

# things are looking up

*Look for growth in the teleport business*

By Craig Landis

**A**s a high-technology venture, communications satellite teleports are alluring because they are the gateways to the stars. But is locating Earth stations in central hub sites for uplink and downlink services still a growth business?

The answer is yes. In the next decade, teleports around the world will continue to experience rapid growth. They will grow because of policy and technology changes that make it easier and, in some cases, more cost-effective to get signals to and from satellites.

## What is a teleport?

The name invokes images of multiple runways, like an airport. The dishes at a teleport are similar to runways in that they provide the uplink and downlink necessary to get the signals into and out of space. These Earth station runways are used by customers who need to deliver signals over long distances, often to multiple points simultaneously. In many of these applications, using only fiber-optic or microwave connections to distribute the signal is not as cost-effective as satellite transmission.

The concept can be described in terms of hubs and spokes. A central teleport hub serves as the link to the satellite, while local spokes bring in material for uplink to a satellite, or send out material that is downlinked from the spacecraft.



*Hawaii Overseas Teleport in Honolulu.*

Teleports provide service to television networks, business data customers, telephone companies, government agencies and research institutions. Manufacturing plants are linked with sales offices around the world. Mainframe computers are linked with individual office networks. Students are linked with instructors far away through distance learning technologies. Television affiliates collect syndicated programs by satellite because it is cheaper and faster than preparing separate videotape copies for each affiliate.

Some teleports also act as backup systems for fiber-optic networks and are relied upon for other contingency and service restoration functions. Most have elaborate backup power systems to remain in operation even when the main electric utilities experience fail-

ures, and many teleports have emergency communication responsibility in their communities.

## Success is not universal

In the United States there are about 30 teleports with international antennas. The main expenses they incur are the land on which the facility is built, the power required to run the equipment, and facility construction and licensing costs. Their profitability often

relies on whether they can use each antenna to provide multiple services.

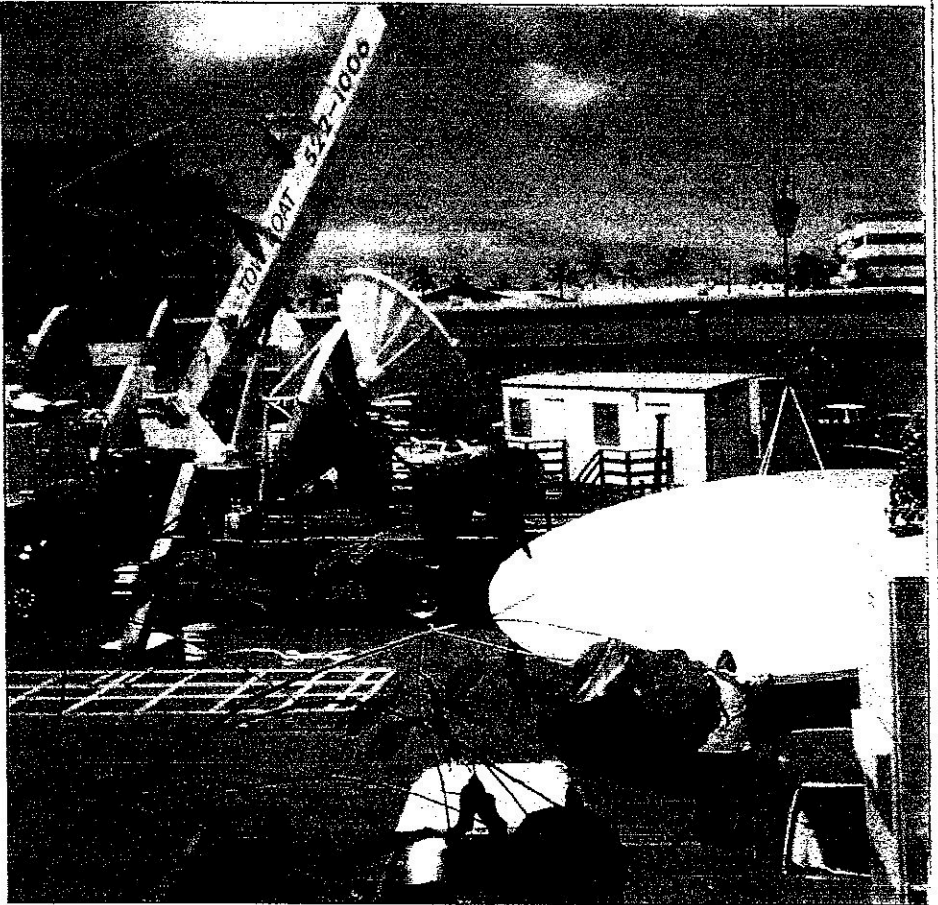
A few teleport ventures have been unsuccessful. They either overbuilt or were located in cities where too much competition existed. The pace of commercial activity in a teleport's immediate surrounding area is vital to the growth of the teleport's business. The growth potential for a teleport also depends in part on the number of satellites visible from its location and on the communications regulations and policies of the country in which the teleport is located. Local zoning laws can place critical limits on any teleport's potential for profit.

