



### HCJB POWER PLANT



*HCJB generator under repair*

About 40 miles to the east of Quito a small stream tumbles down the slopes of the Andes Mountains. The water in this stream eventually forms a part of the Amazon River and flows hundreds of miles across South America and out into the Atlantic Ocean. Near the town of Papallacta, at an altitude of about 10,500 feet, this flow of water has an important part in *Heralding Christ Jesus' Blessings*. About 50 million gallons every day pass through the HCJB Papallacta Power Plant to produce the electrical power needed to run our transmitters.

When HCJB first began broadcasting on Christmas Day of 1931 with a low power transmitter in the city of Quito, power was purchased from the local power company. Some years later the transmitters were moved to the town of Pifo, about 15 miles to the east. Commercial power was not available in this new location so diesel-powered generators were installed. By the early 1960s it was costing over \$100 a day to generate the power necessary to keep HCJB on the air. If any increase in transmitter power was to be considered it became obvious that some cheaper source of electricity would be essential.

A study of the possibilities led to the choice of the river passing by Papallacta. About the same time a used hydroelectric plant was located in Seattle, Washington. This plant, originally installed in 1911, had been taken out of service in 1938 due to a lack of water to keep it in operation. The plant was purchased in late 1961 and transported to Ecuador. Construction of the new power plant began soon afterwards. Completion of the project took several years with the dedication ceremony held on April 10, 1965. Several Ecuadorian government officials were present for this special occasion. For more than ten years now, this power plant has been keeping HCJB on the air and has made possible a large increase in transmitter output.

Water is diverted from the river into a reservoir about 425 feet above the power house. Silt and rocks, which might damage the turbine, settle to the bottom of this reservoir. The water then drops to the power house through a 1,400 foot penstock. This metal pipe decreases in diameter from 38 inches to 32 inches as it descends the slope. Wall thickness increases at the same time from 1/4 inch to 3/8 inch. The turbine consists of a 3,000 horsepower Francis wheel rotating at 720 rpm. At full load some 600 gallons of water pass through the turbine each second under a pressure of 200 pounds per square inch. Speed and water flow are controlled automatically.

The rotating parts of the generator weigh a total of 12 tons, including a 5 ton flywheel. The power generated is 3-phase with 2,900 volts from phase to phase. Due to recurring problems, the generator rotor was completely rewound a few months ago so should continue to provide power for HCJB for many more years.

One of the most impressive parts of the installation is the 20 mile power line between Papallacta and Pifo. A total of 241 concrete poles were used

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## DXing HIGHLIGHTS

How did you get your start in the fascinating hobby of shortwave listening? Probably every ANDEX member can tell a different story about his first experiences with shortwave. Bob Underdown, of Siloam Springs, Arkansas, has sent us this description of his unusual first encounter with radio voices from around the world.

"In late 1972, I began to get interested in electronics and crystal sets. All through December I had been experimenting with regular medium-wave type crystal sets with a high-gain amplifier and homemade antenna coils. One night I decided to see what I could hear if I used half the number of turns of wire needed for a medium-wave antenna coil. Instead of a blur of AM stations coming from my amplifier's speaker, I heard a lot of strange stations I'd never heard before. A few were in English, some were in Spanish, and one or two were in German. I carefully adjusted the tuning until I could hear a strong station in English that stood out from the clutter of stations pouring in all at once. After a few minutes an announcer said, 'This is Radio Nederland, Hilversum, Holland.' That night I also heard the British Broadcasting Corporation, the Voice of America, and some music I later found to be the interval signal of Radio Canada. Much later I found that I had stumbled onto the 49 meter shortwave band.

"But my story doesn't end here. A few days later, one cold, crisp morning, I heard a new station on my 'radio'. I didn't hear the whole identification, but they mentioned something about 'The Voice of the Andes' and Quito, Ecuador. That was over two years ago, and I've fallen in love with this zany hobby of SWling and DXing. My primitive crystal set has given way to a much more modern receiver, and HCJB has become one of my favorite stations."

### ANDEX International --

is the official publication of Andes DXers International, a DX Club operated in conjunction with DX Party Line broadcast over Radio Station HCJB and sponsored by The World Radio Missionary Fellowship, Inc. It is mailed monthly to all members.

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Not only has Bob fallen in love with the shortwave hobby, but he is one of the many who have joined ANDEX. He is member No. 983. It must have been a thrill to hear those first shortwave stations on such a simple receiver, but we are sure Bob finds DXing much more enjoyable on his present radio!

