CW Skimmer – One

Pete Smith, N4ZR

Dayton Hamvention Contest Forum

May 16, 2009

What's Happened to …

- "Contesting as We Know It" – not much
- The Rules – at least we're clear
- The Software –improved
- The Hardware – reaching consensus?
- Operating Techniques – lots to learn
- Breaking news – shhh…..

The Rules

Rules clarified - Skimmer basically treated like packet

- ARRL says remote Skimmers OK so long as not closed systems – some club systems already in use, other shared remote Skimmers planned
- Other major contest sponsors likely to follow suit

Software Improvements

- Early experience – too many busted calls, too many S&Pers spotted
- Revisions made in version 1.4 – greatly improved callsign validation
- Some problems remain – i.e., SoftRock-IF bandwidth limitation

Hardware – Direct vs IF

- SDR From IF Tap on Transceiver
  - K3, TS-850, TS-950 some others already have the IF output
  - Automatically tracks your radio (BPFs, etc.)
  - Excellent ready-made hardware available

But …

Radios…

- SDR-IQ

  - Plug-and-play with Skimmer
  - Add-ons by W2RF, W3OA provide for unattended operation of Skimmer, better integration with logging software and radios

Still More…

- Perseus

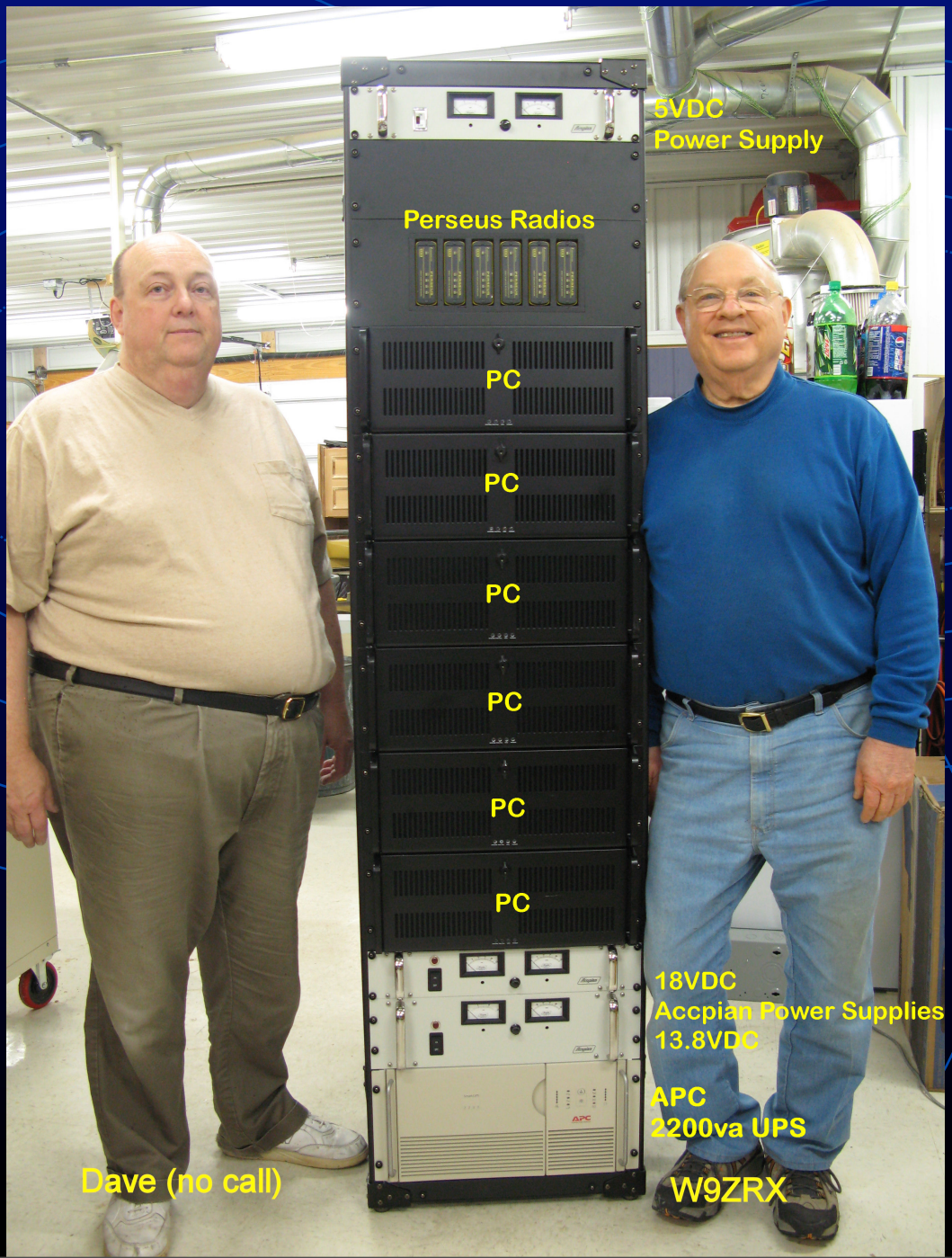
  - High-performance SDR, price 2X
  - Can work with Skimmer with two additional pieces of software and a little effort
  - N6TV is the expert – see www.qrz.com/N6TV

