

A person wearing a grey hoodie and dark pants stands on a rooftop, making a rock-on gesture with both hands. The background features a clear blue sky and several radio towers with various antennas and dishes. A semi-transparent green horizontal bar is overlaid across the middle of the image, containing the text.

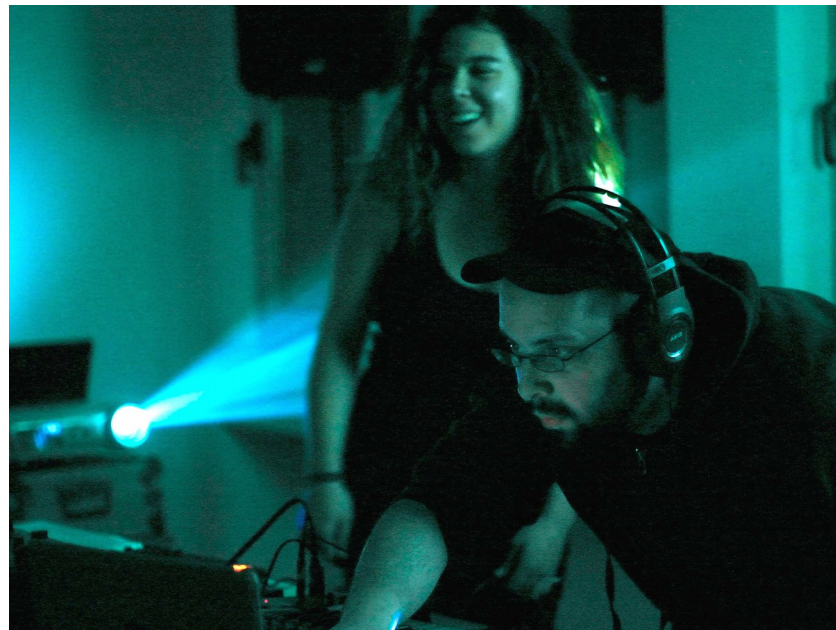
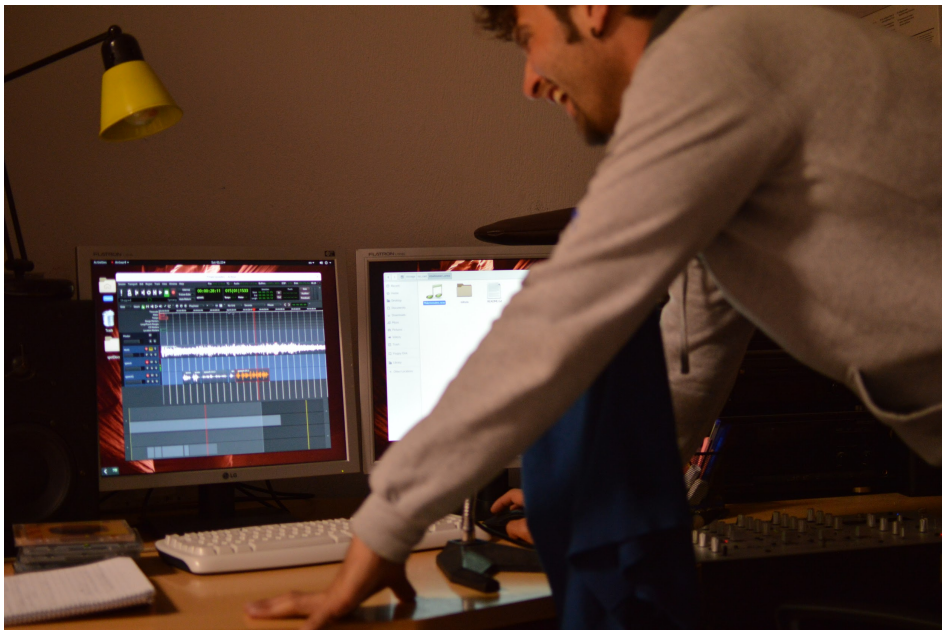
The University of Crete Radio Station Project

George Kiagiadakis, Nick Kossifidis

Who are we?



Why?



