

# 2BSIQ and S03R: Riding the edge of Human Capabilities

Dayton Contest University 2019  
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# Contents

- Presentation will focus on high rate 2BSIQ on CW and SSB operating from a DX location. Digital modes will not be covered
- Definition of 2BSIQ
- Origin of 2BSIQ, where it all started
- 2BSIQ Setups
- How to train for 2BSIQ
- 2BSIQ on SSB
- SO3R

# Definition of 2BSIQ

- 2BSIQ stands for 2 Bands Synchronized Interleaved QSOs
  - Goal is to run on 2 bands simultaneously without interruption
  - Must have: 2 interlocked radios with no interstation interference
- 
- What it is not - S02R, or having 2 different pileups but not attempting to sync them

2BSIQ (Two Bands Synchronized Interleaved QSOs) is a complex contest operating mode that in a protocolled synchronized way enables interleaved two radio running on two bands to dramatically increase QSO rates

- SO2R set-up
- Alternate moment running
- No inter-station interference
- Only one signal on the air

- Management of QSO moments
- Time estimation of TX/RX pairs
- Management audio/QSO field focus

Two Bands      Synchronized  
**2BSIQ**  
Interleaved      Protocol

- Grouping RX/TX moments of QSOs
- Fitting almost 2 QSO in 1 QSO time frame

- Protocol to manage delays
- Protocol to manage synchronization disruption
- Protocol to re-synchronize

# Two Bands

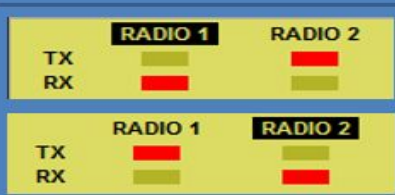
Slide Courtesy of CT1BOH

2BSIQ requires the capability to RUN with no interstation interference, in an alternate way, on two bands, interleaving transmitting signals one at a time



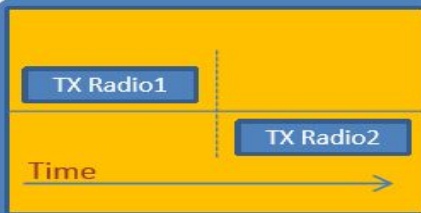
## SO2R set-up

- Two radios; No inter-station interference
- No interference to be able to RUN on any two bands



## Alternate running on two bands

- If radio1 on band 1 is TX, radio2 on band 2 must be RX
- If radio1 on band 1 is RX, radio 2 can be TX