Computers – Godzilla required?

- No, but your 600 MHz P3 won't cut it
- My dedicated Skimmer box – the cheapest P4 dual core, 2 GB memory, 250 GB hard drive, XP Home - $375
- Didn't get over 50 percent CPU utilization even at ARRL DX CW peak

Skimmer Station Design

- Majority of Skimmer setups in use or planned by contesters so far use SDR-IQ, Perseus and LP-Pan/K3.
- Omni-directional or quickly steerable antennas best
- All but SO1R will need ways to manage same-station interference


5VDC
Power Supply
Perseus Radios
PC
PC
PC
PC
PC
PC
18VDC
Accpian Power Supplies
13.8VDC
APC
2200va UPS
Dave (no call)
W9ZRX

Cluster/Skimmer Integration

- Easiest solution is to use WintelnetX by K1TTT
- Merge spots from cluster nodes and Skimmer
- Need a way to easily tell which is which

Operating Techniques

- What's different about Skimmer spots?
  - 10-100X more spots than cluster
  - Not just what someone thinks "worth spotting"
  - If Skimmer is local, spots will always be copyable

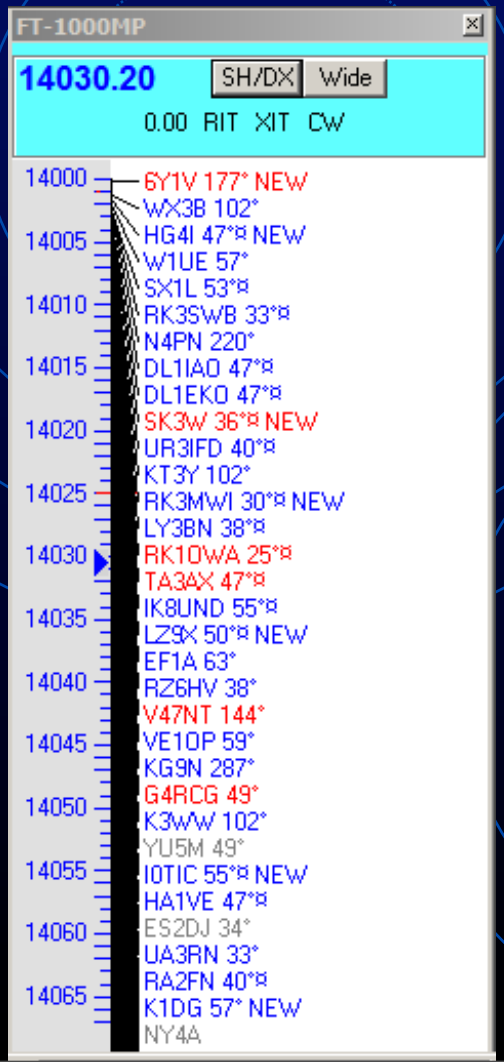
S&P with Skimmer

- Step through the bandmap – all Skimmer spots at the same beat frequency +/- 50 Hz.
- Rates of >100/hour S&P readily achievable, even late in a contest

