Radio's Role in Developing Countries

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Go beyond IP!

AUDIO OVER IP
EMERGING COUNTRIES

Web Radio Case Study

VOV
GIAO THÔNG FM91 MHz

Voice of Vietnam Reaches
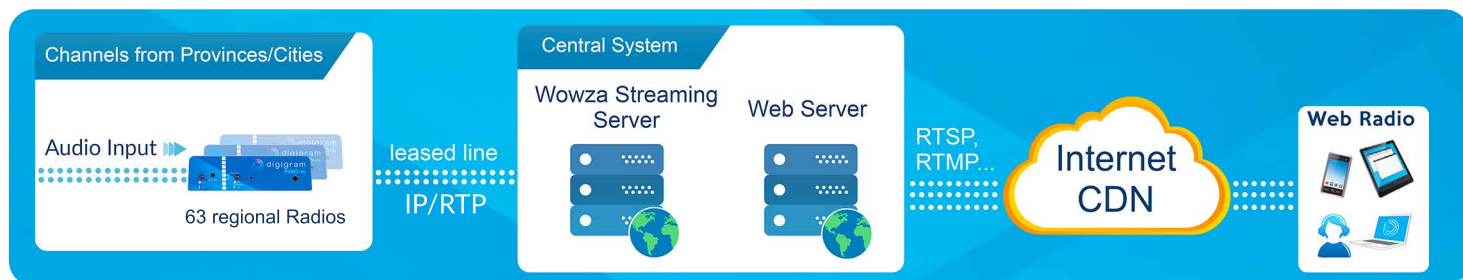Worldwide Audience

Background

Voice of Vietnam enables more than 4 million Vietnamese living overseas to enjoy access to daily radio programming from Vietnam
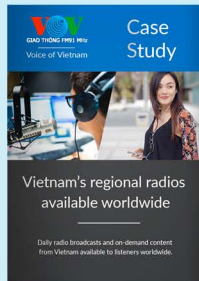
The Challenge

Encoding programs within regional studios so that audio can be streamed via IP to a central webstreaming server for further delivery through the Voice of Vietnam website

Voice of Vietnam solution

Channels from Provinces/Cities
Audio Input
63 regional Radios
leased line
IP/RTP

Central System
Wowza Streaming Server
Web Server

RTSP, RTMP...
Internet CDN

Web Radio

> *The PYKO was an obvious choice for us because it is a cost-effective solution that provides professional broadcast quality with balanced audio inputs and robust streaming technology in a compact form factor.*
>
> - Perry Leong, Project Manager at GBS Alliance Pte Ltd

VOV
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Voice of Vietnam

Case Study

Vietnam's regional radios available worldwide

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Studio to Transmitter Solutions

STL Solutions

IQOYA *LINK

IQOYA *LINK/LE

FM Digital Radio

PYKO

Here are a few of the latest solutions deployed by Digigram

INDIA

93.5 SURYAN FM RADIO
Are your ears tuned in?

superhits RED FM 93.5
Bajaate Raho!

MALAWI

92.5 ufulu FM
WaiLesi Yapamwamba

Galaxy FM

Radio's Role in Developing Countries

Marguerite Clark
Editor in Chief

Radio is the primary communications medium in many developing countries. It is able to reach millions and has a vast impact on societies facing adversity. What are the obstacles and opportunities for radio broadcasters in these regions and how can stations benefit from their unique position, while also ensuring social development for local populations?

This eBook looks at the ways stations and nonprofit establishments, such as QRAM and Farm Radio International, are meeting the challenges of this important role, in terms of marketing strategy, integration of modern technology and dissemination of information. It offers some notable recent examples of how radio organizations are launching or expanding services in specific emerging countries, illustrating how the medium plays an essential part in improving people's lives.

Radio World has published more than two dozen eBooks exploring the many facets of radio station and network operations including digital radio, sports coverage, mobile reporting, studio/transmitter links, social media and more. Find them at radioworld.com/ebooks.

Let us know about how we can make these handy reference guides more useful to you.

— Marguerite Clark

About the cover: Nancy Wilson listens to the radio at the Farm Radio International office in Arusha, Tanzania. Photo by Simon Scott

Australia's QRAM Enables Rural Stations to Stay On Air

Uses innovative content distribution and playout systems that permit transmitters to keep going in adverse weather

By **Davide Moro**

CAIRNS (Queensland), Australia — In 1972 the first Indigenous-produced community radio programs went to air in Australia, and now Indigenous broadcasting includes more than 130 community radio stations collected into the Remote Indigenous Broadcast Services scheme.

Participating stations are often called RIBS stations, and their broadcast licenses, awarded by the Australian Communications and Media Authority (ACMA) require them to serve their local community.

ON-AIR DURING EMERGENCIES

Queensland Remote Aboriginal Media (QRAM) is a non-profit Aboriginal Corporation and is one of eight Remote Indigenous Media Organizations (RIMOs) in Australia. Based in Cairns, Queensland, QRAM provides a range of services to radio stations in the remote Queensland communities: Many of them regularly have to face extreme weather conditions. RIBS stations are often the only terrestrial broadcasts receivable in Aboriginal areas.

Through its "Black Star" network, QRAM provides remote Queensland stations with dedicated engineering services as well as support programming. These new programs also feature the latest mainstream music and news.

This allows its audience to enjoy the same popular songs and artists as people living within larger population centers.

Gerry Pyne, QRAM general manager, says: "It is not reasonable to impose minority formats on people living in remote areas where they do not have a choice to listen to something else if they happen not to like a minority format."

Rainstorms are quite common in those areas, so satellite delivery regularly suffers from impairments, which can easily last for many days. QRAM designed and adopted a specific content distribution scheme, which allows stations in the Black Star network to go on air seamlessly with the scheduled content even in case of extreme weather conditions. QRAM is also committed to keep information and programming going during local emergencies.

