

The Custom Builder and Home Technology 101

National Association of Home Builders
"2008 International Builders' Show"



Randy Stearns
February 16, 2008
8:00 AM - 9:30 AM

Administration



- Cell phones
- Restrooms
- Emergency exits



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Introductions



- Your Instructor Today
- Who is here:
 - Custom Home Builders
 - Technology contributors
 - CEDIA Representatives



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Our Overall Goal



- To educate the Builder, Architect, Designer and related industries about technology:
 - How it is used
 - Its importance
 - Adoption rates
 - Knowledge, skills and disciplines necessary
 - Where to obtain these contractors



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Objectives



- This course will help you understand the benefits and details of:
 - Infrastructural wiring
 - Whole house music
 - Lighting
 - Control
 - Home theaters



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Infrastructure Wiring



- Wire versus technology cabling
 - Electrical wire carries line voltage throughout the structure:
 - Is it safe?
 - Can the wire handle the needs and load of the structure?
 - Is the electricity convenient for the users?
 - The overall need is "**conductivity**" with the right *size* wire.
 - The skills necessary to execute this technology stabilized decades ago



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Infrastructure Wiring



- Wire versus technology cabling
 - Technology cabling called “Structured Wiring” requires many different skills and knowledge perspectives:
 - Telephony
 - Data and networking
 - Audio
 - Video/RF
 - Control
 - Lighting
 - The overall need is “**connectivity**” with the right type of wire properly applied.



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Infrastructure Wiring



- Conductivity -vs.- Connectivity
- Distributing and optimizing signals not power



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Not all Structured Wiring is Created Equal!



- To some builders a structured wire offering is one television cable and one phone cable to a few locations within the home!



To others it can become quite involved

- Phone
- Data
- Cable Television
- TiVo



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Structured Wire Basics



- Structured wiring is the foundation for virtually all the communications and entertainment within the home, as well as the communications for those within the home to the outside world, including:
 - Multiple phone and fax lines
 - High (or standard) speed data, including wireless
 - Music, Cable TV, Satellite, Digital, High Definition, and other entertainment offerings
 - Security systems
 - Lighting
 - Control
 - Others (like irrigation, automation, water features, etc.)



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Data



- 1 million + uses
 - IPTV, UTube, AppleTV, Media servers, iPod.
 - New announcement everyday
 - Smaller, more, faster, easier
- Our Job (Builder & ESC)
 - Prepare each home for the maximum benefits these new technologies offer without compromises (in other words we have to get this accurately installed.....early.)



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Video



- This includes:
 - Home theaters
 - Bedrooms and other televisions
 - Cable television
 - Satellite television
 - DVD
 - TiVo's
 - Displays (big screens, plasma, projectors, etc.)



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Video



- Home buyers enjoy television from many locations throughout their homes, including:
 - Home theaters, family room, bedrooms, bathrooms, kitchens, workshops, basements, decks, gyms, office, etc.



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Video



- The objective is to make certain that the television cabling can handle any choice the user wishes, now and for the future:
 - A single piece of coax severely limits users
 - We recommend at least 3 from the “enclosure or rack”
 - Primary for cable or satellite
 - Secondary for DVR/PVR
 - 3 for up-streaming or other purposes



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Phones



- The home should be wired for a minimum of 4 phone lines:
 - 1 main telephone for the family
 - 1 office line
 - 1 fax line
 - 1 spare
- Use high quality category cabling



Cut away of quality “cat 5” cable



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Data



- The home network utilizes several different complex components, including:

- Computers
- Displays
- Audio systems
- Printers
- MP3 devices (think I-Pod)
- Cameras
- Storage servers
- Appliances
- What's next?



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Data



- All these devices communicate digitally or in a "binary" language.
- The cabling must not "choke" or slow the communication down!



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Data



- Data is used through two basic mediums
 - Hard wired - the benefits of the hard wired connection is:
 - Speed ("up-stream and down-stream")
 - Security
 - Very robust and fault tolerant
 - The challenges of the hard wired connection are:
 - Location specific
 - Limited number of users and locals



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Data



And...

- Wireless - The benefits of wireless are:
 - Use anywhere and everywhere
 - Multiple users in the same location
- The challenges of wireless are:
 - Data speeds lower than wired
 - Security issues
 - Higher degree of faults and data corruption



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Data



Most homes will utilize a combination of both **if** offered!



