

Small Area DAB Transmission

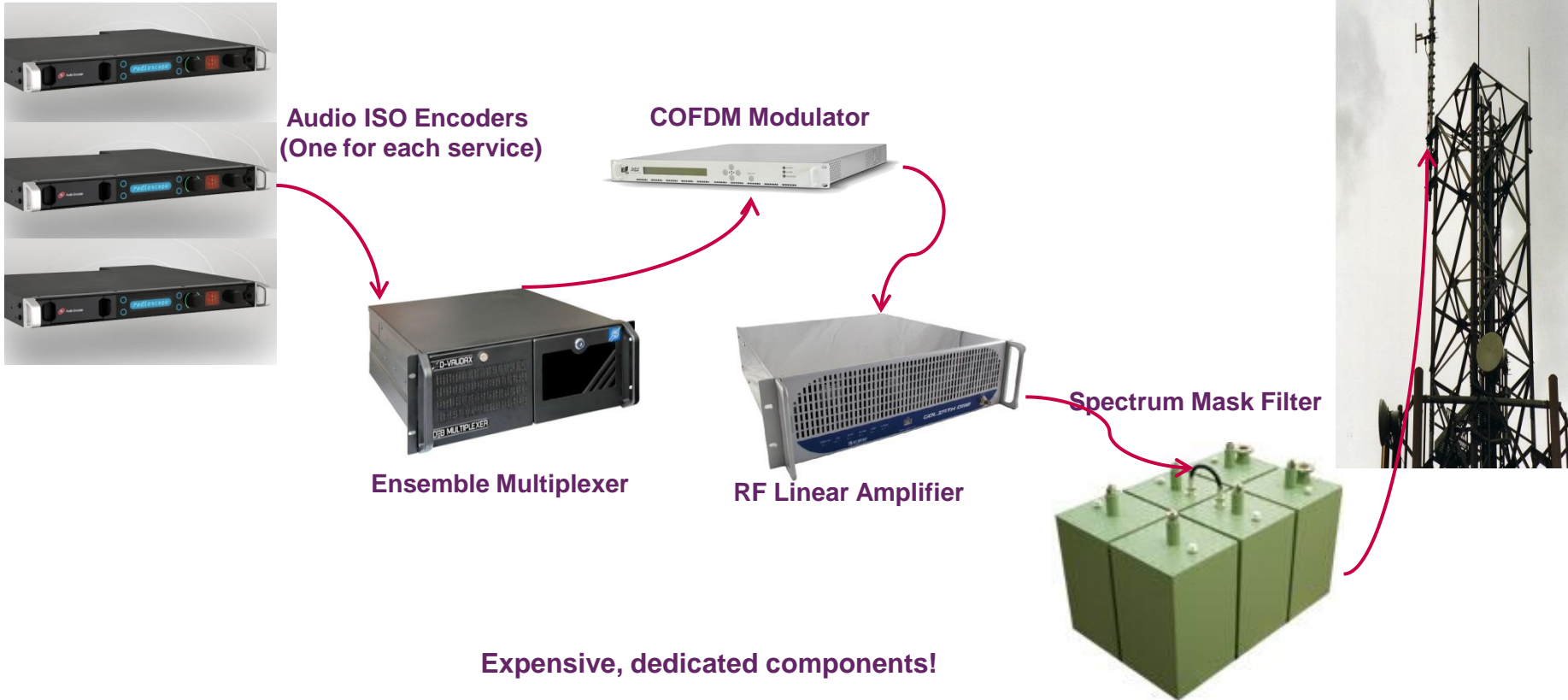
Radio Centre November 2013

Martin James, Broadcast Radio & TV

Small Area DAB Transmission

- Current services are typically county wide – perceived high cost
- Desire for City/Town coverage – lower cost
- Brighton Trial – proof of SDR concept
- Conclusions
- Further Work

Hardware DAB transmission chain.



The software approach:

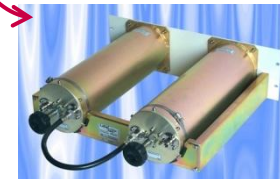


Audio ISO Encoders +
Ensemble Multiplexer +
COFDM.

