Verbatim™

Owner's Manual

SINCE 1948

RACO®

REMOTE ALARMS AND CONTROLS

Warranty

RACO Manufacturing and Engineering Co. Inc., Emeryville, California warrants this product to be in good working order for a period of five years from date of purchase as a new product. In the event of failure of any part(s) due to defect in material or workmanship occurring within that five year period, RACO will, at it's option repair or replace the product at no charge for parts or labor.

Any alteration of the product without instruction from RACO's Engineering Department will automatically void this warranty. If alterations of the unit are authorized by RACO, please complete the authorization form in the Owners Manual and return the form to RACO to ensure the warranty. Under no circumstances will RACO be responsible for consequential or secondary damages.

The defective product should be returned, insured and freight prepaid, securely packaged to the address listed below. Please include a copy of your sales receipt, the dialers serial number, and a detailed description of the problem you are experiencing.

RACO Manufacturing and Engineering Co. Inc.
Service Department
1400 62nd Street
Emeryville, CA 94608

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1 | Overview

1.1 | Product Description

The Verbatim™ autodialer functions as a remote alarm monitor, typically monitoring critical facilities which are not staffed 24 hours a day.

The Verbatim autodialer may be factory configured for different input and output configurations. Your Verbatim may have as many as 32 discrete inputs, 16 analog inputs, 8 digital outputs and 96 Remote Channels. The minimum configuration of the Verbatim autodialer monitors 4 internal input channels.

The internal inputs are sometimes called Physical Channels (PCs). PCs monitor user-supplied external sensors such as float switches, limit switches, etc. Sensors connected to discrete inputs are usually dry (non-powered), isolated contacts which close or open to indicate the sensed condition. In most cases, the outputs of logic controllers may be connected directly to Physical Channel inputs without the need for interfacing relays or other signal conditioning.

Remote Channels (RCs) do not directly connect to sensors. RCs monitor PLC I/O and data table locations as defined by the user. RC data is kept current by the Verbatim constantly making queries to PLC data registers over the industrial network connection.

An alarm condition can be indicated by change at a sensor, by new data from a Remote Channel (RC), or by loss of AC power. When an alarm occurs, the Verbatim accesses the standard phone line to which it is connected, dials the appropriate phone numbers and delivers the user's own pre-recorded voice message corresponding to those particular alarm conditions that are currently active.

Dialing continues repeatedly through the entire list of up to 16 programmed phone numbers, until the alarm is acknowledged by touch tone command or by calling the Verbatim autodialer back.

The Verbatim autodialer incorporates many flexible, voice-supported programming and message recording options, to meet a wide range of user requirements. Yet, in most cases, the user may rely on pre-existing default programmed parameters, greatly simplifying programming. Even default voice alarm messages are provided.

Note:

All user programming except access code and voice message recording may be entered, reviewed or changed either from the front panel or from a remote telephone at any time. Thus, installation and programming may easily be done by separate personnel at separate times.

Most programming is entered in the form of 3-digit codes as described in this manual. All user programming, including recorded messages, is maintained in permanent non-volatile memory.

The Verbatim autodialer incorporates extremely thorough and effective electrical surge protection and overall rugged construction, to deliver reliable operation under real-world conditions.

1.2   Manual Description

This manual guides you through the following procedures:

- Location and mounting
- Initial programming
- Configuring Remote Channels to monitor PLCs
- Voice message recording
- Using Your Verbatim autodialer
- Advanced programming

A glossary explaining the terms used in this manual is included the end of the manual, along with a troubleshooting guide, an index, a return authorization form, and FCC notice to users.

Worksheets are provided to document and clarify your programming and message recording steps.

Please take a moment to read, complete, and mail the warranty registration card at the back of this manual.

1.2.2   Conventions

Throughout this manual various icons are used to visually identify information. They are as follows:

- ◆ The solid diamond symbol shows a list of procedures, decisions, or single step tasks.
- The bullet symbol shows a list of items.

The bomb indicates a warning message. The information concerns process that may result in damage to equipment or harm to a person.

The hand indicates a caution message. The information concerns a process that may result in equipment failure.

The pencil indicates general information.

The open diamond pattern indicates one or more exceptions or special considerations for a process.

The phone indicates that you can access the Verbatim autodialer through your phone.

MINUS
#

Other icons include button or keys on the Verbatim autodialer front panel.

"items in quotes"	Quotation marks indicate titles of sections and messages.
italic	Italic text indicates items for emphasis, message text, and sample text.
ALL CAPITALS	Capital letters reference the names of keys, lights, and LEDs.
Initial Capital Letters	Capitalization of the first letter of a set of words indicates mode and function types.

2 Installation

This section describes how to install the Verbatim autodialer and how to install a parallel printer to use the Parallel Printer Local Data Logging feature.

2.1 Location and Mounting

Choose a mounting location which is not exposed to condensing humidity or temperatures beyond the limits of 20°-130°F. This location should ideally be within 5 feet of a standard RJ-11 phone jack and a *grounded* 120 VAC power outlet.

1. Mount the Verbatim autodialer on centers of 6" x 11 3/8" using the external mounting ears on the enclosure. #10 or 3/16" bolt sizes are best.

2. Install the NEMA 4X weatherproof outer enclosure, (optional purchase).

   This allows the Verbatim autodialer to be mounted outdoors as long as temperature limits are not violated. It is best to provide at least an over-head shelter to minimize direct precipitation and solar heating effects.

3. Install the heater/thermostat for cold or humid environments, (optional purchase).

   The 120 VAC heater dissipates 75 watts, providing a temperature rise of approximately 30 degrees, or 60 degrees when enclosed in the optional NEMA 4X enclosure.

2.2 Wiring

Refer to the diagram on page 2-3 for an example of the wiring connections.

1. Inspect and remove any foreign materials which might create short circuits.

2. Connect the red (positive) battery lead to the positive terminal on the gel-cell battery.

3. Plug the 12 Volt DC power supply into a grounded 120 V AC outlet.

If there are any green grounding wires in place on TS3 originating from plug-in expansion cards, leave those green grounding wires in place on the terminal marked GRN (Green). If the Verbatim autodialer turns on when power is applied, turn it off with the red POWER ON/OFF key.

4. Connect dry (unpowered) contacts to the terminal strip connection points.

   The connection point for basic four-channel units is terminal strip TS1, located on the lower left of the main circuit board. Note that there are four common return terminals marked "C"; any combination of these internally grounded terminals may be used. Terminal strip TS1 may be unplugged for convenience. All terminal points are screw clamp type, eliminating the need for wire termination lugs.

   The contact input wires should ideally be light (18 to 24 gauge) signal wire rather than heavy power wire. This reduces problems of bulk and stiffness.

5. If your unit has 8 or more inputs, the VX32 Channel Expansion Card should be plugged into connector J4.

   If your unit has this card installed, then use TS1 for common return connections only, and connect one side of each contact to the appropriately marked channel input number on the VX32 card. Leave TS1 terminals 1,2,3 and 4 disconnected.

Notes:

◆ The common *return* side of the contacts will need to be consolidated into not more than four wires coming into the TS1 terminals marked "C".

◆ Route the wires to the VX32 card so that they do not protrude above the top of the card, other wise they will interfere with the front panel board when the door is closed.

◆ Terminal strip TS1, and the terminal strips on the VX32 card if any, are not removable terminal blocks. Be sure that the terminal strips do not become unplugged due to wires being stressed when the door is closed.

Caution:

NO 120 VAC INPUT CIRCUITS! Please verify that the circuits you connect to these inputs are "dry" (unpowered) and are *not* directly connected to 120 VAC power. Connecting such circuits will damage the unit.

Exception:

If your inputs are coming from a logic controller with TTL, CMOS or 5-volt DC logic outputs, direct connection may be made as long as the controller has the same electrical ground as the Verbatim autodialer.

Electrical Connection Diagram For Dry Contact Inputs
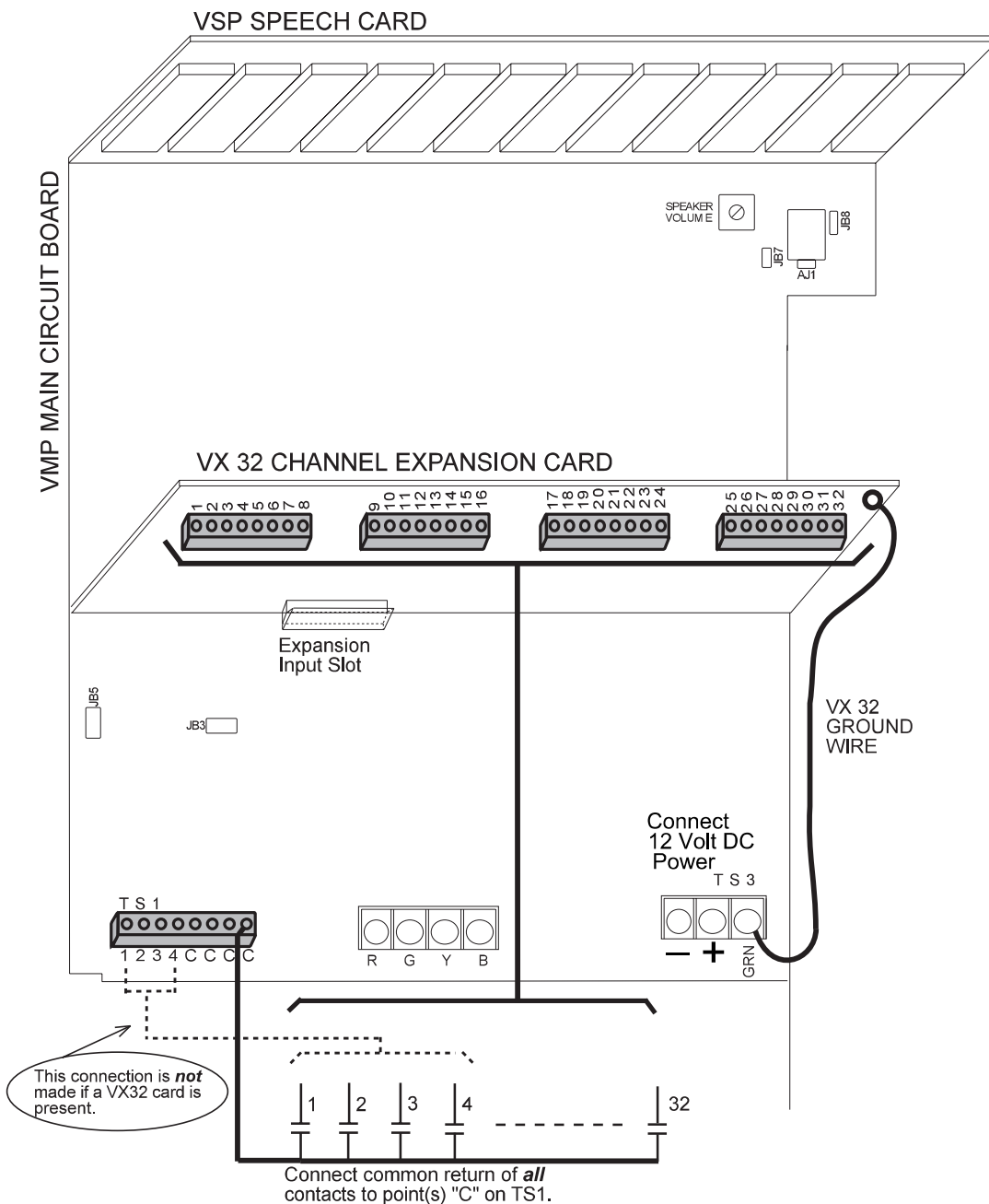
The common returns for all inputs are connected to TS1 terminals marked "C". These four "C" terminals are connected together and to electrical ground.

4 Channel Verbatim: Connect one side of each contact to the corresponding numbered terminals on TS1. The other side of each contact connects to the common return (the "C" terminals on TS1).

8 Or More Channel Verbatim: Connect one side of each contact to the corresponding numbered terminals on the VX32 expansion card. Connect the other side of each contact to the common return (the "C" terminals on TS1 of the main board). Note that TS1 terminals 1 through 4 are not used in this case.

2.3   Installing the Parallel Printer

The Verbatim Parallel Printer Local Data Logger feature will print reports on a local printer which is connected via a standard parallel interface. The local printer will automatically print out each action that occurs; e.g., alarms, acknowledgments, programming entries, inquiry calls, etc. You can cause a printout, upon command, at any time. Also, you may program the Verbatim for automatic printout of all input conditions at regular intervals. A time/date stamp will be included with each printed item.

You will need to:

◆ Connect the parallel printer to the Verbatim front panel using the RACO PPC-1 cable (or equivalent).

◆ Set the time and date so that each printout will be accompanied by the proper time and date stamp.

2.3.1   Installing the Printer Cable

Note:

If you ordered the Verbatim Parallel Printer Port Adapter Cable from RACO at the time you ordered your Verbatim autodialer it should already be properly installed. (The cable may be ordered from RACO using the part # VPPC-1.) You may also use an identically wired cable from a separate source. If you wish to acquire or fabricate the cable yourself, please refer to the, *"VPPC-1 Serial Cable Connection Diagram,"* in Appendix G.

The front panel circuit board must show a designation of VFP4 or higher. Also, the firmware version for the program chips U3 and U4 (on the main circuit board) must be V2.01 or higher. If your hardware does not conform to these revision levels contact your RACO Sales Representative about getting the proper upgrade modules.

The VPPC-1 cable attaches to the front panel circuit board where the mating pins protrude, just inside the front door of the Verbatim . Orient the connector so the cable's Pin 1 index (a red stripe on the cable or an arrow on the connector) is near the corner of the front panel board. The cable extends out of the Verbatim chassis and overlaps the lower chassis wall at the bottom of the chassis. When the front door of the Verbatim is closed the flat ribbon cable will be safely folded around the lower wall of the Verbatim chassis.

At the other end of the VPPC-1 cable is a standard "Centronics" style 36 pin connector. This 36 pin connector is the proper gender to mate with the data connector on the back of your parallel printer. However, if the printer cannot be located within the three-foot length of the VPPC-1 cable, install a standard

"Centronics" parallel printer extension cable (male on one end, female on the other). The extension cable extends from the end of the VPPC-1 cable to the printer.

✏️ *Note:*

The maximum length of the printer extension cable should be no greater than 10 feet. If you need to extend the printer greater than 10 feet from the Verbatim please consider ordering the RACO Serial Local Data Logger Option. Serial interfaces may be extended to a few hundred feet if necessary. Furthermore, if a serial interface is used together with special "line driver" devices, the printer cable may be extended for thousands of feet.

2.3.2 Load Paper and Place Printer On line

The printer must be properly loaded with paper and be on line in order for the Verbatim to print reports. (Some printers have a button labeled "select" rather than "on line.") If the printer runs out of paper or is taken off line, printing will cease immediately. A limited amount of printout data can be saved in the Verbatim internal print buffer while the printer is off line or out of paper. The size of the Verbatim printer buffer depends on several factors such as which Verbatim options are configured (i.e., analog, RSC, PLC interface, etc.). If the printer is off line or out of paper, printout data is sent to the Verbatim buffer each time it would otherwise be printed on the printer. Once the amount of data sent to the buffer exceeds the size of the buffer, printout items will continue to be copied to the buffer but will begin to overwrite buffered data. The printer buffer "wraps" around and new printout data is copied over the oldest printout data.

It is possible that no data will be lost while your printer is out of paper or off-line if you manage to restore the printer to operation before the Verbatim buffer "wraps." Then as soon as the printer is restored to operation, the Verbatim sends the buffered reports to the printer. (Note that the date/time stamp eventually printed will show the time and date of the event; not the time and date of the printing activity.)

2.3.3 Programming Time and Date

Time and date may be entered or changed with the following programming code entries:

◆ To check the date:

```
9 4 1 ENTER
```

◆ To set the date:

```
9 4 1 MM DD YY DW ENTER
```

MM is the month (01 for January, etc.), DD is the day of the month (07 for the 7th day of the month, YY is year (93 for 1993) and DW is the day of the week (1 for Sunday, 2 for Monday, etc.) Entry of the DW is optional.

◆ To check the time:

```
9 4 2 ENTER
```

◆ To set the time:

```
9 4 2  HH MM SS ENTER
```

HH are the hours in 24 hour format (13 for 1 PM), MM for minutes (don't forget the leading zeros) and SS is the seconds. Entry of SS is optional.

◆ To clear the time and date back to a default time and re-initializes the real-time clock chip:

```
935 7 ENTER
```

Note:

The preceding operation should only be necessary if the real-time clock chip has been added or replaced in the field.

2.3.4   Printout at Regular Intervals

The Verbatim autodialer may be programmed to automatically log (print on the printer) all input conditions at regular intervals, by entering the following code:

```
943 XXX.X ENTER
```

where XXX.X is the desired printing interval in hours, from 0.1 to 999.9 The first such printout will occur when the period elapses, rather than immediately upon programming.

◆ To check the presently programmed printing interval enter the following code:

```
943 ENTER
```

◆ To turn off the regular interval printing function enter the following code:

```
943 0 ENTER
```

◆ To immediately print a record of all current user programming enter the following code:

```
944 ENTER
```

2.3.5   Turning Off the System With a Printer

Some parallel printers tend to "leak" electrical current through the parallel interface into the Verbatim when it is powered off, resulting in the Verbatim not remaining turned off. It is possible that a few seconds after powering off the Verbatim it will turn itself back on again. To remedy this condition simply turn off the printer whenever turning off the Verbatim .

3 Programming and Testing

3.1 Starting Up and Clearing the Unit

Basic set-up and testing of the Verbatim involves:

◆ Program at least one phone number.

◆ Program the input channels to reflect alarm conditions.

◆ Test the alarm conditions to be sure witing and programming are correct.

