

Results: North American RTTY Sprint

QRM

How is QRM handled in RTTY contesting? What are the differences from CW and SSB? The main distinction with RTTY is that the operator's brain is not decoding the signal. The software (or hardware) decoder has to separate the signal from noise and from other signals.

Most RTTY decoders work best when presented with a single signal, hence the popularity of using the radio's narrow CW filters. Some decoders, however, are designed to utilize a wider bandwidth because they assume multiple signals and have algorithms to zero in on one or to identify them all in parallel. Examples are CocoaModem by W7AY and the now-obsolete *RITTY* by K6STI. These differing approaches mirror the two basic methods for dealing with QRM while working CW and SSB.

A recent "Contesting 101" column by K4RO revealed that Fred, K3ZO, uses a 2400 Hz CW filter and a 6 kHz SSB filter in his contest radios. Fred prefers to "listen wide" and let his brain focus on the signal(s) of interest. The benefit here is that the human brain — or at least Fred's — can be more capable of extracting the desired signal than hardware and software. I say "can be," since most people are so distracted by QRM that it obscures the desired signal. Equally important, neighboring QSOs and off-frequency callers are readily detected with wide filters.

The downside is that few human brains have the capability to listen wide, whether innate or as a developed skill. Many contesters prefer to use rather tight filtering in their radios to better focus on the desired signal. The downside in this case is the possibility of missing other signals that may be useful in the course of the contest.

RTTY bandwidth is similar to CW but wider by the "shift" or difference between the mark and space frequencies, typically 170 Hz in Amateur Radio RTTY. Thus, about 280 Hz is needed to pass a 170 Hz RTTY signal without degrading it. A 250 or 500 Hz CW filter is ideal for RTTY contesting. In fact, in large pileups, I have been successful with 150-200 Hz filtering. These overly narrow filters provide a net positive compromise in heavy QRM. The signal of interest is somewhat diminished as its outer edges are attenuated by the filter, but the reduction of other signals makes up for the loss. To the extent the signals in the pileup are spread out a bit

Top 10 Scores

Call Sign	Score	Bnd Chgs	Qs Lost	00Z	01Z	02Z	03Z
WØYK	11,000	159	7	74	64	59	54
W6YX	10,604	84	4	50	70	60	62
NØXR	10,215	134	8	67	52	56	52
K6LL	9156	4	9	57	56	54	54
N6ML	8170	94	10	52	45	42	55
AD6WL	8148	94	10	57	48	41	51
W6OAT	8080	2	3	45	51	53	53
AA3B	7955	86	6	31	50	51	55
W7WW	7812	90	7	55	46	41	45
K5AM	7020	44	6	42	52	44	43

and not exactly zero beat helps too.

If the receiver utilizes dual filters — one each for the mark and space signals — cleaner audio can be supplied to the decoder. The current generation of Icom radios (eg, the IC-756PRO series, the IC-7800, etc) and the Elecraft K3 have this feature.

Older radios lacking explicit data or RTTY settings use the SSB mode and AFSK transmission with audio tones applied to the microphone or auxiliary audio input. Some of these radios do not allow selection of the narrower CW IF filters while in SSB mode, so the wider SSB bandwidths are used for receiving RTTY. While this works well for routine RTTY communication, it is a problem in active RTTY contests.

As is the case with CW and SSB, tight roofing filters are an asset in crowded band conditions with big RTTY signals. Recent radios with lower IFs are able to provide roofing filters down to 200 Hz. With roofers just outside the receive passband, good receivers are less prone to IMD and AGC pumping from nearby strong signals.

"Good" QRM?

In this and other discussions about QRM, there is often an underlying assumption that QRM is "bad." There are good things about QRM. For one, it is usually the result of our amateur bands being (over) utilized. Certainly, one benefit contesting brings to the entire ham radio community is hard evidence that our frequencies are indeed being used. Such QRM drives us to develop both technology and operating skill.