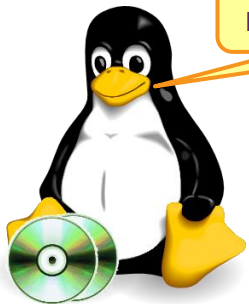
Software Defined Radio



RF Linear Amplifier

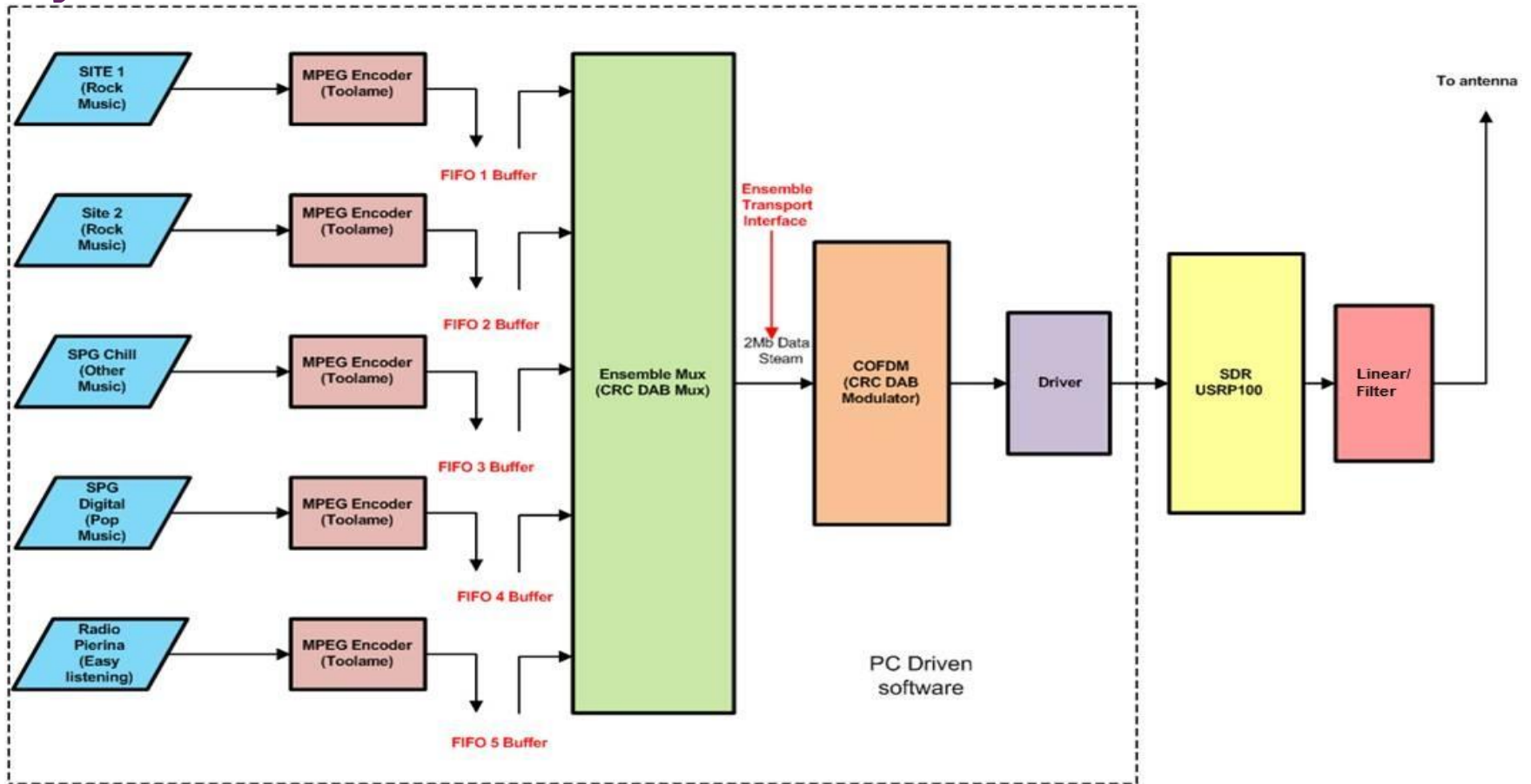


Potentially
simpler filtering



Like the analogue systems,
DAB is now a free standard.

