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Where Fire and Ice Brush the Clouds

By Mark Irwin and Jan Shober

It rises 19,000 feet (5,800 meters) above sea level, this monolith. A climb to its peak can take up to seven excruciating hours. It's snow capped Mount Cayambe, which at the summit is the farthest point from the earth's center due to the earth's bulge at the equator, which the mountain straddles.

Cayambe is only one of the many snowcapped mountains in Ecuador's "avenue of volcanoes." This group of majestic peaks is a principal drawing card for tourism as aspiring mountain climbers come from all over the world to scale their heights. And challenges in number await them. Ecuador's mountains offer snowfields that can avalanche and kill at any moment. Snow melted and refrozen demands extra caution as crevasses are numerous and dangerous. Several mountain climbing clubs in Ecuador have constructed refuges (small buildings near the snowline) for climbers to utilize in their assaults, although some climbs can be accomplished in a single day.

Mount Cotopaxi - a favorite one to climb.

Many climbers enjoy getting ready for longer climbs by first attempting Mount Pichincha, the semi-active volcano just above Quito. This 15,500-foot (4,274-meter) mountain offers terrific views of other summits, such as snow-coned Mount Cotopaxi, soaring into the southern skies of Ecuador at 19,350 feet (5,900 meters). Other mountains within the avenue of the volcanoes include the king of them all, Mount Chimborazo, at 20,700 feet (6,310 meters). Rising up from the jungle zone, Sangay (17,160 feet or 5,230 meters) and Reventador, belch forth noxious gases and constant eruptions of ash and lava. On clear nights, one can look at the horizon and view their constant fire.

Doug Shehane, a teacher at Alliance Academy in Quito, is one example of that hearty breed of mountain climbers willing to tackle these monoliths. For Doug, climbing mountains is a relatively new experience, as his native Cincinnati, Ohio, provided little opportunity for "reaching to the heavens." Although he did climb some mountains in the eastern U.S., Doug has acquired most of his skills and abilities here in Ecuador. He has taken many weekends to scale almost all of Ecuador's major peaks, such as Cayambe. He recalls that climb as being one of the most memorable. "I didn't think I would ever make it to the summit. In fact, at one point I let loose of the rope and told the others to go on without me." Fortunately, Doug's companions convinced him to finish the final hour of the climb--which turned out to be more than two hours of painful perseverance.

Of mountain climbing, Doug says, "It can be frustrated by poor weather conditions, lack of oxygen, or the climber himself being out of shape. But it's well worth the cost. It's absolutely exhilarating!".

If you'd like to learn more about mountain climbing in Ecuador, tune in to "Passport", Mondays in the Americas and Europe, and Tuesdays for the South Pacific. Who knows, maybe you, too, will some day want to climb the peaks in Ecuador's avenue of volcanoes.

Person to Person

John Beck
DX Partyline Host

As the mountains surround Jerusalem, so the Lord surrounds his people both now and forevermore.

--Psalm 125:2

We are blessed to be able to live in Quito, Ecuador, with so many beautiful mountains surrounding this high, Andean city. Although I miss the wide-open prairies of North America, the volcanic peaks also hold an attraction for me. They encircle Quito--just as mountains surround Jerusalem--and remind me of God's presence around His people. Sometimes the snowcaps are hidden from my view by clouds. But I know that beyond the hazy covering, the mountains still stand.

During trials, temptations and times of trouble we may feel that God is absent behind the clouds. However, the psalmist assures us that God is always present, surrounding us with love and desiring our love and obedience in return.

But not even the mountains will remain forever the Scriptures say. Only God Himself is eternal, and it's in Him and His Son that we find our strength.

God is our refuge and strength,
an ever present help in trouble.
Therefore we will not fear, though the
earth give way
and the mountains fall into the heart
of the sea...

--Psalm 46:1-2

ANDEX NEWS:

Our 500 kw is back on the air! If you listeners in Europe have had trouble hearing us on 31 meters, it is because our big transmitter was down for three weeks. Now it's going again. It should help your listening to DX PARTYLINE as well as our other programs.

ANDEX Classified: HCJB again has a good supply of IRCs. They can be purchased for the same low price as before, $5.50 (U.S.) for a pack of 10 coupons.

UNDERSTANDING SW RADIO

by John Beck

Impedance

We run across the term "impedance" a lot in our SWLing hobby, and it's a term that can be confusing. Actually, the definition is simple: Impedance is the total opposition a circuit offers to the flow of alternating current at a given frequency. However, that definition can be misleading, since there are different types of opposition within a circuit.

