

**The Spectrum**  
**Newsletter of the Rocky Mountain Chapter**  
February 2009

President's Letter  
Seminar Announcement for March 19<sup>th</sup>  
Seminar Recap Business Services  
Symposium Announcement for June 16<sup>th</sup> and 17<sup>th</sup>  
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Board Members

**Letter from the President**  
**Rex Kohart**

Rocky Mountain Colleagues,

The Rocky Mountain Chapter is off to a roaring start for 2009. The Chapter elections were finalized at the end of December and the yearly strategic planning session was complete in mid January. We have seen the return of a great board, and also welcome the addition of Jim Stewart. A long time friend of the board; he was selected to his first seat on the board during this election cycle. I also want to thank all the Friends of the Board that have taken an active role in our planning and direction as a chapter. I have stated this in the past, and it became even more evident during this latest planning cycle. The success of our Chapter is due in large part to the great group of industry professionals that keep the Board focused on leading a progressive Chapter.

So here is what is on tap for the remainder of 2009. We already had a very successful Business Services topic covered in January, I hope you made it. I received some great feedback on the presentation. We will be training on a much sought after topic, DOCSIS 3.0, in March. In May we will have a wonderful technology packed seminar on In Home Technology. This will cover Home Networking, Media centers, Wireless HDMI, Tru2Way, and more home centric technologies. In July we will again offer one of our most popular topics, Digital Testing and Measurements. Our hope is to have this topic covered a couple times in different parts of the State. Please look for more to come on the logistics of those meetings. In September we have a requested topic covering one of the most vital portions of our networks, the drop. The seminar will cover drop hardening, updated troubleshooting techniques, National Electric Code (NEC), bonding, connections, Leakage / Ingress, and we will also host BPS training and testing during that session. In November we will dive into IP Basics. This topic is on every engineer's list. It will cover Internet Protocol applications in our networks, IP management for voice traffic, IP Digital Video

mediums, IP routing and networking, and the impact of IPV6 in our operations. In keeping with a great tradition we have also planned the first session for 2010 in January. This will be a Digital Cable 101 topic focused on growing the overall general understanding of our networks, infrastructure, products, capabilities, applications, and the challenges we face everyday.

I also want to take time to point out a few scheduling shifts for our local Chapter and our National Members. The SCTE EXPO, historically held in the June timeframe, has been shifted to more of a fall centric timing going forward. This year it will be held here in Denver in October. This is the show case event for the society and I am excited to see it back in Denver. Fall in the Rockies, what a beautiful time for a great event. With that scheduling change, the Rocky Mountain Chapter needed to shift our annual Symposium into the summer months so we landed on June 16<sup>th</sup> and 17<sup>th</sup>. So let me get this straight, early summer in Colorado, for golf and fun during our Chapter’s annual gathering. The Board has had to make some tough decisions in the past; this was not one of them. We will stay with this June timing going forward in future years. This year’s event will again be held at the Inverness Hotel and Golf Club in Denver. We will have a couple days of vendor show floor activity, cable game competition, fun golf, top notch professional networking, good food, and great guest speakers. Please come join the rest of the chapter in what has come to be a highlight event for everyone’s year.

As you can see, again the Rocky Mountain Chapter of the SCTE is moving and shaking. 2009 is lined out to be one tremendous year of opportunities for you. The Board and I are eager, excited, and humbled to support such a great Chapter of Professionals.

