

Results, Third ARRL RTTY Roundup

This RTTY contest was great!—*KD2BW*

By Hal Blegen, WA7EGA, and Billy Lunt, KR1R

12910 Broadway
Spokane, WA 99216

Contest Manager



Bob, N2FF, reported that his biggest thrill was when V85GA called him for a new country.

On almost every night of the year, a spin through the frequencies where you might expect to find RTTY will probably net far more packet squawking and AMTOR chirping than Baudot. But when it's contest time, the opposite is obvious—Baudot is everywhere! "This contest offers me pleasure in my favorite hobby," said VE2GDZ, "But, where are all these RTTY stations the rest of the year?"

The operator who was once found exclusively on 20-meter RTTY has evolved. He now divides his time and resources between task-oriented modes on HF, VHF and UHF that have only recently come into vogue. If accuracy is more important than throughput, he runs HF AMTOR and packet. On VHF packet he monitors a DX cluster. But on the first weekend in January, when the gun sounds for the RTTY Roundup, he's on Baudot—because that's where the fun is.

In 1989, when the RTTY Roundup was fresh out of the box, only 18 logs showed 400 QSOs or more. In 1991, the number of stations that broke 400 was more than double that. With the exception of high-power, single-op (which held off the challenge by 369 points), the 1991 top scores in high-power DX and in all other stateside categories set all-time records. The demands on equipment and operators has become intense. Let's see what it takes to set the pace.

A Top Single-Op

"A good contest," commented Ed, W3EKT. "I improved my score from last year and that's all I could ask for. I had fun running into old friends. That's what Amateur Radio is all about." Ed turned in this year's overall top score to win the single-operator, high-power class from W3LPL. With four 200-foot towers, three 100-footers and an assortment of gain antennas on each band, it's easy to see why Ed was so loud. 'LPL uses high dipoles and a full-sized quad on 80 (hard-wired for Europe).

The station layout poses interesting challenges for the single-op category. Each band is permanently configured with a homebrew 3-1000Z amplifier and a Drake C-line. The only thing common to all operating positions is the amplifiers' high-voltage, which is routed around the room on coax. To change bands, you pack up and move. Ed used a variety of demodulators: ST-6000s, a couple of DT-600s and an old Electrocom

with separate Microlog ACT-1s for each band.

He hand-logged the contest and used K1EA's contest software after the fact for duping and to get presentable hard copy.

"Attention to detail," he said, "is a neces-



Here's the crew of the number-four US multioperator low-power effort at W5VZF: (l-r) Phil, WA4DDE; Jim, W5VZF; and Rich, KB4HB.

Single Operator Top Ten

W/VE—Low Power		W/VE—High Power		DX—Low Power		DX—High Power	
Call	Score	Call	Score	Call	Score	Call	Score
KE0KB	58,590	W3LPL	73,359	4M5RY	50,666	KP2N	64,848
AA5AU	53,240	(W3EKT, op)		(YV5KAJ, op)		9L1US	38,802
VE6ZX	43,956	WF1B	69,387	EA8AKQ	35,052	AL7LB	34,788
NO1Y	42,133	VE7ARS	66,555	FF1NZH	34,470	AL7BB	30,360
KC2FD	40,040	WF5E	59,032	KP4FP	26,980	OH2LU	16,724
N1SW	39,355	AA4M/6	55,000	G0ARF	22,268	OH2BP	15,232
NT3B	35,708	N6GG	53,037	AL7BK	21,240	HA5CP	12,144
W6/G0AZT	35,340	AA4TH	51,069	PA3DBS	20,090	IK0CNA	8,265
WB4M	35,259	WF5T	43,624	EA6ZP	13,224	SM4RGD	7,436
W7LHO	33,540	K6WZ	40,670	VP2EE	11,286	LU9DBK	6,027
		NO2T	36,855	HL9RY	8,925		

Multioperator High Scores

W/VE—Low Power		W/VE—High Power		DX—High Power	
Call	Score	Call	Score	Call	Score
WB7AVD	59,660	WA7EGA	69,936	JJ3YBB	36,036
NJ0M	54,426	KY1F	38,982	UZ9CWA	26,690
KB9ATR	25,122	W7ZAC	22,680	NL7HP	24,367
W5VZF	19,241	WA0VQR	11,773		
KB5LS	14,904				

sity. If you have to twist your neck to see the screen, by the end of the contest it will be killing you." To improve his rate, he shortened the exchange info. He said that the US stations quickly got used to one-time exchanges, but DX and the Europeans in particular, would ask for repeats if the exchange got too short. Sending the info twice seemed to work.

