

## BAG END STUDIO B CLOSEFIELD / SUBWOOFER SYSTEM

By Bruce Bartlett  
with Jenny Bartlett

In the Hobbit trilogy, "Bag End" is the name of the Hobbit's home. It is also the name of a top pro-audio company who has specialized in speakers and electronics for 20 years.

The company makes a wide variety of speaker systems for monitoring, sound reinforcement, musical instruments, home theater and home stereo.

Some of Bag End's users are Chick Corea, Herbie Hancock, Larry Carlton, Tom Coster, Keith Emerson, Al DiMeola, and many more. Bag End systems are found in such venues as Todd-AO Studio, MGM Grand Hotel, ABC-TV, and Comiskey Park in Chicago.

Reviewed here is the "Studio B" sub/satellite monitor system that includes these speakers:

- MM-8 Nearfield Monitor™ Plus
- D10E-S subwoofer
- ELF-M integrator (processor/frequency divider)

### Features

The MM-8 monitor uses a two-way, coax 8" cone woofer and 1.75" compression HF driver. Since the HF driver is hidden behind a dome-shaped dust cap, all you see is the woofer. The speaker is very attractive, featuring a solid walnut top and bottom, and a black enclosure. I am impressed with its heavy, solid walls. Optional SST-1 stands help position the monitors exactly as needed near your mixer.

Controls for polarity and EQ are conveniently located on the front baffle. A three-position rocker switch lets you set the high-frequency level. I used the brightest (flattest) setting for all my tests because it sounded the most accurate.

The Studio B's deep bass is provided by the D10E-S subwoofer. It uses two 10" cone drivers in a compact sealed cabinet, and is styled like the MM-8. On

the back are dual banana connectors. A vinyl-coated steel grille protects the drivers.

Factory specs for the MM-8 include a sensitivity of 93 dB SPL (1Watt 1 meter), and 100 Hz to 20kHz +/- 3 dB frequency response. Power handling is rated at 150 W continuous or 600 W peak below 3000 Hz; 40 W continuous or 100 W peak above 3000 Hz. The MM-8 weighs 31 pounds each and measures 17.5"H x 12 1/4" W x 8" D. The D10E-D subwoofer weighs 50 pounds and the dimensions are 13" H x 22.5" W x 13" D.

Thanks to the ELF-M active equalizer, the sub response extends down to 18 Hz, which is home-theaterlike subwoofer bass performance. The MM-8 is priced at \$1888/pair; the D10E-S sub is \$582, and the ELF-M processor \$898. The complete system costs \$3368. It is expensive, but from my evaluation I believe it is worth every penny.

The ELF-M processor has balanced XLRs in and out. Connections are intuitive. Connect your mixer monitor outs to the ELF-M inputs. Connect the ELF outputs to the sub's power amp and the satellites' power amp. Since the Studio B system is passive, the user just needs to supply the power amplifiers.

Two pots on the ELF-M processor adjust the subwoofer gain and "concealment threshold." Concealment rolls off only the lowest frequencies when the signal level exceeds the threshold you set. An LED lights when this happens.

Bag End explains the theory behind ELF systems in the company's clear and thorough manual, which goes into great technical detail.

ELF stands for Extended Low Frequencies. It is a new way to reproduce deep bass by extending the low-frequency range with great accuracy. To do this, and ELF processor/equalizer is connected between your mixer and power amps.

The ELF's inventors, Ron Wickersham and Ed Long, are well-known in the audio field. They have introduced many important audio breakthroughs, such as Time-Align® loudspeakers, Near Field Monitors™ and PZM® Microphones.

While most subs have a low-resonance frequency, the Bag End subwoofer has a high-resonance frequency. It operates below that resonance, in the stiffness-controlled region, where the behavior is predictable and uniform. The speaker response rolls off 12 dB/octave below resonance. To compensate, the ELF's EQ (a dual integrator circuit) rises in the low end by 12 dB/octave. The result is a flat bass response.

As a bonus, the phase shift is uniform with frequency. All conventional subs use a low-pass filter to cut out the highs from the woofer. The filter adds considerable phase shift (delay) that increases as the filter cutoff frequency is reduced. This delay can make the bass seem to come later than the upper-range sound. Often, conventional systems sound like the lows are far away, and not part of the sound.

In contrast, an integrator/loudspeaker has a short, uniform signal delay. Bag End claims extremely tight, deep bass with the ELF system engaged. Of note, the impedance curve is claimed to be very uniform, so each note is given equal emphasis.

### Listening Tests

I placed the MM-8 monitors about four feet apart and four feet from me on a stand behind my mixer. They were two feet from an absorbent wall behind them. I angled the speakers toward the listening position. The sub was placed under my mixing console.

