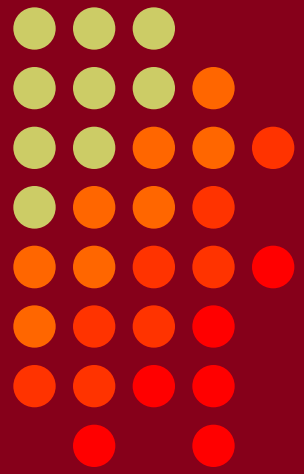
Tips to Improve Your FT8-4 Contest Performance

Ed Muns, W0YK / P49X



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Three Major FT Contests

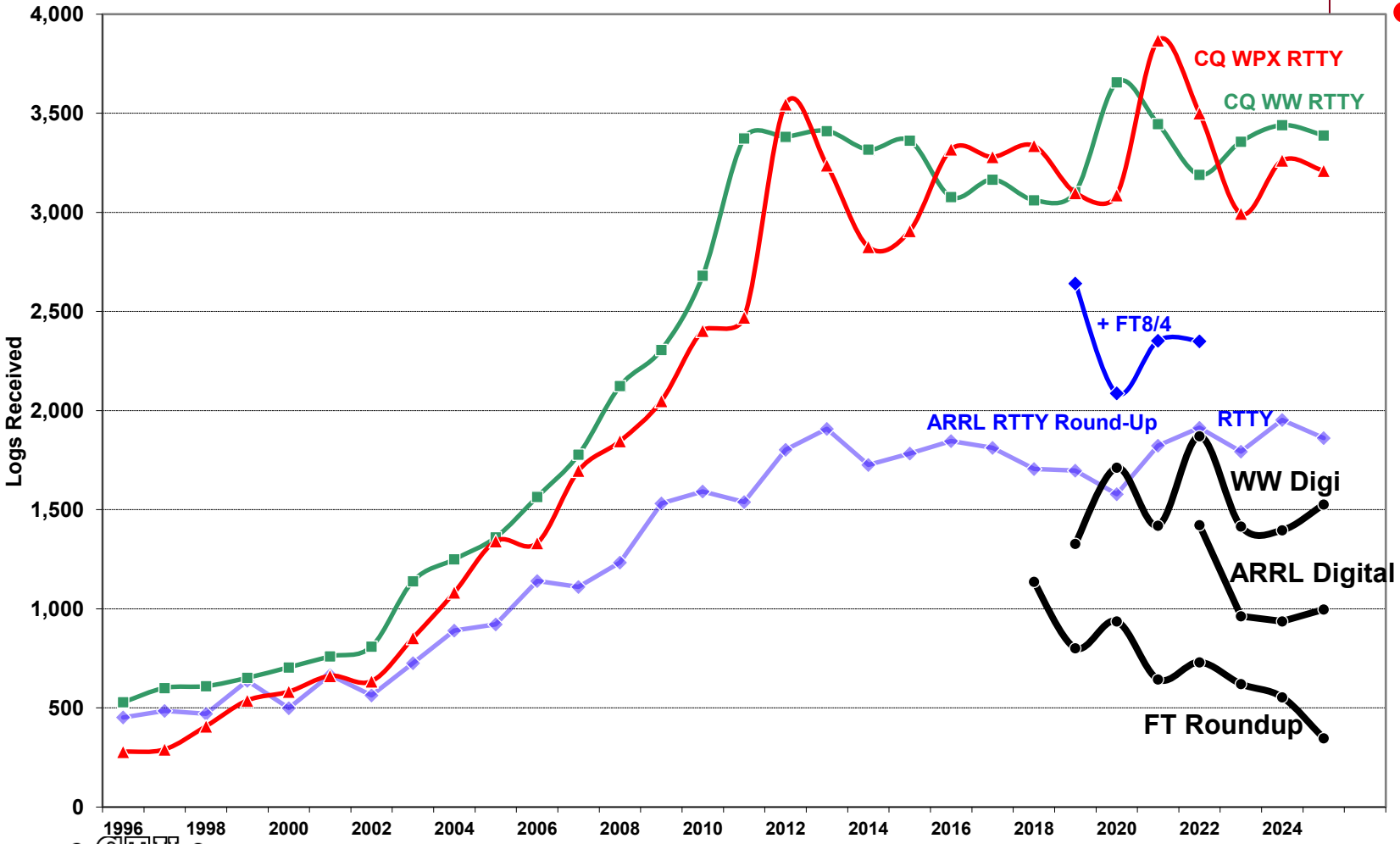
ARRL RTTY Roundup [1st weekend in Jan]

