



Pilot Test of Digital Radio Broadcasting in Regional Areas



Detlef Pagel

**Media Authority Lower Saxony,
Hannover
pagel.nlm@t-online.de**

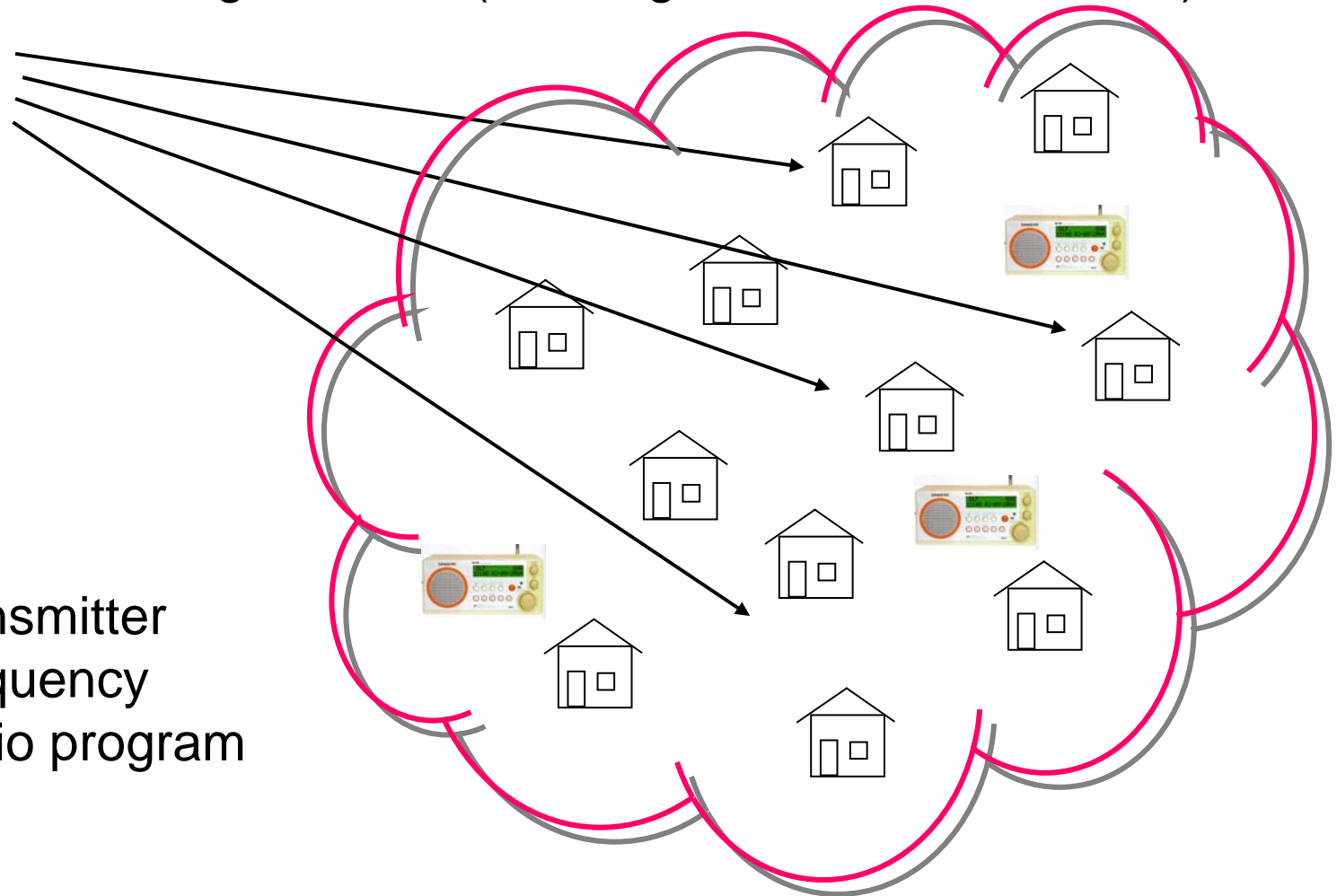
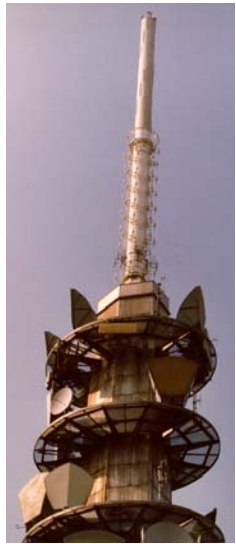