Low Power is No Problem

Tom, KE0KB, is batting two-out-of-three! This year marks consecutive wins and a class record for him in the single-op, low-power category. Although Tom recently moved to Connecticut, his layout in Minneapolis for the 1991 contest included a Kenwood TS-950 transceiver driving a 4-element tribander with a G5RV for the low bands. He used an AEA PK-232 controller for transmit and a HAL ST-6000 feeding a Telereader and a Tono 5000 on receive.

He explained that a nearby neighbor with VCR trouble had a lot to do with his original decision to go low power, but now he doesn't think he'd ever switch. "There are differences in low-power operation," he said. "Holding a frequency is almost impossible. You have to get used to being pushed around." He said 15 meters was his most productive band.

Tom is also big on *ARIES-1* software, which allows him to send and log with a single program. He claimed that using a mouse to control the software prevented fatigue during the contest. He was adamant about logging software, "If I had to log by hand, I wouldn't contest!"

Multiop Success

In the low-power, multioperator class, Jim, WB7AVD, also set a record. He's an experienced contest operator from several multiop efforts, but this was his first attempt from his home in Spokane (Washington). The three-operator effort included Betsy, WV7Y; and Jay, WS7I (Jay won high-power-single

last year). Jim ran a tribander at 60 feet with an inverted-trap-V on 80 and 40 meters off the same tower. He ran a Ten-Tec Omni transceiver into a Heathkit SB-1000 amp which he throttled back to 150 watts (on a Bird wattmeter).

The RTTY was an ST-6000 with Hal DS-RTTY software on one computer for receive while he ran a PK-232 controller with *Scotchlog* on transmit from a second keyboard.

Jim said that it was completely different from high-power operation. "You always avoid the hottest band. When the bands get crowded, it's time to QSY, starting early on 40 and coming back to 10 meters after most stations have gone to 15. We could hardly work 20 meters at all."

He said that off-duty operators spent as much time at home feeding the contest station multipliers as they did operating. To improve throughput, spotting was done on a voice frequency, independent from the DX-spotting cluster (which was also monitored).

"For a multiop effort, extra spotting is essential," he said. "Since most of the time you're operating hunt-and-pounce anyway, you can't afford to miss multipliers."

Multiop Powerhouse

WA7EGA (K7DSR, K7GS, NQ7M, W7YEM and WB7RBJ) again managed to avoid meltdown long enough to set a record in the high-power-multi class. At EGA, a pair of 100-foot towers support Christmas trees for 10-40 and double-extended Zepps for 80 meters. There are two ICOM IC-751 transceivers, one driving a Ten-Tec Titan on 10, 20 and 80, and the other feeding a Henry 2K amplifier on 15 and 40 meters. For RTTY, he runs a set of PK-232s for transmit with *Scotchlog* software. A Dovetron and an ST-8000 feed separate computers, using HAL DS-RTTY for receive.

By separating the receive copy from trans-

mit, there is always a full screen (plus back scrolling) while the logging software controls all transmit buffers. The operator never runs a "live" keyboard. People who type are either too slow or they send too much. In a fast-paced contest like the Roundup, the winning margin can be as narrow as one QSO per hour. The group's best rate was on 20 meters from 0100-0200Z, with more than 80 QSOs per hour. Even the best operator cannot maintain that rate if he has to dupe, log, tune and type all the exchanges manually.

It's hard to convince an operator running 65 QSOs per hour to shut down and QSY to an already worked-out band for a multiplier, especially when he knows he'll be stuck there for 10 minutes. Do it anyway! If it's new DX, or a new state/province any time after 2000Z Saturday, the math always ends up in favor of the multiplier.