QRAM distributes its own-produced content, as well as new music, news programs, advertising and any "recorded" content via IP, in an asynchronous way.

Each transmitter site operated by its affiliate stations receives and locally stores the content in a continuous background process, through a geographic WAN

The QRAM studio used for Black Star productions.

Lavinia Collins, QRAM producer, voice tracks from QRAM studios to remote sites.

deployed over locally available telecom connectivity, including ISDN, ADSL and 4G mobile modems. QRAM also produces and distributes a daily data log with the schedule of events.

LOCAL STORE AND PLAYOUT

"We store programming at each transmitter site," Pyne explained, "where a local playout system generates a local stream according to the corresponding market, then directly feeds the collocated transmitter, exactly as if that stream was coming from a satellite or radio link."

That way, each transmitter, all of which operate autonomously and independently from each other, can seamlessly air "its" content according to the expected schedule as long as AC power is available at transmitting location, even during the worst rainstorms or cyclones when no terrestrial or satellite communication is available.

After adverse events, when IP connection to the affected site becomes available again, the system operated by QRAM automatically realigns the content server at the transmitting site that experienced a loss of connectivity, sending it any content that has become available in the meantime.

The core of the system deployed by QRAM is based on a Wheatstone WheatNet-IP audio network and on the "Site Replication" functionality of the RCS Zetta automation system.

A Wheatstone I/O Blade node sits at any access point in the network, including transmitter sites. A Blade-3

When we shut the door and walk away from the transmitter, we don't know how long it's going to be before someone can get back there again.

— Gerry Pyne

receives QRAM programming from Cairns via IP audio connectivity, which is stored locally at the transmitter site and later played back via the RCS Zetta system.

"The Blade-3 and Zetta system are tightly integrated and able to exchange commands easily because of Wheatstone's ACI protocol," said Dee McVicker, spokesperson for Wheatstone. "Moreover, the Blade-3 also has an audio clip player onboard where emergency programming is stored."

SITE REPLICATION

Failover to the player is automatic in the event that the WheatNet-IP audio system detects silence. The system, says the company, is self-contained and fully autonomous, providing intelligence, redundancy and system recovery in the event of a failure.

QRAM recently installed a transmitting site on Mount Tully, near Cooktown (Far North Queensland), ensuring

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broadcasts to a small community of 5,000 people, many of them members of the Guugu Yimithirr aboriginal tribal nation. Cooktown is located in one of the most active cyclone regions in the world.

With the help of technical management and consultancy services company Agile Broadcast, the station began broadcasting on 96.9 FM in 2016, featuring a WheatNet-IP audio I/O Blade and RCS Zetta playout system sending

Gerry Pyne, QRAM general manager, works during installation activities at Mount Tully.

QRAM equipment sits in a rack located at Mount Tully transmitting site.

signals to a Nautel VS transmitter atop Mount Tully. All of the equipment is networked to the group's main hub studio about 325 kilometers (200 miles) away in Cairns, where programming originates.

"When we shut the door and walk away from the transmitter, we don't know how long it's going to be before someone can get back there again," Pyne concluded. "Should Mount Tully lose internet connection, even for a few days, the station would be able to continue broadcasting as usual."

Davide Moro reports for Radio World from Bergamo, Italy. ∎

QRAM Goes Live ViA Tieline

QRAM performs regular live remote broadcasts over IP, which are integrated into local programming across the Black Star radio network. The network was recently the first Australian broadcaster to purchase Tieline's ViA codec for remote broadcasts.

"With ViA you can arrive minutes before a broadcast, set up the headset mics, check the connection and go live. There's no need for a truck with loads of equipment anymore," said Gerry Pyne, general manager of QRAM. "ViA has an internal battery which lasts for several hours and it's also a great backup if external power is lost. In the bush you don't have much choice when it comes to technologies, so the fact that ViA can use dual USB cellular, dual LAN and Wi-Fi connections delivers the flexibility we require."

An optional POTS or ISDN module supports connections over those networks.

Above: Announcer Greg Reid (left) interviews Hudson Dagge (center) at the launch of Cooktown 96.9 FM on the Cape York Peninsula.

Left: The Tieline ViA codec in Cooktown streams live to a Commander G3 codec at Black Star Central in Cairns.

FRI Helps Radio Serve Africa's Farmers

Supports African broadcasters to provide radio services that share knowledge and amplify the voices of small-scale farmers

By **Davide Moro**

OTTAWA, Ontario — George Stuart Atkins, born in Oakville, Ontario, exactly 100 years ago, was a passionate farmer and radio broadcaster. He helped found the Junior Farmers of Ontario Association in 1946, the start of a lifelong effort to improve the work and pride in farming as a profession.

From the 1950s to the late 1970s, he was the popular voice of the Canadian Broadcasting Co. noon farm radio broadcast. "Serving agriculture, the basic industry. This is George Atkins," was his signature sign-off from CBC.

Through his work as a CBC farm radio broadcaster, Atkins travelled the world meeting with agricultural leaders and farmers, as well as with farm radio broadcaster colleagues from several countries.

ADDRESSING THE AUDIENCE

In 1975, the CBC, All India Radio and the BBC invited Atkins to travel to Zambia to organize a workshop for a group of African farm radio broadcasters. Part of his approach was to visit local farms to interview and record farmers.

FARM RADIO INTERNATIONAL

Chatting with some of African colleagues on a bus ride to one of the farms, Atkins was astonished to learn from a Sierra Leonean colleague that his latest broadcast dealt with how to clean and adjust sparkplugs on tractors. He asked how many farmers within the range of the broadcaster's station might have a tractor. The answer was maybe 10 out of 800,000 listeners.

Atkins wondered about all the other listeners, the majority of whom surely wouldn't find this information useful, and questioned how to make it more pertinent to their specific situations, such as how to raise oxen and make use of animal manure as a fertilizer rather than commercial fertilizer.

