

VU2ZAP and VHF in India

Rajendra Kumar, VU2ZAP, has stirred up considerable excitement ever since he made his first 6-meter contacts last November 7 from his home in Bangalore, India. By early May, Raj logged over 700 stations in 67 countries and all continents, save North America. At least five other Indians have also been contributing to the first ever sustained 6 meter activity from the second most populous country in the world.

Raj Kumar, VU2ZAP

Raj lives in the highlands of south-central India and makes his living growing Arabicas coffee, the fifth generation of his family to do so. He is also a trained electronic engineer who develops VHF-related products, including telephones, pagers and modems. Raj was first intrigued by radio as a teenager in the late 1960s and earned his first license in 1984. He was active in VHF from the start. Raj was one of the founders of the Repeater Society of Bangalore, which put the first Indian VHF repeaters on the air in 1986. Now two public 2-meter repeaters operate in Bangalore.

During the 1980s, Raj was also involved building equipment, designing kits



Raj Kumar, VU2ZAP, at his station in Bangalore, India

for newcomers and helping many get their licenses. He contested using the calls VU2Z and AT0Z. VU2ZAP could usually be found on the 17, 15, 12 and 10 meter bands, but he had always longed to operate on 6 meters. Raj got that chance this past fall when Indians were allowed on two spot frequencies on a trial basis.

For more background about Raj Kumar, check his interesting Web site at members.nbci.com/ggrk/Ham/index.html, which also contains photographs of his station, home and unique gardens.

Six Meters

Indians received temporary permission to operate on 50.350 and 50.550 MHz this past fall using FM only, but SSB and CW were also allowed not long afterward. Six meters is allocated to the land-mobile service in India, as it is in some other countries in ITU Regions 1 (Europe and Africa) and 3 (Asia and the Pacific), but it is unclear whether commercial users are actually occupying the band. The initial special authorization lasted for six months, but in January, the permission was extended until August 1. Raj and other Indian operators have petitioned through their national organization for permanent access to a segment closer to 50.100 MHz.

Other 6-meter operators active from Bangalore (MK82) this past season in-

cluded VU2MKP, who runs an IC-746 to a six-element Yagi; VU2RCR, with an FT-847 and a four-element Yagi; and VU2BGS, who uses a transverter with 25 W and a long wire. VU2RM runs QRP to a small Yagi from Kakinada (NK16) on the eastern coast, and VU2GTE operates 6 meters from Bombay (MK69) on the western coast.

Raj has had incredible success on the band with his FT-847 and a four-element Yagi, as suggested by the 67 countries he worked in just six months. On many days during the early part of this year, Raj worked HZ (Saudi Arabia), EY (Tajikistan), D6 (Comoros), VR2 (Hong Kong), JA (Japan) and other stations with huge S9+ signals. Raj worked Europeans as westward as Spain, New Zealand via long path and across the Pacific to KH6/K6MIO in Hawaii. He has worked PYOFF, as well as other Brazilians and Argentines, but Raj has not yet heard any signals from South Africa or from North America.

This Month

July 14-15	CQ Worldwide VHF Contest, 1800-2100
July 21-22	Six Club Sprint, 2300-0400
July 26-29	Central States VHF Society Conference (Ft Worth, TX)
July 22	Excellent EME conditions, but new Moon



Here is a cartoon drawn by VU2ZAP's talented cartoonist daughter Pia (all of 12 years old) depicting QRM from illegal Chinese cordless phones.

India to Easter Island

VU2ZAP also made some most unusual 6-meter contacts with CE0Y/W7XU on Easter Island between April 2 and 7. Bangalore is just north of the Equator, while Easter Island lies just south of the Equator, almost exactly halfway around the globe. Thus, the two stations were nearly at their antipodes, approximately 18,300 km apart and in ideal positions to take advantage of spring F₂ propagation. No matter which direction VU2ZAP and CE0Y/W7XU pointed their antennas, the great-circle distance between the two varied by less than 3500 km.

