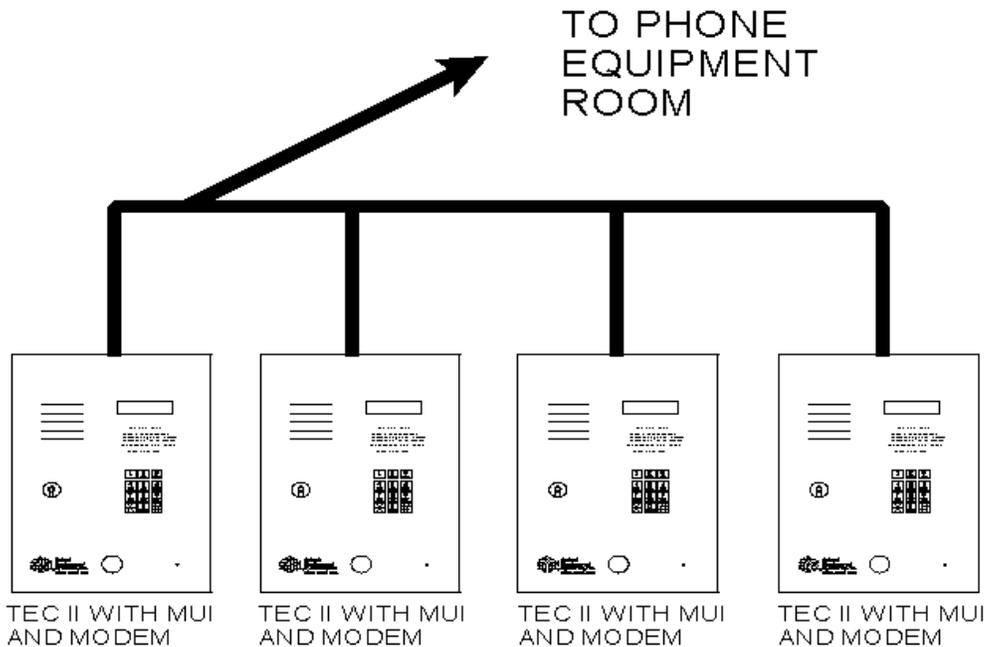


Communicating with Telephone Access Equipment

Whether managing one or multiple telephone access units, communications is the most sensitive part of managing a system. Everyone in the communication loop is trying to save money. You, the customer, may be trying to save money by using one phone line to operate multiple units. The Phone company tries to save money by only repairing telephone lines when they are broken, sending every line, even if it the same number, back to the switching station to be able to test it with a computer, and other cost saving measures like using outside contractors to make connections, etc. The computer manufacturers try to save money by using the least expensive components they can find. The modem manufacturers try to save money by finding the least expensive way to make a modem. With all of that said, you know what we are leading up to. Each part of the communication loop can introduce problems into the management of the telephone access system. The following is a discussion of each part of the communication loop and some of the possible solutions to operate these systems correctly.