- *2018: FT8 added*
- *2020: FT4 added*
- *2022: RTTY-only or FT-only or Mixed*
- *2023: RTTY-only; no other modes*

FT

1. **ARRL International Digital [1st weekend in Jun (2022)]**
   - **Distance-based scoring**
2. **WW Digi DX Contest [last weekend in Aug (2019)]**
   - **Distance-based scoring**
     - **+ Grid multipliers - 160M & 6M**
3. **International FT Challenge [1st weekend in Dec (2018)]**
   - **Distance-based scoring, Grid multipliers, 80M-10M**
   - **Standard daily exchange → *transparent contest***
     - **Missing Grid counts 1 point, i.e., no distance points**

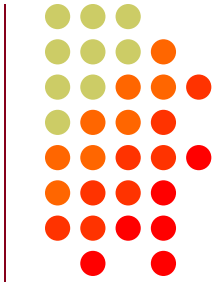
Three Largest FT4/8 Contests



FT8 Software

- WSJT-X
- Derivatives:
  - WSJT-X Improved
  - JTDX
  - MSHV
  - DigiRite (WriteLog only)
  - WSJT-Z
  - JS8Call (conversational; non-contest)

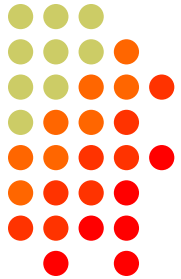
Tips



- Time Synchronization
- Sub-Band Choices
- Split Receive
- Deep Decode
- Rotate Cycles & Modes
- Fill Protocol
- FT QSO Structure & Superfluous QSL Issue
- Minimizing NILs
- FT8 vs. FT4

Time Synchronization

mandatory for reliable QSOs



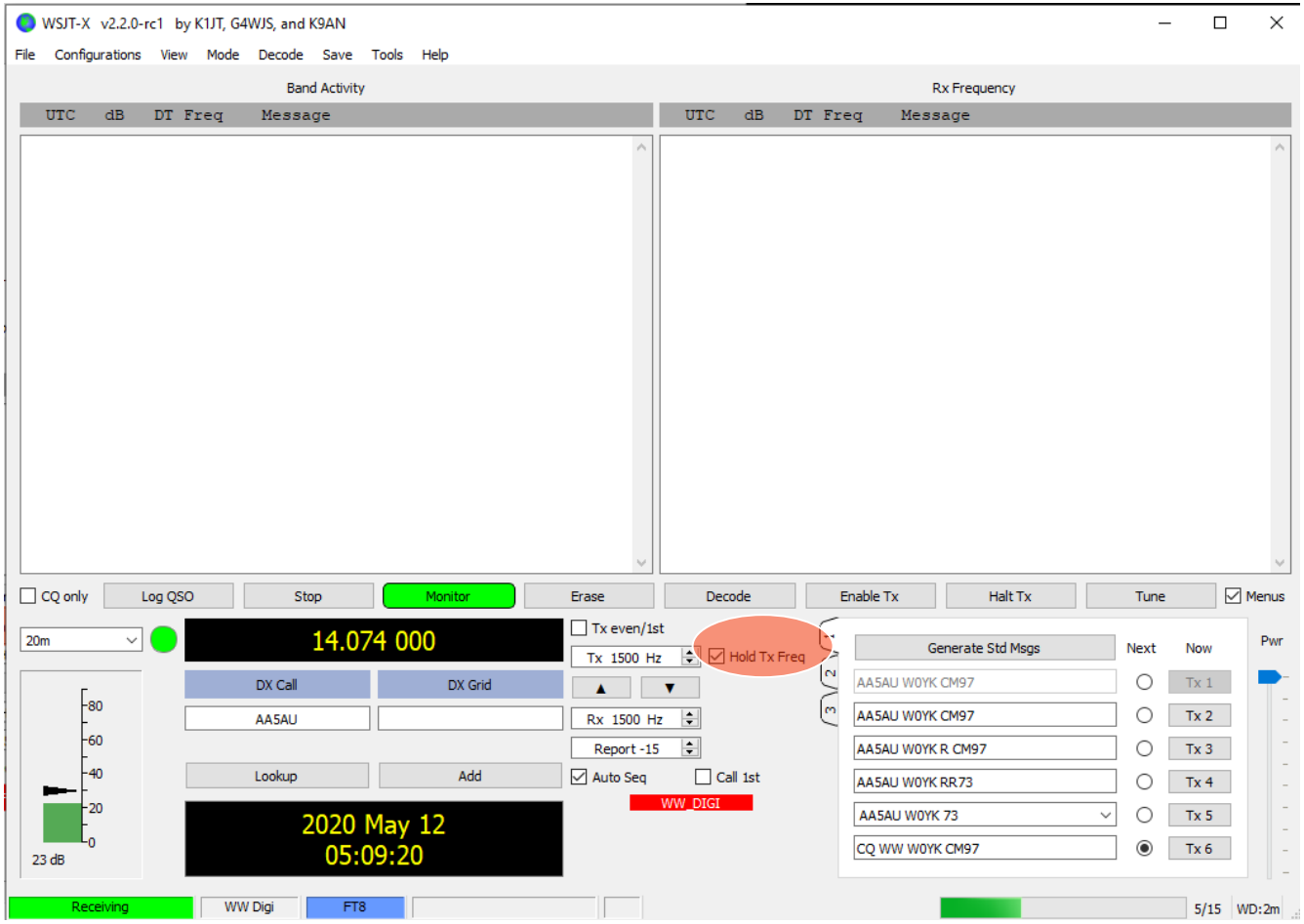
- **Windows Internet Time Sync**
  - **Weekly updates (modifiable)**
  - **Can be unreliable**
- **Alternatives (update often, e.g. hourly)**
  - **Meinberg NTP (recommended by K1JT)**
  - **NetTime (recommended by W0YK)**
  - **Dimension 4**
  - **Atomic Clock Sync**