System overview



Block diagram of DAB ensemble using SDR

Large SFNs are not practical for small stations...

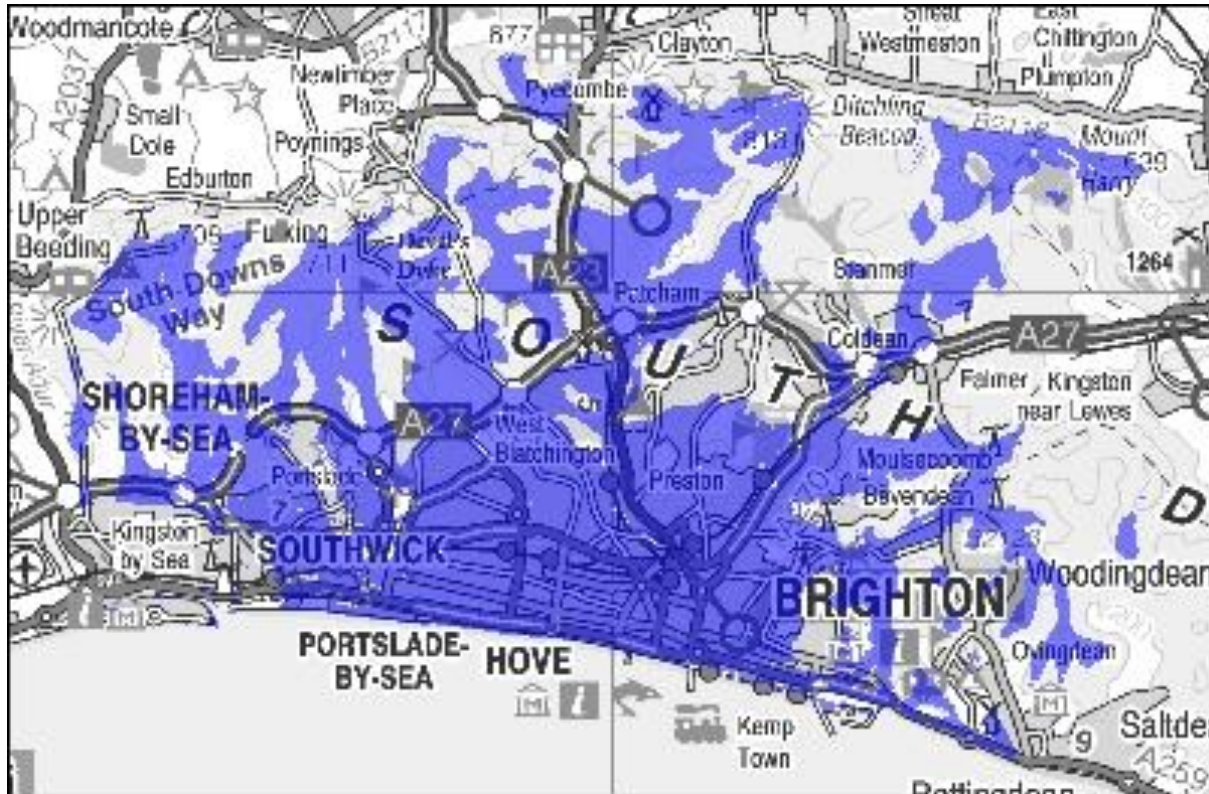


Sussex Coast local DAB multiplex service (NOW Digital) indoor coverage normal propagation conditions, January 2013

The Brighton Experiment.

- Could a single transmitter, low-power multiplex serve a city:
 - Reliably?
 - At a cost comparable to FM?
 - Without causing ACI problems?

Predicted Coverage



Predicted terrain-limited coverage, for mobile reception (58dBμV/m or better).