That made it uncertain what would be the antenna headings for the strongest signals. Paths more-or-less parallel to the equator might have seemed the most likely, but that is not exactly what Raj and Arliss discovered. VU2ZAP usually made initial contact with CE0Y/W7XU around 1530 or 1600 with a beam heading somewhat west of north, but the peak heading gradually moved farther west as the evening approached local midnight. CE0Y/W7XU started with his antennas east of north and found he had to move progressively eastward during the same period. The path typically stayed open until 2000, at least.

Raj and Arliss were surprised by the initial northerly headings, which seemed to put their great-circle path over the Polar Regions. They were at a loss to explain the apparent drifting of optimal path toward lower latitudes as the opening progressed. Signals were often S9, but were sometimes much stronger. On April 3, CE0Y/W7XU worked VU2BGS, who was running just 1 W and a dipole about 12 feet high. The next day around 1715, VU2ZAP reduced his power to 125 mW and Arliss dropped down to less than 1 W, and they could still make contact. Signals usually peaked for VU2ZAP at about 315° and CE0Y/W7XU at 70°. These are closer to the expected headings under ordinary circumstances.

It is difficult to explain these contacts. If the initial contacts were made via great-circle paths, they must have crossed the auroral zone—the least likely for ordinary F-layer propagation near the MUF. It is possible that these contacts with northerly headings were not along great-circle routes at all, but over oddly skewed paths, similar to those observed in other parts of the world during geomagnetic disturbances. Several impressive geomagnetic storms did occur in early April, when the sun erupted in its most intense period of activity for this cycle. Whatever the explanation, VU2ZAP and CE0Y/W7XU

certainly made some most-curious contacts.

Other VHF-UHF Activity in India

Indians also have allocations at 144 to 146 MHz and 434 to 439 MHz. Hundreds of 2-meter FM operators and many repeaters are scattered across India, but SSB/CW activity is rare. As in many other places in Asia, FM cordless phones operating illegally in the 2-meter band make amateur weak-signal work difficult. Even so, VU2RM has worked Sri Lanka (4S7) and Thailand (HS0) on 2 meters. From the western coast, Indians have worked into the Middle East. VU2MKP, VU2IR, VU2TS and VU2DVP, among others, operate through AO-10.

There is plenty of potential VHF and higher activity in India, despite the limited allocations and other problems. Satellite and EME are obvious possibilities. Indians are not well acquainted with sporadic E and there is little documentation on the extent of E-skip from India. This summer may provide Raj and other Indian 6-meter operators with some different sort of excitement. Two-meter tropospheric ducting across the Indian Ocean should be excellent for well-placed stations along the coasts. Perhaps only low VHF and higher activity in adjacent regions, including the western coast of Africa, puts a damper on these possibilities.

ON THE BANDS

Solar activity remained at unusually high levels during the first half of April, resulting in significant auroral activity on several days and enhanced 50-MHz F-layer activity. A few brief sporadic-E openings and localized tropospheric enhancement added to the interesting mix of propagation. Dates and times are UTC.

Six Meter DX

Typical spring equinox conditions continued throughout April, no doubt enhanced by some of the highest levels of solar activity so far observed for Cycle 23. Examples of long-path and skewed-path propagation seemed more common. In addition, several Pacific, Central and South American expeditions enlivened activity worldwide. Some portions of the summaries are based on otherwise unacknowledged reports from G4UPS, the UKSMG Announcement Page and the Web-based DX Summit.

DX in the Americas

US stations across much of the country, with the exception of the upper Midwest and Pacific Northwest, continued to work PY, CX, LU, ZP and CE stations on most days during the first half of the month. VP8CMT (Falkland Islands) appeared on several days, providing a new country for many in the W1 through W5 call areas.

