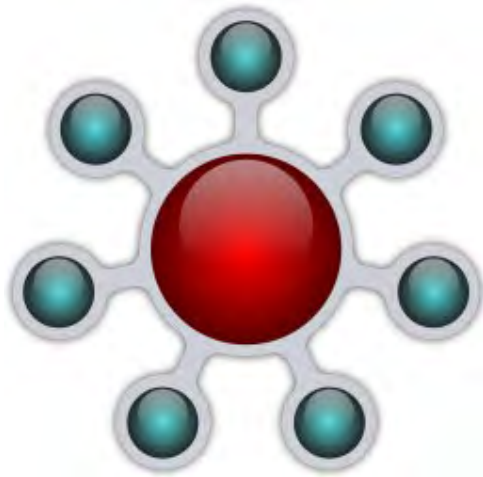


Meet HAL

Rane's New Expandable DSP Platform



Introducing HAL[®] DSP Products

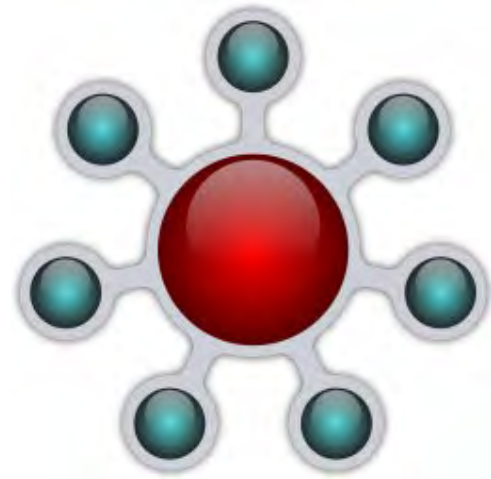


The HAL Family

- Five New Hardware products:
 - HAL1 - DSP brain
 - EXP1 - RAD & DR Expander
 - PAGER1 RAD Paging Station
 - Three Digital Remotes: DR1, DR2, DR3
 - All 20 Existing RADs also supported
- New Software: Halogen
- All engineered, designed, built, tested & supported in Mukilteo, WA USA

NEW HAL[®]

EXPANDABLE DSP



- HAL: Heuristic Audio Laboratory
 - Heuristic - *serving to find out or discover*. Also a problem-solving technique using iterative solutions
- New HAL permits:
 - Expandability of HW, SW, FW, Apps, Profits
- HAL's origins
 - Target new customer application problems
 - Talk to customers, understand current solutions, careful study & research

HAL target applications

- Music & paging systems - retail/restaurant
- Auditorium/church/theater
- Room combining, overflow (cry room)
- Also studied conferencing systems
 - But different DSP architecture & power required by acoustic echo canceling moved this to “down the road”

HAL Goals

- Greater flexibility & power, yet simpler to manage and configure
 - Insanely powerful, insanely easier
- You don't have to be smart to use it, using it makes you smart - i.e., educate
- Opens new apps & customers

What HAL brings to the party

1 of 6

- Expand audio ***and control***
 - Audio begins and ends far beyond rack room
 - Old school analog (conduit) is supported, but this century's approach is supported too: RADs, DRs, EXPs...
- *Plug it in, it works*
 - Auto addressing, auto firmware & auto configuration settings
 - Device behaviors follow physical location
 - Plug in RADs, PAGER1 and/or DRs in other locations, their settings change! (portable cart friendly)
 - All peripheral devices' firmware is stored in the HAL1 brain and automatically sent to devices when plugged in

What HAL brings to the party

2 of 6

- Device Connection
 - HAL1 auto-checks all CAT5 crimps; both ends
 - HAL1 auto-verifies audio to/from RADs works
 - HAL1 auto-verifies devices are plugged in to the correct place
 - Mismatches between HW & SW are easily corrected during setup - *without rewiring the rack!*