Probably the most familiar type of opposition to current flow is resistance--that property which depends upon the type of material, dimensions and temperature. Those little packages called resistors with the pretty color bands are familiar to most of us. Resistance is measured in units called ohms.

Most of the time in DC circuits we only have to concern ourselves with resistance. When we start working with AC circuits, we also have another type of opposition to current flow called "reactance." Reactance is also measured in ohms. There are two types. One type, called capacitive reactance, is the opposition presented by capacitors. The other type, inductive reactance, is the opposition represented by inductors.

Reactance is also dependent upon the frequency of the sine wave we are working with. The reactance of a capacitor decreases with increasing frequency, but the reactance of an inductor increases with frequency.

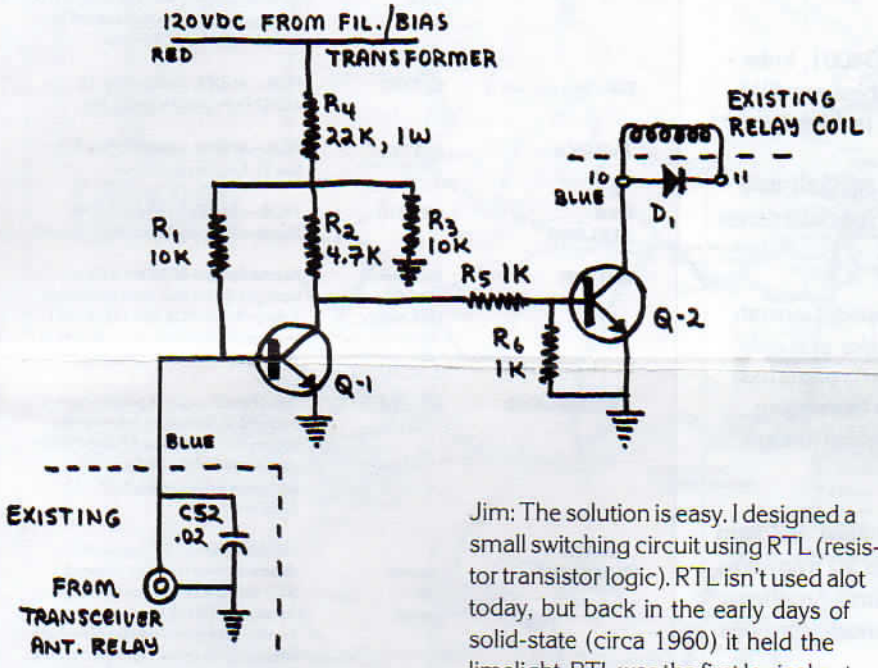
However, we cannot directly add reactance to resistance. In order to add the two different types of opposition, we have to use vectors. There isn't enough space to explore vector addition here, but any good high school math text can teach you how to use them. Whenever these three different types of circuit opposition are correctly added together via vector addition, one comes up with a quantity called impedance. Impedance is also measured in ohms.

Therefore, whenever we say that a circuit has a certain number of ohms of impedance, we are describing that circuit in terms of the total opposition to current flow that is presented by the circuit, including resistance, capacitive reactance and inductive reactance. When mating one piece of equipment to another (such as receivers to antennas or amplifier outputs to speakers), we want to make sure we are using matching or near-matching impedances so that the maximum amount of power transfer can take place.

Super Saver Switch

ANDEX Construction Article No. 1

By Jim Childs and John Beck



John: When a close friend of mine had some problems with the transmit/receive relays in his IC-745 and in his IC-751A transceivers, he started reviewing the instruction manual. The relay for the transceiver had a maximum rating of 1 amp at 12 volts DC. His Heathkit linear amplifier was sending 120 volts DC!

I had a similiar setup: a modern, solid-state transceiver using a Heathkit SB-220 amplifier. I pulled the plug on the linear, banning its use until some remedy was applied. (I'm thankful I didn't damage anything.)

I figured I had choices: sell the amplifier, utilize a separate switch for engaging the amplifier on transmit, construct a relay circuit to act as a buffer between the linear and the transceiver or use a solid-state switch to accomplish the same task. The first option was undesirable; the second was "cheapskate" (although I have another friend who uses the method successfully); the third method was acceptable; but the fourth was intriguing. Off I went to my engineering friend Jim Childs.

