

# Cable AML News

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## 256 QAM-OVER 30 MILES OF WATER

Cable AML recently extended channel carriage of three high power broadband transmitters and receivers in three existing AML links. The



*Upgraded Cable AML Broadband Transmitters*

goal-to increase system bandwidth from 550 to 600 MHz-was achieved by pushing the useable upper edge from 13200 to 13250 MHz. The upgrade enables the links to accommodate 64 and 256 QAM Annex B-modulated digital carriers in the highest 50 MHz of the spectrum, which is now carrying four 256 QAM and three 64 QAM carriers. The links now carry an extra load of 42 video and 40 audio programs and have the capacity to add more programs in the future without any additional changes.

Of the three high power transmitters, one is fed directly from the headend and two are fed from a fiber run. The combination of fiber plus microwave makes it possible to reach previously inaccessible areas.

The upgraded systems are essentially transparent to the digital signals: There was no drop in the measured error rate (MER greater than 36) between the transmitter

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## FLEXIBLE FIXED WIRELESS 3.5 GHz SYSTEM DELIVERED

A high-capacity, point-to-multi-point fixed-wireless system for two-way data and high-speed Internet access was delivered this month by Cable AML.

The state-of-the-art system, Model BWA-2003, provides very high downstream throughput of 30 Mbps per 6 MHz channel. It offers programmable modulation formats of QPSK, 16-QAM or 64-QAM for maximum adaptability to different

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*BWA-2003 Undergoes System Test.*

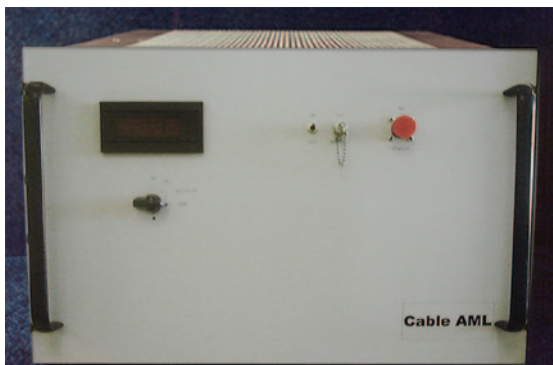
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Four MMDS Stars Shine for Cable AML Customers Page 2

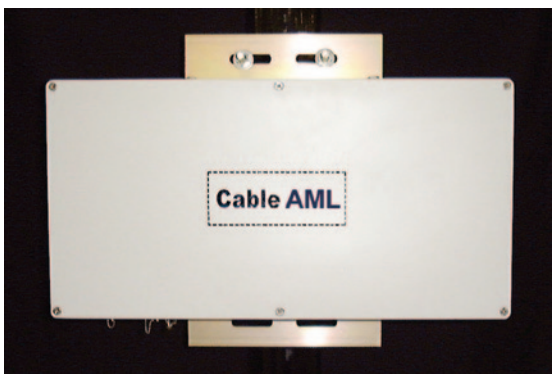
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## FOUR MMDS STARS SHINE FOR CABLE AML CUSTOMERS



*MMDS Compact Transmitter for Single-channel or Multi-channel Application.*



*2.2 to 2.7 GHz Outdoor MMDS Repeater.*



*Outdoor 250 Watt MMDS Transmitter.*

Recent shipments of MMDS transmitters and repeaters (pictured here) are helping customers implement programs, expand existing coverage or begin operating cost-effectively.

Our compact 100 Watt broadband Transmitter Model ITX02-100C provides expanded premium channel service to an existing channelized transmitter that requires separate scrambled audio and video feeds. A bonus is that the transmitter can back up any of the old channelized transmitters in use.

A repeater covering the expanded 2.2 to 2.7 GHz frequency range provides another customer with unparalleled performance in a robust outdoor package. Cable AML is among the few companies that designs and produces MMDS transmitters, repeaters and systems operating outside the standard 2.500 to 2.686 GHz bands.

The Model ITX02-250C 250 watt Compact Indoor Transmitter is the workhorse for systems that require a cost-effective way to expand channel carriage, geographic coverage or both. The ITX02 features state-of-the-art linearization. This is a vital attribute: Improved lin-

earization means that more power can be employed before distortion becomes a problem. The higher the power level, the further signals propagate. Thus, the ITX02 delivers better distortion-free performance over a wider coverage area.