What HAL brings to the party

3 of 6

- RAD Story - for audio I/O outside the rack
 - A/D & D/A Converters at the wall
 - 500 ft. homeruns - 66% farther than Ethernet
 - CAT5 digital audio cables in data cable tray
 - BIG conduit savings, IT folk friendly
 - Endless variety of audio I/O available
 - Expanded control: AM1, AM2, PAGER1

What HAL brings to the party

4 of 6

- Digital Remote (DR) Story - control is key 99% of the time
 - Simple end user remote interfaces sell the rack box(es)
 - DR thousands less than 3rd-party control (AMX, Crestron...)
 - Easy setup & integration w/ auto config, auto verify (no power budget, no termination)
 - Dynamic remote labeling - all w/ LCD display

What HAL brings to the party

5 of 6

- EXPansion Story - audio & control
 - 64 x 32 audio channels & control expansion
 - Up to four, 16 channel EXPs into HAL1
 - Up to twenty-four, 32 channel EXPs out of HAL1
 - Endless variety of audio I/O - plug in RADs, PAGER1, DRs
 - Endless application-specific solutions
 - More EXP devices on the way

What HAL brings to the party

6 of 6

- The most advanced DSP blocks anywhere
 - Paging System[®] auto links dozens of BGM/Paging sources to dozens of zones without wires
 - Paging Manager easy pager-to-zone mapping
 - Room Combining approach will change all future industry expectations
 - The Rane AM2 portable automixer for “talking head” meetings automatically cascade with the rack room HAL DSP room combine processor block.
 - This permits gain-sharing between the audience mic plugged in to the back wall’s XLR jack and the portable mixer’s mics.

Hardware Family



HAL System Audio Channels

INPUTS

OUTPUTS

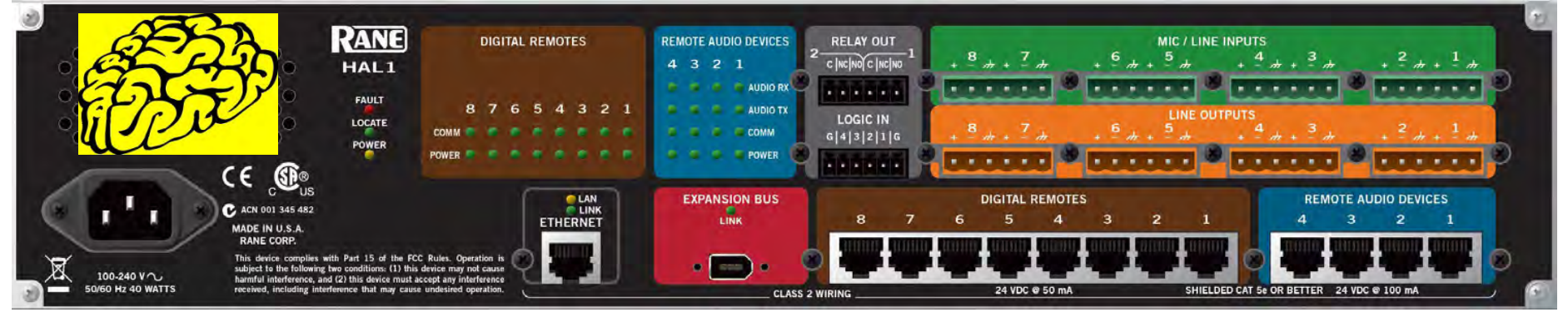
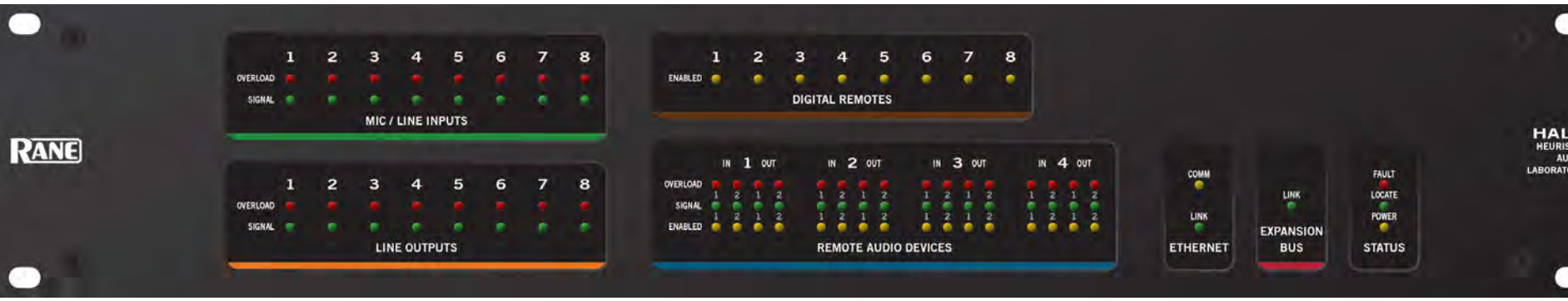
Analog mic/line	8	8 Analog line
Digital RAD ports	8	8 Digital RAD ports
Digital Expansion into HAL1	64	32 Digital Expansion out of HAL1
Total in HAL1 DSP Brain	80	48