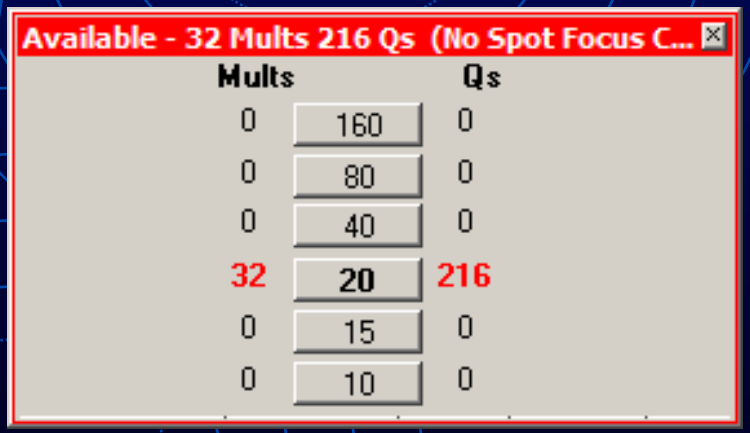
Skimmer Spot Tips

- Keep Skimmer off-screen – or risk a new high in “single-op distracted”
- Keep logging program spot timeout short – no more than 10 minutes
- Use logging program or W3OA SkimScan to monitor and control Skimmer

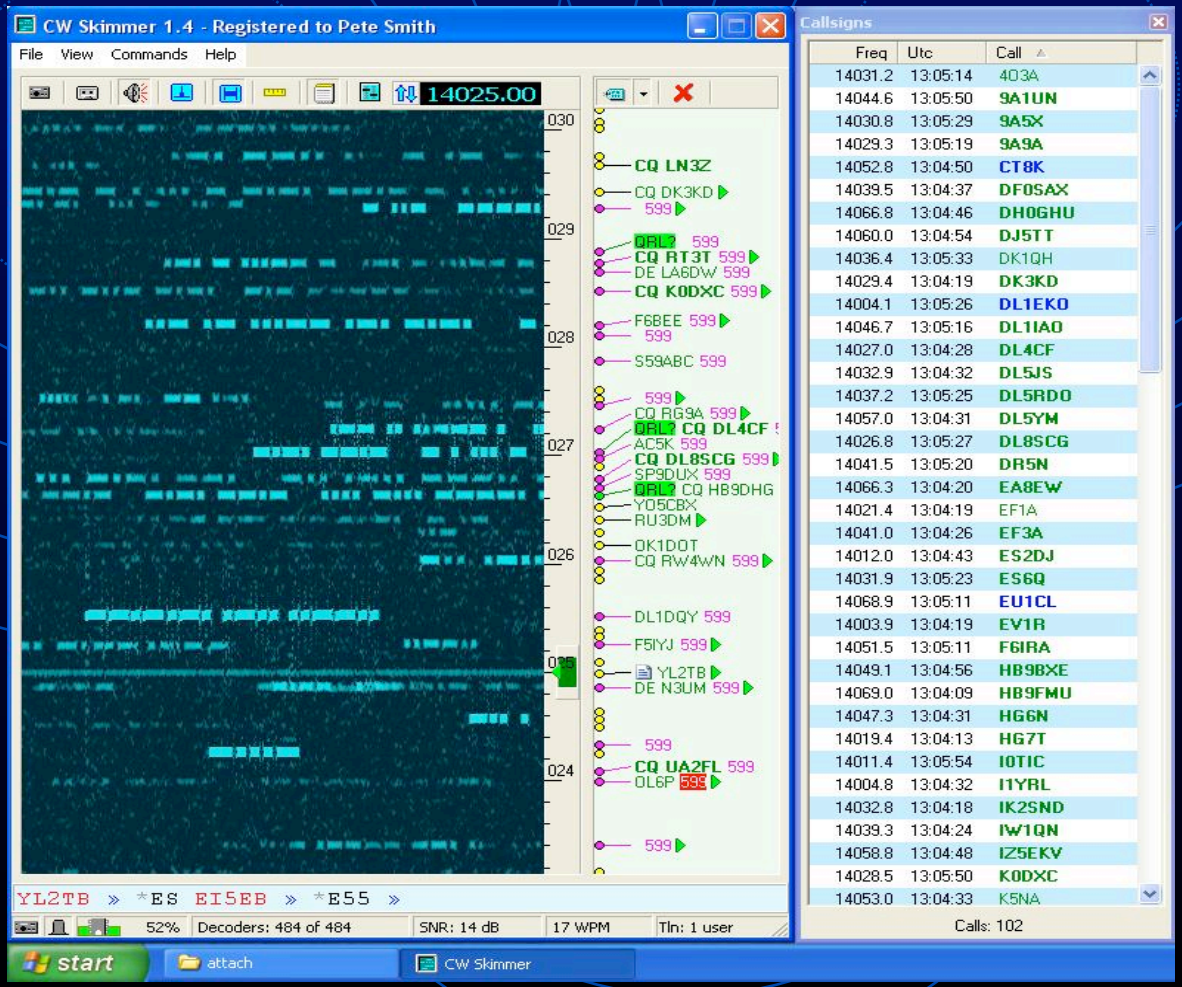
This....


