



ANDEX INTERNATIONAL

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Bumpy roads and a bird's eye view



Summer missionaries (left to right) Allison Pollock, Raquel Reyes, Becky Johnston and working visitor Dan Wales pause on top of Mt. Pichincha for a breathtaking view of Quito.

by Allison K. Pollock

As I sat in the back of the four-wheel drive vehicle, all my senses were alert--especially the one of feeling. I balanced myself precariously on a scrap of semi-clean newspaper to avoid getting grease on my clothes.

The first part of the road up Mt. Pichincha is not really bad. It reminded me of the road I live on--a simple dirt road in New York. Of course, little did I know that what started out as a semi-bumpy trip would be something I'll remember the rest of my life.

The scrap of newspaper soon proved to be useless. The broken tree branches, deep ruts and rocks which formed the road caused the vehicle to bounce along without shame. I was thrown back and forth, up and down. The newspaper kept sliding out from under me.

The heads of my three friends in the back seat jostled in perfect rhythm with the truck and each other--quite a sight to see. I laughed till I had tears.

As we kept going, we held on tight and looked out the window. The view was incredible. Each time we started to grab our cameras, the promise was that the view would get better. The view *would* get better, but we had almost five miles (approximately eight km) to drive before we'd see it.

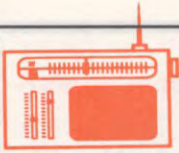
There were more ruts, potholes and tree branches as we drove higher. And the ride got bumpier. On the way up, Jerry Frost, our experienced driver and HCJB's antenna technician on Mt. Pichincha, pointed out various things of interest. HCJB initiated the first television station in Ecuador years ago (selling it a number of years later). He showed us that antenna--the first on the mountain. He also showed us the 15- by 10-foot sheet of metal which acts as a reflector for radio and telephone signals between Quito and HCJB's antenna site in Pifo.

After what seemed like hours--though I'm sure it wasn't--we reached the top. Six of us climbed out of the truck, thankful to be on stable ground. Jerry went to add water to the cooling system. The rest of us stood in awe.

Jerry was right. The view was incredible! Nothing could have prepared me for it--seeing Quito almost 3,000 feet (900 meters) below, nestled in between the mountains.

Five of us opted to climb another peak to get a better view. Trudging along slowly, we were surprised by the warmth of the air, considering the elevation of almost 12,000 feet (approximately 3,600 meters). The path was narrow, but by forming a single line we made our way up--laughing, slipping and falling.

(cont. on page 6)



DXer of the Month

WWCR Radio, Rai-Rome in Italy, Radio Bulgaria, Radio

Pakistan,
Radio
Sweden,
Radio Korea
International,
Radio
Ukraine
International,
Voice of
America,
Radio
Moscow,
Radio Austria
International,
Radio Canada
International,
Radio Japan,
Radio New
Zealand
International,

Congratulations to David Teall (Andex # 9000), DXer of the month!

"I live in a town called Hartlepool, on the northeast coast of England--a nice place to live.

"I am no longer working as I took early retirement to look after my invalid wife and stepdaughter, who are both very ill and need constant care. But we are a happy family and try to live life to the fullest.

"At the moment I'm doing a diploma series--bronze, silver and gold--with Radio Bulgaria. To receive them all, I must QSL Radio Bulgaria a total of 91 times. I'm almost at the end of the bronze series now.

"I just returned to my old hobby of shortwave radio, but my old radio was past its best, so I got a new one--a Yeasu FRG--7. It's just great! I also like reading and listening to music.

"I became interested in radio when years ago my grandfather gave me a very old valve radio. In between the pops and crackles I would hear voices and faint music! I used a coat hanger as an antenna and sat in front of it for hours and hours until it got so hot that it gave up the ghost.

"My very first QSL card was from Radio Canada International. They sent me a lot of information about Canada as well as a small flag. I've QSLed 23 countries:



David, with his Yeasu FRG-7 and 80 ft.-wire antenna.

Radio Romania International, Radio Australia, Radio Prague, Radio Malta, Radio China International, Radio Portugal, Radio Finland, Radio Deutsche-Wella, and HCJB, whose shortwave radio club is the first I've joined. My latest QSL is from Channel Africa Radio TV Services, South Africa.

I began to collect and send QSL cards almost 18 months ago. I do really enjoy getting a card from countries I'll never see and also enjoy learning about other people in the world."