◆ Record voice messages, trip delays and other programming as desired.

All programming operations must be done with the unit in the Program mode.

1. To put the Verbatim autodialer in the Program mode, press PROGRAM. Program mode is indicated by the lighted PROGRAM LED.

Note:

Before you begin programming the Verbatim for your monitoring application it is best to first clear the unit's memory of any old programming. This step also ensures that memory corruption, which might have occurred during shipment or due to anomalous power distrubances, will be wiped away. See Step 2 below.

Caution:

The following step erases all user programming including recorded messages so normally it is done only at initial start-up.

2. To clear the system memory, press:

    9 35 9 ENTER

    If you make an error in code entry, press CANCEL and start again.

Exceptions:

If you have powered up your Verbatim without connecting a live telephone line to the unit you may observe that the TFAIL indicator is on. This indicates that the unit is checking for the presence of a telephone connection and attempting to determine the line configuration. If you are planning to program your unit without a live telephone connection you may wish to disable the Telephone Line Fault Detection (Phone Fault) feature by pressing 9 17 0 ENTER
See Section 6.2.6 for information on temporarily disabling this feature.

Front Panel Keys and Indicators Diagram

MICROPHONE

Verbatim ™

**Remote Alarm Dialing Monitor
with Solid State Message Recording**

CHECK STATUS MODE

NORMAL MODE

REMOTE
CHANNELS

NET 1	NORM	PROGRAM	P1	P5	P9-16	R1	R5	R9-16	R41-48	R73-80
	CHECK	RECORDING	P2	P6	P17-24	R2	R6	R17-24	R49-56	R81-88
	LOBAT	DISARMED	P3	P7	P25-32	R3	R7	R25-32	R57-64	R89-96
TFAIL	PFAIL	PHONING	P4	P8	P33-48	R4	R8	R33-40	R65-72	RADIO

PHONE LINE FAILURE

BATTERY CHARGING
OR DISCHARGING*

AC POWER FAILURE:
RUNNING ON BATTERY**

PHYSICAL
CHANNELS

PUTS UNIT IN
PROGRAM MODE; IF IN
PROGRAM MODE,
TOGGLES
ALPHA/NUMERIC KEYS

EXECUTES PROGRAM
CODE ENTRY

Series VSS

RETURNS TO NORMAL
MODE. IF ALREADY
NORMAL, GIVES CHECK
STATUS REPORT

ALPHA KEY
NUMERIC KEY

NORMAL / CHECK STATUS	PROGRAM / SHIFT	I 1	O 2	B 3
DIAL OUT / PRESS TO TALK	F ENTER	T 4	C 5	R 6
DISARM / RE-ARM	X CANCEL	N 7	M 8	/ 9
POWER ON / OFF	RECORD	. POINT *	: 0	S MINUS #

ACCESS PHONE LINE;
DIALS DIGITS AS THEY
ARE PRESSED; PRESS
TO TALK

DISARMS UNIT. IF
ALREADY DISARMED,
RE-ARMS AND
CLEARS ALL OLD
ALARMS

TOGGLE ON/OFF

RECORDS SELECTED MESSAGE
UNTIL RELEASED

CANCELS PROGRAM
CODE ENTRY

SPEAKER

RACO

*** A discharged battery may take up to a day to fully charge.
Meanwhile, light may remain on.**

**** During AC power failure, all illuminated LED's will
flash to conserve battery power.**

3.2 | Programming Phone Numbers

Refer to Programming Worksheet A (See Appendix J). You are encouraged to write down the phone numbers you want to program, along with a person's name for each phone number.

◆ To program the first dial-out phone number, press:

```
7 01 (then the complete phone number) ENTER
```

For example, to program 1 (510) 658-6713 as the first phone number, press:

```
7 01 1 5 1 0 6 5 8 6 7 1 3 ENTER
```

◆ To program a second phone number:

Use code 7 02 instead of 7 01, progressing to a maximum of code 7 16 for the 16th phone number.

Each number may be up to 60 digits in length. Be sure to include any necessary area codes or "1" prefixes.

❖ *Exceptions:*

◆ To use touch tone dialing, press:

```
9 01 1 ENTER
```

◆ To go back to standard pulse dialing, press:

```
9 01 0 ENTER
```

◆ To insert delays between dialed digits.

Press the MINUS key once for each additional delay desired in the phone number programming process. Default delay is one second.

◆ Refer to Section 6. "Advanced Programming," for specialized programming such as *grouping* phone numbers with input channels, *Call Progress Monitoring* phone fault detection, etc., or to establish and use a *call forward* phone number, etc.

3.3 | Programming Input Channels

Your Verbatim autodialer needs to know whether its input channels are to be *normally closed* (alarm on Open Circuit), or *normally open* (alarm on Closed Circuit).

All contact inputs are initially set normally closed (i.e. they will alarm on Open Circuit). This is the default setting and, therefore, any open circuits, including any inputs left disconnected during installation, will appear as alarms until the inputs are programmed.

◆ To automatically program the inputs:

Make sure all inputs are in their normal (non-alarm) state. Then press:

```
5 0 0 ENTER
```

The Verbatim autodialer automatically examines all inputs and programs them to alarm on the opposite input state from their present status. This code 500 does not affect any channels that have been programmed for Disabled Channels, Status Only, Run Time Meter, or Pulse Totalizer function.

❖ *Exceptions*

In most cases, no further programming of contact inputs is necessary. However, the following configuration options are available:

◆ To set any input to be disabled and never be annunciated, press:

```
5 ZZ 0 ENTER
```

where ZZ is the 2 digit channel number you are programming. Be sure to always use a leading 0 for channels 1 through 9 to keep the channel number a two-digit entry.

◆ To set an individual contact input for normally closed operation (i.e. to alarm on Open Circuit), press:

```
5 ZZ 1 ENTER
```

◆ To set an individual contact input channel for normally open operation (i.e. to alarm on Closed Circuit), press:

```
5 ZZ 2 ENTER
```

◆ To set inputs to report status only, program each individual channel as follows:

```
5 ZZ 3 ENTER
```

This setup never causes an alarm to dial out.

◆ To set contact inputs for the run-time meter function, program each channel as follows:

```
5 ZZ 4 ENTER
```

See Section 6.2.3, "Channel Programming (Configuring)." This setup never causes an alarm to dial out but reports the total accumulated hours that the input contact is closed.

◆ To set any of your contact inputs for the Pulse Totalizer function, see Section 6.2.3, "Channel Programming (Configuring)."

3.4 Initial Testing

Perform the following steps to ensure that your Verbatim autodialer is properly installed.

1. First, temporarily disarm the unit by pressing:

   DISARM/RE-ARM until the DISARM LED is flashing. This prevents the unit from dialing out.

2. Next, physically trip each sensing device in turn (manipulate float switches, relays, etc.).

   Verify that the corresponding input channel LED lights at the front panel, and then restore all sensors to their normal state.

3. Now press DISARM/RE-ARM. This will clear out the channel input LEDs and restore the unit to a ready condition.

4. To test the phone line connection, with the unit's phone cord plugged into its phone jack, temporarily remove the AC power cord to the unit.

   The PFAIL LED will illuminate. At this point all illuminated LEDs will flash on and off in order to conserve battery power. Since the unit is not disarmed this time, after a 0.1 minute Alarm Trip Delay the PHONING light will illuminate and the unit will access the phone line and will begin dialing the first phone number.

   The unit will recite its station ID and power failure messages. You may converse with the person answering by pressing and releasing DIALOUT/ PRESS TO TALK. Press this key again when you wish to speak, and release this key to listen. This action will suspend message recital. In this case, when the conversation is done, you should end the call by pressing NORMAL. Ordinarily the alarm call would end automatically.

5. Now press DISARM/RE-ARM twice.

   This step disarms and then rearms the unit clearing all acknowledged alarms. This clearing also occurs automatically after the Alarm Reset Time has elapsed (default value 1 hour). See Section 5.6, "Alarm Reset Time-out After Acknowledgment."

6. Your Verbatim autodialer is now able to operate, having at least one dialout phone number programmed and having its input channels configured.

   However, you may wish to record your own voice messages (see the next section) or perform special advanced programming items (see Section 6, "Advanced Programming") before referring to Section 5, "Using Your Verbatim autodialer."

4 Recording Voice Messages

This chapter describes how to record your own voice messages. Messages may be recorded for the Station ID and for the Alarm and Normal condition for every channel in your Verbatim autodialer.

Note:

Be sure to complete the programming of the input channels as described in the previous chapter before recording any messages.

Using Default Messages Instead of Recording Your Own.

Recording messages is an optional step. Your Verbatim autodialer comes with built-in default normal and alarm messages for all channels. Recording voice messages can be postponed until you have become more familiar with your unit. You may even choose to record or re-record your own messages from a remote telephone at any time.

Using default messages for selected channels or for the Normal condition of channels is an excellent way to conserve speech memory for certain important and lengthy alarm messages.

Types of Default Messages

- Discrete (i.e. digital, contact) physical channel inputs:

    "Channel N Normal" and "Channel N Alarm."

- Discrete remote channel inputs:

    "Remote Channel N Normal" and "Remote Channel N Alarm."

- Discrete Status-only or Run-time meter physical channel inputs:

    "Channel N is ON" when input circuit is closed, and "Channel N is OFF" when input circuit is open.

- Discrete Status-only remote channel inputs:

    "Remote Channel N is ONE" or "Remote Channel N is ZERO."

- Analog (integer) physical or remote channel inputs:

    ["Channel N, present reading is ..."] followed by the recited analog value.

- Station ID message:

    "ID Number N."

There is also a default Network ID message. See Appendix F for details.

4.1   Planning Messages

Worksheet C in Appendix J is provided to assist you with this. Please use the Worksheet! Not only will you then have a written record of your messages for future reference, you will also then be prepared to record your messages with the greatest ease and efficiency.

In general, two different messages are used for each input channel: One message for the Normal Condition, and another for the Alarm (fault) Condition.

When you have written down the messages that you want to record, you are ready to verify/extend your recording time.

❖ *Exceptions:*

◆ Status-only or Run-time Metering Channels. See Section 6.2.3, "Channel Programming (Configuring)."

To record your own messages for these specially configured channels rather than relying on the default "Channel N is ON" or "Channel N is OFF" messages:

● Plan a message for the Closed Circuit condition and another message for the Open Circuit condition for each channel.

For Run-time channels, the unit will add a report of the run-time in hours, using built-in speech, after the Closed or Open Circuit message.

◆ Pulse Totalizer Channels

See Section 6.2.3, "Channel Programming (Configuring)," for special guidance in planning Pulse Totalizer messages.

4.2   Managing Available Speech Memory

The table below shows the total available message recording time for units with differing total number of channels. The available message recording time may be extended in two ways. First, you may explicitly change the recording rate from the default Rate 1 to Rates 2, 3, or 4 (See Section 6). Secondly, you may automatically extend the message recording time by using the Autoextend™ feature described in this section.

Unit type	Initial recording time (at Rate 1):	Extendable to: (Rate 2, 3 or 4)
4-8	26 sec	40, 54 or 79 sec
16-32	104 sec	160, 216 or 318 sec
33-40 chan. unit	130 sec	200, 270 or 399 sec
41-48 chan. unit	156 sec	240, 324 or 476 sec
49-56 chan. unit	182 sec	280, 378 or 555 sec
57 or more	208 sec	320, 432 or 624 sec

4.2.1   Verifying/Extending Recording Time

Initially, the unit is set for the fastest memory use rate ("Rate 1"), giving the highest fidelity sound recording. If you are sure that your messages take less than the "initial" time shown above for your unit (14 seconds total for a 4-channel unit), go to Section 4.3, "Record Your Messages." You may also verify your unit's current rate setting and corresponding total message recording time by pressing:

     `9 1 1 ENTER.`

If, after performing this step, you think you may need more recording time perform the Autoextend™ step described next. The Autoextend™ feature will automatically extend the available recording time, selecting the optimum recording rate (speech memory rate) to give you the highest possible recording sound quality for your length of recording.

Warning:

  The following step will erase any existing recorded messages.

To use the Autoextend™ feature to extend recording time, have your message Worksheet handy as you press:

     `9 1 2 ENTER`

The Verbatim autodialer will prompt you to immediately begin reciting your entire list of messages at the sound of the beep, one after another, at the same speed that you will want to later record them.

During this time, the Verbatim autodialer will *not* be recording your spoken messages. Instead, it will be timing you.

When you have finished reciting (not recording) the last message, immediately press ENTER.

Over the phone, press ZERO to start the timing, and ZERO again to end the timing. See Section 5.7, "Programming by Phone."

Based on how long your message recital took, the Autoextend feature will automatically calculate which recording rate is optimum for your length of recording time, and will then automatically select that rate. It will tell you how many seconds your message took, and how much total recording time it has now given you.

4.3   Record Your Messages

First, minimize any background sounds. Then proceed as follows:

◆ Have your message Worksheet in front of you and be prepared to recite the first Alarm (fault) Condition message in a loud clear voice within about 6 to 12 inches of the microphone located at the top of the front panel. Press:

     `1 ZZ ENTER`

where ZZ is the appropriate 2-digit channel number, such as 01 for channel 1. Be sure to use leading zeroes, in order to keep ZZ a 2-digit entry. Use 00 for the Station ID message.

`RECORD`

The voice specifically identifies the message you are about to record, and then prompts you to press the RECORD key and hold it just for the duration of your spoken message. Note that the RECORDING light comes on during recording.

☎

Over the phone, since there is no RECORD key, the voice will prompt you to press ZERO to begin recording, and press ZERO again to stop recording. See Section 5.7, "Programming by Phone."

The Verbatim autodialer will immediately play back the message you have just recorded, allowing you to determine if you need to re-record it louder, softer or more clearly, etc.

Experiment with different volume levels to get the best message clarity. If there is too much background noise at the Verbatim autodialer site, record your messages over the phone.

Always stop the recording promptly to avoid wasting recording time.

◆ To record an alternate "Normal Condition" message for channel ZZ, press:

     `2 ZZ ENTER`

and follow the same procedure as above.

◆ To review both existing messages for channel ZZ, press:

     `3 ZZ ENTER`

The Verbatim autodialer will replay both existing messages for channel ZZ. This will include any default messages remaining in use.

❖ *Exceptions:*

◆ For any channels programmed for "Status Only" or for Run Time Meter function, use code 1 ZZ for the Open Circuit message, and 2 ZZ for the Closed Circuit message.

◆ If you run out of recording time, you will hear the message "No more message time." See Section 4.2 above to re-establish total available recording time. You may elect to shorten some messages, or rely more on selected default messages, or you may Autoextend the available recording time. Then, re-record all messages.

◆ If you wish to extend the available time for a specific message while leaving the other messages unaffected, enter the code for recording that message, but add an extra digit 1 through 4, before pressing ENTER.

The digit 1 (Rate 1) gives the shortest time and the best sound quality, while 4 (Rate 4) gives the longest time with poorest sound quality.

◆ If you wish to reinstate a default message, enter the code for recording that message, and an extra POINT before pressing ENTER. For example:

```
1 ZZ POINT ENTER
```

◆ If you wish to use the default Station ID message but with a different ID number in place of the "one", press:

```
9 1 4 N ENTER
```

where N is the desired ID number which may be up to 16 digits long. Some users program the Verbatim autodialer's own phone number as its ID number.

◆ If you want to set a specific recording rate rather than letting Autoextend do it, press:

```
9 1 3 N ENTER
```

where N is the desired recording rate 1, 2, 3 or 4.

◆ You will then need to re-record any messages that were previously recorded at a different rate.

5 | Using Your Verbatim Autodialer

5.1 | Placing Inquiry Calls to the Verbatim Autodialer

☎ You may call the Verbatim autodialer at any time from any phone. The unit will wait the programmed number of rings before answering and then will begin a full status report. The status report starts with the Station ID Message, followed by any special warning messages (e.g.: no phone numbers programmed, or the unit is disarmed, etc.), and concludes with the listing of the status of each channel input.

If there are no alarm conditions on any channel, then the Verbatim autodialer will say "All channels normal" just prior to beginning the complete channel status report.

If there are channels with unacknowledged alarms conditions prior to the call, placing a call to the unit will result in the acknowledgement of these alarms. The Verbatim autodialer will say "Alarm is acknowledged" immediately after reciting the Station ID message.

❖ *Exception:*

   The Call in Acknowledge Mode command (Code 925) may be used to set the Verbatim so that calls *to* the unit will not automatically acknowledge alarms.

The channel status report will be recited the programmed number of message repeats (default is 3 times). Between each recital the Verbatim autodialer will issue a prompting beep and then wait a few seconds for you to optionally enter a special Command Tone. See Section 5.7, "Programming by Phone." After all message repeats, if you have not entered a tone, the unit will say "Goodbye" and terminate the call.

See Section 6.2, "Programming Operations."

5.2 | CHECK STATUS Inquiry at Panel

NORMAL
CHECK
STATUS

When the NORM LED is lit, you may hear a report of current conditions by pressing the NORMAL/CHECK STATUS key. You may cut this report short by again pressing the NORMAL/CHECK STATUS key.

5.3 | Receiving Alarm Calls

When any input condition violates the programmed alarm criteria for an interval longer than the Alarm Trip Delay for that input (See Section 6.2.6), the unit goes into an Unacknowledged Alarm state. The unit begins dialing the first of up to 16 programmed phone numbers. See Section 6.1, "Program Codes," about optional Alarm Call Grouping if you want the numbers dialed to depend on which channel is in alarm. Whenever there is an Unacknowledged Alarm the corresponding channel alarm LED begins flashing.

The voice messages follow the same format as an inquiry call, including the prompting beep, except the channels having no alarm activity are not included in the alarm report. If there is no acknowledgment, the Verbatim autodialer will replay the message for the programmed number of repeats (default is 3) and then will say, "Goodbye," before terminating the call.

