# *Using the RSP1 – Radio Spectrum Processor with your Transceiver as a Panadapter*

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# *What is a Panadapter?*

- "Panadapter is short for Panoramic Adapter. The simple answer is that it allows us to see a panoramic display of the band our radio is tuned to. We can see every signal"*.

- Early implementations used a PC soundcard to achieve this function but were therefore limited to 200 kHz of bandwidth because they rely on the sound card.

- The advent of affordable SDR hardware such as the RSP1 has allowed implementations with much greater bandwidth, and hence much more usefulness.

- The RSP (Radio Spectrum Processor) from SDRplay is a Software Defined Radio which can turn a PC into a general coverage receiver or spectrum analyser spanning Medium Wave (100KHz) through to Microwaves (2GHz).

- Combined with readily available, and capable, SDR software Panadapters are now an affordable and easy to implement reality!

* Definition courtesy KA9MOT http://mypanadapter.com/

# *Hardware Requirements*

- An RSP1 – to acquire signals across the frequencies of interest.

- A Transceiver - preferably with either RxOut or IF Out capabilities, and CAT (Computer Aided Transceiver) capability to allow interaction with the SDR software.

- A PC – to run the SDR software and allow control signals to pass back and forth between the SDR software and the transceiver.

# *Antenna Considerations*

- The RSP1 can share the same antenna as your transceiver, or in some situations you may prefer to use an entirely separate antenna.

- If a separate antenna is used care must be taken with the physical layout to ensure that near-field effects do not overload the RSP1 when you are transmitting from the transceiver.

  - See this article for a discussion of near-field effects: http://www.w8ji.com/antenna_coupling.htm

- If a shared antenna is used it may either be connected "behind" the transceiver, in which case internal circuitry in the transceiver will protect the RSP1, or using a splitter "in front of" the transceiver. If a splitter is used it is essential that a switch is implemented that isolates the RSP1 from the antenna during transmit!

- **In any configuration the maximum input power to the RSP1 must not exceed 0dBm**

- On the following slides we will look at these configurations in more detail

*DO NOT directly connect the RSP to the same antenna as your transmitter, or to an antenna in the near field of a transmitting antenna, as this is likely to result in irreversible damage to your RSP and invalidate your warranty.*

# *Antenna Considerations*

## Separate antenna

- Care must be taken with the physical layout to ensure that near-field effects do not overload the RSP1 when you are transmitting from the transceiver.

  - See this article for a discussion of near-field effects: http://www.w8ji.com/antenna_coupling.htm

Near-field coupling
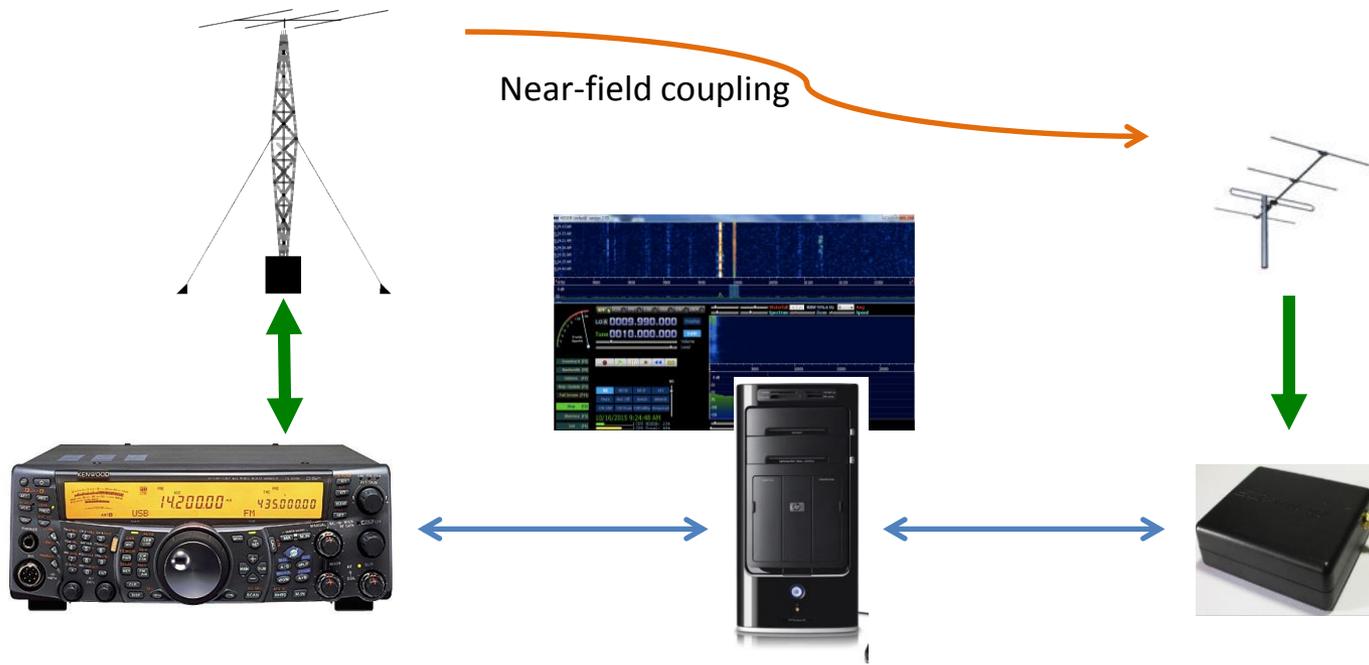
*DO NOT directly connect the RSP to an antenna in the near field of a transmitting antenna, as this is likely to result in irreversible damage to your RSP and invalidate your warranty.*