If you'd like to write to David, his address is: 193 Wynyard Rd., Owton-Manor-Est., Hartlepool, Cleveland TS25 3LG, ENGLAND

"ELECTRONIC" PEN PALS?

ANDEX member James Gunsch from Sioux City, Iowa, U.S.A., suggests: "Why don't we start an 'E-mail Corner' for people who like to get electronic mail (e-mail)? In this way, we can communicate and make friends worldwide through e-mail."

If you're interested in corresponding by electronic mail, please send your complete e-mail address to: ANDEX, HCJB, Casilla 17-17-691, Quito, Ecuador, South America (or via e-mail to: English@mhs.HCJB.com.ec).

Antenna "notebook"

by John Beck

Ham Band Allocations

(cont. from ANDEX, May-June 1995, Vol. 22, No. 3)

The **80-meter band** covering 3.5 to 4.0 MHz is often used for local chit-chat (called "rag chewing") and, in the U.S., for many traffic nets. Long distance contacts are possible during the winter night hours of solar minimums. During the summer months, static and high absorption levels limit the band's range. Although differing from country to country, the Morse code (CW) and digital modes are utilized from 3.5 to 3.75 MHz, while voice, SSTV, FAX and CW can be used from 3.75 to 4.0 MHz. This band also has a DX window extending from 3.790 to 3.8 MHz.

The **40 meter band** covers 7.0 to 7.3 MHz but is shared with broadcast services in regions *one* and *two* (everything outside of the Western hemisphere). As a result, amateur activity on this band can be severely hampered, especially during the evenings. Ionospheric absorption is not as much a problem here, but Maximum Usable Frequencies (MUFs) do sometimes fall below 7.0 MHz, making the band unusable. Again, CW, RTTY and digital modes use the lower half of the band--from 7.0 to 7.15 MHz--while voice, SSTV, FAX and CW are used in the upper half, from 7.15 to 7.3 MHz.

A new band for hams is the **30 meter band**, covering from 10.1 to 10.15 MHz. CW, RTTY and other data modes are used exclusively. This band helps to bridge the large propagational gap that existed between 40 and 20 meters. However, the band is shared with some fixed services in various parts of the world.

The **20 meter band**, covering from 14.0 to 14.35 MHz, is probably the most popular band for DXers. Although it is high enough to be dead during some short periods of low solar activity, it is still low enough to provide long distance contacts to somewhere in the world throughout the entire solar cycle. DX contacts via long path (the longest distance between two points on the earth) are not uncommon. It is more susceptible to SIDs (Sudden Ionospheric Disturbances) and fadeouts. Again, CW, RTTY and data modes utilize the lower half up to 14.15 MHz, while voice, SSTV, FAX and CW all share the upper half, 14.1 MHz should be kept clear so everyone can take advantage of the NCDXF beacons located around the world.

Another new band is the **17 meter band** covering from 18.068 to 18.168 MHz. This band is uniquely divided to

provide CW-only operation from 18.1 MHz downward, with CW, RTTY and other data modes using 18.1 to 18.110 MHz. The remainder of the band is used by voice, SSTV, FAX and CW.

The **15 meter band** has been available to hams since 1952. This band is often dead for large portions of the solar cycle. CW, RTTY and data modes are able to utilize 21.0 to 21.2 MHz, with voice, SSTV, FAX and CW sharing from 21.2 to 21.45 MHz.

Another new band for hams is the **12 meter band**, extending from 24.89 to 24.99 MHz. This band is also shared with some fixed services around the world.

During a solar cycle peak, the **10 meter band** is one of the most popular. One can literally work around the world with very little power. The width of the band (extending from 28.0 to 29.7 MHz) provides room for a large number of hams. Propagation helps by preventing nearby hams from hearing each other and thereby dropping interference levels. Sporadic E also begins to show up at ten meters. CW and RTTY are used from 28.0 to 28.1. CW, RTTY and data modes are allocated up to 28.3 MHz where voice, SSTV, FAX and CW are heard; 29 to 29.5 MHz are allocated to FM and CW use, while CW and FM repeaters are placed from 29.5 to 29.7 MHz. Some amateur satellites also have their outputs or beacons located within the ten meter band.

Activity on the ham **6 meter band** is often avoided due to the increased danger of Television Interference (TVI) since the band is so close to the VHF television band. However, with good technical practices, and some sporadic E at the right time, this band, extending from 50.1 to 54 MHz, can offer nice surprises.

The **two meter band** is well-known for its FM repeater operation, but all other modes can also be found here. The band extends from 144.1 to 148 MHz.