Thank you

- Also, visit our website at: <http://www.scte.org/rockymtn>.
- “Save the date” for this next seminar:

Date	Location	Subject	Speaker	Hours
March 19	Comcast Iliff, Englewood, CO	Return path Optimization DOCIS 3.0 Channel Bonding	<b>Ron Hranac</b> , Cisco <b>Frank Eichenlaub</b> , Cisco	6 + Cert & Safety

- See previous presentations at <http://chapters.scte.org/rockymtn/presentations.htm>

### Recap of the Business Services Seminar on January 22<sup>nd</sup>, 2009

MSO Business Services – Did You Know  
(Edited by Steve Brown for the Spectrum)

Last week the Rocky Mountain Chapter of the SCTE hosted a seminar on Commercial Business and its impact on the future of the communications industry. Ho Kim of New Global Telecom gave us insight on the business history and its future going forward in this growing opportunity. Starting out with the idea of the cable pioneers serving the residential customers as a service evolved into a business serving local establishments with video and audio services shortly afterwards. Alternative services proved that the revenue stream was greater than expected in these establishments and the expectations of these commercial customers were relative to the increased fees. Delivery of these services came with additional fees to be paid to programming. Audio, video and alternative services had programming licenses that had to be paid and thus cable operators were obligated to pass these additional fees on to the commercial establishments. Offerings ranged from background music to pay per event opportunities in restaurants and lounges eventually evolved into high speed communications of 50Mb/sec.

Telephony service to commercial customers is in its infancy stages of the commercial business and is growing leaps and bounds across the industry. While video and HSI revenue is leveling off over the last few years, it is necessary for the cable operators to find new revenue streams. Telephony service to these businesses offers a whole new offering to their product line. However with this new business growth opportunity, there are additional expectations of service and reliability standards. Expectations may include 24/7 service, usage monitoring, service scheduling, reliability standards, and escalations procedures are just a few of the contractual obligations of the cable operator is now faced with to provide competitive services to the customers.

The commercial business revenue is expected to increase ten-fold in the year 2009 over 2008, and is expected to rise year over year at similar growth rates. This proves that the cable business has truly evolved into a full service offering not only for residential customers, but for commercial applications as well. While one aspect of the cable business slows down the cable operators must get more aggressive to the new aspects and offerings to gain additional revenue and continue to grow. Cable operators truly have an advantage over the competition, and must leverage this advantage to its fullest. While coax is available to every business within the cable operators serving area, additional revenue stream are available for a closed LAN and transport via fiber.

Audience participation and various application questions were tabled and ideas brought forward throughout the seminar, proving that the topic was well received and beneficial for all. The seminar was held at the Comcast theater facility which is an ideal location for hosting the event and the 56 attendees. The Chapter Directors would like to thank Comcast's Facilities and Security teams for their wonderful support of the event.

## 14th ANNUAL CABLE-TEC SYMPOSIUM and GOLF OUTING

(Available on Website)

<http://www.scte.org/rockymtn>

Form page 1/3

### **OFFICIAL REGISTRATION FORM**

14th ANNUAL CABLE-TEC SYMPOSIUM

June 16<sup>th</sup>-17<sup>th</sup>, 2009

Company:

Name:

Address:

City, State, Zip:

Phone:

Email:

Product description:

Competitor/s:

Additional people attending:

**PLEASE READ notes 1 & 2 below:**

- 1) Please include your main company name and address so that in the future we can always address this mailing to the Sales or Marketing person of a company in the event that jobs and positions change.
- 2) Please include email address, as this is the way we plan on updating you when we receive your registration and let you know about any other last minute schedule changes.

**OFFICIAL REGISTRATION FORM**  
 FOURTEENTH ANNUAL CABLE-TEC SYMPOSIUM  
 June 16<sup>th</sup>-17<sup>th</sup>, 2009

Form page 2/3

*Basic Agenda*

**Tuesday, June 16th**

**7:30 am Golf Tournament**

**12:30 pm Lunch for Golfers**

**2:00 pm – 5:00 pm Vendor Set up**

**6:00 pm – 10:00 pm Cable Tec Games**

**Wednesday, June 17th**

**7:30 am – Continental Breakfast**

**11:30 am – Technical Lunch**

**8:00 am – 4:00 pm Exhibit Floor Open**

*Floor Closes from 11:30 – 2:00 for Lunch*

**GENERAL**

Platinum Level Sponsorship –	- \$1000	<b>Sub total: \$</b> _____
Gold Level Sponsorship –	- \$900	<b>Sub total: \$</b> _____
Silver Level Sponsorship –	- \$600	<b>Sub total: \$</b> _____