Albert Waal

**Institute of Communications
Engineering, Hannover
waal@ant.uni-hannover.de**

Local Broadcasting with FM

Transmission area
e.g. Hameln (coverage 100,000 inhabitants)

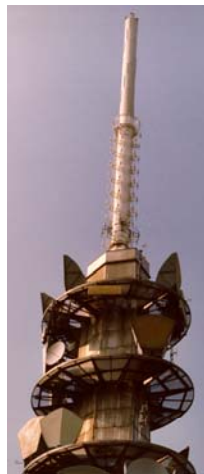


- 1 transmitter
- 1 frequency
- 1 radio program

Broadcasting with DigitalRadio EUREKA DAB-System

1 channel (band III or L-Band)

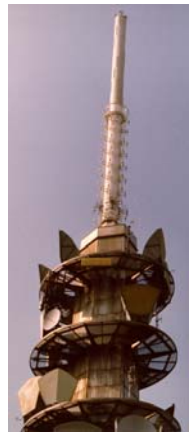
1 multiplex up to 8 radio programs, additional data services



System parameters:
1.75 MHz, 1.1 Mbit/s
MPEG Layer 2

Local Broadcasting with DigitalRadio

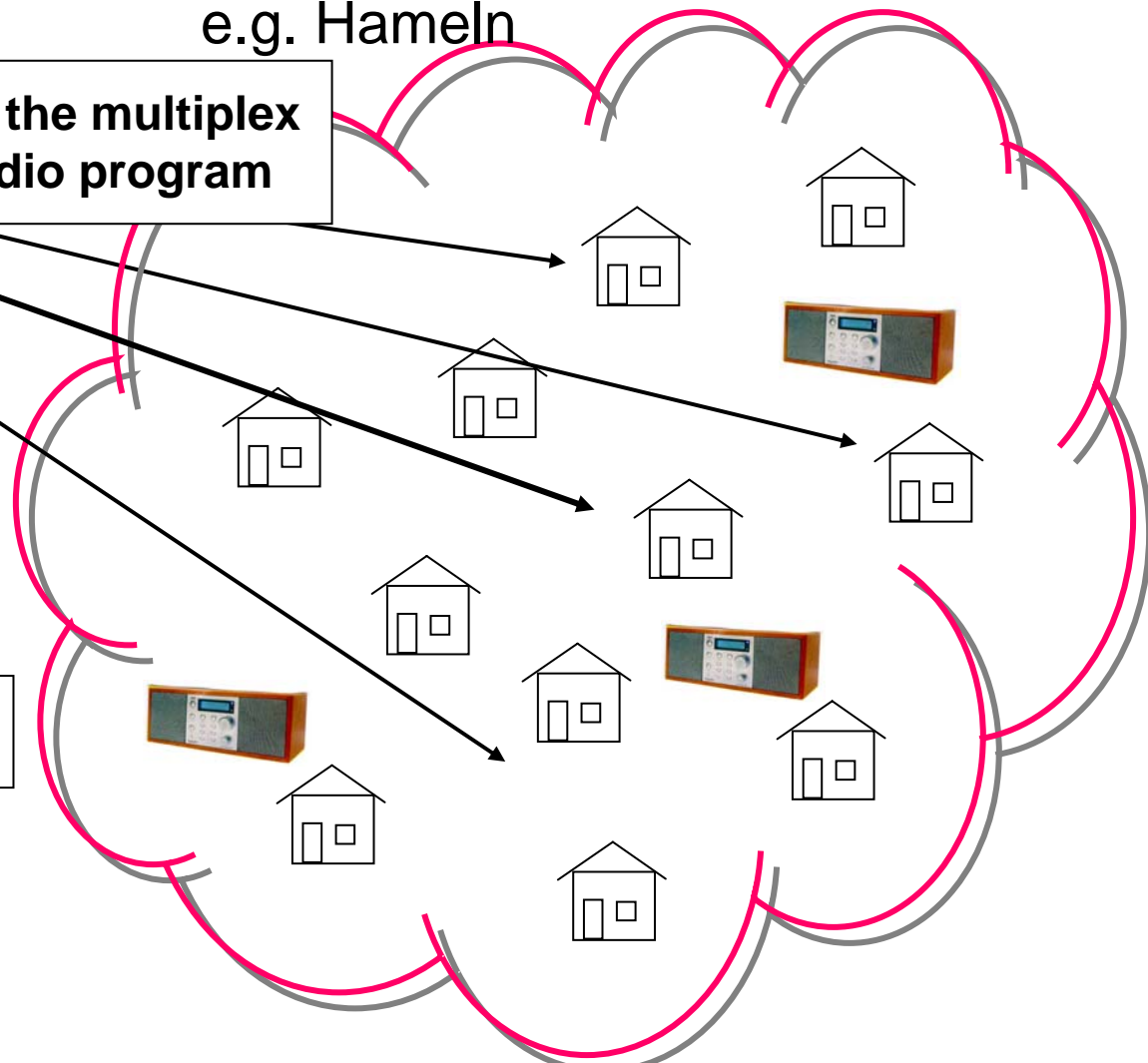
Transmission area
e.g. Hameln



1/8 of the multiplex
= 1 radio program

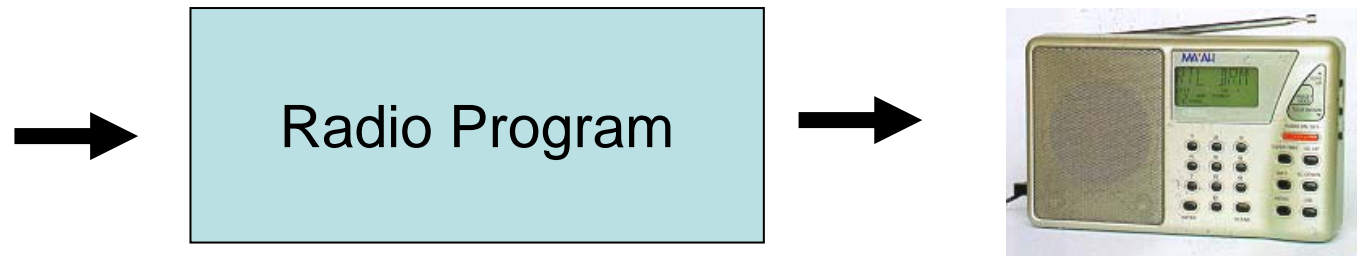


7/8 of capacity ??



DRM System (Digital Radio Mondiale, International Standard)

- Digital radio in the LW, MW and SW range
- Bandwidth 10-20 kHz
- By use of OFDM high spectral efficiency
- 1 frequency, 1 transmitter, 1 radio program



