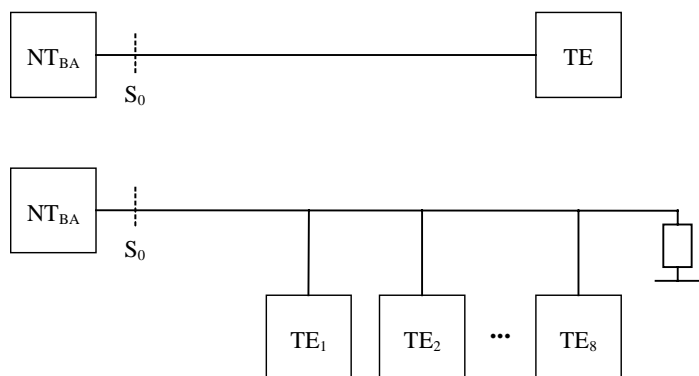
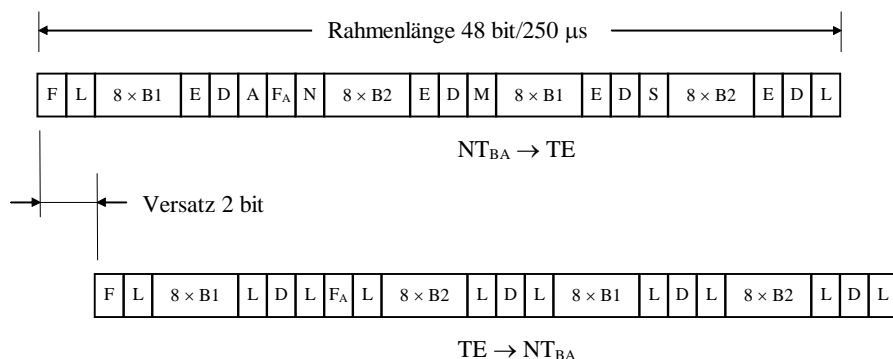


Bild 13-3





- |    |                  |                   |                          |
|----|------------------|-------------------|--------------------------|
| D  | D-Kanal          | F, F <sub>A</sub> | Rahmenkennungsbit        |
| B1 | B-Kanal 1        | L                 | Gleichstromausgleichsbit |
| B2 | B-Kanal 2        | N                 | $N = \bar{F}_A$          |
| E  | D-Kanal-Echo-Bit | S                 | S-Kanal                  |
| A  | Aktivierung      | M                 | Mehrfachrahmenbit        |

Bild 13-4

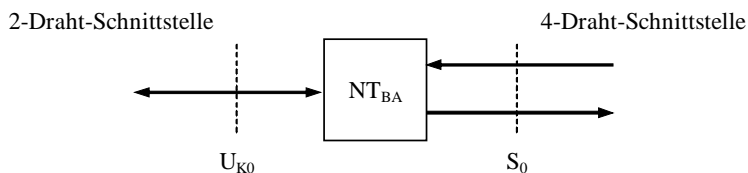
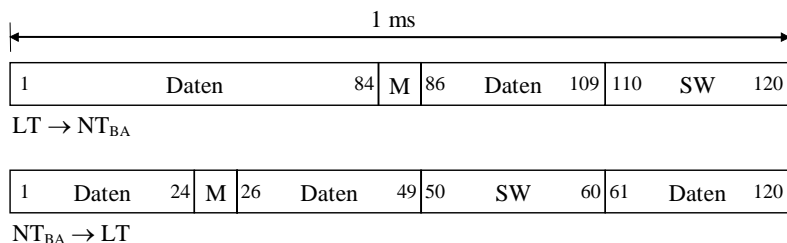