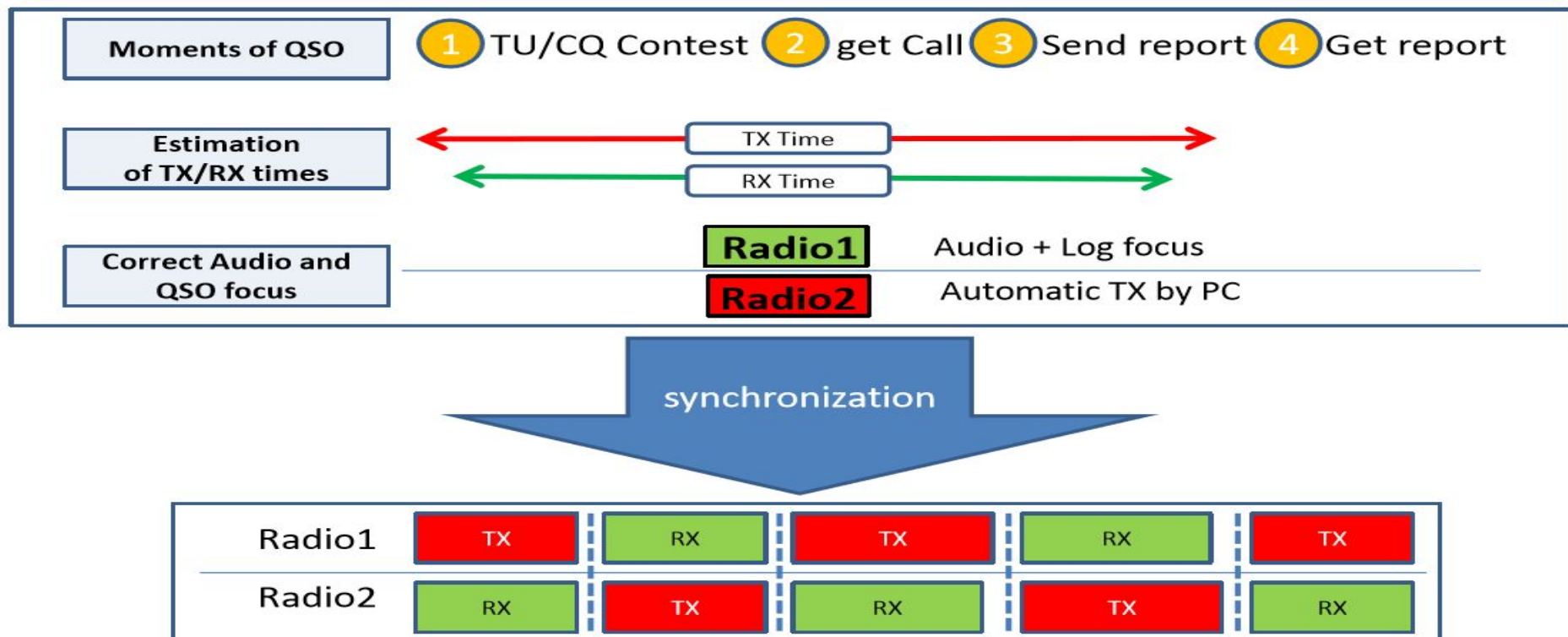
## Only one signal on the air

- To comply with SOAB only one signal on the air
- To comply with SOAB each TX signal to different band

# Synchronized

Slide courtesy of CT1BOH

Synchronization on two bands is the key to a dramatic increase in QSO rates, obtained with management of key QSO moments, estimation of exact length of TX and RX pairs and correct focus of audio and QSO focus



