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How To Improve Modem Communication In A Coin-Op Environment

Today, more and more coin operated machines with modems are being used and sharing the one and only phone line in a location. How do they affect each other? Can they work together successfully? The following will outline issues such as phone line noise, phone line quality, weather issues, how does other telephone equipment affect what you are doing, and other issues that you will come across when using modems for communication.

Unfortunately, with modem communications, occasional disconnections are a fact of life. Those that use dial up for their Internet connection are completely aware of this. Modems need an extremely noise-free line to be able to approach the speed of which they are capable. Anything that degrades the signal on your phone line can result in disconnection.

Where To Check

How do you know whether to check your office or the location for a problem? Generally, if you only have trouble connecting with one or two locations, the problem may be at the location. If you have trouble connecting with many locations, then you should make sure things are in order in your office before sending a technician to the location.

If you are often experiencing disconnects, here are some things to check (in the office and at the location):

Call Waiting

If you have call-waiting on your phone, you need to disable this feature while connecting. Usually this is done by dialing *70 before the phone number. Your local phone book should confirm the correct method for your area. If you are calling in to a machine, you need to be concerned if the location has call waiting as well. Unfortunately, you can only control the call-waiting on your end, but the interruption will disconnect the call no matter which end it is enabled on.

Phone Pickup

Most offices/locations have more than one phone on the same line. If someone else picks up the phone while you are connected to the machine, the modem will most likely disconnect. If you call during the day, you need to first ask whoever is at the location not to answer or pick up the phone during the time you will be communicating with the machines. If the call length is short (typically one minute with dart data), this can be done successfully. With the Arachnid Galaxy II and Black Widow machines, a feature was added where the bullseye can be tapped quickly four times by the person at the location, and the machine will answer on one ring for the next three minutes. Otherwise, since the phone line is shared, the machine might be set to answer on 10-15 rings during the daytime, and the person at the location invariably will pick up.

Install The Correct Modem Software (in your office computer)

Your modem came with software that installed drivers for it to operate correctly. If you are using a generic (Windows) modem driver, this can adversely affect performance. Try reinstalling the modem or using a different driver to see if this helps your connection problems. If you are uncomfortable with this procedure, you may need a computer technician to assist you in checking your modem drivers.

Change Modem Connection Speed (in your office computer)

Sometimes lowering your modem's maximum connection speed can actually increase performance. To understand why this happens requires a brief explanation of how modems work.

By default, when a modem attempts to connect, it tries to connect at the highest speed possible. However, the relationship between connection speed and connection stability are inverted. In other words, the faster the connection, the less stable the connection.

Upon connecting, the modem will test the stability of the connection. If the connection is not stable enough, the modem will abort the connection at the current speed and attempt to connect at a lower speed. That is what all those strange sounds you hear from your modem are all about. The modem keeps trying to connect at lower and lower connection speeds until it hits one that meets its stability requirements.

Unfortunately, on phone lines with static and interference, lower quality modems have a difficult time doing this. Often they will settle on a fast connection speed even though the connection is very unstable. The result is that either the connection gets dropped soon after it is established, or data is garbled as it is transferred across the connection. When data is garbled, the connection requires it to be resent. Although your modem may be transferring garbled data at a fast rate, it will appear to you that the connection is very slow because so very little good data gets through.

In this situation you can fix the problem by manually forcing the modem to connect at a rate that you know will be stable. In Arachnid's **DartComm** you can do this by choosing **Settings > Modem** and then select **Faster** or **Slower**.

Replace Your Modem

If you are concerned that the quality of your modem is sub-par you may want to invest in a new one. The price of quality modems has come down quite a bit in recent years, so it may be a good option.

Phone Line Quality

There could be a large list of reasons why your phone line is considered poor quality. Some of the wires could get wet and make irritating cracking noises. Do you hear more noise when it rains? Maybe your telephone company's central office is really far away. Then your signal would be a bit weaker. Perhaps your phone line has been split so many times that it is difficult to keep the signal.

What to do:

To truly test your phone line, it can take some time and effort. You have to rule out possibilities that could influence your results. You want the most accurate results possible. You also want to test your equipment to see if the problem really is the phone line.