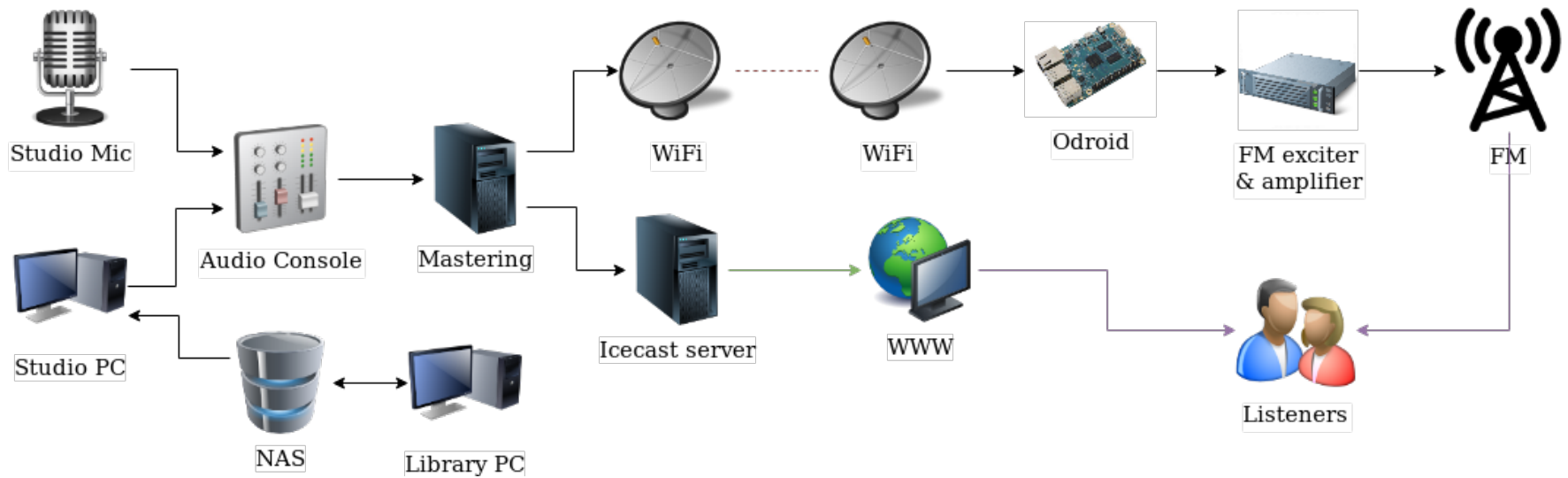
How?