Bild 13-5



SW: Synchronisierwort      M: Meldewort

Bild 13-6

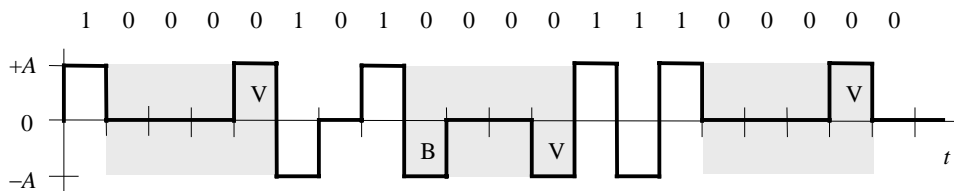


Bild 13-7

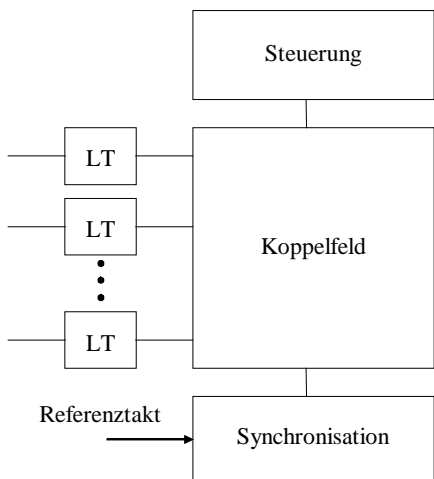


Bild 13-8

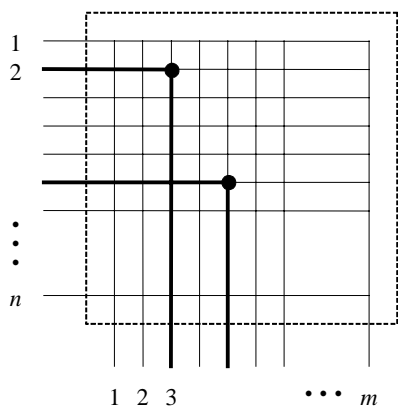


Bild 13-9

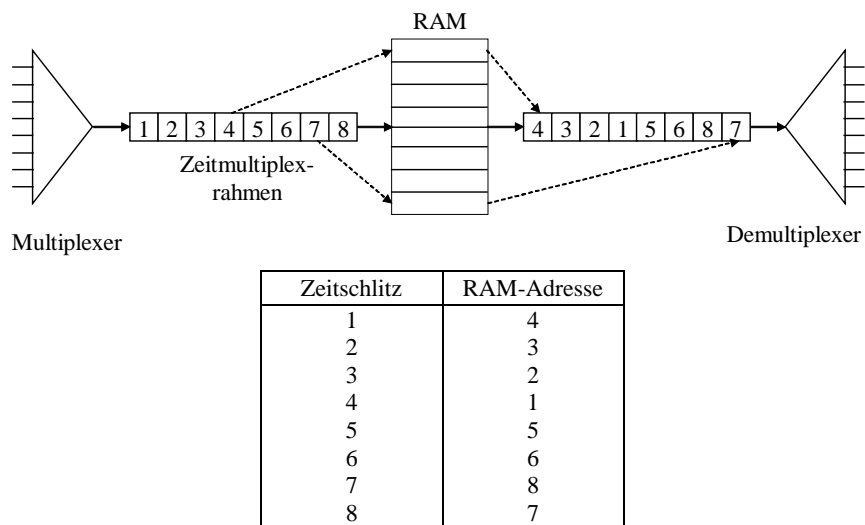


Bild 13-10

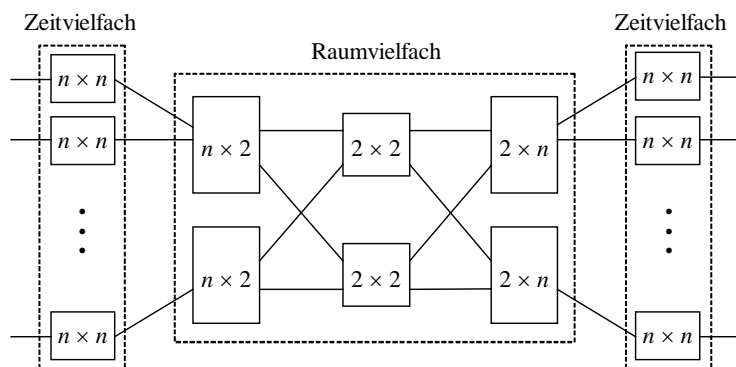


Bild 13-11

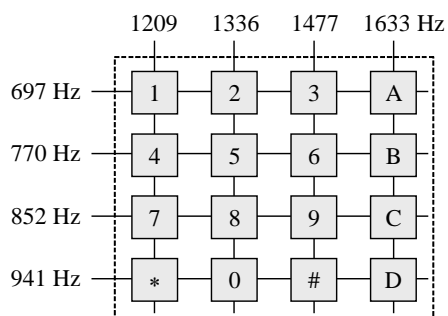


Bild 13-12

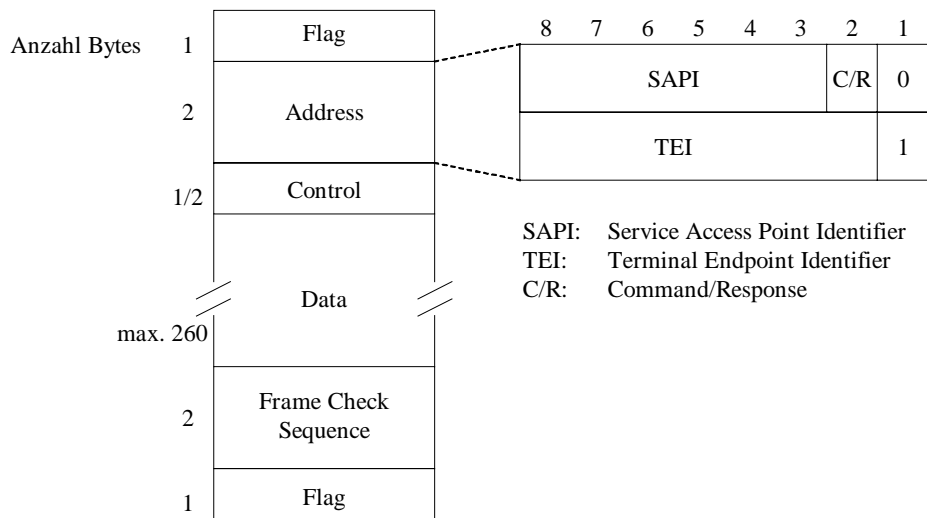


Bild 13-13

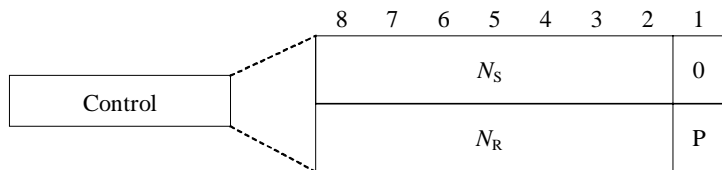


Bild 13-14

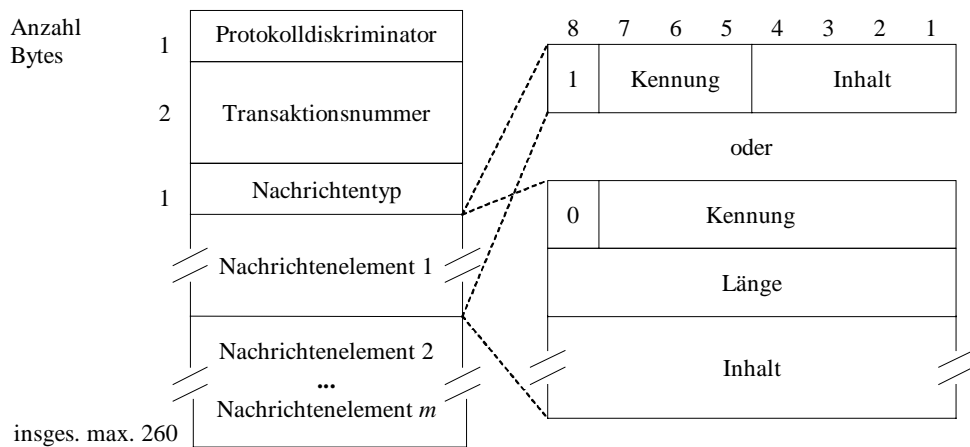


Bild 13-15

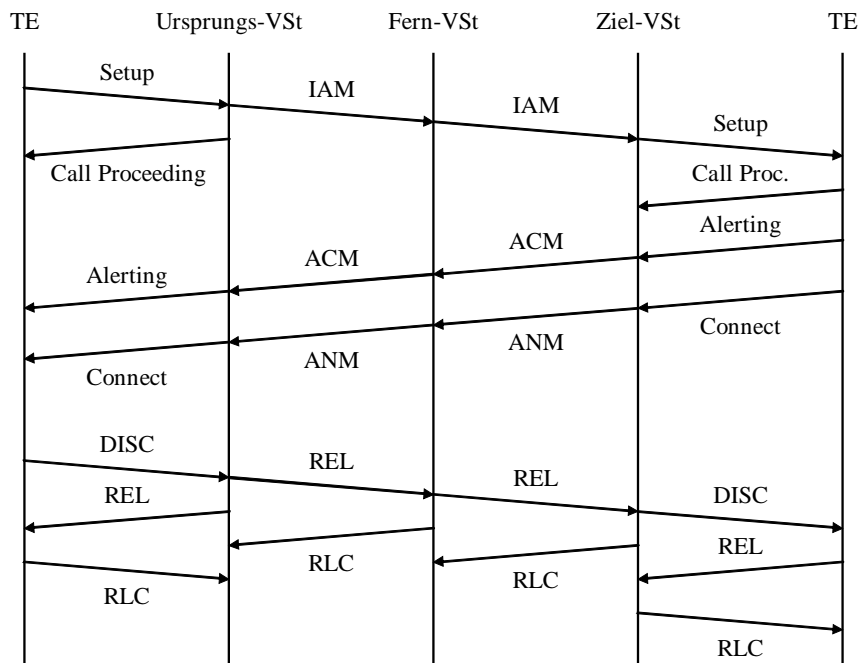


Bild 13-16

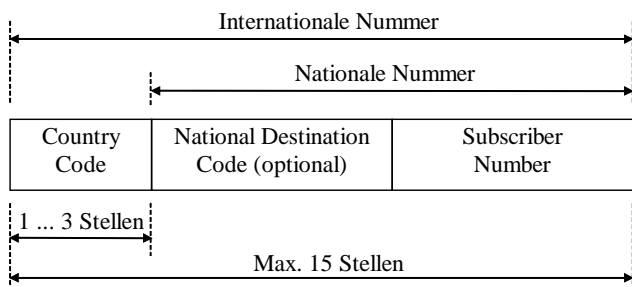


Bild 13-17

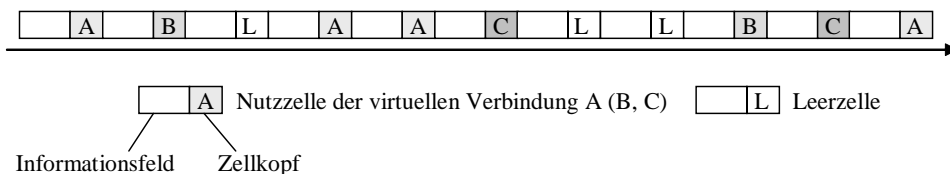


Bild 14-1