The opening of April 11-12, which coincided with a great geomagnetic storm, was especially noteworthy. The band filled from

50.090 to 50.180 with many PY and LU stations, who worked most areas of the US east of the Rocky Mountains. Gary Mitchelson, N3PJU (FM19), caught ZD7K on St Helena around 2130 while trying to break the pileup on VP8CMT. Gary was the first and perhaps only US station ZD7K worked in April.

Signals were extremely strong at times. On the morning of April 12, for example, Paul Besimer, KC8LGL (EM89) worked CE3SAD and CE3EE with just 2.5 W and a dipole. Four days later, Bob Aldridge, KF4DVG (EM60) snagged CE3SAD with 10 W and a 2-meter $\frac{5}{8}$ - λ whip mounted on his car. Other Central and South American prefixes reported in the US included HC, PJ2, YS, YV, TG and TI.

Europe, Africa and the Middle East

Mediterranean-area stations continued their runs into Africa, Central America and South America, but at a slower pace than in March. New and rare stations in European logs included C91CF (Mozambique), J5X (Guinea-Bissau), S79KS (Seychelles), VP8CMT and ZD7MY. G0KZG/mm (EK88) worked well into western and central Europe as he steamed off the west-African coast.

South Americans continued to work into southern Europe and the Middle East, but conditions seemed to slow by the second half of the month. PY, CX, LU and CE stations worked EH, I, 9H, SV, 5B and 4X during the unusual conditions of April 12. Jose Carbini, LU6DRV, reported EH7KW, SV1EN, SV9AJN, 4X6ON, JY9NX and HZ1MD on April 14.

Unusual paths skewed toward the south also provided rare opportunities for US 4 and 5 call-area stations to work southern Europe so late in the season. On the morning of April 9, K2RTH/4 found 5B4FL via such a skewed path. The next morning, WA5RT reported EH8BPX; W4UM worked EH7KW; and K2RTH/4 logged EH7KW, EH8BPX, EH8YG and several CT3 stations. A few US district-4 and -5 stations made similar contacts on the afternoon of April 11, when many operators in the eastern half of the country noticed strong backscatter to the south. ZF1DC was also reported into Europe. Stations in the Northeast heard strong Spanish and Portuguese TV video around 48.250 MHz about the same time, but no Europeans on 50 MHz.

Asia and the Pacific

US stations from Southern California to Florida continued to work ZL, VK and other Pacific areas, especially during the first half of the month. WA3SIX, WA3WUL and perhaps others in the Northeast caught ZL3TY, probably via a sporadic-E link, on April 12. There were few other surprises. W5UWB, K7ICW, N0LL and others worked FO5RA (French Polynesia) on the afternoon of April 1, while CE0Y/W7XU was booming in. N0LL also found FO3BM. The Polynesian pair went on to work others in the US 4 and 5 call areas later in the month, as did KH8/N5OLS and AH8A (American Samoa). Ron Silver, K4SUS, worked all four of them on April 14.

VK9ML (Mellish Reef) was on the air for just four days, but few fortunate US stations were able to catch him. Bob Magnani, K6QXY, worked him on April 22 around 2236, for a US first and DXCC entity #118 for Bob. KF6GYM, K5AM and N5JHV found him over the succeeding two days. In addition to the more-common Pacific stations,

XE2EED worked FK8CA (New Caledonia) and VK8AH in Northern Territory, Australia.

Activity from Japan and Hong Kong also seemed to slow during April, but the enthusiastic Asians continued to log interesting calls. Among those in JA logs were 3D2AG, 5B4FL, 9V1JA, FW5ZL, FK1TK, FK8FHM, H4ORW and JY9NX. VR2XMT reported KH4/W1VX and VK9ML on April 23 and worked A4, JA, LU, PY, VK and VU nearly simultaneously the next day.

Some Expeditions

After N6XQ and XE2EED packed up the 3G0Z expedition to Juan Fernandez on April 3, the pair operated from various locations in Peru for more than a week as 4T1SIX. They often operated under cramped conditions that allowed them to put up only wire antennas, and they were troubled by electrical noise, especially in Cuzco and Lima. Nevertheless, 4T1SIX worked all US call areas, plus VE1-3 and VE9.