A good operator uses both VFOs. Most stations send your call sign at least twice and their own call sign three times. The other 10% slap you with a call sign the instant you let up your carrier. Send a six-second CQ on VFO A, and if you don't have a call before you can hit the switch, select VFO B and tune in a QSO elsewhere on the band. Don't take more than five seconds before switching back to the first VFO to see if anyone answered the CQ. Although you may be a practicing schizophrenic by the end of the contest, calling CQ on one VFO and using the other to systematically move across the band will keep you from missing multipliers without seriously affecting your rate. It will also give you a yardstick to assess band activity. If your rate is dropping and nobody else seems to be doing any new business, it's time to QSY. If you hear a W4 calling a ZL, rotate the beam.

Plan Your Strategy

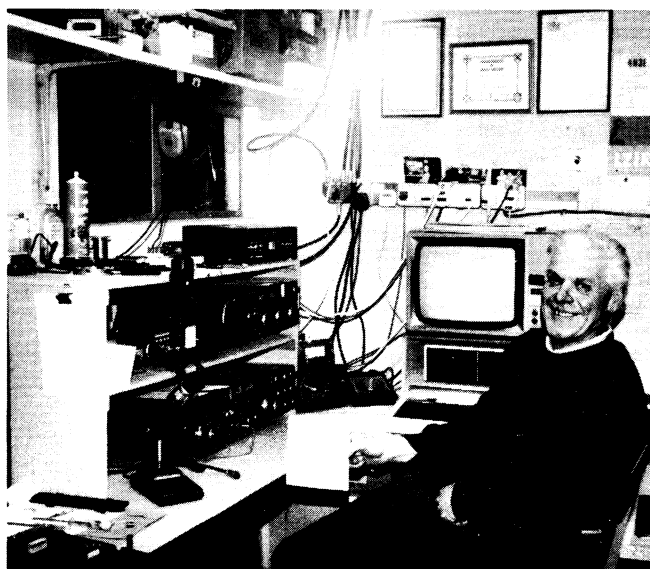
Last year, Europe and the South Pacific were still open after 0100Z (Saturday night). Quitting too early (just because the East Coast

Single-Operator Division Leaders

Division	Low Power Call	Score	High Power Call	Score
Atlantic	NT3B	35,708	W3LPL (W3EKT,op)	73,359
Central	W9KDX	32,300	N9ITX	26,860
Dakota	KE0KB	58,590	W9RXJ	9,548
Delta	AA5AU	53,240	WA5VBE	2,660
Great Lakes	WB8YJF	31,132	W8MQK	35,506
Hudson	KC2FD	40,040	NO2T	36,855
Midwest	KF0LZ	22,914	K6WZ	40,670
New England	NO1Y	42,133	WF1B	69,387
Northwestern	KA7T	27,744	—	—
Pacific	W6/G0AZT	35,340	N6GG	53,037
Rocky Mountain	W7LHO	33,540	WF5T	43,624
Roanoke	WB4M	35,259	WD4JBL	3,900
Southeastern	N4LIH	29,070	AA4TH	51,069
Southwestern	WD7I	19,980	AA4M/6	55,000
West Gulf	N5NUG	5,676	WF5E	59,032
Canada	VE6ZX	43,956	VE7ARS	66,555

Single-Operator Continental Leaders

Continent	Low Power Call	Score	High Power Call	Score
Africa	EA8AKQ	35,052	9L1US	38,802
Asia	HL9RY	8,925	4Z80TA (4X6UO,op)	5,014
Europe	FF1NZH	34,470	OH2LU	16,724
North America	KP4FP	26,980	KP2N	64,848
Oceania	AH6IX	4,472	AH6JF	4,961
South America	4M5RY	50,666	LU9DBK	6,027
	(YV5KAJ,op)			



Bob, G0ARF, had a great time and managed to beat his previous year's score, despite gale-force winds and two power outages.

has gone to bed and the rate is poor) can cost you five or six easy multipliers. I make up the time by starting later on Sunday morning.

Be sure everything is configured exactly as it will be during the contest and give it a trial before zero-hour. If you haven't checked, it probably won't work. This is especially true with software and all devices that are software controlled.

The number of logs submitted has remained constant—around the 300 mark—but casual participation by those who join in for an hour or two seems to be way up. The exchange is easy and there's no number (state-side) to mark the occasional operator as a new guy in the contest.

