RUTGERS
WINLAB | Wireless Information Network Laboratory

Signal Avoidance with 5G

Wesley Chen
Advisor: Professor Predrag Spasojevic

Overview:

- Desire to expand 5G bandwidth
- Must avoid legacy spectrum usage

Goal:

- Develop groundwork to test signal avoidance techniques

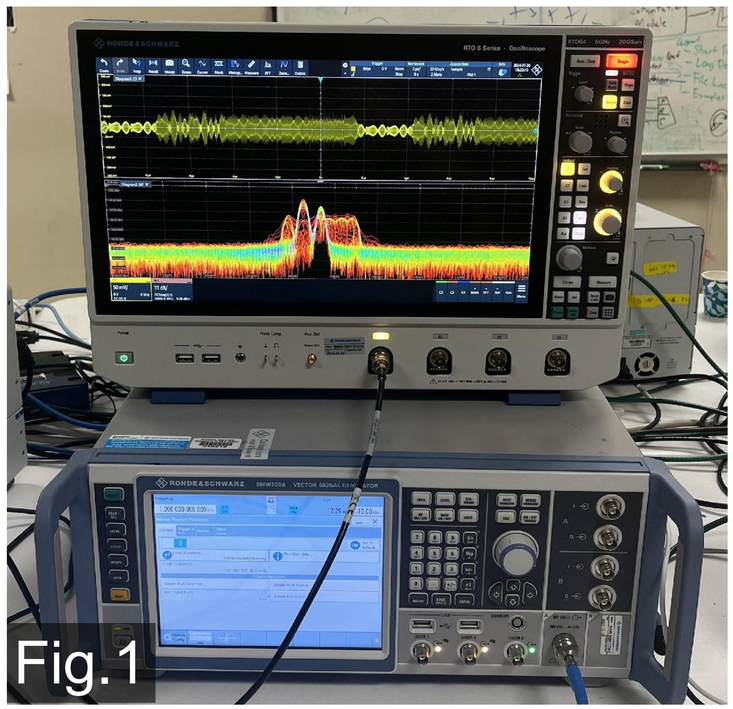

Fig.1

Rohde & Schwarz RTO 6 Series (top)
Rohde & Schwarz SMW200A (bottom)

Architecture

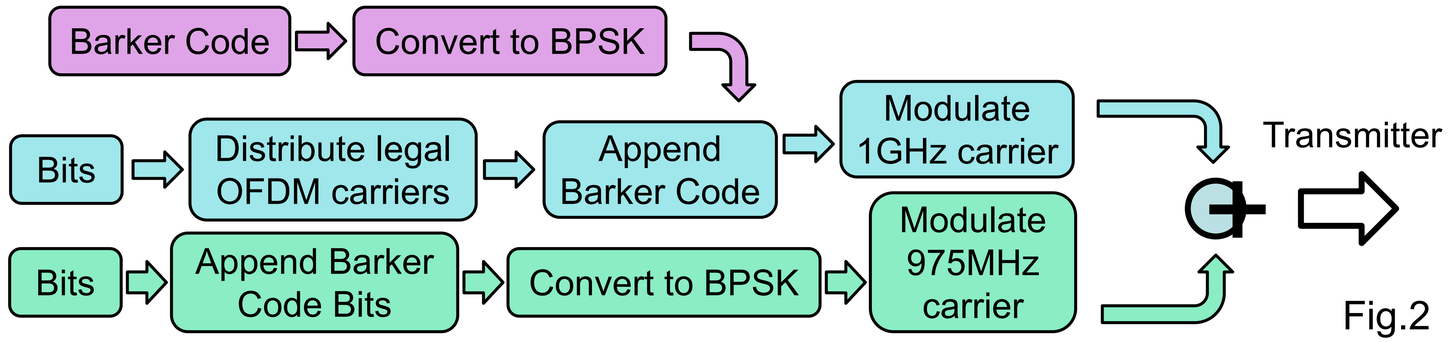

Fig.2

- Figures 2 & 4: architecture for transmission & reception
- Figure 3: OFDM frequency domain.
  - Total bandwidth of 100MHz.
  - Note gap at 965-995MHz.
  - Barker Code spike at 995-1050MHz.
- BPSK bandwidth: 10MHz.
  -Produces 5MHz buffer.
- Simultaneous transmission of BPSK and OFDM in Fig.1