**Ala Carte pricing:**

Vendor limited to 1 table only (\$300) each (6ft x 30 inches) 1 x \$300	<b>Sub total: \$</b> _____
Individual Golf (\$125 per golfer)	- \$125 <b>Sub total: \$</b> _____
Sponsor a tech (SCTE membership for one year)	- \$68 <b>Sub total: \$</b> _____
Do you need a cable drop: Yes ___ No ___ (\$50 extra)	<b>Sub total: \$</b> _____
Do you need power: Yes ___ No ___ (\$50 extra)	<b>Sub total: \$</b> _____
Will you be sending freight: Yes _____ No _____ (Ship to arrive on June 16th)	

**DONATIONS**

We need donations for drawings during the Symposium. Drawings will take place during the exhibit hall time on Tuesday am/pm. Will you be donating for drawings?

Yes \_\_\_\_\_

No \_\_\_\_\_

(All Sponsors will be mentioned during the public announcements)

**Total from above: \$**\_\_\_\_\_

Please return this form before May 1st with a check or credit card information to the address below.  
(Checks may be made payable to: Rocky Mountain SCTE Chapter)

If paying by credit card please include the following information:

Name (as it appears on card):  
Card Type:  
Card Number:  
Expiration date:  
Amount to be charged: \$

## Form page 3/3

Mail form to:

Rocky Mountain SCTE  
P.O. Box 631931  
Littleton, CO 80163 - 1931  
Attn: Steve Murphy

Registration can be emailed to: [steve\\_murphy@cable.comcast.com](mailto:steve_murphy@cable.comcast.com) to reserve your spot even if paying by check.

For more information, contact: Steve Murphy (720) 267-3038 or Dave Krook – Cable Tec Games (303) 408-4116

### GOLF REGISTRATION



Golfer's names

Player name: \_\_\_\_\_

Player name: \_\_\_\_\_

Player name: \_\_\_\_\_

Player name: \_\_\_\_\_

*Golf will be played with shotgun start on Tuesday June 16th, 7:30 am at the Inverness Golf Course.  
The only way to control your group is to secure an entire foursome. Registration for two will be kept in the same foursome*

**Include with the attached registration form to secure your spot.  
Golf sold out last year so sign up early!!!!!!**

Dear Vendor,

Contributions or gifts to the Society of Cable Telecommunications Engineers, Inc. are not deductible as charitable Contributions for federal income tax purposes.

You are cordially invited to attend and display your product line at the 14th Annual Cable-Tec Symposium and Golf Outing. System personnel that will be attending include engineers, technicians, installers, construction, purchasing directors, local origination directors, training instructors and others from around Colorado.

Exhibit hall space is limited this year so make sure to sign up quickly. Initially each vendor will be limited to one table on a first come, first serve basis. If there is space available after May 1<sup>st</sup> more tables will be available to each vendor. You will have the best opportunity to interact one-on-one with the associates who really use the products you provide. The event will begin with a Golf tournament at the Inverness course and will occur Tuesday morning the 16th. Don't miss it! All in all, we believe this event provides the best return for you marketing dollar.

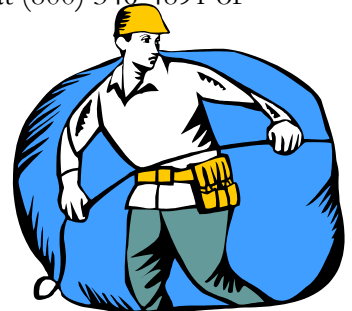
If your company is returning, or would like to join us for the first time this year, I encourage you to register as soon as possible. The event has been sold out for the past 8 years. After **May 1<sup>st</sup>** the table limitation will be dropped. You can register by completing the registration form included in this email with a check to:

**Rocky Mountain SCTE**  
**P.O. Box 631931**  
**Littleton Co 80163 - 1931**  
**Attn: Steve Murphy**

Hotel reservations must be made directly with the Inverness Hotel and Golf Club at (800) 346-4891 or other hotels in the vicinity. No block of rooms have been reserved for this event.

