# Results, June VHF QSO Party <br> Microwaves Mean 

Macropoints!
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WØRGU, multiop, Minnesota.

Mountaintops and microwaves. Megahertz and memories. These are the things of which the ARRL June VHF QSO Party is made.

The 1979 contest, held June 9 and 10, was no exception in those respects. The June bash saw monster montaintop multiop stations, the "mini Field Day style" out-to-have-a-goodtime group efforts, the serious home-station competitors as well as the ops who fired up on fm to "help the contesters out," lasermicrowave contacts and a-m QSOs on 6 and 2 meters. Whatever you want in vhf-uhf operating, this contest probably had it.

The comparison boxes, score listings and soapbox comments contained in this report document what really went down during the contest much better than a couple of paragraphs that paraphrase those statistics

[^0]could. So, it'll suffice if we say that the total number of logs received was up to 520 (from 464 in 1978), there were several dandy singleoperator efforts as well as four multiop scores over the $200-\mathrm{k}$ point mark, and enough new division records were set for us to safely assume that the 1979 June VHF QSO Party was an unquestionable success.

We'll devote the rest of our editorial space to various comments on and discussions of problems that were encountered during the contest. As always, we welcome your comments, praise (hi!), ideas and criticisms. We look forward to hearing from you!

Mountaintopping as always is a popular pastime during the summer contests. A number of problems other than equipment failure occasionally come up.

During the June contest, at least one mountaintop was descended upon by two groups, both claiming to have permission from the authorities. The result? The group that arrived
last made the first one dismantle antennas and look for another site. Unsportsmanlike conduct? You be the judge.
The mountaintop kilowatts are always berated for poor signal quality or working people who weren't really there. Those that put together everything for a big effort once or twice a year have it even harder as those who think they own the band suddenly find it hard not to be king. The mountaintop stations do have to be careful to ensure their signal quality is as good as possible - after all, they will be the loudest thing around in most cases. The unusually strong signal will often tear apart the front end of nearby receivers. It's much easier to blame the mountaintopper than to blame your own equipment for what appear to be spurious signals up and down the band.

On the other hand, the once-a-year mountaintopper had better be familiar with his equipment in case there is a problem. Operating courtesy can solve many of the


Rick, KA1BFK, tries his hand at a little 2-meter action for the K1CZ multiop effort from the backwoods of Maine.


Although K4WO was operated as a singleoperator station by WA4GPM this time, this surplus fire-watch tower, which took nine months to disassemble and reconstruct at 'WO will see duty in the future as the antenna support for multioperator vhf contest groups.
hassles but nothing is more infuriating to lowlanders than the mountaintopper who says 'thanks for the signal report; it must be your receiver. CQ contest. . . ."
The mechanics of the contest presented some problems of their own for more than a few of the participants who submitted entries. We'll list a few of the "No-Nos" that can be seen


We think that Gloria, WA7YAX, is trying to tell us something about vhf contesting from Idaho. Note the open novel next to the SB-110A.


WD4MBK talkin' it up on 6 from W4ATC/4, VA.

Division Leaders

| Single Op | Division | Multiop |
| :---: | :---: | :---: |
| WB4NXY/2 | Atlantic | W3CCX/3 |
| N9SS | Central | WB8HUC/9 |
| KøVXM | Dakota | WØSD |
| WB4JGG | Delta | WB4LHD/5 |
| WA8TTS | Great Lakes | W8DJY |
| WB2WIK | Hudson | WA2SNA |
| WBGZXU | Midwest | WゆOHU |
| K1FO | New England | W1FC |
| WA7RTA/7 | Northwestern | N7NW/7 |
| K6KLY | Pacific | N6AMG |
| K4WO | Roanoke | W4BFB |
| WBøTTW | Rocky Mountain | NøKV |
| WD4IYS | Southeastern | W4VO |
| N6VI | Southwestern | W6XJ |
| WA5HNK | West Gulf | K5CM |
| VE1ASJ | Canadian | VE2KV |
| $\cdots$ | DX | XE2BC |

## Top Ten

| Single Operator |  | Multioperator |  |
| :--- | :--- | :--- | :--- |
| Call | Score | Call | Score |
| K1FO | 68,634 | W1FC | 236,856 |
| WB2WIK | 49,876 | W3CCX/3 | 215,750 |
| K4WO |  | W2SZ11 | 208,241 |
| (WA4GPM, op) | 49,595 | W3BBS | 200,954 |
| K1ZZ | 45,900 | WA2SNA | 112,908 |
| W1JR | 42,579 | W1XM | 91,485 |
| WA2FGK |  | WøOHU | 68,796 |
| (K2LNS, op) | 39,280 | N2SB/2 | 61,596 |
| WB4NXY/2 | 38,320 | K5CM | 60,610 |
| WA8TTS | 38,064 | WB2CAM | 57,889 |
| K1PXE | 37,920 |  |  |
| WA1TZV | 35,642 |  |  |



Numero uno in the multioperator category, W1FC, the Barnstormer ARC. The people (well most of 'em, anyway) and their antenna system.
here from the log-checker's seat.