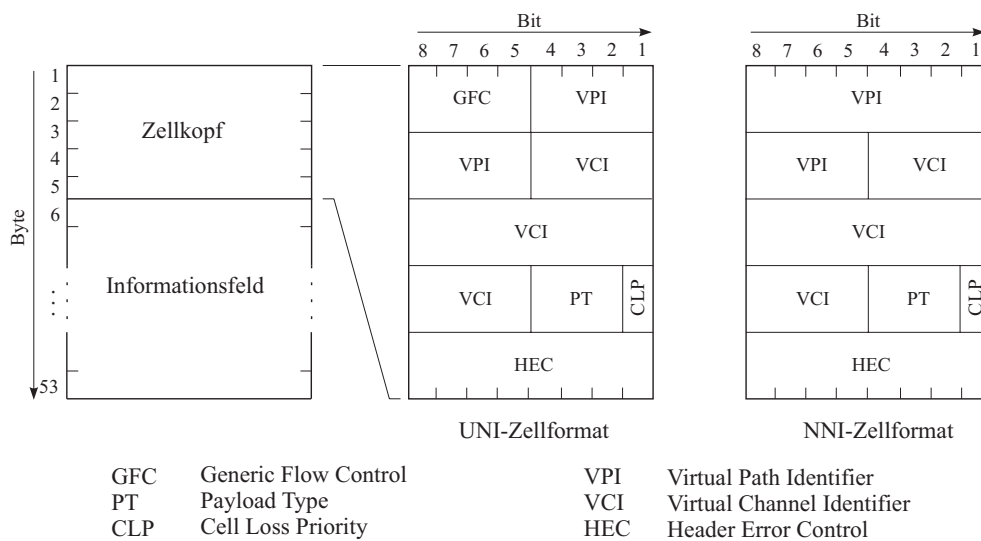


Bild 14-2

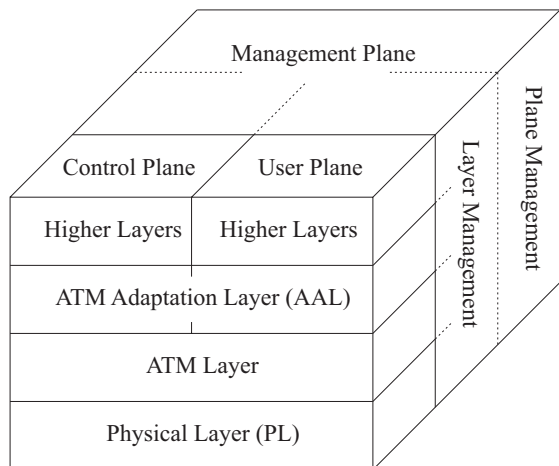


Bild 14-3

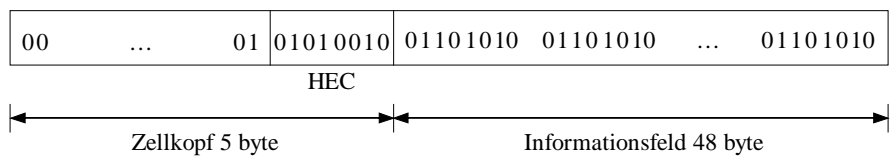


Bild 14-4

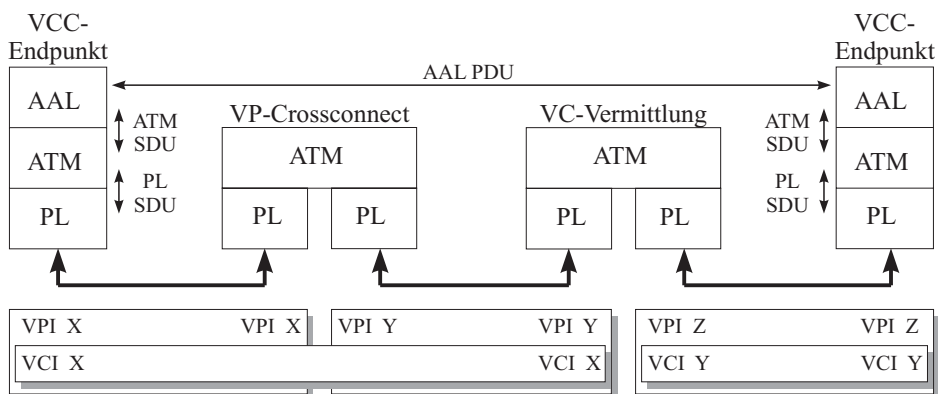
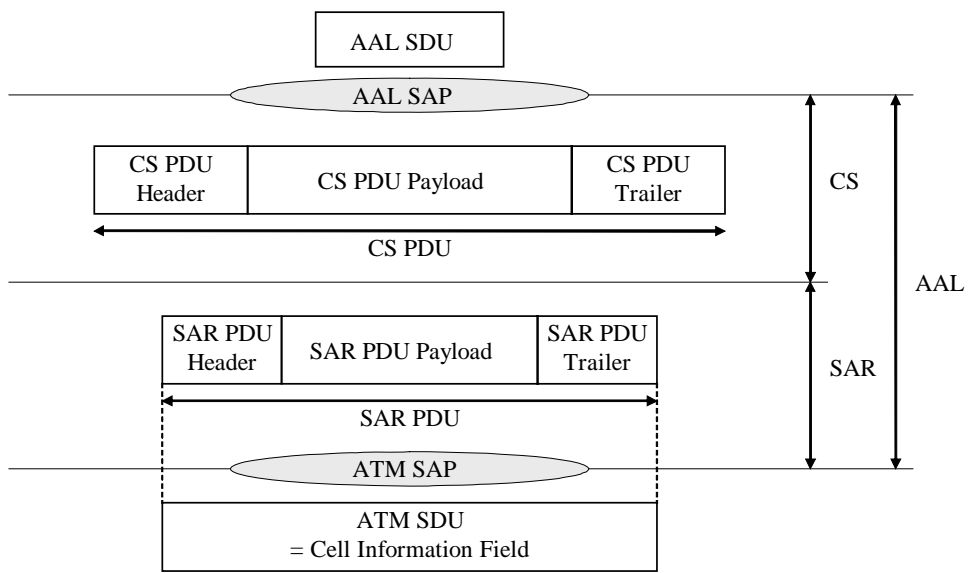
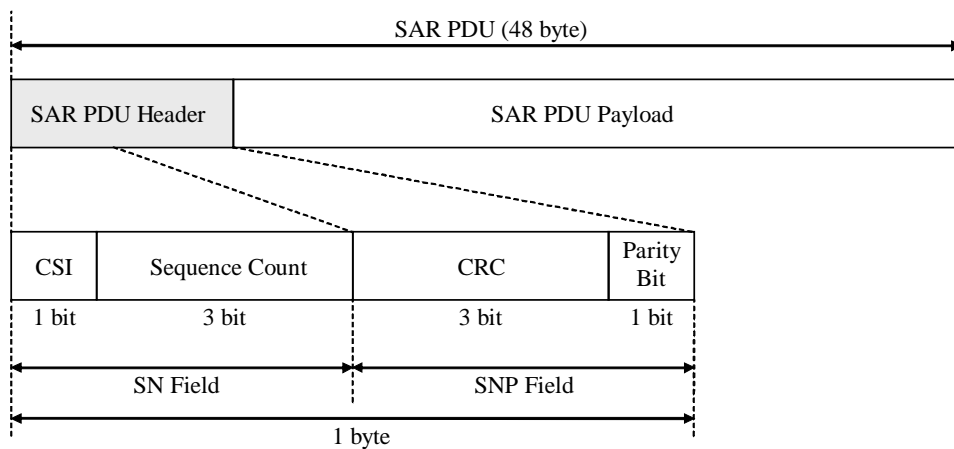


Bild 14-5



CS: Convergence Sublayer                      SAP: Service Access Point  
 PDU: Protocol Data Unit                      SDU: Service Data Unit  
 SAR: Segmentation and Reassembly Sublayer

Bild 14-6



CSI: Convergence Sublayer Indication  
 SN: Sequence Number  
 SNP: Sequence Number Protection  
 CRC: Cyclic Redundancy Check

Bild 14-7

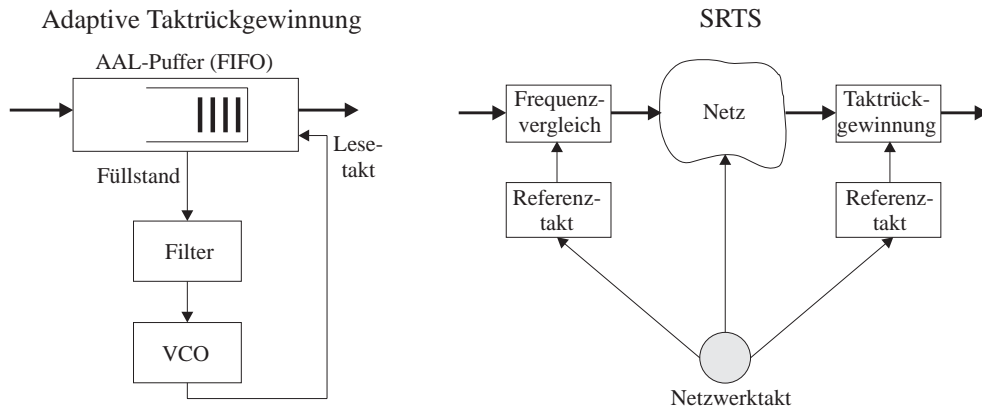
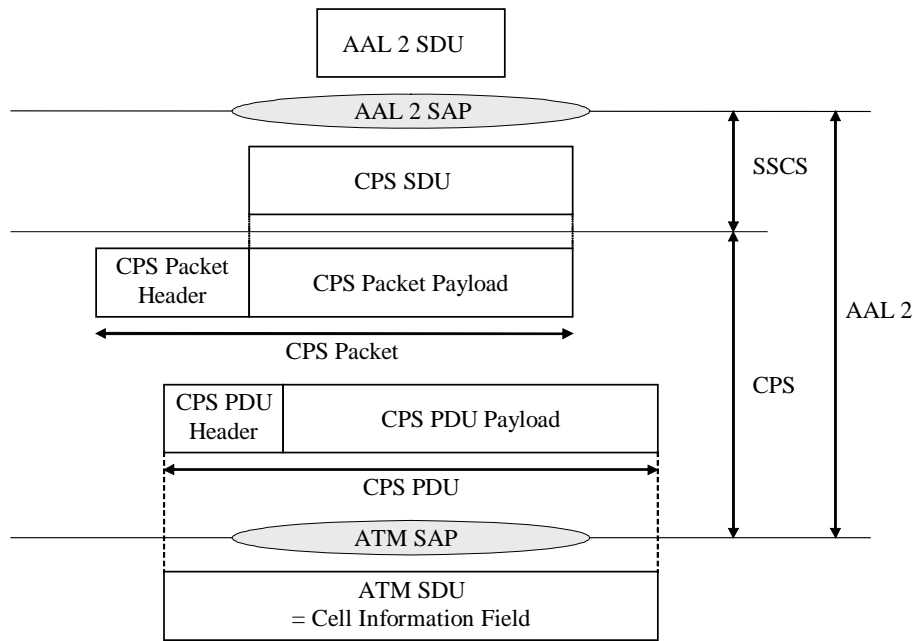


