

# **Modern • Telecommunications for the Poor**

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# Conventional Approach

- Shared access – examples:
  - The Grameen Phone
  - Telecenter
- With shared access, the weak are again on the bottom rung

# Poverty and Disability

- The “chronic” poor are often those with multiple handicaps (physically challenged, lower caste, illiterate,...) – these are the most important to reach
- The “text challenged” are the blind and the illiterate: audio works for both
- Radiophony is therefore audio-centric

# FM Radio

- The only telecommunications technology that the poor can afford to individually own
- A simple transmitter, costing a couple of dollars, turns the poor into content producers – audio content is the easiest to produce
- But is this modern?

# Radio + Internet is a powerful combination

<http://rhzradio.net/index2.htm>

- The RHZ Amateur Radio Network is a peer to peer network based on the FCC allowance for individuals to operate a 100 milliwatt micro-radio station, RHZ uses the internet to share content between micro-stations so they can broadcast the same content at the same time. Anyone can have their own radio station, with a hobby kit as low as \$30!



of the Commonly Radio was designed with the audio directly f...  
This circuit is a very good one for the modulation of the frequency  
of the audio source and subsequent detection of the frequency  
The common collector audio pre-amp offers high gain and low  
and the audio source. It also reduces the probability of...  
... is the preferred  
... manufactured by BEL, it is





# Innovative uses of FM radio

- Simultaneous translation
- Ecologically friendly public address system, using a large number of receivers located near the target audience:
  - Low noise pollution
  - Consumes very little power
  - Multiple voices can coexist
- Emergency transmitter after an earthquake

FIRST TIME EVER: Experiment using 100 short-wave radios keeps noise at Banganga Festival under control

# Why concert was music to many ears

EXPRESS NEWS SERVICE  
BOMBAY 7

**H**OW does one organise an open-air music festival in a silent zone, without court-ing a contempt of court for breaking noise-pollution rules?

For a lesson in an experiment gone right, turn to the just concluded Banganga Festival at the Vallabhnagar tank.

Using 100 short-wave radios, or transistors, the organisers not only kept the sound decibels within the 100-m concert area within the permitted levels, they also entertained over 250 music aficionados for two days and ensured no sound travelled out of the concert area.

Instead of having speakers on the stage, the organisers experimented with what's called a 'distributed sound point'.

Transistors were used



At the 13th Banganga Festival, an experiment to curb noise pollution won kudos. The only 'complaints' were from residents who couldn't hear the music this year. Philips donated 100 transistors for the experiment, which replaced loudspeakers—Neeraj Priyadarshi

as speakers and placed at various key points around the tank where the audience sat or stood.

explained Pandra-based Vikram Krishna (55), CEO of Radiophony, a wireless-

solutions company specialising in innovations for the disabled, and the man behind the experiment.

So sound levels never rose beyond 65 decibels within the concert area.

and the music couldn't be heard outside, agreed noise-pollution activist Samaira Abdulali who monitored the concert.

It also produced "absolute sound clarity" and led to an unexpected bonus—energy conservation, added Krishna.

He explained that the speakers-on-the-stage model often uses up to

## A kind of hush

■ 100 short-wave radios placed at key points in concert area

■ Volunteers ensure the Philips radios are not tampered with or stolen

■ The radios act as speakers, sound clarity is sharp

■ Sound stays within the concert area only

■ This technology, developed by A Bose of Bose Music Systems, has been used abroad for public address systems

30,000 watts to ensure clarity. At the 12 previous Banganga festivals, in fact, 5,000 watts was common. "The transistors consumed only 30 watts," he said.

Anita Garware (62) of the Indian Heritage Society, co-organisers of the festival with the Maharashtra Tourism Development

Corporation, called the experiment "inevitable".

The Bombay High Court's 2003 order banned the use of loud speakers in silent zones and stressed that levels couldn't exceed 45 dB in the day and 40 dB post 10 pm.

With the tank nestled in a silent zone—it lies within 100 metres of two temples—violating the order meant a

contempt of court, while adherence meant the death of the festival, pointed out Garware.

So, skipping a year, the annual festival instead spent April 30, 2004, testing the transistor experiment in the presence of noise pollution activists and police.

The only complaint we've received (this year) is that those living in the vicinity were deprived of a free concert as they couldn't hear the music in their homes this time around, laughed Garware.

**What's great about the Banganga Festival's experiment is that instead of seeking exemption from the noise pollution rules, the organisers kept within the specified limits. I do hope others will follow their lead"**

—Noise pollution activist Samaira Abdulali

NADIA MENEZES

SOMETIMES time and space work each other out to a happy ending.

Anita Garware couldn't continue the Banganga music festival past the city police's curfew hour.

So Vickram Crishna simply kept the music from wandering outside the space it was meant to be in.

The festival, held in a silent zone within 100 metres of two temples, was up against noise pollution rules.

Enter Crishna (54), a walrus-mustachioed technocrat looking for everyday problems to solve.

Over the last twenty years, the textile technologist from IIT, Delhi, moved from designing, developing and supplying modular furniture to recognising the potential of information technology (IT) for everyday living.