# *Antenna Considerations*

## Shared antenna using splitter

- A switch must be used to isolate the RSP 1 during transmit!
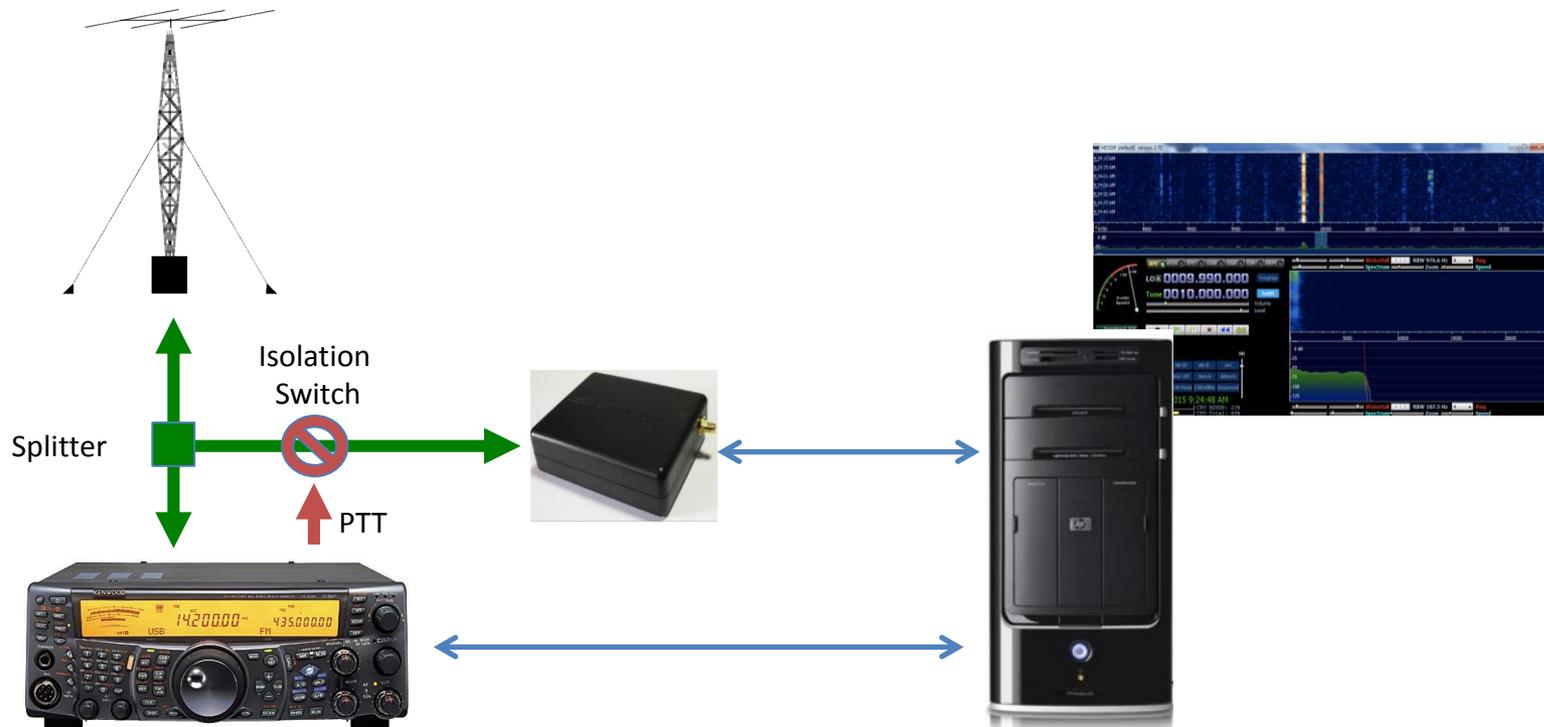


