

## HAA Critical Listening Worksheet Addendum

**Discussion:** The HAA critical listening worksheet was designed to provide three basic contributions to the calibration process. 1) A common language to describe the characteristics of sonic goals, 2) a score sheet from which a calibrator can become more consistent in the assessment of performance, and 3) educate customers on the real capabilities of a high definition audio system.

**References:** The selection of reference material shown here is not designed to be all inclusive or represent the state of the audio production art. We use stereo recordings because from an instructional vantage the experience of these qualities is easier to detect yet they are relevant for all type of recordings including multi-channel.

### Clarity

**Dialogue Intelligibility:** This sonic attribute is perhaps the easiest to understand. There is no movie enjoyment when the listener is challenged to understand dialogue or lyrics.

*Reference: Cantate Domino/Chorus... Can you clearly hear the male (zing zing) chorus and female vocals simultaneously? HAAREF track 18*

**Instrumental Texture:** Any recorded instrument including the human voice is a rich tapestry of sounds. Hearing the range of details from a bow rubbing on a violin string to a guitar pick plucking a string is a good test of such resolution.

*Reference: Pink Floyd Dark Side of the Moon; Time... each clock is an instrument in its own right. HAAREF track 13*

*Reference: Jazz at the Pawn Shop... pick your favorite instrument from top hat, to sax or even a cash register. Pay particular attention to the sound of the mallets striking the xylophone. HAAREF track 4*

**Low Level Detail:** The experience of being “teleported” to another time and place involves a sense of space. The subtle details hidden in the ambient sound field of a recording bring such an experience to life.

*Reference: Cowboy Junkies/Trinity Session... Mining for Gold...listen for the sound of the HVAC in the background of this old church. HAAREF track 12*

*Reference: Jazz at the Pawn Shop... the ambient sound field here is a big part of the show. HAAREF track 4*

*Reference: Cantate Domino/ Chorus... can you hear the size of the church? HAAREF track 18*

*Reference: Rickie Lee Jones; Pop Pop track 3... Can you hear the picking and fret squeaking from the guitar? HAAREF track 14*

## Focus

**Precision Localization:** The sound stage is composed of a series of stereo images superimposed on each other to recreate a sonic experience. Instruments microphoned some distance away should be precisely positioned. Instruments or effects closely mic'd should reveal the location of individual part of the instrument i.e. low parts of a piano vs. high parts, the sound of the pick vs. the fret squeaks etc. Keep in mind this is a three dimensional space within which each sound is placed.

*Reference: Pink Floyd Dark Side of the Moon; Time... can you point at each ticking clock? **HAAREF track 13***

*Reference: Cantate Domino; track 14 Chorus... can you position each singer individually? What about the male vs. female chorus? **HAAREF1 track 5***

*Reference: Robert Farnon; CAPT Horatio Hornblower... can you position each instrument individually in the sound stage? **HAAREF1 track 6***

*Reference: Rickie Lee Jones; Pop Pop track 3... the guitar is large in the soundstage but there are sound emanating from all parts of it. Can you hear the picking from the fret finger squeaking? **HAAREF track 14***

**Image Stability:** Once you locate an image in the sound stage, its position can appear to shift or blend into the mass of sound. Try to listen to an instrument and keep focused even in the midst of other sounds.

*Reference: Pink Floyd Dark Side of the Moon; Time... as each clock begins ringing it becomes more difficult to focus on a single clock. **HAAREF track 13***

*Reference: Cantate Domino; track 6... can you imagine the size of the church? **HAAREF1 track 4***

*Reference: Rickie Lee Jones; Pop Pop track 3... is Rickie Lees voice perfectly centered and stable? **HAAREF track 14***

**Instrumental Dimension:** In addition to position in the sound the apparent size of an instruments image is a valuable clue. This relates closely to how the instrument was mic'd. A close mic'd voice may occupy a larger space than a distant mic'd one. Does the instrument appear to be properly sized?