Measured Coverage

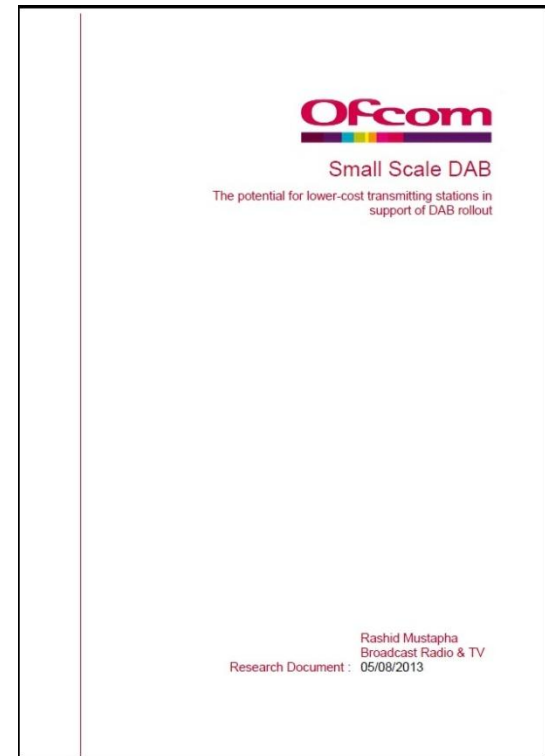


Measured coverage, showing calculated *indoor* reception area (green).

Our work:

- We published* a 'light' report.
- Presented our findings to Government.
- Plan to look into spectrum, and SFN use.
- Consider possible licensing policy.

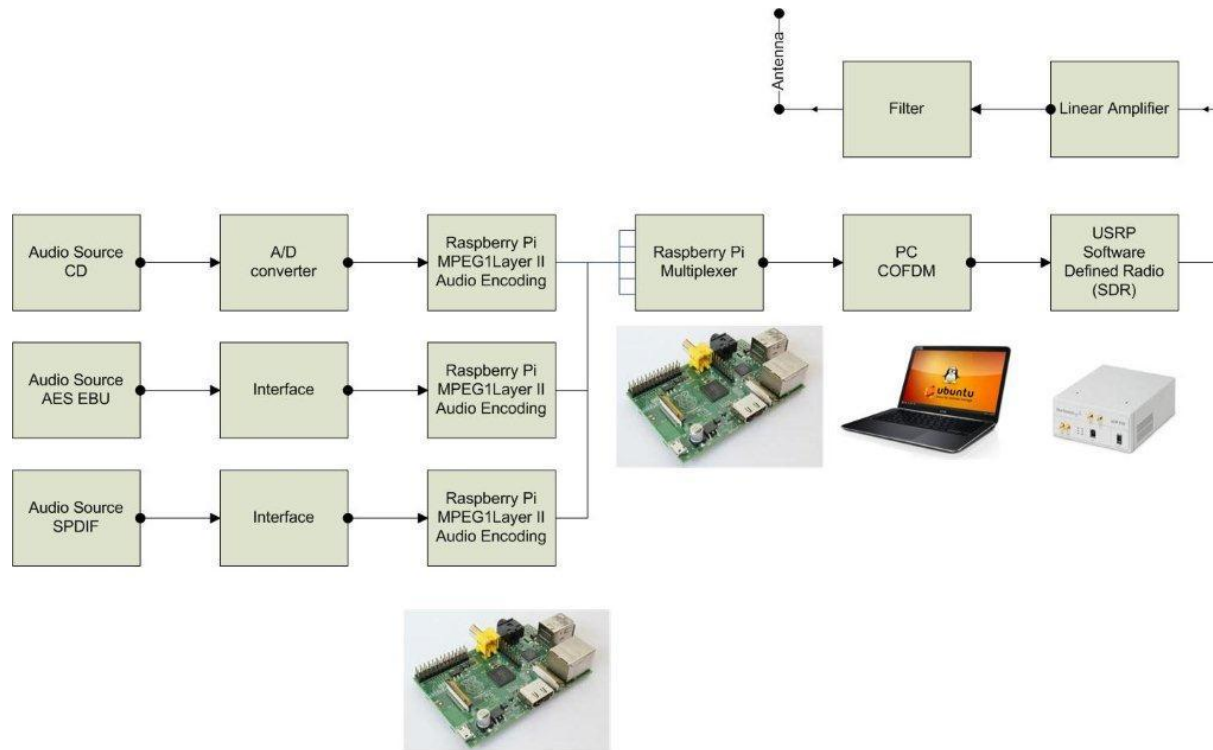
*<http://stakeholders.ofcom.org.uk/market-data-research/other/radio-research/Software-DAB-Research/>