His travel buddies quickly responded saying they didn't have access to that kind of information. It was most likely at that moment Atkins conceived the funding idea of the Developing Countries Farm Radio Network (DCFRN), now known as Farm Radio International.

Nearly all local farm broadcasters in Africa could speak English or French — the two official languages of Canada. Atkins reasoned that, when properly fed by adequate information, those broadcasters could render them from English or French into locally understandable languages and then disseminate the information to benefit millions of small-scale farmers.

From that original idea and following retirement from the CBC, in 1979 Atkins created Developing Countries Farm Radio Network. In the same year, 34 broadcasters in 26 countries received the first package of scripts via mail.

This undated photo show George Atkins working at his desk at the CBC.

Grace Amito (right), radio presenter at Mega FM in Uganda, interviews a farmer in Abululyec in Northern Uganda.

RADIO PARTNERS

Farm Radio International doesn't produce radio programs, rather it handles the aggregation of information potentially useful to farmers located in developing regions (very different from the kind of information required by farmers located in, for example, Europe or in North America), and produces scripts in English and French.

Local farm broadcasters translate those scripts into local languages and produce the content to be aired, allowing the stations to deliver region-specific information and properly addressing the local challenges.

As word spread, more communicators joined, and the demand for materials increased. Today Farm Radio International still is a nonprofit organization, and produces scripts for 650 participating radio partners in 40 African countries, free of charge.

Atkins passed away in 2009 but his endeavor continues. As of 2008, the Developing Countries Farm Radio Network became known as Farm Radio International. While the organization still works to provide broadcasters in developing countries with resources to help them

serve farming audiences, in today's digital age it shares these via email and USB drives rather than by post.

Each of the scripts by Farm Radio International can be downloaded either individually from its website or as a "Resource Pack" dealing with multiple subjects and made up of interview- and drama-based scripts as well as background information on local farming issues.

One of the latest packs deals with the value chain for poultry and cowpea; using insects as chicken and fish feed; the benefits of using high-quality rice seed in northern Ghana; preventing HIV and AIDS in people with disabilities; the benefits of owning and caring for donkeys; best practices for producing Irish potatoes; and a feature on a farmer who makes and uses his own neem-based bio-pesticide.

ADVANCED PROJECTS

Farm Radio International also produces broadcaster how-to documents, which provide valuable guidance for broadcasters looking to improve their skills, as well as a weekly news service, Barza Wire, which shares farming news written by African journalists, along with relevant

events, opportunities, and resources.

The organization says it also facilitates online discussions for broadcasters in English and French and offers both online and face-to-face training opportunities to help African broadcasters produce the "best-possible" radio programs for small-scale farming communities.

Recently, Farm Radio International also began developing special projects, usually funded by government bodies or charity organizations, targeting specific topics as well as local issues.

While standard scripts by FRI address topics that are of general interest across their entire target area, the "Impact" projects address a very specific issue in a well-defined area or region. In the last fiscal year, Farm Radio International worked with 118 broadcasting partners on 35 Impact projects in nine countries.

One of these is called "Scaling Up Resilience for One Million People" (SUR1M). According to the organization, it aims to build resilience by increasing preparedness in the face of these climate extremes, deepening gender-responsive mitigation practices, and building critical assets by reinforcing the disaster risk management capacity of 19 communities in Niger and Mali.

Kwabena Agyei, FRI script writer, and Blythe McKay, FRI's director of broadcaster resources, within the Brong-Ahafo Region of Ghana.

Digigram Adapts to Local Challenges

India's Phase III is the latest phase of the country's radio digitization rollout planned by government.

A total of 839 frequencies are involved, enabling approximately 33 million people access to information across the country. As of late 2016, some 135 frequencies had been allocated.

Digigram says it's working closely and actively with major local public, private and community broadcasters in the country. It has delivered several Iqoya *Link units to Indian media conglomerate Sun TV group, owners of radio stations Red FM and Suryan FM, through its India-based partner Technomedia Solutions Pvt. Ltd.

Digigram explains that it configured the equipment delivered to Sun TV Group to meet local challenges, such as severe weather conditions, communication across vast distances and remotely located transmitter sites and infrastructures. As part of the modifications, Digigram says it reinforced the units' lightning protection system.

The company adds that it also designed a "lite" version of the Iqoya *Link, the Link/LE, in order to allow community radio stations in rural areas (as well as larger stations) benefit from the same features of the Iqoya* Link but at a more affordable price, thus reducing the initial STL investment.

In addition, it says stations in other countries are now benefitting from these updates, such as Malawi-based stations Ufulu FM and Galaxy FM.

Radio can effectively support these efforts by providing information and education on subjects including technologies, how to promote good governance and women's empowerment, while it can also foster behavior change for resilience.

This project saw selected radio partners in the Gao region of Mali and the Tillabery region of Niger air participatory radio campaigns, mini-dramas and interactive radio programming.

LISTENING GROUPS

Radio programming also aims to improve knowledge and engaging citizens and officials on women's rights. In many cultures women are left out from their community's key moments, including listening to the radio — this device, as well as the cellular phone (if any) usually stays in the man's pocket.

So Farm Radio International's broadcasting partners fostered their audience to report back at what time of the day women could have access to the radio receiver; this way, they could schedule content aiming at fostering women's empowerment and awareness at those times.

The organization is also promoting the creation of

Clara Moita, radio presenter at Radio 5, in the station's studio in Arusha, Tanzania.

women's listening groups in order to allow them to listen together to radio broadcast, giving them the occasion to immediately discuss and share their thoughts among each other. It has also worked to use radio to start a conversation around youth mental health in Tanzania and Malawi.

Farm Radio International is funded by several international government bodies, including Global Affairs Canada and Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH, as well as by private donors, including the Bill & Melinda Gates Foundation. ■

TRT Installs 30 Nautel FM Transmitters

Turkish Radio-Television Corp., the country's national public broadcaster, is boosting its roster of FM transmitters with the acquisition of 30 5 kW Nautel NV^{LT} FM transmitters, which will be installed over the next few months at key locations throughout the country. TRT will have the option to purchase an additional nine transmitters if needed.