## POWER SHORTAGE ?

Power! This is one of the commonest subjects discussed these days. It takes a lot of power to keep our modern-day civilization running smoothly. Many will remember the chaos and confusion that resulted a few years ago when a power failure darkened the entire northeastern section of the United States, from New York all the way up to Boston. Just another indication of our dependence on electrical power. Even a radio station like HCJB is very dependent on power. Large radio transmitters eat up a lot of electricity. This is why HCJB operates its own hydroelectric power plant, in order to have all the energy necessary to keep the programs on the air.

Most people take for granted the power they use. When they switch on a light or put a piece of bread in the toaster, they expect the power to be there to do their bidding. They don't think much about where the power comes from or how the utility company gets it to their home or place of business. They aren't too concerned about the petroleum, coal, uranium, or water that is consumed in producing the energy to meet their needs. That is, they aren't concerned until they face a power shortage or failure that affects their daily living. Or until prices rise to meet the rapidly increasing costs of some natural power sources. They may be jolted as they think of the future prospects when they find their favorite filling station has no gasoline for sale. Then they begin to realize that some sources of energy are limited.

As the world population continues to explode, it is becoming more and more evident that the conventional sources of power may not be able to keep up with the increasing demands. As the developing nations continue to expand industrially, their use of power increases rapidly. The world is beginning to see that there are serious shortages ahead and that costs will continue to spiral upward.

The energy crisis is critical, with ever greater problems looming ahead, but we need to think of

# DX QUIZ - No. 1

- 1 - What celestial body has the greatest influence on shortwave propagation?
- 2 - From what country does the NHK broadcast its programs?
- 3 - What do the initials "ANARC" stand for?
- 4 - The "DX Juke Box" is produced by which well-known shortwave station?
- 5 - What is the length of an average sunspot cycle?
- 6 - Who are the "BAD Guys"?
- 7 - A DXer erects a new dipole antenna. It is 32.5 feet long. On which shortwave meter band will this antenna give best results?
- 8 - We are presently very near the time of (1) maximum, or (2) minimum, sunspot activity.
- 9 - How many times a week does HCJB broadcast the "DX Party Line"?
- 10 - What are the call letters of the standard time and frequency station located in Ottawa, Canada?
- 11 - What organization will hold its 1975 Convention during the month of August in Montreal, Canada?
- 12 - Name the region of the earth's atmosphere that makes possible shortwave reception over long distances.
- 13 - What do the initials "AIR" stand for?
- 14 - A shortwave station in San Francisco, California, beams a program to Japan. This signal will cross the Pacific Ocean near (1) Alaska, or (2) Hawaii.
- 15 - Radio Poland uses a well-known piano theme for its interval signal. Who was the composer of this music?
- 16 - A station is transmitting on a frequency of 11.915 MHz. In what meter band is this station operating?
- 17 - A DXer living in New York is planning to install a new dipole antenna. His main interest is to get good reception of stations in South America. He should erect his antenna so that it runs (1) north-south, or (2) east-west.
- 18 - During seasons of high sunspot activity the international shortwave stations tend to use the (1) lower, or (2) higher, frequency bands to give best reception.
- 19 - For good reception of stations on the Tropical Bands, the entire path of the signal from transmitter to receiver must be in (1) sunlight, or (2) darkness.
- 20 - What is the name of the country formerly known as Ceylon?

ANSWERS NEXT MONTH

another type of power which is even more important to us personally -- the power to live the lives we should, to defeat sin, and to make us the children of God. This power is inexhaustible, it will never run out, there will never be any shortages, and the price will never increase. It is the free gift of God! There is never any reason to have a shortage of this power in your life. God tells us in His Word, "He gives power to the tired and worn out, and strength to the weak. They that wait upon the Lord shall renew their strength. They shall mount up with wings like eagles; they shall run and not be weary; they shall walk and not faint" (Isaiah 40:29, 31). The Apostle Paul wrote, "I pray that you will begin to understand how incredibly great His power is to those who believe Him. It is the same mighty power that raised Christ from the dead" (Ephesians 1:19).

Do you have a power shortage in your life? Do you lack that power that God has available for you? Believe in Him and accept Christ by faith as your personal Savior. Then this power can be yours. We suggest that you read God's Word, the Holy Bible, every day. Look to Him for a "Living Word" for that day, which will be life and strength for you. Wait on Him for guidance all during the day for what to do next or how to proceed in difficulties and problems that come up unexpectedly. Following His guidance always brings victory. Yes, the Lord will give you that most important spiritual power with overflowing abundance. Put your trust in Him today!

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to carry the four wires over the mountain pass. At one point the line reaches an altitude of about 13,500 feet above sea level! Each pole weighs around 1,500 pounds and the aluminum-steel cables are 5/8 inch in diameter. Voltage on the line is 24,000 volts between lines.

