

# Communications

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Engineer

## AWA chosen for Telecom ADSL demo

by Richard Chirgwin

A million dollar contract to create a demonstration ADSL system for Telecom has been awarded to AWA.

The trial system will be installed at Telecom Research Laboratories in Melbourne, and will allow Telecom to evaluate the technology's feasibility as a pay-TV delivery system.

With Telecom's consortium out of the race for one of the satellite pay-TV channels, the organisation is moving quickly to evaluate cable-based systems.

ADSL (asymmetrical digital subscriber line) potentially offers Telecom an efficient, quick and low cost delivery system because it uses existing twisted pair cables, whereas either coaxial or fibre delivery demand heavy infrastructure investment.

AWA Communications' head Dr Laurie Mackechnie said quick delivery was vital to AWA winning the bid.

"We were able to deliver a

credible solution, and I believe we were able to deliver quite a bit sooner than the other bidders."

The trial system is due to be operational in the first quarter of next year.

AWA was able to minimise development time because its existing digital switching system, AWANET, can be modified to support ADSL traffic.

"We've based our switching and distribution on an existing platform which we've had for a number of years, and which is suitable for modification to carry ADSL traffic."

With the switching question answered, Dr Mackechnie said AWA will be working with outside organisations for other components of the trial system.

He said a partner would probably be found to provide encoder/decoder capabilities, and the ABC's audio digital mass storage system, D-CART, is being modified to carry video signals and act as the video server.

While Telecom is

currently talking about ADSL as an interim while fibre to the home is rolled out, there's no reason ADSL can't have a more permanent home in the Telecom network, since it can carry relatively wide bandwidth signals (up to 6M bits/s on current technologies) and is suitable for any digital traffic, not just digital pay TV.

While emphasising that a wide range of opinions about ADSL exists at the moment, Dr Mackechnie said: "I personally believe that ADSL could become a permanent system. If it works, it provides the ability to deliver quite a lot of bits to the home.

"While it can only carry one channel of video at one time, I don't see that as a restriction, because the user can choose between any number of channels switched from the local exchange.

"That's what we're giving to Telecom in the trial system - the ability to switch

between a lot of program sources.

"So while it won't deliver all those sources simultaneously, it will offer instantaneous access to any source."

The trial system will demonstrate both broadcast video, with one source being viewed by many receivers, and video-on-demand, where users interactively select a narrowcast service at the time they want it.

For the trial system, AWA has settled on the DMT (discrete multitone) modulation scheme, which earlier this year was chosen by ANSI as its preferred modulation scheme in the proposed ADSL standard.

However, Dr Mackechnie emphasised that its system will support either DMT or AT&T's QAM modulation scheme.

AWA has also bid with an unnamed partner for Telecom's commercial ADSL system. Results of this tender are expected by the end of the year.