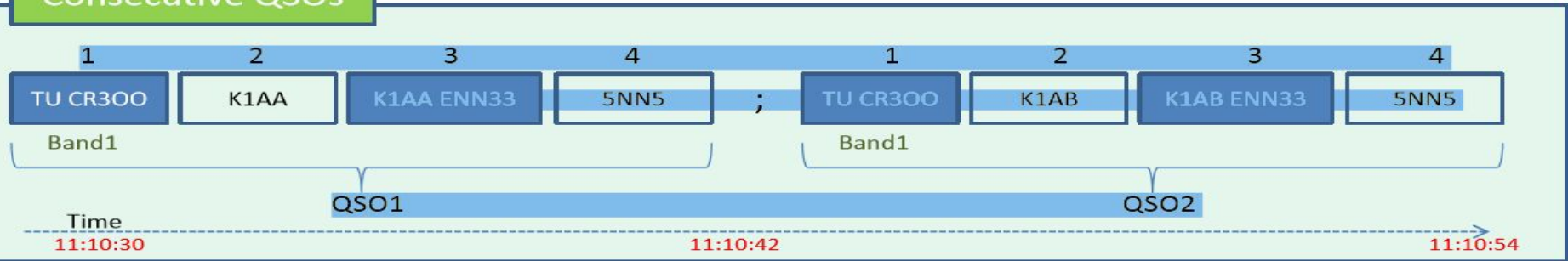


# Interleaved QSOs

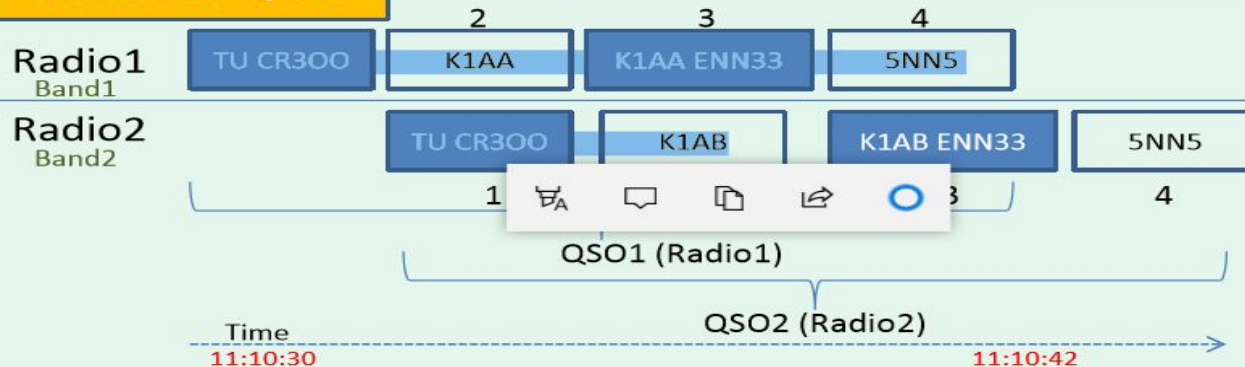
Slide courtesy of CT1BOH

2BSIQ changes the paradigm from consecutive (one radio, one band) to interleaved (two radios, two bands). "Two QSOs" fit in the approximate time frame needed for one QSO

## Consecutive QSOs



## Interleaved QSOs



## Interleave of Pair QSO moments



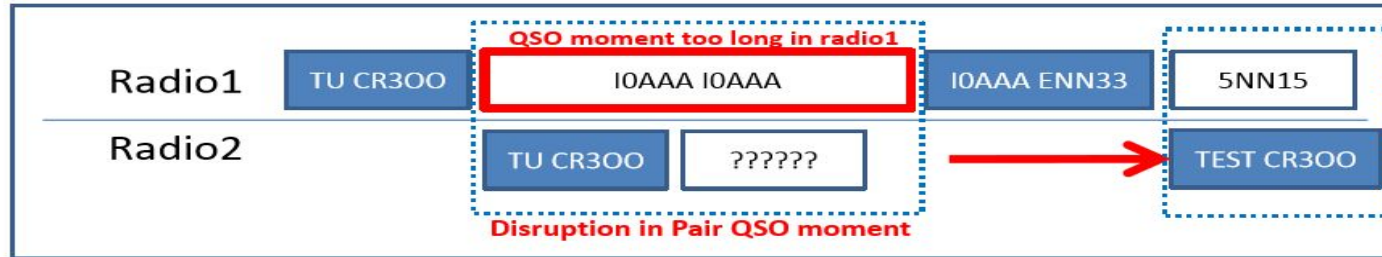
# Operating Protocol

Slide courtesy of CT1B0H

Perfect synchronization of “pair QSO moments” in two bands is not always possible, therefore an operating protocol must be followed to handle efficiently those situations



Perfect “pair QSO moment” synchronization



Disruption in “pair QSO moment” synchronization

**Operating protocol**  
“What to do when”:

1. There are situations that push forward next pair QSO moment
2. There is disruption of synchronization
3. Re-synchronization of moments of QSO is needed