See Appendix I for information on alternate annunciator state models. Annunciator state models support various Return To Normal (RTN) calling sequences.

Phrases Appended to Alarm Messages

(user recorded or default)

These appending phrases will continue to be included in any status reports until the Alarm Reset time expires for that channel.

ALERT
Any channel with an input violation which has not been present longer than the Alarm Trip Delay for that channel will have its status message appended with the word "Alert."

NOW NORMAL
If the violation which originally caused the alarm has gone away the phrase "Now Normal" will be appeneded to the alarm status message.

ACKNOWLEDGED
Any channel which was in an unacknowledged alarm state but became acknowledged will have its status message appended with the word "Acknowledged."

NOW NORMAL, ACKNOWLEDGED
Any channel which is both acknowledged and whose input voilation has gone away will have its status messages appended with the phrase "Now Normal, Acknowledged."

Note:

When the autodialer goes into alarm, it dials each phone number in sequence until it receives an acknowledgement. The alarm may be acknowledged after the warble tone by pressing a touch tone "9"; by calling the unit back after it says, "goodbye," or by pressing NORMAL on the front panel. After acknowledgement, the dialer will not call out again on that channel until it is reset. This is usually done automatically after a set period of time called the *Alarm Reset Time*, which allows the person who acknowledged the alarm time to go fix the source of the problem without further callouts from the dialer. After the reset time, the unit is automatically reset, and any alarms present at that time will cause a dial out.

Exception:

Power Failure alarms only cause two spoken messages: *1)* When power has been off for longer than the Power Failure Trip Delay, "Power is Off" is reported. *2)* When power has been off and is later restored the message "Power is On" is reported.

5.4 Continued Dialing in the Absence of Acknowledgment

The Verbatim autodialer will then wait for the programmed Time Between Alarm Calls (default 2 minutes; See Section 6.2.12, "Miscellaneous Programming Tips," to change default time), during which you may call the Verbatim autodialer back to acknowledge the alarm. If no acknowledgment is received at the end of this period, the next phone number will be dialed. The process will be repeated indefinitely, repeatedly going through all the designated phone numbers, until acknowledgment is received.

Exception:

If you want further calling terminated when channels return to normal you may so program the unit by using the "Set Return to Normal" command (Code 923). See Appendix K.

ANATOMY OF AN ALARM

| ALARM TRIP DELAY | DIALS ENDLESSLY UNTIL ACKNOWLEDGED | ALARM RESET TIME |
| VIOLATION OCCURS | UNACKNOWLEDGED ALARM | ALARM ACKNOWLEDGED | ALARM RESET. READY FOR NEW ALARM |
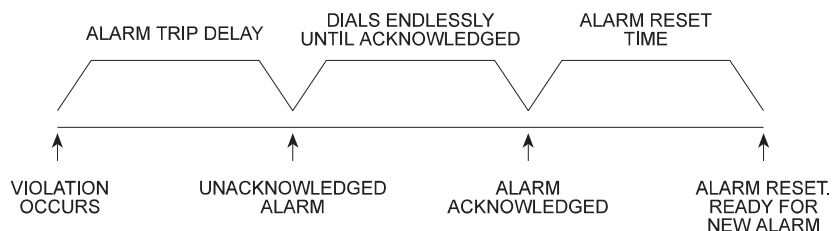
5.5 Acknowledging the Alarm Call

To acknowledge the alarm during the alarm call wait to hear the prompting "warble" tone then enter a touch tone '9' (Also 1, 2, 4, or 0 will acknowledge in this situation). The Verbatim autodialer will say "Alarm is acknowledged, Goodbye" and terminate the call. See Section 5.7, "Programming by Phone," for additional ways of acknowledging an alarm without ending the call.

Alternative methods of Acknowledging:

Wait for the alarm call to end then place a call to unit.

At the front panel press NORMAL, PROGRAM, DISARM, or DIALOUT .

Upon acknowledgment, the channel LED changes from flashing to steady illumination.

At the end of the Alarm Reset period the channel alarm LED turns off, the Acknowledged Alarm status is cleared for that particular channel input, and it is again ready to go into Unacknowledged Alarm whenever a violation occurs at that input. In particular, if a violation has not been removed (prior to timeout), dialing begins immediately upon the Alarm Reset period timeout. To reactivate the alarm before the alarm reset timeout period is over, re-arm the alarm.

5.6 Alarm Reset Timeout After Acknowledgment

As shown in the figure, "Anatomy of an Alarm," p. 5-3, when an acknowledgment is received, the Verbatim autodialer begins timing out the Alarm Reset Time, (default 1 hour).

Further calling on behalf of that channel is suspended, regardless of further activity at that particular input during this period. If new alarms occur on other channels during this period, the unit will go back into the Unacknowledged Alarm state and dial the first appropriate phone number, with dialing continuing until a new acknowledgment is received.

5.7 Programming by Phone

☎

During any phone call (inquiry call or alarm call), at the end of each round of messages, the prompting warble tone is issued. If you press a Command Tone "1" at the sound of the warble tone, the Verbatim autodialer will prompt you to enter a program code. (Or, if you have established a Security Access Code, you will first be prompted for this code).

To enter programming codes over the phone:

- Enter a touch tone "1" after the warble tone.

- Enter the program code followed by # #.

- Enter an additional # # when you are ready to hang up.

You may enter codes for most of the programming operations described in this manual except reading or changing the optional security access code. See Section 6 for more information about the 910 Security Access feature.

Since some of the front panel keys are not found on a touch tone keypad, some special conventions apply for over-the-phone programming:

In Place Of:	Enter:
CANCEL	* *
ENTER	# #
POINT	*
MINUS	#

- ◆ To enter the Program Mode press "1" after the warble tone.

- ◆ To end a phone call after programming:

  Press # # without a prior digit entry.

  The Verbatim autodialer will then issue a prompting beep which is another opportunity to enter a "1" if you didn't want to end the call. It will then say "Goodbye" and end the call.

❖ *Exception:*

☎

Over the phone, you may not program more than one consecutive dialing delay, because # # (two in a row) is interpreted as ENTER when programming. However, you may extend this delay using code 928. See *Program Code Table* p. 6-9.

- ◆ If you initially enter a Command Tone "2" in place of the "1", you will be in a special Program Review Mode, which allows you the safety of checking any of the programming items or messages, without the possibility of altering any of them.

- ◆ If you initially enter a Command Tone "3" in place of the "1", you will hear a report of each channel that has any acknowledged or unacknowledged alarm condition.

- ◆ If you initially enter a Command Tone "4" in place of the "1", you will hear a listing of all programmed phone numbers, plus any other basic programming items that you have altered from their default values. This is particularly useful in diagnosing operating problems.

◆ If you initially enter a Command Tone "8" in place of the "1", the unit will not be acknowledged and will immediately say "goodbye" and end the phone call.

◆ If you initially enter a Command Tone of "0, 5, 6, 7, or 9," in place of the "1", the alarms will acknowledge an alarm and the unit will immediately say "goodbye" and end the phone call.

Note:

Command tones "1, 2, 3, and 4" will acknowledge all alarms, even those not in their Alarm Call Group (ACG). See Section 6.2.13. Command tones "0, 5, 6, 7, and 9" will acknowledge only alarms in their ACG. Command tone "8" will not acknowledge any alarms, but will give the status of all alarms.

5.8 Dialing Out and Conversing Through the Verbatim Autodialer

DIAL OUT
PRESS TO TALK

At the panel, starting in the Normal Mode, press the DIALOUT/PRESS TO TALK key. Next press the digits of the phone number you want to dial. Each digit you press will be dialed as you press it. You will then hear the sound of the ringing.

When you hear the phone answered, press and hold the same DIALOUT/ PRESS TO TALK key as you speak to the person on the line, and release the key to listen. Continue the conversation in this manner.

◆ To end the call press NORMAL. If the DIALOUT/PRESS TO TALK key is not pressed for more than 2 minutes (or as previously set), the Verbatim autodialer will automatically end the call.

◆ To automatically re-dial a number that was previously manually entered by this method, press DIALOUT/ PRESS TO TALK as before, then press ENTER rather than entering digits manually.

NORMAL
CHECK STATUS

If you are at the panel when a phone call is in progress, you may suspend the message report and converse with the person on the other end by pressing the DIALOUT/PRESS TO TALK key as described above. There will be no additional dialing, since connection has already been established. To end the call, press NORMAL.

6 Advanced Programming

6.1 Program Codes

This chapter provides the Program Codes table which summarizes the wide variety of available programming operations, along with a description and comments. Additional information may be found in referenced notes below as well as in the referenced sections elsewhere in the manual.

When the overall programming is cleared out at initial start-up, all programming is automatically set to factory default values as shown in the table. Most of these default values are quite suitable for most users and only selected items may need to be programmed to different values.

ENTER

◆ To read the existing programmed settings:

Enter a code and then ENTER without any intervening value. This reads the existing programmed setting without changing it.

POINT
*

◆ To clear a program:

Enter POINT *after the code* and before ENTER. This clears the program item, or returns it to its default value.

In the Program Codes table, several forms of numeric value entries are shown:

Value	Definition
V	A value of one or more digits which may include a decimal point or minus. Examples: .5, 2.8, 300.6, 60.
N	One or more digits giving a whole number; no decimal points allowed. Examples: 1, 5, 20.
DN	A two-digit Designation Number for phone numbers (01 for first number, 02 for second, etc.).
1/0	Used to turn a function ON (1) or OFF (0).
ZZ	2-digit channel number (use ZZ=00 for ID message).

6.1.1 | Notes for Programming Code Table:

Refer to these numbered items under the "Notes" column in the following *Programming Code Table.*

1. ZZ = 2 digit channel number. Use ZZ=00 for Station ID message.

2. For any channels you have programmed as "Status Only" or "Run Time Meter", use code 1 ZZ for the Open Circuit message, use code 2 ZZ for the Closed Circuit Message. See Section 6.2, "Programming Operations," for message information for any Pulse Totalizer channels.

3. DN (Designation Number) is 01 for first dialout phone number, 02 for second number, etc. DN = 00 for special "callback" phone number. Use MINUS to insert any needed delays between digits. Each such delay is 1 second unless extended using code 928.

4. Actual power failure trip delay may be a fraction of a second longer than programmed value, due to power supply discharge time which varies with the number of option boards.

Caution:

5. If Alarm Reset Function is turned OFF, acknowledged alarms will NEVER RE-ARM, preventing further alarm calls after acknowledgment for each channel.

6. Speaker always operates during front panel programming, even if programmed to be off.

7. Cannot be read or changed over the phone.

8. Does not change channels that have been configured for "Status Only," "Run Time Meter," or "Pulse Totalizer."

Caution:

9. High Speed Dialing setting may not work reliably with some telephone company exchanges.

10. Add POINT to restore default message.

11. To pre-set a Run Time value, include the value before ENTER.

12. Maximum value that can be entered is 4,294,967,294.

13. Omits all mention of disabled channel. Restore by setting for Normally Closed, Normally Open, etc.

Programming Code Table (Page 1 of 8)

Code	Description & Comments	Default	Range/Values	Notes	Section
				See p. 6-2	

Channel Status Reading

Code	Description & Comments	Default	Range/Values	Notes	Section
0ZZ	Reads status of channel ZZ				6.2.1
0ZZ0	Reads actual open/closed circuit status directly				6.2.1

Message Recording and Reviewing

Code	Description & Comments	Default	Range/Values	Notes	Section
100	Records Station ID message			1, 2, 10	4.3, 6.2.2
1ZZ	Records channel ZZ alarm message			1, 2, 10	4.3, 6.2.2
2ZZ	Records channel ZZ normal message			1, 2, 10	4.3, 6.2.2
3ZZ	Reviews channel ZZ both messages ZZ=00 for Station ID msg			1	4, 4.3, 6.2.2
911	Reads current record rate and available record time				4.2
912	Autoextend: sets optimum record rate for recited msg				4.2
913 N	Sets recording rate	Rate 1	Rate 1-4		4.3
914 N	Inserts N in place of 1 in canned station ID message	Station 1	1-16 digits		4.3

Channel Programming (Configuration)

Code	Description & Comments	Default	Range/Values	Notes	Section
500	Sets current status as normal for all channels				3.3, 6.2.3
500 N	Sets all inputs to config parameter N	normally closed	0/1/2/3 0 = disarmed 1 = normally closed (default) 2 = normally open 3 = no alarm		3.3, 6.2.3
5ZZ	Reads alarm criteria for channel ZZ	1			6.2.3
5ZZ 0	Disables channel ZZ			13	3.3, 6.2.3
5ZZ 1	Sets chan ZZ normally closed			1	3.3, 6.2.3
5ZZ 2	Sets chan ZZ normally open			1	3.3, 6.2.3
5ZZ 3	Sets chan ZZ for no alarm (status report only)			1	3.3, 6.2.3
5ZZ 4	Sets chan ZZ for run time meter operation			1	3.3, 6.2.4
5ZZ 4 V	Preset starting value	0.0 hrs	0.0-99,999.9 hrs	1	6.2.4
5ZZ 7 N	Pulse totalizer: ACTIVATES with starting value N			12, 2	6.2.5
5ZZ 8 N	Pulse totalizer: sets scale factor N			12	6.2.5
5ZZ 6 N	Pulse totalizer: sets alarm setpoint N with starting value N			12	6.2.5

Programming Code (Page 2 of 8)

Code	Description & Comments	Default	Range/Values	Notes *See p. 6-2*	Section
Alarm Trip Delays					
600	Reads power failure alarm trip delay				6.2.6
600 V	Sets power failure alarm trip delay to V	0.1 min	0.1-999.9 min		6.2.6
6ZZ	Reads chan ZZ alarm trip delay				6.2.6
6ZZ V	Sets chan ZZ individual alarm trip delay to V	2 sec	0.1-9999.9 sec	1	6.2.6
6ZZ POINT	Returns chan ZZ individual alarm trip delay to default	2 sec		1	6.2.6
902 V	Sets global (all channels) alarm trip delay to V seconds	2 sec	0.1-9999.9 sec		6.2.6
902 POINT	Returns global (all channels) alarm trip delay to default	2 sec			6.2.6
Phone Numbers and Pulse/Tone Dialing					
700	Reads special "callback" phone number			See Code 924	6.2.18
700 N	Sets special "callback" phone # to N		1 - 60 digits		6.2.18
7DN	Reads phone number DN		01 - 16 DN = 01-16		3.2, 6.2.7
7DN N	Sets phone number DN to N phone #		1 - 60 digits N can = up to 60 digits	3	3.2, 6.2.7
7DN POINT	Clears out phone number DN				3.2, 6.2.7
900 0/1	Read/Set Call Progress Monitoring	0 (OFF)	0/1 0 = OFF 1 = ON		6.2.12
901 0/1/2	Sets dialing mode	Pulse mode	0/1/2 0 = pulse 1 = tone 2 = high speed	9	6.2.7
903 V	Sets time between callouts to V	2 min	0.1-99.9 min		6.2.18
906 N	Sets ring answer delay to N N = whole number	1 ring	1 - 20 rings		6.2.18
908 0/1	Sets Autocall ON/OFF	OFF	0/1 0 = OFF 1 = ON		6.2.18
909 V	Sets Autocall interval to V	24 hrs	0.1-99.9 hrs		6.2.18
916 N	Set Automatic Phone Fault Detect frequency	24 hrs	0.1 - 24 hrs	916 POINT resets to default	6.2.10
917 0/1/2/3	Set Phone Fault and Auto Tone-Pulse	3	0/1/2/3 0 = Phone Fault OFF/Auto Tone-Pulse OFF 1 = Phone Fault ON/Auto Tone-Pulse OFF 2 = Phone Fault OFF/Auto Tone-Pulse ON 3 = Phone Fault ON/Auto Tone-Pulse ON		6.2.10
918	CPM Ring Count	10 rings	5 - 20 rings		6.2.12
928 N	Extends length of inserted dialing delays to N sec	1 sec	1 - 10 sec		6.2.7

Programming Code (Page 3 of 8)

Code	Description & Comments	Default	Range/Values	Notes *See p. 6-2*	Section
Alarm Call Grouping					
5ZZ 9	Reads channel ZZ alarm call grouping linkage			1	6.2.13
5ZZ 9 DN	Links channel ZZ to phone numbers DN.	Calls all phone #s	01 - 16 DN = 01-16	1	6.2.13
5ZZ 9 POINT	Clears channel ZZ alarm call grouping linkage.			1	6.2.13
Alarm Ready Scheduling					
935 7	Initializes real-time clock chip on install to 1/6/92 2				2.3, 6.2.19, 7.9
941 MMDDYYD	Sets date	01/06/92 2	01/01/94 - 12/13/20 D *(Day Code)* is optional: 1 = Sunday 2 = Monday 3 = Tuesday 4 = Wednesday 5 = Thursday 6 = Friday 7 = Saturday		2.3, 7.9
942 HHMMSS	Sets time	08:00:00	00:00-23:59:59 (military-24-hour-clock)		2.3, 7.9
961	Read weekday rearm/disarm times				7.9
961 RRRR DDDD	Sets weekday rearm/disarm times	1700, 0800		RRRR=rearm time, DDDD=disarm time (military-24-hour-clock)	7.9
962	Reads weekend rearm/disarm times				7.9
962 RRRR DDDD	Sets weekend rearm/disarm times	1700, 0800		RRRR=rearm time, DDDD=disarm time (military-24-hour clock)	7.9
963	Reads weekend rearm/disarm day of week				7.9
963 R D	Sets weekend rearm/disarm day of week	Friday, Monday	R = rearm day D = disarm day		7.9
964	Reads holiday rearm date				7.9
964 MMDDYY	Sets holiday rearm date	12/24/90	Today - 12/31/20 MM = month DD = day YY = year		7.9
965	Reads holiday disarm date				7.9
965 MMDDYY	Sets holiday disarm date	12/24/90	The day after the holiday rearm date (see Code 964) - 12/31/20		7.9