New Players in Each Year's Roundup

"This was my first RTTY contest, very challenging," said KW3U, "I learned from it; my old C-64 did well." KA1BVM was also new, "My first RTTY Roundup. Lots of fun! I worked 46 states on 40 meters with a full-wave loop." NQ7C missed a state: "This is my first RTTY test," he wrote. "I'm already looking forward to next year's test, but where was Nevada?"

It looks like WA8ZNC is going to be multi-op next year. He says, "This was my step-daughter's first contest. She received her ticket, KB5OHG, less than a month ago. At age 10, she took to contesting well. I guess I'll have to share the rig in future contests." And KB5OHG warned, "This was my first contest and I did real well, so watch out, world!"

There were single-op entries that probably should have counted for multiops. "Not much of an effort this year because I had to play Mr Mom this weekend," complained ND2K. "One thing nice about RTTY is that three screaming kids in the shack don't affect RTTY copy!" Another unintentional multi was KM4IG. "This year's contest was enjoyable, even with a contest buster (an eight-week-old baby boy)," he said. "This is the second RTTY Roundup I've participated in. Forty meters came alive like last year and it's great to make the number of QSOs on 40 that I did."

N5NA also had an extra challenge. "First time in an RTTY contest," he explained. "Lots of fun, but have you ever tried contesting with a two-year-old in the room who wants to play radio, too?"

DX participation was down from last year. This is not surprising. Like the Sweepstakes, the Roundup builds a heavy curtain of signals as US stations work each other with their beams pointed inward. It's a tough nut from a DX standpoint. HL9RY admitted, "Great contest, but I sure goofed on this one. I ran low power and couldn't get over the stateside QRM. Even the weather wouldn't cooperate. Freezing rain had the antenna frozen due north. Sure didn't do as well as last year from Louisiana."

WF1B was delighted. "The greatest moment of contest," he wrote, "was when HL9RY called me near the end of the contest for a much-needed multiplier. It's a great contest and gets better every year!"

Even SM4RGD was hooked. "Thanks for a nice contest. This was my first ARRL

contest and I'm sure it's not the last one. The conditions were very good on 28 MHz. Thanks to all stations."

High Versus Low Power

Although it takes more patience and better operating skills to compete in the low-power, 150-watt class, it's still the most popular category, running about 3:1 over QRO entries. AB4GR wrote, "Another excellent contest. It's amazing what you can do with 50 watts and an inverted-V antenna," and from AE0Q, "Most fun I've ever had in a contest, even with indoor dipoles!"

N9ITX may have regretted his decision to run high power. "Despite computer RFI problems, TVI problems on 15 meters, and spending two hours fixing the antenna tuner," he wrote, "I still had a blast in the contest!"

AH6IX proved that low power was no guarantee either. "Boy did the RF gremlins catch me! I had an RF-feedback problem for the first several hours and made few contacts. I finally tracked it down to a 2-meter amplifier connected to a 2-meter radio (both off), which was then connected to the same TNC as the HF rig. I had a lot of fun, this is turning into one of my favorite contests!"

Is there a doctor in the house? 1990's top "peanut whistle," AA5AU, says, "The lack of LA stations made me a popular multiplier, catapulting me over the 600-QSO mark. But working two computers and fretting over a slowly dying transmitter is enough to send anyone over the edge. The rig can be fixed, but my brain will never be the same. Do we have to do it again next year? You bet!"

NJ8M wrote, "I just fired up on RTTY for the first time on Friday. I had a ball, but I still enjoy CW. Now I know what digital modes really mean. My fingers are raw from typing." WB8SVK also ran out of fingers. "Next year," he wrote, "I'll have the PTT line fixed and I plan to run RTTY and packet. Thanks for a great time! I'll send the bill from the orthopedic surgeon!"

Despite a high technical difficulty factor, the word that best describes the Roundup is fun! N2HOS dubbed it "a heck of a good contest!"