*Reference: Cantate Domino; track 6... how far away from the mike is the singer? Does she seem to be right-sized? **HAAREF track 17***

*Reference: Jazz at the Pawn Shop1... pick your favorite instrument from top hat, to sax or even a cash register. Pay particular attention to the sound of the mallets striking the xylophone. **HAAREF track 4***

*Reference: Rickie Lee Jones; Pop Pop ... Rickies voice is close mic'd. Do you feel you can visual how close she is to the mike? Does her voice occupy a true to life space from that perspective? **HAAREF track 14***

## Envelopment

**Depth & Spaciousness:** The sound stage is composed of a series of stereo images superimposed on each other to recreate a sonic experience. The backdrop for this is the ambient sound field. The farthest sense of depth in any recording is this ambience and the instruments farthest away from the microphone.

*Reference: Cantate Domino; track 4 Chorus... a large church or a small one/do you hear the sense that the front wall of your sound room is far away? **HAAREF track 18***

*Reference: Jazz at the Pawnshop/Lime House Blues... Is the soundstage wall to wall/are the instruments floating in front of the speakers? **HAAREF track 4***

*Reference: FairyTales/ The Moon is a Harsh Mistress; Radka Toneff... Is the piano stretching wall to wall fully across the sound stage and well in front of the speakers? **HAAREF track 3***

**Continuity:** For multi-channel systems the surround field should be seamless without interruption. Panning from front to back or side to side should appear smooth and without interruption.

*Reference: Jazz at the Pawnshop/Lime House Blues... Are you listening from within the crowd, immersed from all sides? **HAAREF track 4***

*Reference: Pink Noise from all five channels can reveal any holes in the sound field. Don't be tempted to look beside or behind you. The sound field is meant to be heard with the listener facing forward.*

*Reference: Apocalypse Now; Helicopter Attack- Valkyrie... The helicopters appear to fly deep the sky and should smoothly pan from front to back and vice versa.*

**Surround Field Cohesiveness:** This is an element related to any frequency shift that is observed as sound pan around the sound stage. Timbre shifting is difficult to combat since our ears create their own timbre shifting as sounds change elevation or azimuth.

*Same as above*

## Dynamics

**Effortlessness:** The system should reproduce loud passages with ease and without adding any distortion. Bass is a big player here and often the limiting factor in the system.

*Reference: Rafos/Gates of Dafos ... be careful of the volume? **HAAREF track 16***

*Reference: Sheffield/Drum Improvisation... Excellent test for dynamics with clarity **HAAREF track 8***

*Reference: Sheffield/Roll em... make those horn blaze **HAAREF track 7***

*Reference: Rickie Lee Jones; Pop Pop ... Rickies voice is close mic'd. Is her voice clear and lifelike or harsh? **HAAREF track 14***

**Dynamic Contrast:** This describes the reproduction of transients in music. Extremely dynamic instruments like the piano, drums and even the human voice can sound dull or 2-dimensional without properly reproduced dynamics. This is that sense of life and realism that can startle without appearing overwhelming.

*Reference: Pink Floyd Dark Side of the Moon; Time... the clocks demand much from a system but can sound like they are in the room. HAAREF track 13*

*Reference: Fairytales/See Her... pianos are difficult to because they are subtly dynamic. HAAREF track 3*

*Reference: Jazz at the Pawnshop/Lime House Blues... the xylophone is very dynamic HAAREF track 4*

**Subtlety:** This describes the audibility of the quietest passages in a recording. Often the sound of ambient noise (not electronic noise) recorded at the same time of the instrument are important to relate realism. Other details can be hidden by the compression of dynamics due to too much ambient noise.