FT-1000MP
14030.20
SH/DX
Wide
0.00 RIT XIT CW
14000
14005
14010
14015
14020
14025
14030
14035
14040
14045
14050
14055
14060
14065
6Y1V 177° NEW
WX3B 102°
HG4I 47°¤ NEW
W1UE 57°
SX1L 53°¤
RK3SWB 33°¤
N4PN 220°
DL1IAO 47°¤
DL1EKO 47°¤
SK3W 36°¤ NEW
UR3IFD 40°¤
KT3Y 102°
RK3MWI 30°¤ NEW
LY3BN 38°¤
RK1OWA 25°¤
TA3AX 47°¤
IK8UND 55°¤
LZ9X 50°¤ NEW
EF1A 63°
RZ6HV 38°
V47NT 144°
VE1OP 59°
KG9N 287°
G4RCG 49°
K3WW 102°
YU5M 49°
I0TIC 55°¤ NEW
HA1VE 47°¤
ES2DJ 34°
UA3RN 33°
RA2FN 40°¤
K1DG 57° NEW
NY4A

OR


Available - 32 Mults 216 Qs (No Spot Focus C...
Mults
Qs
0 160 0
0 80 0
0 40 0
32 20 216
0 15 0
0 10 0

Not This…


CW Skimmer 1.4 - Registered to Pete Smith
File View Commands Help
14025.00
CQ LN3Z
CQ DK3KD 599
QRL? 599
CQ RT3T 599
DE LA6DW 599
CQ K0DXC 599
F6BEE 599
S59ABC 599
CQ RG9A 599
QRL? CQ DL4CF
AC5K 599
CQ DL8SCG 599
SP9DUX 599
QRL? CQ HB9DHG
YO5CBX
RU3DM
OK1DOT
CQ RW4WN 599
DL1DQY 599
F5IYJ 599
YL2TB
DE N3UM 599
CQ UA2FL 599
OL6P 599
YL2TB » *ES EI5EB » *E55 »
52% Decoders: 484 of 484 SNR: 14 dB 17 WPM Tln: 1 user
Callsigns
Freq Utc Call
14031.2 13:05:14 4O3A
14044.6 13:05:50 9A1UN
14030.8 13:05:29 9A5X
14029.3 13:05:19 9A9A
14052.8 13:04:50 CT8K
14039.5 13:04:37 DF0SAX
14066.8 13:04:46 DH0GHU
14060.0 13:04:54 DJ5TT
14036.4 13:05:33 DK1QH
14029.4 13:04:19 DK3KD
14004.1 13:05:26 DL1EKO
14046.7 13:05:16 DL1IAO
14027.0 13:04:28 DL4CF
14032.9 13:04:32 DL5JS
14037.2 13:05:25 DL5RDO
14057.0 13:04:31 DL5YM
14026.8 13:05:27 DL8SCG
14041.5 13:05:20 DR5N
14066.3 13:04:20 EA8EW
14021.4 13:04:19 EF1A
14041.0 13:04:26 EF3A
14012.0 13:04:43 ES2DJ
14031.9 13:05:23 ES6Q
14068.9 13:05:11 EU1CL
14003.9 13:04:19 EV1R
14051.5 13:05:11 F6IRA
14049.1 13:04:56 HB9BXE
14069.0 13:04:09 HB9FMU
14047.3 13:04:31 HG6N
14019.4 13:04:13 HG7T
14011.4 13:05:54 I0TIC
14004.8 13:04:32 I1YRL
14032.8 13:04:18 IK2SND
14039.3 13:04:24 IW1QN
14058.8 13:04:48 IZ5EKV
14028.5 13:05:50 K0DXC
14053.0 13:04:33 K5NA
Calls: 102
start
attach
CW Skimmer

Reverse Beacon Network

- Volunteers, using Skimmer, reporting stations heard to http://reversebeacon.net
- Initial idea was to map spots, like this…

CQ WPX 2008

Map
Satellite
Hybrid
Asia
Africa
Atlantic Ocean
Pacific Ocean
South America
Indian Ocean
Australia
Google
Terms of Use
160m / 80m / 40m / 30m / 20m / 17m / 15m / 12m / 10m / 6m
world wide / zoom to US / zoom to Europe / zoom to North Atlantic