Checking the Line for Noise

To make this test you need a telephone that you can plug into the modem where it says PHONE. Make sure that you have a dial tone. If not, you are not successfully connected to the existing phone line.

Then you need to get rid of the dial tone so you can listen to the line. Dial a number, any number but obviously one which is valid for your area, so that you don't get the dial tone replaced by a busy signal. The easiest and most common across all areas is a "1". Is your dial tone gone? Now listen and concentrate while you are doing so because you are only going to get 30 seconds before it times out and gets replaced by a busy signal again.

This is the first major step to checking if you have a good line for a modem. Is it quiet? No pops, bangs, crackles, creaking, or faint voices in the background from other people's conversations. All or any of these noises will cause you a problem on a modem.

Just what are these noises? Well, it can be something as simple as a loose screw on a connector block somewhere between you and the exchange, or water getting into one of telephone company's cable ducts and the waterproofing around the cable joints has started to break down. You could have a bad connection in the house somewhere, and not necessarily on the line extension that's feeding your modem. Other people's conversations (called "crosstalk" in the trade) are not so easy to pin down, and are usually more likely to be further "into the system" before the source becomes apparent.

If you didn't hear noises, don't worry, your phone line can still be poor quality. Fixing it may be a bit more difficult though. Line noise can be very intermittent and may not be there when you are listening, but it may come back later.



Check your phone line for any splitter devices. A splitter basically splits your phone line into multiple "branches" that can go to a computer, a phone extension, a fax machine, etc. *Splitters can degrade the quality of the line.* Try temporarily disconnecting the splitter if you are using one. **It will work best if every phone (modem) is connected direct to where the phone line comes into the building.**

The more phones on a line, the more likely extra noise or interference will be introduced. Be especially wary of "novelty" phones that have neon lights or special "ring" sound effects. Also cordless phones, answering machines, and fax machines offer interference on the phone line that will block modem signals.