*Reference: Chicago Symphony/Scheherazade... the first few minutes; listen for the violinist breathing, turning pages etc HAAREF track 20*

*Reference: London Symphony/Carmina Burana... listen for the silence of the hall, the occasional cough, and can you hear the Kingsway subway passing by? HAAREF track 20*

## Response

**Timbral Accuracy:** This can be a difficult thing to ascertain without expert experience listening to musical instruments. Instruments each have their own acoustical character and any response anomalies can skew the sound away from reality.

*Reference: Jazz at the Pawnshop/Lime House Blues... many common instruments HAAREF track 4*

*Reference: Sheffield Prime Cuts/ Thelma Houston... female vocal performance. HAAREF track 6*

*Reference: Stereophile Test CD; Christ Church/Recorded by John Blaine... we've all heard church organs. HAAREF track 10*

*Reference: Fairytales/See Her... female vocals are difficult, listen for honking, hollowness, or excessive sibilance. HAAREF track 3*

**Smoothness:** While timbre can be distorted by broad changes in response coloring the sound, more abrupt changes in response can become annoying. This is the sense ringing or blurring of certain tones. For bass the sound can be seemingly monotone or hollow.

*Reference: Stereophile Test CD 2... a test tone designed to expose uneven bass response. **HAAREF track 20***

*Reference: Cantate Domino; track 4 organ... listen to the low frequency pipes? **HAAREF track 17***

*Reference: Sheffield Prime Cuts/ Thelma Houston... bass guitar lines. **HAAREF track 6***

*Reference: Rickie Lee Jones; Pop Pop ... Are the notes the standup bass plays even in amplitude and are they all integrated in its stereo image? **HAAREF track 14***

**Tonal Extension:** This describes the extent high or low of frequencies reproduced. Deepest bass tones require a subwoofer or very large full range speaker.

*Reference: Stereophile Test CD 2... a test tone designed to expose uneven bass response. **HAAREF track 20***

*Reference: Cantate Domino; track 4 organ... listen to the low frequency pipes? **HAAREF track 17***

*Reference: Sheffield Prime Cuts/ Wise to the Lines... the symbols are tight and extended. **HAAREF track 20***

*Reference: Stereophile Test CD; Christ Church/Recorded by John Blaine... focus on the low pipes. **HAAREF track 10***

**Tonal Cohesiveness:** Of particular importance is that each sonic image appears to be continuous and cohesive. Sound emitted from different drivers can appear to disembodied the sound most noticeably when using a subwoofer; all sound of one instrument should appear to come from the same place.

*Reference: Stereophile Test CD 2... all the bass should appear to come from the Fender bass. **HAAREF track 1 and 2***

*Reference: Sheffield Prime Cuts/ Thelma Houston... female vocals can often appear to be audibly different from tweeter to midrange; another bass guitar and the vibes. **HAAREF track 6***

*Reference: Rickie Lee Jones; Pop Pop ... The standup bass should be one image not an image and a sub. **HAAREF track 14***

## HT Advanced Reference CD Tracks

- Track 1: Fender Bass in left and right channels  
Source: Stereophile Test CD 2, STPH 004-2  
Use: Envelopment: Continuity, Focus: Image stability, Response: cohesiveness and smoothness.  
Info: <http://www.stereophile.com/musicrecordings/338/>
- Track 2: Fender Bass out of phase and then in phase  
Source: Stereophile Test CD 2, STPH 004-2  
Use: Envelopment: Continuity, Focus: Image stability, Response: cohesiveness and smoothness.  
Info: <http://www.stereophile.com/musicrecordings/338/>
- Track 3: The Moon is a Harsh Mistress  
Source: FairyTales; Radka Toneff and Steve Dobrogosz (ODIN Records-Toftesgate 69-N-0552 Oslo Norway)  
Use: Envelopment: Depth (Soundstage width and depth), Focus: Instrumental dimension.
- Track 4: Limehouse Blues  
Source: Jazz at The Pawnshop, Proprius PRCD 7778 (also available as SACD)  
Use: Clarity: Low Level Detailing, Envelopment: Depth and width
- Track 5: Wise to the Lines  
Source: Sheffield Track Team: Sheffield Drum and Track Record, Sheffield CD 14/20)  
Use: Focus: Precision Localization and image stability
- Track 6: To Know You is to Love You  
Source: Thelma Houston and Pressure Cooker: I've got the Music in Me, Sheffield CD 2  
Use: Response: Timbral Accuracy and smoothness
- Track 7: Roll 'Em  
Source: Harry James and his Big Band; Still Harry after All these Years, Sheffield CD-11  
Use: Dynamics: Dynamic Contrast and effortlessness, Focus: Image stability
- Track 8: Drum Improvisation  
Source: Jim Keltner; Sheffield Drum and Track Record, Sheffield CD 14/20)  
Use: Focus: Precision localization, Dynamics: Efforlessness
- Track 9: Drum Improvisation  
Source: Sheffield Drum and Track Record, Sheffield CD 14/20)  
Use: Focus: Precision localization, Dynamics: Efforlessness

