

## *Satellite Telephone Service for Rural Thailand*

*On the surface, modern Thailand is a country of bustling cities, successful businesses, thriving industry and well educated citizens.*

*Yet, apart from the mainstream there is another Thailand – a land of small villages and sparsely populated, outlying regions whose*



*development has not kept pace with the rest of the country. Here many people still live under primitive conditions, without the amenities taken for granted by the city dwellers.*

*As part of an ongoing program called the National Economic and*

*Social Development Plan, the Thai Government recently launched a project to develop the country's remote regions. By offering education, job training, industrial expansion and modern telecommunications, the Government planned to bring these regions closer to the standard of living enjoyed by the urban population.*

*The Government-owned Telephone Organization of Thailand (TOT) was placed in charge of telecommunications aspects of the development project. TOT contracted several private companies to provide basic telephone service in isolated areas where most of the residents had never seen a telephone.*

*SAMART Corporation, a leading Thai telecommunications integrator and communications service provider, was assigned responsibility for providing a major part of the new public telephone system. SAMART decided on a satellite solution and turned to its long-time partner, STM Wireless, for the technology. The efficient operation of the network since its installation exemplifies STM's successful record for providing superior quality, reliable telephone networks throughout the world.*

## APPLICATION NOTE PUBLIC TELEPHONY RURAL ACCESS



## A Telephone Network in the Sky

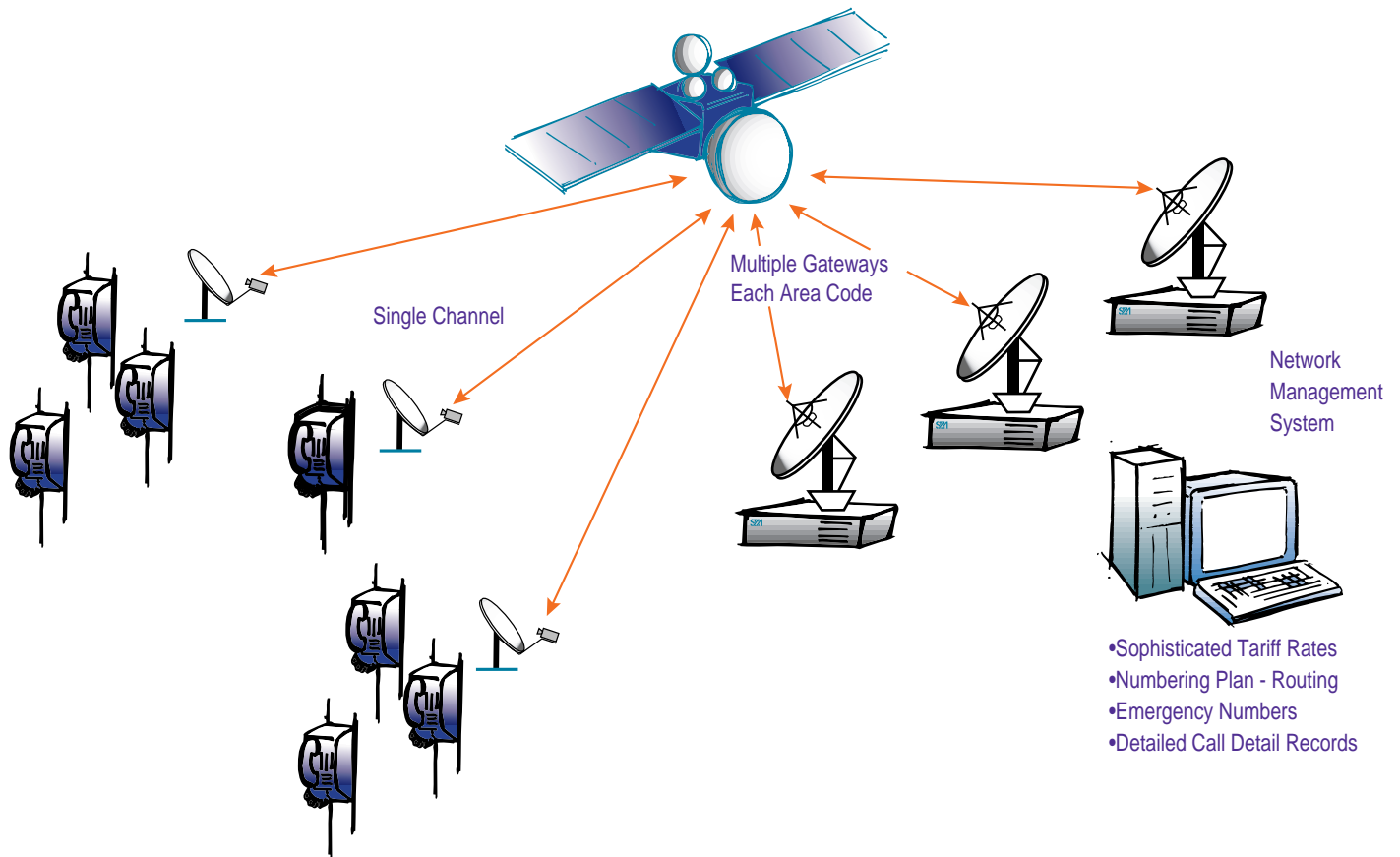
After considering a variety of satellite architectures, SAMART concluded that STM's Single Channel Per Carrier/Demand Assigned Multiple Access (SCPC/DAMA) was best suited to Thailand's rural telephony needs. The reliability and low maintenance typical of STM equipment were the most important features influencing that decision. Others included satellite bandwidth efficiency, voice quality, full-mesh multi-gateway operation and modular design.

