



Crunch GP12D2

Ground Pounder 12-inch subwoofer



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With a stack of neat products to review, things are really starting to pile up. So this time around, I've decided to enlist the help of one of our students, Anthony Myers. Anthony came to Mobile Dynamics (East) from Harrisburg, PA and has 13 years experience working as an electronic technician and installer.

Up for review this round, the Crunch GP12D2 subwoofer; rumour has it, that Crunch completely redesigned their subwoofer-line upon joining the Maxxsonics family of brands (including AutoTek, HiFonics and MB Quart). So let's see what changes have indeed been made to the Crunch car audio line.

FIRST GLANCE

Removing the Crunch GP12D2 out of its box was an enlightening event! The new GP series uses a translucent, titanium-treated, polypropylene cone, which is illuminated from behind via blue LEDs that highlight the new Crunch logo.

Beyond the glitz and glamour, this 12-inch driver seems to have all the trimmings of a quality mid-market subwoofer featuring a ridged injection-moulded cone, a rubber butyl surround, progressive spider with integrated tinsel leads, aluminum former, 100oz double-stacked magnet structure and 25mm vented pole, among others. These attributes should help it achieve a 600WRMS power rating.

Our first impression of the Crunch GP12D2: Beefy! This driver appears to be well built and ready to rock out of the box... but let's see if the bench backs up this subwoofer's mean appearance.

GETTING BENCHED

As a standard practice we break in subwoofers for no less than 100 hours using varying frequencies and power levels. The Crunch GP12 was broken in using 50-, 40-, 30- and 20Hz sine wave tones for the first 50 hours, followed by 20 Watts of pink noise for another 50 hours. To determine whether a driver has been broken in, we typically measure its F_s before and after frequency >>

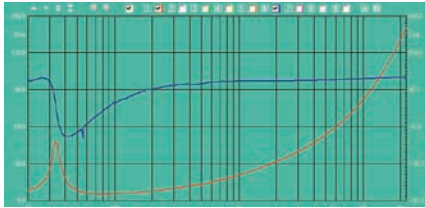
CRUNCH GP12D2 - GROUND POUNDER 12-INCH SUBWOOFER

injection. In this case the GP12's Fs fell from 38Hz to 26Hz after 100 hours.

After break-in, we exposed the Crunch GP12 to a slew of quality control and design error tests to rule out driver defects. We ran unsmoothed 256k MLS Impedance sweeps, Phase sweeps, and 1/48 octave Sinusoidal THD sweeps directly through the driver, in free air at -10dBV, 0dBV and 10dBV.

Impedance & Phase

19.747%



The Crunch GP12D2 performed above expectation for its class, however, significant odd-order THDs were noted between 50- and 60Hz during deep Sinusoidal Sweeps.

This occurrence forced us to run some additional tests to determine the true nature of the distortion. Ultimately, it proved to be related to cone resonance issues and in the end, we gave the Crunch GP12 woofer a clean bill of health, since these distortions weren't uncommon to drivers targeted for mid-market consumers. We simply had to rule out technician error to ensure that our measurements were valid.

Moving on, we entered into Thiele & Small parameter measurements. These measurements require two impedance samples, one in free air and another in a box of known air volume. We ran unsmoothed 256K MLS Impedance Sweeps for both

tests and calculated the following from the results. We were unable to implement LSE correction.

BRINGING IT DOWN

Thiele & Small Parameters

| | | | |
|----------------|---------------------------|--------|-----------------------|
| Fs | 25.7265 Hz | Lces | 37.6736 mH |
| Qms | 8.8472 | Rmt | 81.2069 Ωm |
| B•l | 17.2875 T•m | Zmax | 57.8269 Ω |
| Cms | 0.1261 mm/N | L1kHz | 2.5917 mH |
| Cas | 3.04E-7 m ⁵ /N | Re | 3.9500 Ω |
| Cmes | 1015.8780 μF | Qts | 0.6043 |
| Rat | 33702 ΩA | Sd | 0.0491 m ² |
| Zmin | -54.3136 Ω | RMS | 5.5470 Ωm |
| η _o | 0.1069% | Ras | 2302 Ωa |
| Vas | 42.4144 L | Res | 53.8769 Ω |
| Qes | 0.6486 | Mmd | 297.4462 g |
| dBspl | 82.4893 | Zavg | 37.2984 Ω |
| Mms | 303.6018 g | L10kHz | 1.1004 mH |
| Mas | 126.00 kg/m ⁴ | | |