The transmitters will be used to assist TRT's broadcast of channels, which include one local, five regional and four national radio services, as well as six AM radio broadcasts. Use of the Nautel transmitters, which feature the company's Advanced User Interface, will allow for TRT to perform remote management from its headquarters in Ankara.

The transmitter's operational features include onboard direct-to-channel digital exciter, IP and streaming audio input ability, advanced scheduling capabilities, instrument-grade spectrum analyzer, and an optional onboard Orban processor.

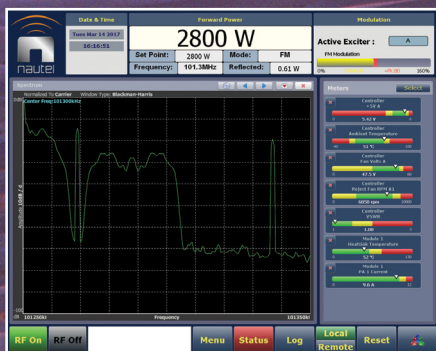Nautel has worked previously with TRT, providing transmitters to support its broadcast infrastructure.

FBC Strives to Keep Ethiopians Informed

Commercial national broadcaster also helps country's community broadcasters disseminate information

ADDIS ABABA, Ethiopia — Fana Broadcasting Corporate S. Co. is an Ethiopian commercial national broadcaster and multilingual radio station. It used to be a clandestine anti-government Voice of Liberation (Voice of EPRDF) before its establishment as "Radio Fana S.Co." in 1994.

With the defeat of the notorious military regime by the EPRDF-led struggle, Radio Fana was reorganized under the ownership of the four financial regional endowments. The major shareholders of the company are Effort, Tiret, Tumsa and Wondo.

FBC leverages its technical knowledge and experience to provide services to smaller community broadcasters throughout Ethiopia.

In January 2011, Radio Fana Sh. Co. became Fana Broadcasting Corporate S. Co. to facilitate entering into the TV business. FBC currently operates three shortwave, one medium-wave and 12 FM transmitters nationwide. It says that it incorporates commercial and public service roles and advocates developmental journalism to foster nation-building and fight against poverty.

With some 369 journalists and a total staff more than 800, FBC's mission is to offer "quality media services by providing informative, educational and entertaining programs that help build a democratic and prosperous Ethiopia where all citizens benefit from such developments." The broadcaster is also working on upgrading its engineering support for the national broadcasting equipment.

The news-talk-variety/information and entertainment station says it actively promotes and protects equality among ethnic, gender and faith-based communities and nations and nationalities to foster their values, languages,

Worldcast Systems

The pre-wired integrated transmitter rack located in the Southern Nations, Nationalities' and Peoples' Regional state of Ethiopia at a SNNPR Radio and TV regional station, incorporates an Ecreso 1000 W FM transmitter with audio processing and a WorldCast Systems FM receiver.

Each turnkey package is based on an Ecreso FM transmitter but customized to the customer's requirement. WorldCast says the compact Ecreso FM 1000 W transmitter is often selected as the core system as it offers a digital modulator, various in-built features, remote control capability and efficiency of up to 72 percent.

The French company supplies a fully integrated rack with antenna and cabling as needed, as well as additional devices such as audio processors, RDS encoders and audio codecs when required. "This integrated approach is ideal for FBC's customers who include many university and community stations. FBC's engineers perform the on-site installation and commissioning," explained WorldCast. ∎

Photos: Worldcast Systems

Muluken Berhanu (left), engineering and project directorate director at FBC, poses with Abate Daba, FBC senior technician (seated) and Tesfagegnehu Sitotaw, project coordinator (second from left), along with the installation team at the new transmitter site.

culture and history.

FBC broadcasts in five national languages — Amharic, Afan Oromo, Somali, Afar and Tigrigna Sidama and Wolayta. It airs a total of more than 800 hours of content per week across its services. It can be heard online at *www.fanabc.com*.

In addition to its own broadcasting operations, FBC leverages its technical knowledge and experience to provide services to smaller community broadcasters throughout Ethiopia who lack the in-house skills required to get a radio station up and running. For these activities, FBC sought out a partner who could provide a turnkey FM transmitter package for its customers and found this in WorldCast Systems.

The FBC recently installed a turnkey rack from WorldCast Systems at this SNNPR regional station.

RADIO'S ROLE IN DEVELOPING COUNTRIES

Libyana Hits FM Benefits From Accurate Planning

Commercial FM station encourages knowledge, optimism in "recovering" nation

BENGHAZI, Libya — Libyana Hits FM is a private CHR station, broadcasting in Benghazi and its surroundings on 100.1 MHz as well as online through a website (*www.libyanahits.fm*) and mobile applications.

Libyana Hits FM, managed by a group of Libyan youth with experience in media, broadcasting and music production, claims it was the first station to air only "revolutionary" songs.

According to its website, the station seeks to "take the steps forward in encouraging a modern society that values art, creativity, knowledge, optimism and is open to creativity and cultures around the world."

The station strives to train and educate its audience, in an effort to reduce unemployment.

The station also prides itself on supporting local talent, helping to bolster a market where creative talent can pursue their professional dreams, and as a result improve Libyan culture and exercise "soft" power. Post-war Libya is coping with high levels of unemployment, ex-combatants and a ruined infrastructure — the station emphasizes that it is "keen on continuously training and educating local assets in order to help them free themselves from unemployment, and pursue a career in the vibrant media sector."

Libyana Hits FM recently had the opportunity to utilize an existing tower, which offered the station coverage of the entire city and its surrounding areas. United Kingdom-based systems integrator Broadcast Gurus, a sister company of Broadcast Warehouse, assisted Libyana Hits FM in providing the station with the best possible coverage from the tower.