1) Time. The rules say that operating time can total no more than 28 out of the allotted 35 hours. Yet some folks, especially the multis who run a station on each band, tend to be a little sloppy in their time-keeping. A word to the wise: Adding a "few minutes here and there'" past the allotted time to the 28 hours allowed for the contest period comes under the heading of "rubber clocking" and may present grounds for disqualification of the entry in question.
2) Exchanges. Complete exchanges (in this case, the name of the ARRL Section) must be acknowledged and recorded in your entry for each and every QSO claimed for contest credit. Enough on this.
3) Duplicate QSOs. A station may be worked only once per band, regardless of mode. Check your log during the contest period and especially after the contest for duplicate QSOs. Dupes found during our logchecking process are bad news. Large reductions in total score and possible disqualification can result from dupes left in your entry.

The bottom line after all this ranting is, read the contest rules. Follow those rules to the letter. And spend the time to check your entry for completeness and accuracy. It'll be worth the trouble in the long run.

This year seems to be the one in which the use of uhf bands has bloomed, especially for the multioperator stations. The $432-\mathrm{MHz}$ band was loaded with signals: K2RIW reported in

## All-Time Division Leaders

| Single Operator |  |  |  | Multioperator |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Call | Score | Year | Division | Call | Score | Year |
| WA2DPU | 43,351 | 78 | Atlantic | W3CCX/3 | 215,750 | 79 |
| K9HDE | 33,572 | 77 | Central | W9NWE | 48,195 | 78 |
| WADCSL | 21,808 | 77 | Dakota | WøOHU/¢ | 60,164 | 77 |
| WB4JGG | 17,458 | 79 | Delta | W4BFB/4 | 74,404 | 78 |
| WA8TTS | 38,064 | 79 | Great Lakes | K81II | 90,522 | 78 |
| WB2WIK | 49,876 | 79 | Hudson | WA2SNA | 112,908 | 79 |
| WA@MRH | 20,435 | 77 | Midwest | WøOHU | 68,796 | 79 |
| K1MNS | 75,537 | 78 | New England | W1FC | 236,856 | 79 |
| K7GWE | 20,515 | 74 | Northwestern | W7LYE/7 | 35,776 | 77 |
| N6NB | 69,184 | 77 | Pacific | WA6JUD/6 | 81,213 | 76 |
| K4WO | 49,757 | 79 | Roanoke | W4BFB | 57,013 | 79 |
| WAףTVZ | 22,935 | 77 | Rocky Mountain | WB5AXC/5 | 23,424 | 76 |
| W4GJO | 32,292 | 62 | Southeastern | W4VO | 28,450 | 78 |
| K6YNB | 60,342 | 76 | Southwestern | W6AMT | 105,080 | 76 |
| WA5HNK | 34,151 | 77 | West Gulf | K5CM | 60,610 | 79 |
| VE2DFO | 24,012 | 78 | Canadian | VE3ONT | 82,188 | 74 |
| W2BN/C6A | 18,700 | 77 | DX | XE2BC | 23,961 | 78 |

Area Leaders
Multioperator

|  | W1FC | W4BFB | W6XJ | N7NW | WOOHU |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 50 | 453/45 | 272/45 | 178/40 | 150/27 | 400/57 |
| 144 | 794/25 | 435/15 | 219/12 | 145/8 | 274/16 |
| 220 | 59/17 | 31/4 | $57 / 5$ | $42 / 2$ | 10/7 |
| 432 | 102/23 | 1717 | 39/7 | 23/3 | 31/11 |
| 1296 | 19/9 | - | 6/6 | $4 / 2$ | - |
| 2.3 | 715 |  |  |  |  |
| 3.4 | $5 / 5$ |  |  |  |  |
| 5.7 | 5/5 |  |  |  |  |
| 10 | $9 / 5$ |  |  |  |  |
| Single Operator |  |  |  |  |  |
|  | K1FO | K4WO | WA5HNK | WA7RTA | N9SS |
| 50 | 132/27 | 161/40 | 338/49 | 74/26 | 273/53 |
| 144 | 321/22 | 362/20 | 65/9 | 53/7 | 125/14 |
| 220 | 38/15 | - | 1/1 | 712 | 1/1 |
| 432 | 85/21 | 69/15 | $27 / 5$ | $8 / 2$ | $17 / 8$ |
| 1296 | 13/8 | - | 2/1 |  | - |