In the past, Crunch has produced decent but rather ordinary mid-market drivers, however; we believe the new Crunch GP12D2 represents a changing of the guard. The Maxsonics team has clearly empowered their recently acquired Crunch division to re-invent this speaker from the ground up.

On the bench, the Crunch GP12 performed quite well, exceeding expectations throughout most of the tests. However, the driver does suffer from some non-linearity, which disqualifies it as an ultra high-fidelity speaker. The colorations we encountered could be the result in trade-offs made for frequency extension and output efficiency, which would be consistent with the driver's classification as an ultra low-frequency transducer.

The more time we spent investigating this subwoofer, the more it became apparent that Crunch intentionally biased it to produce high output at extremely low frequencies in small sealed enclosures. We also discovered that the Crunch GP12D2 is very tough! As an offering of proof, we present the ultimate test. Involved were the following: one Crunch GP12D2 12-inch subwoofer, one 1.25-cubic foot sealed enclosure, one grounded AC extension cord with stripped ends and one empty 120 Volt AC wall receptacle.

That's right; we plugged it directly into the wall and measured an average input at 60Hz of no less than 2,400W! Things shook off shelves and the breaker eventually heated up and popped, but the driver didn't fail. Crunch claims that the GP12D2 is capable of handling 600Watts RMS and 1,200Watt peaks thermally. And it seems that they weren't kidding! The specification is validated! Sorry Crunch, this sub is getting sent back slightly used and abused.

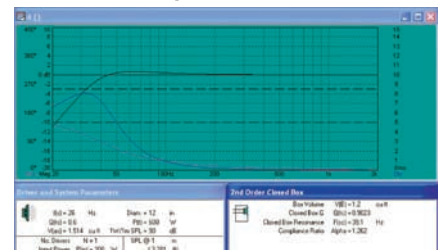
Ultimately, the test scores and correlations led us to believe that Crunch intentionally designed the GP12D2 more as a high-output, low-frequency transducer (loudspeaker) with the mindset of out-performing and out-valuing any other drivers in its class. As mentioned earlier, this subwoofer was not perfect, at least from a sound quality perspective, but we believe that it's completely on the mark with regards to living up to its series name designation; Ground Pounder!

THE LAST WORD

The Crunch GP12D2 is clearly a subwoofer for individuals who desire to experience deep bass at higher outputs, allowing them and any passengers in the vehicle next to them to feel it! If you like to be seen, heard and perhaps felt by others as you drive by, the Crunch GP12D2 could be just what you're looking for.

These subwoofers are completely comfortable in either sealed or ported applications, however, unless you are an experienced speaker builder or have the funds to have a professional build it, stay away from ported enclosures; we recommend that you construct a sealed enclosure as outlined below. >>

Enclosure Response



CRUNCH GP12D2 - GROUND POUNDER 12-INCH SUBWOOFER

The following design is based on our interpretation of Thiele & Small parameters measured in our Mobile Dynamics Lab (East) and may vary from manufacturer recommendations.

Enclosure(s)

Box Alignment: Sealed
Net Box Volume: 1.2
Box Fill: 15% Dacron Fiber
Estimated Qtc: 0.9
Estimated F3: 39Hz

When coupled to most vehicle gain factors, this combination should produce deep tubby bass, with excellent mechanical power handling capabilities! The Crunch 12D2 small volume requirement and DVC capabilities allow for easy implementation of multiple drivers in most vehicles. For the ultimate air-moving experience, we recommend that three GP12D2s be used in a box with a net 3 cu.ft. of shared air, with 25% fill.