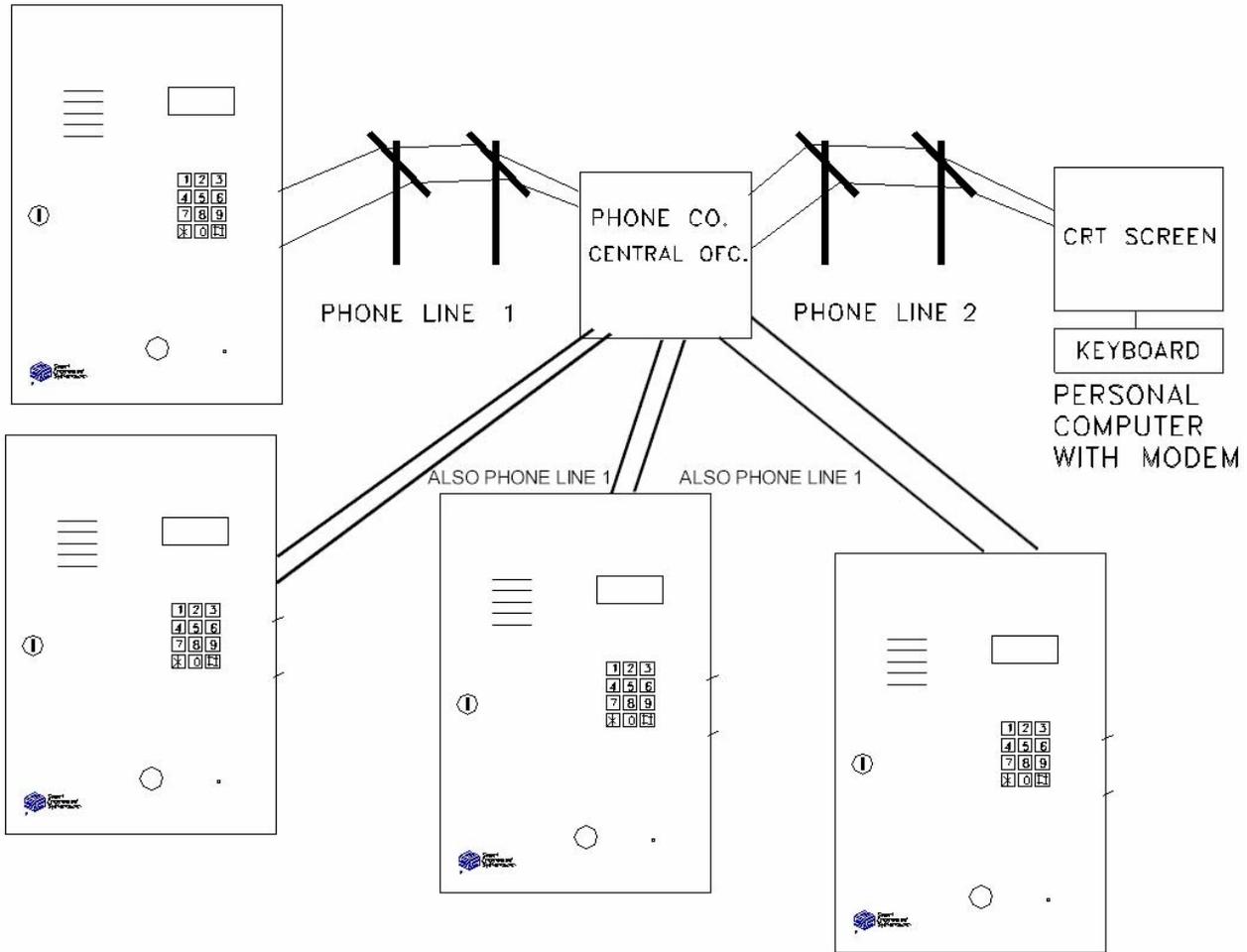
Diagram 1.

Copper wire connections. Preferred method on connecting several units.



Many customers, when it is possible, combine units onto one phone line. Select Engineered Systems provides accessories for the equipment to enable this combining of units to work properly. One option is the OPTKMUI board. This option senses when a phone line is in use and prevent another unit from breaking in on a conversation or programming session. This option was designed to work by sensing the drop in voltage on a phone line when an extension (another unit) on the same line is activated. **(Diagram 1.)** The unit is then prevented from using the phone line, while still allowing PIN's and any card readers connected to it to continue to work. While the phone line is in use by another unit, the display indicates this with a message of "Phone Line Busy Please Wait".

Diagram 2.
Central Office Connections.
Fiber Optic cable will not work. Copper connections require adjustment.



If you order multiple extensions with same phone number from the phone company, the phone companies may run separate lines from the nearest central station so the lines can be monitored with a computer, saving them money. If the runs are fiber optic, there is **NO VOLTAGE DROP** at the other extensions.

FIBER OPTIC RUNS WILL NOT WORK.

If the runs from the CO are Copper, (**Diagram 2.**) the voltage drops to the 25 to 35 volt range, a jumper on the OPTKMUI may be removed, allowing it to sense in that range. The normal tripping range is 11 to 13 volts and the normal off hook voltage is 4 – 6 volts.