The emphasis is on different bands in different parts of the country. Compare your results to those listed above (QSOs/multipliers) to see how you can become a giant killer.
with 140 QSOs and 23 sections for NLI, while K8WW found 94 QSOs and 22 sections from OH .
Moving up one notch to 1296 were 45 stations, 22 of them multiops. Activity was concentrated in the East/Northeast but 15 stations west of the Mississippi completed at least one QSO. Even in the sparsely populated (microwave-style) West, K6ZMW squeezed out 9 QSOs in six sections, with a 220 -mile QSO to N6CA/7 the prize catch. ${ }^{\top}$ The frequencies above 1296 were almost the exclusive territory of the multioperator groups. The distinction between the biggest multiop groups was almost completely due to the microwave contacts and multipliers. Nine groups were successful on 10 GHz . Credit for the longest QSOs goes to WIFC - WAIKPS ( 70 mi ), W8GK WA4PGI (56 mi), W3BBS - K3RYL/2 (35 mi ) and W6OAL - K6MEP ( 22 mi ).

With the emphasis shifting toward the higher frequencies, the top single-operator stations may have to get into the act in the near future. What limits are there for microwave contacts? Many seem to think that line-of-sight conditions are necessary, but that isn't so. Work by G3RPE, reported in Break-In, April 1979 (New Zealand), indicates the following:
"The basic conditions for scatter communications at amateur level in the centimeter
band are: 2 kHz of passband in the receiver, and $180-\mathrm{cm}$ paraboloid reflectors at both ends. Then the standard combinations become:

|  | Power |  |  |
| :--- | :--- | :--- | :--- |
| Band | Output | ERP | Distance |
| 1.3 GHz | 40 W | 16 kW | $600 \mathrm{~km}(360 \mathrm{mi})$ |
| 2.3 GHz | 30 W | 30 kW | $500 \mathrm{~km}(300 \mathrm{mi})$ |
| 5.7 GHz | 2 W | 10 kW | $400 \mathrm{~km}(240 \mathrm{mi})$ |
| 10 GHz | 1 W | 16 kW | $400 \mathrm{~km}(240 \mathrm{mi})$ |

The limit here is transmitter stability; the higher the frequency, the more stability becomes important. Aiming two-dish antennas is difficult, but add to that a signal that is changing in frequency, and the problem can be insurmountable.

Because some groups have microwave capabilities and other do not, some friction has developed. What is the ethical way to make microwave contacts during a contest? A multiop station might wait years for another $5.7-\mathrm{GHz}$ station to show up nearby. So why not prearrange some contacts? Build transceivers for 2.3 through 10 GHz and have a friend visit an adjacent mountaintop. The rules do limit the use of a transmitter to one call sign


N4VC, AL, teamed up with WD4DGF to join the ranks of multioperator stations in Tennessee in the June VHF QSO Party past.


The W8GK/8 ops ready the $10-\mathrm{GHz}$ gear for their 56 -mile QSO with WA4PGI. This QSO was the happy ending to a tale of woe that included losing the 432 equipment to lightning.
only so five people using the same equipment can't be worked for contest credit.

Is it ethical to use one antenna for several stations while switching transmitters? It is within the present rules but maybe the rule needs to be strengthened to, say once a station (tx, rx, antenna) is used to contact one or more other stations during the contest it cannot be used under another call sign.

As always, the areas with the smaller sections (East-Northeast) will have the scoring advantage. With the acceptance of the latitudelongitude grid system in the uhf contest, maybe the vhf contests should undergo the same metamorphosis.

One of the ultimate goals is to encourage the use of the microwave bands. Members of the multioperator station should be allowed to make these microwave DXpeditions. Once enough microwave equipment is in use, multiop groups may even begin to talk to each other, heaven forbid! One of the problems in log checking is that we seldom receive logs from these satellite groups to confirm both ends of the QSO.