Arliss Thompson, W7XU and his wife NOQJM operated from Easter Island (CE0Y) during the first week in April. The pair made just over 1000 contacts on 6 meters on all continents and in 54 DXCC entities, including stations in every US call area, as well as VE1, 2 and 9. NOLL was especially excited to work CE0Y/W7XU because the contact gave him 6-meter DXCC entity #100, after many years on the band. Many others got a new country from their Easter Island contacts. Arliss also worked European prefixes SV, 9H, I, EH, throughout the Middle East, including 5B, JY, OD, 4X and A4, as well as VU, YB and JA in Asia.

Clint Walker, operating as W1LP/mm on both sides of the Panama Canal, was astounded at the extremely strong signals from both 3G0Z and CE0Y/W7XU for several days running. On April 6, Clint worked Easter Island easily with his 2.5 W handheld FT-817 and built-in mini-antenna as he walked around the deck of his tanker.

V31RH (operated by Dick Hanson, K5AND) made 225 QSOs on 6 meters in 17 DXCC entities during his brief stay in Belize early in April. About 100 of his QSOs were with ZL and VK stations and another 100 were with US stations, primarily in the southern half of the country and mostly by scatter.

Long-Path Contacts

Bob Cooper, ZL4AAA, was among several operators to mention several spectacular long-path sessions during April. On 50 MHz, long-path contacts are those that go around the daylight side of the Earth in the opposite direction from the ordinary direct great-circle path. Such contacts are always longer than 20,000 km in length, that is more than half-way around the Earth. ZL4AAA, for example, worked VU2ZAP around 1945 on April 7 over about a 28,600-km great-circle path.

There were numerous similar contacts. Around 1430 on April 3, LU8MB worked VK4CP and other Australians via the long path across Africa (28,100 km). CE0Y/W7XU also made some extraordinary long-path contacts that morning, beginning with VU2ZAP (21,800 km) and other Indians around 1540, then YF1OO, YB0CBI and YC1MH (about 25,400 km) after 1610. Around 1820, Arliss heard 9M2TO/b via long path. One unusual aspect of these long paths over North America was that Arliss did work occasional US sta-

tions, including W3BO and W3VIR, but the W3s heard nothing of the Asians Arliss was also working.

Conditions must have been especially good on April 9. I5MXX, I0WTD and other Italians worked KH8/N5OLS around 2115 (26,400 km). JY9NX and 4X1RF found JG3IFX and other JAs after 2140 (at least 31,000 km) for some of the longest-path contacts claimed. The next day around 2055, AH8A worked 5B4FL (26,000 km) along a similar path. On April 25 after 1230, PY5CC worked VK8MS, VK8AH and five VK4 stations (about 24,000 km).

Aurora

In addition to the spectacular aurora of March 31-April 1 reported last month, there was a relatively weak aurora on April 8 and another intense event over the evening of April 11-12. Stations from coast to coast and as far south as Georgia and Oklahoma participated in the April 11-12 event, but little that was out of the ordinary took place. Gary Flynn, KE8FD (EM89), worked 1850 km west to K0GU (DN70) on 2 meters, for one of the longest contacts reported. Ron Sizer, K1VYU (FN31), hooked up with W3EP (FN31), N1BUG (FN44) and WA8RJF (EN91) on 432 MHz. Also reporting auroral activity were N1RZ, W1ZC, WB2AMU, WB2EZG, WV2V, N7DB, N0JK and NOLL.

Aurora Down Under

Are there radio auroras in the Southern Hemisphere? Of course, but we do not often read about such events, primarily because there are relatively few populated areas south of 30° latitude and within reach of even the most intense radio aurora. The geomagnetic storm of March 31-April 1 provided one of those rare opportunities for radio Aurora Australis. David Minchin, VK5KK, who writes the "VHF—UHF, An Expanding World" column in the Australian journal *Amateur Radio*, summarized activity in his May issue.