Jim: The solution is easy. I designed a small switching circuit using RTL (resistor transistor logic). RTL isn't used alot today, but back in the early days of solid-state (circa 1960) it held the limelight. RTL was the first logical outgrowth of transistor development (using solid-state devices for switching). Although it is very slow, it's very simple and was perfect for this application.

John: The circuit is simple and straightforward. As shown it is designed for use with the Heathkit SB-220 linear, but can be used with other units with some modification. When in the transmit mode the contact closure of the transceiver's antenna relay closes, grounding the base of Q-1, causing the transistor to turn off. Since it is off, the collector voltage of Q-1 goes high causing Q-2 to turn on and conduct. This completes the circuit path to relay coil, energizing it and thereby closing the contacts.

Jim: R-3 and R-4 act as voltage dividers to drop the 120-volt DC supply down to a usable level (about 15-volt DC). R-1 provides enough base current to Q-1 to ensure that it will stay "off" in the receive mode. R-2 provides base current to Q-2 when Q-1 is "off" (not conducting). R-5 and R-6 improve the noise margin of the circuit by ensuring that Q-2 stays off whenever Q-1 is on.

The diode D-1 has been added across the relay coil (terminals 10 and 11) to prevent a voltage spike from damaging Q-2. This spike is created whenever the relay de-energizes.

John: All of the resistors, except for R-4, are 1/4 watt, 20-percent tolerance. R-4 has to be able to safely reduce the supply voltage while still providing Q-2 with enough base current to saturate (1 to 2 milliamps). You can figure this out by using basic Ohm's Law calculations. However, I'm easily confused about how to select the other components.

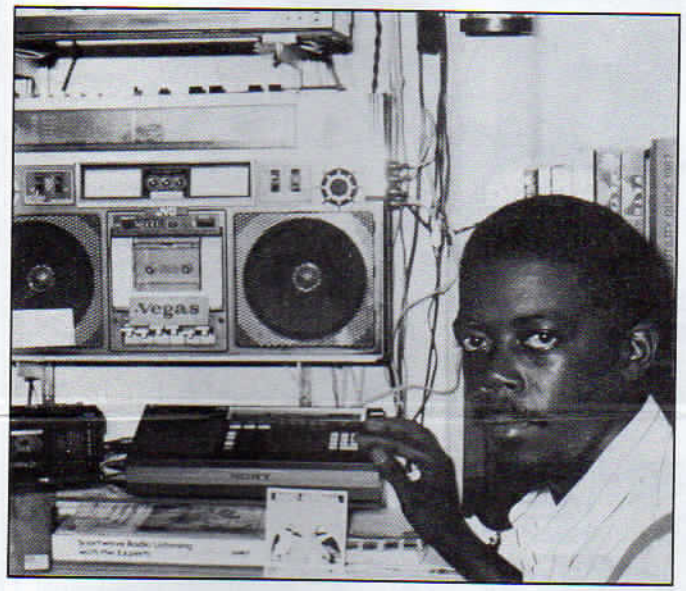
Jim: This circuit is fairly flexible in that regard. Q-1 is a general, garden variety type of NPN small signal transistor (eg: 2N3904 or ECG-123). Q-2 has to be able to handle the supply voltage (120-volts DC in our case). Note especially the collector-to-base and collector-to-emitter ratings of the transistor. It also has to be able to handle the relay current produced. That's why I had you measure the resistance across the relay coil. Again, we simply use good ol' Ohm's Law to estimate the current. The diode across the relay coil also has to handle the supply voltage so look for one with the appropriate PIV figure.

John: If you try this same circuit, be sure you observe standard safety practices and construction procedures. The voltages inside linear amplifiers can kill you. If you are uncertain how to proceed, ask someone with more construction experience.

I constructed the circuit on perf board using point to point wiring. Layout is not critical.

We would be interested in your reaction to this construction project. Would you like to see more? What types? Write us here at ANDEX International and let us know!

Special DXers



Ian Weekes

ANDEX is pleased to introduce Ian Weekes, ANDEX No. 6158, of Arouca, Trinidad, West Indies, as one of our Special DXers for this issue.

Ian is a 29-year-old construction worker who enjoys playing cricket, bicycle riding, swimming, listening to music and studying electronics when he is not listening to shortwave.