Bild 14-8





SSCS: Service Specific Convergence Sublayer  
 CPS: Common Part Sublayer

Bild 14-9

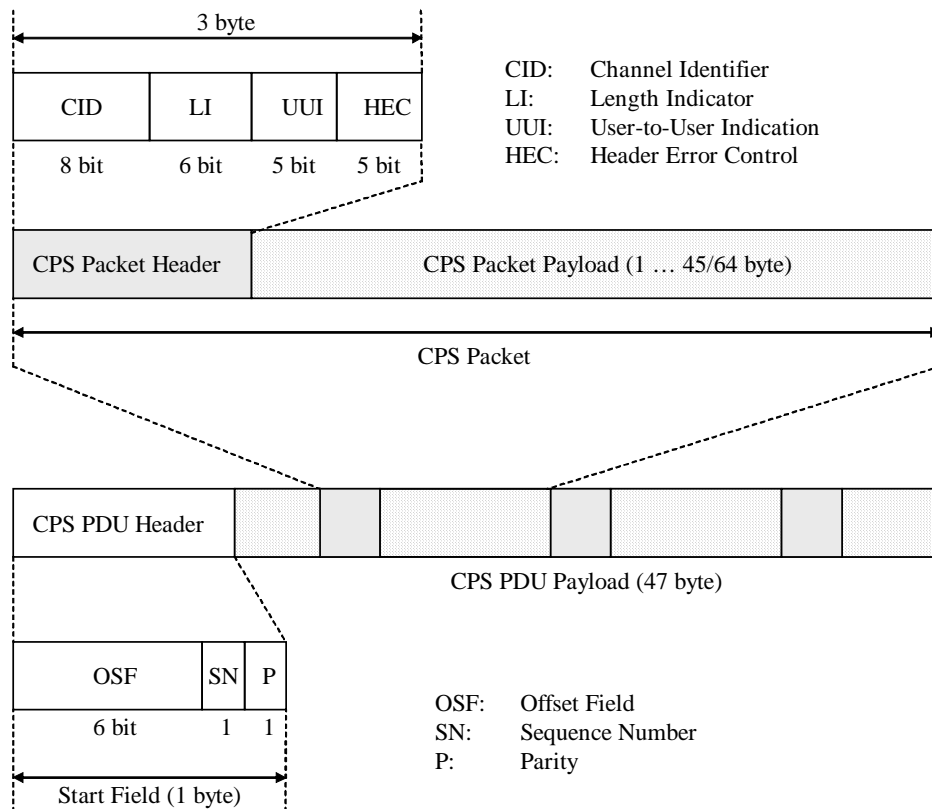
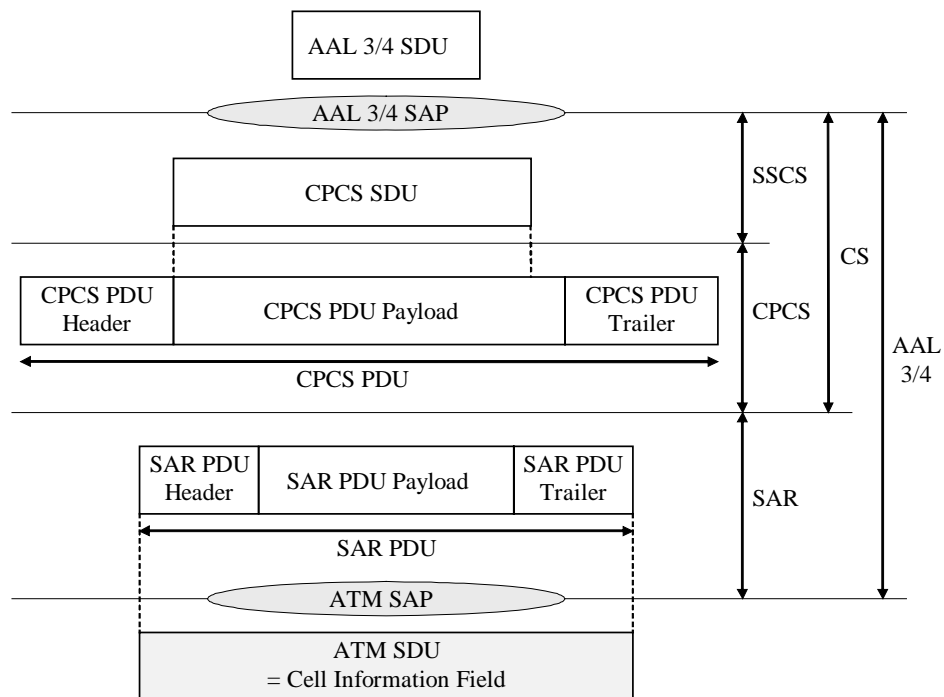
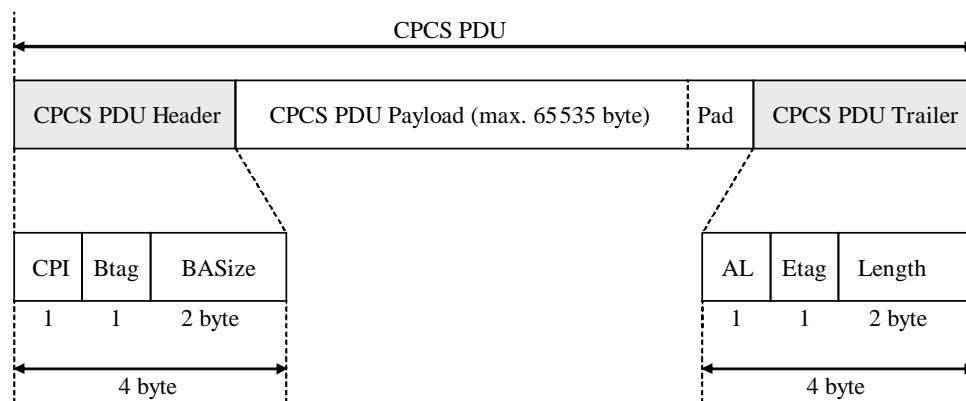


Bild 14-10



SSCS: Service Specific Convergence Sublayer  
 CPCS: Common Part Convergence Sublayer

Bild 14-11



CPI: Common Part Indicator      AL: Alignment  
 Btag: Beginning tag              Etag: End tag  
 BASize: Buffer Allocation Size