### The industry's roots

The author's first exposure to what are now called teleports was in the early 1980s, with the gateway Earth stations owned and operated by Comsat Corp. on the east and west coasts of the United States. In those days, one dish was a hobby and two dishes was a teleport. To uplink from the Comsat facilities, you needed a matching order by telex from the satellite facility in the destination country, and it took a long time to get confirmations of overseas satellite orders. Nowadays, fast faxes and on-line reservation systems are commonplace.

U.S. domestic satellite operators like AT&T, Western Union and RCA realized they needed a location to turn around the signals from their satellites to Intelsat spacecraft over the three major oceans of the world for global network distribution. They received permission to locate their domestic antennas next to the Comsat gateways, and with that arrangement, broadcasters had a more efficient way to arrange multiple satellite hops for news and special event coverage.

The next major development affecting ground facilities was the launch of the first privatized international satellites, led by PanAmSat almost a decade ago. Immedi-



*Expansion of Hawaii Overseas Teleport.*

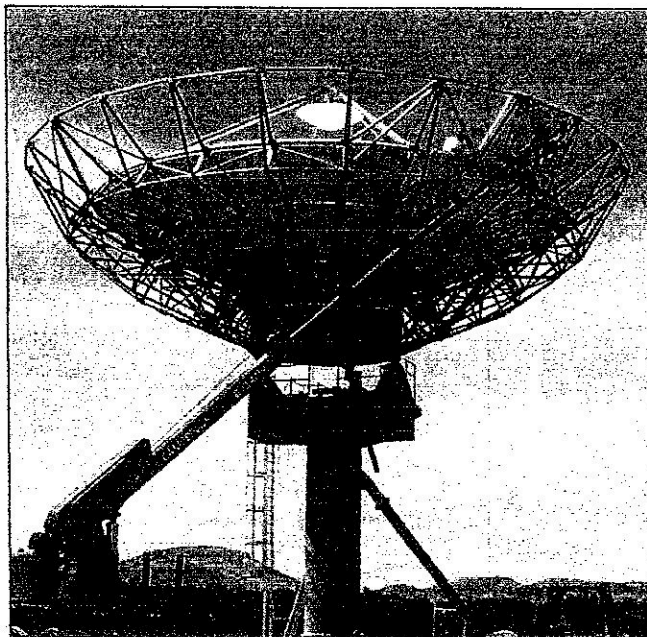
ately, more gateway uplinks were needed to give customers access to the new capacity. International Earth stations based in the United States soon were deregulated, and facilities other than those owned by Comsat were allowed for direct

international uplinks. This led to the opening of teleports in Atlanta, Los Angeles, New York, Washington and at many other sites. Most major metropolitan areas now have a teleport; some have more than one.

Companies like Vyvx and GlobeCast North America combine their expertise in satellite capacity management with fiber-optic networks that connect numerous sites in spiderweb fashion. Recently, Vyvx purchased teleports in several major U.S. cities to provide complete service starting with the fiber-optic freeway from one end of the country to the other. The signal is routed from the fiber-optic network to an offramp of sorts at the appropriate teleport, for uplink across the Atlantic or Pacific. For information shippers, it is not "planes, trains and automobiles," it is fiber, teleports and satellites.