Finding a Run Frequency

In major RTTY contests like ARRL RTTY Round-Up, CQ WPX RTTY and CQ World Wide RTTY, 20 meters can be

Top 10 QSOs

WØYK	250	W9WI	4658
W6YX	241	KØAD	4384
NØXR	227	K6UFO	4356
K6LL	218	K1GU	3876
W6OAT	202	VA6APB	3584
AD6WL	194		
N6ML	190		
W7WW	186		
AA3B	185		
K5AM	180		

Top 10 Mults

NØXR	45	KU8L	39
WØYK	44	WA7BME	25
W6YX	44	KØFYI	19
AA3B	43	N9XX	15
N6ML	43	KD7RUS	10
AD6WL	42	W6NF	4
K6LL	42		
W7WW	42		
W6EU	41		
WØBR	40		

Top 10 Low Power

KE5OG	5735	AD6WL	94
WØBR	5600	N6ML	94
KØHW	5476	W7WW	90
NO3M	4773	AA3B	86
AB4GG	4662	WØBR	85
		W6YX	84
		KØHW	67

Top QRP

WØMU	3429
N6WG	768
K6MI	391

TOP 10 Golden

KU8L	39
WA7BME	25
KØFYI	19
N9XX	15
KD7RUS	10
W6NF	4

Top 10 Band Changes

WØYK	159
NØXR	134
N4ZZ	110
AD6WL	94
N6ML	94
W7WW	90
AA3B	86
WØBR	85
W6YX	84
KØHW	67

packed with contest QSOs from 14,060 to 14,130, sometimes beyond. What constitutes a "hole," where one might set up a run frequency? Different answers emerge depending on whether one is using a TS-930 with a 15 kHz roofer and 2.8 kHz SSB IF filters or a K3 with a 370 Hz roofer followed by the DSP Dual-Tone Filter of sharp 50 Hz filters around the mark and space frequencies. With the latter setup, mark-to-mark spacing of 250-300 Hz is no problem.

Since many are using wider receivers, however, practical spacing is wider across the band. Even if you can copy 100 percent with strong signals just 300 Hz on either side of you, the majority of stations you work may not be able to copy *you*, due to your neighbors' strong signals. Whether or not a nearby station is interfering with you is simply a matter of how clearly you're printing the signal you're trying to copy.

If you can hear other diddles in your passband, there certainly is potential for your print to be affected. But even if you don't actually hear off-frequency diddles, a close-by station could be affecting your AGC or providing IMD that keeps your decoder from giving clear copy. This is where a bandscope, wider filtering or frequently moving the RIT to either side is useful in monitoring.

So, you find what you consider to be an appropriate hole in the mayhem of RTTY contesting. How long do you listen? Do you send "QRL?" If so, how many times? Should you have a message programmed with something like "in use"?

I don't think the answers to these questions are much different than for CW or SSB. For all modes, it really depends on the specific situation. In addition, there are various operating styles or personalities for acquiring a run frequency. Sending "QRL?" after you've listened long enough to a quiet frequency to reasonably assume it is unoccupied, is unarguably the most considerate first transmission.

On the other hand, simply sending your call sign once is no more disruptive and still gives the current user of the frequency opportunity to declare his or her presence. (It's always a grin to tune across the band during a contest, hear a station dump "QRL?" into a relatively quiet place and then have two or three other stations come back with "yes"! Using "QRL?" announces that the frequency is not likely in use and invites lots of competitors for it.)

I feel the important things are to carefully listen and to keep your initial transmissions very short as you ease into a new run frequency. The listen part applies not just prior to your first transmission but to listen diligently between your next few transmissions. There can be a station in your skip zone that you aren't copying well, or there can be an occupant on the frequency who is focused on copying a very weak signal you cannot hear.

It is good to be aware of frequencies that are likely to be in use, such as the NCDXF beacon transmitters, eg, on 14,100 and 21,110 kHz, etc. Each of the 18 beacons transmits only a few seconds every three minutes, and many may not be audible at your location. You can bet that they are there and transmitting their QRP and low power, 24 hour per day, every day. Another example is PSK operators who,

Team Scores

SWACC		NCCC 1		NCCC 2		TCG	
NØXR	10,215	WØYK	11,000	W6EU	6929	N4ZZ	6384
K6LL	9156	W6YX	10,604	W6SX	5004	AB4GG	4662
AD6WL	8148	N6ML	8170	K6XX	4864	W9WI	4658
W7WW	7812	W6OAT	8080	KJ6RA	4686	W4RK	4454
K5AM	7020	N6CK	5040	W6TQG	3330	W4NZ	4448
KE5OG	5735	K6TD	4865	KT6YL	2900	K1GU	3876
W0BR	5600	K9YC	4795	KD4HXT	2700	NB4M	1690
KØHW	5476	K6UFO	4356	N6EE	1425	W4BK	1416
NO3M	4773	K6CTA	3658	K6DGW	1377	W4BCG	1222
K8UT	4257	K6MM	3248	W6NF	12	Total	32,810
Total	68,192	Total	63,816	Total	33,227		