But now…. Something new

Signal Comparison Tool

STEP 3: results for your query:
DATE: 2009-02-22 - DE: OY3JE/20m - DX: W3LPL,K3CR,N3RS,K3LR
go back one step

de	dx	freq	cq/dx	snr	time
OY3JE	W3LPL	14019.1	CQ	2dB	2009-02-22 11:45:14
OY3JE	N3RS	14013.6	CQ	8dB	2009-02-22 11:47:33
OY3JE	W3LPL	14019	CQ	7dB	2009-02-22 14:12:22
OY3JE	K3LR	14020	CQ	9dB	2009-02-22 14:30:50
OY3JE	N3RS	14013.6	CQ	8dB	2009-02-22 14:33:59
OY3JE	W3LPL	14019.1	CQ	12dB	2009-02-22 14:58:16
OY3JE	K3LR	14020	CQ	8dB	2009-02-22 14:58:56
OY3JE	N3RS	14013.6	CQ	15dB	2009-02-22 15:08:07
OY3JE	W3LPL	14019	CQ	18dB	2009-02-22 15:08:58
OY3JE	K3LR	14020	CQ	8dB	2009-02-22 15:27:13
OY3JE	W3LPL	14019.1	CQ	10dB	2009-02-22 15:28:00
OY3JE	K3LR	14020	CQ	12dB	2009-02-22 15:49:09
OY3JE	N3RS	14013.6	CQ	14dB	2009-02-22 16:00:43
OY3JE	W3LPL	14019	CQ	14dB	2009-02-22 16:00:47
OY3JE	K3LR	14020	CQ	7dB	2009-02-22 16:00:48
OY3JE	K3LR	14020	CQ	4dB	2009-02-22 16:38:20
OY3JE	W3LPL	14019	CQ	6dB	2009-02-22 16:38:37
OY3JE	N3RS	14013.6	CQ	8dB	2009-02-22 16:51:25
OY3JE	W3LPL	14019.1	CQ	10dB	2009-02-22 16:51:36
OY3JE	K3LR	14020	CQ	7dB	2009-02-22 16:51:51
OY3JE	W3LPL	14019.1	CQ	5dB	2009-02-22 17:11:41

Signal Comparisons

- All spots now include SNR (signal to noise ratio) – thanks, VE3NEA
- Near-simultaneous spots may yield useful comparative data
- Of course, SNR is affected by QSB, QRM, QRN – not a measure of absolute signal strength

Making it better

- Need more “Reverse Beacons” on more bands, especially during contests
- Data can be passed to reversebeacon.net with zero interference to any other use

And now … drum roll

Skimmer and Log-Checking

- Whole-band recordings make a new level of precision possible
- First full-scale test done during CQ 160 CW

The Test

- CQ Committee recruited 5 Skimmer stations: 3 in North America and two in Europe
- Entire 160M band recorded for 48 hours from multiple locations - ~96 GB each
- Hard drives sent to contest committee for review