DAMA technology permits any user to connect directly with any other user in the network. It is a full-mesh point-to-point technology that facilitates telephone communication and takes advantage of commercial geostationary satellite capacity to enable lower calling charges. DAMA optimizes satellite usage by automatically allocating transponder space to each active telephone circuit when needed. This "bandwidth on demand" feature is cost-critical in the TOT application, a network of several thousand subscribers, since it allows those subscribers to share valuable satellite resources and limit unused capacity.

STM and SAMART installed more than 1,200 remote terminals throughout the small villages and remote regions of Thailand to allow direct point-to-point telephone calling. Gateways were placed within each of the service area codes to serve as central telephone exchanges interconnecting with the Thai public telephone system. The DAMA network was designed so that each call placed was first analyzed by the local satellite system, then assigned to the gateway that corresponded to the area code called. STM created an infrastructure that routed calls among the gateways and remote terminals, resulting in a fully autonomous "telephone network in the sky."

In addition, STM was responsible for many of the functions a telephone service company would perform for a terrestrial system. Company engineers developed a highly sophisticated network management system that incorporated the Thailand National numbering plan. They also built into the system the tariff rates that allowed customer billing for special emergency numbers and information service as well as local, toll and long distance calling.

STM was further required to customize its DAMA-10000 network to operate within the Thai telephone signalling interfaces, including payphones which are unique to that country. The result was a satellite network that operated smoothly and integrated seamlessly with the public telephone system.



TOT  
Network Diagram

## Bringing the World to the Thai Countryside

Pornchai Krivichian, SMART project manager, was favorably impressed with the performance of the DAMA network. "In spite of the rough environment, STM's equipment demonstrated the same grade of service I would expect in a developed urban area," he commented.

"This rural telephone system was a build-to-operate network," Mr. Krivichian recalled. "We had an agreement with TOT to complete the work in a very short time frame. Meeting the deadline was a major challenge for me personally, as project manager. STM helped tremendously by completing and installing the satellite equipment in record time."

He added that not only the line quality, but the speed of response and availability of service far exceeded SMART's expectations.

“STM’s ability to integrate the DAMA network with public telephone systems has been particularly useful to SAMART.” Mr. Krivichian continued. “STM designed a numbering system, developed detailed call records for billing customers, and established the connection between the public telephone system and pay phones. All these service functions were critical here, since a public telephone system must be of the highest quality.” He also commented on the value SAMART placed on STM’s extensive background in customizing the DAMA network to operate within the unique signaling systems of other parts of Asia as well as Mexico, Latin America and Africa.



“The rural telephony project has been successful and a great deal of the credit goes to STM,” Mr. Krivichian observed. “We very much appreciate the dependable performance of the network. TOT plans to continue expanding and adding remote terminals.” He emphasized that the project has made Thailand a more progressive country.

“But even more important,” he concluded, “it has made an enormous difference in the lives of the thousands of people who now have telephones for the first time. As an example, these same people would have walked several kilometers just to get help in case of a medical emergency. They led isolated lives for many years, but now they have great peace of mind just knowing that if someone is seriously ill, they can pick up a phone and expect help right away. They’re not cut off from the rest of the world anymore. And we believe that is ultimate proof of our project’s success.”



## DAMA Technology Worldwide

The DAMA-10000 VSAT Network offers a variety of high-performance features:

- Fully meshed, single hop satellite transmission. Any user can connect directly to any other user anywhere within the network without passing through a central hub.
- Satellite based telephony architecture able to provide telephone service based on the same expected quality and ease of use as a terrestrial based system.
- CCITT R2 signalling structure easily adaptable to the signalling needs of individual countries.
- Economical and flexible bandwidth sharing with any mix of voice, FAX, video and data traffic allocated on demand.
- Expandable system architecture that allows networks to grow with increasing demands.

The basic DAMA-10000 system can be easily customized. In addition to the rural telephony system used by the Telephone Organization of Thailand, potential applications include:

- Private corporate networks
- ISDN network extensions
- Cellular telephony backbones
- Video conferencing