Potential applications.

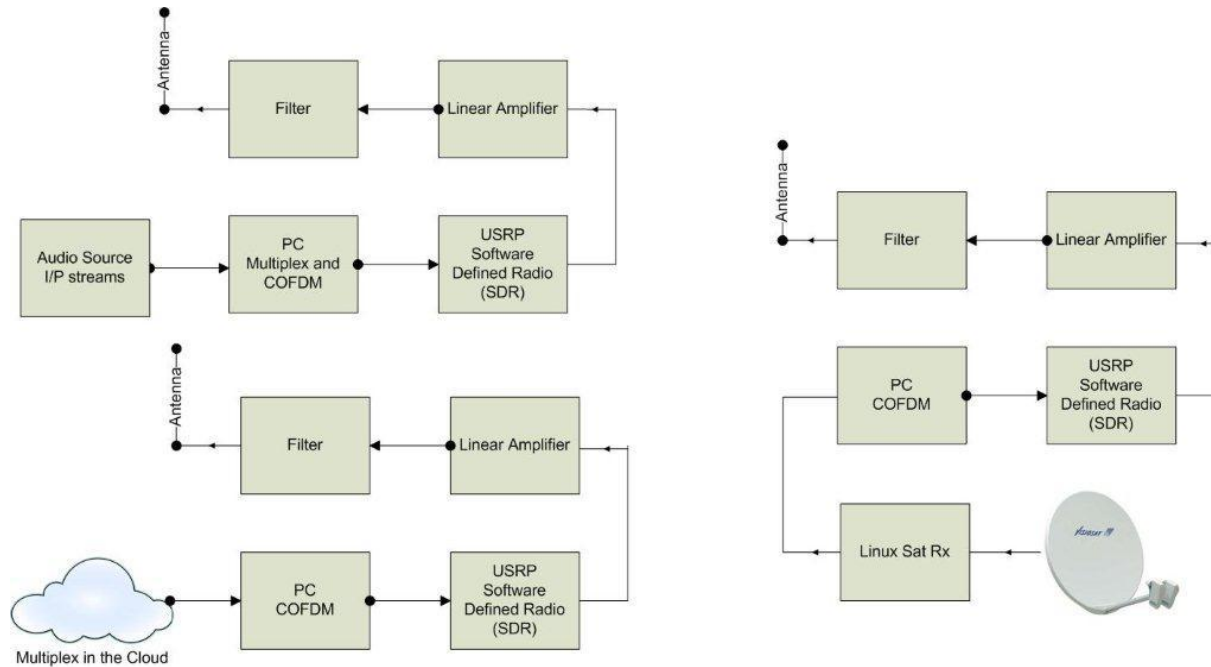
- We have had some thoughts about uses for small scale DAB:
 - Local and Community, temporary, and incremental services.
 - Serving remote rural areas (last few per cent population, roads).
 - Low-cost Adjacent Channel Interference (ACI) hole repairing.