The **1.25 meter band** now extends from 222 to 225 MHz. This is shared with other services in some areas of the world (for example, here in Ecuador, many radio stations have their STLs in this area of the spectrum). Again, FM repeaters are prevalent.

The next three higher bands are often referred to as the **centimetric bands**. The **70 cm band** extends from 420 to 450 MHz, the **33 cm band** goes from 902 to 928 MHz, and the **23 cm band** extends from 1240 to 1300 MHz.

Modulation

Before we delve directly into the subject of antennas there are a couple of concepts we need to be familiar with. The first is *modulation*. Basically, modulation is the

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(cont. from p. 3)

process of adding information to the RF (Radio Frequency) carrier wave that we have been describing. The two most popular types are *Amplitude Modulation* (or AM) and *Frequency Modulation* (FM).

In AM, the amplitude of the high frequency (relatively speaking) RF carrier wave is varied in accordance with low frequency information. During the process of modulation, two sidebands are created alongside the central RF carrier wave. These are referred to as the *upper* and the *lower sidebands*. There are many variations that can be created with this type of modulation. We can have the *full double sideband*, within a single channel, keyed on and off for the purpose of aural reception. (This is what a Morse code signal might be.) We could also use the full double sideband with a single channel of analog information for the purpose of sound broadcasting. (That would be the technical description of an AM phone signal.)

The center carrier contains most of the power (50 percent), but none of the information. The sidebands carry all the information, but very little of the total power (25 percent each). With the appropriate equipment on both the transmitting and receiving ends, we could strip away the carrier and one sideband, placing all of the power into the signal component that contains the information (referred to as a *single sideband* signal). Or instead of suppressing the carrier completely, we could reduce it or have it vary with the amount of information being transmitted. Each of these signals would have advantages and disadvantages.

While AM has several advantages (relatively simple and inexpensive equipment at fairly low carrier frequencies) it suffers from low fidelity and susceptibility to static crashes. Frequency Modulation (FM) was developed to overcome these shortcomings. In FM systems, the intelligence is impressed onto the carrier as frequency variations instead of amplitude variations. Although the actual carrier frequency

can be varied directly, more often a lower frequency is modulated, then multiplied up to the desired carrier frequency.

Decibels

One other concept we need to discuss is that of decibels. Originally, the decibel was based on the response of the human ear to sound. Relatively small changes can be heard at low sound levels, but as the volume is increased, a larger and larger change is needed. The *bel* is a measure of the smallest change that the ear can detect. (The scale of change is said to be logarithmic.) Since bells were discovered to be too large to work with, everyone began to use a tenth of a bel or a "*decibel*." Decibels make electronics work much easier since they can be added and subtracted without conversion if the base of comparison is the same. Since the decibel is a measure of change (not a measurement of power), two powers are always needed for the calculation. The formula is: $dB = 10 * \text{Log} (P2/P1)$. It doesn't matter which power (larger or smaller) is used for P1 or P2. We are making a comparison, and the outcome will be either a loss or gain in dB. Now we can agree on one of the powers being a reference level. For example, many telephone companies use *1 mW* as a reference. As a result, a phone repairman referring to an amplifier of *so many dB* will inherently know that one of the powers being referred to is 1mW. (This is why whenever we hear antenna manufacturers claiming their antennas have *x amount of gain in dB*, we need to ask, "Gain over what?") It is also possible to express voltage or current gain in dB, but the formula changes slightly:

$$dB = 20 * \text{Log} (P2/P1)$$

(to be continued next issue)

John Beck is director of International Radio at HCJB and hosts "Ham Radio Today" every Wednesday.

Person to Person

Lightning hit one of HCJB's antennas on the mountain [Mt. Pichincha] last night, traveling down the antenna and melting some coils in the tuning house. All morning I've been cleaning and rebuilding those coils--a real messy job! (Not to mention that we got stuck in the mud on the way up and had to use the winch on the front of the Trooper to get us free.)

But my reward was having a cup of coffee in the Donut Cafe here in Quito yesterday morning and listening to the beautiful Christian music coming from their sound system as they had their radio tuned to HCJB. It was music with a message ... a message about God's intervention in our lives!

I heard immediate results from my work. Not all HCJB engineers experience that as some live at our antenna

"farm" in Pifo, almost 40 minutes from Quito.

What a joy to live here and be in the Lord's work!