The Barnstormer ARC (W1FC/1) maximized the microwaves in the June contest, but not without a lot of sweat and planning. Their $2.3-, 3.4-$ and $5.7-\mathrm{GHz}$ stations consisted of $1150-\mathrm{MHz}, 500-\mathrm{mW}$ crystal-controlled sources

## Multiplier Leaders

| 50 MHz |  |  |  | 144 MHz |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Call | Mult | Call | Multipliers | Call | Multipliers | Call | Multipliers |  |  |  |  |
| WA1LUJ＊ | 34 | N6AMG＊ | 20 | K1FO | 22 | W7LUX | 5 | N6AMG＊ | 5 | W8DJY＊ | 2 |
| W．1XM＊ | 33 | W60AL＊ | 21 | K1Z2 | 22 | WA7JTM＊ | 5 | W6CN | 5 | W8VP＊ | 7 |
| K1TOL | 41 | K6MEP＊ | 18 | K1PXE | 21 | N7AKB＊ | 6 | W6NXB | 5 | K3LNZ／8＊ | 7 |
| W1FC＊ | 45 | K6KLY | 17 | WB1ALW | 22 | WA7RTA／7 | 7 | K6BPC＊ | 5 |  |  |
| WA1MAG＊ | 37 | W6XJ＊ | 40 | W1FC＊ | 25 | K7KOT | 5 | WB6ESQ＊ | 5 | K9XY | 3 |
| W2SZ／1＊ | 44 | WB6LBR | 18 | W2SZ／1＊ | 23 | N7NW／7＊ | 8 | W6OAL＊ | 6 |  |  |
| WA1RWU＊ | 39 | W6YKM／6 | 26 | WA1RWU＊ | 22 |  |  | K6MEP＊ | 6 | WØOHU | 7 |
|  |  |  |  |  |  | WA8TTS | 19 | WB6FTW／6 | 5 | KøTLM＊ | 2 |
| K2CBA＊ | 32 | WA7JTM＊ | 22 | W2YX | 22 | K8AT | 21 | W6XJ＊ | 5 | WめSD＊ | 3 |
| WB2WIK | 37 | WA7FSI | 16 | WB2WIK | 24 | WB8PAT＊ | 17 | W6YKM／6＊ | 8 |  |  |
| WA2FGK／2 | 33 | K7NV | 28 | WB2CUT | 22 | W8DJY＊ | 16 |  |  | VE2KV＊ | 9 |
| WA2SNA＊ | 32 | N7AKB＊ | 35 | WA2SNA＊ | 23 | W8VP＊ | 21 | WA7RTAI7 | 2 | VE3BQN | 8 |
| WB4NXY／2 | 36 | WA7RTA／7 | 26 | K2GE＊ | 23 | WB2DNE／8 | 16 | K7HSA | 2 | VETXF | 2 |
| W2HRW | 33 | N7DB17＊ | 30 | WB2CAM＊ | 22 | K3LNZ／8＊ | 20 | N7DB／7＊ | 2 |  |  |
| N2SB／2＊ | 38 | N7NW／7＊ | 27 | K2NE＊ | 22 | W8GK／8＊ | 21 | K7AUO＊ | 2 | XE2BC＊ | 5 |
| K2NE＊ | 37 | WA7KYM | 30 | K2LWR | 25 | WB2DIN／8＊ | 20 | WB7UUP | 2 |  |  |
| K2BWR＊ | 32 | WB7UJY | 16 | W2AV | 24 |  |  | N7NW／7＊ | 2 |  |  |
| K2OEQ＊ | 32 |  |  |  |  | N9SS | 14 |  |  |  |  |
| N2JY＊ | 32 | WB8BGY | 38 | W3CCX／3＊ | 25 | W9IP | 18 |  |  |  |  |
| WA2IKO＊ | 32 | WA8TTS | 41 | W3BBS＊＊ | 24 | GW3NJY／ |  | 432 MHz |  |  |  |
|  |  | K8AT | 33 | WB3CZC＊ | 24 | W9 | 14 | Call | Multipliers | Call | Multipliers |
| W3CCX／3＊ | 45 | W8DJY＊ | 37 | WA3CPH／3＊ | ＊24 | WB9NTL | 16 |  | Mulipliers |  | Multipliers |
| W3BBS＊ | 45 | W8VP＊ | 40 |  |  | W3EP／9 | 19 | K1FO | 21 | W6YKM／6＊ | 6 |
| WB3CZG＊ | 36 | WB2DNE／8 | 39 | WA4EWA | 17 | WA9MCJ | 14 | K1ZZ | 16 |  |  |
| W3ILG＊ | 35 | K3LNZ／8＊ | 38 | AK4T | 17 | WB8HUC／9＊ | 13 | K1PXE | 20 | W7LUX | 2 |
| W3XO | 35 | W8GK／8＊ | 35 | K4WO | 20 | W9LTU＊ | 12 | WB1ALW | 16 | WA7RTA | 2 |
| WB3LSY | 37 |  |  | WA4SBC | 17 |  |  | W1JR | 19 | K7HSA | 2 |
| WB3CBB | 32 | W9SS | 53 | W3IY／4 | 18 | WBøZXU | 13 | W1XM＊ | 19 | W7TYR | 2 |
| W2CNS／3＊ | 40 | W91P | 46 | WA4HHP | 20 | WøOHU＊ | 16 | WA1TZV＊ | 16 | W7JXU | 2 |
| W3GNR／3＊ | 37 | GW3NJYI |  | WA4KXV | 18 | WøRWH | 14 | W1FC＊ | 23 | N7DB17＊ | 2 |
| WA3CPH／3＊ | 36 | W9 | 31 | K4QIF | 22 | K4ZLE／ | 12 | W2SZ／1＊ | 23 | K7AUO＊ | 2 |