He first heard HCJB in 1979, but soon after this, his radio was stolen. He did not begin to seriously pursue shortwave as a hobby until about 2 1/2 years ago. In the past year he has collected nine QSL cards. Ian has four radios: a Sony ICF 2010, a Sony WA 8000, a Hitachi shortwave portable and an IVC all-band portable. He also has an eavesdropper antenna.

Ian indicates that shortwave listening has brought many changes to his life. "The whole world now seems like a small village to me," he says. "Shortwave listening allows me to enjoy life more. I work six days a week and listening to my shortwave radio is helping me to learn to relax and slow down."

Ian does spend a good deal of time relaxing with his shortwave. He listens about two to three hours each night and even longer on Saturdays. "Shortwave listening has become a part of me," he comments.

Ian adds that he is a Christian. "I keep following and trusting the Lord Jesus and I love going to church and Bible-teaching meetings." And that is one of the reasons he enjoys HCJB. "I was amazed to hear the Word of God on the radio during the week. I had only known about Sunday morning religous programming. Now I know it is available on shortwave during the week, thanks to HCJB."

Congratulations, Ian, on being chosen as a Special DXer. If you would like to correspond with Ian about shortwave or congratulate him, his address is: No. 2 Constantine Avenue, Arouca, Trinidad, West Indies.

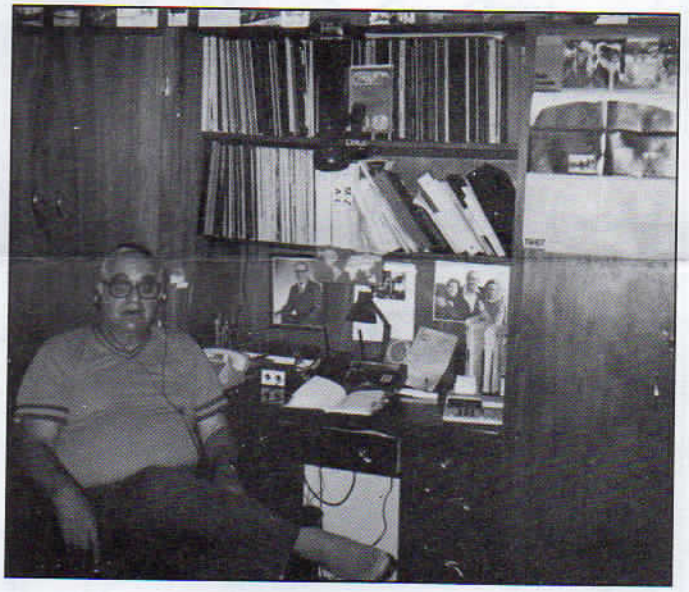
Retired professor of communications and educational administration, Robert Singer ANDEX No. 6201, from Colorado, is our Special DXer from the United States.

Robert was born and educated in Hungary before emigrating to Great Britain and ultimately the United States. After World War II he became involved in education and held the post of dean of continuing education at the University of Northern Colorado before being appointed professor at the same university. After he retired in 1985, he became active in volunteer work for the local sheriff's office. Robert also reads, travels, enjoys classical music and opera, and of course, DXing.

He has visited 47 of the 50 states, traveled in every country in Europe except Albania and Bulgaria, and last year also visited Australia, New Zealand, China and Hong Kong. He speaks English, Hungarian and German.

DXing is among Robert's recent additions to his list of hobbies. He began on January 12, 1987. He has received QSL cards from most of the continents. Robert indicates he has a thriving interest in SWLing--he recommends serious reading on the subject and careful planning of one's additions to a QSL collection.

ANDEX congratulates Robert on being chosen as one of our Special DXers. If readers would like to send their own note or congratulations to Robert, his address is: 2353 Sunset Lane, Greeley, CO 80631, U.S.A.



Robert Singer

The request for a map of Ecuador came from Charles Leck, ANDEX 6445 of Kendall Park, NJ, USA. This will help you to find the places we mention in connection with the work of HCJB from time to time.

Pen Pals

SANJAY KUMAR - Kokar, H.B. Road, Ranchi-834001, India - ANDEX 6009 - Age 21 and a student. His hobbies are SWL-DXing, pen pals, playing tennis, collecting and fashions.

MASSIMILIANO SANTINI - Via S. Agata 8, 06049 Spoleto, Italy - ANDEX 6505 - A 16-year-old student with a special interest in Latin American culture and DX information.

JENS SCHARSIG - Wuerkerstr. 7, DDR-7022 Leipzig, German Democratic Republic - ANDEX 6393 - Would like pen pals from Benelux, West Germany, or Austria. German is preferred, but writing is also possible in English, Swedish or Norwegian. His interests ar DXing, pop music, corresponding and foreign languages.