AMPLIFICATION

The Crunch GP12D2 is an efficient bass transducer with good impedance qualities at lower frequencies, making it an easy load for almost any amplifier. If you are planning on using one, power it with 150-300WRMS @ 2 Ohms; two with 300-600WRMS @ 2 Ohms; and three with 600-1,200WRMS @ 2 Ohms. With regards to Damping Factor, scores of 50 or higher will be more than adequate. Once we finished up with the objective measurements at Mobile Dynamics (East), we passed the Crunch GP12D2 over to Tech Editor Dave MacKinnon for his subjective testing and impressions.

SUBJECTIVE IMPRESSIONS

This woofer looks pretty neat; though the basket may be stamped, it is treated with a cool black chrome paint finish and elaborate magnet boot. The three connection terminals are what really had me scratching my head. Ah... lighting... lots of very neat lighting. Cool!

At first, I'll admit I was concerned that the focus of design on this woofer may have been sacrificed for the sake of cool looks. But, there is only one way to find out for sure – whack it in the trunk of the ole' Subaru WRX and check it out. I

installed the driver with both 4Ω voice coils wired in parallel and installed the driver in a 1.0 cubic foot sealed enclosure, set our DPX1001.1 amp for a 2Ω load and headed out for some measurement and listening. One minor complaint – the rubber gasket that is glued to the top side of the mounting lip is a little loose in a few spots. A spot of silicone or something similar would cure that in a jiffy.

DOES IT MEASURE UP?

I measured in-car frequency response at 2.83V at 20-, 40-, 60- and 80Hz. The GP12D2 produced 106.6-, 109.4-, 107.3- and 105.3dB respectively – very, very linear and quite efficient. Do remember this sub has a new 2Ω load, so this is the equivalent of 4 Watts instead of the usual 2 Watts that 2.83V represents when a 4Ω load is connected. Our TermLAB USB meter showed a very loud 132.64dB at 46Hz. This was very intense to say the least. Also, compared this to the output of some of the ported 12-inch drivers we've reviewed over the years, this thing gets freakin' loud!

Time to have a listen – up first was a recently purchased (replaced) Dire Straits "On Every Street" CD. Yep – the entire CD. I really like this disc – it has deep bass, it has dynamics, it has extended drawn-out notes and its fun to listen to. Up first was *Calling Elvis* – this track gets down fairly deep and the mid-bass from the snare drum rocks. I'm happy to report that the Crunch GP12D2 handled both the fast and the deep without any problem at all. In fact, I really like how fast this woofer is. OK, let me explain that before we go on, because it's an expression I tend to use a lot. I really like woofers with frequency response extensions up nice and high without rolling off. This lets you decide where the crossover frequency will be. It also allows the driver to be crossed over to provide excellent mid-bass impact – something that a great many manufacturers don't choose to offer. So to sum it all up, a woofer that plays mid-bass well is a woofer I like to call "fast."

The next track was *Iron Hand*. This has some more deep bass lines as well as percussion. The Crunch GP12D2 loves those low notes. I mean it really loves them. The windows were down while listening to this track and I could feel the



air pressure changes in my lungs. That doesn't happen very often.

Wanting to go even deeper, I pulled out *Bach-busters* and cued up "Toccatà and Fugue in D Minor." Did I mention the Crunch GP12D2 likes to play low notes? It *really* likes it. Perhaps, from a purist standpoint, it's a little too much bottom end for a realistic performance. Did the bass line sound like a pipe organ? Yes. Did it have a natural balance? No. Was it a hell of a lot of fun? YES!

CONCLUSION

My fears of the cosmetic features overshadowing the performance of this driver have been completely squashed. This Crunch woofer is a heck of a lot of fun to listen to. There is no doubt that the Ground Pounder namesake was chosen appropriately, but we'd suggest that 'Ground Shaker' or 'Seismograph Breaker' would be even more appropriate. What matters most, is that we really liked this woofer and I'd personally like to leave one in my car just to scare people with – I'd even hook up the cool blue lights! **PAS**

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