Brendan Lofty, sales manager at Broadcast Gurus, explained that after careful planning and calculation,
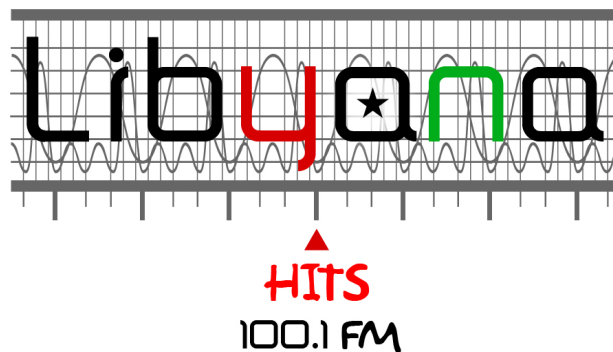
they equipped the station with the full transmission, STL and studio package from various manufacturers in the industry.

"In order to make sure Libyana Hits FM remains on air in any occasion, we also provided the station with the backup transmission for an added peace of mind," he said.

Under the terms of its license, Libyana Hits FM required a 600 W transmitter, which meant great effort in properly designing the transmitting antennas in order to achieve the best possible coverage. "Since Benghazi is a coastal city, we made sure the signal was directed inland to make certain the energy was used effectively, sending the signals to the city and not out to sea," Lofty explained.

Broadcast Gurus came up with a solution using double dipole antennas, modeled to offer the best coverage on each of the tower faces; two BW Broadcast TX600 FM transmitters with a fully automatic changeover unit and high-power relay; and low-latency MDO STL-IP codecs with Ubiquity links for the short link from the studio. The IP links also allow the transmitters and audio processors to be linked back to the studio.

"The experience working with Broadcast Gurus has been very satisfactory," concluded Samer Saed, chief operations officer at Libyana Hits FM. "Their team was extremely professional, meeting their targets while providing high-quality service and advice. We selected them after having carried out extensive research and are very pleased with our choice." ∎

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Dziko FM Sticks to the Basics

Malawian private station targets rural communities, helping them develop and sustain cultural values, tradition

By **Lameck Masina**

LILONGWE, Malawi — One of the latest privately-owned radio stations to hit the Malawi's airwaves, Lilongwe-based Dziko FM, is leaving no stone unturned to find recognition in the country's competitive radio industry.

With its "people-centered approach," more than 100 radio listener clubs have thus far been formed for the station in nearly all districts of central Malawi. The groups form around people in a community who listen to a certain radio station of their choice for a particular reason. The station is also well-known for promoting local music.

STRAIGHT TO TOP

"There is no magic potion for our success," said station Founder and Chairman Chikumbutso Mtumodzi, "we just prioritize people's interests in all our programming. People want good content, people want to listen to nice music and people want to feel connected to what they hear on the radio — so this is what we are doing."

Mtumodzi said the radio largely targets rural communities to help them develop and sustain their cultural values. "For instance we air programs that promote culture, such as Nyau, a traditional dance of the country's largest ethnic group, Chewa. We play music for different traditional dances. The goal is to encourage and give them a chance to appreciate their culture," he said.

According to Mtumodzi, the rationale of broadcasting via satellite is to awaken and use modern changes and advances in information technology.

"We are moving with the changing times. Satellite reception is clear and we want to give our audience the best sound quality in addition to good programming,"
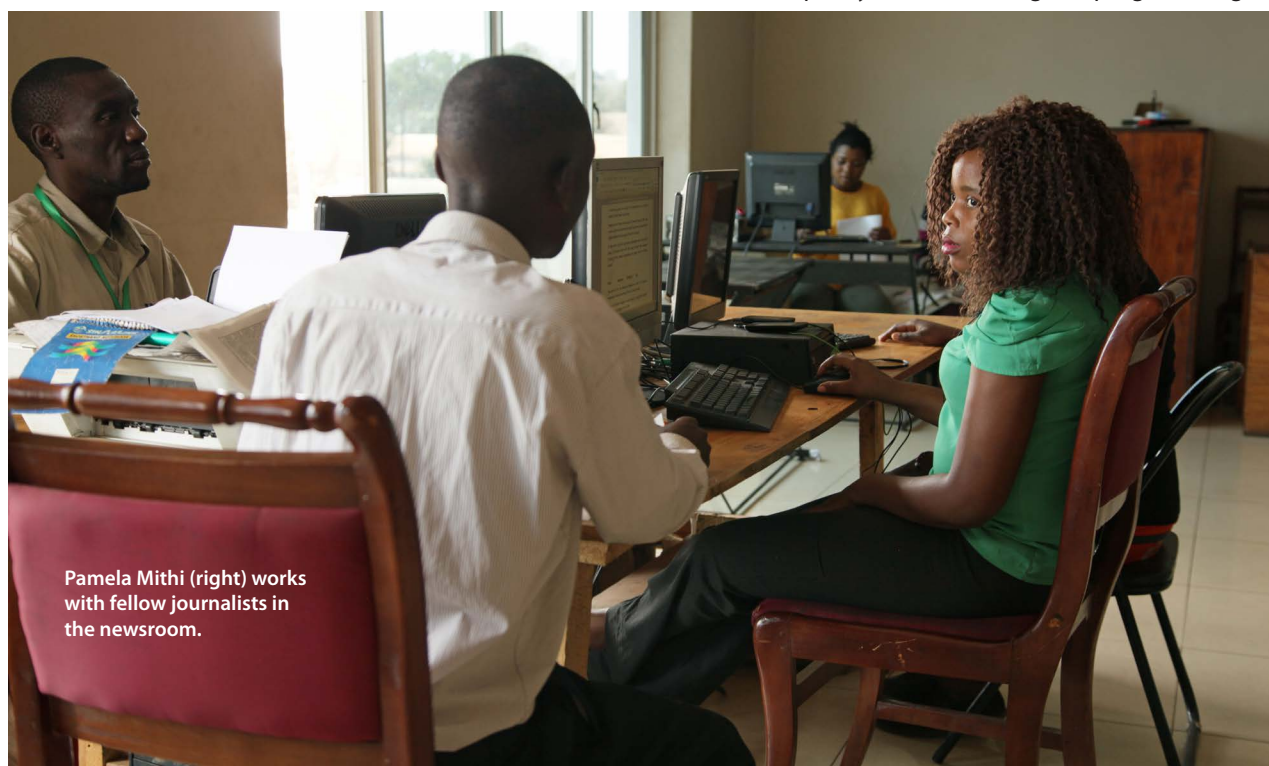
Pamela Mithi (right) works with fellow journalists in the newsroom.