With our present transmitter installation, this power plant provides more than sufficient energy. However, when the projected 500 kw transmitter is installed in about two years, it will be loaded to

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## ANDEX MEMBER 1500



*Mark A. Clark tuning SW-717*

ANDEX has passed another important milestone. Recently, Mark A. Clark was accepted as a new member and received his membership certificate with the number 1500. With other members who have joined more recently, ANDEX has now enrolled well over 1500 members in the one and a half years of its existence.

Mark lives in Ada, Oklahoma, and is a 16-year-old student. He has been interested in shortwave listening for about four years. In addition to DXing he enjoys music, sports, and anything that has to do with electronics. He averages about four hours a day with his Heathkit SW-717 receiver tied to a 150 foot long-wire antenna. Other equipment includes a tape recorder.

Congratulations to Mark A. Clark on becoming ANDEX member 1500. Mark has been sent a special award in recognition of this honor.

## DX BADGE

Would you like an attractive badge to wear on your coat lapel or jacket to advertise your interest in DXing? The Swedish DX Federation has produced such a badge. About 1-1/4 inches in diameter and printed in blue and yellow, this is a badge you will be proud to wear. These badges are available by sending only two IRCs for each badge desired. One extra IRC will bring you your badge airmail in much less time. Send your order for one or more of these badges to Fredy Neuman, Riksförbundet DX Alliansen, Box 84, S-520 43, Åsarp, Sweden. By wearing one of these DX badges you may help interest others in this fascinating hobby!

## DXer OF THE MONTH



*Arnold using his SX-122A*

Most ANDEX members got their start in the short-wave hobby at an early age. One exception is Arnold E. Ortmann, our August "DXer of the Month". He found DXing to be a fascinating occupation after he retired in 1967. During the past five years he has undergone considerable surgery on both eyes as well as having suffered two heart attacks. He has been left with only poor sight in one eye. Being able to travel around the world through the magic of shortwave radio has helped him through these difficult years. After listing all the physical difficulties he has had, Arnold comments, "Other than that, no problems!"

Arnold was born in a suburb of Pittsburg, Pennsylvania, where he still resides. His schooling was in the same area, and he graduated from the University of Pittsburg with a Bachelor of Science degree. Following his years of training, he taught Biology and General Science for two years, clerked in a department store for three years, and then spent 28 years as a welfare worker and rehabilitation counsellor. Arnold also served in the United States Army during World War II and retired with the rank of Major following 23 years of service as a Reserve Officer.

It was after he retired that Arnold caught the DX bug, and he has been active ever since. He first heard HCJB on May 7, 1967, and has listened regularly since that date. In his collection of QSL cards he has a copy of every card offered by HCJB since he began tuning in. He has kept an accurate log of every station he has heard and the total number has now reached 110. The cards he has

received are kept in large albums, the size of photograph albums, for convenient display.

There are two good radios in Arnold's listening location. A Zenith Transoceanic, D-7000-Y, is used with its built-in waverod antenna. A larger Hallicrafter's SX-122-A operates with a 75 foot outdoor antenna. Both receivers give excellent reception, and he divides his time between them. Most of his listening is done during the evening hours, 2300-0500 GMT, as he finds the opportunity. In addition to DXing, Arnold finds time to keep up his stamp collection, another hobby he finds very interesting and educational. Besides being a member of ANDEX, No. 193, Arnold has also joined several other DX clubs, including those sponsored by Radio Portugal, Radio Australia, Radio Prague, Radio Canada, Radio Finland, Radio Kiev, Radio Japan and the BBC.

Due to his loss of vision, Arnold is unable to do much reading. Instead, he is supplied with Talking Books from the Blind Association which have been recorded on records. Recently he and his wife completed listening to the entire Revised Standard Version of the Holy Bible. We are happy to have Arnold E. Ortmann as our "DXer of the Month"!

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near capacity. Investigation is being carried on at present with the hope of adding a second turbine and generator to increase the capacity of the Papatlacta Power Plant. This additional power will be essential before any further increase can be made in our transmitting facilities.

Whenever you listen to HCJB, think about the water rushing down the eastern slopes of the Andes Mountains. God is using the power in this water to help spread His Gospel around the world.

Listen to DX Party Line and invite your friends to tune in. Heard 3 times each week on HCJB.

For South Pacific: Monday-Thursday-Saturday  
0930 GMT 31 m - 9.745 mHz  
49 m - 6.130 mHz

For Europe: Monday-Thursday-Saturday  
0930 GMT 25 m - 11.915 mHz  
1930 GMT 16 m - 17.855 mHz  
19 m - 15.300 mHz

For North America: Tuesday-Thursday-Sunday  
(Monday-Wednesday-Saturday 9:30 PM EST)  
0230 GMT 25 m - 11.910 mHz  
31 m - 9.560 mHz  
49 m - 5.970 mHz