Bild 14-12

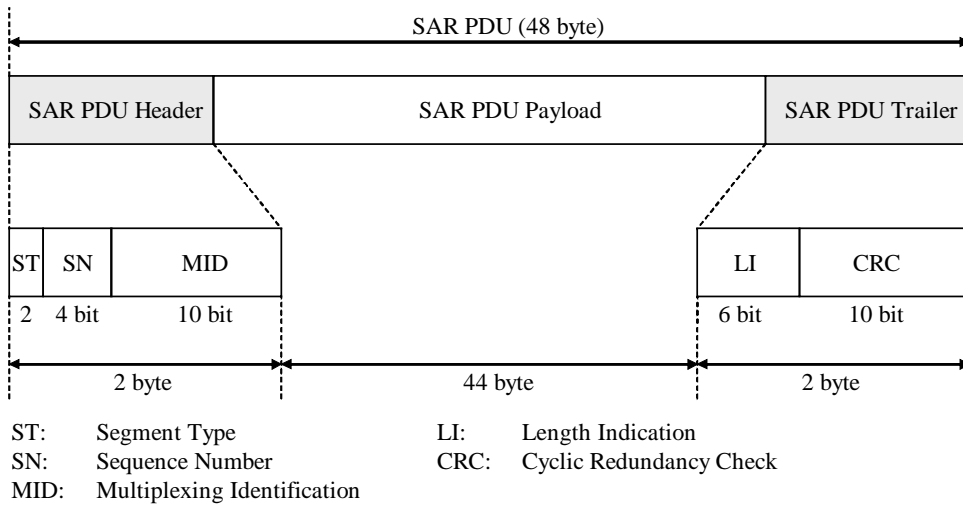


Bild 14-13

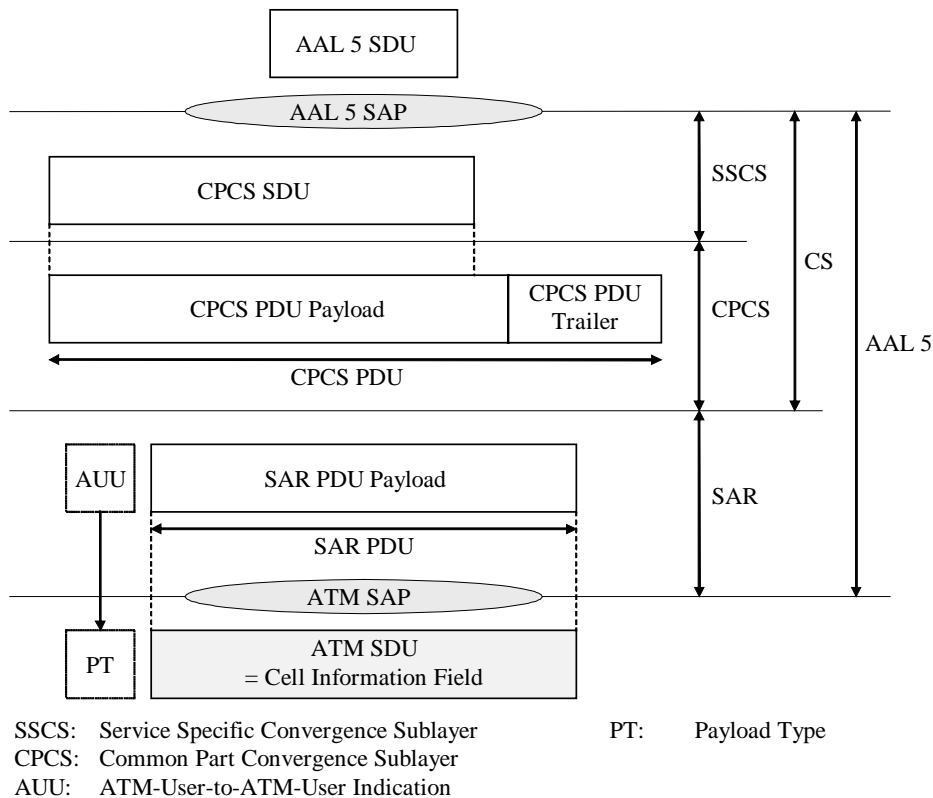


Bild 14-14

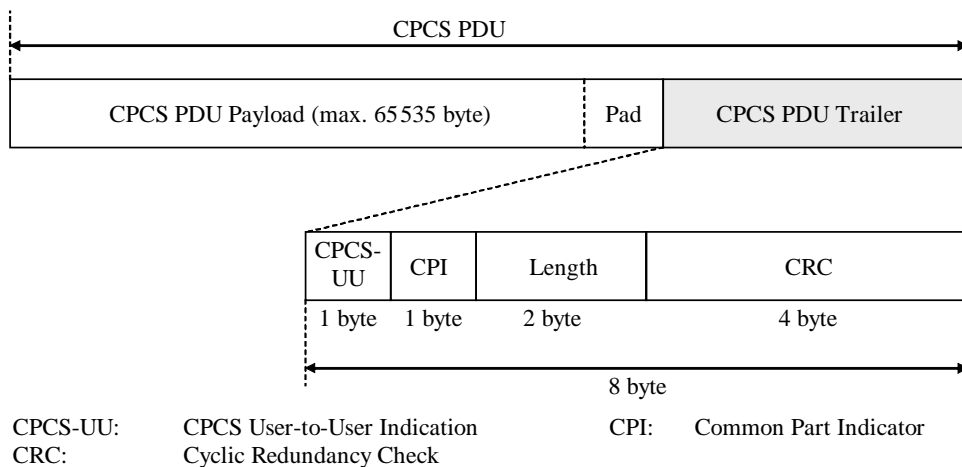


Bild 14-15

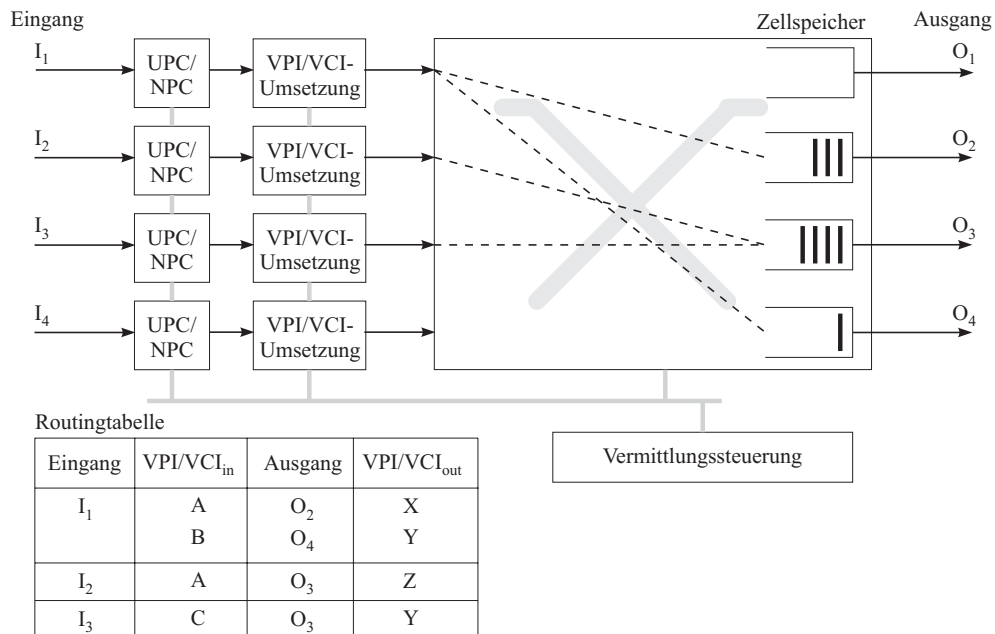


Bild 14-16

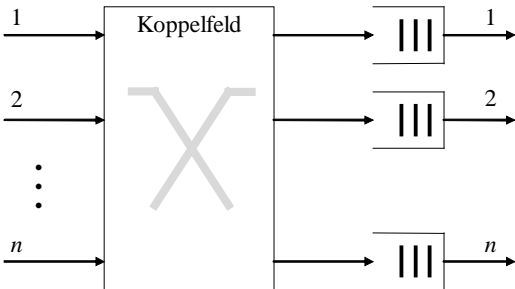


Bild 14-17

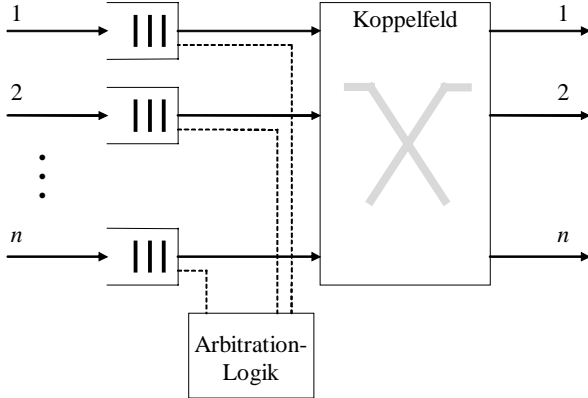


Bild 14-18

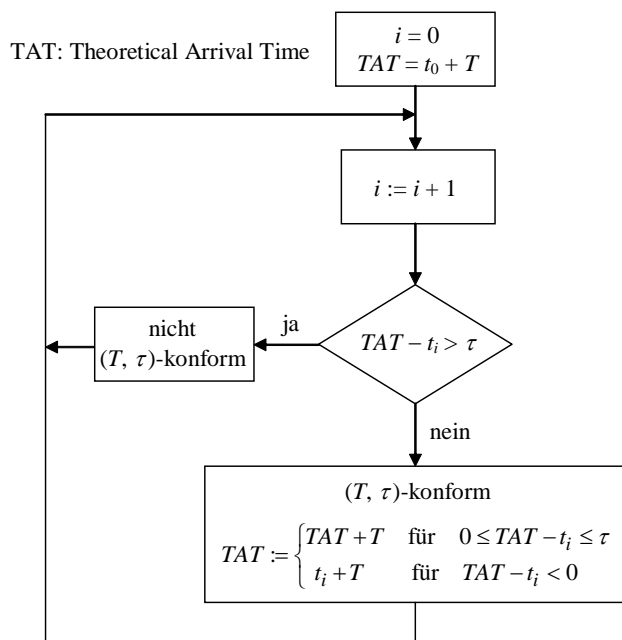


Bild 14-19

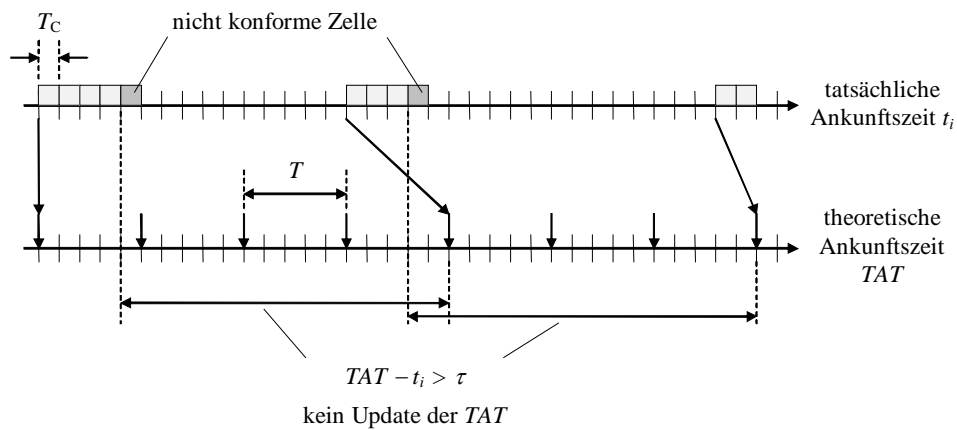


Bild 14-20

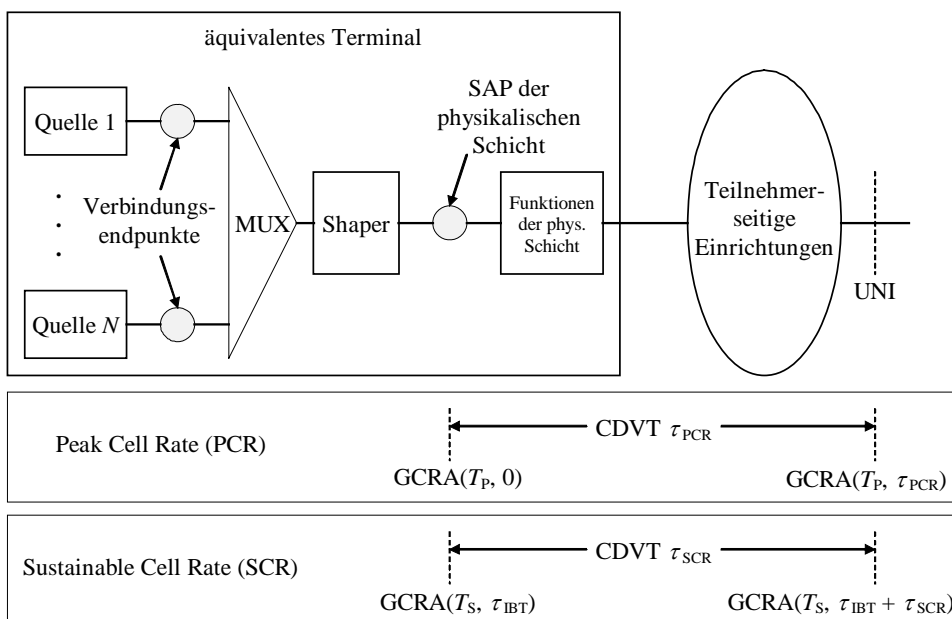


Bild 14-21

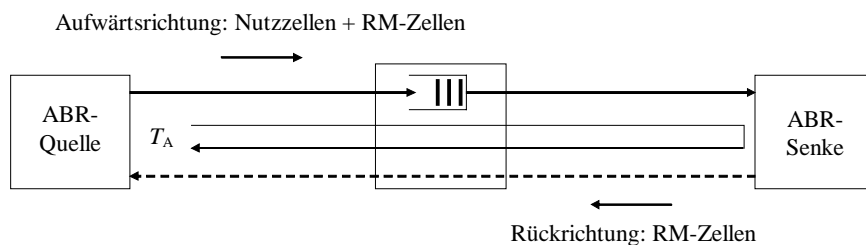


Bild 14-22

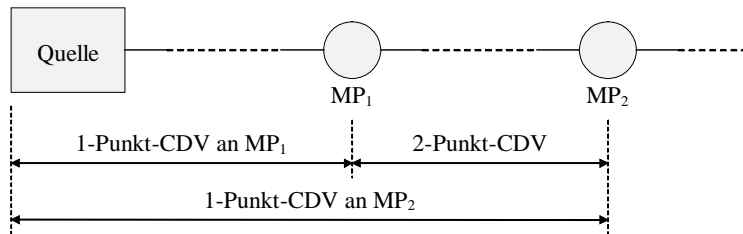


Bild 14-23