Lameck Masina

Lameck Masina

The station's producer, Thom Ali, puts together a program in the production studio.

he said.

The station boasts 22 full-time staff members most of them work in shifts. It also has interns.

Radio programs that have contributed to the station's popularity include "Kadzutsa" ("Breakfast"), "Umoyo wa Mayi" ("Woman's Health"), "Mchikumbe pa Ntibu ("A Farmer on Radio") and a popular phone-in program, "Kwachitikanji," ("What's Happening").

ADVERSITY

In June, however, the popularity of Kwachitikanji nearly landed the station into trouble when the Malawi Communications Regulatory Authority (MACRA) summoned Mtumodzi over the contents of the program, which MACRA officials claimed breached the broadcasting tenets of "fair play." MACRA said that during the program, the station was letting callers use hate speech and warned Mtumodzi to suspend the phone-in program.

Because of this, some of the advertisers threatened to withdraw their sponsorship of the radio programs if the station continued to host opposition politicians and other government critics who they said talk ill of the government.

"I took that as a disgusting and sad development," said Mtumodzi."We report on anything that concerns the life of a Malawian. We are not here to please anyone; we are not here to nurse people's political egos. We represent the common person." None of the threats materialized, thanks to fruitful discussions the radio had with MACRA and with its sponsors.

MACRA has long been asking broadcasters airing live phone-in programs to install profanity delay systems in their studios that would help broadcasters control the broadcast of hate speech and foul language. Only a few of the country's stations make use of the technology however, mainly due to financial constraints.

News and current affairs is another area that has helped the station increase its audience. The newsroom airs three main news bulletins per day in both the local language, Chichewa, and English. News briefs and updates are aired every hour.

"We strive to air balanced news that is important to our audience and without compromise," said Pamela Mithi, head of the news and current affairs department.

Good sound quality has also helped Dziko FM attract listeners. The station's engineer, Norwin Mwamadi, says the station owes this to the gear they have installed. The station's on-air studio is fitted with an Allen & Heath ZED-12FX 12-channel sound console, Behringer HPX2000 headphones and Behringer C-3 condenser mics. It also makes use of a Fostex PH-5 headphone amplifier, Fostex PM0.4 active studio monitors and a Barix Extreamer 500 IP audio encoder/decoder. The production studio is fitted with a Peavey mixer and Behringer headphones.

"The equipment has worked to our advantage," commented Mwamadi. "I am told that many listeners tune into our broadcasts not only for its content but also because of the quality sound. When we started, we were only heard around [the capital] of Lilongwe. Now we are planning on expanding our coverage so that we can reach the entire southern region of the country," he added. ∎

Tieline's Affordable Codec Solutions

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Use Bridge-IT XTRA with low cost 5GHz wireless bridges for the ultimate inexpensive STL path. Bridge-IT XTRA features dual internal power supplies, built-in SD card backup, RS232 data, 4 GPIOs, plus complete remote control using the Toolbox graphical user interface.

For remotes, install Bridge-IT at the studio and use Tieline's affordable Report-IT Enterprise smartphone codec app to go live in seconds over cellular or Wi-Fi networks with crystal clear 15kHz quality audio!
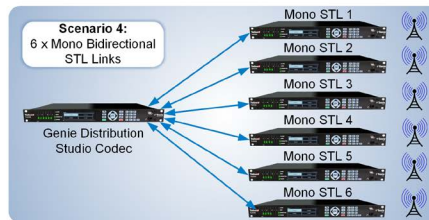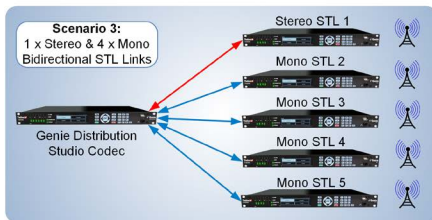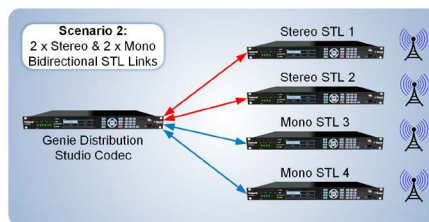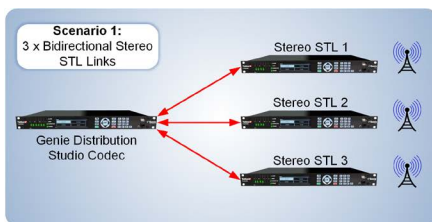
Genie Distribution bidirectional connection options

Genies Deliver Award Winning Solutions

Multi-award winning Genie STL and Genie Distribution codecs are designed for mission critical STL and audio distribution applications, delivering:

- Rock solid links over managed and unmanaged IP networks.
- Multiple layers of backup.
- Full remote control and monitoring via a web-GUI and SNMP.

Both codecs offer multiple layers of transport redundancy over IP, ISDN and POTS. Genie STL is for stereo applications and Genie Distribution supports multi-unicasting to 50 end points, multiple multi-unicasts, or multiple multicasts. Genie codecs include SmartStream PLUS redundant IP streaming, automatic jitter buffer adjustment, backup audio file playback, plus 4 GPIOs, RS232 data and more.