### Squeezing more customers onto satellites

The most important factor affecting teleport profitability today is digital compression technology. Most teleports are already providing compression equipment and services, and demand for this is increasing. Compression will reduce the cost per program to send signals around



*Vyvx's teleport in Steele Valley, Calif., recently added a new 16.4-meter dish.*

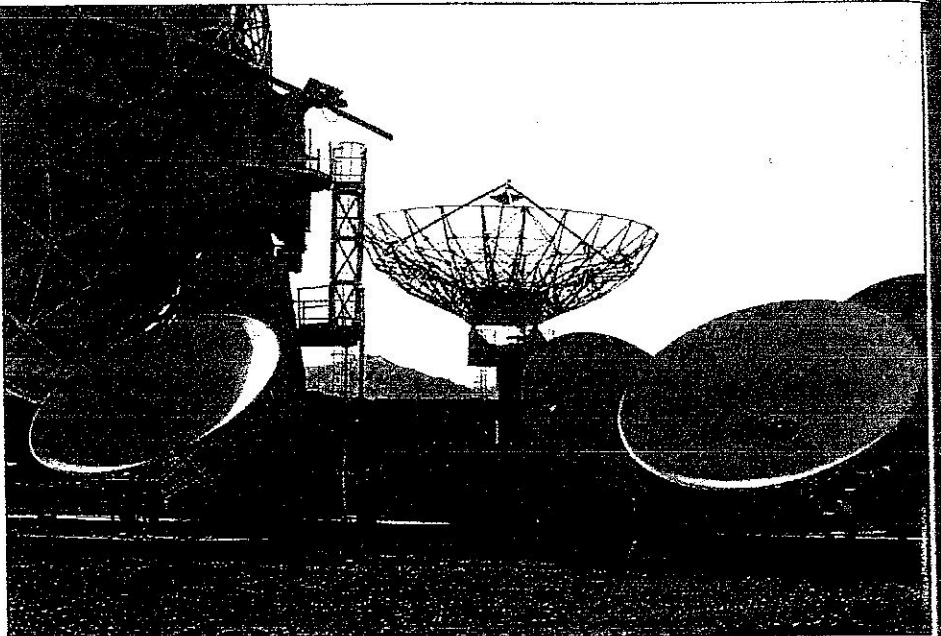
the world. Lower distribution costs will stimulate new ventures.

Digital compression equipment allows more signals to be carried over a single satellite transponder. Many customers can be served using the same antenna system, increasing the teleport's return with each new service added. The strategy of offering multiple digital services from one antenna is the key to teleport profits, because more users can take advantage of each spacecraft at any given time.

### Governments step aside

Deregulation has led to more plans to launch privately operated satellites, and therefore a great deal of new communications capacity, to serve developing areas of the world. While there are still more satellites serving North America than anywhere else for the moment, the other regions of the world are catching up. As each new satellite becomes available, its capacity is only economically viable if there are conveniently located teleports in its coverage area or footprint.

Like international airlines, satellite operators must secure "landing rights" to serve particular countries. There are many cases where government prohibition, not technical ability, is all that prevents ground facilities from communicating with a



Vyxx's Steele Valley facility has a variety of dishes.

### The Asian example

There are 26 new spacecraft currently on order to serve customers in Asia. Some of those will be regional satellites, combining service to a particular country with some international capacity. China, Japan, Malaysia, the Philippines and Thailand all have launches scheduled, and have built or are planning teleports to serve domestic and international satellite systems. Japan has carefully planned to incorporate teleports, or teletopia as the Japanese call them, into every major metropolitan district. Several are already operational, and two are located on an artificial island platform.

Until recently, the only facilities capable of international up-linking in Asian countries were operated by government-controlled telecommunications monopolies. But Westinghouse's Group W has teamed with a Singapore company to invest \$30 million in a broadcast center and teleport facility which is now operating. This may result in Singapore becoming a headquarters for foreign

broadcasters eager to get a share of the growing Asian market.

### Two-way services

Sometimes the signal from the teleport is delivered to receive-only antennas — at

cable television head ends, for example — and other times there is two-way communication between the teleport and the destination.

Some of the two-way communication links provided by teleports are between the teleports and remote sites in VSAT [very small aperture terminal] networks. These remote sites are like miniature versions of the systems located at teleports, but they are not designed to handle as much capacity. VSATs are usually located at a corporation's customer site or branch office. They enable the remote site to exchange data with a larger hub antenna at a teleport or at a corporate headquarters. The growing use of VSATs for intracompany communications and Internet services adds to the demand for, and profitability of, teleport operations.

