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QST Issue: Feb 2004
Title: Re "Emergency Power at W1ZR"
Author: Joel R. Hallas, W1ZR

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TECHNICAL CORRESPONDENCE

ELECTROVOICE 66x SERIES MICROPHONES

By Michael Kiley, WA9ZPM, 5445 137th Pl, Crestwood, IL 60445-1525; **mikejkiley@juno.com**

◊ In "The Doctor is IN" (Sep 2001, p 57), you answered a reader question about using an Electrovoice 664 microphone with an ICOM IC-706MKII transceiver. I have used the EV 664 for public address and Amateur Radio for years. First, let me explain the 664. The Electrovoice 664 is a variable-D cardioid design, which, unlike most other cardioids, does not boost the low frequencies when speaking closely into it. Other EV models of this design are the 660, 666, 674 and 676. The 664 has a transformer with two secondary windings, so it can match both high and low-impedance inputs. The older versions of this microphone have a four-pin Amphenol connector, making the impedance selection by connecting to the appropriate pins. Pin 1 is ground; it connects to the case and to the return of the high-impedance output, while pin 2 is the "high" side of this output. The high-impedance output is intended to match inputs of 50 kΩ or more and will produce about 10-20 mV_{rms} of signal under normal speech conditions. Pins 3 and 4 of this connector are the low-impedance output; this is isolated from the case and is intended for balanced inputs. The level here is 1-2 mV_{rms} and will work with input impedances of 100 Ω to 1 kΩ. If you are using this mic to feed a low-impedance unbalanced input, tie pins 1 and 3 to the shield (ground) and use pin 4 for the high side.

Back in the 1960s, the Electrovoice 664 was touted as a high quality microphone for amateur use; it was advertised in *QST* and the *Handbook*. I have heard varied opinions from different amateurs about its performance on the air, but I have had good results with it. The only problem is that the low output voltage in the low-impedance connection may not fully drive most radios, and the high-impedance hookup may not suit the relatively low impedance of the microphone input on most rigs. Try the low-impedance hookup first; if you need more gain, switch to the high impedance arrangement.

You will need to provide an external push-to-talk switch for the 664 since it does not have one built in. Do not, I repeat, do not attempt to add a PTT switch to it by drilling or otherwise modifying the microphone body housing. In the EV variable-D mikes in particular, the case forms an important part of the acoustical design of the mike, and alterations to it will adversely affect its response and pickup pattern characteristics. Also, the inner workings of the 664 are quite delicate and could be easily destroyed in the process. I have seen this mike sell at hamfests for $50 to $100, so if you have one that is working and in good cosmetic condition, by all means preserve it.

RE "EMERGENCY POWER AT W1ZR"

By Joel R. Hallas, W1ZR, ARRL Assistant Technical Editor

◊ My comment (*QST*, Dec 2003, pp 41-44) about smart battery charger RFI raised some eyebrows at ARRL HQ. I decided to look into the subject a little deeper. With the efforts of Mike Gruber, W1MG, and Mike Tracy, KC1SX, from the ARRL Lab, I was able to get data on the conducted emissions on the power line from my Guest ChargePro. The level with no filtering was in the range of 40 to 60 dBμV across the HF spectrum. No wonder I was hearing it! I spent some time on the phone with the technical teams at some of the other vendors and thought, based on my conversations, that the Xantrax TrueCharge charger had the best hope of being better. We brought one into the Lab and found essentially the same kind of response! These devices exceed the normal levels for residential use; on the other hand they are designed to be used on boats and just barely meet the industrial (Class A) rating.

An alternative I didn't try, but may be worth considering, is an "old technology" linear charger. A&A Engineering (**www.a-aengineering.com**) offers a 5 A linear "smart charger" that promises noise-free operation and is designed for both standard and gel-cell batteries (thanks to K5NT for the pointer). Charles Industries makes a dual 5 A linear (nonswitching, non"smart") charger that is specified at a float charge voltage of 13.7. This is high for a gel electrolyte battery, but should be in range for either an AGM or liquid-electrolyte battery. My Douglas AGM battery specifies 13.5 to 13.8 as the float voltage, for example. This kind of charger has nothing in it to generate RFI, is in the same price range and may be a good choice if you are not using gel-cell batteries and don't mind a bit more weight. Notice that we have not tested either of these units.

As mentioned in the article, I had concentrated my filtering on the dc leads (something the Lab wasn't prepared to measure with their ac-line test fixture) and was successful at eliminating problems from that source with my brute force filter. Since it was clear that the ac leads were now the problem, I tried wrapping seven turns of the power cable around an Amidon FT-240-43 toroid core, as close to the charger as practical. I won't go so far as to say that there is no noise, but I was unable to identify any noise on any band above ambient noise level. If additional filtering were required, I would add a commercial line filter such as those made by Corcom between the toroid coil and the ac line. I would appreciate hearing from anyone who has had similar experiences or who has come up with a better solution.

Among the correspondence I have received about this article was a note from N9SFX noting that many rigs stop operating at a higher voltage than my Ten-Tec Paragon. In fact, Pete reports that some will not even operate at 12 V! He has solved that problem by devising a scheme using a home constructed battery composed of seven, rather than the usual six, cells to make a nominal 14 V battery system. Chip, K7JA, notes that there is a company providing a different solution—a power regulator that provides 14 V output even when the battery drops as low as 9 V (watch the battery specifications for the lowest safe voltage from your battery). These products are manufactured by Jacobs Electronics **www.jacobselectronics.com/products/caraudio/caraudio.htm** and are designed for car audio fans (presumably those who don't mind walking home). They make 375, 750 and 1500 W models.

HOW AC RMS VOLTAGE RELATES TO DB ON VOM SCALE

By Lionel Mordecai, K6CEQ, 78 Vallecito Way, Chula Vista, CA 91910; **l_mordecai@hotmail.com**

◊ I recently bought a small volt-ohmmeter and was curious about the little table in the lower-right corner. Here's what I learned: The relationship between ac rms voltage and power dissipated in a resistor is given by:

$$\text{Power} = \frac{V_{rms}^2}{\text{Resistance}} \qquad \text{[Eq 1]}$$

For example, a 600 Ω resistor[1] with

[1]This is not arbitrary. In audio work, 600 Ω is a common system impedance, just as 50 Ω is for RF work. A voltage of 0.775 across a 600 Ω load dissipates 1 mW, and audio folks call it a dBm, although it takes only 0.224 V to dissipate a milliwatt across 50 Ω.—*Bob Schetgen, KU7G*

Bob Schetgen, KU7G ♦ Senior Assistant Technical Editor ♦ tc@arrl.org