HAL1
HEURISTIC
AUDIO
LABORATORY

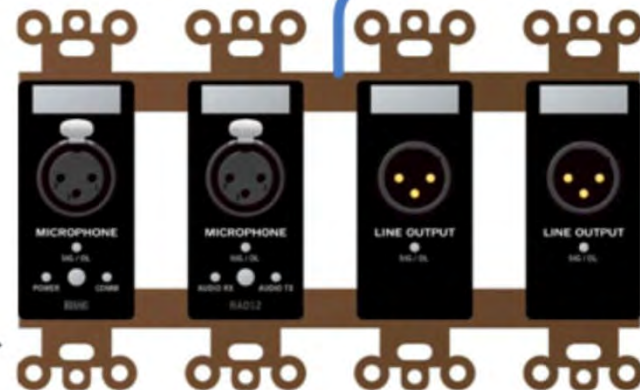
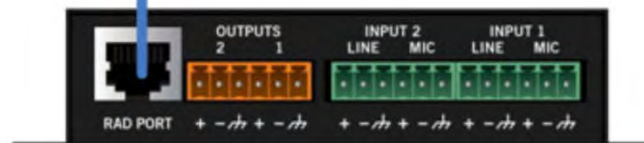
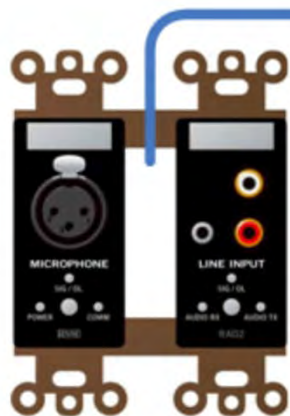
HAL1
HEURISTIC
AUDIO
LABORATORY