5. YCCC (W7WHY, NP3D/W2, N1SV, NJ1F, K5ZD, KB1NRB, OL6X).....19,888
6. Corner (W7MRC, W7OM, W7NNN, N7BV, N7KE).....12,172
7. Digital (K9SEX, NQ5D, KU5B).....5389
8. NCCC 3 (N6WM, N6WG, N6TQS).....3266
9. Paducah (ND4X).....2368

Top Single Radio

Call Sign	Score	Bnd Chgs	Qs Lost	00Z	01Z	02Z	03Z
K6LL	9156	4	9	57	56	54	54
W6OAT	8080	2	3	45	51	53	53
W6EU	6929	2	9	36	49	35	52
KE5OG	5735	10	14	44	45	39	31
W7WHY	5439	11	8	37	34	34	43
N6CK	5040	2	4	36	37	21	50
W6SX	5004	3	5	27	40	39	33
K6TD	4865	2	4	33	37	35	34
K6XX	4864	2	8	35	46	38	11
K9YC	4795	2	7	28	35	36	39

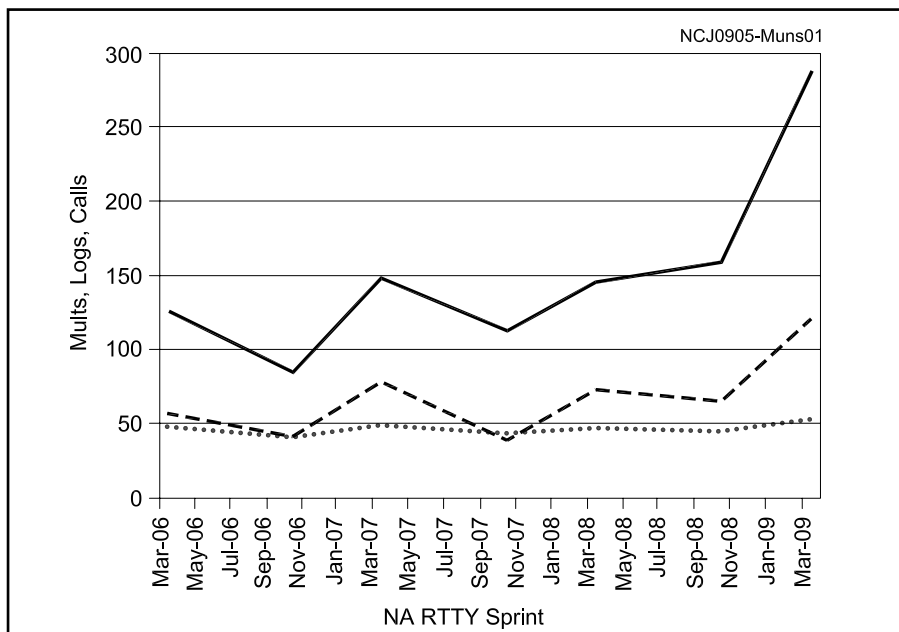


Figure 1 — RTTY Sprint activity continues to rise. Note the uptick in logs and call signs over the past two events.

very predictably, operate 70 kHz up from the band edge with no more than 1-2 kHz spread, if that. Since it is more likely they are on this frequency than others, an extra-careful listen is in order. Even if .070 is quiet, why operate there if you can avoid it and leave it available for PSKers? While it is not a regulatory requirement to keep that frequency clear, it is the considerate thing to do.

CW and RTTY occupy much of the same subbands, and during CW contests lots of CW can be found in the typical RTTY portions of the band, 70+ kHz up. Similarly, in RTTY contests QSOs are found as low as 7025-30, for example,

especially since some countries' digital subband is narrowly contained there. For ops in Japan, this is 7025 to 7045 kHz. A starting point for learning these things is the recommended band plans published by ARRL.

ANARTS World Wide RTTY Contest

The word from Pat Leeper, VK2JPA, is that the ANARTS event will no longer be held. As the now-former contest manager/secretary, Pat found he was no longer able to do the job, and no one has been found to replace her. This is very unfortunate, considering the contest's popularity. It also became known that the vast majority

of submitted logs deviated so much from the Cabrillo format that log checking was severely hampered. It is a reminder to all of us to help our volunteer log checkers by insuring that our submittals conform to a contest's Cabrillo format submission requirement.

How's Don, AA5AU, Doing?

"RTTY Contesting" columnist Don Hill, AA5AU, and his wife continue to live out of a suitcase waiting for a serious house problem to be resolved. At least they've upgraded from a hotel room to a small apartment, where Don's e-mail capability has been somewhat restored.