|  |  | K9RO | 47 | WD4GXN | 19 | KøTLM＊ | 11 |  |  | K7KOT | 3 |
| WA4CQG | 35 | W9ZX＊ | 37 |  |  | AI站＊ | 12 | K2CBA＊ | 21 | W7YOZ | 2 |
| W4VO＊ | 39 | W9NFE | 28 | WB4LHD／5 | 11 | WøSD＊ | 12 | K2RIW | 23 | N7WW17＊ | 3 |
| K4WO | 40 | WA9PKL | 27 | N5DL＊ | 15 |  |  | W2VC | 20 |  |  |
| W4WHK | 35 | WB8HUC／9 | ＊35 | WA5FDF＊ | 10 | VE1ASJ | 21 | WA2SNA＊ | 20 | WA8TTS | 18 |
| WA4KKY＊ | 39. | WA9KGQ | 27 | WB5LUA | 12 | VE1UT | 16 | K2GE＊ | 18 | K8AT | 12 |
| W4BFB＊ | 45 | WB9OPD | 39 | K5CM＊ | 16 | VE2KV＊ | 15 | K2BWR＊ | 17 | WB8PAT | 10 |
| K1FJM／4 | 44 | WA9LZM | 28 | K5LZO | 14 | VE3FN | 21 |  |  | K8WW | 22 |
| WD4MGB | 40 |  |  |  |  | VE3AEA／3＊ | 17 | K3SXA | 16 | K8DIO | 14 |
| WB4BND | 36 | WBDTTW | 27 | N6AMG＊ | 11 |  |  | W3CCX／3＊ | 22 | W8DJY＊ | 12 |
| WD4LWL＊ | 37 | NゆKV＊ | 47 | K6BPC＊ | 10 |  |  | W3BBS＊ | 22 | W8EAC | 13 |
| WB4JGG | 35 | WB＠ZXU | 42 | WB6ESQ＊ | 9 | XE2BC＊ | 10 | WB3CZG＊ | 15 | K3LNZ18＊ | 11 |
| N4CD | 41 | WBØTEM | 38 | K6MEP＊ | 11 |  |  | W3IP | 18 |  |  |
|  |  | WøOHU＊ | 57 | W6XN | 9 |  |  |  |  | N9SS | 8 |
| WB4LHD／5＊ | 48 | NめLL | 46 | W6XJ＊ | 12 |  |  | WA4IPI | 10 | GW3NJYI |  |
| N5DL＊ | 44 | WФXG | 31 | W6YKM／6＊ | 9 |  |  | WD4EKA／4＊ | 10 | W9 | 8 |
| WA5FDF＊ | 41 | KøTLM＊ | 47 |  |  |  |  | K4WO | 15 | K9RO | 5 |
| WA5UUD | 42 | WADCSL | 31 | 220 MHz |  |  |  | N4CD | 10 | K9MBX | 7 |
| WA5YOU＊ | 37 | KøVXM | 43 | Call | Multipliers | Call | Multipliers | WA4SBC | 16 | WB9QBU | 6 |
| WB5LUA | 37 | WBØYQS | 32 | Call | Multipliers |  | Multipliers | W3IY／4 | 11 | K9SLQ | 6 |
| WD5FXM | 43 | WøSD＊ | 53 | K1FO | 15 | W3CCX／3＊ | 18 | WD4GXN | 15 | WA9JFM | 9 |
| WB5KTC | 37 |  |  | K1ZZ | 11 | W3BBS＊ | 21 | K4QIF | 17 |  |  |
| WB5FCR | 39 | VE1ASJ | 34 | K1PXE | 16 | W2CNS／3＊ | 11 |  |  | WBøZXU | 6 |
| K5CM＊ | 66 | VE2KV＊＊ | 29 | W1JR | 11 | W3GNR／3＊ | 10 | WB4LHD／5 | 6 | WøOHU＊ | 11 |
| WA5HNK | 49 | VE3CKU | 24 | W1XM＊ | 13 |  |  | N5DL＊ | 5 | WøRT＊ | 4 |
| K5LZO | 46 | VE3AEA／3＊ | 18 | W1FC＊ | $17$ | W4VO* | 3 | WA5FDF＊ | 6 | KøCJ | 4 |
|  |  |  |  | W2SZ／1＊ | 19 | WA4IPI | 3 | WB5LUA | 6 | KøTLM＊ | 5 |
|  |  | XE2BC＊ | 17 |  |  | W4CQ＊ | 3 | K5CM＊ | 9 | KøALL＊ | 4 |
|  |  | XE2IL＊ | 23 |  | 12 | N4SM＊ | 4 | WA5HNK | 5 | KøVXM | 5 |
|  |  | VP2VDL＊ | 17 | WA2FGK／2 | 11 | W4PAR／4＊ | 3 |  |  | WøSD＊ | 6 |
|  |  |  |  | WA2SNA＊ | 15 | W4GG／4＊ | 3 | N6AMG＊ | 5 |  |  |
|  |  |  |  | W2EIF | 11 | W4BFB＊ | 4 | N6VI | 5 | VE1UT | 11 |
|  |  |  |  | WB2CAM＊ | 11 | K4LHB | 9 | K6BPC＊ | 6 | VE1SJ | 8 |
|  |  |  | ， | K2BWR＊ | 13 | K6LEW／4 | 5 | WB6ESQ＊ | 6 | VE2BBK | 14 |
|  |  |  |  | K2YCO | 12 | W4ATC＊ | 5 | W60AL＊ | 6 | VE2KV＊ | 12 |
|  |  |  |  |  |  | WA4WZQ＊ | 3 | W6XN | 5 | VE3BQN | 11 |
|  |  |  |  |  |  | WD4FVP＊ | 3 | W6XJ＊ | 7 | VE3FN | 10 |
|  |  |  |  |  |  |  |  |  |  | VE6SW | 1 |
| ＊Indicates m | ultiop | station |  |  |  | K5CM＊ | 2 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  | XE2BC＊ | 4 |