The studio

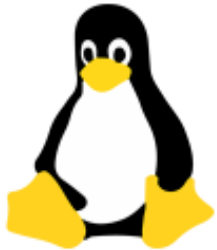


Technical setup





GNOME™



Technology used

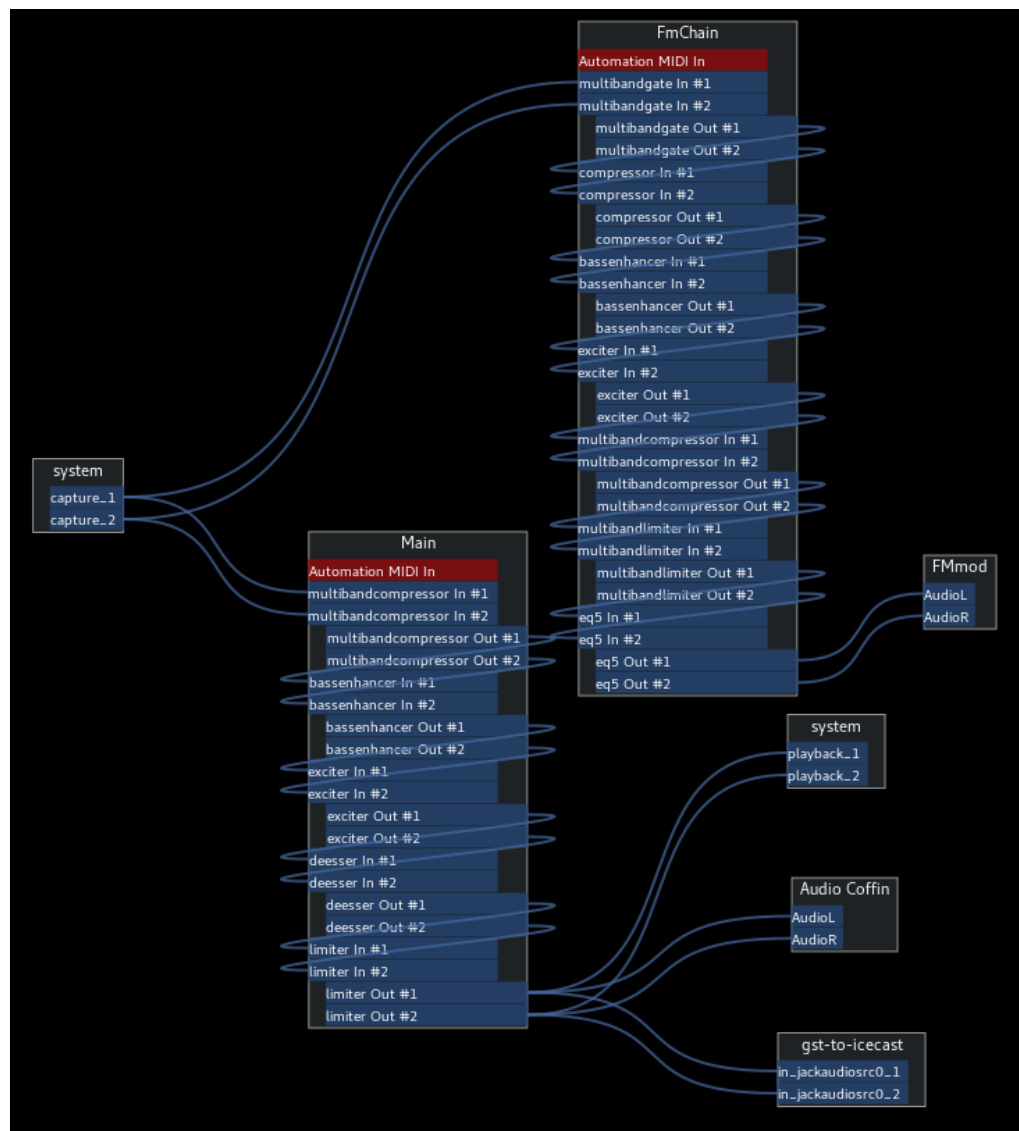
Under the hood

Audio mastering & encoding

- Calf Studio Gear
- IceStreamer
 - ◆ GStreamer based replacement for Darkice
- FM & RDS encoding: JMPXRDS
 - ◆ An SDR that generates the FM Multiplex (MPX) signal
 - ◆ Streams the MPX with RTP (GStreamer) to remote odroid through its Hi-Fi shield (384KHz)

Audio recording

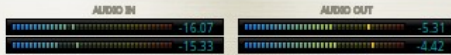
- Audio Coffin!
 - ◆ Also acts as an audio logger



Calf JACK Host

File Add plugin

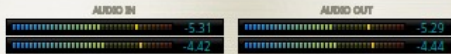
Multiband Compressor



Calf studio gear

Edit Connect Remove

Bass Enhancer



Calf studio gear

Edit Connect Remove

Exciter



Calf studio gear

Edit Connect Remove

Deesser



Calf studio gear

Edit Connect Remove

Limiter



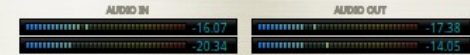
Calf studio gear

Edit Connect Remove

Calf JACK Host

File Add plugin

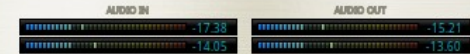
Multiband Gate



Calf studio gear

Edit Connect Remove

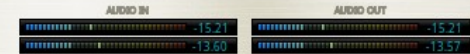
Compressor



Calf studio gear

Edit Connect Remove

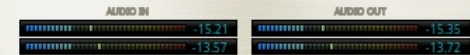
Bass Enhancer



Calf studio gear

Edit Connect Remove

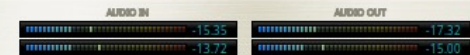
Exciter



Calf studio gear

Edit Connect Remove

Multiband Compressor



Calf studio gear

Edit Connect Remove

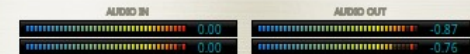
Multiband Limiter



Calf studio gear

Edit Connect Remove

Equalizer 5 Band



Calf studio gear

Edit Connect Remove

Audio Coffin

01:25:17

A small window titled 'Audio Coffin' with a timer at 01:25:17 and a coffin-shaped icon with a cross.

JACK Audio Connection Kit [(default)] Started.