Merlin & Merlin PLUS for Multiple Remotes

Merlin and Merlin PLUS codecs can deliver multiple simultaneous remote broadcasts over IP, ISDN and POTS. Merlin supports bidirectional stereo plus a separate bidirectional IFB channel, or up to two mono connections with different Tieline IP codecs or smartphones using Report-IT.

The multi-award winning Merlin PLUS offers a simple, compact and scalable solution with support for up to 6 bidirectional mono connections with IP codecs, or smartphones using Report-IT. Alternatively, connect two stereo connections, each with a separate IFB channel.

Connect Tieline's ViA, Report-IT, Commander G3 and i-Mix G3 codecs for low delay, high fidelity audio with full remote control and rock solid connections. SmartStream PLUS, automated jitter buffer management and a wide selection of high quality, low delay algorithms are included as standard.

Merlin PLUS codec at the studio

6 bidirectional mono remotes

China Advances Its Digital Radio Standard

"Home-grown" CDR digital solution could allow the country to reach a large number of digital listeners

By **Davide Moro**

BEIJING — China Digital Radio, broadcasting in the FM band, commonly referred to as CDR, has been operational since November 2013. It is labeled as GY/T 268.1–2013 and was published by the authority State Administration of Press, Publication, Radio, Film and Television of the People's Republic of China (SAPPRFT).

At the 2016 NAB Show, a session focused on the CDR standard and its rollout plans supported by the Chinese authorities. SAPPRFT's Director of the Academy of Broadcasting Science Peng Gao told the audience about the background of the CDR Project and the general state of digital radio broadcasting in China.
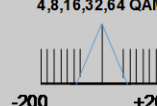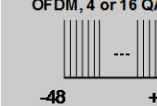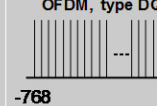
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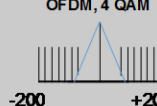
Apart from the technical figures and the performance of the CDR standard, the audience appeared very interested in the announcement by Gao that digital radio rollout plans included the coverage of more than 560 cities in China before the end of 2016, ranging from the southern to eastern regions of China.

At the time of last year's spring NAB Show, three trial networks were on air in Beijing, Guangzhou and Shenzhen. Gao's statements demonstrated China to be a country capable of reaching the highest number of digital radio listeners worldwide in a short period of time, thanks to its own "home-grown" CDR digital solution.

One of the commonly reported difficulties of digital radio development and popularity is the — still-limited penetration of digital receivers in houses and (where applicable) cars. Chinese authorities, well aware of this matter, succeeded in fostering the development of a new generation of digital receivers.

During his speech, Gao presented the latest generation silicon chipset, with a footprint comparable to the smallest coin available in China. "Commercial receivers are now available on the market from leading manufacturers," he said. "Portable receivers feature a single-board layout with onboard SoC chipset, SD card reader and USB ports. The form factor is comparable to same-class analog receivers."

Parameter	FM	HD Radio	China Digital	DRM+	DAB+
Frequency	87.5 MHz – 108 MHz Band II	55kHz - 1705kHz 87.5 MHz – 108 MHz	87.5 MHz – 108 MHz Band II	47 MHz – 68 MHz 87.5 MHz – 108 MHz 174MHz – 230 MHz	174 MHz – 240 MHz Band III
Programs / Channel	1	1 to 4 (max)	1 to 4 (or More)	1 to 4 (max)	Typically 9 to 24 (64 max)
Data / Channel	RDS 1,2 kBit/s	Flexible Program Associated and Non Program Associated Data rates	Flexible Program Associated and Non Program Associated Data rates	Flexible Program Associated and Non Program Associated Data rates	Flexible Program Associated and Non Program Associated Data rates
Analog Simulcast	N/A	Yes	Yes	Yes*	No
Channel	200 kHz	400kHz	400kHz	96 kHz	1.5 MHz
BW Capacity	N/A	96/124 kBit/s	96 kBit/s-1.5 MBits/s	96/kBit/s	1.5 Mbits/s
Modulation	Single Carrier FM -100 kHz +100 kHz	Multi-carrier (up to 524) OFDM, 4 QAM -200 kHz +200 kHz	Multi-carrier (up to 524) 4,8,16,32,64 QAM -200 kHz +200 kHz	Multi carrier (106) OFDM, 4 or 16 QAM -48 kHz +48 kHz	Multi Carrier (1536) OFDM, type DQPSK -768 kHz +768 kHz

GatesAir/Tim Anderson

The chart highlights the key characteristics of FM, HD Radio, China Digital Radio, DRM+ and DAB+.

HYBRID BROADCASTING

CDR operates in the FM band (87 to 108 MHz) and is a type of in-band on-channel system. IBOC is a hybrid method for simultaneously broadcasting digital radio and analog radio in the same frequency band by placing additional digital subcarriers in the sidebands of the AM or FM channel.

Current IBOC systems include HD Radio, FMeXtra, CAM-D and DRM.

Gao explained that in 2011, the Chinese Academy of Broadcasting Science, TiMi Tech and various broadcasters began working on the CDR research project, carrying out lab and field tests and drafting the standard.

CDR's key features include flexible spectrum utilization modes and the capability to fit both FM and AM broadcasts. As regards to error-correction, CDR developers decided to use LDPC algorithms as the main FEC schemes. This, says Gao, proves more powerful than

Peng Gao, director of the Academy of Broadcasting Science at SAPPRFT, during its speech at the 2016 NAB Show.

other FEC systems used in other digital radio standards. Audio compression is based on the Chinese DRA coding scheme.

In the FM band, CDR transmission modes are based on 100 kHz sub-bands, and a single broadcast can span over 200 to 800 kHz. The simulcasting of analog FM and digital signals requires a 400 kHz channel. Digital-only broadcasts require a minimum of 200 to 800 kHz.