with PLL．The output was multiplied by two， three and five using varactor multipliers（300 mW at $2.3 \mathrm{GHz}, 200 \mathrm{~mW}$ at 3.4 GHz and 100 mW at 5.7 GHz ）and fed to the antenna through a stripline $20-\mathrm{dB}$ coupler and direc－ tional ferrite circulator．The coupler samples a small amount of transmitter power which acts as the local oscillator．This is applied to one in－ put of a ring mixer．The main transmitter
source is offset by 4 MHz from the mobile units．After multiplication this becomes 8 MHz at $2.3,12 \mathrm{MHz}$ at 3.4 and 20 MHz at 5.7 GHz ． Since the transmitter source is the receiver local oscillator，this frequency difference is the i－f frequency．The $10-\mathrm{GHz}$ setup consisted of Gunnplexer transceivers separated in frequency used as the i－f strip．Thanks to K1KA for the W1FC microwave station information．

## Soapbox

When I got to Norfolk，VA，with my vhf gear for departure via military transport，I found that I was 102 pounds over my baggage allowance for the flight to KG4－land．Worc out one knee of my suit pants with my pleading．I must be convincing since I was able to get on the C－141．Left the entire station that was donated by SMIRK there and KG4AN is now on 6 meters for good ．．．conditions were not the best ． had 360 QSOs on 6 before the contest and only 89
during the contest . . (W2BN). 6-meter conditions were good to the south but poor to the West Coast (VE2KV). The miniature livestock (bugs) that kept us company did not in the least detract from our enjoy ment of our tremendous station location (3000 feet high atop a mountain in southwestern PA) . . . Mother Nature put on a fine water show, creating a lake in the middle of our camp on the first day and she chased us off the mountain on Sunday evening with another water show and a heavenly electrical display, just as the 6 -meter band had opened for the first time that day ... All told, we worked 33 states and Canada, no too bad for our first contest - we shall return. 73 de "The Bug Mountain Boys" (WA3CPH/3). A typical springtime coastal tropo opening created excellent band conditions from VE1-land to North Carolina on Saturday night, Sunday morning and Sunday evening