System parameters: 10-20 kHz, approx. 5-48 kbit/s,
MPEG 4 AAC+ SBR

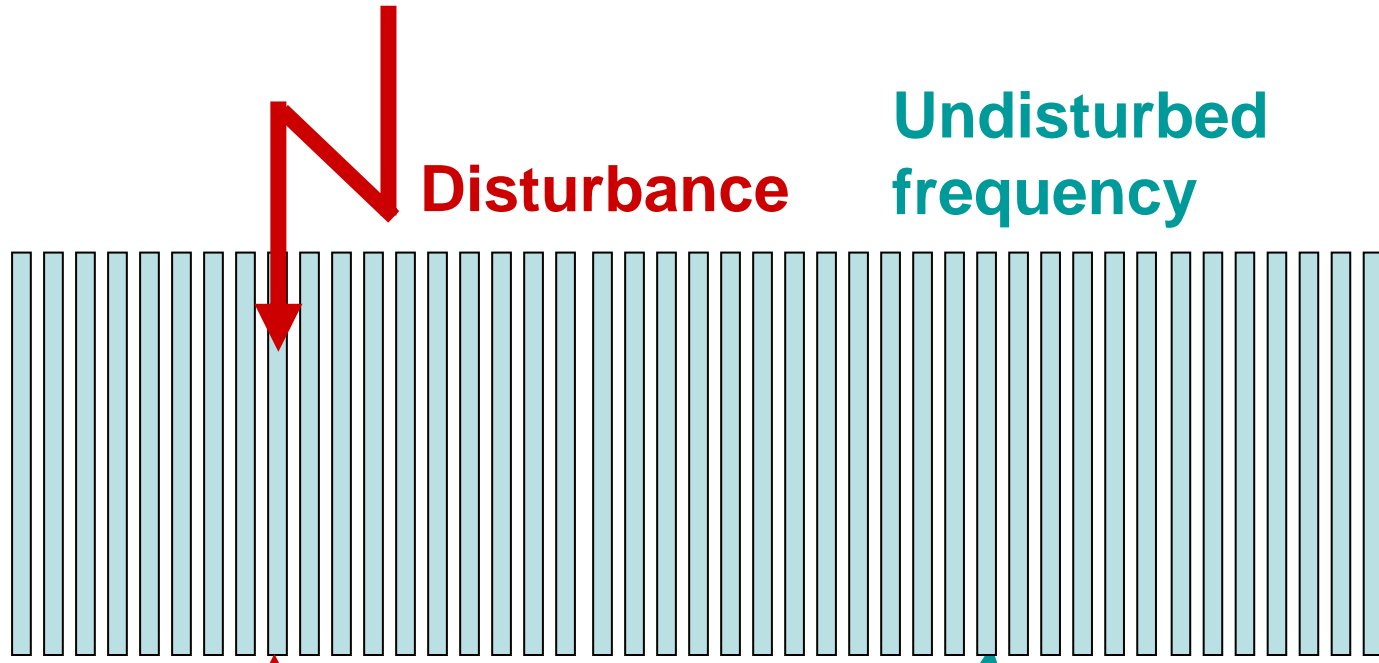
Pilot Test

Goal of test:

Determination whether local radio broadcasting with DRM in sufficient technical quality is economically realizable.

- Short wave range (11-m band)
frequency hopping
- VHF range (87.5 – 108 MHz) DRM+
e.g. practical tests, DRM+ transmissions

Frequency Hopping



Program disturbed
→ Frequency change

To avoid disturbances
have effect on reception,
frequency hopping is used



Frequency Hopping

The current bit error probability (BER) and the number of not-decoded audio frames are supplied over the internet to the transmission site by the reference receivers. An algorithm decides on the necessity for frequency hopping.

Reference receivers:
Sat Service Schneider
Module DRT 1
integrated in PC`s /
STARWAVES W37





NLM

The Transmitter Site

High of transmitting aerial: 70 m
Effective radiated power ERP: 80 W
Transmitting frequency: 26045 kHz
Data rate: 26480 bit/s
Modulator: TRANSRADIO Type DRM-DMOD2
DRM power amplifier: Sat Service Schneider 100 W



Transmitter site



Ground plane antenna

Pilot Test Participants

- **Media Authority Lower Saxony (NLM)**, Hannover
Project steering
- **University of Hannover**,
Institute of Communications Engineering,
Scientific project management, basic research,
transmitter and receiver technology
- **STARWAVES GmbH**, Bad Münden
Basic research, transmitter and receiver technology,
Technical support

Further information: www.digital11.de