Sub-Band Choices

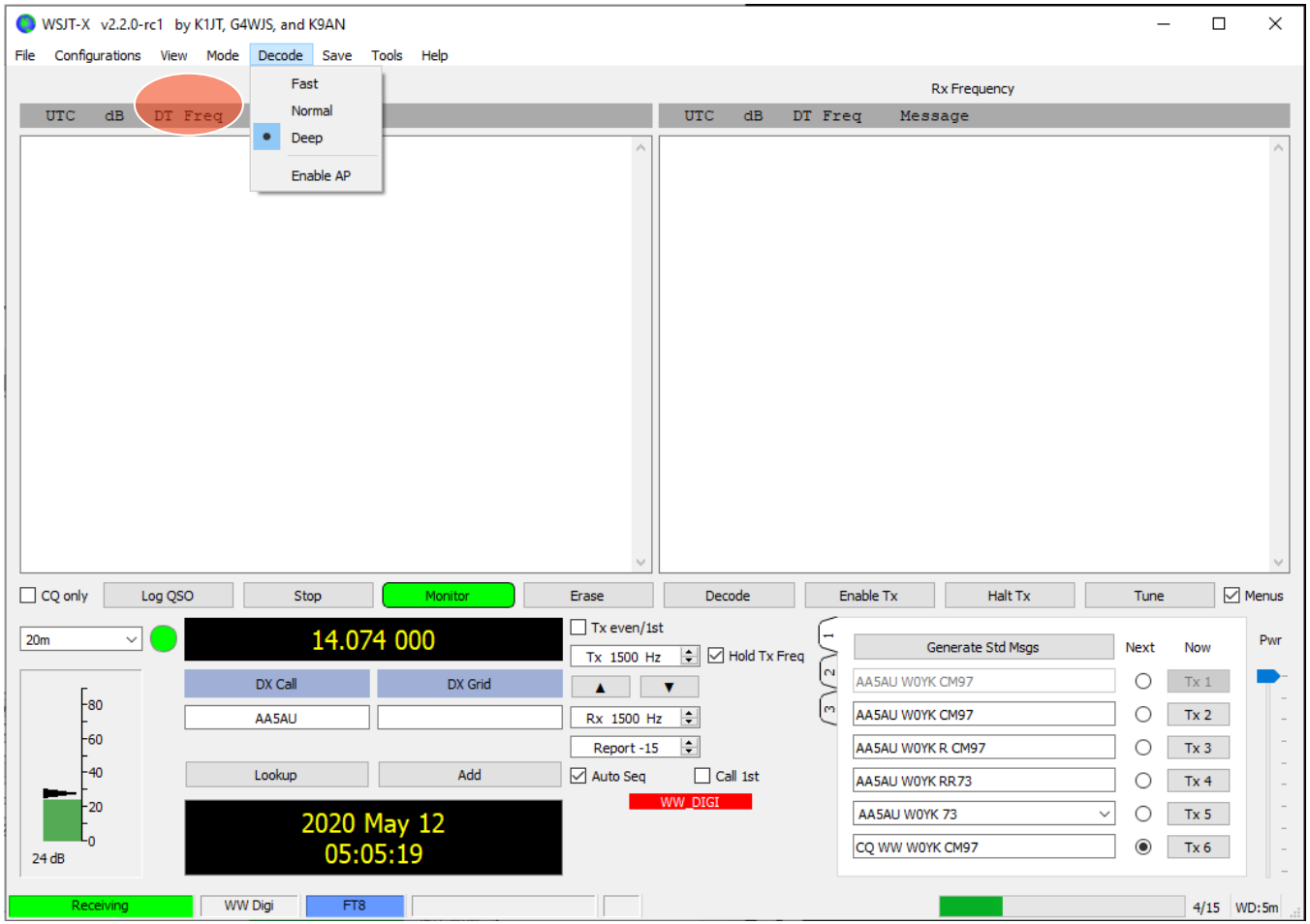
Int'l Digi, WW Digi, FT RU

- Suppressed-Carrier dial frequency
  - FT4: xxx80 *(now the daily default)*
  - FT8: xxx90
