Gentner®

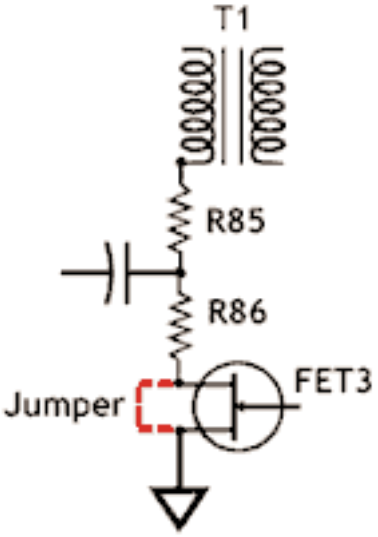
FAQ: VRC2000

Poor or No Touch-Tone (DTMF) Decoding

Since touch-tone receive levels vary from area to area, a modification to the VRC2000 flexible circuitry may be needed to accommodate these variations. Gain on the DTMF receive amplifier circuit is a factory setting that may be too high for certain Central Office telephone lines and other types of telephone systems, thus causing the DTMF tone level to distort. The level of the DTMF tone should be reduced into the decoder. A simple modification to the VRC2000's flexible circuitry will accomplish this.

•Solution

FET3 needs a jumper put between the source and drain (two outside legs of the FET). This will set up a voltage divider circuit for the incoming DTMF tone and attenuate the signal by 6dB before the signal reaches the amplifier circuit. If the FET is bad, old, or noisy, this can add distortion into the incoming DTMF tone and not allow the decoder to read the signal. The jumper also cleans up the distortion from the noisy or bad FET. (See block diagram, below.)



This block diagram is also on Page 227 (Figure 24) in the VRC2000 Installation and Operations Manual. This block diagram is also on Page 84 (Figure 24) in the VRC2000 Installation and Operations Manual (Rev. 2.00). Typical readings of the DTMF level: U16, pin 8 < 1 Vpp when receiving the DTMF tone. If more attenuation is needed even after the modification has been done to FET3, R49 can be changed from a 20kOhm resistor to a 39kOhm resistor.

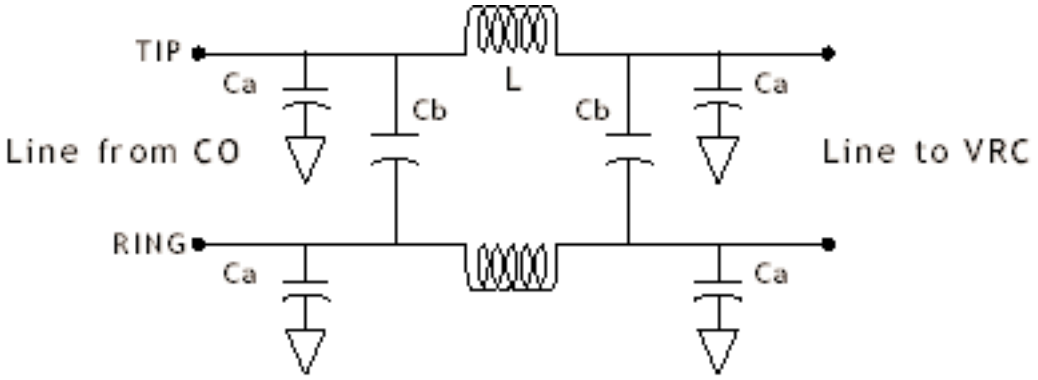
Note: The jumper modification to FET3 will not damage the VRC2000 circuit.

RFI Interference (Poor or No Touch-Tone Decoding or No Auto-Answer)

RFI interference occasionally affects the VRC2000 by not allowing the unit to auto-answer or by intermittent touch-tone (DTMF) problems.

• Solution

RFI problems typically are cured with any or all of the following suggestions: Correct site grounding problems. Avoid wiring which creates ground loops (two paths to station ground) Update the phone company's surge protection. AM RFI is often generated by central office carbon shunt surge protectors that are installed from tip-and-ring to ground. Update the carbon shunts to the gas tubes. Build or buy an RF filter for the phone line. Gentner supplies a Telephone Surge Protector with the VRC2000, but does not provide an RF filter for the phone line. This can be bought through your local phone company or a filter can be built up using a diagram of an RFI filter. (See diagram, below.)