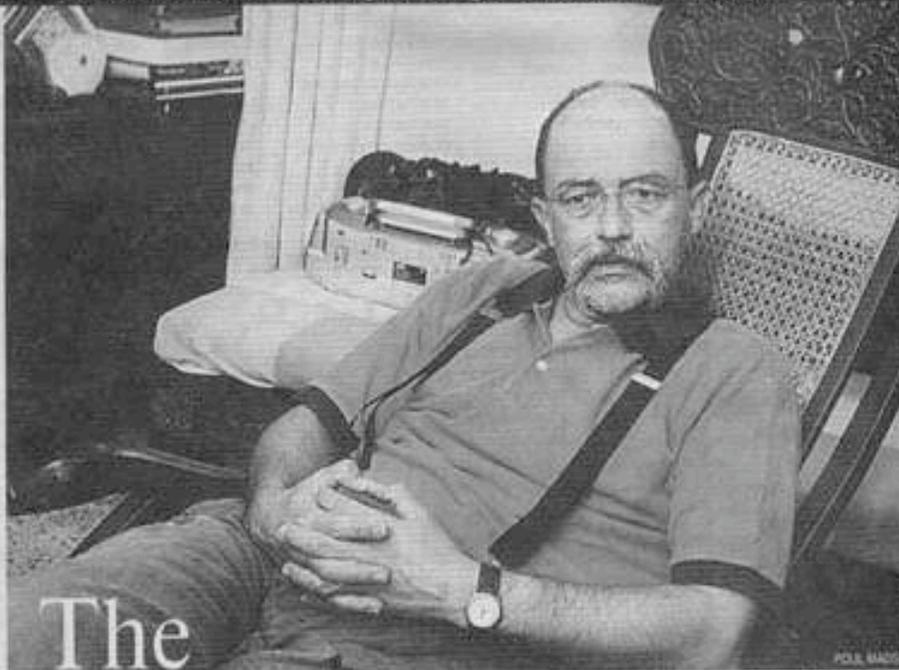
"I'd been watching IT develop and the switch was inevitable," shrugs the techie whose reading spans both "fiction and non-fiction".

And so he dabbled in journalism as managing editor of *Technocrat Magazine*, moved on to vice president (IT) at the Business India Group and finally realised his talent for design meshed with his need to make technology accessible to the ordinary man.

Thus was born Radiophony in 2000, a private company with a social conscience.

Crishna roped in fellow IIT-ian and friend Dr Arun Mehta for Radiophony's mission: To help people with no means, financial or physical, to easily access telecommunication and electronics.

Radiophony's special moment was the Hawking Project. Noted physicist



# The man who saved the MUSIC

Stephen Hawking, who suffers from severe motor disability that restricts his use of traditional mouse-click technology, was looking for a voice-based alternative.

"eLocator is now downloadable from the Net," smiles Crishna.

Then he frowns—Radiophony couldn't package and sell the technology "because we haven't been able to attract the venture capital we need."

"We want our innovations to reach the public

and for that we need investments," stresses Crishna.

In the background, there's frenzied cleaning in his cluttered single-room 'office' inside his

Bandra flat after pigeons made it home for a while.

For now, the two—Dr

Mehta works from Delhi—have kept Radiophony alive with their respective careers in consultancy. And if a funds crunch is bad, a dream project gone sour can be bitter.

Mana Radio, launched in October 2002, was India's first community radio venture. Mana gave villagers in Oravakal, Andhra Pradesh, their own voice.

Radiophony helped set it up when the state government asked it to.

Four months later, the Information and Broadcasting Ministry shut Mana down because its guidelines didn't recognise village-run community radio.

The fight to get Mana Radio back on the road continues. And Radiophony was seneschoring for new causes to champion. That's when it heard about Banganga.

The team successfully guided the proud Mumbai tradition away from accusations of noise pollution to responsible art.

At the recently concluded fest, the company used tiny transistors instead of speakers, sprinkling multiple units of them among the audi-

ence, instead of clustering them all on stage.

The results were good enough for all parties—the audience, the pollution activists and the cops.

"What's great was instead of asking for an exemption from curfew rules, they worked on the problem and stayed inside the limit," says noise pollution activist Sumaira Abdulali.

Garware, also chairperson of the Indian Heritage Society, Mumbai, is Radiophony's latest fan.

"It made a world of difference when Vickram came to us and said 'Here's how we can help'. It took the festival to another level."

The IIT-ian himself knows exactly what science must do for him.

"Technology will make the difference it has the potential to, only if the ordinary man—poor, disabled, illiterate, vernacular-tongued—can access it," he says.

THE REAL  
**hot**  
DUDE

# WiFi

- At a high point, put a small computer with at least two WiFi cards:
  - One or more, with directional antenna, for connectivity between villages
  - One with an antenna pointing down at the village
- The bandwidth can be used for telemedicine, distance learning, interconnecting radio stations...

# Lower Frequency

- WiFi needs line of sight: the cost of the mast increases exponentially with the height
- Lower frequency transmission can penetrate foliage, even walls
- Cognitive radio, for instance in the bands for terrestrial TV, analog mobile..
- WiMax designed to work without LoS?

# Wireless Optical

- A combination of a laser pointer, simple electronics and a mike could allow a farmer to send voice to a central receiver, which broadcasts this via FM radio
- RF bandwidth limited: just as optical technology dominates wired connectivity, so can wireless optical communications – RF cannot sustain 500% annual bandwidth growth
- Optical better focussed, uses far less power
- No regulatory issues

# Approach to telecom for the poor

- Don't wait for the rich countries to address such problems
- Take a fresh approach: why use FM in only the way it has been used since it was invented over 50 years ago
- More research needed in wireless optical