HAL1
HEURISTIC
AUDIO
LABORATORY

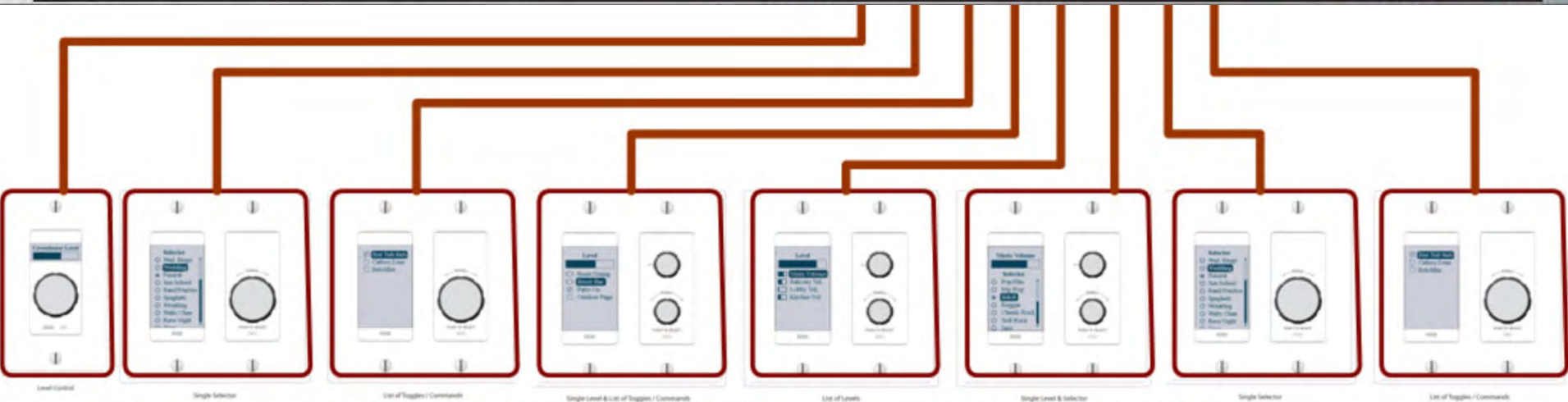
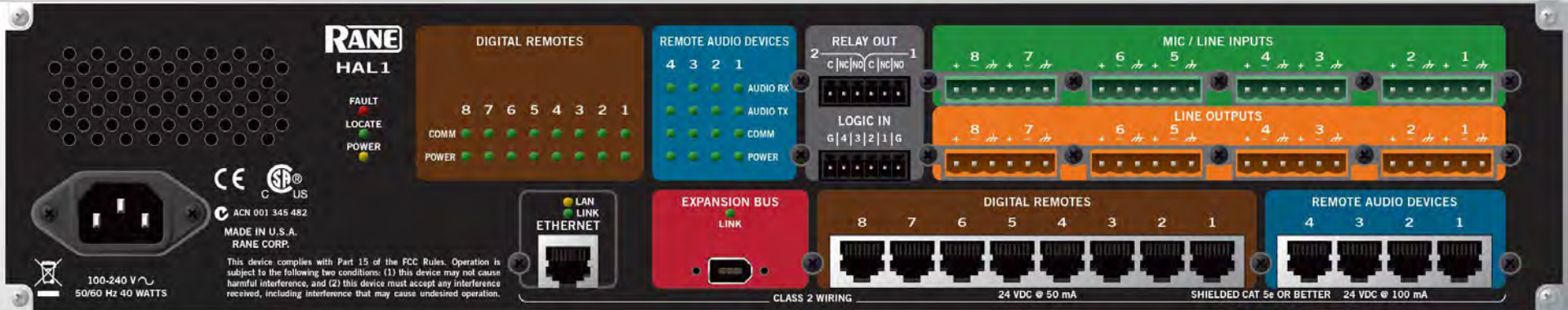
HAL1
HEURISTIC
AUDIO
LABORATORY



HAL1 - DSP Brain



4 RAD Ports: from 2x2 I/O to 64 inputs. Audio where it's needed.
Homerun connection: auto-checks CAT5 crimp & verifies audio.
20 models: RADs, PAGER1, AM1 & AM2 Automixers & 3 DRs.