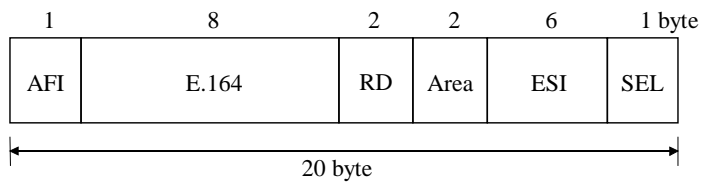


Bild 14-24



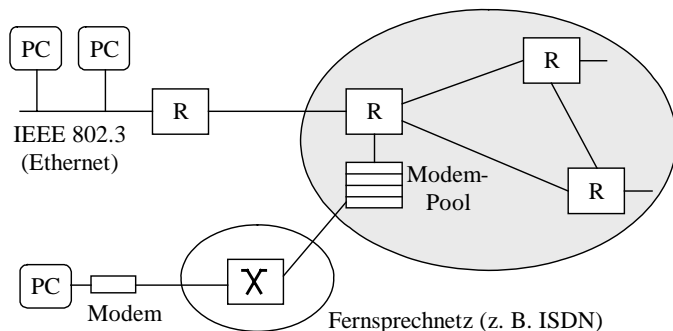


Bild 15-1

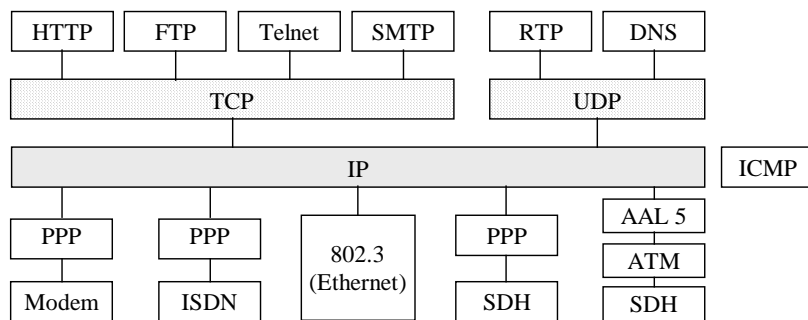


Bild 15-2

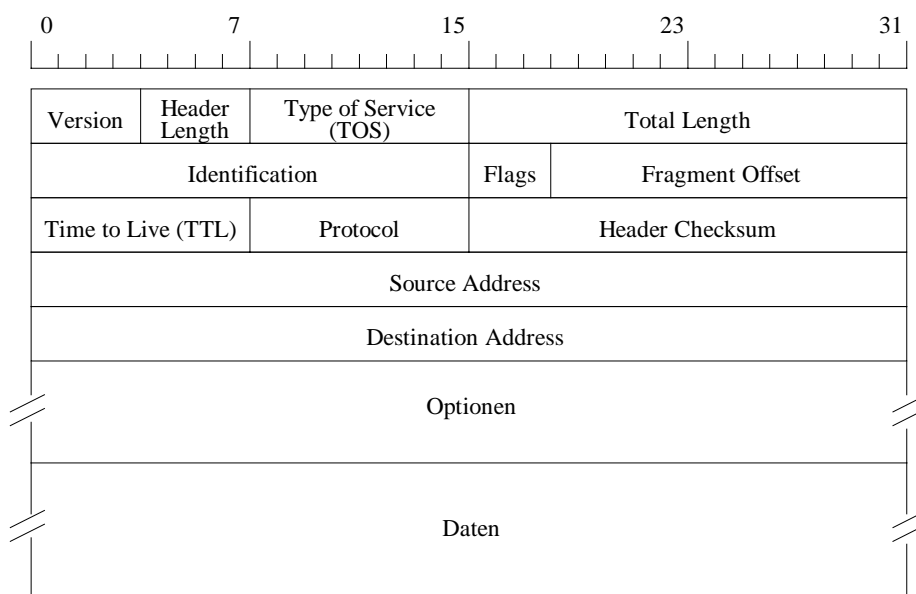


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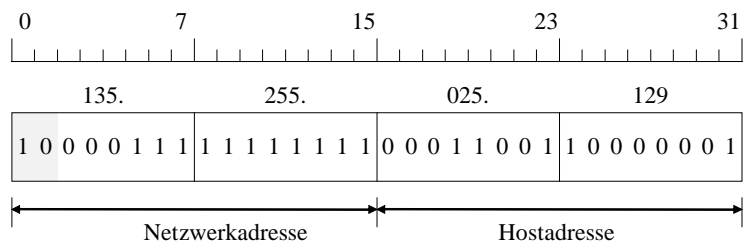


Bild 15-4

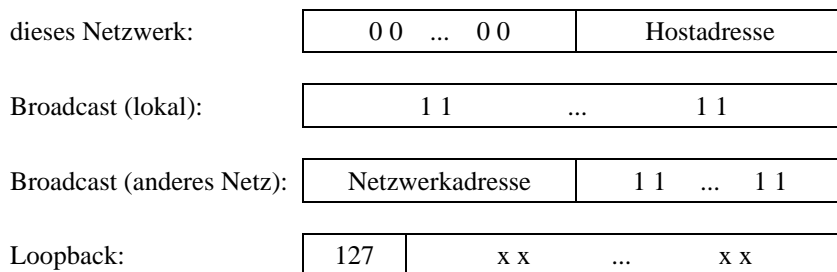


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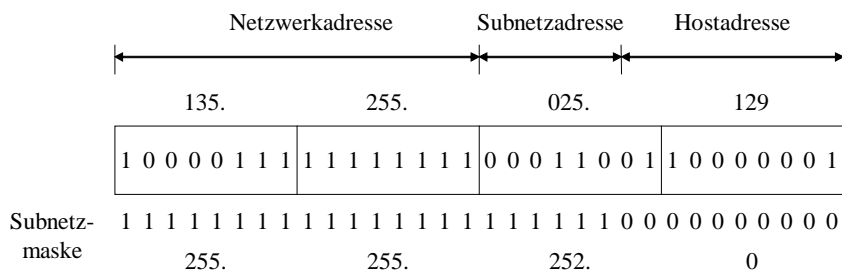


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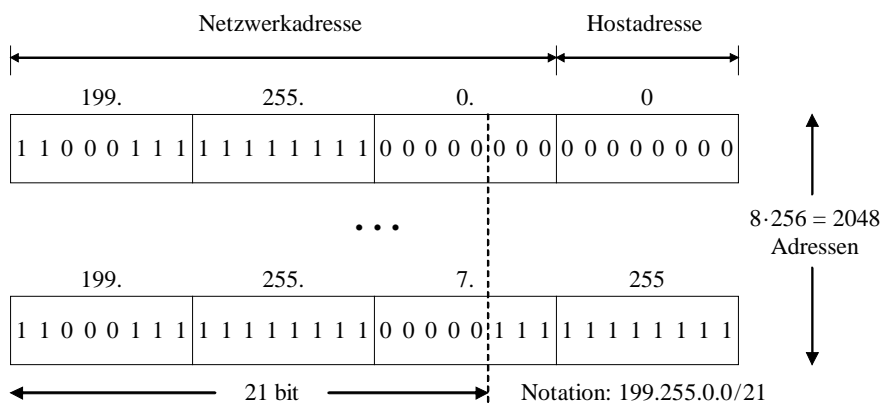


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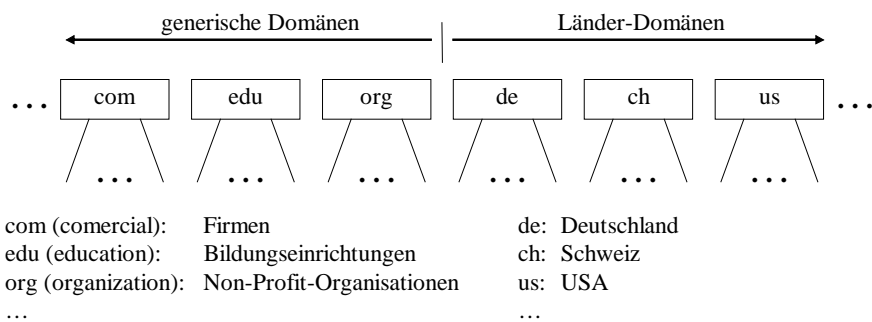