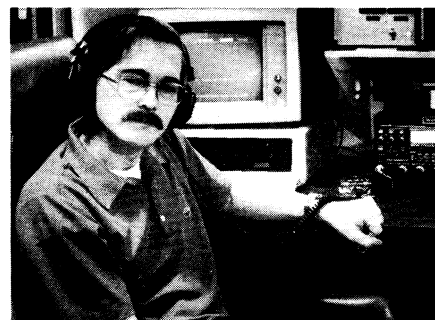
I think everyone agrees with N2KAD: "This was truly a great experience. I can't wait until next year." See you then.

10-Meter Contest Score Correction
KR2Q's score was inadvertently omitted from the 1990 ARRL 10-M Contest Results in July 1991 QST. Doug operated from his NNJ QTH in the CW-only QRP class and had the top W/VE score in that category, with 672 QSOs and 102 multipliers—275,400 points—in 32 hours of operation.

SOAPBOX

This was my second year in the Roundup. This was the best contest I've ever entered. RTTY ops are the best! (K9RRB). It was fun, but I missed the whole idea on multipliers. I'll get them next year. (WA8MEM). Great contest! I wish conditions could have been better on 10 meters. Each year I keep getting better, but how I hate the paperwork. Thank you until next year! (NT3B). Great contest. I was glad to hear more DX stations this year. It was fun working DX on 40 meters and the West Coast on

80 meters (WB4M). Thanks for great contest. Achieved my best QSO/hr rate ever for a RTTY contest. I'll definitely be back next year for more fun (VE6KRR). This was a good contest for someone looking for WAS RTTY. Most of the states were there, including Hawaii. I had fun again this year! (WA3Q). Good contest, but I need computer software that dupe and talks to the TNC (VE7SSS). Good to see more KH6s and KL7s in this contest and the Technicians' activity above 28,100 (W8PBX). Good contest. After 10 years of 160 contesting, I thought I knew something! At least we have a year to prepare for the Fourth RTTY Roundup. Most dupe-free contest ever. Thanks (WM9M). The RTTY subbands are known as the gentlemen's frequencies. In the heat of the contest, all lived up to this fine reputation (WA8FLF). Great fun! It was a pleasure to give out Vermont as a new multiplier for so many. See you next year! (K1HKI). I promise that next year I'll be rested before the weekend and my antennas will be up in time for the contest (VE2OWL). I didn't hear much DX, and packet was scarce. It was a fun contest (WA0QIT). I thoroughly enjoyed it! I accomplished my goals of becoming a better RTTY operator, and picked up 25 new states and a couple of DX countries! All the ops I heard were friendly and helpful. My wife, a non-ham, even said she liked this contest—I wasn't so noisy. See you next year! (K15GX). This was a most enjoyable contest and appeared to have much more participation than last year's contest. Though propagation to Europe and Alaska was a bit lacking this year, the added participation made up for the lack of "over-the-pole" multipliers. I'll be looking forward to next year's roundup with great expectations (AL7BB). Had more fun this year. It's the funniest thing on the bands for RTTY enthusiast. See you next year! (WA3UXZ). Very enjoyable contest. My son, KB5ILT, and I had fun with the minipileups. Does anyone operate RTTY in Utah or Montana? The RTTY Roundup is now a legitimate excuse for being locked in the shack for a weekend (KB5ILS).



Roger, NQ6C, home-brewed his RTTY software to allow online logging and duping.



Don, AA5AU, remarked that the lack of Louisiana stations helped him catapult over the 600-QSO level.

Scores

Scores are listed by continents, DXCC countries and ARRL/CRRL Sections. DX stations are listed first, then the US and Canada. Within each country or Section, single-operator scores are listed first and then multioperator scores. Each line score lists call sign, final score, number of QSOs, number of multipliers, hours operated and power (A = less than 150 W output; B = more than 150 W output).