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Infrastructure Summary



- Head end requirements
 - Accessibility, size, location, heat, electrical requirements
- Other trades... other systems
- Timing
- Expectation client
- Build your own appropriate structured wiring scheme



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Whole House Music



- Some of the latest research shows that over 75% of those polled who are thinking about a new home “highly desire” music throughout their home (CEA consumer research)

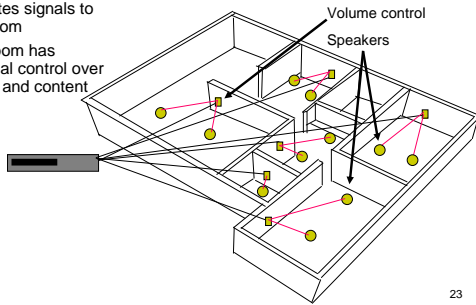


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Whole House Music System overview



- Whole house amplifier distributes signals to each room
- Each room has individual control over volume and content



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Music



- Multi-room single source
 - Volume control based
 - No control of source
- Multi-room multi-source
 - Key pad / touch-screen
 - Limited to full control of sources



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Music



• Speakers:

- Box
 - Floor standing
 - Book shelf
- In-ceiling, in wall



- 2005 turning point for in-wall –vs- box speaker sales



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Music



• Sources:

- CD.... dying
- Digital (XM, Sirius, HD, AM)
- Internet radio
- Servers
- iTunes/iPod / mp3
- Other



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Control - Music



- Simple in room volume control



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Control - Music



- In room Keypad: very easy to use, increases access and gives status of electronics.



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Control - Music



- In-room touch screen very easy to use, the ultimate!



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Music Summary



- Equipment
 - Location, power, heat,
- Wiring
- User interface
 - What type, location
- Speaker placement
- Functionality, features



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Lighting

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- Light within the home is taken for granted, it must be included
- Light has the ability to change space, and mood
- Harnessing the control of light adds great benefits
- Most likely the next adopted "standard"



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Lighting

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- Features and benefits
 - Energy benefits
 - Aesthetic
 - Increased productivity/ convenience
 - WAUX



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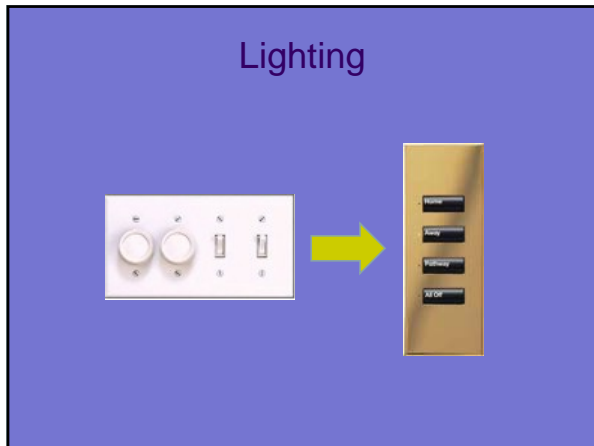
Lighting

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Light Level	Electricity Saved	Bulb Life Extended
90%	10%	2 Times
75%	20%	4 Times
50%	40%	20 Times
25%	60%	Greater Than 20 Times



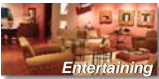
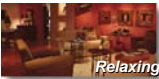

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Lighting

- Add Scenes
- Add Pathways
- Add Timers
- Add Security

- Same space.....
 - Three different rooms







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Lighting

- 3 Reasons:
 - Aesthetics
 - Wall clutter
 - Architectural effect
 - Security
 - Lights on
 - Convenience
 - Lights off

- 3 types:
 - Localized
 - Normal wiring
 - Centralized
 - Central wiring
 - Optimized
 - both


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Lighting Summary



- Load schedule
- Fixture schedule
- Switching schedule
- Structure
- Wiring plan



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Control



- Why Control?
 - "Most home electronic systems make users feel stupid" *Utz Baldwin CEDIA President 2007*



- Your systems should be as easy to use as a telephone:

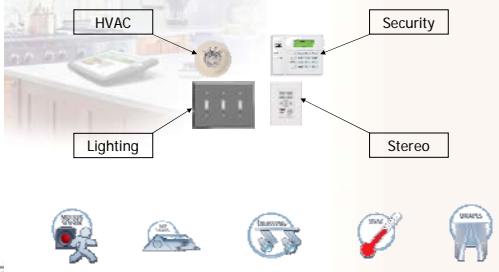


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Control



Aesthetics – Normal wall clutter



Control

Aesthetics – A better solution

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Control Summary

- All sub systems
 - Entertainment
 - Lighting
 - Security
 - Pools, spas, fountains, rivers
 - HVAC
 - Shades
 - Motors, gates
 - Weather stations
- Irrigation
- Fireplace
- Doors
- Surveillance
- Email integration,
- Web control / monitoring
- Appliances
- Energy usage
- Front door caller ID
- Delivery email
- Knowing what your kids are up to.... Priceless. ⁴¹

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Control Summary

- Interfacing with every trade
- Each system speaks a different language
- Each family member is unique
 - Technology confidence
 - Preferences (which change over time)
- Technology touches every surface of your home
 - So much to consider, why bother listing it here

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Home Theaters/Media Rooms



- A Home Theater
- A Media Room



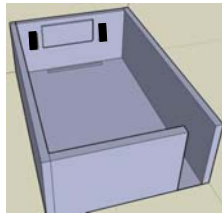
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The Room



The structure and shape of the room will have large influence on the overall outcome of the theater:

- Isolation
- Surround field
- Room induced resonance
- Bass response
- Voice frequency clarity
- Crispness and timber of the room
- And many other factors will affect room performance



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Home Theaters/Media Rooms



- The implementation of a full home theater or media room is complex
 - The room size, design and structure
 - The Display
 - The Audio
 - Control

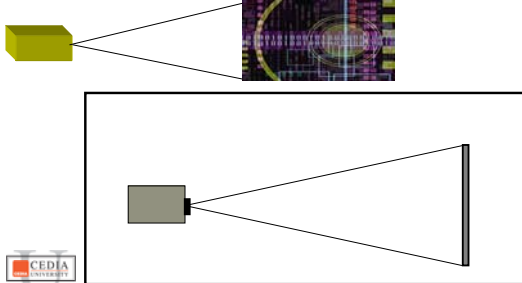


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The Display



- Two piece projection:



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The Display



- Two piece projection - example:

This is a high end projection screen (glass) that is actually curved – the projector is in a room behind the image



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The Display



- Flat Screen:
 - LCD or Liquid Crystal Display: Pro/Con
 - Plasma: Pro/Con



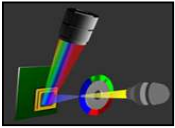
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The Display



– Rear Projection

- LCD: Pro/Con
- DLP: Pro/Con

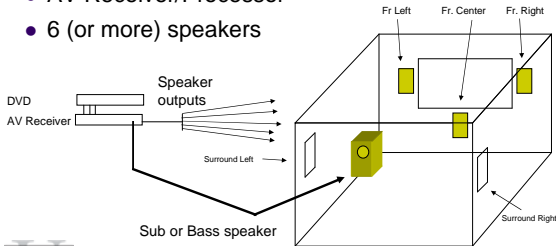


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Home Theater Audio Basic Set up



- Source (DVD or Cable Box)
- AV Receiver/Processor
- 6 (or more) speakers

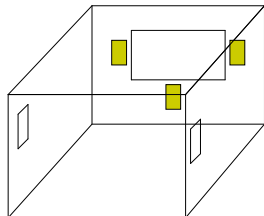


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Home Theater Audio Basic Set up



- Placement of speakers is critical – some factors to consider:
 - Dispersion patterns
 - Reflections
 - Standing waves
 - Seating
 - "Sweet Spot"



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Home Theaters



- Successful execution of...



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So now what?



- Technology is racing ahead of many:
 - Rights management
 - Platforms are changing – How long will the following last?
 - CRT
 - DVD
 - CD
- Builders please keep pace!



Get Up To Speed



- CEDIA courses “The Fully Automated Home” & “Top 10 Trends”
- CEDIA Finder Service
www.cedia.org/finder_service
- Develop a relationship with a certified Electronic Systems Contractor (ESC)



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- Thanks for investing with us