For more information, contact:

**Steve Murphy (720) 267-3038 or Dave Krook (303) 408-4116**



**ANNOUNCING THE**  
**14th Annual**  
**Rocky Mountain SCTE**  
**CABLE-TEC SYMPOSIUM & GOLF OUTING**

**Vendor Sponsorship Opportunities**



## **Platinum Level Sponsorship includes:**

*Full Service Table*

*Up to 4 Attendees*

*4 Golfers*

*Prize Hole Sponsor with Sign*

## **Gold Level Sponsorship includes:**

*Full Service Table*

*Up to 2 Attendees*

*4 Golfers*

*Hole Sponsor with Sign*

## **Silver Level Sponsorship includes:**

*Full Service Table*

*Up to 2 Attendees*

*2 Golfers*

**Use the registration form to secure your spot.**

## **The SCTE Rocky Mountain Chapter Scholarship Opportunity**

Joe Thomas

The times are tough..... just read the paper or watch the news and we all know that things are going to get better..... they just have to.

In these hard times job loss is collateral damage to the effects of the credit, housing, and energy issues affecting our country. The Rocky Mountain Chapter is proud to be in the position to offer its members a way of providing some security or opportunity in these times. We believe that through a scholarship program we can assist members wanting to differentiate themselves from their peers through education and certification.

### **Why does the RMC support a Scholarship Program for its Members?**

We make it easy on our members to enroll, test, and certify for SCTE certifications covering a wide range of job classifications and skills. Certificates range from residential installation practices to digital video engineering and all points in-between. Visit the [www.scte.org](http://www.scte.org) web site for certification offerings. Our scholarship application should take you less than 15 minutes to complete and you'll just need to add two letters of recommendation before sending to us.

### **Why should I certify with the SCTE?**

The SCTE is the leading source of certification specific to our industry. There are over 15,000 worldwide members and more than 3,000 members enrolled in SCTE certification programs. It is the most comprehensive and widely recognized program in the industry.

In this competitive job market any edge you can give yourself will help you rise above the masses when being considered for a promotion or a new job. Believe me when I say, that experience and "time in the trenches" is invaluable to our employers and it has let many of us earn a great living in a great industry.

However, there are large numbers of people out there looking for job that have time and work experience on their side. Unemployment is expected to move into the double digits in 2009 and competition is only going to become fiercer. How will you secure your current position or prepare yourself for the next promotion opportunity?

Today you need something else to demonstrate your commitment to expanding your work knowledge and skills. Otherwise your resume looks just like the two dozen other ones sitting on a hiring manager's desk.

College classes are another avenue for motivated individuals. A college degree is a fantastic goal and the SCTE Foundation has funds available for grant to help you here as well. Consult the [www.SCTE.org](http://www.SCTE.org) web site for more details. But College is not for everyone and the time, family responsibilities, and other constraints are endless. SCTE certification allows you to simply test at a local seminar after home studying for as long as you wish. There is no set class schedule or deadlines. The RMC offers testing at about every seminar. Certification is a viable route for many whom have full time jobs but yet want to advance and demonstrate their knowledge.