Excerpts from K1DG CQ 160 UBN

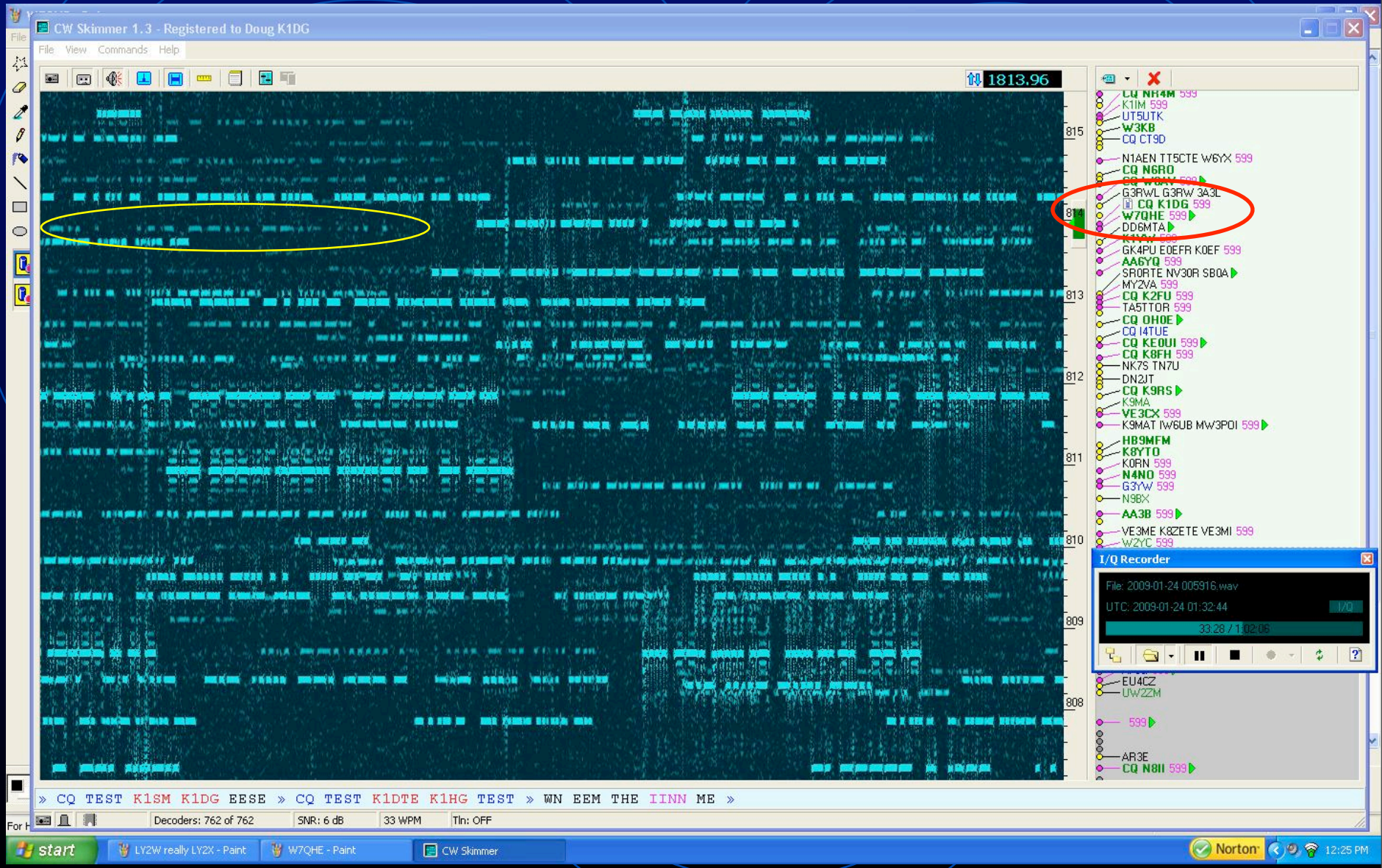
CALLSIGN CHECK RESULTS

S50TA is incorrect. Should be S51TA.
F5NTV is unique.
W1AMU is incorrect. Should be W1AMF.
K2FFH is incorrect. Should be K2FF.
W7QHE is unique.
K5AY is unique.
W5IF is unique.
UR6IOK is incorrect. Should be UR5IOK.
SP1I is incorrect. Should be SP1S.
K6JV is unique.
OK1NZ is unique.
W7SY is unique.
4Z5MV is incorrect. Should be 4Z5MU.
LY2W is unique.
N8SP is incorrect. Should be N8HP.
OK1FP is incorrect. Should be OK1FPS.
SK5CR is unique.

Can we test these?

Remember…uniques are NOT removed from logs

What does Skimmer hear and see?