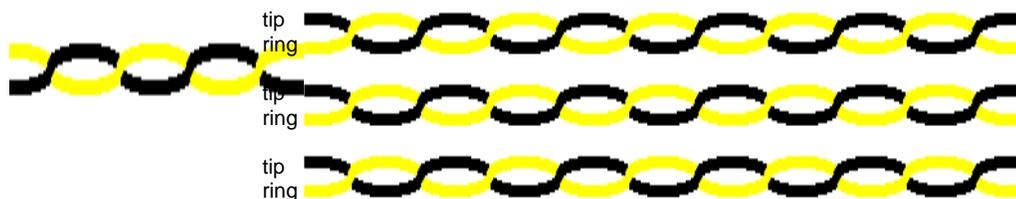
If the phone wiring on a site is paralleled to have multiple extensions with one phone number, the normal off hook voltage will normally be to the 4 – 6 volt range and the jumper should stay on. **Your best choice is to have your system connected as Diagram 1.**

TroubleShooting

Modem Connections depend on clean, proper phone lines. You should be aware of some of the mistakes that are made. Phone lines are run in pairs. Each pair is twisted together as it goes, to prevent noise and keep the sound clear. **Bell wire must not be used for phone lines. Twisted pair (Cat 3, or better) must be used.**

Installers can some times make a mistake and use the common lead from a different pair. This would mean the pair of wires in use ARE NOT twisted together to prevent noise. This will show up as noise on the line OR not being able to connect to SOME of the telephone access units with a Modem. **See page 5, Test 1**

Diagram 3.
Crossing the pairs

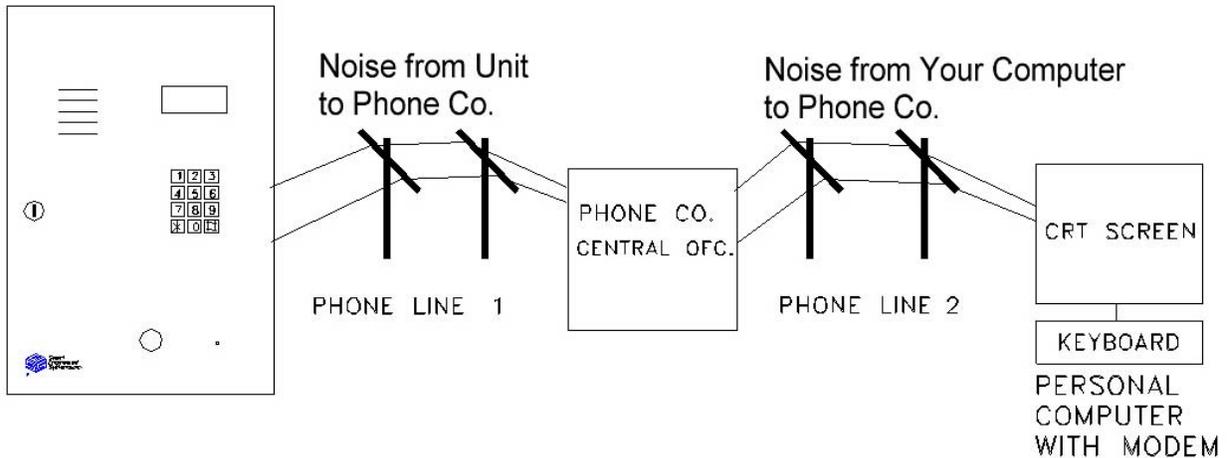


No, I didn't cross the wires...

Diagram 4. Phone line example.

November, 2003

Example of noise affecting phone line.



This can be caused by several different problems. Bad phone lines. Bad phone lines can be at your office at the computer end or at the telephone access unit. **See page 5, Test 1.** There are several simple tests that can assist you. The problem could also be modem incompatibility. **See page 5, Test 2.**

I just bought a new computer and now I can't connect. If you were able to connect before with another modem and now you can't, it can be another problem. **See page 5, Test 2.** **Please note all factors of test 1 must work first.** The modem in your computer cannot match up with the modem in your telephone access unit(s). The computer places the call, you hear it dial, ring, the modems tone and then it hangs up. It seems, that in order to make the modems less expensive, they came up with a way to use 'software' modems that they call "WinModems". This means the modems only work in Windows. Well, the major expense in developing these modems is the software that make the modems work. It seems that the communication standard that our modems use (V.42bis) was left out of some modems. Because you use another standard to connect to the internet (V.90 & V.92), more popular users would never know V.42bis was missing. After many hours on hold, some testing on their part, a modem manufacturer told us to "Take the modem back to the store and buy another before your 90 day support is over" **See page 6, Test 3.**

That's just great, but what can I do to find out WHAT my problem is?