The Rocky Mountain Scholarship program covers membership cost, testing fees, and peer recognition. The details of how to apply for a scholarship from the RMC is available on our web site: <http://chapters.scte.org/rockymtn>

## Technical Forum

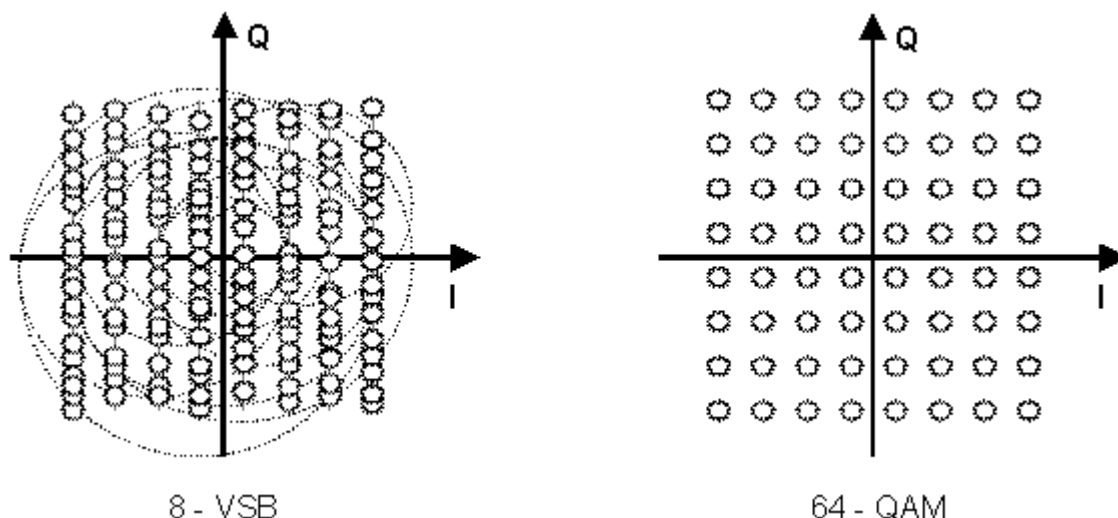
### Tech's Forum

By Jim Stewart

Welcome back to "The Tech's Forum". This section of the SCTE newsletter features articles and tips for technical personnel of the CATV Industry. Ideas and articles for "The Tech's Forum" are always welcome. If you would like to contribute please contact me at [jim\\_stewart2@cable.comcast.com](mailto:jim_stewart2@cable.comcast.com).

Let's get back to our focus of the last several editions, understanding the broadcaster's 8-VSB signal and more specifically how it differs from QAM signals used by the CATV Industry. A major difference between the two technologies is how information is represented. QAM uses combinations of amplitude and phase shifts to represent information. 8-VSB uses shifts in amplitude only, 8 amplitude levels to be specific. In diagram 1, I have included a constellation display for each technique for comparison.

**Diagram 1 (8-VSB Constellation vs. QAM Constellation)**





In the last edition, we mentioned that 8-VSB is capable of transmitting at a data rate of 19.39 Mbps. This compares to 38.8 Mbps for the commonly used “256 QAM downstream signal” and 26.97 Mbps for the “64 QAM downstream signal”. This variance in speeds can be attributed mainly to the different symbol rates of each technique. Despite the greatly different modulation schemes used, both QAM and 8-VSB use MPEG-2 to “stuff” packets.

In the next edition of the “Tech’s Forum” we will continue to discuss the differences between 8-VSB and QAM.

## **Broadband: Service Availability**

(“This article originally appeared in the December 2007 issue of *Communications Technology* magazine. Reprinted by permission of the author.”)

**By Ron Hranac**

For several years, I've said cable operators can provide reliable high-speed data, voice, and digital video services if the entire cable network - headend, distribution plant, and subscriber drops - meets or exceeds certain minimum technical performance parameters. Those parameters include: (1) the technical requirements in Part 76 of the **Federal Communications Commission's** rules (or equivalent cable regulations in countries other than the United States); (2) the assumed downstream and upstream RF channel transmission characteristics in the DOCSIS Radio Frequency Interface Specification; and (3) ensuring the HFC plant's unavailability contribution does not exceed 0.01 percent as described in the PacketCable Availability Reference Architecture. The latter is equivalent to 99.99 percent availability, or what we call "four nines." Striving to meet or exceed the PacketCable availability guidelines is a good idea even if you don't use PacketCable in your network.