Programming Code (Page 4 of 8)

Code	Description & Comments	Default	Range/Values	Notes	Section
				See p. 6-2	

Alarm Ready Scheduling . . . *Continued from p. 6-5*

966	Reads alarm ready schedule control number				7.9
966 N	Sets alarm ready schedule control number	0	N control 0-7 0 = OFF 1 = Weekday 2 = Weekend 3 = Weekday and Weekend 4 = Holiday 5 = Weekday and Holiday 6 = Weekend and Holiday 7 = Weekday, Weekend and Holiday		7.9

Local Data Logging Programming Codes

935 7	Initialize real-time clock chip on install to 1/6/92 2				2.3, 6.2.19, 7.9
941 MMDDYYD	Sets date.	01/06/92 2	01/01/94-12/31/20 D *(Day Code)* is optional: 1 = Sunday 2 = Monday 3 = Tuesday 4 = Wednesday 5 = Thursday 6 = Friday 7 = Saturday		2.3, 7.9
942 HHMMSS	Sets time	08:00:00	00:00-23:59:59 (military-24-hour clock)		2.3, 7.9
943 V	Sets regular interval local printing	OFF	0 = OFF .1 - 999.9 hrs		2.3, 7.9
944	Prints all current programming immediately				2.3, 7.9

Analog Input Programming

5 ZZ 1 X.XX	Sets low signal input value				B.1.5
5 XX 1 POINT	Sets low signal input value to real world point				B.1.5
5 ZZ 2 X.XX	Sets low signal input spoken value				B.1.5
5 ZZ 3 X.XX	Sets high signal input value				B.1.5
5 ZZ 3 POINT	Sets high signal input value to real world point				B.1.5
5 ZZ 4 X.XX	Sets high signal input spoken value				B.1.5

Programming Code (Page 5 of 8)

Code	Description & Comments	Default	Range/Values	Notes See p. 6-2	Section

Analog Input Programming . . . *Continued from p. 6-6*

Code	Description & Comments	Default	Range/Values	Notes	Section
5 ZZ 5 X.XX	Sets low setpoint alarm value				B.1.5
5 ZZ 6 X.XX	Sets high setpoint alarm value				B.1.5
5 ZZ 7	Sets analog input signal type	0	0/1/2 0 = 4-20 ma signal 1 = 0-1 VDC signal 2 = RACO TS-705A		B.1.3

Remote Supervisory Control

For all items in this section: N = output number, Range = 01, 02, 03, 04, 05, 06, 07, 08

Code	Description & Comments	Default	Range/Values	Notes	Section
95 N	Reads RSC output #N ON/OFF condition			14	C.1.3
95 N 0	Turns RSC output #N OFF				C.1.3
95 N 1	Turns RSC output #N OFF				C.1.3
95 N 2 V	Turns RSC output #N ON for V seconds only	1 sec	1 - 99,999 sec		C.1.3
95 N 3 V	Turns RSC output #N OFF for V seconds only	1 sec	1 - 99,999 sec		C.1.3
9500	Reports ON/OFF status of all outputs				C.1.3
9500 0	Turns OFF all outputs				C.1.3
9500 1	Turns ON all outputs				C.1.3
9500 8 V	Establish default pulse duration in minutes (When using 95 N 2 or 95 N 3)				C.1.3
9500 9 V	Establish default pulse duration in seconds (When using 95 N 2 or 95 N 3)				H.2.3

Data Acquisition/Central Data Logging

Code	Description & Comments	Default	Range/Values	Notes	Section
919 V	Sets quick intercall time	60 sec	35-999 sec		E.2
981 V	Return To Normal (RTN) calling	0	0/1/2/3/4/5	See Code 923	E.1, K.4
982 0/1/2	Acknowledgment calls to central station	0	0/1/2 0 = 1 1 = ON 2 = resets all alarm acknowledgment call status		E.3
983 0/1	Modem Automatic Speed Select	1	0/1 0 = OFF 1 = ON		E.4

Programming Code (Page 6 of 8)

Code	Description & Comments	Default	Range/Values	Notes See p. 6-2	Section

Data Acquisition/Central Data Logging . . . *Continued from p. 6-7*

Code	Description & Comments	Default	Range/Values	Notes	Section
984 0/1	Modem High/Low speed selection	1	0/1 0 = 300 1 = 1200		E.5
985 N	Data call attempts	3	1 - 10		E.6
986 0/1	Sets answer mode	0	0/1 0 = Data-to-Voice 1 = Voice Only		E.7
987 N	Data/Voice autocall calls	0	0/1/2 0 = Autocalls to Central Station only 1 = Autocalls to personnel numbers only 2 = Autocalls to all numbers		E.8

Miscellaneous Programming Items

Code	Description & Comments	Default	Range/Values	Notes	Section
902 V	Sets global (all channels) alarm trip delay to V	2 sec	0.1-9999.9 sec		6.2.6
904 V	Sets alarm reset time to V	1 hour	0.1-99.9 hr		5.6, 6.2.18
905	Clears all acknowledged alarms and clears reset timers				6.2.18
907 N	Sets number of alarm message repeats to N N = whole number	3 repeats	1-20 repeats		5.3, 6.2.18
910 N	Establishes a security access code N	None	0-8 digits	7	6.2.18
920 V	Power failure trip delay (duplicates function of code 600)	0.1 min	0.1-999.9 min	4	6.2.6
921 0/1	Sets power failure alarm	ON	0/1 0 = off 1 = on		6.2.6
922 0/1	Sets alarm reset timers	ON	0/1 0 = off 1 = on	5	6.2.18
923	Annunciator Sequence	1	1-4 <u>Values</u>: 1 = M-1designations 2 = A-1-4 designations 3 = A-1 designations 4 = A-1-4 variant	See also Code 981	K.4
924	Initiates test callback to phone # 00			unit must be ARMED	6.2.18
925 0/1	Turns on/off alarm acknowledgment on call-in to dialer.	ON	0/1 0 = OFF 1 = ON		
926 V	Sets delay before return to normal (Exit Delay) to V	2 min	1-99.9 min	Nonrecurring Function	6.2.18

Programming Code (Page 7 of 8)

Code	Description & Comments	Default	Range/Values	Notes See p. 6-2	Section
Miscellaneous Programming Items . . . *Continued from p. 6-8*					
927 0/1	Sets intercall delay parameter	0	0/1 <u>Values:</u> 0 = Normal operation of intercall delay. 1 = If new Unacknowledged alarms occur during the intercall delay period, the unit will begin a new dialout immediately. The unit will dial the next phone number in the dialing sequence. It will not start over at the top of the list.	** Firmware version 2.01+ only**	
928 N	Extends length of inserted dialing delays to N sec	1 sec	1-10 sec		5.7, 6.2.7
930 0/1	Sets arm or disarm unit for alarm callouts	armed	0/1 0 = disarms 1 = arms unit		6.2.18
932	Invokes one-time 15-second listening period	OFF			6.2.18
933 0/1	Sets local microphone ON or OFF	OFF	0/1 0 = OFF 1 = ON		6.2.18
934 0/1	Sets speaker ON or OFF	ON	0/1 1 = ON 0 = OFF	6	6.2.18
Clear Out Operations					
935 0	Clears out phone numbers; sets all delays to defaults				6.2.19
935 1	Clears out phone numbers only				6.2.19
935 2	Clears out all alarm call grouping linkage				6.2.19
935 3	Sets the following delays to their factory default values: 902, 903, 904, 920, 921, 926, 928			921 sets power failure alarm ON	6.2.19
935 4	Clears all user recorded messages				6.2.19
935 5	Clears all programming except messages			does not clear 913, 930, 941, 942	6.2.19
935 6	Clears all totalizers to 0 (not to preset) reading				6.2.19
935 7	Clears real-time clock chip (reinitialize)				2.3, 6.2.19, 8.9
935 9	Total clearout: Erases all programming & messages			does not clear 941, 942	3.1, 6.2.19
Diagnostic Readouts					
940	Reads all 4 diagnostic counts (add 0 to clear all 4)				6.2.20
940 1	Reads call in count (add 0 to clear)				6.2.20
940 2	Reads dial out count (add 0 to clear)				6.2.20
940 3	Reads acknowledged alarm count (add 0 to clear)				6.2.20
940 4	Reads power failure alarm count (add 0 to clear)				6.2.20

Programming Code (Page 8 of 8)

Code	Description & Comments	Default	Range/Values	Notes See p. 6-2	Section
Local Alarm/Line Seizure					
960 0	Read local alarm relay/line seizure				H.8
960 00/01	Set local alarm relay/line seizure 00 = local alarm relay 01 = line seizure	00	00/01		H.8

6.2　　　　Programming Operations

The following descriptions show the relevant program codes in parenthesis, and are organized according to their appearance in the preceding Program Codes table located in Section 6.1, "Program Codes."

Refer also to Section 5, "Using Your Verbatim Autodialer," for a description of over-the-phone programming.

6.2.1　　　Channel Status Reading

Code	Function	Description
0 ZZ	Read Status of Channel ZZ	Plays the message that corresponds to the present input condition of Channel ZZ.
0 ZZ 0	Read Open/Closed Circuit Status Directly	Says "Channel ZZ is closed" if channel ZZ input is presently Closed Circuit, or "Channel ZZ is open" if the input is Open Circuit. Useful in troubleshooting, especially at setup time.

✎ *Note:*

If a channel is disabled, its status will never be mentioned.

6.2.2　　　Message Recording and Reviewing

Be sure to refer to Section 4, "Record Voice Messages," for important details on message recording, including codes 911, 912, 913, and 914.

Code	Function	Description
100	Record Station Message	
1 ZZ	Record Channel ZZ Alarm Message	Used for Open Circuit message for channels programmed for NO ALARM (status only), or for Run Time Meter operation. Also used for a preamble message for channels programmed for Totalizer or Analog function.

2 ZZ	Record Channel ZZ Normal Message	Used for Closed Circuit message for channels programmed for NO ALARM (Status Only) or for Run Time Meter operation. Also used for "units of measure" portion of a message following preamble and digit readings, for channels programmed for Totalizer or Analog function.
3 ZZ	Review Channel ZZ Messages	Use 3 00 to review Station ID message

6.2.3 Channel Programming (Configuring)

Also see Section 3.3, "Programming Input Channels."

Code	Function	Description
500	Set Present Input Status as Normal Condition for All Contact Input Channels	Used at setup time as the most expedient way of programming the Normally Open/Normally Closed configurations ("Alarm Criteria") of contact input channels. Special configurations such as Status Only, Run Time Meter or Totalizer may then be programmed for specific individual channels. This code does not affect channels already programmed for Status Only, Run Time Meter, or Pulse Totalizer. **APPLIES ONLY TO CONTACT INPUTS.**
500 0	Sets the Alarm Criteria for all contact channels to DISABLED	Used at setup time as the most expedient way of programming all channels to the same alarm criteria. **APPLIES ONLY TO CONTACT INPUTS.**
500 1	Sets the Alarm Criteria for all contact channels to NORMALLY CLOSED	Same as above
500 2	Sets the Alarm Criteria for all contact channels to NORMALLY OPEN	Same as above
500 3	Sets the Alarm Criteria for all contact channels to STATUS ONLY	Same as above
5 ZZ	Read Channel ZZ Programming ("Alarm Criteria")	
5 ZZ 0	Disables Channel from Being Monitored and Reported	
5 ZZ 1	Set Channel ZZ for Normally Closed Operation	An Open Circuit condition will cause an alarm. **APPLIES ONLY TO CONTACT INPUTS.**
5 ZZ 2	Set Channel ZZ for Normally Open Operation	A Closed Circuit condition will cause an alarm. **APPLIES ONLY TO CONTACT INPUTS.**
5 ZZ 3	Set Channel ZZ for No Alarm (Status Only)	**APPLIES ONLY TO CONTACT INPUTS.**

6.2.4   **Run Time Meter Programming**

You may program any of the ordinary contact (digital or discrete) input channels to accumulate and report the number of hours that their respective input circuits have been closed. Any such channels will never cause an alarm, but on inquiry will recite the channel's Closed Circuit message or the Open Circuit message according to the status of the input, and will then report the accumulated Closed Circuit time (run time) to the tenth of an hour.

◆ To program channel ZZ for Run Time Meter operation, press:

5 ZZ 4 ENTER

◆ To preset a starting value, press:

5 ZZ 4 V ENTER

where V may be any value from 0 to 99,999.9.

◆ To delete the Run Time Meter programming, you must reprogram the channel for any other type of alarm criteria.

As with channels programmed for NO ALARM (Status Only) operation, the default Open Circuit message is "Channel N is off." To record your own Open Circuit message for channel ZZ, use program code 1 ZZ. The default Closed Circuit message is "Channel N is on." To record your own Closed Circuit message for channel ZZ, use program code 2 ZZ.

6.2.5   **Pulse Totalizer Function Programming**

The Totalizer function counts the accumulated number of pulses (momentary contact closures) occurring at the contact input for a channel which you have programmed for Totalizer operation. This function is typically used to accumulate the pulse output of rotary flow meters.

An alarm set-point may be programmed to create an alarm call upon reaching a particular total value. Scale and offset factors are programmable, and user-recorded messages may be used.

Any contact input channel may be programmed for the Totalizer function, up to a total of 8 Totalizers. The input pulse rate must not exceed 100 pulses per second, and if the rate is over 50 pulses per second, the pulses must have a 50% duty cycle.

◆ To program channel ZZ for Totalizer operation, press:

5 ZZ 7 ENTER.

Note:
  This function must be done to Activate the Totalizer. It is only possible to program up to 8 contact input channels for Pulse Totalizer. However, any 8 inputs may be used from the full set of contact inputs in your unit.

◆ To establish a non-zero starting value for the spoken reading, add the desired starting spoken value after the 7 and before ENTER.

◆ To establish a scale factor (so that a number of pulses will be translated into a single spoken unit count), press:

`5 ZZ 8 N ENTER`

where N is the number of pulses corresponding to a single spoken unit count. For example, if a pulse from a flow meter occurs for each 1/10 gallon of water flow, but the desired report is needs to be in thousands of gallons, a value of 10,000 would be used for N. The unit uses the word "percent" in speaking of the scale factor.

The spoken scaled value will "roll over" to zero upon reaching 4,294,967,294 (2^{32}). Values above this should not be entered at the keyboard.

The default message for Totalizer channels is "Channel N Totalizer count is N." User-recorded messages are normally done in two segments. Use program code 1 ZZ to record a preamble message such as "The total water flow reading is". Use program code 2 ZZ to record an ending units-of-measure message such as "thousand gallons". During the report, the unit will insert the digits comprising the actual scaled value. In this example, the resulting complete report would be "The total water flow reading is (spoken value) thousand gallons".

◆ To establish a Totalizer alarm set-point, press:

`5 ZZ 6 N ENTER.`

When the scaled value reaches N, the unit will go into Unacknowledged Alarm and begin dialing. After the initial alarm has occured, a new alarm will not occur until the user has reset the criteria. You may program a value of zero for N to cancel any previously programmed Totalizer alarm set-point for channel ZZ.

◆ To clear out all Totalizer readings to zero in one step, press:

`9 3 5 6 ENTER.`

6.2.6   Alarm Trip Delays

The Alarm Trip Delay is the length of time after a violation occurs before the unit goes into Unacknowledged Alarm and begins dialing. The default value is 2 seconds for all inputs and 0.1 minute (6 seconds) for power failure. During this time, if a status is read, the message will be the ALARM message, with the extra word "alert" appended. If the violation is corrected before the Alarm Trip Delay times out, no alarm or dialout will occur.

There are two ways to change this Alarm Trip Delay: global (common for all channels except power failure) programming, and individual programming for each channel and power failure.

◆ To program a new global Alarm Trip Delay, press:

`9 0 2 V ENTER`

where V is a value consisting of 1 to 4 digits, between .1 and 9999.9 seconds. For example, possible entries include .1, 5, 5.1, and 600.1 (seconds).

◆ If you wish to program a new Alarm Trip Delay for an individual ZZ channel, press:

`6 ZZ V ENTER`

◆ To set a different Power Failure Trip Delay, press:

`6 00 V ENTER` (code 920 does the same thing)

◆ To turn off the Power Failure Alarm function, press:

`9 2 1 0 ENTER`

◆ To turn on the Power Failure Alarm function, press:

`9 2 1 1 ENTER`

Note:

The global code 902 overrides any previously set individual channel Alarm Trip Delays. Therefore, if you wish to establish a different global Alarm Delay and also program selected inputs for still different individual trip delays, perform the global programming first, and then any individual trip delay programming.

The default trip delay is 2 seconds for the contact channels and 6 seconds (.1 hour) for power failure. If you are getting a lot of "nuisance" alarms, with a call saying, "alarm now normal," you might think about setting the alarm trip delay up a bit. A good example of this would be the power fail trip delay. In some areas of the country, it is very common to have short periods of power failure -- ten seconds or less. These may not be of particular concern, so setting the power fail trip delay to .2 or .3 hours could save unnecessary phone calls.

Caution:

When leaving program mode all timers for unacknowledged alarms and violations will be reset.

6.2.7   Phone Numbers and Pulse/Tone Dialing

Also see the section 6.2.13, "Alarm Call Grouping," and Section 3.1, "Starting Up and Clearing the Unit."

Note:

DN is the 2-digit Designation Number: 01 for the first phone number, 02 for the second number, up to 16 for the 16th phone number.

Refer to Programming Worksheet A. Write down each phone number you wish to program, along with a person's name, for future reference.