Africa				Oceania				Mississippi				KA8OUT									
Canary Islands				Philippines				K2SE				WB5ASP									
EA8AKY	35,052	276	127-24	A	KE9ADU3	3,528	98	36-24	B	KAZWYE	629	37	17-16	A	W8MEM	1,595	55	29-8	A		
Sierra Leone				Hawaiian Islands				3				W5VZF (+KB4HB,WA4DDE)									
9L1US	38,802	446	87-24	B	AH6JF	4,961	121	41-14	B	N2DCH	406	24	17-24	A	W8EXI	782	34	23-8	A		
Asia				Australia				Delaware				New Mexico									
HL9RY	8,925	175	51-15	A	AH8IX	4,472	104	43-16	A	WA3KZK	17,621	263	67-18	A	WFST	43,824	532	82-24	B		
Japan				South America				Eastern Pennsylvania				North Texas									
JR4GPA	4,859	113	43-24	A	VK3EBP	2,967	69	43-17	A	NT3B	35,708	452	79-24	A	NSNUG	5,678	129	44-22	A		
JA9MJR	3,120	65	48-24	B	VK2BQS	432	24	18-24	A	WA3Q	24,450	326	75-17	A	KB5F	4,284	119	36-15	A		
JA3BSH	300	20	15-11	A									NR5Z								
JJ3YBB (JA3s AHL,CZY,FHL,PJL,JH3s													KB5OHG/N								
QFQ,LLV,UHG,JE3TXA,ops)	36,036	273	132-24	B									171								
Asiatic Russia				Colombia								Oklaoma									
UZ9CWA (UA9s CFV,CGA,UV9CAF,ops)	26,890	314	85-24	B	HK3AHM/1	8,820	180	49-24	A	WA3MKB	9,150	183	50-14	A	KSTU	2,775	75	37-24	A		
Israel				Argentina												WB9QIR					
4Z80TA (4X6UO,op)	5,014	109	46-24	B	LU9DBK	6,027	123	49-11	B	KZ3X	2,665	65	41-15	A	KI5GX	2,205	63	35-7	A		
Europe				Venezuela												KN5W					
Balearic Islands				Maryland-DC												KB5LS (+KB5LT)					
EA6ZP	13,224	152	87-24	A	W3PL (W3EKT,op)	73,359	741	99-24	B	W3BAT (NZ3Q,W3FZR,ops)	3,154	83	38-22	A	14,904						
Ireland				Connecticut												South Texas					
EI3GC	6,292	121	52-24	A	1	73,359	741	99-24	B					NSNMX							
France				N3UN												West Texas					
FF1NZH	34,470	383	90-24	A	NO1Y	42,133	483	91-23	A	WB8WRY	27,720	330	84-17	A	WFSE	59,032	628	94-24	B		
F6GVK	1,815	55	33-24	B	WA8LT	8,957	189	53-20	A	WA3UXZ	24,192	336	72-22	A	NSNA	3,800	100	38-17	A		
England				Alabama												6					
G8ARF	22,268	293	76-20	A	KE4BM	10,032	176	57-18	A	K9RRB/3	9,145	155	59-22	A	East Bay						
G4UZN	7,808	128	61-24	A	AB4GR	9,169	173	53-24	A	WA3G/M	8,256	172	48-22	A	W8GAZT	35,340	465	78-24	A		
G4XDD	2,088	58	36-24	A													N8KHS	2,738	74	37-10	B
Wales				Georgia												Los Angeles					
GWBANA	5,049	99	51-12	A	AA4TH	51,069	587	87-24	B	WB3AVN	7,072	136	52-4	B	KF6HI	13,702	221	82-20	A		
Hungary				Maine												WB8SMX					
HA5CP	12,144	184	66-24	B	WI1Y	23,944	328	73-15	B	N3GWW	6,302	137	46-16	A	N6WDT	204	17	12-5	A		
Switzerland				New Hampshire												Orange					
HE7CEY	2,640	60	44-24	A	NJ1H	9,990	185	54-18	A	WA3SCW	2,812	74	38-24	A	W8WFO	11,591	173	67-13	A		
Italy				Rhode Island												WA8FIT					
IK6CNA	8,265	145	57-24	B	WF1B	69,387	697	101-24	B	KN4IC	18,180	303	60-21	B	KC8BZO	6,820	124	55-8	A		
IO6KHP	5,304	104	51-12	A	N1SW	39,355	463	85-22	A	KN4CG	17,018	254	67-19	B	SA8BZO	3,081	79	39-5	A		
IK6CNA	3,404	92	37-24	B	WA1WIA	35,673	517	69-20	B	WB4LKP	1,832	51	32-6	B	Santa Clara Valley						
Norway				Vermont												NQ6C					