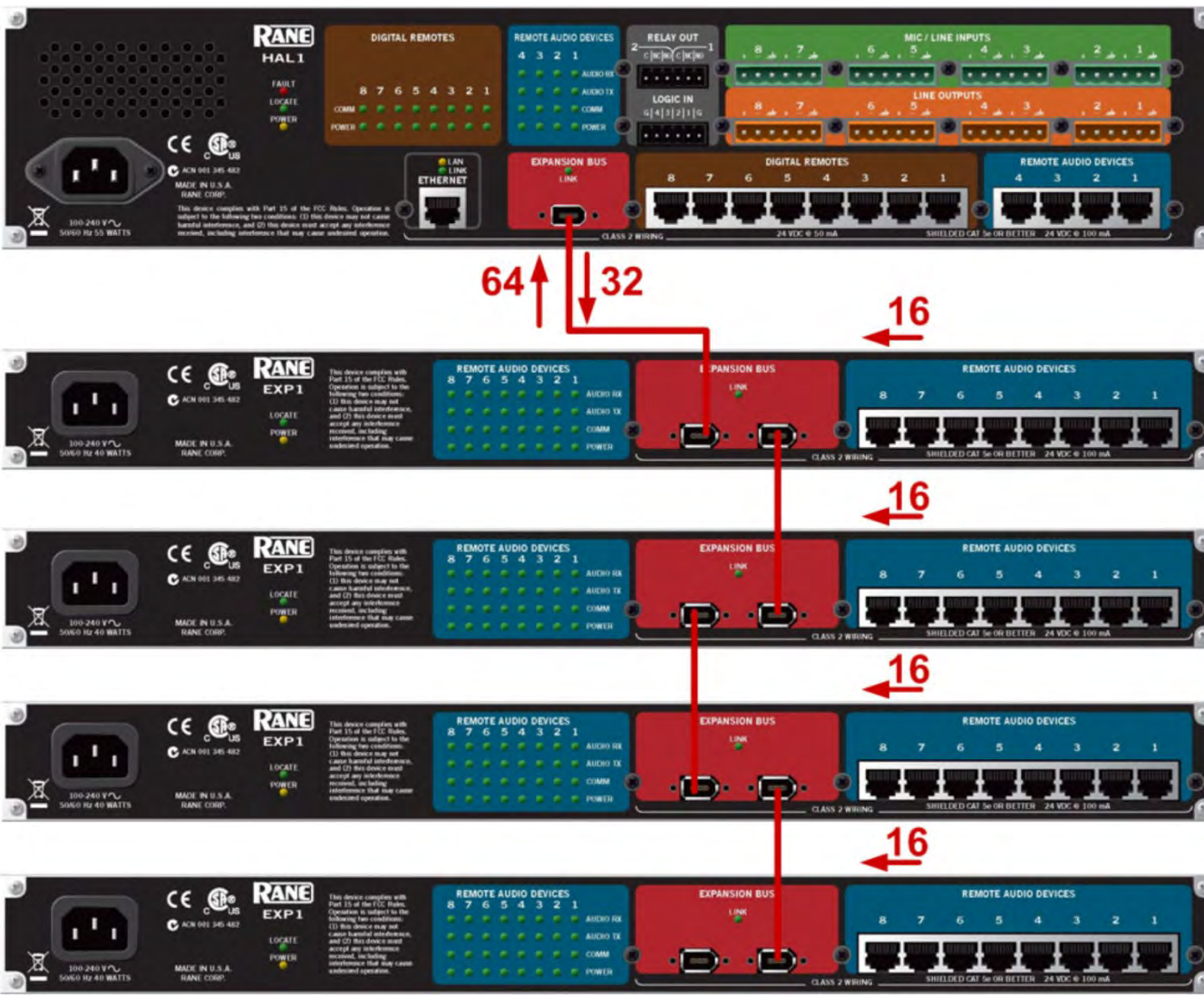
8 Digital Remote Ports: DR1, DR2, DR3

Homerun Connection: auto-checks CAT5 crimp.