◆ To program the first phone number to be dialed on alarm, press:

    `7 01 (then the complete phone number) ENTER.`

◆ To program the second phone number to be dialed on alarm:

    Use code 7 02 in place of 7 01, progressing to a maximum of code 7 16 for a 16th phone number.

Each phone number may be up to 60 digits in length. Be sure to include any necessary area codes or "1" prefixes.

◆ To erase phone number DN, press:

    `7 DN POINT ENTER.`

◆ If you need Touch Tone dialing, press:

    `9 01 1 ENTER.`

◆ For high speed dialing, press:

    `9 01 2 ENTER.`

Caution:

"High speed dialing" may not work reliably with some older telephone company exchanges.

◆ To switch back to pulse dialing, press:

    `9 01 0 ENTER`

◆ To insert delays between dialed digits (e.g. after a leading "9" in PBX systems), in the programming process, press the MINUS key once for each one-second delay desired. To extend the length of each delay beyond 1 second, press:

    `9 28 N ENTER`

where N is the number of seconds of delay desired for each delay invoked with the MINUS key.

6.2.8   Enhanced Telephone Interface Features

The Enhanced Telephone Interface features give the user additional power to solve unusual telephone system interface problems and to provide more reliable and efficient notification of alarms.

The Enhanced Telephone Interface Features include the following functions:

◆ 60 Digit Phone Numbers

- For all 16 telephone numbers and the call-back number.

◆ Telephone Line Fault Detection (Phone Fault)

- Tests phone line at regular programmed interval
- Flashes TFAIL LED on dialer front panel upon failure
- Logs Phone Faults and phone line restoration to Local Printer

◆ Automatic Selection of Tone versus Pulse Dialing

- Tests for tone capability upon first power up without user intervention
- May be overridden for PBXs with "non-standard" dialtones

◆ Call Progress Monitoring (CPM)

- Detects busy and ringing signals
- Waits until phone is answered to annunciate voice reports
- Abandons call if busy or no answer and quickly tries next number

◆ Numeric Pager Support

- Designate Pager only numbers - no voice annunciation
- Insert pager system terminator characters such as '#' or '*'
- Insert DTMF A, B, C & D tones in phone number strings for unique IDs

◆ PBX Support

- Ignore "non-standard" PBX dialtones
- Insert "wait for outside line" dialtone into phone number strings

The Enhanced Telephone Interface Features are included on Verbatims with a mainboard Revision of VMP-5a and above and firmware revisions 2.09 and above ONLY.

Contact your RACO Representative about upgrading if the Enchanced Telephone Interface is required.

6.2.9 | 60 Digit Phone Numbers

Telephone numbers may be as long as 60 digits. This allows, for instance, the Verbatim autodialer to make calls using long distance companies which require entry of access codes. Even with many digits occupied by long distance numbers and access codes there will still be sufficient digits remaining for calls to pager systems requiring complex sequences of terminators, ID numbers, time delays, tone detects, etc.

6.2.10 | Telephone Line Fault Detection (Phone Fault)

The Phone Fault Detection feature tests the telephone line whenever the unit needs to make a phone call and at a regular programmable time interval (as long as there are phone numbers programmed).

Phone Fault is turned ON by default but may be disabled if so desired. Also, the Phone Fault Detection interval is user programmable.

Phone Fault shares a user code with the Automatic Tone/Pulse Selection capability. The basic user command is code 917. Entering code 917 with no parameter will cause a recitation of the current settings for Phone Fault and Automatic Tone/Pulse Selection.

The following parameters may be entered:

◆ Turns OFF BOTH Phone Fault Detect and Auto. Tone/Pulse Select

9 1 7 0

◆ Turns ON Phone Fault Detect, turns OFF Auto. Tone/Pulse Select

9 1 7 1

◆ Turns OFF phone fault detect, turns ON Auto. Tone/Pulse Select

9 1 7 2

◆ Turns ON BOTH Phone Fault Detect and Auto. Tone/Pulse Select (default)

9 1 7 3

Note:

The factory default setting for code 917 is parameter 3, BOTH Phone Fault Detect and Auto. Tone/Pulse Select ON.

The command code 916 is used to set the Automatic Phone Fault Detection interval. This time interval can range from 0.1 hour to 24 hours. The factory default setting is 24 hours. Enter the command 916 followed by a value from 0.1 to 24.0 to program the Phone Fault Detection interval.

◆ For example, to set the Phone Fault Detection interval to 0.3 hour., enter:
```
916 0.3
```

Whenever a Phone Fault is first detected, a Local Data Logger (LDL) message will be sent to the printer with date and time stamp. Additionally, the Phone Fault LED, labeled TFAIL, will begin to blink.

If a Phone Fault is detected at the beginning of an outgoing phone call the TFAIL LED will flash and the unit will return to the NORMAL state. Then, while still in the NORMAL state, the unit will continually check the telephone line every 30 seconds for restoration of the telephone service.

When telephone service is restored, a message will be sent to the Local Data Logger's printer and the TFAIL LED will go from flashing to solid ON. The Verbatim autodialer will then resume making any pending phone calls. The TFAIL LED will remain ON until a voice message about the Phone Fault is communicated via the phone or to an operator at the front panel by pressing the CHECK STATUS button. The TFAIL LED and pending voice annunciation of the Phone Fault condition may also be cleared at the front panel by pressing the DISARM/RE-ARM button twice.

No Phone Fault Detection will be performed if there are no phone numbers programmed. If the unit needs to make an alarm call when there is a Phone Fault the numbered channel LEDs will blink continuously even though the unit is in the NORMAL state. This unusual condition will only be seen while there is a Phone Fault and the unit is constantly testing for the return of telephone service.

6.2.11   Automatic Tone/Pulse Selection

When Automatic Tone/Pulse Selection is ON the Verbatim autodialer will test for the ability to use tone dialing. This test will be performed only once, one minute after the unit is powered on or is reset. Automatic Tone/Pulse Selection enables the installer to not be concerned about whether the telephone line supports tone dialing.

Automatic Tone/Pulse Selection shares a user code with Phone Fault Detection. The basic user command is code 917. Entering code 917 with no parameter will cause a recitation of the current settings for Phone Fault and Automatic Tone/ Pulse Selection. The following parameters may be entered:

◆ Turns OFF BOTH Phone Fault Detect and Auto. Tone/Pulse Select
```
9 1 7 0
```

◆ Turns ON Phone Fault Detect, turns OFF Auto. Tone/Pulse Select
```
9 1 7 1
```

◆ Turns OFF phone fault detect, turns ON Auto. Tone/Pulse Select

   9 1 7 2

◆ Turns ON BOTH Phone Fault Detect and Auto. Tone/Pulse Select (default)

   9 1 7 3

Note:

The factory default setting for code 917 is parameter 3, BOTH Phone Fault Detect and Auto. Tone/Pulse Select ON.

Setting Automatic Tone/Pulse Selection ON when it was previously OFF will cause the Verbatim autodialer to perform the test for Tone/Pulse Selection even though it has been longer than one minute since the unit was last powered on or reset.

After powering the unit on, Automatic Tone/Pulse Selection may be temporarily suspended by any front panel activity. Automatic Tone/Pulse Selection will then be resumed one minute after the front panel activity has ceased.

No Tone/Pulse Selection will be done while the unit is being programmed over the phone or if there are not phone numbers programmed.

6.2.12 Call Progress Monitoring (CPM)

Call Progress Monitoring (CPM) operates by listening for the presence or absence of busy and ringing signals. These are the same signals you hear after you dial a phone number. Proper operation of CPM requires that the busy and ringing signals are composed of standard Call Progress frequencies.

The possibility exists that CPM may not function properly because the CPM tones on a particular phone system are not standard.

Unlike other equipment with Call Progress Monitoring, CPM on the Verbatim autodialer does not include detection for the dial tone at the beginning of the dialout session. However, dialtone detection is an integral part of Phone Fault Detection. This allows CPM to be operational even when the Verbatim autodialer is installed inside of a PBX phone system which has a non-standard dialtone.

CPM is intended to detect the following phone line states:

● phone line is busy - both subscriber and trunk busy signals are detected
● non-existent phone number
● phone unanswered - still ringing
● phone answered - ringing stopped

When CPM determines that a call is not complete, an appropriate report will be sent to the local printer.

Reasons for a non-completed call:

- CPM determines the line is busy
- CPM does not detect cessation of ringing before end of programmed CPM ring count
- CPM does not detect either busy signal or valid ring signals

Reason for a completed Call:

- CPM detects at least one ring followed by cessation of ringing

If a call is not completed, the Verbatim autodialer will disconnect the call and enter the intercall delay state. At the end of the intercall delay, the next programmed telephone number will be dialed.

When a call is not completed, the intercall delay will always be shortened to 30 seconds. This CPM altered intercall delay is fixed at 30 seconds and is not affected by the user-programmed intercall delay. The normal programmable intercall delay will apply only to the delay between completed calls.

Call Progress Monitoring for firmaware version 2.09 is set to ON by factory default. If CPM is OFF the Verbatim will deliver voice messages without regard to any ringing or busy signals. This unit will simply dial the number, then after a short delay, start annunciating voice reports.

As noted above, dialtone detection is actually a part of the Phone Fault Detection feature. It is possible to have CPM turned OFF and Phone Fault Detect turned ON. In this case, the unit will test for a dialtone but not for busy or ringing signals.

Use code 900 to read or set CPM programming. Use code 900 followed by a 1 or 0 parameter to program CPM ON (1) or OFF (0).

The CPM ring count is the number of rings Verbatim autodialer will wait for an answer before considering the call to be incomplete. Use code 918 to read or set the number of CPM rings. The factory default is 10 rings and the user may program any number of rings from 5 to 20.

- For example, to program the CPM ring count to 10 rings, enter:

  ```
  918 10 then ENTER
  ```

6.2.13 | Alarm Call Grouping

This is a programming step that "links" selected channels to selected dialout phone numbers, so that when a given channel goes into alarm, only the phone numbers "linked" to that channel will be dialed. Ordinarily, an alarm on any channel will cause dialing of the entire list of phone numbers.

Alarm Call Grouping is typically done when certain channels are associated with a specific category of personnel, such as electrical, plumbing, security, etc. However, Power Failure to the Verbatim autodialer causes dialing of all phone numbers. If you need to limit Power Failure alarm calls to selected numbers:

1. Turn off the regular Power Failure alarm function using code 9 2 1 0, (described below)

2. Then connect an unused input channel for power failure monitoring, using the contacts of a relay.

To program for Alarm Call Grouping:

1. Enter your phone number. It is important to first write in your entire list of phone numbers on Programming Worksheet A in Appendix J.

Note:

There is a 2-digit "Designation Number" on the Worksheet associated with each phone number (01 for the first number, etc.). This number corresponds with the 3-digit program code for entering phone numbers (701 for the first number, etc.).

2. Group them by using code 5 ZZ 9 DN. Begin by filling in Programming Worksheet B in Appendix J.

   Refer to the filled-in examples for guidance. The right-hand column will now contain the actual program code strings which you should now enter, terminating each string entry with the ENTER key.

   For example, to link channel 1 to the second and fifth phone numbers, following the filled-in example, you would press:

   5 01 9 02 05 ENTER

3. Phone numbers will always be dialed in ascending order of the 2-digit Designation Numbers, regardless of their order in your program code entry. Note that an alarm on any channel that is not "linked" with a program code entry will cause dialing of the entire list of phone numbers.

   ◆ To read the linkage programming on channel ZZ, press:

      5 ZZ 9 ENTER

◆ To "un-link" channel ZZ so that it again calls all phone numbers, press:

```
5 ZZ 9 POINT ENTER
```

◆ To undo all existing linkage on all channels, press:

```
9 35 2 ENTER
```

6.2.14   Alarm Ready Scheduling

Refer to Section 7, "Using the Alarm Ready Schedule Feature," for use and application information. See also Appendix E , "Data Acquisition/Central Data Logging."

6.2.15   Local Data Logging Programming Codes

Refer to Chapter 2, "Installation," for use and application information.

6.2.16   Analog Input Programming

Refer to Appendices B, C and D, "Analog Signal Input," "Remote Supervisory Control Output," and "Printer Options," for use and application information.

6.2.17   Remote Supervisory Control

Refer to Appendices B, C and D, "Analog Signal Input," "Remote Supervisory Control Output," and "Printer Options," for use and application information. See also Appendix E, "Data Acquisition/Central Data Logging."

6.2.18   Data Acquisition/Central Data Logging

Refer to Appendix E, "Data Acquisition/Central Data Logging."

6.2.19   Miscellaneous Programming Tips

(903) Time Between Alarm Call Outs

This is the length of time after ending one alarm call-out and before beginning the next call-out. Default value is 2 minutes; range is 0.1 to 99.9 minutes.

◆ To program a different number of minutes V, press:

```
9 03 V ENTER
```

(904, 922) Alarm Reset Time

This is the length of time after acknowledgment before a given channel (or Power Failure) is automatically reset to a clear condition, ready to act on a new alarm condition. Refer to the diagram "Anatomy of an Alarm" in Section 5, "Using Your Verbatim Autodialer," for a depiction of the various events involved in association with the Alarm Reset Time. Default value is 1 hour; range is 0.1 to 99.9 hours.

◆ To program a different number of hours V, press:

    9 04 V ENTER

◆ To turn the Alarm Reset Timer function off, press:

    9 22 0 ENTER

Caution:

You should not turn the alarm reset timer function off under normal circumstances because once a given channel's alarm has been acknowledged, it would never again cause an alarm call out.

◆ To turn the Alarm Reset Timer function on again, press:

    9 22 1 ENTER

(905) Clear All Acknowledged Alarms and Alarm Reset Timers

Especially during setup and testing, it is useful to be able to re-trip an alarm after it has previously been tripped and acknowledged, without having to wait for the Alarm Reset Time to expire.

◆ To perform this clear out, press:

    9 0 5 ENTER

At the panel, the same result may be more easily obtained by pressing DISARM/RE-ARM to disarm the unit, then pressing it again to rearm the unit.

(906) Ring Answer Delay

Represents the number of rings required when calling the Verbatim unit, before the unit will answer. A long ring delay might be programmed if you wish personnel to have the opportunity to answer a regular telephone on the same line, before the Verbatim autodialer would answer. Default value is 1 ring; range is 1 to 20 rings.

◆ To program a different number of rings N, press:

    9 06 N ENTER

(907) Number of Alarm Message Repeats

Represents the total number of times each message or set of messages is spoken during each alarm call out. Normally a value of 3 repeats (strictly speaking, the alarm message plus 2 repeats) should be programmed. The reason for this is that there needs to be adequate message recital time to allow adequate time to answer the phone call and hear at least one complete set of messages. Default value is 3 repeats; range is 1 to 20 repeats.

◆ To program a different number of repeats N, press:

   9 07 N ENTER

(908) Autocall Test Function

The Autocall Test Function causes the unit to place test calls at regular intervals for the purpose of ongoing verification of Verbatim autodialer and phone line functioning. Calls are placed only once for each interval, to each regular phone number programmed (7 01 through 7 16). The exception being the acknowledgement of a test call, where additional calls will not be placed for that time interval. Each call gives the station ID message and a statement that this is a test call, plus a report of all inputs.

◆ To turn this function on, press:

   9 08 1 ENTER

◆ To turn it off, press:

   9 08 0 ENTER

The first series of calls begins as soon as the Autocall Test Function is turned on. Therefore, if you want the unit to call at 5 PM each day, you will need to turn this function on at that time. The default interval is 24 hours; range is 0.1 to 99.9 hours.

◆ To program a different interval V, press:

   9 09 V ENTER

Note:

If the Verbatim autodialer is in the disarmed mode, call-outs/autocalls will not be made.

(910) Security Access Code

Once you establish a Security Access Code, unauthorized personnel are prevented from altering your programming or messages over the phone without first entering the Access Code. This does not affect programming access at the panel.

◆ To establish an Access Code N of up to 8 digits, press:

   9 10 N ENTER (at the panel)

Once established, whenever you press a Command Tone 1 at the prompting beep, the unit first prompts you to enter the Access Code before allowing you to perform programming or message recording operations. You may still read existing programming without using the Access Code by pressing a Command Tone 2 at the prompting beep. However, the Access Code itself cannot be read over the phone.

◆ To delete the Security Access Code so that no code is required in order to perform over the phone programming, press:

   `9 1 0 POINT ENTER (at the panel)` **ONLY**

(921, 930) Power Failure Alarm Function ON/OFF; DISARM/RE-ARM All Alarms

◆ To turn off the Power Failure Alarm function, press:

   `9 21 0 ENTER`

◆ To turn the Power Failure Alarm function on again, press:

   `9 21 1 ENTER`

◆ To disarm the unit, preventing any alarm call outs, press:

   `9 30 0 ENTER`

◆ To rearm the unit, press:

   `9 30 1 ENTER`

At the front panel, the same result is more easily obtained by using the DISARM/RE-ARM key.

(700, 924) Callback/Callforward

This feature causes the unit to dial a special "zeroth" phone number on command. This is typically initiated over the phone, causing the unit to call back to the person who invoked the command, in order to verify the ability of the unit to successfully dial out. The unit gives a status report of all channels as part of this call.

◆ To program this special callback number, press:

   `7 00 (then the complete phone number) ENTER`

◆ To initiate the actual dialing, press:

   `9 2 4 ENTER`

If you have executed this command over the phone, the unit will advise you that it will be calling the callback number in 15 seconds. Then it will end the current call in preparation for placing the callback call. If you have executed this command at the front panel, the dialing will occur immediately.

Note:

If the Verbatim autodialer is in the disarmed mode, call-outs/autocalls will not be made.

(926) Delay Before Return to Normal (Exit Delay)

Sometimes it is desirable to prepare the unit for the ability to detect violations and dial out, but with an "exit delay" that allows the user time to exit or remove temporarily existing alarm violations before the unit becomes active.

