

I want my MP3 music throughout my house now!

Abstract

This article describes how MP3 music from a computer in the home office was distributed throughout the house on existing cat3 phone wires for a customer not willing to spend a lot of money with professional installers. It took less than half a Sunday afternoon to finish the whole project. Even though this project utilized cat3 wires, the solution is applicable to cat5, cat5e and cat6 wiring as well.

Introduction

MP3 music has become very popular over the last few years. The challenge has been in getting the music from the PC in the home office or study to the family room, bedrooms, kitchen, etc. without undertaking a major effort in remodeling the home or running new wires all over the house. This has usually called for a professional A/V installer that cost a small fortune. Inexpensive wireless solutions sold over the Internet have proven less sanguine, unreliable and of poor quality at the best. More reliable and higher performance wireless solutions like TrueMusic™ have been a bit expensive and probably an overkill for MP3 quality music.

A customer's quest for a very low cost method to send his MP3 music to the family room stereo system led to the solution described here. For a reliable music distribution at low cost it had to operate on existing wires in the home. Luckily, the customer had standard cat3 wires for telephone to various rooms in the home. It was quickly realized that the only way to avoid new wiring was to use the existing telephone wires. Since only two of the four pairs in the cat3 were being used for the two telephone lines in the home, it left two unused pairs throughout the home that were not punched to any outlets. These unused pairs of cat3 wires were used by the TPA transmitter and receiver to send music around the home. The solution yielded a very high quality audio distribution over customer's existing cat3 telephone wires.

The system design

Here is a simple step-by-step guide for a do-it-yourselfer to install the whole system in a few hours.

Step 1:

Prepare the wall plates to accept an RJ-45 connector (8 pins/8 contacts) instead of the RJ-11 (4 pins/4 contacts). Figure 1 shows the basic difference between the two jacks and the pin positions used for the telephone lines on the cat3 wires.

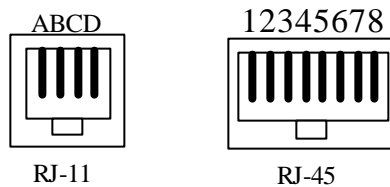


Figure 1

Standard wall plates with RJ-45 punch down jacks can be purchased from your local computer store, electronics shop or even the builder stores like Home Depot, etc.

The primary telephone is wired on the middle two pins B&C and the second telephone is wired on the outside two pins A&D on the RJ-11 connector. The middle pair B&C is moved to pins 4&5 and the outside pair A&D is moved to pins 3&6 on the RJ-45 connector. The other two unused pairs of cat3 wires are punched down on pins 1&2 and 7&8. This process takes less than 10 minutes even for the novice. The telephones should still operate normally since the RJ-11 plug will still key into the RJ-45 jack. The outside two pairs of the cat3 wires are now ready to carry the left and right audio signals from the TPA units.

Repeat this step for all the rooms where the MP3 music needs to be distributed and also the room where the PC is located that generates the MP3 music. Thus all wall plates are prepared for the MP3 music distribution on existing cat3 wires.

Connect an RJ-45 splitter or “Y” adaptor to each of the newly terminated wall plates. The telephones can be plugged back into one of the jacks on the adaptors. Test and make sure all the telephones are operating normally.

Color code for standard phone wiring:

Primary phone line is Red and Green wires (pins 4 and 5)

Second phone line is Black and Yellow wires (pins 3 and 6)

Wiring for TPA units:

Orange and Grey wires (pins 1 and 2)

Brown and Blue wires (pins 7 and 8)

Step 2:

Connect the stereo audio output of the PC to a TPA transmitter using standard audio cables. The output of the transmitter is connected to the jack on the adaptor in step 2 via a standard cat3 or cat5 patch cord. These patch cords can be purchased from your local computer or electronics shop and are available in various pre-cut and pre-terminated lengths of wire at a nominal cost.

Step 3:

In the various rooms where the music is needed, connect a TPA receiver using standard cat3 or cat5 patch cords to the jack of the “Y” adaptor. Connect the stereo audio cables from the output of the TPA receiver to the local amplifier in the room. (i.e. Integrated A/V receiver’s auxiliary input or a mini book-shelf audio system) Power the TPA receivers with the supplied AC/DC wall adaptors.

Voila! In three easy steps, MP3 music is distributed throughout the home. And it only cost a little over \$100 per room! Thus saving the customer several thousands of dollars charged by a professional installer.

The final implementation for the customer is as shown in Figure 2. It took less than a couple of hours on a Sunday afternoon to finish the project and enjoy the MP3 throughout the home. Total expense for the complete solution as shown in Figure 2 is less than \$ 390.

Figure 2 (See attached)

Even though this project was based on regular cat3 telephone wires, the same solution will apply easily on cat5, cat5e and cat6 solutions as well. The SuperTranZ™ circuit incorporated in the TPA™ transmitters and receivers eliminates ground loops and noise pick up, and provides a clean signal in the remote rooms. There is no loss of signal even when more than 16 TPA receivers are connected to the same TPA transmitter on the cat3 or cat5 wires. The wires can be daisy chained or home run to a telephone patch bay.

More details on the TPA products can be obtained from the following links.

<http://www.wireless-experts.com/pragmatc/pdf/tpa.pdf> or the website www.wireless-experts.com

In summary, it can be seen that the existing cat3 telephone wiring can be utilized properly for a high quality music distribution. The plug-and-play simplicity of the TPA™ enables the do-it-yourselfers to have a high quality music distribution system installed by themselves without any problems but also enables professional installers in completing their installations with speed and performance. Also the new homeowners in recent years who have been lucky enough to have their homes pre-wired with structured wiring can benefit from the ease and simplicity of this design. They can add high quality of music to their homes without any additional wiring.

Conclusion

Using the TPA transmitter and receiver units over existing cat3 telephone wires, a simple and elegant method for distributing MP3 music throughout the home has been presented. This project was completed

with great simplicity yet delivered high quality music throughout the home. It saved a lot of time and money for the homeowner.

About the Company

Pragmatic Communications Systems, Inc., is a Silicon valley based company established in 1994 to design, develop, and produce a variety of innovative products for wireless audio, video, and data communications. The majority of company's products until 1997 were primarily designed for industrial and commercial applications. The success of these products has led to a strong and dynamic technology base, which has been applied to new generation of products such as the TPA, PADS[™], DMS[™], CATS[™], TrueMusic[™] wireless hi-fi system and TrueView[™] wireless video system. The company's philosophy is to use its technologies to solve problems that have gone unresolved for decades.

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Author's biography

Prasanna M. Shah is the Chief Pragmatist and Thinker at Pragmatic Communications Systems, Inc. He earned his M.S. degree in Electrical Engineering from Stanford University and B.S. degree in Electrical Engineering from Santa Clara University, Santa Clara, CA. He has more than two decades of experience working on semiconductors for analog and digital audio, video, cellular telephones, wireless communications, fiber optic communications, data communications, data acquisition and industrial controls in the Silicon Valley. He holds patents on power line and wireless data communications, and several patents pending on audio, video and wireless multimedia systems. An avid audiophile and music lover, in his free time, he likes to apply his pragmatic thinking to solve complex problems.

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