- Use receiver's maximum BW: 2.5-4 kHz
- QSO partner > 3 kHz … call above 3 kHz
- Move dial frequency up in 3 kHz increments

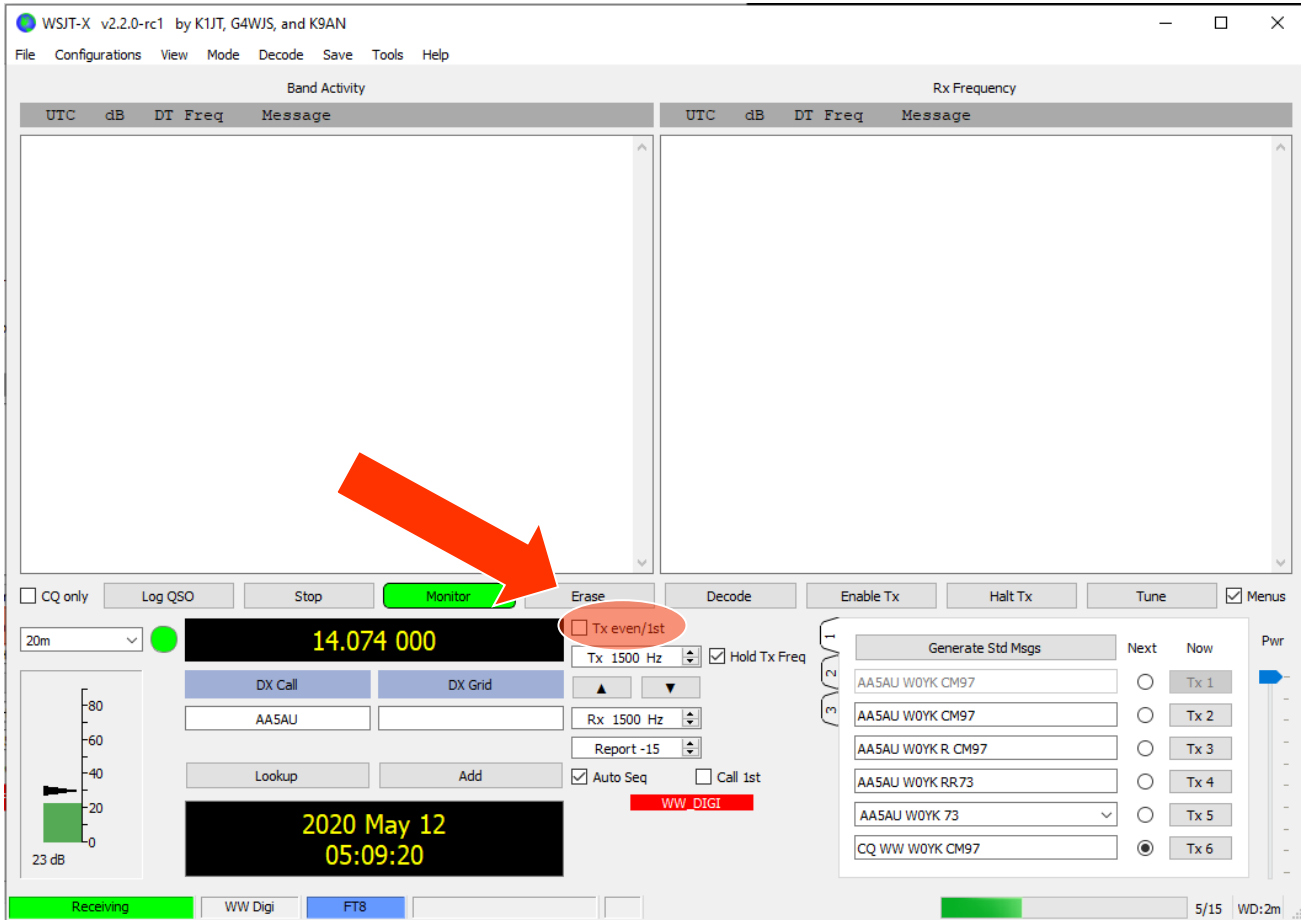
Split Receive (lock transmit)