The CDR system makes use of the OFDM modulation and includes QPSK, 16-QAM and 64-QAM modulation levels along with four LDPC code rates — 1/4, 1/3, 1/2 and 3/4.

CDR defines three possible OFDM transmission modes: Mode 1 for large area SFN operation; Mode 2 for high-speed mobility; and Mode 3 for higher data rates at the expense of a shorter cyclic prefix, suitable for quasi-stationary reception.
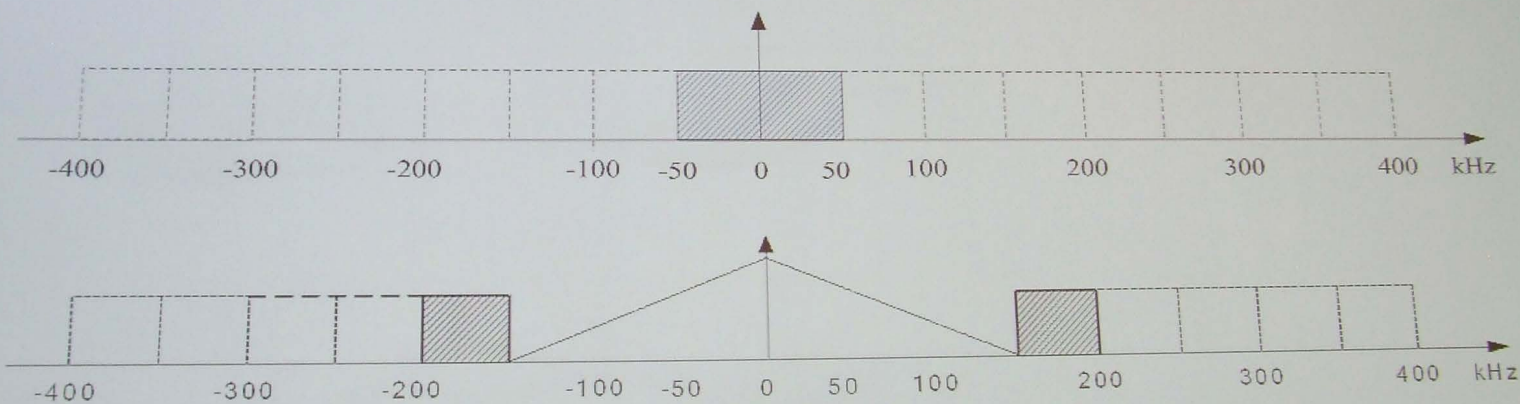
Spectrum occupation guidelines of the China Digital Radio standard.

Coverage in Beijing

A map showing China Digital Radio coverage in Beijing along main roadways.

PERFORMANCE

Depending on the LDPC code rate and the adopted transmission mode, net bitrate ranges from 36 to 356.4 kbps per each 100 kHz sub-band, with a maximum spectrum efficiency of 3.56 bit/Hertz. A single 200 kHz channel can then carry a useful bitrate ranging from 72 to 712.8 kbps.

"According to our studies, CDR requests a minimum C/N ratio, which is about 2 dB lower than the C/N required by DRM systems under comparable receiving conditions," said Gao.

"This is also due to the efficiency of LDPC error correction algorithms," he said. Gao illustrated how under typical AWGN conditions CDR (FM) requires a minimum C/N equal to -0,57 dB, while DRM requires 1.3. In SFN opera-tion, CDR minimum C/N is equal to 3.66, while DRM 5.4.

Audio compression in CDR adopts the latest version of the Chinese-built DRA+ codec, recently enhanced with Spectral Band Replication and parametric stereo tech-nologies, thus matching the AAC+ v2 codec in terms of nominal features.

Gao said that, according to their experience, DRA+ at 24 kbps features a sound quality "near FM," while at 48 kbps sound quality is "better than FM" and at 64 kbps with 22 kHz bandwidth sound quality is "comparable to MP3 128 kbps."

The Academy of Broadcasting Science ran compre-hensive test and measurement sessions on the three networks, both static and "en roulant," which Gao said confirmed the standard's "excellent" QoS. ∎

BBC World Service Launches BBC Somali App

BBC Somali's radio program and news headlines will now be available to listeners around the world for free courtesy of the new BBC Somali App. Created by BBC World Service and in-language mobile distribution platform AudioNow, BBC Somali App is available through phones, tablets and other iOS and Android connected devices.

Free radio programs are available through the BBC Somali App via an audio player or standard-rate telephone call using Interactive Voice Response technology in the U.K., U.S., Nigeria, Kenya, South Africa, Sweden, Norway and Australia. Headlines and news summaries in text are also available.

In addition, users of the app can also directly link to *bbcsomali.com* through a news headline or summary.

www.bbc.com/somali

Onair Medya Equips Afritel

Afritel Radio Station in Abuja, Nigeria, rang in the new year with a bevy of new broadcast systems that it acquired from Onair Medya. The Turkish company delivered its 6 kW and 4 kW FM transmitters, antenna and radiolink systems to the station.

According to Onair Medya, its FT6K 6 kW transmitter features two 3 kW amplifiers, with the ability run without interruption if one amplifier fails by reducing the power to 2 kW. It is designed with LDMOS technology, features an automatic changeover system for N+1, and faults can be monitored by the display on the front panel and the internet. The FT4K model features an LDMOS transistor, as well as all the features of the FT6K.

www.onair.com.tr

DRM Announces Enterprise Award for Africa

Individuals or organizations from Africa now have the opportunity to win The DRM Enterprise Award 2017, with entries currently being accepted.

The DRM Enterprise Award winner is selected by an independent board of specialists from organizations in the region and DRM Consortium reps who judge how a candidate promoted, applied and actively supported Digital Radio Mondiale. The winner will receive a cash prize.

Previous winners of the award include the Solomon Island Broadcasting Corp., and engineers from Radio Republik of Indonesia.

www.drm.org