I would like to note in particular that activity was spread out nicely on 2 meters as a result of the 144.2 calling frequency (KIPXE). A meteor sked with WIFC on 50 MHz produced a QSO in just a few minutes. This mode should be used more often, particularly during the hours when activity is normally low .. . 220 MHz has real potential, but we need more activity. The real benefits of this band will be realized when the activity increases . . . the 2-meter EME array worked well on terrestrial paths and made up for the otherwise poor conditions on this band (WøVB/WØRGU). Wow!! What a tropo opening on 1296 on Sunday night. I can't wait until I get more than 20 microwatts to that dish ... Even with such a poor setup, I was able to work four stations in three sections, including W2SZ/1 150 miles away. That comes out to about $7,500,000$ miles per watt!!! (WAITZV). We operated from a high point here in flat South Jersey. Our ground elevation was 180 feet above sea level, which is about as high as you can get


Feast your eyes on the rolling communications center of K6LEW/4, VA. What you sees on the out side ain't necessarily what you sees on the inside.
in SNJ . . . The duct that ran up the coast on Sunday night was fantastic. We didn't even know if the 1.296 gear worked until this test, and wow, does it ever. That band had to be the most fun. Our antenna relay failed, so antenna switching on 1296 was done by N2SB and WB2NPE while WB2RVX manned the key. We looked like three drunk clones of Marconi, listening for New England on 1296! We wish all our competition gud luck in September and we will be in there going strong (hopefully). Projects to improve our sigs on 432 and. 6 meters are now underway. This section
(SNJ) is becoming very competitive and we love it. K2NE, Look Out!! (N2SB/WB2NPE/WB2RVX and N3RG).

## Feedback

In reference to the 1978 ARRL June VHF QSO Party (sec page 89 of November 1978 QST), W2BN/KL7, fisted as a single-operator station, should have been listed as the multioperator station certificatc winner for Alaska.

Cores are listed in order, single-operator stations first within each section. From left to right: call, score, number of QSOs, number of multipliers, bands operated (A-50 MHz, B-144 MHz, C-220 MHz, D-430 MHz, E-1215 MHz, F-2.3 GHz; G-3.4 GHz, H-5.7 GHz, I-10 GHz).



K3RYL does 1296, W3BBS-style from eastern Pennsylvania.


The station equipment and antennas of WB2WIK, used to establish the number-two single-op score in this June QSO Party.

N4SM + KA 4 Z ZN,KB4BT


West Indies
KG4BN(W2 BN,KG4S EP HC; ;oprs)
5
$\begin{array}{ll}\text { Arkansas } & \\ \text { W5SEP } & \text { 784- 28-28-A } \\ \text { WA2RVI/5 } & 6844.37-18 . A B D \\ \text { WB5NBC } & \text { 480. 48-10-B }\end{array}$


WD5FXX 336-28-12-A

 KA9DTF, NQAC1, WDOEAG) $11,466-17663-63-A B D$




## Northern Texa

## 


K5CM(+K5SW,N5s CG KW)
Southern Texas
WA5HNK 30,225-433-65-ABCDE
$\begin{array}{lc}\text { K5LZO } & 29,5112-479-62-A B C D \\ \text { K5EI } & 39937-127-31-A B \\ \text { WA5IVX } & 3724-133-28-A \\ \text { N5AF } & 200-25-8-A\end{array}$

## 6

East Bay
N6AMG(+N6!G,WA6VEF

| Los Angeles |  |
| :---: | :---: |
| N6VI | 3196-163-17-ABC |
| W6CN | 1044-38-9 |
|  | 616-17. |
| W6NXB | 340. |
| W86BDQ | 255. |
| W6PFE | 63. 7. 7-BC |
| K6BPC(WA6HXD,WB6YVP, |  |
|  |  |



WB6LBR 1300-50-26-AB

Arizona


| WATFSIT7 WATYAX | $\begin{array}{r} 1044-58-18-A B \\ 260-20-13-A B \end{array}$ |
| :---: | :---: |
| Montana |  |
| W7KNT WA7PDC N7ALX(+ | $\begin{gathered} 490-35-14-A \\ 50-10-5-A B \\ 7 K H O) \\ 34-34-1-B \end{gathered}$ |
| Nevada |  |
| K7NV N7AKB ${ }^{+}$ | 2044- $73-28-A$ 3854- 385-4 |


Utah
WA7ADK(+WB7QVZ) $96-24$.