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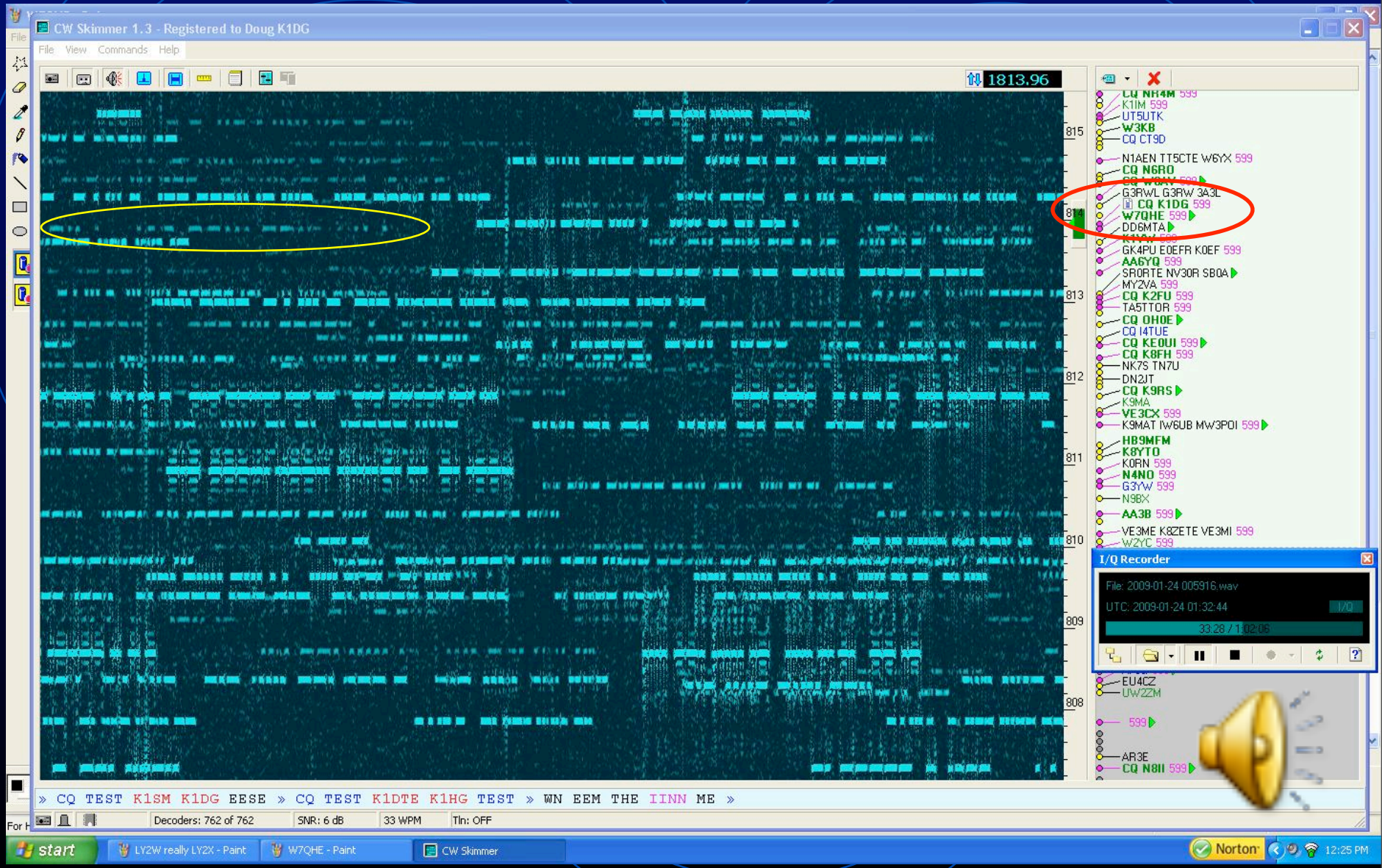
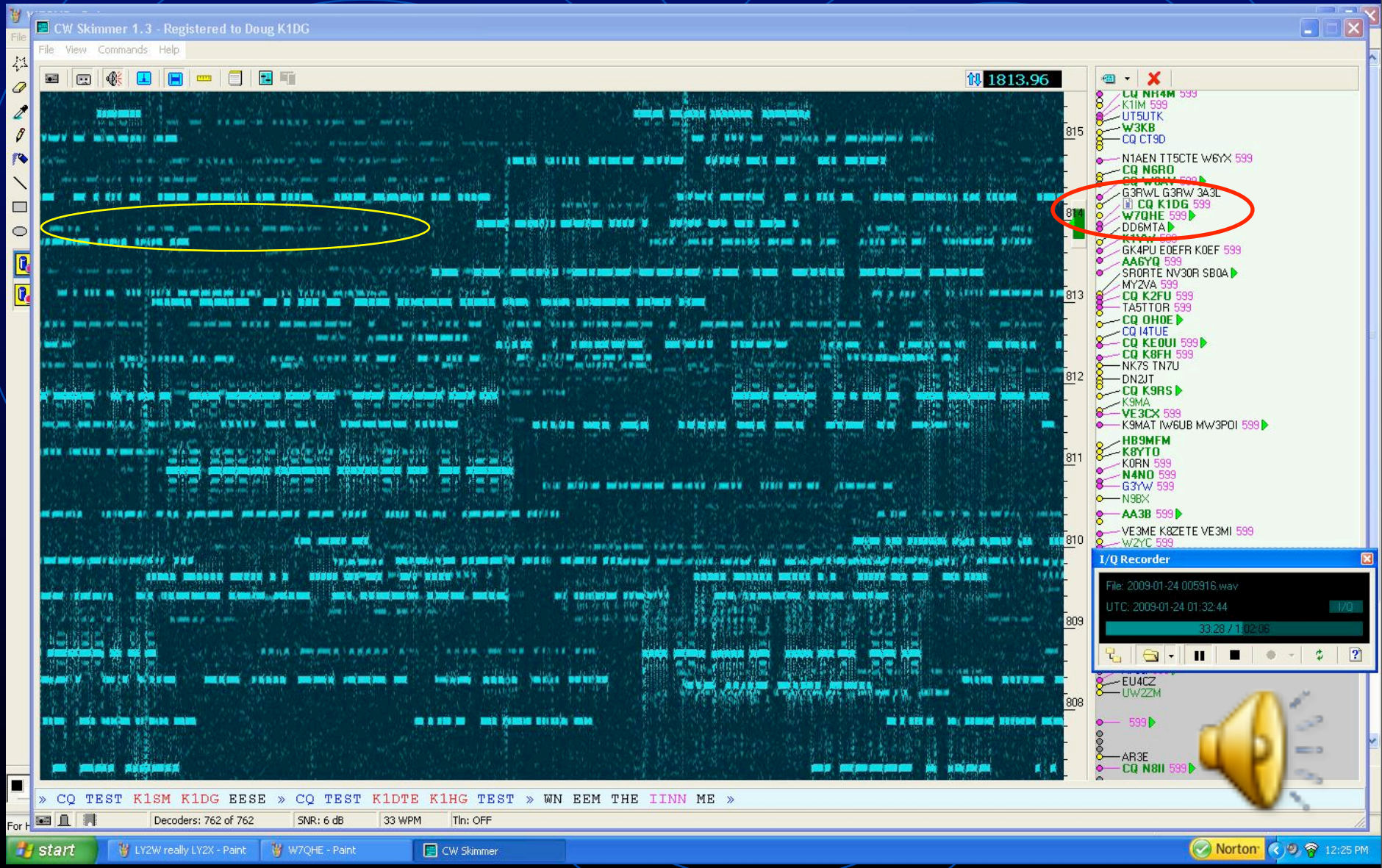


