

The third IEEE EMC Phoenix Chapter meeting of the 2006-2007 season was held on February 21, 2007 at Garcia's Mexican Restaurant, in the Embassy Suites Hotel at Rural Road and I-60 in Tempe, AZ.

The meeting began with the customary social hour starting at 5:30 pm, with dinner at six. Again, we had a excellent attendance, with even more new faces than December's meeting!

After we all had our fill of Garcia's Mexican food chapter chairman Harry Gaul called the meeting to order at 7:15 pm. Business began with the introduction of our new chapter officer, as Jim Dykema has joined us as treasurer. Welcome Jim! We then continued with our customary round table introductions and the call for EMC employment/employers. We are also searching for any interesting speakers for our next chapter meeting. If you have any ideas for speakers, please contact one of the chapter officers.

After the general chapter business was completed, Harry introduced our featured speaker, Michael J. Oliver of MAJR Products Corporation.

Mr. Oliver is Vice President of Electrical / EMC Engineering at MAJR Products Corporation responsible for customer technical quoting and consulting, new product development, and is the ISO-9001:2000 management representative. His expertise is in EMI/RFI shielding technology with a background in electronics, military shelter electrical systems, and high power antenna / radome design. He holds a B.S. degree in Electrical Engineering from Gannon University and has been an Electrical Engineer since 1989. He currently holds three patents (two pending), on EMC shielding - thermal management devices. He currently serves as Chairman of the newly formed IEEE Pittsburgh EMC Society, Vice Chairman of the SAE AE4 Electromagnetic Compatibility Committee, and member of the IEEE EMC Standards Advisory Coordination Committee (SACCom).

Mr. Oliver started the presentation by reviewing EMC fundamentals, including basic definitions of EMC terminology. He mentioned a very interesting Georgia State University web site at <http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html>, which has an excellent glossary of electromagnetic and other Physical terms. He pointed out the distinctions between Differential Mode versus Common Mode noise interference generation, and potential mitigation methods for each (including shielding). He mentioned that common mode interference is generally more predominant. He also discussed Plane Wave versus E-Field and H-Field shielding, and provided equations for each. A good rule of thumb dictates that material type dominates shielding effectiveness below 10 MHz and holes or apertures dominate shielding above 10 MHz. He also mentioned how partial shields may not operate as intended since they can actually increase emissions on the 'unshielded' side.

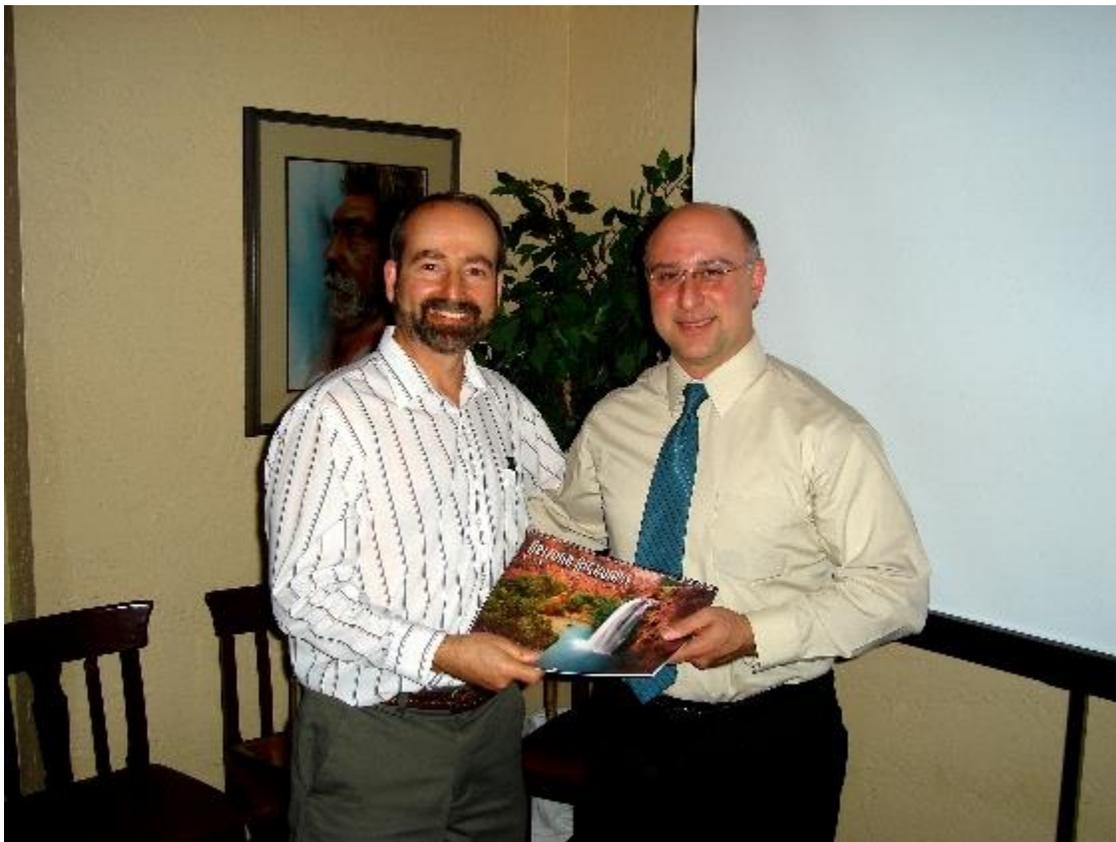
Mr. Oliver then discussed the MIL-DTL-83528 shielding test method, and recommends that non-conductive bolts or fasteners should be used when making this measurement. He also mentioned that Beryllium-Copper makes an excellent shielding material, but care should be used in instances where RoHS compliance is mandatory. According to Mr. Oliver, 2% beryllium is generally considered acceptable.

Mr. Oliver then explained concepts of aperture shielding. For slot apertures, shielding can be estimated by the equation $SE = 20 \log (\text{Lambda}/2L)$, where L is the longest dimension of the slot. Hole aperture shielding can generally be estimated by $SE = 40 \log (\text{Lambda}/2L)$. If multiple apertures are present, shielding loss is proportional to $20 \log N$, where N is the number of apertures within $\text{Lambda}/2$. MAJR Products Corporation has an excellent Excel-based design tool to assist with shielding calculations at their website: <http://www.majr.com/>.

Regarding Honeycomb vent panels, a 4:1 thickness to width ratio is considered ideal. Remember that nickel or tin plating is important to reduce the effect of 'Glue Lines' in the honeycomb material. Mr. Oliver recommended MIL-STD-1250 as a good resource for galvanic corrosion.

After the presentation, Harry Gaul presented Mr. Oliver with a beautiful Arizona Highways Calendar for his excellent presentation. We would very much like to thank Mr. Oliver for his time and effort!

The meeting was called to a close at about 8:30 pm. Stay tuned for upcoming speakers. Our thanks to all who attended!



Harry Gaul presents Mike Oliver with an Arizona Highways calendar on behalf of the Phoenix Chapter. *Photo by Steve Gerard.*