	L	Ca	Cb
AM	22uH	0.0022uH	1000pF
FM	390-500uH	220pF	100pF

This diagram is also on Page 230 (Figure 25) in the VRC2000 Installation and Operations Manual
This diagram is also on Page 85 (Figure 25) in the VRC2000 Installation and Operations Manual (Rev. 2.00).

Note: AT&T's Z100A filter has performed well at AM sites.

Calculating a Calibration Constant

The VRC2000 uses a calibration constant to calculate and calibrate the internal readings to that of the transmitter or other site equipment readings. The VRC2000 can receive a sample voltage of 0 to +10Vdc. The calibration constant is multiplied by the sample voltage to give the user a reading that matches the equipment.

- **Solution**

Formula: Equipment Reading / Sample Voltage = Calibration Constant

Example: 15KW/5Vdc = 3 for a calibration constant

Bad Example: 15,000W / 5Vdc = 3,000 for a calibration constant

Note: Try to keep all calibration constants below 100 if possible. Use KILO in the unit identifier word instead of a calibration constant above 1,000.

Metering System Failure Alarms

The VRC2000 calls regularly or intermittently with a metering system failure.

- **Solution 1**

Typically metering system failure alarms are caused by the metering inputs with sustained or instantaneous voltages greater than 10Vdc. The VRC2000 does not report which channel the surge occurred on. Check to see if a metering input is near 10Vdc. Reduce the sample voltage into the VRC2000 metering channels.

• Solution 2

Analog regulator AC ripple can also generate metering system failures. U23 pin 40, +5Vdc with < 30 mV AC ripple; U15 pin 4, +12Vdc with < 30 mV AC ripple; U15 pin 11, -12Vdc with < 30 mV AC ripple. Poor power rectification can only be cleaned up by AC line conditioning.

• Solution 3

Lightning or power surges on the phone line or a power surge on any of the status channels can stress or damage U39 and U40. This can also cause a metering system failure. Remove the two ICs from the sockets, power the unit back up and check to see if the alarms still occur. The VRC2000 can be powered up with U39 and U40 removed, the unit with lose status readings, but this may fix the problem of alarms occurring. Replace the damaged ICs with new ICs. 74HCT541

Lithium Battery

The VRC2000 does not save the set-up features of the program when it loses power.

• Solution

The berg jumper by the internal lithium battery is not enabled (berg jumper toward battery) or the battery has discharged all of its power. The life expectancy of the lithium battery is around four years. Check the battery with the VRC2000 unit powered down. If the battery voltage is less than 3Vdc, the battery needs to be replaced. The replacement part is a TL-5134 3.6Vdc.

Lightning Strikes/Power Surges

Lightning strikes or power surges will usually enter the VRC2000 via the phone line, status or metering channels.

If . . .
1) the ON-LINE LED is always on,
2) the unit will not answer the phone line,
3) metering channels read no voltage with voltage applied and / or,
4) a voltage reading registers with no voltage applied, the VRC2000 has probably taken a power surge.

• Solution 1

If the ON-LINE LED is on all the time, the data bus from the microprocessor is locked up. Most of the ICs in the unit are tied to the data bus for communication to and from the microprocessor. It only takes one IC to be bad to lock up the bus. The two ICs that normally require replacement first are U39 and U40. Remove power from the unit, pull those two ICs from the sockets, reapply power, If the ON-LINE LED is still on, contact Gentner Technical Support for additional assistance.

• Solution 2

If the VRC2000 will not answer the phone line. The Telephone Surge Protector may be faulty. Bypass the Telephone Surge Protector, plug the phone line directly into the VRC2000, try calling the unit again, if the VRC2000 does not answer again, check the telco circuit on the VRC2000 board. Check the following parts: R67 and R68 2.2 Ohm resistors (may be burned or open), CR9 and CR10 (may have a short), C74 (may have a short), U42 pin 5 (should pulse low when a call is ringing), V1 (may have a short), BR2 (may be faulty), or Telco Line Traces on the bottom of the VRC-2000 board may be burned. Remove the board and check.

Note: If the Telephone Surge Protector is bypassed, repair or replace the surge protector as soon as possible. Avoid a direct line into the VRC2000 without a Telephone Surge Protector.