Scoring

Call Sign	Name	QTH	20	40	80	QSO	Mults	Score	Team	Call Sign	Name	QTH	20	40	80	QSO	Mults	Score	Team	
N1SV	LES	MA	12	58	43	113	34	3842	YCCC	KJ6RA	MARC	CA	10	86	46	142	33	4686	NCCC 2	
K5ZD	RANDY	MA	0	42	25	70	28	1904	YCCC	K6UFO	*MARC	CA	52	46	34	132	33	4356	NCCC 1	
KB1NRB	*ALLAN	CT	0	20	37	57	23	1311	YCCC	K6CTA	ED	CA	45	48	25	118	31	3658	NCCC 1	
N1SXL	*DEAN	CT	1	25	30	56	23	1288		W6TQG	MARC	CA	30	54	27	111	30	3330	NCCC 2	
KE1V	*ERIK	MA	0	19	7	26	17	442		K6MM	MARC	CA	15	59	38	112	29	3248	NCCC 1	
NP3D/W2	ANDY	NY	12	49	48	109	36	3924	YCCC	KT6YL	MARC	CA	40	34	26	100	29	2900	NCCC 2	
NJ1F	BRIAN	NY	0	37	54	91	33	3003	YCCC	KD4HXT	*DAVE	CA	22	48	20	90	30	2700	NCCC 2	
K2DSL	*DAVID	NJ	0	40	51	91	32	2912		N6WMM	MARC	CA	4	43	26	73	30	2190	NCCC 3	
N2EIK	JOHN	NY	0	55	21	76	33	2508		N6EE	MARC	CA	29	19	9	57	25	1425	NCCC 2	
AA3B	BUD	PA	15	98	72	185	43	7955		K6DGM	MARC	CA	14	39	0	51	27	1377	NCCC 2	
W0BR	*BOB	PA	6	65	69	140	40	5600	SWACC	N6WG	*MARC	CA	15	25	8	48	16	768	NCCC 3	
NO3M	*TY	PA	12	53	64	129	37	4773	SWACC	WA6BOB	*MARC	CA	-1	36	0	35	16	560		
WW3S	*JAMIE	PA	5	37	56	98	32	3136		N6QQ	JOHN	CA	0	24	0	24	18	432		
N8NA	*KARL	DE	4	41	40	85	35	2975		K6MI	*JOHN	CA	3	20	0	23	17	391		
WI2E	JOE	PA	0	16	19	35	19	665		N6TQS	*MARC	CA	4	5	19	28	11	308	NCCC 3	
K3RWN	*RICH	PA	-1	10	21	30	21	630		N6FD	*ERICH	CA	13	0	0	13	9	117		
N3RDV	*MARK	PA	0	3	10	13	7	91		K6LL	DAVE	AZ	68	102	48	218	42	9156	SWACC	
N4ZZ	DON	TN	30	80	58	168	38	6384	TCG	W7WW	RED	AZ	44	95	47	186	42	7812	SWACC	
K4HMB	JOE	NC	41	56	57	154	38	5842		W7WHY	TOM	OR	27	72	48	147	37	5439	YCCC	
K4IQJ	DICK	AL	32	52	56	140	34	4760		W7MRC	*PAUL	WA	19	60	36	115	30	3450	Corner	
AB4GG	*KENNY	TN	13	52	61	126	37	4662	TCG	N7NM	DOUG	WA	19	46	41	106	29	3074		
W9WI	*DOUG	TN	18	63	56	137	34	4658	TCG	W7OM	*ROD	WA	34	49	12	95	30	2850	Corner	
W4NZ	TED	TN	22	58	59	139	32	4448	TCG	KW7N	*STEVE	WA	27	43	19	89	30	2670		
K1GU	*NED	TN	24	37	53	114	34	3876	TCG	W7NNN	*ERIC	WA	24	21	31	76	27	2052	Corner	
W3YY	BOB	VA	21	47	30	98	33	3234		N7BV	*CHUCK	WA	11	41	22	74	26	1924	Corner	
N4IQ	*BILL	SC	0	49	41	90	33	2970		N7KE	*KEY	WA	14	41	24	79	24	1896	Corner	
AB4SF	*WRAY	VA	0	40	50	90	32	2880		WX7P	WILSE	WA	19	35	0	54	26	1404		
ND4X	*PAUL	KY	4	29	41	74	32	2368	Paducah	N7ON	MARC	NV	0	14	45	59	22	1298		
W4OJC	BILL	GA	21	43	14	78	26	2028		W7ABC	ROBIN	WA	15	15	11	41	24	984		