Hot-swapping encouraged. Each with customizable backlit LCDs

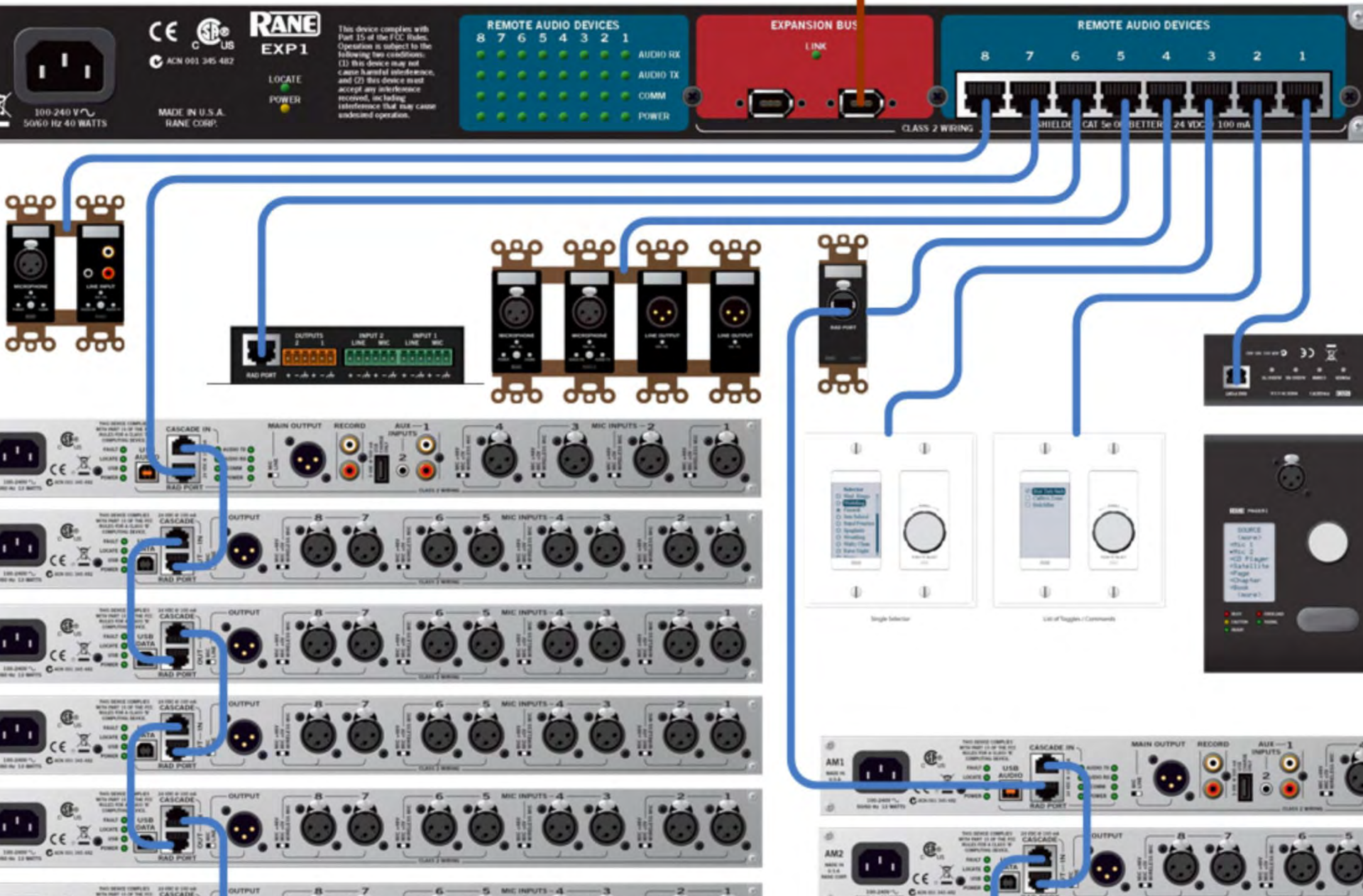
HAL1 - EXP1 Expansion Unit

- RAD & DR Expander



- Max of four EXP1 devices
- Supports RADs and DRs

anssi



PAGER1 RAD



- Mic stage RAD
 - SW adjust
- *Scenario* (group of zones) LCD list
- Select knob, push-to-talk
- Status indicators

Scenarios

Page All

Table Ready

Patio

All Dining

North Dining

South Dining

Dock

Garden

Kitchen Areas

PAGER1
Scenarios
screen

Three Digital Remotes

- DR1
 - Volume control





DR2

- Preset Recall:
 - Single Selector
 - “Radio buttons”





DR2

- Preset Recall:
 - List of Toggles or Commands





DR3

- Single Level & Select
 - “Source select & volume”