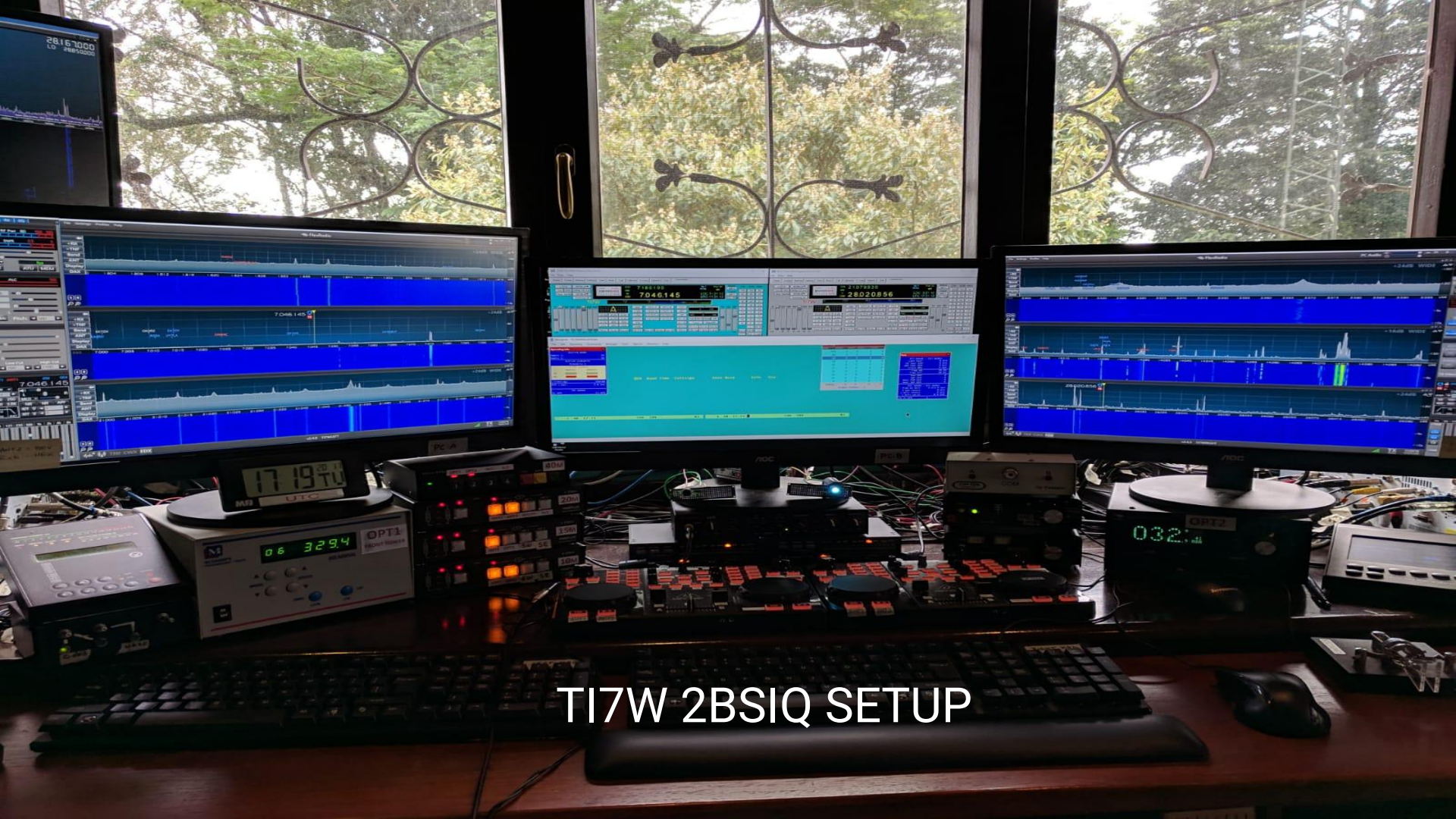
# Origin of 2BSIQ

- When did it all start?
- How I became involved
- Why there was controversy when this practice first started
- What steps I took to prove that 2BSIQ was possible
- First attempt at ZF2MJ



ZF2MJ 2BSIQ SET UP





TI7W 2BSIQ SETUP

ZF1A Antennas, 17el LP at 100ft, C31XR at 50ft, Pro67 at 60ft, 2 el 80m yagi at 90 ft and Inv V on 160m





RA6LBS Gear at ZF1A - Filters  
for 10/40, 4 stack matches, Tri  
Plexer and 2 Quadplexers





# Success at ZF2MJ

- 2015 CQWW CW was first 2BSIQ implementation
- Had 8 hours over 300
- 10,223 claimed q's and 10,014 after log checking
- 27 300+ hours over the last 4 years in CQWW CW
- Won first place in the world 2015 and 2016

Summary						
BAND	QSO	CQ	DXC	DUP	POINTS	AVG
160	262	14	40	2	579	2.21
80	987	25	80	18	2354	2.39
40	2390	34	100	39	6204	2.60
20	2473	37	106	61	6030	2.44
15	2676	34	110	42	6688	2.50
10	1435	26	88	14	3440	2.40
TOTAL	10223	170	524	176	25295	2.47
FINAL SCORE: 17 554 730						

# Training for 2BSIQ

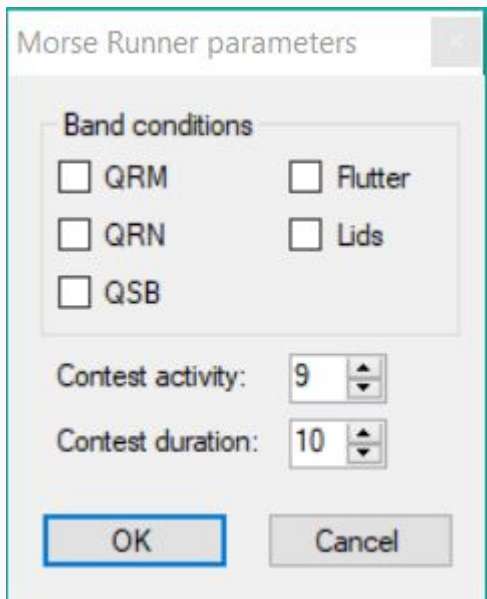
- Practice Practice Practice!
- RUFZ
- Get on the air!
- DX Log with Morserunner Built in
- Should already be proficient in S01R and Standard S02R before moving on to 2BSIQ