What does Skimmer hear and see?



Closeups of Skimmer Screen

D E W 7 Q H E

CONCLUSION: W7QHE is a good QSO –
the log-checking software did the right thing

Sometimes you get away with one…

CALLSIGN CHECK RESULTS

LY2W is unique.

QSO: 1813 CW 2009-01-24 0519 K1DG	599 ME	DL1YD	599 14
QSO: 1813 CW 2009-01-24 0520 K1DG	599 ME	LY2W	599 15
QSO: 1813 CW 2009-01-24 0520 K1DG	599 ME	DK3WW	599 14
QSO: 1813 CW 2009-01-24 0520 K1DG	599 ME	LY2X	599 15

As heard in W3

As heard in Zone 14

As “seen” in Zone 14

L Y 2 X 5 N N A 5

Sometimes you get away with one…

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QSO: 1813 CW 2009-01-24 0520 K1DG	599 ME	DK3WW	599 14
QSO: 1813 CW 2009-01-24 0520 K1DG	599 ME	LY2X	599 15

As heard in W3

As heard in Zone 14

As “seen” in Zone 14

L Y 2 X 5 N N A 5

A busted exchange caught

EXCHANGE CHECK RESULTS

NR4M : A should be VA ← obvious typo
WA2RZJ : NJ should be NY

QSO:	1813	CW	2009-01-24 0516	K1DG	599 ME	LZ9A	599 20
QSO:	1813	CW	2009-01-24 0516	K1DG	599 ME	WA2RZJ	599 NJ

TU K1DG
WA2RZJ LZ9A both calling
LZ9A 599 ME
TU 5992T
TU K1DG
DE WA2RZJ
WA2RHJ 5NN ME ← DG COPIES CALL WRONG
R 5NN NY TU WA2RZJ
RZJ TU K1DG ← DG CORRECTS SUFFIX

The log checking software did the right thing

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R 5NN NY TU WA2RZJ
RZJ TU K1DG ← DG CORRECTS SUFFIX

The log checking software did the right thing

Fearless Predictions

- Skimmer will be essential for top-tier multi-ops and Assisted/Unlimited competitors
- Skimmer will have a decisive impact on single-op competition in contests where there is no “unassisted” category
- A Top Ten SS operator will decide that using Skimmer on Sunday will let him jump past his competition and win the whole thing.