LA6BX	2,535	65	39-14	A	K1HKI	10,120	184	55-24	A	KB4FEN (+KA4WOC)	1,947	59	33-10	A	W6DBV	8,116	139	44-17	A		
LA5RBA	384	24	16-8	A	N1FKR	2,291	79	29-13	A					N6TTO							
Bulgaria				Western Massachusetts												N6RJB					
LZ1KXA	945	45	21-24	B	W1BYH	34,443	387	89-20	B					W6DFJ							
Finland				Rhode Island												San Diego					
OH2LU	16,724	226	74-16	B	WF1B	69,387	697	101-24	B					AA4M/6							
OH2BP	15,232	224	69-24	B	N1SW	39,355	463	85-22	A					N6GG							
Czechoslovakia				New Hampshire												Sacramento Valley					
OK2BXW	7,920	132	60-24	A	WA1WIA	35,673	517	69-20	B					N8GG							
OK1DIG	4,922	107	46-24	A													7				
Denmark				Vermont												Arizona					
OZ7XE	893	47	19-6	B	K1HKI	10,120	184	55-24	A					WD7I							
Netherlands				Rhode Island												K9JNB					
PA3DBS	20,090	287	70-24	A	N1FKR	2,291	79	29-13	A					WB8SVK							
Sweden				Western Massachusetts												Eastern Washington					
SM4RGD	7,436	143	52-24	B	W1BYH	34,443	387	89-20	B					KD7H							
SM6BUV	1,880	48	35-24	B	KA1BVM	19,776	309	64-16	B					KJ7RN							
SM4CMG	420	21	20-5	B	WJ1Y	14,559	211	68-24	A					WA7EGA (+K7s DSR,GS,YEM,NQ7M,							
Poland				Rhode Island												WB7RBJ)					
SP3BGD	8,784	144	61-24	A	WN1E	4,042	94	43-14	A					W7ZAC (+KQ5R,K7HBB,KA7CFU,							
SP2UUU	924	33	28-24	A	KC1SP	414	23	18-6	A					NA7R,WB7s DBS,RYO)							
SP3XR	336	28	12-24	B													22,680				
Iceland				New Hampshire												Idaho					
KE9YG/T	2,178	66	33-24	B	W1BYH	34,443	387	89-20	B					KA7T							
North America				Rhode Island												K7NHA					
Alaska				New York												KK7A					
AL7LB	34,788	446	78-24	B	WB2EAR	25,258	346	73-18	B					K9VW							
AL7BB	30,360	440	69-24	B	N2HOS	22,185	261	85-13	B					KI7Y							
AL7BK	21,240	360	59-16	A	WM2U	19,296	288	67-24	A					N7IXI							
AL7MK	3,663	99	37-24	A	N2EIK	15,540	259	60-24	A					Wyoming							
NL7HP (+NL7RT)	24,367	413	59-24	B	N2KAD	10,140	195	52-21	A					W7ZAC							
Virgin Islands				New Jersey												W7GVV					
KP2N	64,848	772	84-22	B	W2KHQ	4,600	92	50-12	A					N7QV (+KQ5R,K7HBB,KA7CFU,							
Puerto Rico				New York												NA7R,WB7s DBS,RYO)					
KP4FP	26,980	355	76-20	A	KG2H	3,822	91	42-8	A									22,680			
Anguilla				Tennessee												Michigan					
VP2EE	11,286	209	54-24	A	KC2FD	40,040	440	91-24	A					WB8MQ							
El Salvador				Virginia												N8FHE					
Y5/WDA4FN	7,350	150	49-24	A	KA4RRU	22,344	294	78-24	A					KB5V							
				Louisiana												WBPHG					
				New Jersey												WA8OUR					
				Arkansas												Ohio					
				Mississippi												WB9JF					
				Alabama												K8WAS					
				Georgia												WB8PX					
				South Carolina												W8LNL					
				North Carolina												WD9FTZ					
				Kentucky												N8LAZ					
				West Virginia												WB8STO					
				Maryland-DC												WB8WTS					
				Delaware												KF8ES					
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	
				New York																	
				New Jersey																	
				Pennsylvania																	