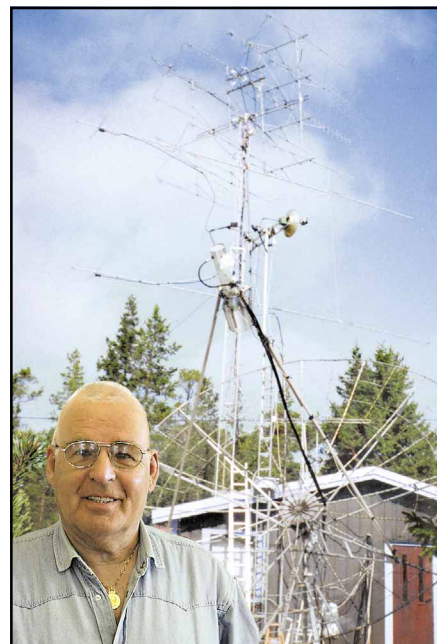
He reported that several dozen VK1, 2, 3 and 5 stations scattered across the southern part of the country made auroral contacts on 50 and 144 MHz. The Australians' experiences are much like those reported from North America and Europe, save their maximum range on 144 MHz seemed limited to 1200 km or so and beam headings did not usually venture far from due south.

The relatively shorter auroral paths observed Down Under might be the result of the greater distance between southernmost portions of Australia and the southern auroral zone. In contrast to populated areas of Europe or North America, only the most intense auroras affect Australia. The only other continental areas in the Southern Hemisphere within radio aurora range are the southern tips of South America and Africa.

First 1296-MHz Aurora Contact

Carl Mohlin, SM3AKW, and Karl-Gosta Forssen, SM5QA, completed a historic first 1296-MHz aurora contact on April 11 at 1650. Signals were 33A both ways, with characteristic Doppler broadening and a 5-kHz Doppler shift. The pair ran 500 W each with four 27-element Yagis and a 2.3-meter dish. The two were 358 km apart.

Carl had been attempting to make a 1296-MHz auroral contact for more than 20 years. Other stations had heard his signals via aurora



Carl Mohlin, SM3AKW, with his antennas.

from time to time, but he had not heard any 1296-MHz aurora until this past April 1, when he copied SM5QA. The pair completed 10 days later, after more than a year of efforts.

VHF/UHF/MICROWAVE NEWS

1296-MHz EME Beacon

The Search for Extraterrestrial Intelligence (SETI) League is running a novel beacon with an antenna array that tracks the Moon. The W2ETI beacon runs on 1296.000 MHz, with 20 W output to a quad array of right-hand-circularly-polarized helix antennas, whenever the Moon is above the horizon at FN20.

Paul Shuch, N6TX, SETI League Executive Director, estimates that the beacon signal should be strong enough to hear off the Moon with a 12-foot dish and DSP-enhanced optimal receiver. The current operating schedule is a standard 2.5-minute EME sequence, which consists of 60 seconds of steady CW, 60 seconds at half power, followed by 30 seconds of W2ETI identification in slow Morse code.

The main purpose of the beacon is to provide amateur and professional radio astronomers with a signal to calibrate receiving systems from a known source in the sky. Paul hopes to increase the beacon power to 100 W in the near future. For more information about the beacon and the SETI League's other projects, check the Web site at www.setileague.org.

September Conferences

The Eastern VHF/UHF conference is scheduled for August 31 to September 2 at the Radisson Hotel in Enfield, Connecticut. For further information, Contact Bruce Wood, N2LIV, at bdwood@erols.com.

Microwave Update 2001, sponsored by the 50-MHz and Up Group of Northern California, takes place September 27 through 30 at the Four Points Hotel, Sunnyvale, California. For information about presenting a paper, activities and accommodations, see the Conference Web page at www.microwaveupdate.org/.

QST