
Subject: Mystery Drivers & Plans for the Pi 6 Theater

Posted by [Vello](#) on Sun, 02 Dec 2001 00:51:58 GMT

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Wayne-Thanks very much for the Pi 7 plans. I came across (and purchased) a a set of drivers from a late 60s Curtis Mathis stereo console unit. The woofers are a stamped basket 12" with paper cone and cloth surround, no markings other than "29B49-1" which I presume is the model number. The tweeters are a 2x6 metal horn tweeter, no markings other than "V/60". The crossover consists only of a single capacitor (4.7 uf 25VDC), no coil or anything else. The drivers are in pristine condition and I would really like to incorporate them into a Pi 6 (Theater) design. Can you offer any suggestions on determining the specs on these speakers ? Also- please email the plans for the Pi 6.Thanks !-Vello

Subject: Measurement equipment and software

Posted by [Wayne Parham](#) on Sun, 02 Dec 2001 01:59:16 GMT

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I suggest using the Woofer Tester from Parts Express or Speaker Workshop from Audia. You can also measure them yourself using the following technique and formulas:You'll need a signal generator and meter or scope. Put a test resistor in series, something between 10 and 1000 ohms.Find Re. It is the DC resistance of the voice coil.Find Fs. It is the frequency where impedance is highest.To find mechanical and electrical Q values, the following formulas are used: $Q_{ms} = F_s * (Z_{max}/Re)^{0.5} / (F_h - F_l)$ $Q_{es} = Q_{ms} / (Z_{max}/(Re - 1))$ $Q_{ts} = Q_{ms} * Q_{es} / (Q_{ms} + Q_{es})$ whereFs is the resonant frequency of the speaker in free air (Hz)Zmax is the impedance of the speaker at resonance in free air (ohms)Re is the DC resistance of the voice coil (ohms)Fh is the frequency above Fs where speaker impedance is $(Z_{max}*Re)^{0.5}$ F_l is the frequency below Fs where speaker impedance is $(Z_{max}*Re)^{0.5}$ Note: F_l and F_h can also be found at the points where voltage across the test resistor is equal to V_q in the follwing formula: $V_q = (V_{max}*V_{min})^{0.5}$ whereV_{min} is the voltage across the resistor at the speaker's resonant frequencyV_{max} is the voltage across the resistor at a frequency far from resonanceTo find V_{as} using the sealed box method, the following formula is used: $V_{as} = V_b((F_b / F_s)^2 - 1)$ whereV_b is volume of the sealed cabinet (ft³, m³ or liters)F_b is the resonant frequency of the speaker in the box (Hz)F_s is the free-air resonance of the speaker (Hz)