| Wyoming |  |
| :--- | ---: |
| WA7KYM | 1024. $32-32-A B$ |
| WB7UJY | $832-52-16-A$ |
| Alaska |  |
| WL.7ACY | 52-26-2-AB |

## 8 <br> $\begin{array}{lr}\text { WB8BGY } & 13,720-273-49-A B D \\ \text { AF8Z } & 5775-157-35-A B D \\ \text { WD8DSV } & 2574-99-26-A B\end{array}$  WABULG(+KABCQM,WABS MFL MGO QBGVXE,WB8S PGK WXS, <br> Oni <br> WA8TTS 38,064-445-78-ABD <br> $\begin{array}{ll}\text { WABTTS } & 38,064-445-78-A B \\ \text { K8AT } & 26,400-372-66-A B \\ \text { WB8PAT } & 11,300-502\end{array}$ <br> KB WA <br> W8 <br> W8DJY (+W8ULC. WABS WQC WXT, WB8S EEX NFJ,WD8s DZN KVR) <br> WB8s EEX NFJ,WD8SDZN KVR) <br>  <br> CQE ERBONYARAHOWB8S WD8SAHVAKI YK TII YCZ, <br> WD8S AHV AKI LVJ QJB,oprs)

WD8RZG(+WD8s 1QJ RUW) WD8QMP(+KA8EHA
$161-41-4-B$

Wes
9

$\begin{array}{ll}\text { Indiana } & \\ \text { WB9NTL } & 7667-183-41-A B C D \\ \text { W9NFE } & 6588-183-36-A B C D\end{array}$


Wisconsin
WA9KGQ
K9XY
WA9LZM
WA9JF
$\begin{array}{ll}\text { WA9JFM } & 2790-93-30-A B C D \\ \text { WA9CM } & 2214\end{array}$
WA9CU
NB9RD
WB9PDK

## 0

## $\begin{array}{ll}\text { WB9TTW } & \text { 7744-242-32-AB } \\ \text { WOK.IV } & 3625-119-29-A B C D\end{array}$

 $\begin{array}{ll}\text { WBOWEC } & 3025-113-29-A B C D \\ \text { WBGVGC } & 2240-112-25 B C D\end{array}$

KAOCHANGs BZ DV,WQs MBZ
YNE,WD GNM) $17435-308-55-A B C D$
WB9IKJ $1+$ WgOZL,WB9s NOXOPV





## Nebraska



## North Dakota

WAgCSL 5735-185-31-A KOALL (+AJPK WAOS ZOK ZNJ,

South Dakota
KgVXM $15,232-262-56-A B D$
WBqYQS $9020-201-44-A B D$
WBgULX/9 $128-15-88-A B D$
WQSD
WOSD + AAOF,KOS AGHF QC,
KBGES,NQAITWAGUFS,
WDQHOJ,WA2VEV $33,670-433-74-A B C D$

VE
$\begin{array}{lr} & \\ \text { Maritime } & \text { Newfoundland } \\ \text { VE1ASJ } & 17,380-316-55-A B \\ \text { VEIUT } & 5967-185-27-B D \\ \text { VE1BNN } & 1975-79-25-A B \\ \text { VE1SJ } & 756-33-17-80 \\ \text { VEIBCZ } & 184: 46-4-A B\end{array}$

VE2BBK 4329-79-39-ABD NW YU,VE3BTZZ) $26,664-365-66-A B C D E$ Ontario

|  | $\begin{aligned} & \text { E3CRUOOR) } \\ & 12,348-223-49-A B C \end{aligned}$ |
| :---: | :---: |
| VE3FN | 4092-111-31-BD |
| VE3CKU | 3432-143-24-A |
| VE3GCE | 2016-126-8-B |
| VE3CRA | 264- 22-12-A |
| VE3HAB | 90-18-5-B |
| VE3AEA/3 | (VE3s FDP |
| prs | 9143-211-41-AB |
| E(+ | E6 |

Albert
VE6SW 78. 12. 6-ABD

## British Columbia

VE7XF 792-63-12-ABC
VE7ASM/7(VE7SALJAOUAS
BBB BN,oprs) $724-88-8 . A B$
DX

## Mexico


British Virgin Istands
VP2VDL(WB2RLKK,A14R,oprs)
1003. $59.17-\mathrm{A}$
Check Logs
W1WHL,WA1MUG,K4EJQ,K7ICW,
WA2AFE,W2CC,KP6BC/2,WA6ZKC


[^0]:    *Communications Asst., ARRL
    **Asst. Communications Manager, ARRL