To set delay before Return to Normal:

1. Press:

   9 26 V ENTER

   where V is the desired delay in minutes (range 1.0 to 99.9 minutes).

2. Then press DISARM/RE-ARM if necessary to extinguish the flashing DISARMED legend light. However, do not press NORMAL, but instead leave the unit in PROGRAM mode, with the PROGRAM light illuminated. The unit cannot go into alarm while in PROGRAM mode.

When the delay period times out, the unit will automatically return to NORMAL mode and will then be ready to act on any alarm violations that occur after that time. This code must be re-entered each time you wish an exit delay, since the delay value automatically returns to the default value of 2 minutes upon timeout.

The 2 minute default value provides protection against the possibility that someone might walk away leaving the unit in PROGRAM mode, or perhaps hang up the phone after performing over-the-phone programming without properly ending the call.

(932, 933, 934) Microphone and Speaker Operation

If you enable the front panel microphone using program code 933 as described below, the microphone will be automatically activated for a 15 second listening period at the end of each alarm or inquiry call, allowing you to hear the sounds near the unit from a remote telephone.

An additional warble tone is issued at the end of this listening period, allowing you to postpone tone acknowledgment until after the listening period.

◆ To turn this function on, press:

   9 33 1 ENTER

◆ To turn this function off, press:

   9 33 0 ENTER

If you have turned the microphone on, as above, then during any phone call, you may also invoke a one-time listening period by entering Remote Program Mode (press 1 at the warble tone) and then entering 9 3 2 # #.

◆ To turn off the speaker so that neither alarm call or inquiry call activity is heard at the unit, press:

```
9 34 0 ENTER
```

The speaker will still be heard when operating keys at the front panel.

◆ To turn the speaker on again, press:

```
9 34 1 ENTER
```

Note:

The speaker volume may be adjusted via the trimpot marked SPKR VOL shown on the Electrical Connection Diagram. See Section A.1, "Adjusting Internal Speaker Volume.

6.2.20   Program Clear Out Operations

The following list of program codes provides a flexible variety of operations to conveniently clear selected programming items in order to allow for a fresh start.

Code	Function
935 0	Clears out phone numbers; sets all delays to default.
935 1	Clears out phone numbers only.
935 2	Clears out all alarm call grouping linkage.
935 3	Sets the following delays to their factory default values: 902, 903, 904, 920, 921, 926, 928 (921 sets power failure alarm ON)
935 4	Clears all user recorded messages.
935 5	Clears all programming except messages. (Does not clear 913, 930, 941, and 942)
935 6	Clears all Totalizer counts to zero.
935 7	Clears and initializes clock.
935 9	Total clear out (Does not clear 941 and 942).

Caution:

Code 9 35 9 erases all programming and messages.

6.2.21 (940) Diagnostic Readouts

To assist in analyzing the way the unit is operating, the following list of diagnostic count codes is provided.

Code	Function
940	Reads all 4 diagnostic counts (add 0 to clear all 4)
940 1	Reads Call In Count (add 0 to clear)
940 2	Reads Dial Out Count (add 0 to clear)
940 3	Reads Acknowledged Alarm Count (add 0 to clear)
940 4	Reads Power Failure Alarm Count (add 0 to clear)
940 0	To Clear all Counts

7 | Using the Alarm Ready Schedule Feature

7.1 Definition

An Alarm Ready Schedule is defined as an interval of time during which the Verbatim autodialer is ARMED and "Ready" to respond to alarm conditions. Alarm Ready Schedules can be automatically started according to times and dates entered by the operator. An Alarm Ready Schedule commences with the Verbatim autodialer becoming REARMED. (If the Verbatim autodialer was previously not DISARMED then the schedule will still be commenced at that time.) Once the Alarm Ready Schedule has commenced the Verbatim autodialer will continue in an ARMED state until the end of the Alarm Ready Schedule, at which time the Verbatim autodialer will be automatically DISARMED. Once an Alarm Ready Schedule has commenced it is said to be "active."

There are three steps to programming for Alarm Ready Scheduling:

◆ Date and time setting

◆ Enter alarm start and stop times

◆ Enable the Alarm Ready Scheduling feature using code `966 N`.

7.2 General Descriptions

Alarm Ready Schedules can be viewed as really nothing more than an automated way of pressing the REARM/DISARM button. Therefore, if an alarm occurs while the Verbatim autodialer is DISARMED, no dial-outs will be made and the alarm will be automatically acknowledged. Correspondingly, if there is an acknowledged alarm when the Verbatim autodialer becomes REARMED and the input violation is still present then the Verbatim autodialer will begin calling after the trip delay has elapsed.

If the Verbatim autodialer is doing a sequence of alarm calls or Autocall calls at the time when an Alarm Ready Schedule should change the Verbatim autodialer's REARM/DISARM state the change will be delayed until after the end of the calling sequence.

Alarm Ready Schedules can be temporarily overridden by the operator pressing the REARM/DISARM button. However, if the REARM/DISARM button is pressed during an active Alarm Ready Schedule the schedule still remains active. If the operator DISARMs the Verbatim autodialer in the middle of an Alarm Ready Schedule the schedule will actually continue to it's ending time. It will then deactivate itself and attempt to DISARM the Verbatim autodialer just as if the Verbatim autodialer was still ARMED. If the operator DISARMs the Verbatim autodialer in the middle of an active Alarm Ready Schedule, then REARMs the Verbatim autodialer once again before the end of the Alarm Ready Schedule the schedule will remain active until its ending time. The schedule will then be deactivated and the Verbatim autodialer will be DISARMED.

Weekday Timer

```
                    00:00
        21:00                 03:00

    18:00                         06:00

RE-ARMED - 17:00

                                08:00 - DISARMED
        15:00                 09:00
                    12:00
```

▦ ARMED PERIOD

Weekend Timer

```
                    SUN
        SAT                   MON
                            MONDAY
FRIDAY                        08:00
 17:00                      DISARMED
RE-ARMED

    FRI                         TUE

        THU                   WED
```

Holiday Timer is Linear

July 6, 1993
08:00
DISARMED

Current Date/Time

JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP

1993

July 2, 1993
17:00
RE-ARMED
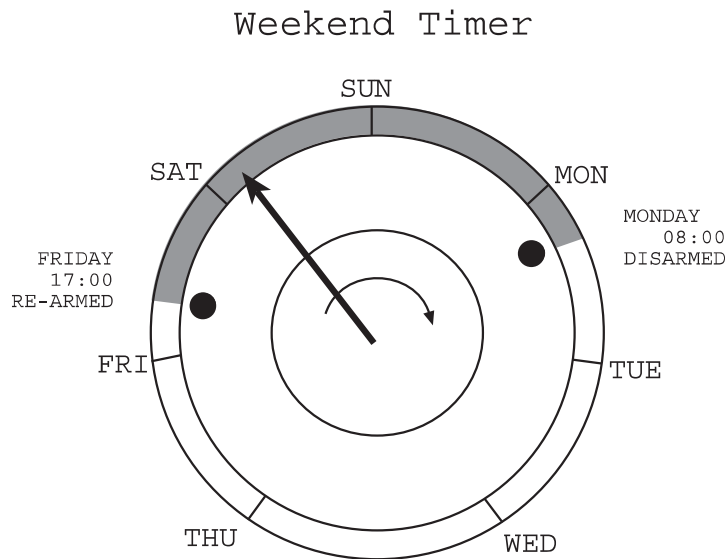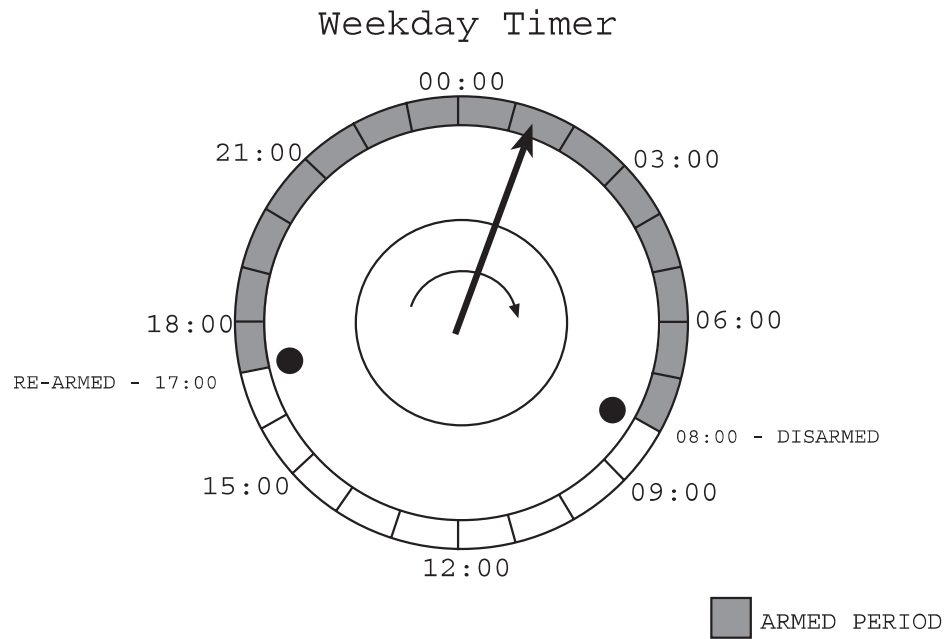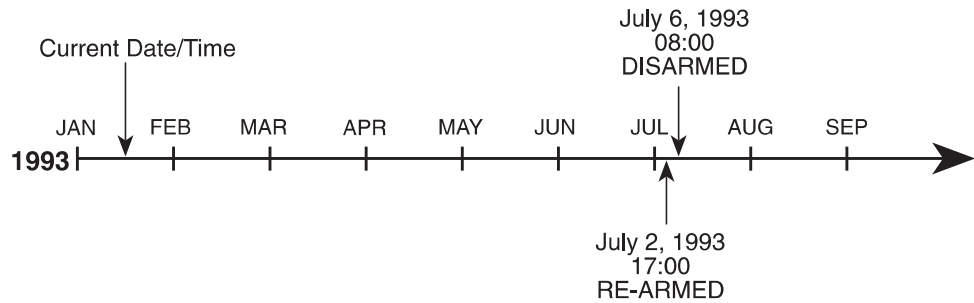
7.3 Alarm Ready Schedule Modes

There are three possible Alarm Ready Schedules modes: Weekday, Weekend & Holiday. Any combination of these three possible schedules may be enabled at one time, however, the Verbatim may only become REARMED or DISARMED by one mode at a time.   See Section 7.7, "Alarm Ready Schedule Priorities." For example, you may have both weekday & weekend schedules enabled at the same time or you may have all three enabled at the same time. When the Verbatim becomes DISARMED or REARMED by an Alarm Ready Schedule it will verbally announce which mode caused the REARM/DISARM action. The Alarm Ready Schedule modes are as follows:

Mode	Schedule
Mode 1	Weekday Schedule
Mode 2	Weekend Schedule
Mode 3	Holiday Schedule

For example, if there was a weekday schedule enabled to REARM the Verbatim at 1700 daily, when the weekday schedule became active the Verbatim would say, "REARMED for mode 1". Also, when there is a local printer connected to the Verbatim , the mode of the Alarm Ready Schedule causing the REARM/ DISARM (WEEKDAY, WEEKEND, or HOLIDAY) will be printed along with the current time.

7.4   Weekday Schedule Mode 1

The weekday schedule will REARM the Verbatim autodialer daily at the programmed weekday REARM time and DISARM the Verbatim autodialer daily at the programmed DISARM time. If no weekend schedule is enabled (via the Alarm Ready Control Number settings) then the weekday schedule applies everyday, Monday through Sunday. As noted below, the weekend schedule is overridden by the weekend and holiday schedules.

7.5   Weekend Schedule Mode 2

If programmed, the weekend schedule operates once a week. The weekend schedule is set by factory default to be Friday through Monday. If the defaults are used the Verbatim autodialer could be REARMED every Friday afternoon at 1700 and DISARMED again every Monday morning at 0800. The weekend schedule could be changed from the defaults, for example, so that the Verbatim autodialer would be REARMED on Saturday and DISARMED on Monday (for organizations with 6 day work-weeks).

When the weekend schedule is enabled the weekday schedule will be overridden. In other words, there would be no DISARMING of the unit at 0800 Saturday morning.

By default, the weekend REARM/DISARM times are set to be the same as the weekday REARM/DISARM times. However, non-default weekend REARM/DISARM times may be entered if the operator so chooses.

Therefore, if personnel regularly leave early on Fridays then the REARM time could be set to 1500 instead of the usual 1700.

7.6   Holiday Schedule Mode 3

The Holiday schedule is a one-shot, non-recurring schedule which overrides all of the other schedules.

The Holiday schedule will be set by factory default to some Holiday period in the past (such as last Christmas).

Note:

For the Holiday schedule only, the exact date is entered including the year. Once, the Holiday schedule has been run it is complete and finished until a new schedule, for some date in the future, is entered.

To use the Holiday Alarm Ready Schedule, the operator must enter the REARM date (month/date/year) and DISARM date (month/date/year).

For the time-of-day, the Holiday Alarm Ready Schedule always uses the Weekend REARM/DISARM times.

7.7   Alarm Ready Schedule Priorities

There is a priority among the Alarm Ready Schedules. The Holiday Alarm Ready Schedule has the highest priority, then comes the weekend schedule and finally the weekday schedule.

If all three Alarm Ready Schedules are to be active, a Holiday schedule will always start at it's scheduled time & date regardless of the state of the other schedules. When the Holiday schedule is over then the other schedules will resume.

Likewise, the Weekend Alarm Ready Schedule has priority over the Weekday Alarm Ready Schedule. The weekend schedule will always start at its programmed day-of-week and time regardless of the state of the weekday schedule. When the weekend schedule is over then the weekday schedule will resume.

7.8   Programming Alarm Ready Schedule Parameters

The following section explains the Verbatim autodialer codes to be used for programming Alarm Ready Schedules and the Alarm Ready Schedule Control Numbers. Alarm Ready Schedule parameters may be entered either at the front panel or over the phone.

There are some restrictions which must be remembered when entering DISARM/REARM times and ALARM READY SCHEDULE CONTROL NUMBERS.

1. When entering new schedule times, the REARM time must be later than the time the operator is programming the schedule. However, it may not be possible to "jump" into a schedule when exiting the programming mode. For example, if the current time is 1700 hours and the operator enters a weekday schedule to REARM daily at 1630 and DISARM daily at 0730, this new schedule would not start until the following day at 1630 hours.

    Conversely, assume that the current time is 1700 hours and that the operator goes into PROGRAM mode and enters a new weekday schedule to REARM at 1705 and DISARM at 0800. At this time, the operator can either return to NORMAL mode or continue in PROGRAM mode and do other programming. Even though it may be after 1705 when finally returning to the NORMAL mode, the weekday schedule will still begin (or have begun) at 1705 hours.

2. You cannot enter any holiday date values which will cause the holiday REARM or DISARM date and time to be earlier than the current date and time. As explained below, the holiday schedule uses the weekend times for the time-of-day of the holiday REARM and DISARM.

3. It's useful to understand that the Verbatim autodialer's internal count-down timers used for REARM/DISARM times are re-calculated as a result of the operator making certain Alarm Ready Schedule programming changes. Anytime a new REARM or DISARM date/time is entered, a calculation is made to determine the next REARM and DISARM for that particular schedule.

    Also, when the ALARM READY SCHEDULE CONTROL NUMBER is changed all REARM and DISARM date/times are re-calculated. Further, whenever the current date or time is set or changed by the operator, all REARM and DISARM date/times will be re-calculated.

7.9   Starting the Real-Time Clock Chip, Time and Date Setting

Use Program Code 935 7 ENTER to start the real time clock chip. This needs to be done only once at the time of the installation of the chip.

Time and date may be set or corrected with the following programming code entries:

◆ To check the date:

    941 ENTER

◆ To set the date:

    941 MM DD YY D ENTER

MM is the month (03 for March); DD is the date (07 for the 7th day of the month); YY is the year (89 for 1989); and D is the day of the week (1 for Sunday; 2 for Monday, etc.). Entry of D is optional.

◆ To check the time:

    942 ENTER

◆ To set the time:

    942 HH MM SS ENTER

HH are the hours in military time (13 for 1 PM); MM are the MM (09 for 9 minutes); and SS are the seconds. Entry of SS is optional.

◆ To clear the time and date back to 00:00:00 on 01/01/89:

    935 7 ENTER

7.10 Setting Alarm Start & Stop Times

CODE 961

READ WEEKDAY REARM & DISARM TIME (defaults: 1700 & 0800) Press 9 6 1 then ENTER to hear the Weekday REARM & DISARM times recited. Times will not be altered and new REARM & DISARM values will not be calculated.

SET WEEKDAY REARM & DISARM TIME Press 9 6 1 plus REARM & DISARM time. For example, 961 1600 0700 then ENTER to set REARM time to 1600 (4:00 P.M.) & DISARM time to 0700 (7:00 A.M.) The user is allowed to enter just the REARM time, i.e.; 961 1600 (enter). But, if the user wants to change the DISARM time then both the REARM & DISARM times must be entered.

CODE 962

READ WEEKEND REARM & DISARM TIME (defaults: 1700 & 0800) Press 9 6 2 then (enter) to hear the Weekend REARM & DISARM times recited. Times will not be altered and new REARM & DISARM values will not be calculated.

SET WEEKEND REARM & DISARM TIME Press 9 6 2 plus REARM & DISARM time then ENTER, for example, 962 1500 0700 then ENTER to set REARM time to 3:00 P.M. & DISARM time to 7:00 A.M. The user is allowed to enter just the REARM time, i.e.; 962 1500 ENTER. But, if the user wants to change the DISARM time, then both the REARM & DISARM times must be entered.