# Importance of DX Log

- By far the most realistic training method for 2BSIQ

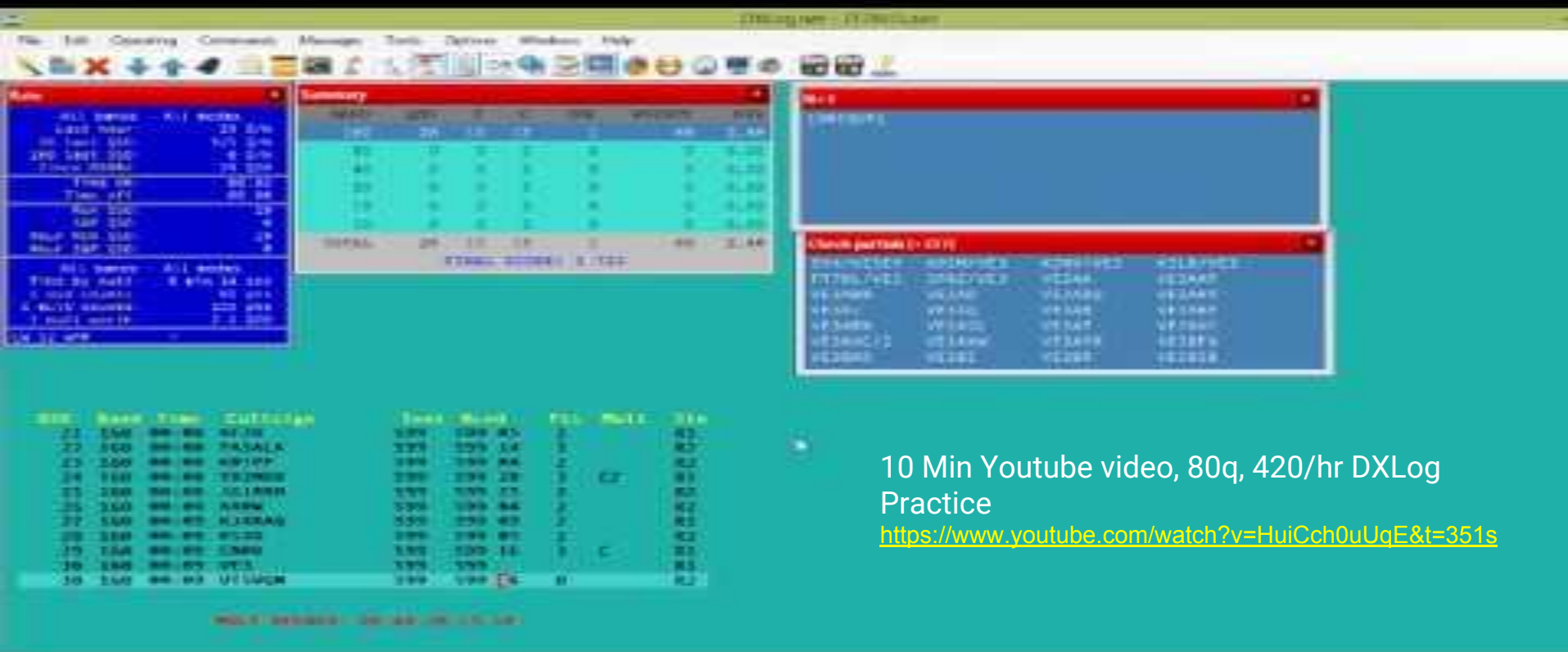
Best settings:

1. Remove all Band Conditions (QRM, QRN, QSB etc)
2. Set Contest activity to 9
3. Set Contest duration to 10
4. Set the speed to 48wpm



# When is training complete?

- You should be able to routinely get 300 q's an hour
- You should have roughly the same number of q's on each side
- Start by attempting it in smaller contests like NAQP
- Note, it is difficult to try outside of contests as the timing will rarely be correct





# 2BSIQ during lower rate periods

- Can still increase over all rate
- Interleaving not as crucial, but still important
- Send slower CW during these times
- Send longer CQ's if needed