DR3



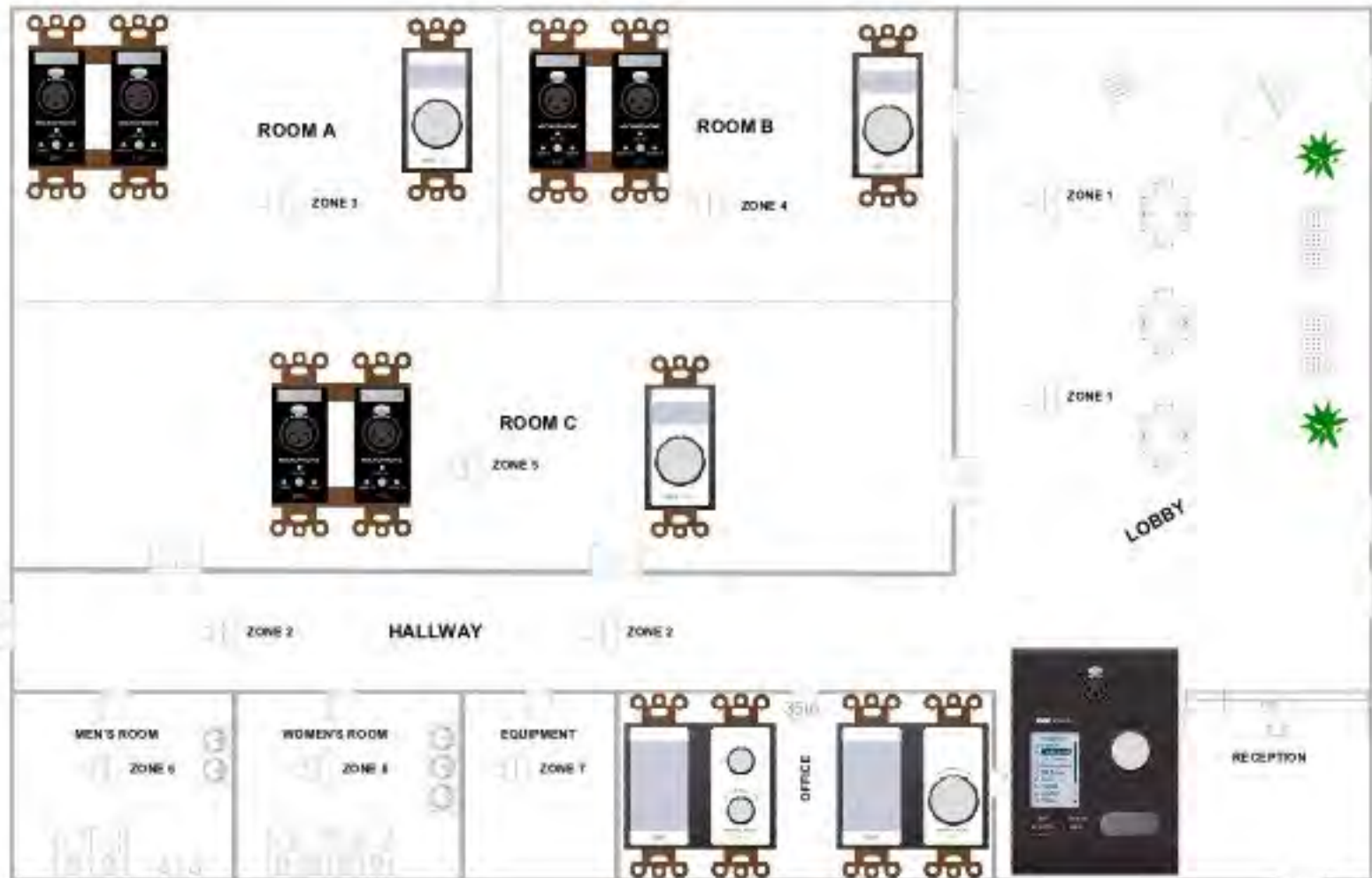
- Single Level & List of Toggles /Commands
 - Preset Recall + Level