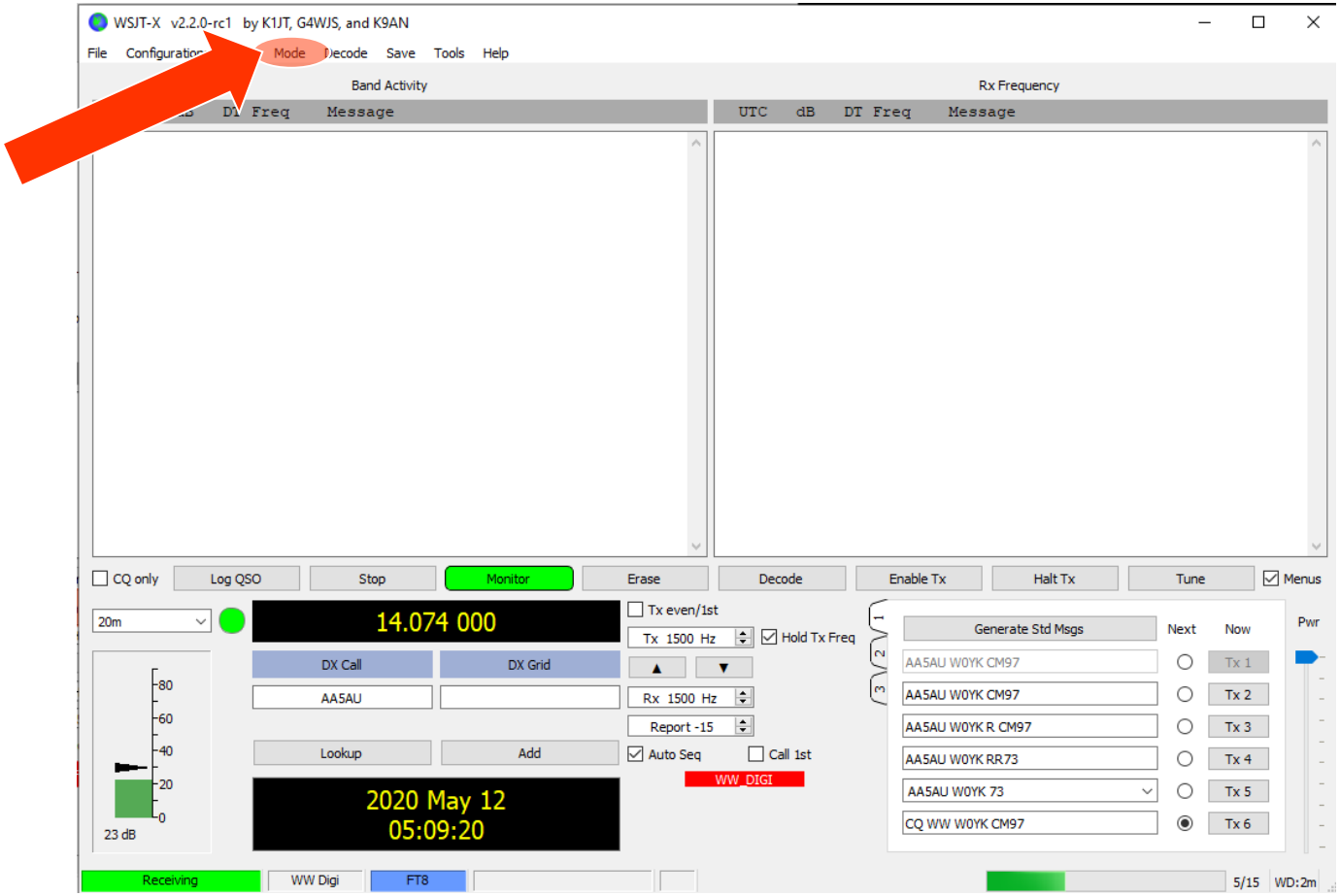
Deep Decode


WSJT-X v2.2.0-rc1 by K1JT, G4WJS, and K9AN
File Configurations View Mode Decode Save Tools Help
Fast
Normal
Deep
Enable AP
Rx Frequency
UTC dB DT Freq
UTC dB DT Freq Message
CQ only
Log QSO
Stop
Monitor
Erase
Decode
Enable Tx
Halt Tx
Tune
Menus
20m
14.074 000
Tx even/1st
Tx 1500 Hz
Hold Tx Freq
DX Call
DX Grid
AA5AU
Rx 1500 Hz
Report -15
Lookup
Add
Auto Seq
Call 1st
WW_DIGI
2020 May 12
05:05:19
24 dB
Generate Std Msgs
Next
Now
Pwr
AA5AU W0YK CM97
AA5AU W0YK CM97
AA5AU W0YK R CM97
AA5AU W0YK RR73
AA5AU W0YK 73
CQ WW W0YK CM97
Tx 1
Tx 2
Tx 3
Tx 4
Tx 5
Tx 6
Receiving
WW Digi
FT8
4/15
WD:5m

Rotate Odd/Even Cycles



Rotate FT4/FT8 Modes



FT Fill Protocol

CQ W0YK CM97	
W0YK AA5AU EL92	*←AA5AU calls with exch*
AA5AU W0YK R CM97	*← W0YK's QSL with exch*
W0YK AA5AU RR73	*←AA5AU's QSL; QSO complete*
AA5AU W0YK R CM97	*← AA5AU implicitly "asks" for a repeat*
W0YK AA5AU RR73	*←W0YK repeats QSL msg*

QSO Requirements

- Each QSO partner sends:
  - Their call sign
  - Exchange
  - QSL
- QSO complete and logged

WW Digi QSO

60-75 sec./QSO

- **CQ WW AA5AU FN42**
- **N3QE AA5AU R-FN42**
- *(N3QE AA5AU 73)* ← *N3QE may expect this "2nd QSL"*

- **AA5AU N3QE EM05**
- **AA5AU N3QE RR73** ← *QSO complete*
- *(AA5AU N3QE RR73)* ← *N3QE may repeat if no "2nd QSL"*

Two Generals Problem [1,2]

