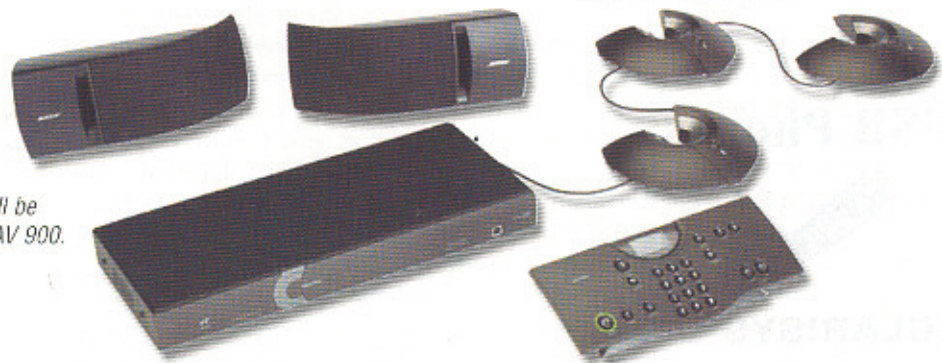


RAV900

ClearOne Communications, Inc.
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Price: North American retail pricing will be \$2,599 for RAV 600 and \$3,099 for RAV 900.



ClearOne's RAV 600 and RAV 900 (pronounced "rave") are meeting room conferencing systems designed to provide a higher-quality alternative to audio-conferencing systems or standard conference phones. It features Gentner Distributed Echo Cancellation, noise cancellation, microphone gating, and a drag-and-drop graphical user interface for easy system setup, control, and management. In addition to superb audio quality, it can also connect to popular rich-media devices such as video and web conferencing systems. The RAV comes complete with an audio mixer, microphone "pods," an intuitive software interface, RS-232 serial port, VISCA Camera Port, a remote control device, and get this — premium Bose loudspeakers.

In fact, the President of TMC, Rich Tehrani came into the labs area and remarked, "Since when does TMC Labs get its hands on and test Bose speakers?" We too were a bit surprised when we opened the ClearOne box to find high-end wall-mountable Bose speakers. Our first thought was that wall-mountable Bose speakers were "overkill" for audioconferencing — but how wrong we were. We'll explain in just a bit.

Installation

We tested the RAV 900, which comes with three microphone pods (the RAV 600 comes with two). Both

models include Ethernet control for remote management and configuration capabilities, as well as built-in Web interface for management. Hooking up the RAV900 unit was a no-brainer. We always attempt to hook things up without referring to the manual as an acid test of how easy something is to install. We were able to successfully set up the unit without looking at the manual once thus helping the RAV to earn a perfect 5 installation rating.

We liked the fact that the unit uses standard RT45 cables to connect the microphone pods to the main RAV unit. No proprietary wiring to worry about — you can simply use your existing RJ45 cabling and RJ45 jacks already installed in most conference rooms to connect to one or more microphone pods. Each microphone pod has two RJ45 ports (In and Out) allowing you to daisy-chain multiple microphone pods that terminate to a single RJ45 wall jack. If you connect the wires in

the wrong direction a red light turns on; likewise a green light appears if you connect the wires correctly. These microphone pods can be positioned in different areas of the meeting room for maximal acoustic pickup. For our tests we connected three pods positioned in various locations in the labs. Then you go to your networking closet and simply disconnect the meeting room's RJ45 cable from the patch panel currently connecting to a network switch or hub and connect it to the RAV conferencing unit. We should point out that the unit allows single input connection to CD, DVD players, VCRs, etc., for playback over the system's speakers.

Next, we connected the various other components of the RAV unit including a wireless antenna, RJ11 telephone wire, telephone handset, power cord, and of course we spliced some speaker wire to connect to the Bose speakers. Side note: Call us audiophile geeks, but any time you get paid to splice speaker wires at work is definitely a good day!

Operational Testing

For our initial tests we decided to use a Teltone Analog Simulator to provide dial tone to the RAV. We connected a 40-foot long RJ11 phone wire to a second telephone handset so we could move this telephone far enough away from the Bose speakers and microphone

RATINGS (0-5)**Installation: 5****Documentation: 5****Features: 5****GUI: 4.75****Overall: A**



Figure 1. Clear One: The RAV900 Web interface for configuration.

Pods prevent feedback or echo. From this telephone we dialed the RAV unit and it rang. We answered the call using the wireless remote control device, which features a LCD screen for displaying pertinent information such as call length and CallerID, as well as configuring various features. After answering the call we tested the audio quality and were extremely impressed. The audio output from the Bose speakers was very rich and unlike many competing audioconferencing systems we have tested, the audio from the Bose almost made it feel like the remote caller was actually in the room. This fact changes the whole dynamic of holding an audioconference when the sound is "warm" and inviting instead of "cold" or distant like most audioconferencing systems. We now understood why ClearOne chose to use high-end external Bose speakers.

We could already see that the RAV unit was performing flawlessly when it came to echo cancellation. In fact, even though the microphone pods were positioned only two feet away from the Bose speakers, the remote caller did not hear himself in any sort of feedback loop or echo. For our next test, we wanted to be sure of 100 percent full duplex operation since often times echo cancellation can cause full duplex issues. We had the remote caller recite the alphabet and the RAV unit user count to 10. Unfortunately, we noticed that once the

RAV unit user started speaking it would clip the remote caller. That is, it would cut off the remote user's voice from coming out the speakers. Even worse, as long as the RAV user was speaking, there was no way the remote caller could interrupt him. We knew that such a high-end conferencing system couldn't possibly be "half duplex." We suspected our Teltone analog simulator was to blame and not the RAV unit, so we did some further investigation. First we called ClearOne and they confirmed that our test results were a bit strange since they have no problems with full duplex on their products. We performed an audio conference with ClearOne with a RAV unit on their end and duplicated our test and it performed flawlessly. We were able to interrupt, talk simultaneously, etc.