*DO NOT directly connect the RSP to the same antenna as your transmitter as this is likely to result in irreversible damage to your RSP and invalidate your warranty.*

# *Antenna Considerations*

## Shared antenna "behind" the transceiver

- Internal circuitry isolates the RSP1

IF or RF
Out
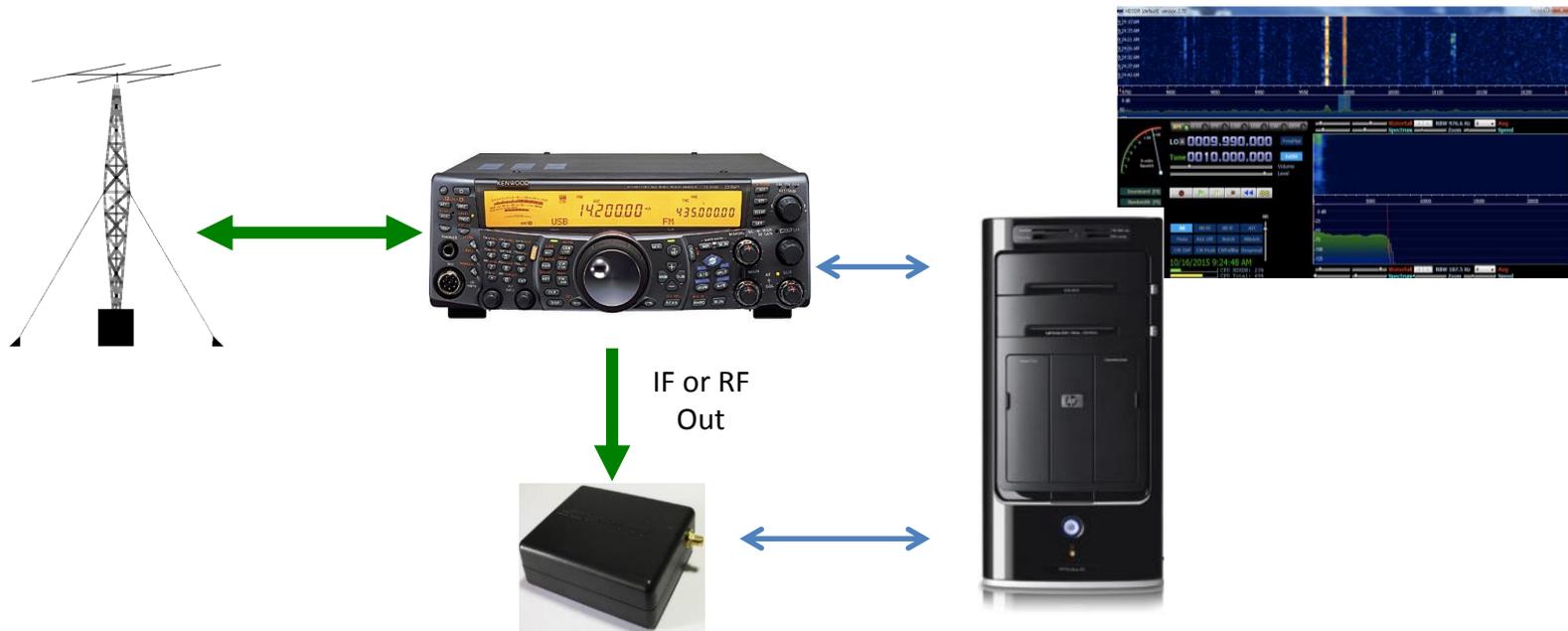
IF Out:   - Displayed bandwidth limited by transceiver on-board filters
          - RSP1 tuned to IF frequency

RF Out:   - RSP1 can display up to the full 8MHz bandwidth capability

# *Software Requirements*

- Any of the SDR Software programs that support RSP1 can be used to provide a basic spectrum display.

- HDSDR and SDR Console have built-in capabilities for CAT and other add-on software, to allow for communication between the SDR software and the transceiver.

- Ham Radio Deluxe and OmniRig are commonly used for advanced implementations.

- We recommend you research the available options and select according to your expectations and requirements:

| | |
|---|---|
| HDSDR: | www.hdsdr.de |
| SDR-Console: | www.sdr-radio.com |
| CubicSDR: | cubicsdr.com |
| Ham Radio Deluxe: | ham-radio-deluxe.com |
| OmniRig: | www.dxatlas.com/omnirig/ |
| N4PY: | http://www.n4py.com/ |

# *For more information:*

- Company website: www.sdrplay.com

- Community Forums: www.sdrplay.com/community/

- Email: support@sdrplay.com
  - US customers: support-us@sdrplay.com

- Facebook: https://www.facebook.com/groups/sdrplay/
  - Independent group run by enthusiastic users!