WR1Q	*LYLE	TN	0	24	44	68	27	1836		WA7BME	*RON	UT	0	25	0	25	13	325		
K4FX	BILL	NC	20	32	17	69	26	1794		KD7RUS	*TIM	WA	7	3	0	10	10	100		
NB4M	*CHRIS	TN	5	31	29	65	26	1690	TCG	W6NF	*MARC	NV	1	3	0	4	3	12	NCCC 2	
W4BK	*FRANK	TN	3	25	31	59	24	1416	TCG	K8UT	LARRY	MI	34	34	61	129	33	4257	SWACC	
W4BCG	*BILL	TN	0	13	34	47	26	1222	TCG	KU8L	*CURT	MI	4	26	9	39	19	741		
K4LW	*BOB	GA	0	25	7	32	22	704		N8NOE	*JEFF	MI	4	2	0	6	6	36		
W8DQ	GARY	TN	3	16	10	29	18	522		KE9I	GERARD	IN	13	37	70	120	34	4080		
KG4LCF	*LARRY	FL	0	32	0	32	13	416		ND9E	BILL	IL	3	63	42	108	36	3888		
N4FL	*LEX	FL	1	16	5	22	14	308		N7GVV	*JIM	IN	2	0	37	39	25	975		
K14SP	*JACK	AL	0	6	11	17	15	255		W9ILY	*JOHN	IL	7	38	0	45	21	945		
K5AM	MARK	NM	48	87	45	180	39	7020	SWACC	N9XX	*DAN	WI	0	15	0	15	11	165		
KE5OG	*BILL	TX	46	73	36	155	37	5735	SWACC	KC9GGV	*GARY	IN	1	13	0	14	9	126		
WA5ZUP	JOHN	NM	3	84	39	126	33	4158		N0XR	DEAN	IA	53	100	74	227	45	10,215	SWACC	
W5KI	STEVE	AR	21	60	51	132	30	3960		K0HW	*JIM	SD	26	65	57	148	37	5476	SWACC	
K9SEX	*RUFF	TX	46	38	0	84	29	2436	Digital	W4RK	BILL	MO	29	54	48	131	34	4454	TCG	
AE5PW	*PAT	AR	23	27	29	79	26	2054		K0AD	*AL	MN	44	60	33	137	32	4384		
NQ5D	*LONZO	TX	14	40	13	67	27	1809	Digital	W0BH	BOB	KS	33	47	49	130	29	3770		
KU5B	COLIN	TX	26	25	1	52	22	1144	Digital	W0MU	*MIKE	CO	35	53	39	127	27	3429		
AA5VU	*DICK	TX	30	0	12	42	20	840		N0EOP	*ED	CO	13	40	0	53	17	901		
K5WW	*ERIK	TX	26	10	0	36	20	720		N0AT	*RON	MN	6	5	36	47	19	893		
WA0SXV	MIKE	NM	0	5	26	31	14	434		K4IU	*FRED	MN	10	9	9	28	13	364		
KB4KBS/5	*SCOTT	TX	4	9	0	13	12	156		K0FYI	*BOB	CO	0	14	5	19	14	266		
W0YK	MARC	CA	62	125	63	250	44	11,000	NCCC 1	AC0E	*JIM	KS	0	23	0	23	8	184		
W6YX	MARC	CA	72	107	62	241	44	10,604	NCCC 1	K0XU	*JIM	NE	12	5	0	17	6	102		
N6ML	MARC	CA	47	90	54	190	43	8170	NCCC 1	VA6APB	*CHRIS	VE6	45	36	31	112	32	3584		
AD6WL	JIM	CA	52	95	47	194	42	8148	SWACC	VE3RCN	*KEVIN	VE3	4	20	28	52	25	1300		
W6OAT	MARC	CA	57	100	45	202	40	8080	NCCC 1	VE3JI	*IAN	VE3	7	31	18	56	23	1288		
W6EU	MARC	CA	29	87	53	169	41	6929	NCCC 2	VA3WPV	*WALT	VE3	3	14	1	18	12	216		
N6CK	MARC	CA	44	53	47	144	35	5040	NCCC 1	XE1GRR	*TONY	XE	26	24	2	52	19	988		
W6SX	HANK	CA	20	71	48	139	36	5004	NCCC 2	OL6X	DANIEL	OK	0	24	9	33	15	495	YCCC	
K6TD	MARC	CA	49	65	25	139	35	4865	NCCC 1											
K6XX	MARC	CA	44	57	27	128	38	4864	NCCC 2											
K9YC	MARC	CA	14	66	57	137	35	4795	NCCC 1											

* Low Power
** QRP