Start Stop Started RT 38.4 % 96000 Hz Quit

0 (0) 00:00:00

Stopped --

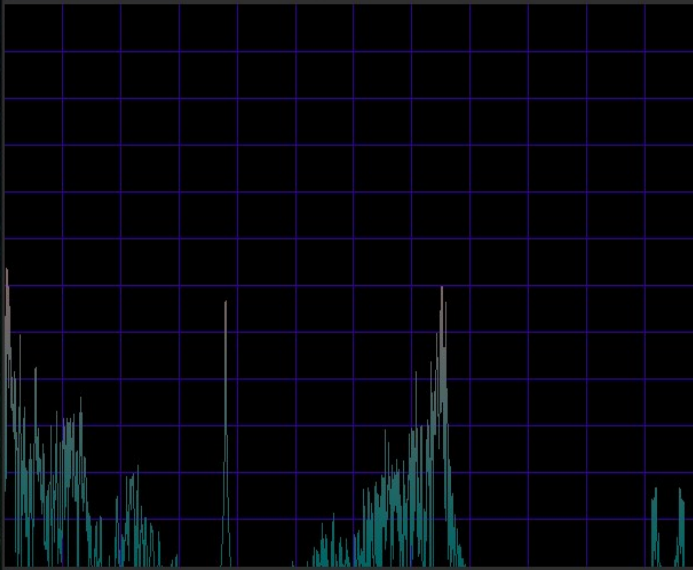
Messages Session Setup...

Connect Patchbay About...

A control panel for JACK Audio Connection Kit with buttons for Start, Stop, Quit, Messages, Session, Setup..., Connect, Patchbay, and About... It also displays status information like 'Started RT 38.4 % 96000 Hz' and a timer '00:00:00'.

JMPXRDS Control Panel

MPX Generator | RDS Encoder | RTP Server



Smooth Hold | Max Hold

MPX Gain Controls

- Audio: L 50% R
- Pilot: 9%
- Subcarriers: Stereo 120% RDS 4%
- MPX: 71%

FM Stereo Modulation Mode


- DSB (Default)
- SSB (Hartley)
- SSB (Weaver)
- SSB (LP Filter)
- Mono

Audio Filter Controls

- Low pass filter

FM Pre-emphasis

- 50µsec (World)
- 75µsec (U.S.A.)
- No pre-emphasis



JMPXRDS Control Panel

MPX Generator | RDS Encoder | RTP Server

Station Info

Programme Service Name (PSN): **RSPK96, 7**

Programme Identifier (PI): **1060**

Dynamic PSN from file: (None)

Country: **Greece** Language: **Greek**

RadioText

Time Crunch by Niacin

Flush remote buffer

Dynamic RT from file: (None)

Programme Info

Programme Type Name (PTYN):

Programme Type (PTY): **None**


Programme Flags

- Traffic Announcement
- Traffic Programme
- Music / Speech switch (MS)

Decoder Info

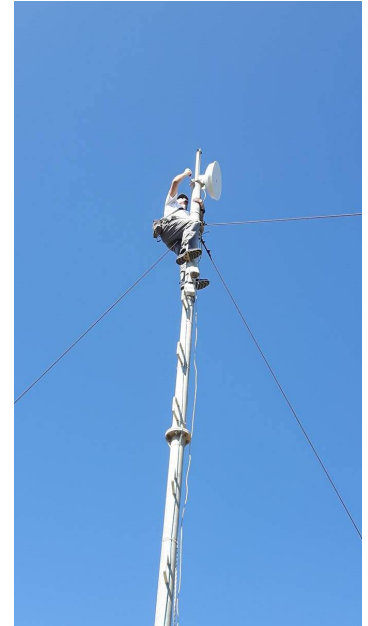
- Stereo Artificial Head
- Compressed Dynamic PTY

Enable / Disable RDS Encoder



FM Transmission

- Remote FM antenna on a mountain
- Link with directional Wi-Fi antennas (Ubiquiti)
- Odroid C1+ with Hi-Fi shield
 - ◆ JMPXRDS RTP client
 - ◆ Outputs FM MPX signal
- Analog FM exciter & RF amplifier



Autopilot

- Fill with music when there is no show
- Automatic selection of songs and spots
 - ◆ With certain rules
- The “Zones” concept
 - ◆ Time of the day => music kind
 - ◆ Main & intermediate playlists
- Meet **audio-scheduler**

Δευτέρα	Τρίτη	Τετάρτη	Πέμπτη
SouthernFolk Rock	Chillatronica	Gospel	Jazz Foundation
Classical Beats performed by british scums	Groovin'	Indie	America's Funk & Soul
West goes Modal	Reggae	Chillatronica	Latin jazz
Modal	Bluegrass	Latin Jazz	Balkan
Chillatronica	Power of Rock	Southern Folk Rock	Indie
Swing	Every Tuesday is Mardi Gras	Bebop	Jazz fusion
Blues Rock	Surf Baroque	The Progressives	West goes modal
Indie	Progressive		Classical Beats performed by british
Punky Reggae Party	Melpo	Jazz Fusion	Ψυχεδέλειες
World Fusion	Alternative	Hip Hop with scratches	
Ψυχεδέλειες	Experimental Electronica	Groovin	Alternative
IDM	Post Rock	Trip-Hop	Melpo
20th Century Classical	Κλασικισμος	Experimental Electronica	IDM
Ballads	Can you Swing?	Minimalism	Ζαποέ