Demark
Outside

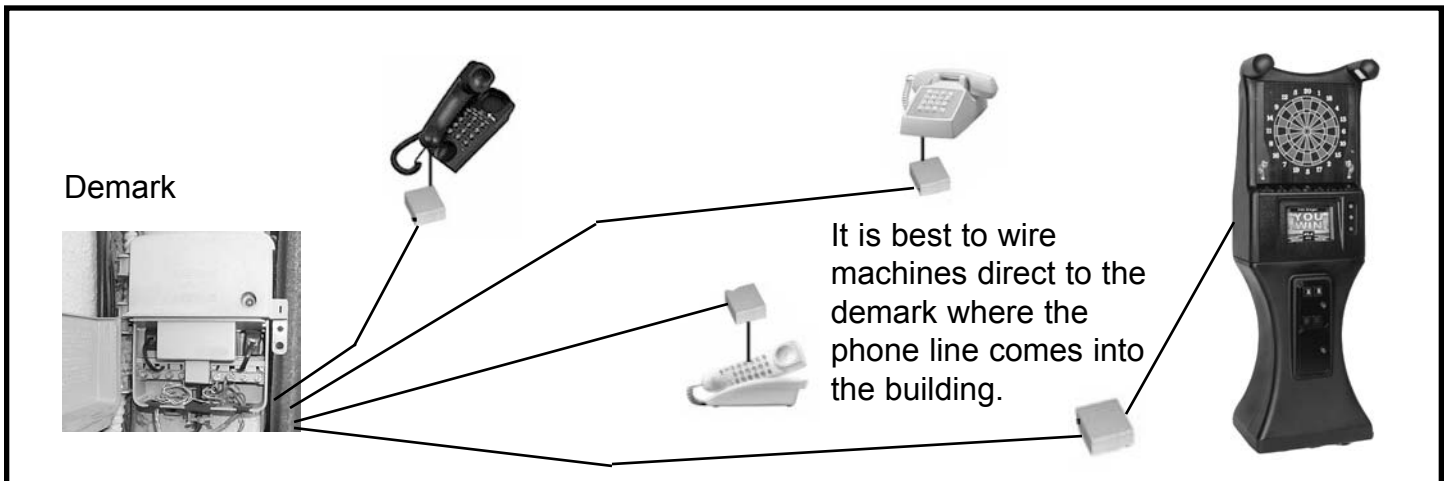
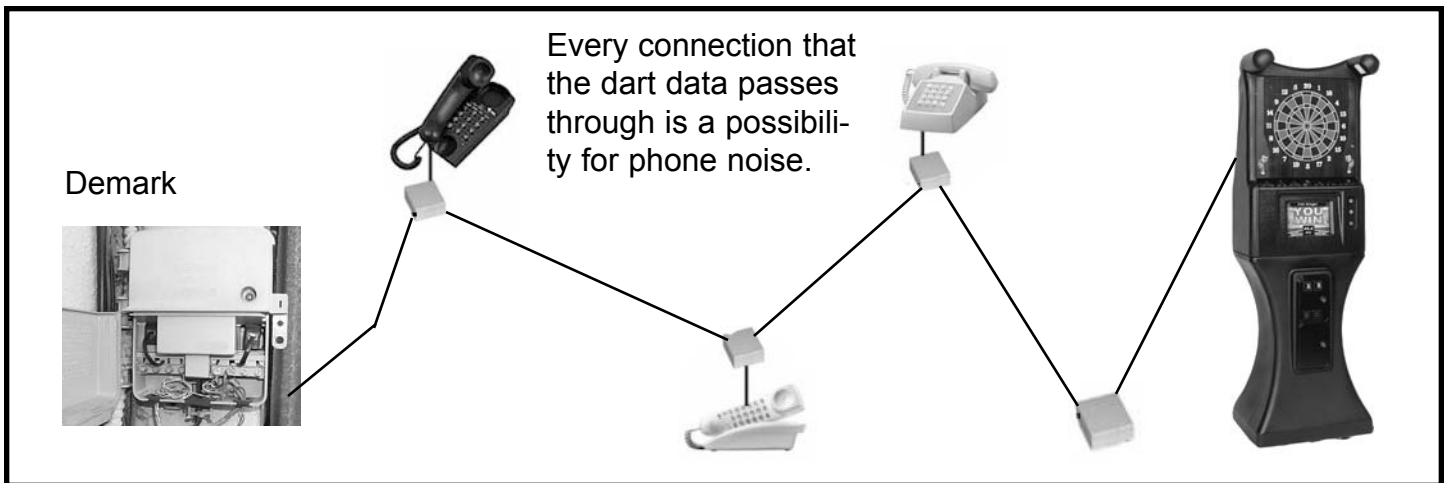


Single Line
Entry



Older
Style

Newer telephone terminal boxes (usually on the outside of the house or building) have a standard telephone jack in them into which the whole building plugs in. If you have this then you can unplug the building, plug in a good phone and listen for noise. This will help determine if the problem is inside or outside the location. Make sure you check what devices, such as an alarm system, are connected to the phone line before disconnecting!



At the junction block or entrance bridge, you can also test the telephone company's wiring using a multimeter. For a typical four wire system, you don't need to disconnect any wires to perform this test. Touch the "+" probe of the multimeter to the green and "-" probe to the red wires. If you have a second line, "+" to black and "-" to yellow. If you get a low DC voltage reading across a pair of wires (red-green or black-yellow), around 48v, you know that you are connected to the telephone company. No voltage means you are not getting a signal from the telephone company. Make sure no one is making a phone call while making this test or the voltages will not measure properly.

Do you use an extremely long run of phone extension cable? If, for example, you are using a 50-foot flat phone cable from the wall jack, this will also degrade the signal that is going into the coin operated machine. Try switching to a shorter piece of phone wire. If the wire has to be long, use the **round phone cable** (as opposed to flat) as the wires inside are twisted to help prevent noise from affecting the line.

If you have several cordless phones, try disconnecting them temporarily. Multiple cordless phones can put an increased load on the phone line, which will degrade the signal and make it harder for your modem to maintain a connection. I have seen the connections where the handset touches the bases get dirty and create noise in the phone line as the phone handset is charging.