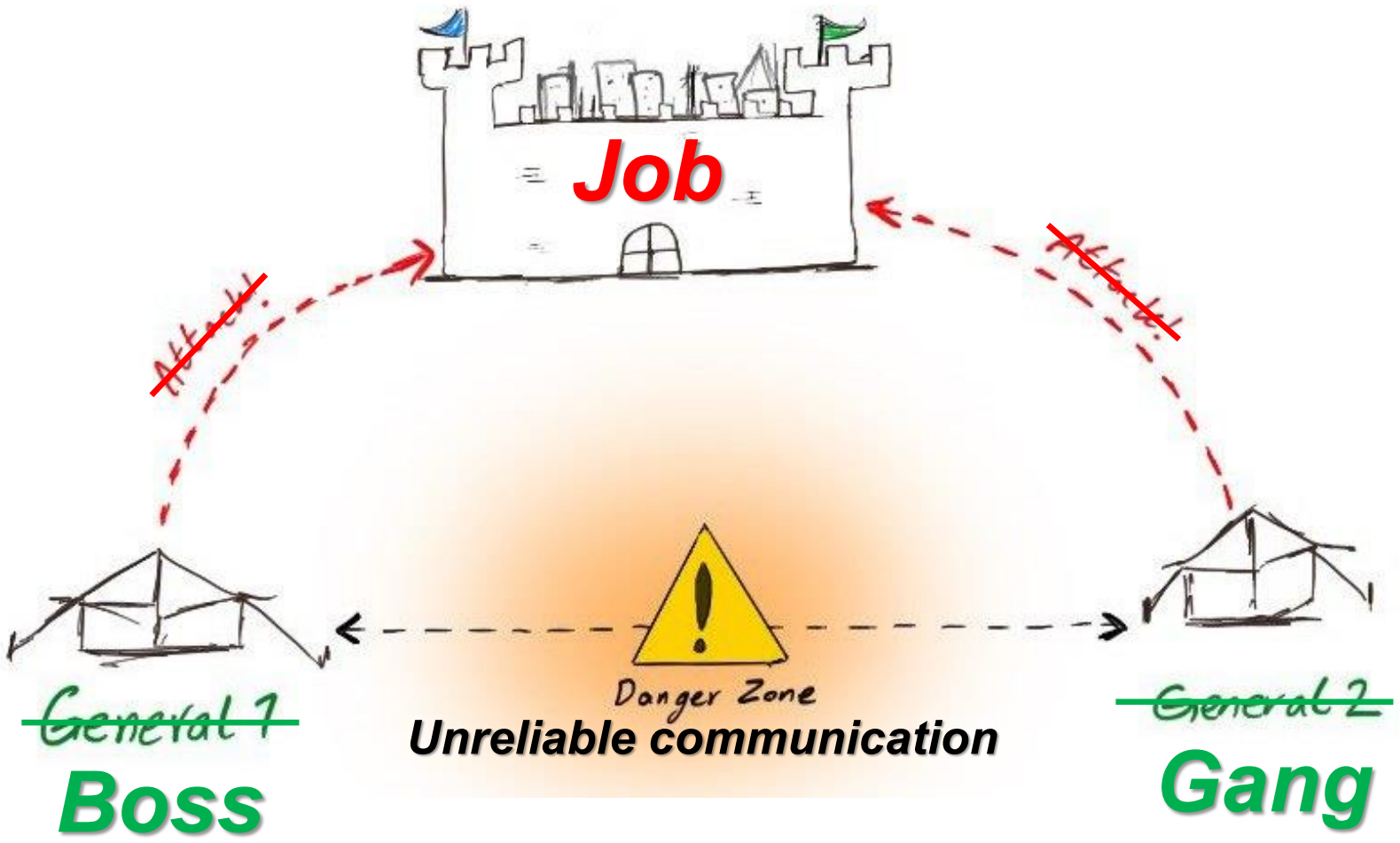
unreliable communication

- 1975 computer science thought experiment
- Communication over an unreliable link
  - e.g., TCP
- ACKs could theoretically be infinite
- Solution
  - Accept some uncertainty; don't try to eliminate
  - Mitigate to reduce consequence(s)

[1] E. A. Akkoyunlu, K. Ekanadham, and R. V. Huber, 1975 "Some Constraints and Trade-offs in the Design of Network Communications", page 73

[2] Jim Gray, 1978 "Notes on Data Base Operating Systems", page 465

The Gangsters Paradox



Radiosport Solution

CW, SSB & RTTY

- Each QSO partner QSLs the exchange ***once***
- Context reduces uncertainty
  - Other station doesn't repeat their last message
  - Other station doesn't ask for a repeat
  - Other station rolls into their next QSO

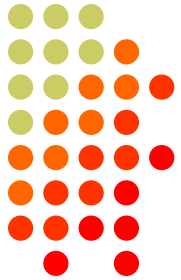
Radiosport Solution

FT4 & FT8

- Run station QSLs the S&P QSL
- Implied by default WSJT-X logging behavior
- De facto expectation
  - Many FT ops won't log the QSO without this superfluous QSL of the final QSL
  - Thus, NIL rate increases
    - CW, SSB & RTTY = 1-2%
    - FT = 5-6%