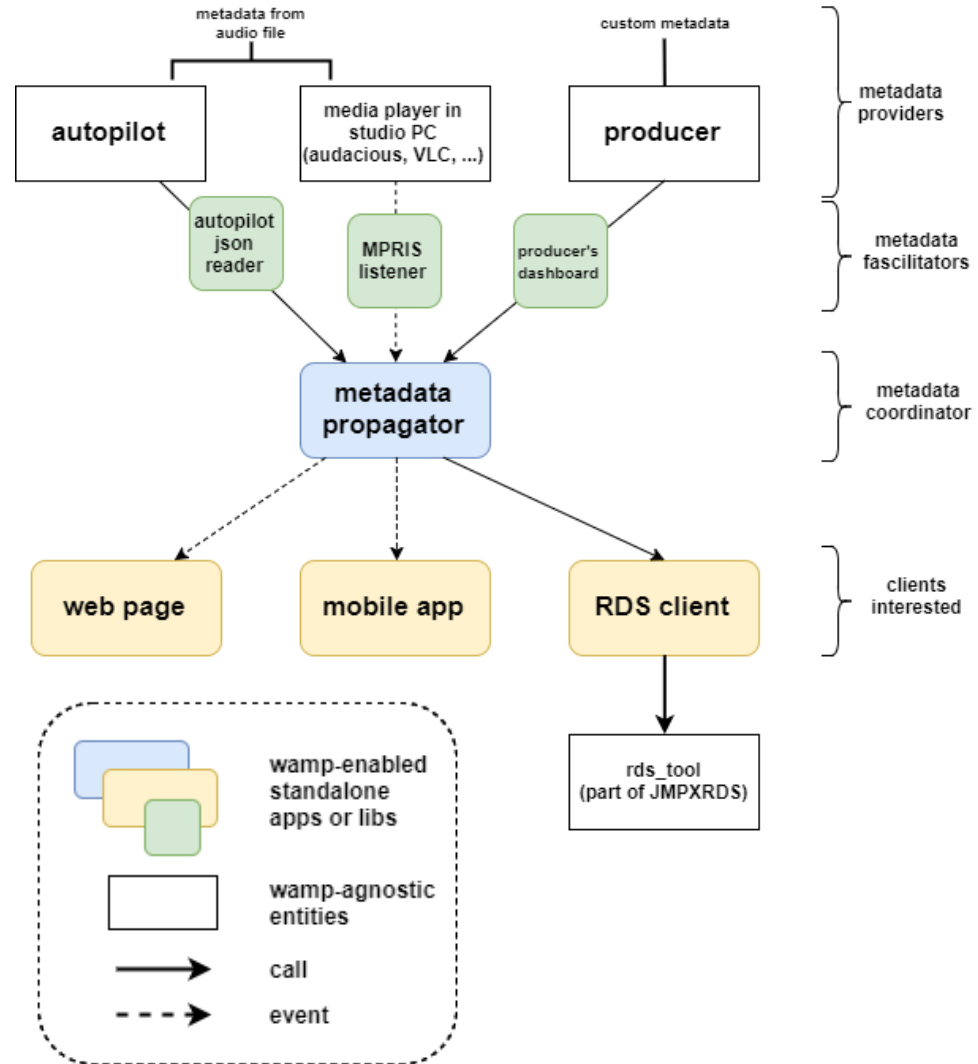
Metadata

- An infrastructure based on WAMP (WebSocket) for transmission of playback metadata and relevant information from many sources to many clients.
- Uses **crossbar.io**
- Distributed in many machines (studio, NAS, mastering, mobile)
- Message sample:

