Backyard Radio

megfault

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*Why don't you go to a radio station
just as you did to theatres?*

"Big radio is no more necessary. Sooner or later, large and global
communication technologies will be integrated into the Internet.
Radio, television and telephone will become local nodes to it.
Thus globalists will discard such exiting medium. A new type of
multi-media terminal linking to the internet will appear.
So it is the time when radio and television (and even telephone)
must re-find their own emancipating possibility. Micro radio
station will re-find a possibility of getting-together space such as
theatre and club."

– From Tetsuo Kogawa's *A Micro Radio Manifesto*[1] (2002)

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[1] http://anarchy.translocal.jp/radio/micro/

Background on MicroFM

> *"micro" means something beyond the mere size of transmitting power and service area*

> $\rightarrow$ diversity, freedom, alternative to mass media, etc

Some history, worldwide:

- origin in Italy, mid-1970's
- quickly over 1000 senders, spreads to France and other neighboring countries
- was really big in Japan for a long time
- public radios in the US since 1960's for (mostly) educational purposes
- decline in interest, sees revival in the following decade
- pirate senders in the US since end of 1980's spark legal battles
- FCC finally re-legalizes LPFM in early 2000's, licenses required

Legal situation in Germany

"Allgemeinzuteilung von Frequenzen in den Frequenzbereichen 87,5-108 MHz, 863-865 MHz und 1795-1800MHz für drahtlose Audio-Funkanwendungen"[2]:

- ▶ not restricted to any standard
- ▶ no registration required
- ▶ max 50nW (should be enough for about 100m radius)
- ▶ lower power within 5min if no audio signal input
- ▶ valid since 2006 until the end of 2016
- ▶ future: ??? (probably will be extended, didn't find more info)

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[2]Bundesnetzagentur, Vfg 7 / 2006

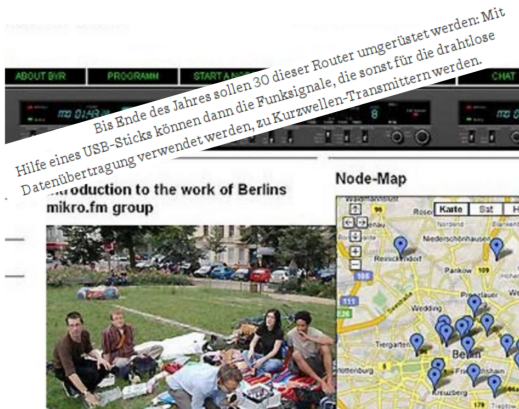# Example projects in Germany

(not to be confused with free radios)

- mikro.fm, formerly mini.fm in Berlin
- backyardradio.de (also in Berlin), coupled to Freifunk
  - some Internet archeology: mostly active from 2007-2010
  - mentioned in Tätigkeitsbericht 2007 of Förderverein Freie Netzwerke e.V.
  - website now dead, state unknown
  - not many more infos

Hörfunk aus dem Hinterhof

Oma Kassupke als Radio-DJ: Mit dem Berliner Backyard Radio kann jeder auf einer eigenen UKW-Frequenz senden.

Von Johannes Kuhn

Vollmundige Reportagen vom Frühstückstisch, polternde Politikkommentare aus dem Hobbykeller oder kecke Moderationen über dem Bügelbrett: Das Internetradio ermöglicht es jedem Menschen mit Breitbandzugang, seine eigene Radiostation ins Leben zu rufen.

Bis Ende des Jahres sollen 30 dieser Router umgerüstet werden: Mit Hilfe eines USB-Sticks können dann die Funksignale, die sonst für die drahtlose Datenübertragung verwendet werden, zu Kurzwellen-Transmittern werden.

BackyardRadio v2

- new Backyard Radio project starting now in Darmstadt[3]
- `#ffda-backyard-radio` on hackint IRC server
- additional sender in 87.5MHz - 108MHz
- audio stream comes from several servers in Freifunk network
- community-ran platform for queuing audio tracks
- to prevent legal issues and extra costs: no GEMA artists, free licenses only

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[3]https://taiga.darmstadt.freifunk.net/project/backyard-radio/

BackyardRadio v2 - the senders

- ▶ we found some cheap electronic "garbage" on eBay
- ▶ Sony Ericsson MMR70 FM Transmitter, less than 1EUR
- ▶ a few FFDA members are working on it:

THINGS WHICH WORK SO FAR

flashing radio firmware to the atmega32l:

- Hook up the avr to the isp programmer [1], [2]
- connect UART like here [2] with a standart TTL 3.3V FTDI
- Flash the radio firmware from [3] with make fuses, make program
- open serial console e.g. screen /dev/ttyUSB0 38400, cmd prompt will appear like

```
Loaded new OSCCAL 181 instead of 161
delay(1000) = 1000
ID MMR70mod, FM 97.00MHz
Radio OFF, Stereo ON , TX Power 0, Volume 0, Audio Gain 0dB
> >
```

- you can get possible commands by typing help, but the firmware seems to have some bugs and most of the commands do not return any output. the firmware in the test folder seems to work properly. With a sdr I see no signal on 97Mhz after turning on radio, so the command is probably not executed or something is wrong with i2c connection to the transmitter.

[1] http://www.elektronik-labor.de/AVR/MMR70_2.html
[2] http://petersieg.bplaced.net/?MMR-70_Hacking
[3] https://github.com/achilikin/shDAN/tree/master/

HARDWARE MODIFICATION IDEAS

CHEAP SOLUTION BY USING ONLY MMR-70

- hook the transmitter up to uart of ff routers. transmit audio data to the atmega32l and output it as pwm to the TSM 1-6. The audio quality will be poor but is cheap

BackyardRadio v2 - the platform

We are planning to use an adaptation of demovibes[4]:

- ▶ does not work like a usual radio station
- ▶ registered users can append tracks to the playlist queue
- ▶ anyone can upload tracks (moderated)
- ▶ possibility to rate tracks, keep a favorites list, write comments
- ▶ forum and chat available

Example instances of demovibes:

- ▶ https://www.scenemusic.net
- ▶ http://www.cvgm.net

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[4]https://github.com/arabek/demovibes

Future plans

- Get things to work^{TM}
- Get users (consumers & producers)
- Get content (tunes, documentaries, interviews, poetry, . . .)
- ????
- PROFIT!!

Extra material

- "Hörfunk aus dem Hinterhof": `http://www.sueddeutsche.de/digital/internet-radio-hoerfunk-aus-dem-hinterhof-1.337818`
- History of LPFM in the US: `http://diymedia.net/the-history-of-lpfm/7338`
- German legislation on using the FM range: `https://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Telekommunikation/Unternehmen_Institutionen/Frequenzen/Allgemeinzuteilungen/2006_07_AudioAnwendungen_pdf.pdf?__blob=publicationFile`
- Rundfreifunk (by FF Leipzig) on the Public Information Platform: `http://www.public-ip.org/sendungen-rundfreifunk.html`
- A blog entry on Berlin's Backyard Radio: `http://www.numblog.de/archives/472-Radio-Subbotniks-Backyard-Radio-und-mikro.fm.html`