CODE 963:

READ WEEKEND REARM & DISARM DAY-OF-WEEK (defaults: Fri. & Mon.) - Press 9 6 3 then ENTER to hear the Weekend REARM & DISARM day-of-week (d-o-w) recited as a number from 1 to 7. Note: Sunday = 1, Monday = 2, etc. Day-of-week will not be altered and new REARM & DISARM values will not be calculated.

SET WEEKEND REARM & DISARM DAY-OF-WEEK Press 9 6 3 plus REARM & DISARM d-o-w then ENTER. For example, 963 6 1 then ENTER to set the weekend REARM day-of-week to Friday & REARM day-of-week to Sunday. The user is allowed to change only the REARM d-o-w if so desired, e.g.; 963 7 ENTER to set the REARM d-o-w to Saturday. But, if the user wants to change the DISARM d-o-w then both the REARM d-o-w & DISARM d-o-w must be entered.

CODE 964:

> **READ HOLIDAY REARM DATE** (default: 12/24/95) Press 9 6 4 then ENTER to hear the Holiday REARM date recited. The Holiday REARM will not be altered.
>
> **SET HOLIDAY REARM DATE** Press 9 6 4 plus REARM date. For example, enter 964 12 24 95 ENTER to set holiday REARM date to December 24, 1995. The new REARM date can not be before today's date.

Note:

The day-of-week date cannot be entered for a Holiday schedule.

CODE 965:

> **READ HOLIDAY DISARM DATE** (default: 12/26/95) Press 9 6 5 then ENTER to hear the Holiday DISARM date recited. The Holiday DISARM will not be altered.
>
> **SET HOLIDAY DISARM DATE** Press 9 6 5 plus REARM date. For Example, enter 965 12 26 95 ENTER to set holiday DISARM date to December 26, 1995. The new DISARM date can not be before today's date.

Note:

The day-of-week date cannot be entered for a Holiday schedule.

7.11 Enabling the Alarm Ready Schedule Feature

CODE 966

> **READ ALARM READY SCHEDULE CONTROL NUMBER** (default: 0) Press 9 6 6 then (enter) to hear the Alarm Ready Schedule Control Number recited. The Control number will not be altered and new REARM & DISARM values will not be calculated.
>
> **ALARM READY SCHEDULE CONTROL NUMBER HAS THE FOLLOWING MEANING**:
>
> 0   OFF No Alarm Ready Schedules executed. Also used to reset all active Alarm Ready Schedules.
>
> 1   Only the Weekday Alarm Ready Schedule will be active. (Daily: Monday-Sunday) Default: REARMED everyday 1700 & DIS-ARMED everyday 0800.

2   Only Weekend Alarm Ready Schedule will be active. Default: REARM every Friday 1700 & DISARM every Monday 0800.

3   Both Weekday & Weekend Alarm Ready Schedules will be active. Default: REARM daily at 1700 Monday-Thursday & DISARM daily at 0800 Tuesday-Friday. REARM Friday at 1700 & DISARM Monday at 0800.

4   Only Holiday Alarm Ready Schedule will be activated. Default: REARM at 1700 December 24, 1990 then DISARM at 0800 December 26, 1990

5   Both Holiday & Weekday Alarm Ready Schedules will be activated. Default: REARM daily at 1700 & DISARM daily at 0800. REARM at 1700 December 24, 1990 then DISARM at 0800 December 26, 1990.

6   Both Holiday & Weekend Alarm Ready Schedules will be activated. Default: REARM every Friday at 1700 then DISARM every Monday at 0800. REARM at 1700 December 24, 1990 then DISARM at 0800 December 26, 1990.

7   Holiday, Weekend & Weekday Alarm Ready Schedules will be activated. Default: REARM daily at 1700 Monday-Thursday then DISARM daily at 0800 Tuesday-Fri. REARM every Friday at 1700 then DISARM every Monday at 0800. REARM at 1700 December 24, 1990 then DISARM at 0800 December 26, 1990.

Note:

Whenever a new Alarm Ready Schedule Control Number is entered all REARM & DISARM values will be recalculated. Any active Alarm Ready Schedules will be halted and the Verbatim autodialer will be left in which ever REARM/DISARM state it was last in.

7.12   Factory Defaults

Activity	Schedule
Weekday REARM time	1700
Weekday DISARM time	0800
Weekend REARM day-of-week	Friday
Weekend DISARM day-of-week	Monday
Weekend REARM time	1700
Weekend DISARM time	0800
Holiday REARM date	12/24/90
Holiday DISARM date	12/26/90
Holiday REARM time	always same as Weekend REARM time
Holiday DISARM time	always same as Weekend DISARMtime
Alarm Ready Control Number	0 (all schedules disabled)

✎ ***Note:***

Both Weekend times are initially the same as their respective Weekday times, but can be reprogrammed.

7.13 Weekday and Weekend Alarm Ready Schedule Programming Example

For the following example assume that personnel are present at a plant being monitored by the Verbatim autodialer during normal business hours, Monday through Friday, 7 A.M. to 4 P.M. Assume further that there is someone at the plant every Saturday from 7 A.M. until 12 Noon and that the personnel would be aware of any alarm conditions at the plant and would <u>not</u> want the Verbatim autodialer to be making calls to phone numbers in its phone number list.

In this example, the Verbatim autodialer should be:

- REARMED every weekday evening at 1600
- DISARMED every weekday morning at 0700
- REARMED every Saturday at 1200 noon
- Stay in the ARMED state until it is DISARMED every Monday at 0700

For the example, use the following steps:

1. Verify that the current time is one of the times when the Verbatim autodialer is DISARMED, i.e.; during normal workday hours. It is important that the time be the current time, since any Alarm Ready Schedule begins with the Verbatim autodialer becoming REARMED and ends with the Verbatim autodialer becoming DISARMED.

    If a user were to set up a repeating Alarm Ready Schedule (weekday or weekend) during the time the Verbatim autodialer was to be ARMED, the programmed schedule would not actually begin until the next time that schedule was to take effect. For example, if the current time was 1630 and a weekday schedule was being programmed, that weekday schedule would not actually start until the next day at 1600.

2. Press the PROGRAM key to put the Verbatim autodialer into the program mode.

3. Set the current date and time: (if not already set)

    a. Enter CODE "941 MM DD YY d" followed by ENTER

        Where:

        MM = 2 digits for month, DD = 2 digits for date,

        YY = 2 digits for year, and d = 1 digit for day-of-week.

    b.   Enter CODE "942 HH MM SS" followed by ENTER

             Where:

                 HH = 2 digits for hours, MM = 2 digits for minutes,

                 SS = 2 digits for seconds.

4. Set the Weekday REARM/DISARM times:

      Enter CODE "961 1600 0700" followed by ENTER to set the REARM time to 1600 and the DISARM time to 0700.

5. Set the Weekend REARM/DISARM times:

      Enter CODE "962 1200 0700" followed by ENTER to set the weekend REARM time to 1200 and the weekend DISARM time to 0700.

6. Set the Weekend REARM/DISARM day-of-week:

      Enter CODE "963 7 2" followed by ENTER to set the weekend REARM day-of-week to Saturday and the Weekend DISARM day-of-week to Monday.

7. Enable both the Weekday and Weekend Alarm Ready Schedules:

      Enter CODE "966 3" followed by ENTER to set the Alarm Ready Schedule Control Number to 3 to enable both the Weekday and the Weekend Alarm Ready Schedules.

Note:

If the Verbatim autodialer is configured with a local printer, a summary of all of the REARM and DISARM times will be printed.

8. Return to the Normal mode and make sure the Verbatim autodialer is DISARMED.

8 Maintenance, Testing, and Battery Replacement

Regular testing is the main element of a maintenance program for ongoing Verbatim autodialer reliability. The test should include interrupting AC power to the Verbatim autodialer for at least 4 hours to verify the gel cell battery maintains Verbatim autodialer operation for that time. You may wish to disconnect the phone cord to avoid nuisance calls during the test period.

Note:

The LOBAT light on the Verbatim activates whenever the charge or discharge current for the rechargeable battery exceeds a certain level. If the battery is not fully charged (as following installation or following a power failure) then the charging current will activate the light. If the battery is currently being discharged (as during a power failure) the light will be activated. The LOBAT light does not necessarily warn of a battery wearing out. It should be considered a secondary indication of battery and charger activity.

The gel cell battery is much like a car battery. That is, at the end of its life when called on to deliver power, it discharges very quickly without prior warning. The best protection is to replace the battery every 3 years regardless of any test results.

The battery is a *Power Sonic PS 640, 4 AH 6 volts*

You may order a replacement battery from RACO at the address below:

RACO Manufacturing and Engineering Co.
1400 62nd Street
Emeryville, CA 94608

Or from:

Power Sonic, Redwood City, CA; (415) 364-5001

See Section 9.2, "Phone Support Procedures," and Section 9.3, "Returning Parts to the Factory," for more information.

9 | Troubleshooting Tips

9.1   What's The Problem?

Unit is dead: no lights or voice.

If the unit will not respond to the ON/OFF key, verify that the battery is connected. Verify that there is 120 volts AC between the WHITE and BLACK wire terminals on TS3. Verify that the fuse (1/4 amp slow blow) is not blown.

Unit seems OK but will neither answer nor dial out on phone line.

This assumes that you hear a voice report at the panel when you press CHECK STATUS. With the NORMAL light lit, test the phone line by pressing DIAL-OUT. The PHONING light should light and you should hear a dial tone.

If you do not hear a dial tone, open the door of the unit and verify that relay K1 is correctly seated in its socket, with its indentation mark facing downward. Check the phone line and its connection with a DC voltmeter and/or a separate telephone handset. Verify the presence of about 50 volts DC between the RED and GREEN conductors on phone line terminal strip TS2. This voltage will drop to just a few volts when the Verbatim autodialer or other connected phone device goes off hook (PHONING light lit).

If you do hear the dial tone after pressing DIALOUT, press the digits of a valid phone number. You should hear the loud clicks of relay K1 (for pulse dialing) or else the tones of tone dialing, as you press each digit. The dial tone should cease after you have entered the first digit. Continue until you have dialed the complete phone number. You should now hear the sound of ringing and someone answering at the other end. End the call by pressing NORMAL.

Unit answers incoming calls, and also goes into alarm when it should and attempts to dial out, but does not reach dialed number.

First, verify whether the unit is actually attempting to dial out, as evidenced by pulse dialing clicks or tone dialing sounds followed by message recital. If not, then see the separate problem below, "Unit does not go into alarm when it should".

If your unit has previously been programmed for Automatic Tone/Pulse select (via code 917 2 or 917 3) and has been left connected to a phone line for several minutes, then you can assume that the correct dialing mode for your phone line has already been selected. Again, refer below to "Unit does not go into alarm when it should."

If Automatic Tone/Pulse select is programmed OFF (via code 917 0 or 917 1) and you hear the clicks or tone dialing sounds, but the dial tone does not cease, perhaps your phone system requires the opposite mode of dialing (pulse vs tone) from its presently set mode. Read the present mode by pressing PROGRAM 9 0 1 ENTER. Then set the opposite by entering 9 0 1 1 (to change to tone dialing), or 9 0 1 0 (to change to pulse dialing). Then press NORMAL and repeat the manual DIALOUT procedure as described above.

Verify that you have programmed complete phone numbers including any area codes or "1" prefixes that might be required to complete the call.

Consider whether your phone system requires a prefix such as 9 to be dialed, followed by a delay period (to access an outside phone line) before dialing out. If so, see Section 3.2, "Programming Phone Numbers."

Unit dials out, but will not answer incoming calls.

Check programmed ring delay by pressing PROGRAM 9 0 6 ENTER. If it is set for a number larger than one, the Verbatim autodialer is not supposed to answer until the corresponding number of rings has been received. Try setting it back to 1 using code 9 0 6 1 ENTER. If the unit still will not answer incoming calls but is able to dial out, try plugging a regular telephone into the same phone jack in place of the Verbatim autodialer and see if it rings. If the problem is not the phone line, try temporarily connecting test point C to test point D on the main circuit board, for a period of about 5 seconds and see if it "answers" with the PHONING light and a voice report, then call the factory for advice.

Unit will not go into alarm when it should.

This is usually the result of incomplete understanding of how the Verbatim autodialer manages alarms.

For the Verbatim autodialer to go into Unacknowledged Alarm and Dial Out, a violation must be continuously present for the Alarm Trip Delay time. At least one phone number must be programmed. The unit must not be in the DIS-ARMED state. And, the channel that has the violation must not already be in an acknowledged alarm state, since acknowledged alarm status for a given channel (including power failure) precludes further activity on that channel until that status is cleared. Refer to Section 5, "Using Your Verbatim autodialer," for a discussion of how the unit manages alarms.

To clear the acknowledged alarm status of all channels including power failure, starting with the NORMAL light lit, press DISARM/RE-ARM to get the flashing DISARMED indication, then press it again to re-arm the unit with all acknowledged alarm statuses cleared. Now any violations lasting longer than the Alarm Trip Delay will cause unacknowledged alarms and dialing.

Unacknowledged alarm status is indicated by the corresponding channel number flashing. Acknowledged alarm status is indicated by the same light remaining on continuously without flashing.

If you don't observe this, press PROGRAM and then press 7 0 1 ENTER to check your first phone number. Press 9 0 2 to check the Global (overall) Alarm Trip Delay. For the specific channel ZZ (2 digits) that you are attempting to create an alarm on, also press 6 ZZ to check for any longer Individual Alarm Trip Delay setting.

Check the Normally Open/Normally Closed alarm criteria programming for this channel by pressing 5 ZZ. Make sure it is not set for No Alarm or for Run Time Meter, since these settings would not allow an alarm. Now, for example, if the channel is configured Normally Open, you will want to temporarily provide a Closed Circuit at its input to trip the alarm. You can directly read and verify the Open/Closed status you are applying by pressing 0 ZZ 0. You may also use a DC voltmeter to trace your circuit connections. With the Verbatim autodialer turned on, an Open Circuit to a channel contact input reads 5 volts DC with respect to the "C" terminals or electrical ground. A Closed Circuit reads zero volts.

Unit keeps calling when it should not.

Be sure that the initial alarm call is in fact being acknowledged. The unit will specifically state "alarm is acknowledged" at the moment you successfully acknowledge the call. The unit will accept a tone acknowledge only following the prompting warble beep.

Also, be sure that the alarm violation has been corrected. Otherwise, even if the alarm is acknowledged, when the Alarm Reset period times out, dialing will begin again.

Write down exactly what the unit recites when it gives the unwanted call. This provides valuable guidance as to the cause and correction of the problem. You may need to lengthen the Alarm Trip Delay in order to minimize nuisance alarms, particularly the power failure Alarm Trip Delay (code 920). If you hear an alarm message with the phrase "now normal" added at the end, it means that the violation occurred long enough to trip the alarm but has returned to normal by the time you are hearing the report. In the case of power failure, if the power has been restored by the time the message is being heard, the message will be "Power is on". The fact that power is mentioned at all lets you know that there has been a power failure lasting longer than the power failure Alarm Trip Delay. Power will continue to be mentioned in any phone call or front panel status check, until the Alarm Reset time expires.

Unit is continuously "locked" in on state, or is behaving erratically.

Environmental factors such as lightning or power surges may have caused program lockup. With the unit turned on, use a screwdriver blade to momentarily connect the two pins on Jumper Block JB5 (see diagram Appendix H, p. H-26).

If this does not return the unit to normal operation, next try jumping the 2 pins on JB3. This latter step will erase all user programming and recorded messages, so all user programming and messages will need to be re-entered.

9.2   Phone Support Procedures

Make sure you have the following before you call:

- Serial #: Found inside front panel. If you are not at the unit, call the unit up and enter program code 968. This will give you a number that our Customer Support Department can reference.

- Note the unit's symptoms: Exact speech pattern, what it is saying, if it is calling or not. The more specific and accurate you are in describing the symptoms, the quicker the Customer Support Department will be able to diagnose and troubleshoot the problem. In many cases, it may save a return to the factory.

THEN call 1-800-449-4539 for Customer Support.

If the Customer Support determines that the unit needs to be sent to the factory for repair, you will be given a Return Materials Authorization (RMA) number.

9.3   Returning Parts to Factory

Pack all parts well! To avoid extra charges, return any removed chips card guides or daughter boards to the factory at the address below:

RACO Manufacturing and Engineering Co.
1400 62nd Street
Emeryville, CA 94608

Remember to:

- Put return address on package.
- Include a packing slip.
- Have serial # and RMA # handy when you call in for tracking.

A Verbatim Series SFP Autodialer

The following is an instruction supplement for the Verbatim Series SFP autodialer. This supplement describes differences between the Verbatim Series SFP, and the Series VSS.

The Series SFP is a modified Verbatim autodialer which omits the front panel keypad and some of the front panel LED indicators. The primary practical difference between the two models is that the programming for the Series SFP must be done over the phone, whereas programming for the Series VSS may be done over the phone or at the front panel.

The enclosed diagram of the front panel of the Series SFP (p. A-2) replaces the Series VSS diagram on page 2-5 of this manual. A supplemental diagram of the inside view of the front door panel (p. A-3) is also enclosed, showing the location of the ON/OFF switch.

The practical differences to consider in programming and using the Series SFP are explained below.