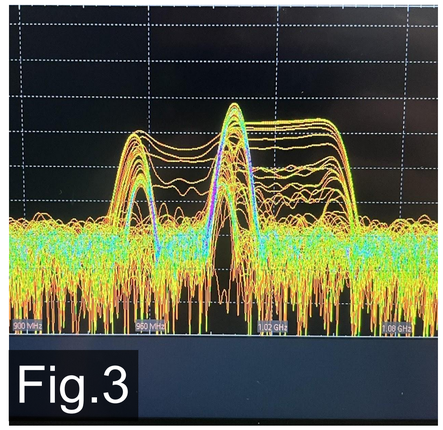

Fig.3

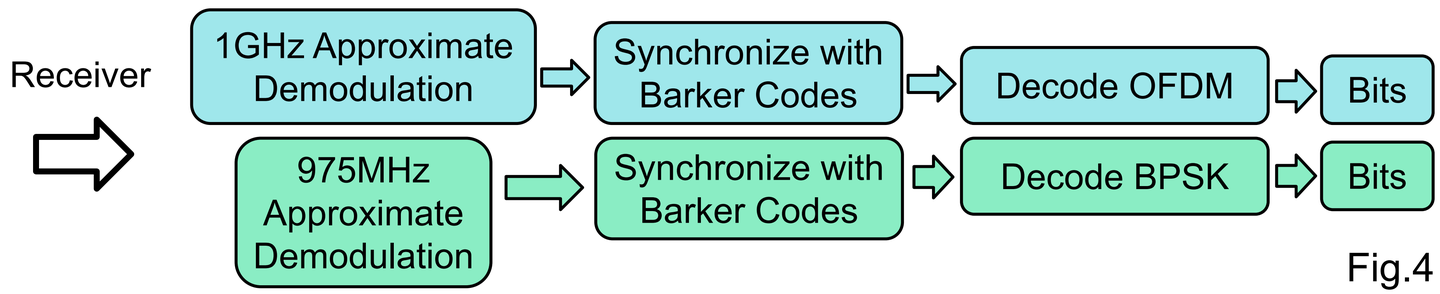

Fig.4

Results & Conclusions:

- Both signals interfere with other's bits and synchronization
  -little interference on 1st OFDM group until BPSK power is ~20db greater than OFDM power
  -following groups (total 4) become unsynchronized even when BPSK power is 80db lower
- BPSK is unaffected until OFDM is 0db relative to BPSK
- In future, developed architecture will test signal avoidance

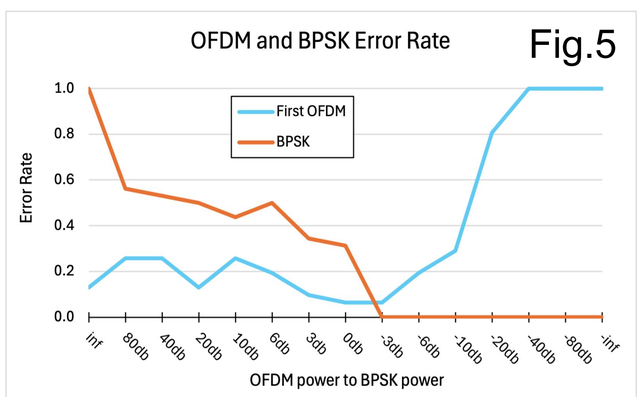

Fig.5

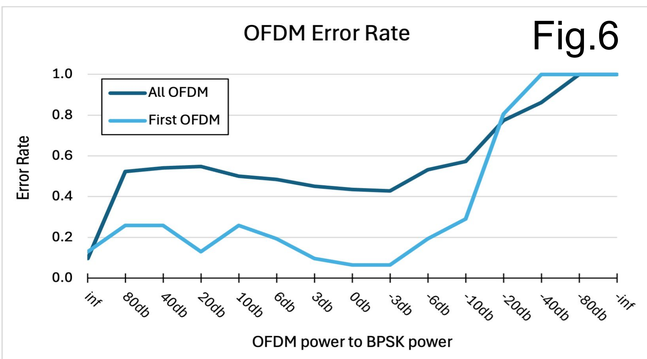

Fig.6

WINLAB