HERMAN BOELS - Vrijheidsstraat 31, B-9300 Aalst, Belgium - ANDEX 6425 - Wants pen pals no older than 20 from anywhere, but prefers Scandinavia, Australia or North America. Hobbies are languages, correspondence and music (besides DXing).

MARTIN SCHOECH - Neuwokern, DDR - German Democratic Republic - ANDEX 6157 - Would like to write in German, Russian or English. He collects stamps.

JIM HUGHES - 332 West Coal Street, Shenandoah, PA 17976, U.S.A. ANDEX 6467 Is partially blind, but would like to correspond especially with missionaries.

WOODY SMITH - 1044 Lancewood Drive, Knoxville, TN 37920, U.S.A. - ANDEX 6470 - He is interested in exchanging video cassettes of TV programs, commercials and music programs from South America, Caribbean, South Korea, Philippines, Taiwan, etc. He especially likes Andean music.

ROGER ABBOTT - "Ailsa Craig" Warialda Rd., Inverell, N.S.W. Australia - ANDEX 6438 - Would like a pen friend from Australia, but will write to anyone. Hobbies are SWL, DXing and electronics.

CLIVE MUNRO - P.O. Box 420, Midland WA 6065 Australia - ANDEX 6295 - 41 years old. His interests are writing, reading, philately, exchanging news, views and experiences, and following international cricket. Wishes to correspond with members in Africa (south of the equator), the Americas, the U.K. and New Zealand.

HANS-JURGEN KRETSCHMER - 8017 Dresden 17, P.O. Box 43, German Democratic Republic - Would like to hear from someone who has a Globetrotter receiver and could share information on it.

FEES FOR ANDEX MEMBERSHIP MAY BE PAID IN THE CURRENCY OF THE COUNTRIES BELOW BY SENDING TO THE ADDRESS GIVEN:

AUSTRALIA	A $6.50	HCJB—ANDEX, GPO Box 691, Melbourne, Vic 3001, Australia
CANADA	C $6.50	HCJB—ANDEX, 2110 Argentia Rd., Mississauga, Ontario, Canada L5N 2K7
FINLAND	FIM 25 to the bank	Send fee to: Radio HCJB, Helsingin Sp/Helsingfors Sb, 405506-09630716. Send application form to: Radio HCJB, PL-101, 15111 Lahti, Finland
ITALY	L 7.000	HCJB—ANDEX, Via Cavalloti, 16, 41043 Formigine (Modena), Italy
JAMAICA	J $25	HCJB—ANDEX, Jamaica Office, P.O. Box 31, Kingston 6, Jamaica
NEW ZEALAND	NZ $10	HCJB—ANDEX, P.O. Box 82-296, Highland Park, Auckland, New Zealand
SWEDEN	Equivalent of $5.00 USA dollars	Fees to: Postgiro 68 06 80-6 OR to bank giro 332-4407. Send application form to: Radio HCJB, Box 110, 54201 Mariestad. Check the current exchange at your bank to determine the fee.
SWITZERLAND	SFr. 10	Send Fees through the postal system to: Radio HCJB-Schweizer Arbeitszweig, Mannedorf, P.C. Glarus 87-3468. Send application form to: Radio HCJB-Schweizer Arbeitszweig, Postf. 119, 8708 Mannedorf
UNITED KINGDOM	3 pounds 75 pence	HCJB—ANDEX, 131 Grattan Rd., Bradford, West Yorkshire, England, BD 1 2HS OR send to Post Office giro account 625 2311 by using a transfer form from a members Girobank account or using the "Transcash" service available at all post offices in the U.K.
U.S.A.	US $5.00	HCJB—ANDEX, P.O. Box 553000, Opa Locka (Miami), Florida 33055-0401
WEST GERMANY	DM 12	Margot Stegmiller, Hebelstr. 32, D-6908 Wiesloch, Federal Republic of Germany Account Nr. 2074 15-675 Postgiro Ludwigshafen

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Applicants may use the United Kingdom post office giro account by sending the equivalent of three pounds and 75 pence.

IF YOU LIVE ANYWHERE ELSE, REMIT $5.00 (U.S.A. dollars) to: HCJB-ANDEX, P.O. Box 553000, Opa Locka (Miami), Florida 33055-0401.

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HCJB

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