Tested ARM devices:



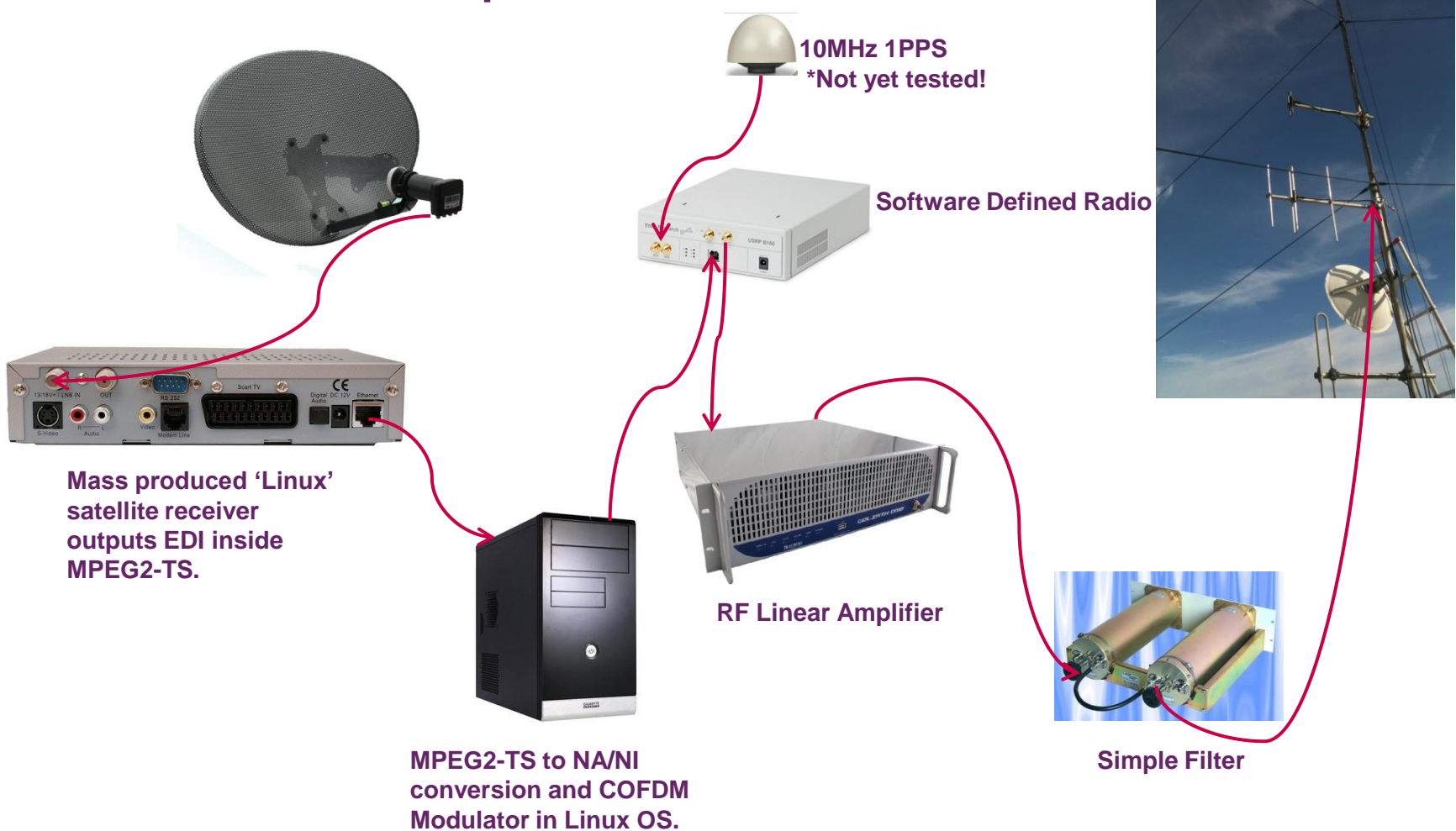
Modular system with Raspberry Pi encoders and multiplexer

Tested Configurations:



Alternative configurations

Low-cost filler/ACI repair.



CONCLUSIONS AND NEXT STEPS

- Potential solution for small stations: proof of concept
- More work required over the next few years
- Need to investigate spectrum, regulation and licensing policy implications
- We need your support
- Proposed open meeting early in 2014 to discuss with small stations

Thank you!

<http://ofcom.org.uk>



 **mmbTools**

<http://mmbtools.crc.ca/>

<http://www.opendigitalradio.org>