I penned a two-part column about deploying voice over Internet protocol (VoIP) telephony in the October and November 2004 issues of *Communications Technology*. The columns focused on the three categories of technical parameters highlighted in the previous paragraph, with a fair amount of discussion about factors that impact network availability.

### **Availability defined**

This might be a good place to stop for a moment and define availability, a term that's often confused with reliability. Availability is the ratio of time that a device, system, network or service is available for use to total time, often expressed as a percentage. We know that a 365-day year comprises 8,760 hours. A common network availability spec - which comes from the old **Bellcore** spec - is the previously mentioned 99.99 percent. That works out to 8,759.124 hours of uptime, or no more than 52.56 minutes of outage per year. If you think that's tough, try five nines (99.999 percent), which works out to 8759.91 hours of uptime, or no more than about 5.26 minutes of outage per year. Yikes!

Reliability is related to availability, but it's not the same thing. Reliability is the probability that a system or device will not fail during some specified period. Thus, it's incorrect to say "99.99 percent reliability" or "four nines reliability."

### **Meeting four nines**

Back to network availability: Can an HFC network meet four nines? The bottom line is generally yes, but there are some "ifs" that come into play. Let's look at a few of the major factors that impact network availability. First, a modern HFC architecture significantly reduces cascaded devices and components

compared to old tree-and-branch architectures, which helps a bunch. Obviously, the shorter the active device cascades after the node, the better. A maximum of two or three amps in cascade is ideal, as far as helping to achieve the holy grail of four nines availability.

Next is suitable use of backup power - in the headend, hub, outside plant, and embedded multimedia terminal adapter (EMTA). That means backup generator and uninterruptible power supply (UPS) in the headend and hub, standby power supplies in the outside plant, and battery backup in the EMTAs.

Status monitoring of critical headend and hub equipment, nodes, and standby power supplies is important to achieving high end-to-end availability.

Appropriate redundancy where it makes sense helps, too, as does the use of hardened - think more reliable - devices everywhere. To round things out, I like to toss in proactive system maintenance practices, high quality subscriber drop installations, a quality control program, and practices to enable quick service restoration after an outage has happened.

### **Service availability**

That largely takes care of network availability, but what about service availability? In other words, what things can affect service availability but not network availability?

To understand where I'm going with this, consider the following hypothetical example. Assume that one of your subscribers is watching a movie on **HBO**, and another subscriber is surfing the Web using a cable modem. During the movie, HBO has a problem of some sort at its main studio or uplink that causes its signal to disappear. Did an outage occur? Think carefully about your answer.

Let's look at this more closely. From the perspective of the subscriber surfing the Web, did an outage occur? What about from the perspective of the subscriber watching the movie on HBO? Obviously the person surfing the Web did not experience an outage, but to the sub watching HBO there was an outage.

Did a cable network outage occur? No.

Did a service outage occur? Yes.

So, did an outage occur? You be the judge. My vote is yes.

The point of this example is to illustrate that there can be service outages but not network outages. The cable network - specifically the outside plant - keeps on working, but one or more services are affected for whatever reason. This suggests that we need to pay attention to both network availability and service availability. That said, what are some factors that can affect service availability?

### **Factors**

Ingress and impulse noise are biggies. When they're present, the cable network is usually still operational. Indeed, high-speed data subs might not notice anything wrong because if their data packets don't get through the first time, they can be retransmitted. But VoIP telephony subs might experience voice quality problems or perhaps even dropped calls. Remember, voice packets cannot be retransmitted. They have only one chance to get through. If they don't make it the first time, they're toast.

Other gremlins that can affect service availability but not network availability include upstream or downstream laser clipping, sweep transmitter interference, and intermittent connections. These likely will have a similar impact on VoIP telephony service as ingress or impulse noise, while cable modem service appears to be more or less humming along just fine. Digital video might get hammered with intermittent

tiling, yet analog TV channels appear fine with perhaps nothing more than an occasional glitch in the picture.