### Connections to the Internet

The rapid growth of usage of the Internet is another factor in teleport profitability. Internet services require high-speed data links tying servers to data seekers around the world. A growing percentage of the data relayed through the Internet is delivered by satellite. Fiber-optic links across the oceans compete for this business, but they are inherently not as flexible and cannot provide the sort of multipoint distribution that satellites (and teleports) can. Some countries still prohibit private use of the Internet. Others have not built the infrastructure of ground-based relays that might compete with satellites to connect users in remote areas.

Internet servers demand ever higher speeds for data circuits. This enables



7-meter antenna at Hawaii Overseas Teleport.

satellite. Many such prohibitions will fade now that 70 countries have agreed, under the auspices of the World Trade Organization, to a framework for deregulating their telecommunications markets. That agreement should bolster the plans for privately owned teleports in these countries.

someone to click a mouse on a personal computer to access information rapidly across the globe. Experts estimate that 80 percent of the information available on the Internet is stored on computer servers in the United States. This suggests greater demand for high-speed data circuits sending material out from the United States. These connections also require a return path for the requests for data, and in many cases the speed or capacity of the inbound circuit from the users does not have to be as fast as the connection that shovels requested data out to the user.

As the burden of regulations decreases, direct-to-the-site Internet services by satellite are becoming more useful. Some people argue that the inevitable delay encountered when using geostationary satellites makes them a poor choice for high-speed data transmissions. But NASA recently demonstrated that satellites can support data rates exceeding 600 megabits per second.

### More bang for the buck

When a teleport facility invests hundreds of thousands of dollars in an uplink system, it hopes to reap the return by signing up plenty of customers. Each uplink can serve all or some of the transponders on the spacecraft at the same time. One antenna can integrate voice, data and video signals and feed them at the appropriate frequencies simultaneously. The same antenna can receive incoming material and thereby provide multiple one-way and two-way links. Of course, electronic components for each service (including redundant or backup electronics that usually are incorporated into the overall service plan) must be added each time capacity is increased.

It takes three satellite hops to get completely around the world using geostationary spacecraft. Locations in the middle of ocean regions (Hawaii, for example) can be useful as central hubs for relaying signals between two satellite systems. These locations are able to stretch

the utility of a satellite connection by extending the coverage area far beyond one satellite's effective horizon.

The various low Earth orbiting satellite systems that will blossom early in the next century will require precise control from the ground, and this, too, will be done at teleports. Future satellite systems designed to communicate with small antennas at higher frequencies will also require telemetry services from teleports below.

The list of teleports around the world will no doubt increase. For now, the forecast for their profitability is definitely looking up.



#### About the author

Craig Landis is the founder and president of Vision Accomplished and The Hawaii Overseas Teleport in Honolulu. Further information is available on the World Wide Web at [www.visionaccomplished.com/va-hawaii](http://www.visionaccomplished.com/va-hawaii).

## Xicom Technology Introduces Klystron Power Amplifiers Half the Size of Competitive Products

Xicom Technology has introduced a revolutionary new line of Klystron Power Amplifiers that occupy only 17 rack-units. This significant size reduction allows for a 1:1 Redundant Configuration in a single cabinet. And reduced size is complemented by reduced weight: Xicom's KPAs weigh 60% less than competitive units. Xicom's technologically enhanced KPAs are the ideal choice for reliable uplink service in commercial satellite earth stations.

- ★ Power Levels from 1700W to 3350W
- ★ C-, Ku-, & DBS-Band Coverage (Extended Frequency Available)
- ★ Digital Display & User-Friendly Interface
- ★ Harmonic & Receive Band Filtering
- ★ Motorized/Fast-Tuned Channel Selector Option
- ★ Power Factor Correction
- ★ RF Gain Control
- ★ RS-232/485 Serial Interfaces for Remote Control

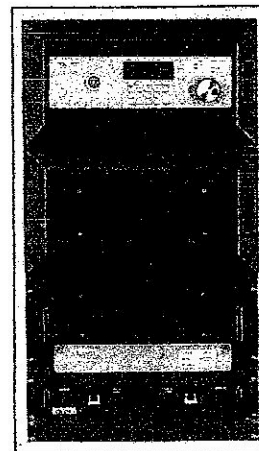
ISO 9001



Available in Single-Thread, Redundant, and Phase-Combined Configurations.

955 Stewart Drive, Sunnyvale, CA 94086  
Tel (408) 481-3000 Fax (408) 481-3001 [www.xicomtech.com](http://www.xicomtech.com)

Please see us at SCEC '97 booth #529



**Xicom**  
TECHNOLOGY