- Track 10: Ave Maria  
Source: Takaoki Sugitani; William Partridge; Sterophile Test CD 2 STPH 004-2  
Use: Envelopment: Depth, Focus: Precision localization
- Track 11: Polwheal: Captain Horatio Hornblower Suite  
Source: Robert Farnon & The Royal Philharmonic Orchestra; Robert Farnon:  
Concert Works Reference Recordings RR-47CD  
Use: Focus: Precision localization and image stability
- Track 12: Mining for Gold  
Source: Cowboy Junkies: The Trinity Session RCA 8568-2-R  
Use: Focus: Instrumental dimension, Envelopment: Depth
- Track 13: Time  
Source: Pink Floyd; Dark Side of the Moon  
Use: Focus: Precision localization
- Track 14: Hi-Lili Hi-Lo  
Source: Rickie Lee Jones; Pop Pop, Geffen ART-NO-T209  
Use: Response: Smoothness, Focus: Instrumental Dimension, Clarity:  
Instrumental Texture
- Track 15: Gates of Dafos  
Source: Rafos; Ryko RCD10108  
Use: Dynamics: Effortlessness, Focus Instrumental Dimension
- Track 16: Concerto for Organ solo in A major, LV 130 "del Signor Gentili" by  
Johann Gottfried Walther  
Source: Alf Linder (Organ) ; Cantate Domino Proprius 7762  
Use: Response: Tonal extension and smoothness, Envelopment: Depth
- Track 17: Soloist  
Source: Carl Orff (Composer), André Previn (Conductor), St Clement Danes  
School Choir (Orchestra), London Symphony Chorus (Orchestra), Sheila  
Armstrong (Performer), et al. EMI B000002RYZ  
Use: Dynamics: Effortlessness, Envelopment: Depth, Focus: Precision  
localization
- Track 18: Zither Carol (Zing Zing)  
Source: Oscar's Motet Choir; Cantate Domino Proprius 7762  
Use: Clarity: dialogue intelligibility, Focus: image stability
- Track 19: Warble tone track  
Source: Sterophile Test CD 2, STPH 004-2

Use: Response smoothness

Track 19: The Story of the Kalender Prince

Source: Rimsky-Kosakov; Sir Thomas Beecham and Royal Philharmonic, EMI  
CDC 7 47717 2

Use: Focus: Precision localization and image stability, Envelopment: depth

Track 20: The Story of the Kalender Prince

Source: Rimsky-Kosakov; Reiner and Chicago Symphony, JVC JMCXR-0015

Use: Focus: Precision localization and image stability, Envelopment: depth

Track 17: Reprise

Source: Carl Orff (Composer), André Previn (Conductor), St Clement Danes  
School Choir (Orchestra), London Symphony Chorus (Orchestra), Sheila  
Armstrong (Performer), et al. EMI B000002RYZ

Use: Dynamics: Effortlessness, Envelopment: Depth, Focus: Precision  
localization