Distortions - composite triple beat (CTB), composite second order (CSO), common path distortion (CPD), and so on - don't physically take the network down, but they sure can impair signals if they're severe enough. Group delay? Micro-reflections? Crummy frequency response? Low carrier-to-noise ratio (CNR)? The plant is still up and running, but some or all of the digital services may be affected, perhaps to the point of no longer working. Analog TV channels may or may not be visibly affected, but they're probably still watchable.

### Tracking

Many cable operators track network availability, but how many track service availability? Granted, the latter would be a lot more difficult because it would entail keeping tabs on each channel or service carried on the network. Indeed, it probably would be very difficult to obtain accurate service availability numbers for all services. But put yourself in the shoes of your customers.

If we go back to the example of the subscriber watching a movie on HBO when the signal disappeared, in that subscriber's mind an outage occurred. He or she doesn't know or care if the service outage was caused by loss of power, a cut cable, a defective piece of headend equipment, or the hypothetical problem back at HBO's main studio or uplink. We might know that the cable network itself didn't experience an outage, so its availability was unaffected. But there was a service outage, one that impacted all subscribers watching HBO at the time.

Ron Hranac is a technical leader, Broadband Network Engineering, for Cisco Systems and senior technology editor for *Communications Technology*. Reach him at [rhrnac@aol.com](mailto:rhrnac@aol.com).

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Frank Eichenlaub	<a href="mailto:eichenf@cisco.com">eichenf@cisco.com</a>	Cisco Systems	Board, Web Mstr Region II Dir	303-790-6659

## 2009 Friends of the Board

Definition: Somebody who supports the functions of the local chapter by participating in meetings; provides input that helps drive board decisions, volunteers as a speaker, possibly financially supportive, and generally those who make and impact through their involvement.

<b>Name</b>	<b>Email</b>	<b>Company</b>	<b>Position</b>	<b>Phone Number</b>
Tom Gorman	<a href="mailto:tom.gorman@chartercom.com">tom.gorman@chartercom.com</a>	Charter	SCTE Chairman	303-323-1482
Dave Robinson	<a href="mailto:drobinson@evisearch.com">drobinson@evisearch.com</a>	EquiVision Exec Search	Newsletter editor	303-722-8920
Randy Bailey	<a href="mailto:randyb3@comcast.net">randyb3@comcast.net</a>	Co Springs School District 11	Friend	719-520-2488
Jim Garcia	<a href="mailto:edwin_garcia@cable.comcast.com">edwin_garcia@cable.comcast.com</a>	Comcast	Friend	719-457-4517
Robert Kostelny	<a href="mailto:rob.kostelny@comcast.net">rob.kostelny@comcast.net</a>	TSS, Inc	Friend	303-995-6689
Richard Covell	<a href="mailto:rgcovell@msn.com">rgcovell@msn.com</a>	T*TSI	Friend & Speaker	303-646-5050
Hugh Long	<a href="mailto:hlong222@comcast.net">hlong222@comcast.net</a>	Educ Services	Friend	303-601-5930
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Steve Snider	<a href="mailto:stephen_snider@cable.comcast.com">stephen_snider@cable.comcast.com</a>	Comcast	Friend & Speaker	303-603-2167
Joe O'Fallon	<a href="mailto:joe.ofallon@adc.com">joe.ofallon@adc.com</a>	ADC	Friend	303-520-8043
Brook Queen	<a href="mailto:bqueen@evolutionbb.com">bqueen@evolutionbb.com</a>	Evolution	Friend	303-717-8830
Rex Gerhardt	<a href="mailto:Rex_Gerhardt@comcast.net">Rex_Gerhardt@comcast.net</a>	Comcast	Friend	720-490-5141
Frank Wimler	<a href="mailto:frank.wimler@chartercom.com">frank.wimler@chartercom.com</a>	Charter	Friend	720-250-7917
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