Jerry Frost, an HCJB technician responsible for maintenance of local radio facilities, has traveled up and down Mt. Pichincha--where HCJB's FM and AM transmitters are located--twice a week for six years. He keeps HCJB's local radio on the air.

Visiting radio stations in Latin America

by Ken MacHarg

Travelers to Latin America will discover many exciting vistas, historic churches, fascinating museums and beautiful parks. In fact, many express surprise at how much there is to see and how comfortable traveling is.

For the radio hobbyist there is an added attraction—hundreds of small shortwave radio stations scattered throughout the continent which gladly accept visits from foreign listeners. In fact, it has been my pleasure (and tested my wife's patience) to visit a number of these outlets throughout Central and South America.

We have yet to be turned away from one of these local stations. Instead, even when arriving on a Sunday or during *siesta* time, we've always found someone who has opened the door, inviting us through for a tour.

Just recently we were in Ipiales, Colombia, visiting the famed *Las Lajas* Cathedral—a magnificent church constructed on a bridge over a raging river. As we walked through the *Las Lajas* settlement, we happened to pass by a two-story edifice with the name *Radio Las Lajas* and an RCN logo painted on the side. The door was hanging open, so we popped inside.

A station salesman, Jairo Narvaez, was at the controls as a live broadcast of a mass from the church in the valley below was drawing to a close. He showed us around the studios, answering our questions about schedule, transmitter and audience. Ten minutes later we were on our way, and a new friend had been made and another station visited!

It was two years ago that my wife, Polly, and I were traveling through Chile. We were in Temuco and had visited a city park with a beautiful vista of the city. We had heard about *Radio Esperanza* but didn't think we'd have time for a visit. But, on the way down the hill we passed a Christian and Missionary Alliance Church with the *Radio Esperanza* sign outside.

Little did we know what was in store. Station manager, Rev. Ray Woerner, took us out by truck to the radio facility on the edge of town. Snuggled in a beautiful new building, the FM and shortwave studios and offices were the result of his hard labor. He was proud to show us around.

Afterward, he took us to Pizza Hut for supper, and we spent the evening sharing ideas about Christian international radio.

Then there was *Ecos del Oriente* here in Ecuador. I had been in the Amazon jungle for a week with an HCJB medical caravan. Somehow the food and I hadn't agreed, so when the group stopped in *Lago Agrio* for breakfast on the way back to Quito, I decided that a walk around town would be better than greasy eggs and meat.

It was still early in the morning and the town was just stirring to life. I walked from one end to the other in about 20 minutes and was on my way back when, there in front of me, was the *Ecos del Oriente* building. Up the stairs I went just to say hello and look around, but it was more than just a quick hello. The staff on duty took me across the roof of the building to the

studio where I had the chance to check out their control board and recording studio. Then came the question: Would I be willing to tape an interview for their noon news program? I speak Spanish, but not well enough to do radio work. But I was willing, and they were so kind. We sat in front of the microphone and discussed HCJB's medical caravan ministry and the outreach of the "prestigious broadcaster, HCJB." On the way out they loaded me down with stickers and other station information.

I've visited other radio stations as well—*Radio Cuzco* and *Radio del Pacifico* in Peru, *Radio Reloj*, TIFC, Radio for Peace International and Adventist World Radio in Costa Rica, HOXO in Panama, and who knows how many here in Ecuador. Just showing up seems to work fine. I've never asked for a QSL card or other souvenirs but have just shown interest in the station and its people. In turn, they've been more than kind in showing me around, allowing me to take photos and often giving me stickers, pennants and other "goodies."

Why not plan to come this way—to Latin America? Include station visits in your itinerary. Oh yes! And be sure to stop in Quito and visit us here at HCJB. The welcome mat is always out!



PHOTO BY KEN MACHARG

The transmitter site for Radio Cuzco in southern Peru is right across the road from Sacsayhuaman, a must-see Inca ruin on a hill overlooking the city.

Ken MacHarg is director of HCJB's English Language Service.

Bumpy roads ... (cont. from p. 1)

I could only stand in awe when I finally arrived on the second peak. The beauty of God's creation will forever be etched on my mind!

The trip down in the truck wasn't as bumpy, at least not for me. I sat in a seat and empathized with the person in the back ... precariously balanced on the semi-clean scrap of newspaper.

Allison K. Pollock was a summer missionary with HCJB's public information department this year.



Listen to "Jungle Jam" on HCJB every Saturday, broadcast to the Americas at 14:30 UTC-9:30 Eastern Standard Time. The frequencies are 15115 and 6080.

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