# Tips for 2BSIQ

- Never listen to your transmit audio!
- Sign your callsign after every single QSO!
- Keep speed between 40 and 52wpm
- Goal should be a minimum of 45 hours of 2BSIQ
- The other hours should be used to S&P for mults

# Operator Health

- 2BSIQ is more taxing than any other kind of operating
- Must aim to be in good health both mentally and physically
- Meals and drinks should be planned out in advance

# Meals

## Things to eat during contest

- ☐ Chicken
- ☐ Hardboiled eggs
- ☐ Nuts
- ☐ Protein bars
- ☐ Water
- ☐ Bcaa powder
- ☐ Caffeine ok on 2nd day
- ☐ Oatmeal
- ☐ Whole grain bread
- ☐ Will need either melatonin or tylenol pm for thursday night
- ☐ Fruits, especially mandarin oranges



# 2BSIQ on SSB

- Difficulties in doing 2BSIQ on phone
- How to properly interleave QSO's on SSB
- Learning to speak while not listening to your voice
- Slowing down to keep everything in sync



# The future of 2BSIQ on SSB

- In order for it to work properly, all sending must be done by the computer
- Current technology not good enough yet, but getting close
- Important to have a non computerized voice, or else it turns people away

# Theoretical Max QSO Rates and Total Q's

## Current Max QSO's per Hour

2BSIQ CW	SO1R CW	2BSIQ SSB	SO1R SSB
387	275ish	395	470

## Theoretical Max QSO Rates

2BSIQ CW	SO1R CW	2BSIQ SSB	SO1R SSB
400-410	300	410	500

# S03R

- Why do S03R?
- S03R Strategy
- When to implement it

# S03R Audio and Technology

- 2BSIQ audio remains the same
- 3rd radio audio added in, and always in both ears at the same time
- BIP / BOP switch
- Lockout box, 3rd radio should always win

STATION 1 IC-7610

STATION 2 IC-7610

BEVERAGES ON RUN 2 MAY ONLY BE USED ON 80M. THEREFORE ONLY RUN 1 SHOULD BE USED ON 160 M

THE AUTO HEADPHONE SWITCH SWITCHES HEADPHONES TO THE LISTENING RADIO WHEN THE OTHER IS TRANSMITTING. THE 1/8" STEREO AUDIO OUT SENDS LINE LEVEL AUDIO TO THE PC FOR RECORDING BOTH RADIOS AT ALL TIMES. RADIO 3 AUDIO IS COMBINED AFTER THE AUTO SWITCH. IT HAS A SWITCH TO SELECT BOTH EARS NORMAL, LEFT EAR ONLY, OR BOTH EARS OUT OF PHASE. SIMPLY UNPLUG IT WHEN NOT IN USE

INSTALL WINTEST VER 4.26 OR LATER TO BE ABLE  
TO SELECT ICOM IC 1C-7610 UNDER "RADIO 1"

- 1 LONG UHF - UHF (RG-8)
- 1 SHORT UHF - UHF (RG-8)
- 7 SHORT UHF - UHF (RG-8X)
- 2 LONG UHF - UHF (RG-8X)
- 5 RCA TO UHF
- 6 RCA TO RCA (SHORT)
- 2 RCA TO RCA (LONG)
- 1 RCA Y (M TO 2F)
- 1 UHF TEE
- 5 RCA-F TO BNC-M



# Important links

[https://www.youtube.com/watch?v=lu2IO3P9o\\_0&t=1s](https://www.youtube.com/watch?v=lu2IO3P9o_0&t=1s) CT1BOH 2BSIQ Presentation

<https://www.youtube.com/watch?v=bIW1Z1uFbRw&t=1s> ZF2MJ 2BSIQ with audio

<https://www.youtube.com/watch?v=42TCOtmJuEI> CT1BOH 2BSIQ with audio

<https://www.youtube.com/watch?v=XujVshm8ROI> N6MJ@KP3Z 2BSIQ on SSB, no audio

<https://www.youtube.com/watch?v=HuiCch0uUqE> DXLog 10 min practice session

# Q & A

Any questions are welcome!

# Special Thanks!

This presentation would not have been possible without contributions from the following: CT1BOH, K6AM, KL9A, N4YDU, N6WIN and NN1C.