Our OTX02-250 provides the highest available power from a broadband outdoor MMDS transmitter in the market, making it possible to start service with analog or digital channels at a very low initial investment. ♦



*Broadband 250 Watt MMDS Transmitter.*

### Upcoming Events!

Western Show  
"Broadband Plus"

December 4 - 6, 2002  
Anaheim, CA

## THE BWA-2002: KEY FOR WIRED AND WIRELESS VoIP LONG DISTANCE

One of the most promising areas for the Internet is telephony service. An early implementation of Internet telephony—more properly called Voice over Internet Protocol (VoIP)—is low-cost international service. Cable AML's BWA-2002 fixed wireless system is a key enabler of wireless implementations of international VoIP.

The BWA-2002 supports VoIP in several ways. The system shown in the photograph features Cable AML's Long Distance IP System (Model LDIP-1000) integrated with an existing BWA-2002. It is used by the operator to offer VoIP service using an end-to-end fixed wireless infrastructure. It also provides connectivity between the wired telephony hub and the IP satellite link at the headend, which sends the packetized calls to the Internet access point.

With the integration of Cable

AML's LDIP-1000 System with the BWA-2002, the operator can offer low-cost international calling services to both wireless and wired customers. Wired customers call a local phone number, enter a personal access code number and the international destination phone number. Wireless customers can place a call



*Customer Training for VoIP System.*

entirely within the system, without access to the local PSTN.

The system then selects the outgoing line based on least-cost routing tables for the different long distance suppliers available. It establishes and monitors the call and debits the caller's account in real time.

The savings are realized by the conversion of the analog call to IP. This allows the call to be processed and trafficked through the IP network at a fraction of the cost of traditional phone calls. The savings can be passed on to customers.

The installation and integration of the LDIP-1000 System into an existing BWA-2000 went without a hitch. Says Santiago Paez, Chief Engineer of CMM in Paraguay: "With the training I received on the system at Cable AML, it installed in one day and has been running perfectly since. The system is friendly to operate, and friendly for users of our service". ✦

### 30-mile from page 1

input and output, and no degradation in the bit error rate ( $1 \times 10^{-9}$ ).

One of the links covers 30 miles, most of it over water. Water can be a challenging environment for high frequency microwaves because of high levels of reflection when the



*Transmit AML Antennas for 30 Mile Link.*

seas are calm. Despite the challenge, there was no perceptible degradation in the digital signal constellation.

The upgrade proves that high quality carriage of digital signals is possible even under some fairly inhospitable conditions. Moreover, this is possible even if the demanding and more fragile 256 QAM format is being used in the Cable Television Relay Service Station (CARS) band. The result is increased flexibility for CATV systems seeking to upgrade existing microwave links to accommodate digital expansion and two-way transmission without expensive fiber runs. ✦

### 3.5 GHz System from page 1

deployment scenarios.

Operating in the internationally licensed 3.4-3.6 GHz band, the BWA-2003 broadband wireless access system is the most cost-effective available to provide high-speed IP connectivity to thousands of subscribers within 20 kilometers of the base station.

Cable AML has delivered Broadband Wireless Access (BWA) systems operating in the 2.5, 3.4-3.6, 26 and 28 GHz bands. The company can deliver the same per-channel throughput performance at practically any band in the 1.5 to 42 GHz frequency range. ✦

## CABLE AML's 18 GHz BROADBAND REPEATER IS POWERFUL AND RUGGED



*18 GHz Outdoor Repeater.*

Cable AML is the leader in delivering on-frequency repeaters for multichannel video and data applications. The 18 GHz Repeater (photo), which was introduced last year, is a broadband unit designed for a digital multi-carrier system.

This outdoor repeater re-broadcasts 20 QPSK-modulated digital video carriers at 18GHz. This terrestrial direct-to-home (DTH) system is similar to a multichannel DTV system except that it operates at a much higher frequency-18 GHz versus 800 MHz.

The service radius for the 18 GHz repeater is greater than 2 Kms. This repeater has a high gain (70 dB) across 600 MHz of instantaneous bandwidth. It features input and output test ports for fast installation and operation without service interruption and is built to withstand the rigors of outdoor placement and operation.

Cable AML designs and manufactures on-frequency and frequency-translating repeaters at all frequency bands between 2 and 42 GHz, specializing in multi-channel or multi-carrier applications with stringent video quality specifications. ✦

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