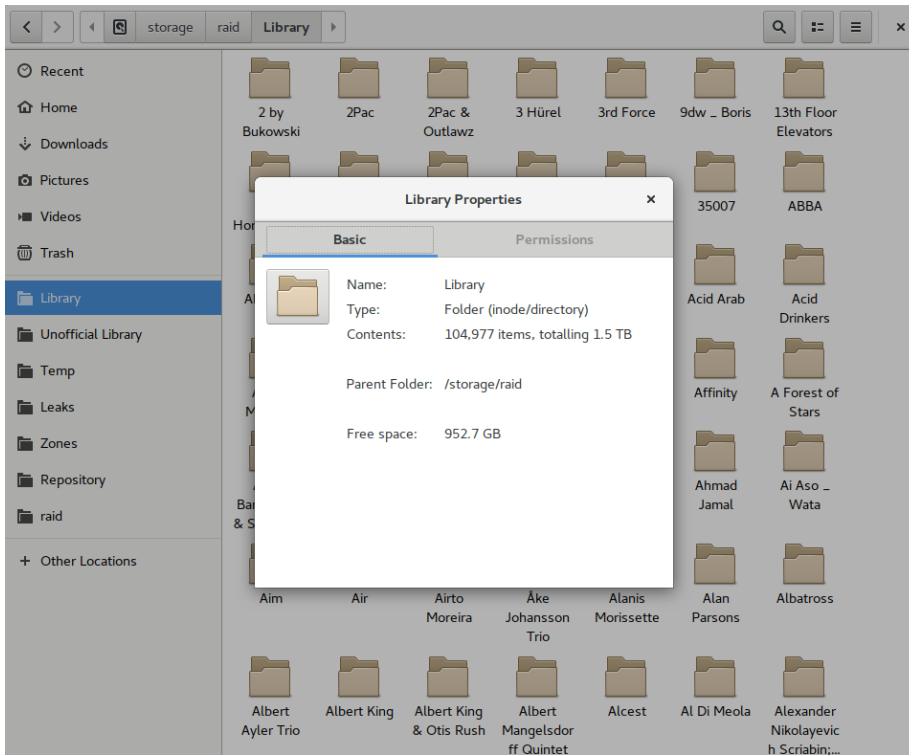
```

{
  "producerName": "autopilot",
  "slotTitle": "Playlist name",
  "slotDuration": "10:00-12:00",
  "slotAuxiliaryMessage": "A message about the playlist.",
  "slotDescription": "A pretty long description about the playlist.",
  "slotURL": "http://www.radio.uoc.gr/playlist_name.html",
  "imageUrl": "http://radio.uoc.gr/metadata/cover.jpg",
  "albumTitle": "Abbey Road",
  "songTitle": "Come Together",
  "songLength": "4:19",
  "artist": "The Beatles",
  "genre": "Rock",
  "year": "1969",
  "metadata_url": "https://musicbrainz.org/release/d6010be3-98f8-422c-a6c9-787e2e491e58"
}

```



Music library



The screenshot shows the MusicBrainz website interface. At the top, there is a navigation bar with 'uoc_radio' and 'My Data' dropdowns, a search bar, and a language dropdown set to 'English'. Below the navigation bar, the page title is 'Edits by uoc_radio'. A 'Quick links' section contains links for 'Search for edits', 'Refine this search', 'Open edits', 'Subscribed entities', 'Subscribed editors', 'Help:Voting FAQ', 'Editing FAQ', 'Style guidelines', and 'How editing works'. A 'Found 345 edits' section includes a pagination control with 'Previous', '1', '2', '3', '4', '5', '...', '14', and 'Next' buttons. The main content area displays an edit for release #50627286, titled 'Add medium', with a note 'My vote: N/A automatically applied' and 'Closed: 2018-01-31 20:45 UTC'. The release information is as follows:

Release: Polygon by The Cher's Wet Dream Collective [Add Note](#)

Position: 1

Format: CD

Tracklist:

#	Track Name	Artist	Duration
1	Concept For Fools	The Cher's Wet Dream Collective	8:25
2	Order To Decompose	The Cher's Wet Dream Collective	4:59
3	Heptagon	The Cher's Wet Dream Collective	7:43
4	Albert J	The Cher's Wet Dream Collective	10:57
5	The Glass	The Cher's Wet Dream Collective	7:52
6	Rain	The Cher's Wet Dream Collective	3:41
7	Death of a star	The Cher's Wet Dream Collective	7:04

Artist Credits: # **Artist**

1-7	The Cher's Wet Dream Collective
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Future ideas

- Desktop apps
 - ◆ For show production
 - ◆ For autopilot management
- Zones, shows and misc information in a database
- Website as a view of that database
 - ◆ Plus messaging system
- Web tool to allow people to contribute playlist ideas
- Digital studio
- Real-time declipper

FOSDEM¹⁸

Thank you!

Any questions?

<http://radio.uoc.gr>

<https://github.com/UoC-Radio>