Thus, our prime suspect once again pointed to our "trustworthy" Teltone simulator, which we have used for years in the labs. We disconnected the Teltone simulator and used two real PSTN connections instead and then repeated our tests. This time the unit passed with flying colors. We suspect that due to the fact that the Teltone analog PSTN simulator has almost no latency that the ClearOne RAV unit's echo cancellation

mechanism wasn't designed for this. Goes to show you that sometimes the most accurate test is a real test and not a simulated one!

We would be remiss if we did not mention the RAV Web interface (Figure 1). It displays microphone levels, echo cancellation settings, and more. From this user interface you can tweak the audio settings, including the ability to turn off the echo cancellation if you so chose. You can also locate other RAV units on your network using the unique network name or IP address and then manage them via the web interface.

Specifications:

Audio Mixer

- AEC tail time: 128 ms Adaptive noise cancellation: (6 – 18 dB)

Microphone Pod

- Coverage: 360 degrees
- Connection: RJ-45 with Cat. 5, Link In/Out Ports
- Maximum Distance from Base Mixer: 50' (RAV 900), 75' (RAV 600)
- Frequency Response: 60 Hz – 14 kHz (+/- 1 dB) THD+N: <0.08% (-45 dBu input @ 1 kHz)
- Sensitivity: -45 dBu
- Input Level: -6 dBu for 1 kHz 94 dB SPL microphone input
- Dynamic Range: > 65 dB

Room For Improvement

According to their specifications the RAV900 supports up to 50 feet of cable and the RAV600 supports up to 75 feet. We would like to see support for longer length microphone pod RJ45 cables for

PROS and CONS	
Excellent audio quality.	Would love to see longer cable length.
Ease of use.	
Unique ability to tie in video.	

situations where the networking closet is far from the meeting room.

Conclusion

Besides the unique multiple microphone pod system and unique utilization of RJ45 cabling for daisy-chaining

microphone pods is RAV's truly unique ability to tie in a DVD or videotape player or video from your computer along with the audio. RAV's ability to directly interface with your video- and audio-conferencing systems makes it a powerful solution. TMC Labs was very

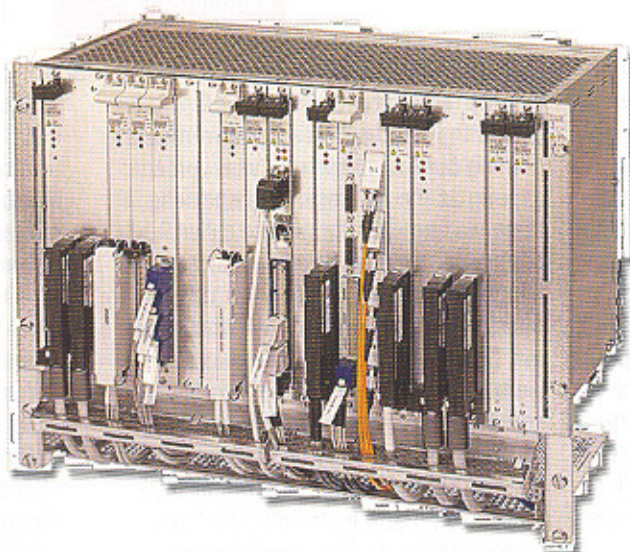
impressed with RAV900's excellent audio quality, easy-to-use wireless controller, and its innovative Web interface for viewing and configuring the RAV units, making this a great choice for any conference room. ■

UMUX 1500

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We live in a time of escalating telecom competition, and carriers that take hold of and make the most of technology as a strategic tool will be the industry winners. Their services have to be multifaceted and for that they need a multi-function, multi-service access platform as their customer base could span from the rural to the urban and require a blend of subscriber services and technologies.

At the least a carrier or service provider's wish list for a multi-access platform would run like this — support the old and the new, i.e., PDH, SDH, IP, ATM, POTS and ISDN telephony, Ethernet, etc. Elaborating this a bit further you would need a cross connect, SONET/SDH terminal multiplexer, add drop multiplexer, digital subscriber line access multiplexer (DSLAM) functionality coupled with ATM-based concentrated multiplex function for bundled transmission to the core network, a migration path to VoIP, Ethernet over SDH (EoS), broadband xDSL services etc.



For such a platform we did not look far into the horizon as Keymile's UMUX multi service access platform family seemed to meet most of those aspirations. Keymile offers a choice between the UMUX 1500, UMUX 1200 and UMUX 900. But we settled for Keymile's market-proven SDH product platform the UMUX 1500 as it is designed to support very low bit rates

and goes all the way up to 155 Mbps. It is a 21-slot modular DC powered 19" chassis thoroughbred. If you have one versatile multifunction platform like that then it certainly makes the finance managers happy for the savings that can be accrued from it.

For the UMUX 1500, Keymile promises SDH standards compliance, support for SDH ECC and overhead bytes, traffic protection functions, a broadband bus backplane, end to end management and interoperability with multi vendor SDH equipment. It is a true carrier class chassis as it implements traffic and equipment protection standards namely 1+1 equipment protection (EQP), Liner trail protection (LTP), Sub-network connection protection (SNCP), multiplex section protection (MSP), synchronous equipment timing source (SETS) protection, and so on.

UMUX 1500 is very versatile and lends itself to various functions. It is a SDH STM-1 terminal multiplexer and add drop multiplexer. It has a 128 x 2

RATINGS (0-5)

Installation: 5
Documentation: 4
Features: 5
GUI: 4
Overall: A-