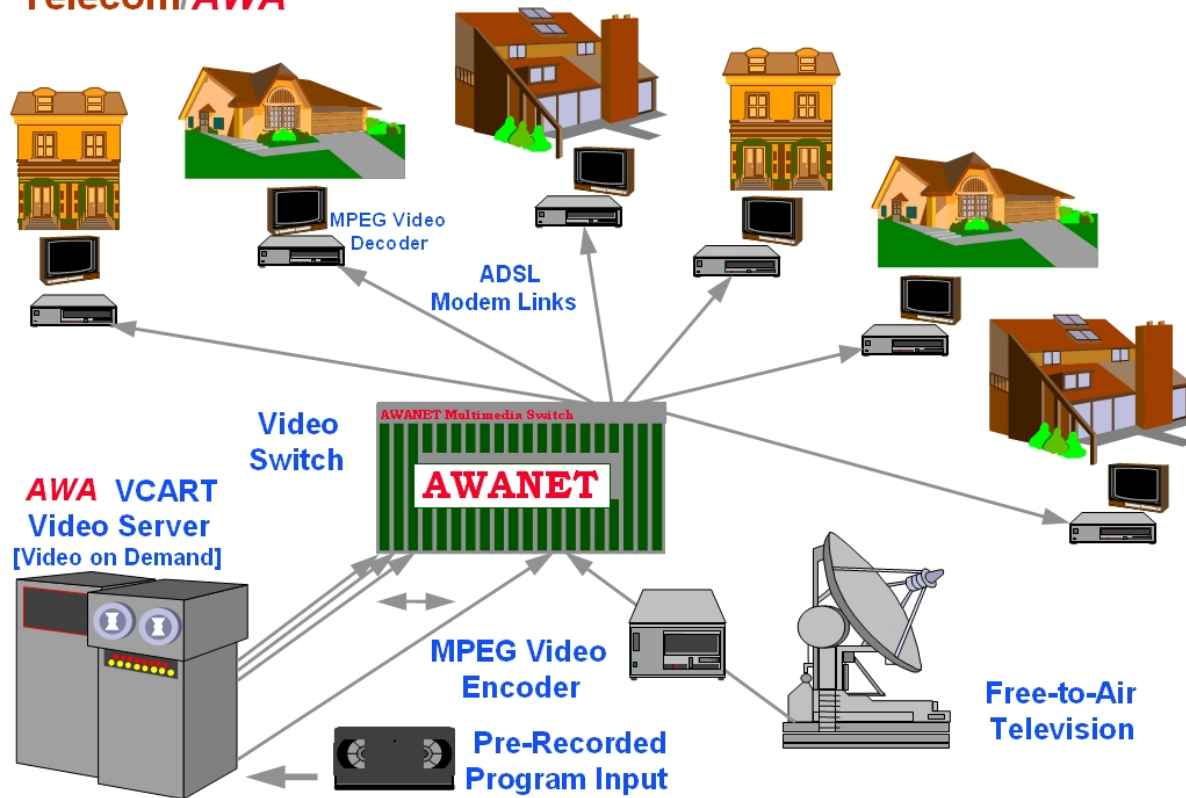
## Manageable stackables from Cabletron



Cabletron's HubSTACK stackable Ethernet hubs offer an economical, scalable solution for workgroups and provides MIB II and RMON support and Cabletron's distributed LAN monitoring (DLM) software.

Old Govt to save with

## Telecom/AWA



Demonstration Pay TV System with 2 Mbit/s ADSL and MPEG-1 Video-on-Demand (1994)



**AWANET-100 Multimedia Switch**

The AWANET-100 Multimedia Switch supported up to two FDDI-2 Interface Cards and two bi-directional 100 Mbit/s backplane channels supporting up to 96 x 2.048 Mbit/s MPEG encoded video channels (non blocking). The backplane also included two 10 Mbit/s Ethernet Channels for packet data and upstream video control. The data from these Ethernet channels was bridged to the FDDI-2 packet channel.



**Video Server Room – Equipment Supplied by AWA**

The video server room comprised the new VCART VME-based video server developed by the ABC and manufactured by AWA, plus the AWANET-100 based Video Switch, NTL MPEG-1 encoders, and 2.048 Mbit/s Megalink interfaces to the Telephone Exchange nearest to the Telecom Pay TV Office.



**Telecom Pay TV Office**



### Example Video-on-Demand Control Interface Upgrade (1995)

By 2008 standards, the Telecom – AWA demonstration Pay TV system was actually leading edge for its time. Today, broadband ADSL to the home is common-place, but in 1994, it was very new and standards were just evolving. Telecom had to trial both DMT and CAP ADSL technologies, but it was the DMT approach which formed the basis of the ADSL standards that we have today.

As part of AWA's turnkey system delivered to Telecom Australia, the DMT technology employed for this demo was sourced by AWA from Amati Communications in Palo Alto USA. As seen from the Telecom Pay TV Office photo, there is a large black box with an Amati label. This box provided one ADSL interface. Internally, there was a large motherboard fitted with many high power DSP chips which were programmed by Amati to implement the DMT multiplexing algorithms at speeds between 1.5 Mbit/s (T1) and 6 Mbit/s (T2). For the Australian Pay TV demo system, 2.048 Mbit/s (E1) was selected. With 2008 technology, a small chip can support 24 such ADSL or VDSL interfaces with speeds between 10 Mbit/s and 100 Mbit/s over copper cable – depending on the transmission distance.

Other parts of the AWA system shown in the Telecom Pay TV Office photo include the MPEG-1 decoder, a processor, monitor and modem to implement the ABC VCART upstream control interface, a power supply for equipment with no 240VAC power capability and drums of copper cable to test the ADSL segment of the system. Clearly, the AWA turn-key system project awarded to AWA in 1993, was designed to implement a Pay TV demo for Telecom as soon as possible, rather than as elegantly and as small as possible. The objectives were met and the demo system performed well.

Telecom Australia eventually upgraded this demo Pay TV system and contracted NEC Australia to provide a larger 300 home ADSL field trial using the then-preferred ATM switching technology.