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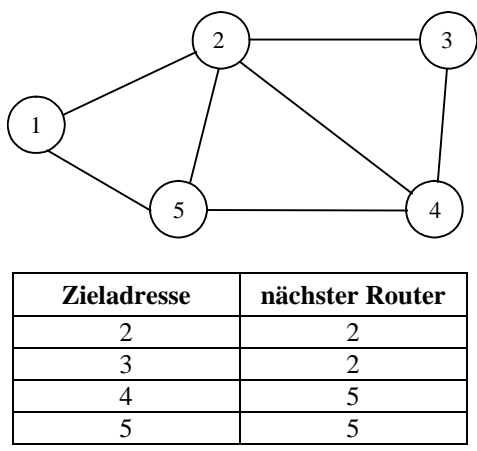


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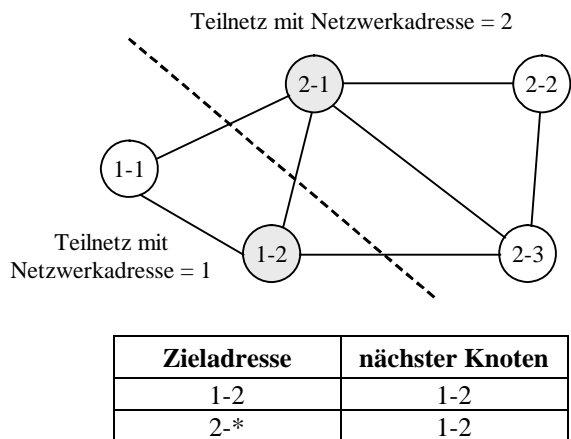


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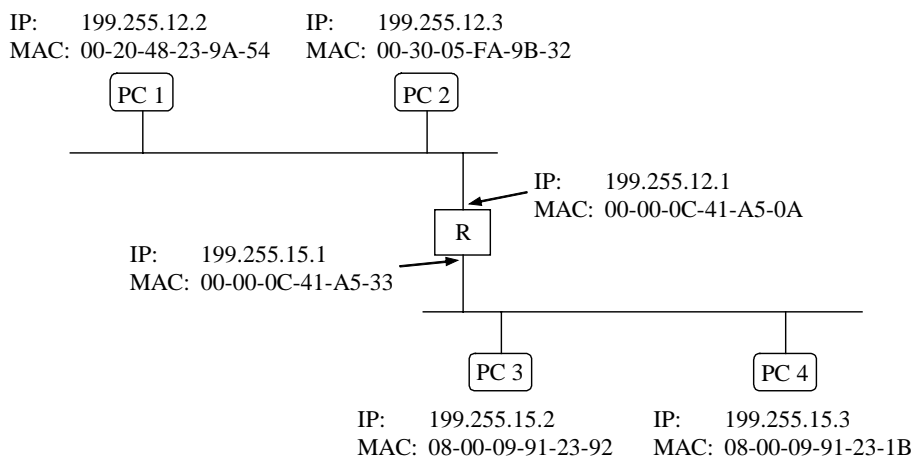


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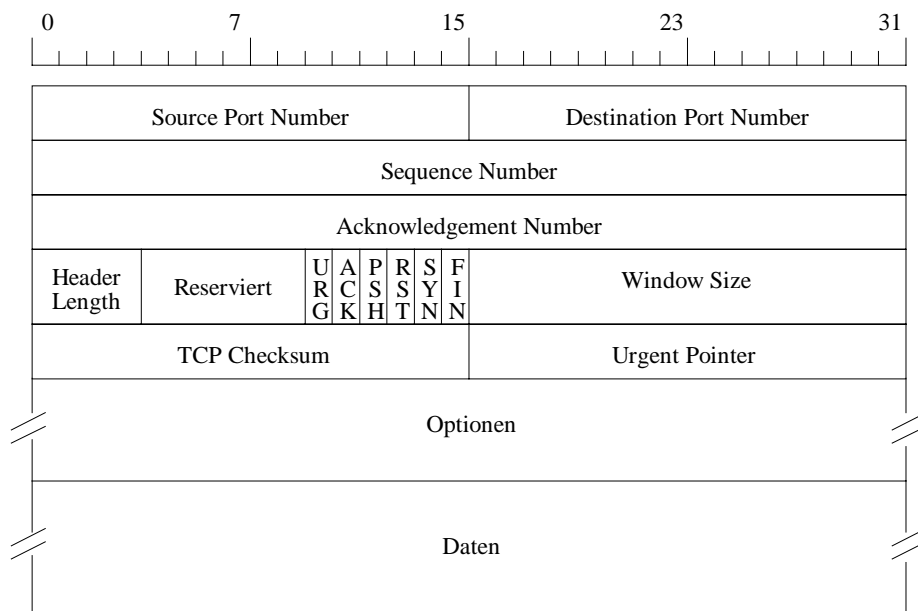


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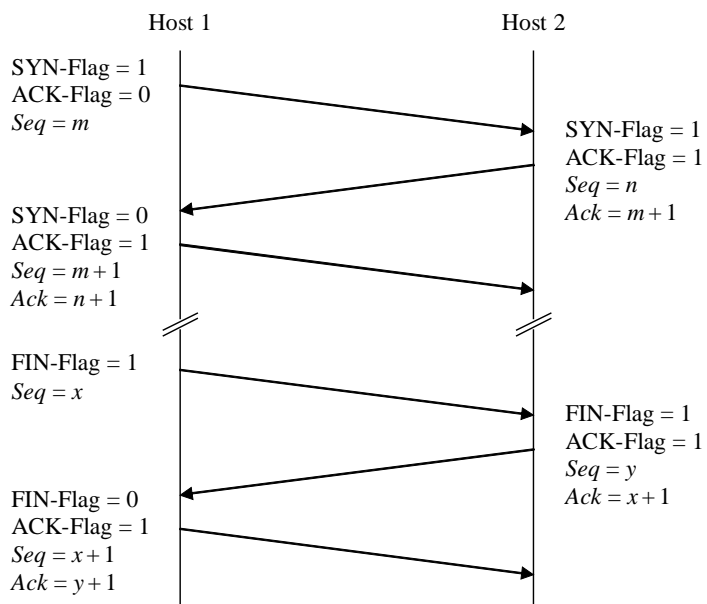


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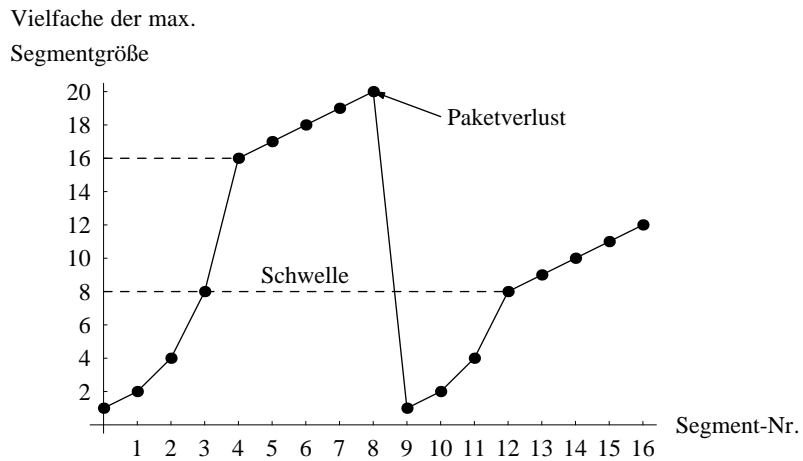


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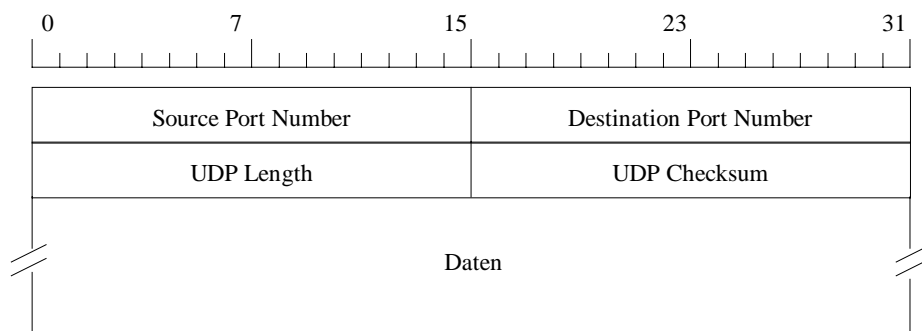


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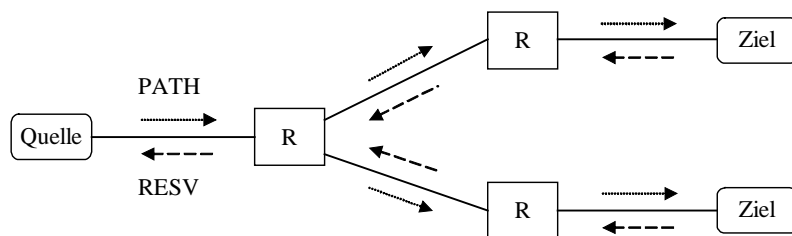


