



International Amateur Radio Union Region 1

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Subject	Innovative Data & DATV in 50MHz		
Society	RSGB	Country:	UK
Committee:	C5	Paper number:	NS20_C5_19
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Introduction:

In this paper we propose options for accommodating innovative Data and DATV usage in 50MHz. The contribution is intended to assist the C5 '50 MHz Working Group'.

Background:

Following WRC-19, most countries will have access up to 52 MHz, which will be widely available across Region-1. This is therefore the focus of this proposal as we consider that the band plan framework for 52-54 MHz is already fit for purpose, even if the technology needs further development. The narrowband segment has previously seen changes, needs stability, and should not be changed. As per VHF Newsletter-86, the focus should therefore be in the 50.5-52 MHz segment.

50	50.5	51	51.5	52	52.5	53	53.5	54
	Narrow BW and Beacons	Key area for review / proposals			Wideband all-modes			

Key Considerations / Proposals

The current (Vienna 2019) band plan note includes

Experiments using wider bandwidth digital modes may take place in the 50 MHz band within the 50.5 - 52 MHz segment where local conditions permit, on the basis it does not cause interference to other users (including narrowband/beacon use)

- noting that potential options for this include around 50.6, 51.0 or 51.7 MHz and maximum bandwidth of around 50 kHz
- That Member Societies encourage such 50 MHz digital experiments to support innovation and development of the band and report results back to IARU Region 1

There have already been a small number of 50 MHz DATV trials using DVB-S/QPSK. Whilst QPSK is not the ideal waveform for the highly variable propagation conditions (as ideally some form of OFDM may be better), the experience gained is that up to 500kHz is required.

Digital modems for time-duplexed data links are also emerging. These can run at a range of data rates, but it is reasonable to expect a couple of usage categories to emerge with <128kb/s for longer-range voice/data/telemetry ranges; and 256-333kbs for shorter-range data. The latter also needing up to ~500kHz BW like DATV.

Repeaters: We would not expect significant growth in classical FM voice repeaters as they

face significant problems from expensive duplex filtering, low antenna gain and ambient noise. Their presence in the current IARU band plan does restrict options and will need to be part of the wider consideration. Briefly, two output frequency options currently exist in the current IARU band plan:-

- The lower frequency solution referred to by Usage note 1.2.2, and widely used in the UK, was developed to be optimal for band sharing with primary users - as the transmitter outputs are below 51MHz and it thus leaves most of 51-52 MHz free for other uses.
- The upper range option with outputs above 51.8 MHz has very few deployments across the rest of Region-1. It may limit other use and requires more spectrum due to the wider split.
- CTCSS is necessary for FM repeaters, so some overlapping usage near their inputs or output can facilitate shared spectrum use by other amateurs (as well as primary users).
- Practical considerations suggest we might expect greater growth in simplex gateways and TDD data, which unlike repeaters do not require large cavity filters.

Simplex: Current use of 6m FM simplex is quite modest. A useful option would be to accommodate this next to the IARU voice gateway frequencies near 50.6 MHz as well as their current position (where an overlap by future data may occur).

Narrow Data: The existing designation at 50.620-50.750 could accommodate some new use. There is also scope here for a better common alignment of 50.5-50.7 to avoid a repeater overlap.

Voice Modes: Voice Gateways and the repeater outputs are listed as FM only – this is too restrictive and should be FM/DV. (The specific FM & DV calling frequencies are not affected)

Bandwidth: The 12kHz Bandwidth limit for 'All modes' is too restrictive. It should be either modified to accommodate newer modes, or deleted (as per recent 70cm changes)

Editorial: Updates will be required for 1.2.2 and e, f and g depending on the meeting outcome

Recommendations:

Subject to the discussion in the Working Group, our proposals are:-

- 1) Add the lower voice repeater output frequencies at 50.7- 50.9 MHz directly in the main table for clarity to encourage that option for newer deployments if there is demand
- 2) Voice repeaters and gateways to be designated as FM/DV in the band plan
- 3) Discuss and re-align the 50.5-50.7 MHz range to be common (without any repeater overlap) and enable at least part of it to accommodate 50kHz BW Digital Comms (currently it has a 12kHz maximum bandwidth)
- 4) Designate 51.0 MHz as a centre for narrower bandwidth data, up to 200 kHz BW
- 5) Designate 51.7 MHz as a centre for 500kHz shared usage

Note: Update the original 12kHz bandwidth limit and footnotes appropriately

Financial implications: None