DR3

- List of Levels
 - “Multi-zone Volume control”
 - Simple remote Input mixing -or-
 - Multi-room volume control

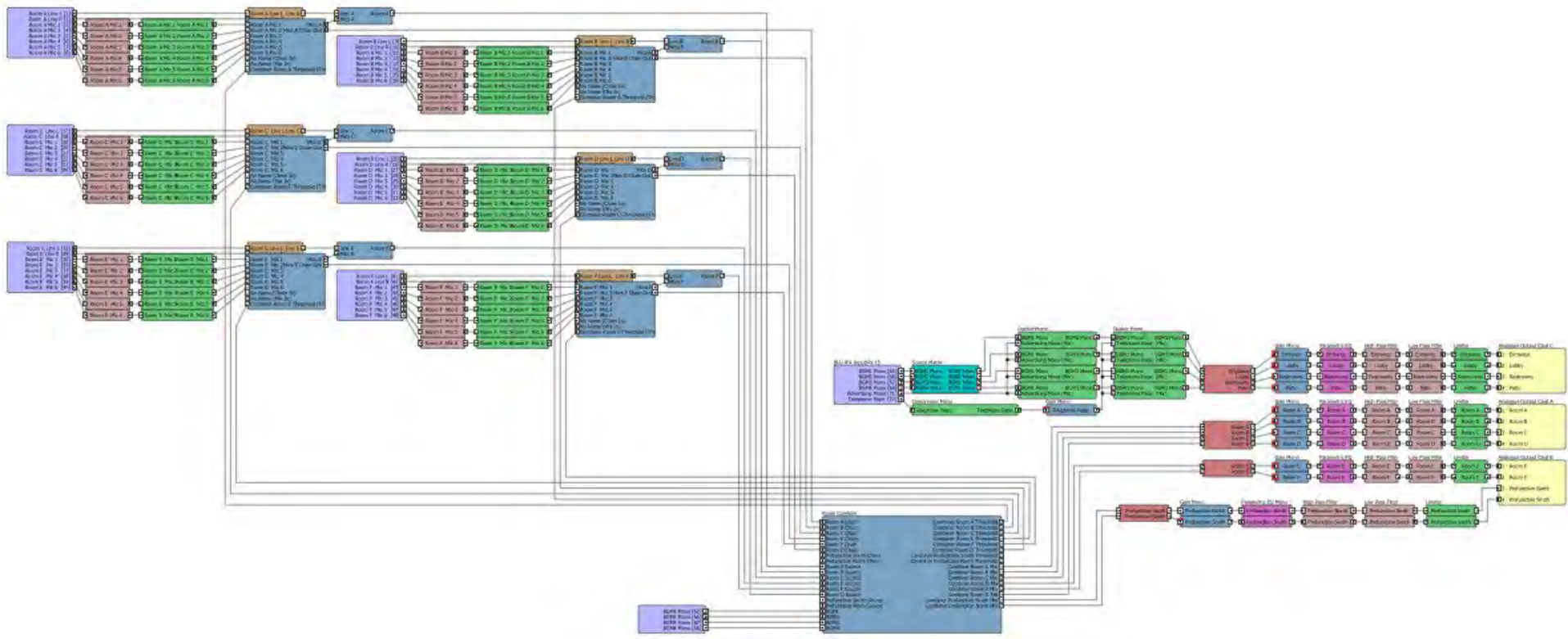


Halogen Software: Hotel du Jour



6 Room Combine Compare

- BSS: 183 blocks, 271 wires. No paging into room combine



6 Room Combine Compare

- Rane Halogen: 171 blocks, 162 wires
- And the Rane solution permits paging into the room combine rooms



Conclusions

- Do larger, formerly complex jobs fast with WAY fewer wires, no presets and intuitive control linking
- Paging system eases pager-to-zone map
- Verify control linking behaviors offline
- Verifies connections (CAT5), audio...
- Behavior changes: plug it in, it works
- Gain-share mix between wall mic jacks, portable mics and rack-connected mics