To connect the ELF-M processor to my power amps, I used some XLR-to-RCA adapters, with XLR pins 1 and 3 wired together. Unfortunately, this made the sound dull in the highs and weak in



## AT - A - GLANCE

**Applications:** Recording studio, project studio, mastering facility

**Features:** Sealed cabinets, ELF subwoofer EQ, driver grilles, banana plug connectors

**Price:** \$3,368 (system)

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the low bass. So I removed the connection to pin 3 - as the manual recommends - and all the lows and highs came back.

Here are my impressions of various instruments played by the Studio B system:

- Cymbals and percussion: Naturally crisp but not hyped up. Extended highs.
- Snare drum: Detailed, fair impact.
- Kick drum: Very deep and quick. Bass drum roll: Deep and powerful.
- Bass: Detailed, no audible doubling, tight, nonresonant.
- Piano: Natural, uncolored, not edgy.
- Voice: Natural and human, not too sibilant. In one listening room, some vocals were overly warm and chesty. In another room, they were okay.
- Acoustic guitar: Delicate, not harsh.
- Electric guitar: Meaty
- Strings: Smooth, not steely, A sound like you hear in a concert hall.

Overall, the Studio B system is smooth and neutral, without coloration. In one room I heard a midbass rise, but not in another room.

Stereo images have extremely sharp focus. Tone quality stays fairly constant

as you move in front of the speakers. There is a good sense of detail. Listening fatigue is very low.

The Studio B system is efficient, so it plays louder than most speaker systems. You can turn it way up without any amplifier clipping or audible speaker breakup. It has a gutsy, thrilling sound.

When I did mixes on the Studio B system, the mixes tended to sound just a little bright on other speakers - due partly to the Bag End's gradual treble roll-off (see measurements). The perceived brightness in other speakers also was the result of my getting used to the extended low bass in the Bag End system.

### Measurements

I measured the Studio B system with a Crown TEF-20 analyzer. First I disabled the Concealment (low frequency toll-off) feature. The mic was one meter away from an MM-8 nearfield monitor, on axis to the center of the cone. The measurement resolution was 300 Hz to exclude room reflections. To measure the sub, I put the mic very near a speaker cone. This yields a response in halfspace, as when the sub is on the floor. Resolution was 1 Hz. I joined the sub curve with the satellite curve at 100 Hz, and I assumed the response to be flat from 100 to 300 Hz.

## Product Points

### BAG END STUDIO B MONITORING SYSTEM

#### PLUS

- + Accurate, neutral sound
- + Very sensitive and plays loud
- + Low listening fatigue
- + Deep bass
- + Sharp imaging

#### MINUS

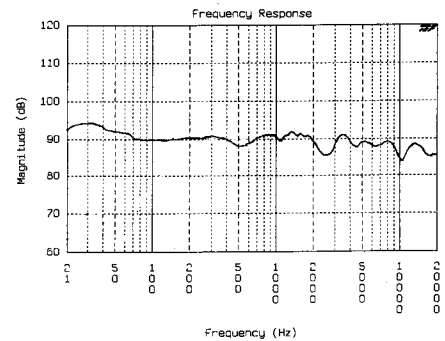
- Pricey, but you get a lot

#### THE SCORE

Expensive, but transparent and revealing monitor system with ultralow bass extension.

Figure 1 shows the anechoic frequency response of the sub/satellite system. The curve is 1/3-octave smoothed to

**FIGURE 1**



correlate more closely with the perceived tonal balance. The response is 20 Hz to 20 kHz +/- 4 dB, which is excellent. At 30 degrees off-axis, the response was down 5 dB at 3.5 kHz, 0 dB at 10kHz and 15 dB at 15kHz. Thus, the high-frequency dispersion up to 10 kHz is good.

In Figure 2, is the Energy Time Curve, or transient response. It is fairly good, About 0.06 msec after the first arrival is a secondary radiation about 5 dB down. Another one follows at 0.17 msec after the first arrival and is 11 dB down.

Finally, Figure 3 shows the total harmonic distortion vs. frequency at 95 dB SPL, one meter away. Above 50 Hz, the THD is the lowest I have measured of any speaker so far: below 2.6%. This low distortion accounts for the system's low listening fatigue. Even at 20 Hz, THD is 6.5%, which is remarkable for such a small enclosure. At 90 dB SPL (not shown), THD is only 3.8% at 20 Hz.

### Summary

Summing up, the Bag End Studio B system is in the high end of satellite/sub monitoring. A great deal of sophisticated engineering has gone into the design. It doesn't get much better than this.

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