Check for surge protectors that are connected to your machine. A surge protector with phone jack connections may protect your line from voltage spikes, but it can also degrade the signal as it passes through the protector. Try temporarily disconnecting the line from the surge protector if you have one.

Other Telecommunications Equipment

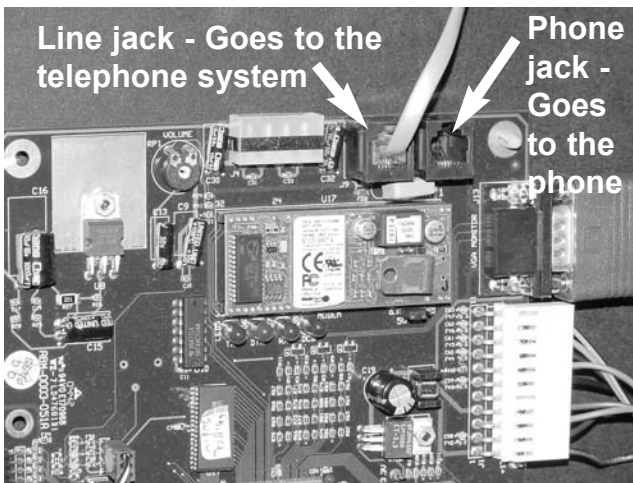
Line noise can be added by almost any phone device. If you have anything else connected to your line, such as a fax machine, caller ID box, VISA machine, downloading jukebox, or other machine that has a modem (don't forget the pay phone should you be connected to it), disconnect them if you can and try again. Noise may also be caused by other uncontrollable factors such as nearby high voltage power lines, fluorescent lamps that are flickering, light dimmers, neon bar signs, compressors or other motors/devices that may run periodically.

Weather

Is the problem linked to weather conditions? If you have more connection troubles during very wet weather it could indicate moisture getting into your telephone terminal box on the side of the house, or into the cable to your house through faulty insulation. If you can say that the problem is outside the location, then it is the telephone companies responsibility to fix the noise. Remember who is paying for the phone line. If you call the phone company and it is an internal problem, the location may receive a bill. The phone company may be able to make tests from their office to determine if the line is bad or not. And that test may, in their mind, say the line is good, but actually it might only be good for voice communications.

Lightning striking again... You may have had a lightning strike affect your phone system and not even know it. A surge can selectively fry one of your phones, or a modular jack, or a single connection, leaving no glaring evidence other than the malfunction.

The checks mentioned above will fix most disconnection problems. The basic method is to use a process of elimination. Try disconnecting anything additional you may have on the line, and run a phone wire directly from the wall jack to your computer (or coin-operated machine). Then you can start adding devices back to your line and try connecting in between. Eventually, the culprit that is causing the line noise will probably be easily identifiable.



What If The Machine Answers And I Only See Garbage Characters On My Computer Screen?

Modems are not very smart devices. When the phone call comes in to the coin-operated machine, anything that has a modem is listening, and they all think that the phone call might be for it. But they only know how to count rings. So, whichever modem is set to the lowest number of rings at that particular time, will answer the phone. It may not be the machine that you think it is and the result would be information that is not readable by the program you are using. This is why we have dart machines answer on one ring between the hours that you decide are best.

What If The Machine Does Not Answer At All?

One thing to be checked is to see if the ring voltage is reaching the machine. It is possible that, even though you hooked up a telephone to the machine and hear a dial tone, that the ring voltage has been blocked. This happens often on a pay phone line (they do not want incoming calls). To check, hook your phone to the phone connector marked "phone" (not "line"), and call the number. If the phone rings, the ring voltage is getting there. If not, chances are the modem is bad or has been told not to answer (check your modem setup settings).

Summary

The next time you have trouble with your modem communications, keep in mind the items that we have discussed such as; what will cause line noise, whose responsibility is the connection if the noise is inside the building (or outside), what happens if the location has call waiting, how does connection speed affect the call (is fast or slow more reliable?), and remember to hook to the phone system where it comes into the building if at all possible. I hope this will help make your communications troubleshooting easier.

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