We offer you the following:

Test # 1

1. **Check your phone line.** This is the most common type of failure today.
 - a. Start with dialing the number with a regular phone. The best test is to find a standard phone and plug the phone into the jack of the modem that says "Phone" or has the picture of a phone at the receptacle. This way you are testing every connection and every wire in use.
 - b. Listen for noise on the line. Listen while it is ringing. Hear noise? Hissing? Popping? Crackling? Time to call your phone company.
 - c. Does the unit answer? No? Does the unit have power? Time to call your dealer!
 - d. Listen when the unit answers. Hear noise? Time to call your phone company or your dealer. You cannot communicate properly with telephone access system until the phone line is clear of static.
 - e. When the unit answers, you should hear one pip sound, then clear air with no pops, scratches or other noises. Then after 7 seconds, you should hear the modem tone, trying to connect. No? ? Time to call your dealer!
 - f. Repeat these steps using the phone line connected to the computer. Listen for the same things. If it is noisy now, you know the problem is in the phone line to your computer. Do you have other equipment connected to this phone line? Fax machine? Other stuff? This type of equipment can cause interference. Unplug them and try the test over again.
 - g. If you have a second phone line in the office, you could try connecting the computer to the second phone line and try the test over again. Does it work now? If so, you now know the phone line needs repair.
 - h. We have seen a number of instances were the phone line installer gets the tips and rings for several phone lines mixed up or crossed **See diagram 3**. When this occurs, you can talk, there MAY (Or Not) be hum on the line, but modems will not connect. This is because when the phone circuit is not transmitted in pairs, the noise canceling properties of the phone wire is defeated. This problem can only be found and cured with a "Point to Point Connection check" and must be done by a professional.
 - i. If you can hear all of the things we describe properly, proceed to step two, if not, **you must solve the problem before you can proceed, because you are not making the proper connection.**

Test # 2

2. **Adding a modem string** to this modem to make it connect
 - a. Go to "Start", then "Control Panel", then "Modems" or "Phone & Modem Options"
 - b. Select the "Modem" tab at the top, then "Advanced"
 - c. You should see a box that says "Extra Settings" with a window that you can type in.
 - d. Type in "+MS=B212". This will set the modem to 1200 baud using the standard modulation.
 - e. Select "OK", the screen will close to the Modem page
 - f. Select "OK", the screen will close to the Control Panel

- g. Select "OK", the screen will close to the desktop.
- h. Your modem should now connect at 1200 baud.
- i. You would need to remove the instruction to use this modem with the Internet and type in the instruction to use the modem with the telephone access system.
- j. This "Fix" was checked with a US Robotics Model 5660A that would not connect to our telephone access units. It has since been tested with other modems using the "Conexant" chipset and did not work with some "Rockwell" chipsets and may not work with other modems.

Test # 3

- 3. Buy another modem** to use with your telephone access system. We recommend buying an "External Modem". They are easier to install (You don't have to open your computer) just plug in the cable and plug the transformer into the wall. Install the drivers and you are good to go!
- a. We have tested the following external modems and they work.
 - i. US Robotics 56K* Faxmodem Model 5686E (Need to buy Cable to connect to computer)
 - ii. US Robotics 56K V.90 Model 5686. (Need to buy Cable to connect to computer)
 - iii. Compusa 56K External Fax Modem V.92 SKU #289090 (Comes with cable to connect to computer)
 - b. If you want to use an internal modem, we have tested the following units and they work:
 - i. US Robotics 56K* Faxmodem PCI for windows Model 5699E
 - ii. Compusa PCI Internal Data/Fax Modem V.92 SKU #289204
 - iii. Compusa PCI Internal Data/Fax Modem V.90 SKU #274406