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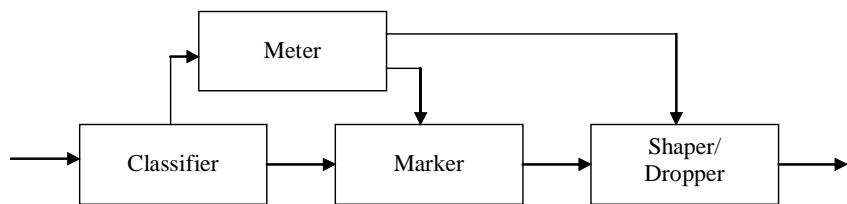


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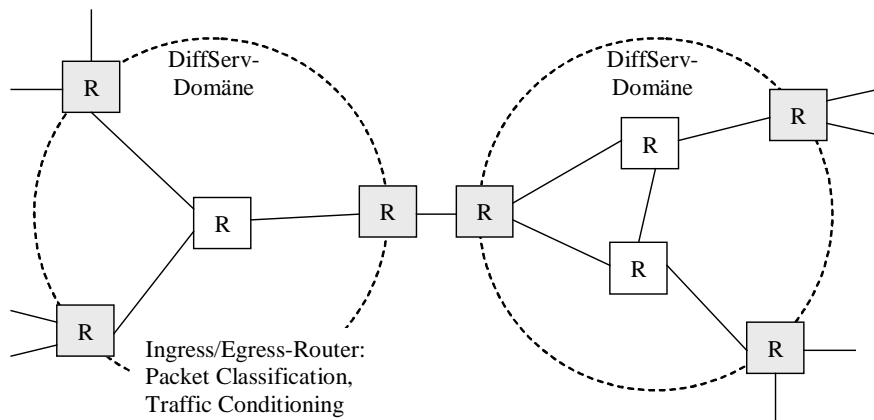


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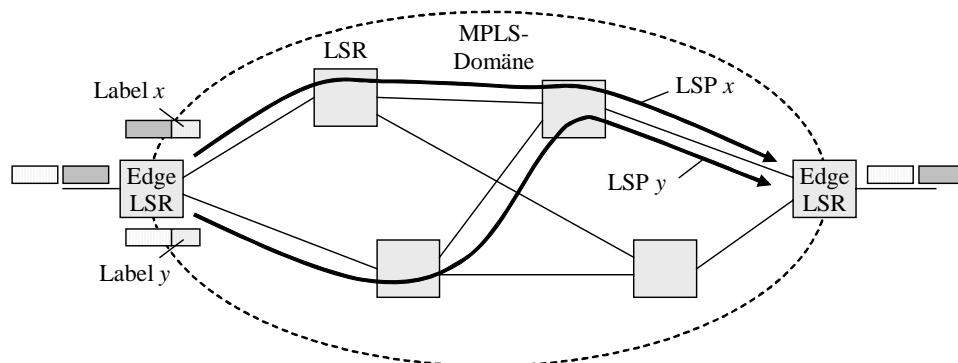


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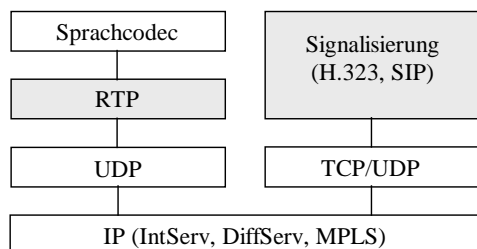


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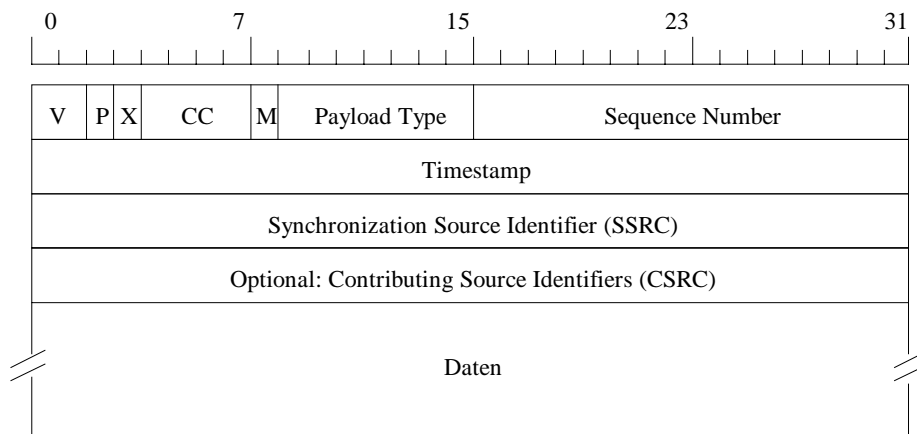


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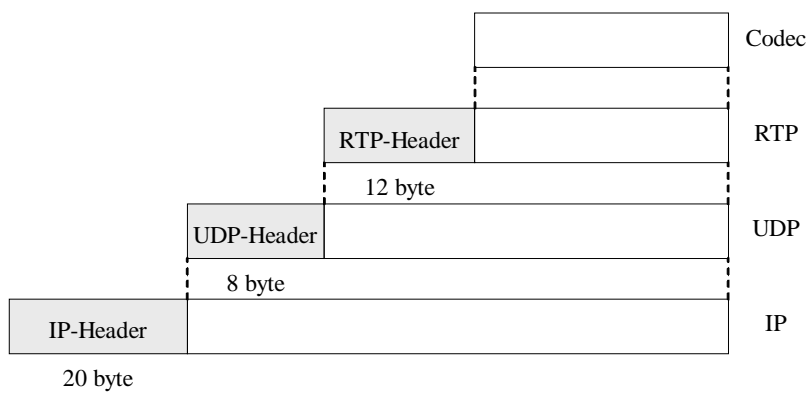


Bild 15-22



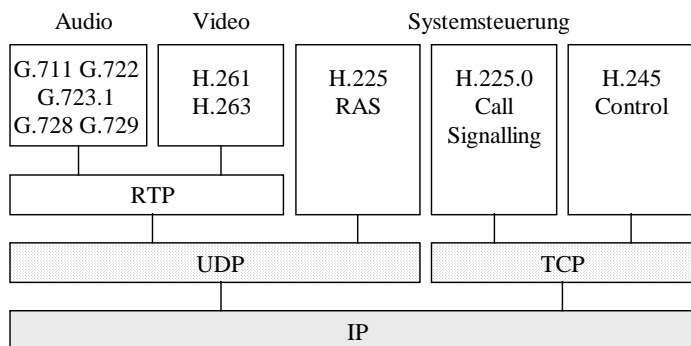


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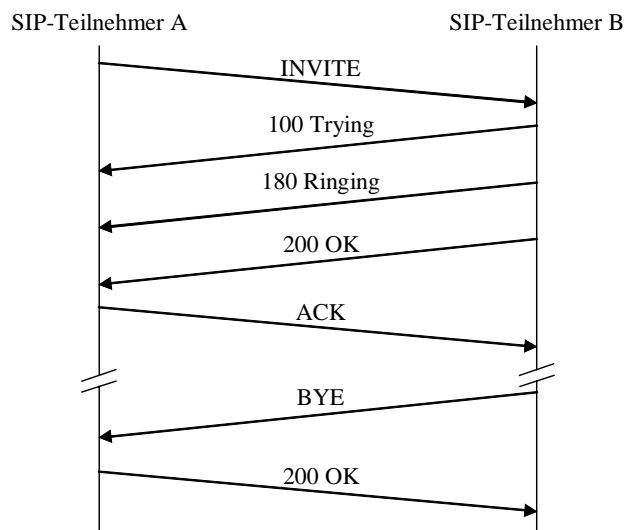


Bild 15-24

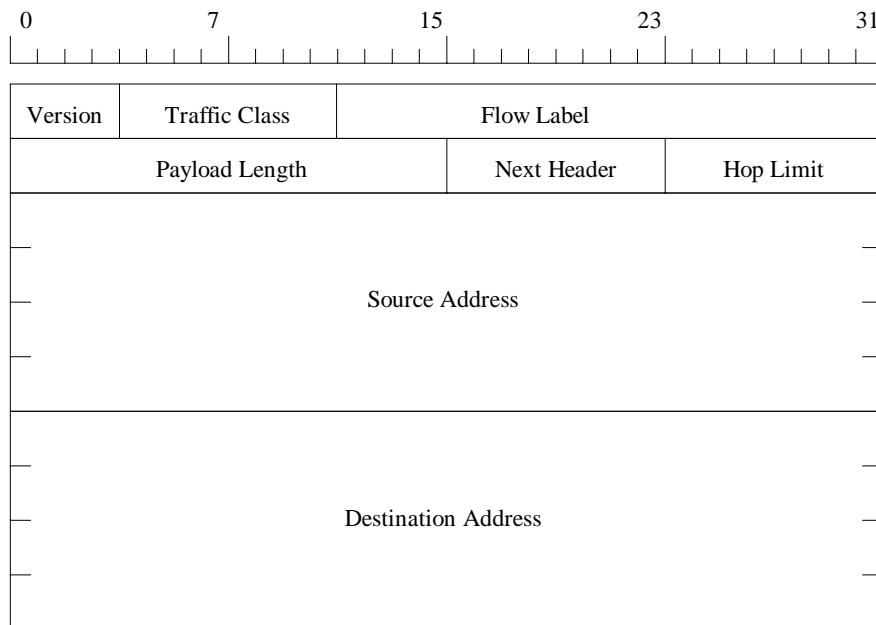


Bild 15-25