WW Digi QSO

60-75 sec./QSO
30 sec./rolling QSO



QSO period 1
QSO period 2

- **CQ WW AA5AU FN42**
- **AA5AU N3QE EM05**
- **N3QE AA5AU R-FN42** ← *Implicit "2nd CQ for others*
- **AA5AU N3QE RR73**
  AA5AU W0YK CM97
- **W0YK AA5AU R-FN42** ← *Implicit "2nd QSL" for N3QE*
  (N3QE AA5AU 73) ← *Explicit "2nd QSL" for N3QE*
- **AA5AU W0YK RR73**
  (AA5AU N3QE RR73)
- *(W0YK AA5AU 73)*
  (N3QE AA5AU 73)
  } *Confusing explicit "2nd QSL" for N3QE or W0YK*

WW Digi QSO

60-75 sec./QSO
30 sec./rolling QSO

QSO period 1
QSO period 2
QSO period 3

- **CQ WW AA5AU FN42**
- **N3QE AA5AU R-FN42** ← *Implicit CQ for new callers*
- **W0YK AA5AU R-FN42** ← *Implicit "2nd QSL" for N3QE*
  Implicit CQ for new callers
- **NJ4P AA5AU R-FN42** ← *Implicit "2nd QSL" for W0YK*
  Implicit CQ for new callers
- **CQ WW AA5AU FN42**

- **AA5AU N3QE EM05**
- **AA5AU N3QE RR73**
  AA5AU W0YK CM97
- **AA5AU W0YK RR73**
  AA5AU NJ4P EM55
- **AA5AU NJ4P RR73**

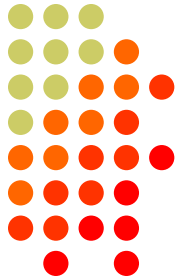
Minimizing NILs

Recommendation #1

- **Develop skill to dynamically change message and send 73 message if needed**
  - **Look for a clue that your message was not received, e.g., your QSO partner re-sends his report.**
  - **e.g., use the Alternate F1-F6 keys in WSJT-X**
- **Always log the QSO when receiving an RRR, RR73 or 73 message.**
- **Always log the QSO when sending RRR, RR73 or 73 message.**

Minimizing NILs

Recommendation #2



- **Give in!**
  - **Send the superfluous 73, but**
  - **Don't require it from your QSO partner**
- **Yes, it's unnecessarily slower, but**
  - **FT contesting is currently slow enough to absorb the extra message**
  - **And minimizing NILs increases score**

Working Non-Contesters

Depends on Contest Exchange

- **SNR**
  - **FT Challenge**
- **Grid Square exchange (S&P only)**
  - **ARRL Int'l Digi, WW Digi**
  - **CQ answered with Tx2 instead of Tx1 → don't call CQ**
- **QTH, serial number, name, etc.**

FT8 vs. FT4 Strategy

- FT4 is faster; FT8 decodes better
  - Intrinsic vs. extrinsic speed
    - FT4 is intrinsically 2x the speed of FT8
    - FT8 is more likely to decode
    - Either might be extrinsically faster at a given time
  - Dynamically choose the mode with:
    - the highest QSO rate, or
    - the most multipliers
- New stations & multipliers in each mode
  - and, each cycle

Resources

- Thursday night practice
  - https://www.ncccsprint.com/ft4ns.html
- Software Email reflectors
  - wsjt-devel@lists.sourceforge.net (WSJT-X)
  - n1mmloggerplus@groups.io (N1MM Logger+)
  - digirite@groups.io (DigiRite)
  - writelog@contesting.com (WriteLog)
- Tutorials for WW Digi DX Contest
  - rttycontesting.com/tutorials/n1mm/operating-ww-digi-with-n1mm/ N1MM/WSJT-X
  - rttycontesting.com/tutorials/writelog3/digirite/ WriteLog/DigiRite
- Software web sites
  - physics.princeton.edu/pulsar/K1JT/wsjtx.html (WSJT-X)
  - n1mm.hamdocs.com/tiki-index.php (N1MM Logger+)
  - https://writelog.com/digirite (DigiRite)
  - www.writelog.com (WriteLog)