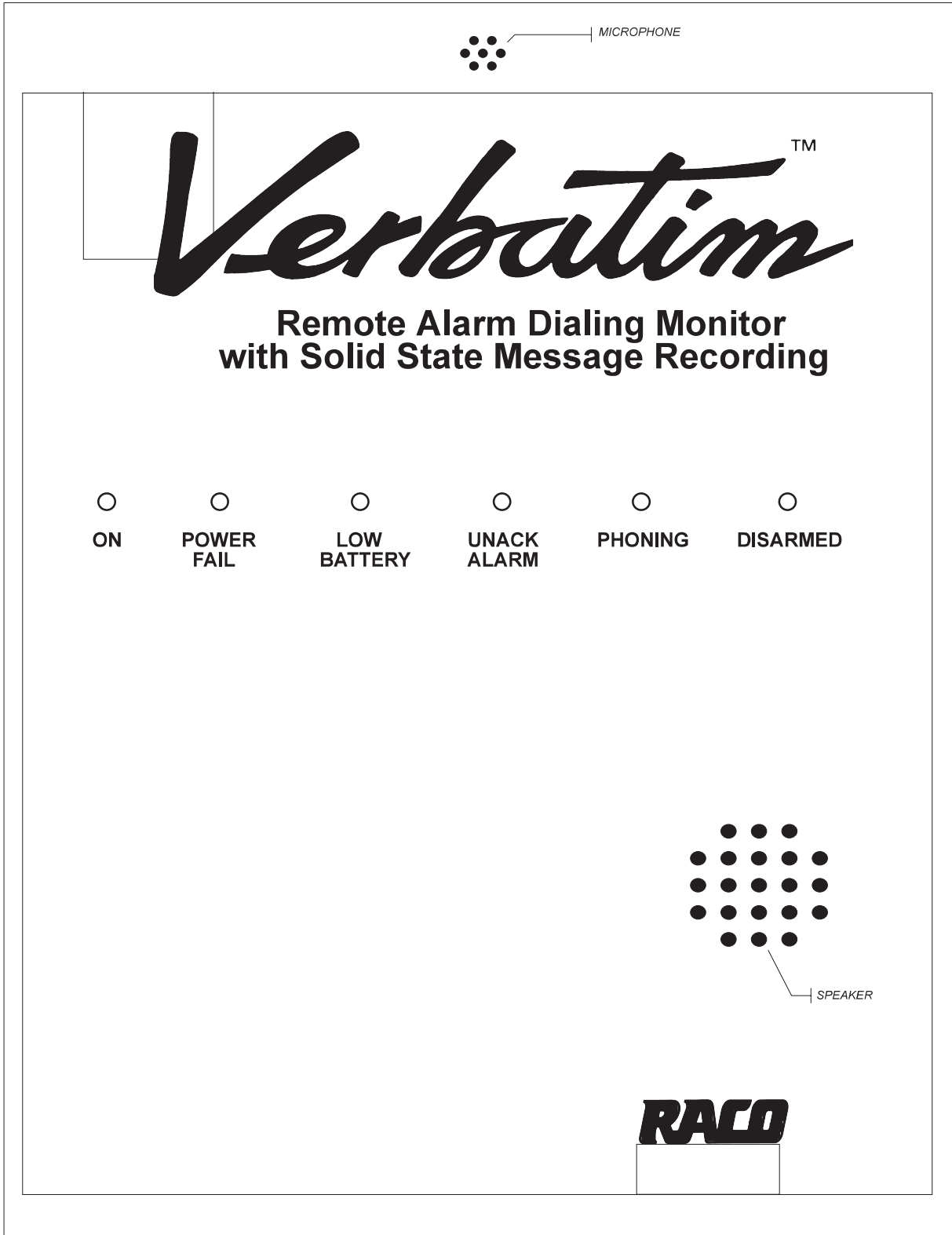## A.1 Programming the Series SFP from a Remote Telephone

All programming of the Series SFP Verbatim autodialer is done from a remote Touch Tone telephone. This method of programming the product is described in Section 5.7 of this manual, and it is also more briefly referred to at other places in the manual such as Sections 4.2 and 4.3. With the Series SFP, this is the sole applicable means of programming. Therefore an "advance" description of over-the-phone programming follows.

When you call the Verbatim from any Touch Tone telephone, it will answer and begin reciting its message. At the end of each round of messages, you will hear a warble tone. If you press a command tone "1" immediately following this tone, you will the Verbatim autodialer will then be in Program Mode, and you will be prompted to enter a program code.

A chart listing the program codes is located in Section 6.1 of this manual. This section also includes some guidelines for using the program codes, and a more complete description of the programmable items is located in Section 6.2.

Program code entries generally consist of three digits, which may or may not be followed by additional followup values, before you complete the entry by pressing the # key twice. You will hear a spoken confirmation of each numerical tone digit as you issue it. There is no spoken response to the # or * key.

Verbatim Series SFP Front Panel Diagram

MICROPHONE

Verbatim™

Remote Alarm Dialing Monitor
with Solid State Message Recording

○	○	○	○	○	○
ON	POWER FAIL	LOW BATTERY	UNACK ALARM	PHONING	DISARMED

SPEAKER

RACO

* A discharged battery may take up to a day to fully charge. ** During AC power failure, all illuminated LED's will
** Meanwhile, light may remain on.   flash to conserve battery power.**

Verbatim Series SFP Inside Front Panel ON/OFF Switch

<- ON
<- OFF
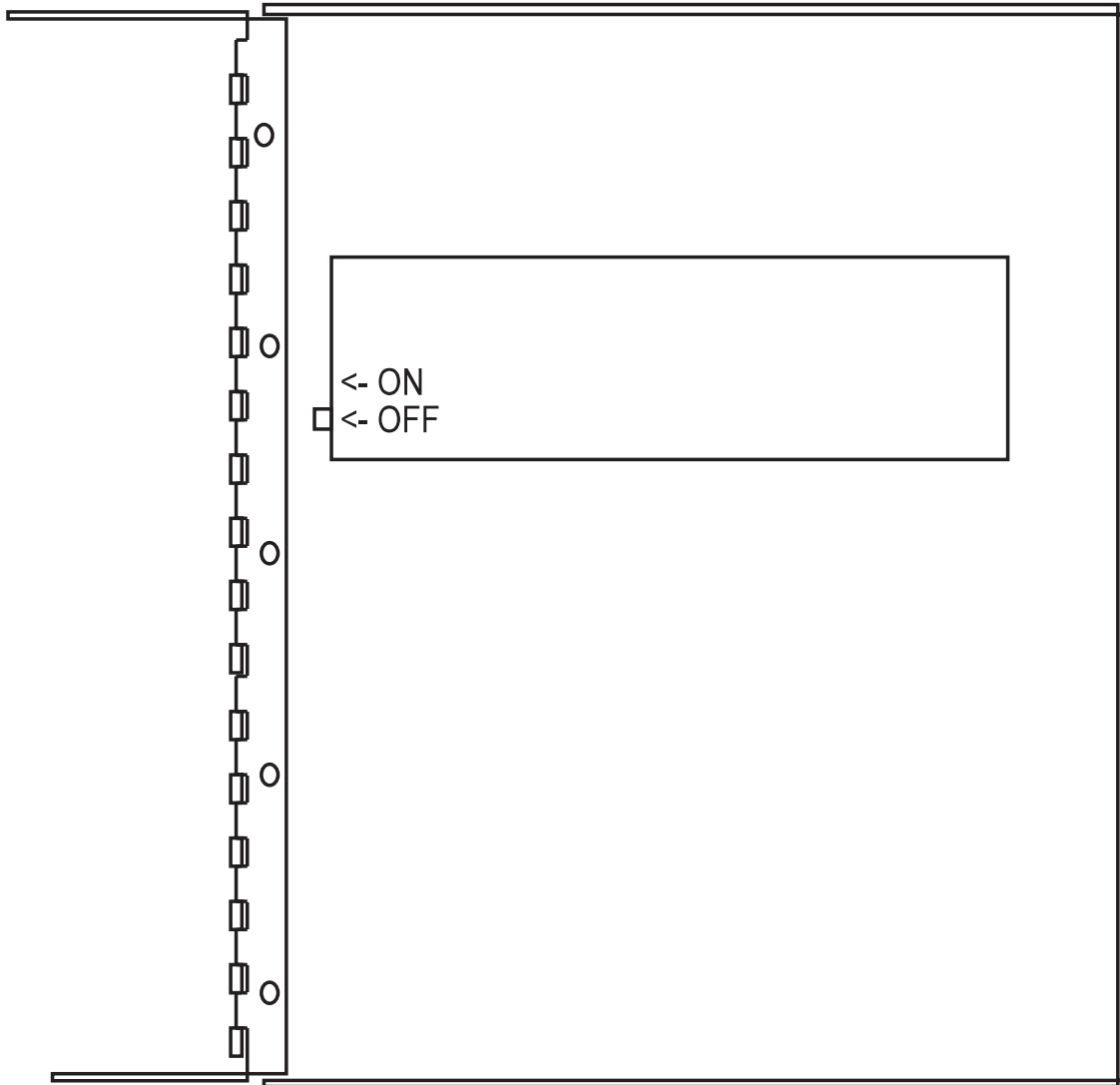
Inside view of front panel, showing ON/OFF switch

Note:

The procedure of pressing the # key twice, is to be used in relation to all references throughout this manual to the term, "ENTER."

In general, if you enter just the three tone digits followed by # #, you will hear the present setting or value for that program item. If you include additional values before the # #, the new value will replace the existing setting or value. In either case, the voice report will provide confirmation of the updated program setting or value.

Sometimes there is need to include a decimal point or a minus as part of a value entry. Also, if you make a mistake as you are issuing tone digits, you will want to cancel the entry. The conventions for these functions are as follows:

CANCEL	* *
ENTER	# #
POINT	*
MINUS	#

To end a phone call after programming, press # # without any prior tone digit. The Verbatim autodialer will then issue a prompting warble tone which is an opportunity to re-enter a "1" if you did not really want to end the call. It will then say, "Goodbye," and end the call.

Refer to Section 5.7 for a description of the other command tones that may be used in place of the "1" for special purposes.

A.2   Programming and Testing

The following sections provide a sequential reference to this manual regarding the relevant differences and similarities in instructions for the Verbatim Series SFP.

A.2.1   Resetting (Clearing) the Unit

Caution:

The following step erases all user programming including recorded messages so normally it is done only at initial setup.

Turn the unit on if it is not already on, via the switch at the rear of the front panel door. From a touch tone telephone, place a call to the phone number of the unit, and at the sound of the warble tone, issue a command tone "1" as described above.

To clear the system of all programming, in program mode as described above, issue:

`9 3 5 9 # #`

As always, if you make an error in issuing tone digits, press * CANCEL and start again.

A.2.2   Programming Phone Numbers

Essentially the same as Section 3.2 in this manual.

A.2.3   Programming Input Channels

Essentially the same as Section 3.3 in this manual.

A.2.4   Initial Testing

Temporarily place all input signal sources into their alarm state, long enough to satisfy the alarm trip delay. The unit will begin dialing the first phone number, perhaps before you have managed to get all the inputs into an alarm indication state. You should hear the a dial tone and then the sound of ringing, and then the sound of someone answering the call. Testing consists in verifying that the call is actually received at the first phone number, and that all the alarm messages are recited.

Your Verbatim Series SFP autodialer is now able to operate, having at least one dialout phone number programmed, and having its input channels configured. However, you may wish to record your own voice messages (Section 4) or perform special advanced programming items (Section 6) before referring to Section 5 on using your programmed Verbatim Autodialer.

A.3   Recording Messages In Your Own Voice

Essentially the same as Section 4 in the Owner's Manual, but following the guidelines for over-the-phone programming and recording.

A.4 | Using Your Programmed Verbatim Autodialer

Section 5.7 is largely replaced by the discussion in Section 4 regarding over-the-phone programming, except for discussion of the alternative command codes "2," "3," "4," and "0."

Disregard Section 5.8.

A.5 | Remainder of the Manual

All other descriptions in this manual may be followed and applied to the SFP with no practical limitiations.

Note:

The lack of front panel programming has specific impact on some minor aspects of specific programming items, as follows:

◆ **CODE 910:**

SECURITY ACCESS CODE No Security Access Code may be programmed since this could only be programmed from the front panel keyboard.

◆ When a delay between dialing digits is needed (as for pager applications), it will only be possible to insert one delay period, since this is done over the phone by pressing the # key, and if this were pressed more than once in succession it would be interpreted as a Cancel Entry command. Therefore to get the length of delay desired, use 928 to extend the duration of the single delay from its default value of one second, to whatever value is needed.

◆ **CODE 926:**

EXIT DELAY FUNCTION The Exit Delay function is not applicable in the absence of the front panel keyboard.

◆ The Speakerphone/Dialout function is not applicable in the absence of the front panel keyboard.

◆ There is no Parallel Printer Output.

◆ The speaker and microphone are present. However the microphone is limited to the function of optionally "listening in" since voice recording must be done via remote telephone.

◆ The On/Off function is controlled via the slide switch inside the front panel door. See diagram on page A-3 .

A.6 Enhanced Telephone Interface Features

The manual Section entitled, "Enhanced Telephone Interface Features," is generally applicable except that there is no front panel indication for telephone line failure.

B | Analog Signal Input

B.1 | Analog Connections

Refer to the diagram (page B-10) showing the VAN analog boards for connection of analog inputs. Be sure you follow the indicated positive and negative polarity indications, except in the case of TS705 temperature sensor inputs, for which positive and negative polarity does not matter. Two signal wires are required for each input. The terminal blocks can be unplugged for convenience. Because of the space constraints, it is best to use small gauge wire like telephone wire. If bulkier wire is needed outside the dialer, it is best to install a terminal strip outside the dialer to make the transition from the bulkier wire to the more compact wiring going into the analog input connection points.

Note:

Take care to route the incoming signal wires to one side of the enclosure or the other so that they do not interfere with the front panel circuit board when the unit's door is closed. Also, try to route the analog signal wires away from power wiring to minimize noise pickup.

B.1.1 | Programming for Analog Channels

Each analog input will need to be programmed to specify:

1. The analog Input Signal Type (if other than standard 4-20 ma input).

2. The numerical value to be spoken at a corresponding minimum signal level.

3. The numerical value to be spoken at a corresponding maximum signal level. Items 2 and 3 amount to programming the translating scaling factors for each analog input.

4. In many cases you will also want to program high and low setpoint limits for each analog input.

5. You may also elect to replace the generic default voice message with your own recorded messages for any analog channel, as described in section 4.

B.1.2   Assignment of Input Channel Numbers

The unit automatically assigns the lowest channel numbers to whatever number of contact input channels exist on the unit (whether or not you are using them) and the analog channels are assigned channel numbers beginning with the next available number.

For example, the first analog input on a unit with 24 contact inputs and 16 analog inputs would be "channel 25" and the last analog input would be "channel 40". Note that since the unit's maximum LED display capacity is a total of 32 channels, on such a unit the final 8 analog channels would not have corresponding LED status indicators on the front panel. Further, note that on units with remote channels, the LED display may group inputs into a single indicator.

It is important that you have correctly determined the channel number assigned for each analog input channel before performing the following programming steps.

B.1.3   Programming the Input Signal Type

(You may skip this step if you are using 4-20 ma inputs).

The analog inputs are very flexible and can accommodate a variety of Input Signal Types, but the unit needs to know which type each input is being used for a given analog input. Note that in addition to programming the Input Signal Type, the physical component configurations on the VAN plug-in circuit card must match the Signal Type used. Normally this will have been handled in the process of ordering the unit and will not require additional user attention. If there is any doubt about this, refer to the markings on the rear of the VAN circuit board. If there is still any question, refer to the markings you find and also your unit's serial number, when contacting the factory.

◆ To program the Input Signal Type for input channel ZZ:

`5 ZZ 7 N ENTER`

where ZZ is the two-digit channel number, and N is a single digit as follows:

0   for a 4-to-20 milliamp current loop input. This is the default setting, so if your inputs are 4-20 milliamp current loops, you may skip this step.

1   for 0 to 1 volt DC signal input. In the case of larger signal levels, such as 0 to 10 volts DC, the hardware input circuitry on the VAN card will have been factory configured to pre-scale the signal to a range within 0 to 1 volt DC, and corresponding special scaling information will be provided to fit the particular application.

2   for a Raco Temperature Sensor input (sensor model TS705A), used to measure temperatures from -20 to +120 degrees F.

3   for additional types of special custom-specified signals.

Summary of Codes for Input Signal Type

0 (default)	4-20 ma current loop
1	0-1 volt DC
2	Raco temperature sensor
3	Other special inputs

B.1.4   Programming the Scaling and Offset Factors

This set of steps is not necessary for inputs using a Raco Temperature Sensor, since these values will be automatically inserted if the parameter 2 is selected in the above step.

In the above step, accepting the default parameter of 0 for 4-20 milliamp inputs automatically provides for a spoken reading of 0.0 percent for the minimum (4 ma) signal input value, and 100.0 percent for the maximum (20 ma) signal, until you enter different factors.

In most cases, you will want to program the unit to give spoken reports in terms of the actual physical variables being monitored, such as water level in feet, etc. In general, you will need to determine the desired spoken numerical values corresponding to two widely separated (low end and high end) signal input values. Often this will be available from the overall system specifications. In other cases, this will be determined (or revised) based on actual on-the-spot observations. The Verbatim Autodialer offers the unique option of entering this scaling information based either on your particular system specifications (the System Specification method) or else on your real world observations (the Real World Method). Also, scaling information which you may have originally entered based on your system specifications may later be easily "fine tuned" based on real world observation.

In addition, you may wish to record your own identifying message to replace the default message, as described in the message recording section of the manual.

B.1.5 | Additional Perspective on Scaling Factors

Analog Math

It may be useful, in comprehending the process of establishing the scaling factors, to visualize a graph which relates the water level in a tank to the input from a 4-20 ma transducer. To establish the relationship on such a graph, it is necessary to define two separate points, or coordinate pairs ideally at two widely separated points on the graph. For such a linear relationship any point on the "reading" (Y) may be calculated from the formula:

```
y = mx + b
```
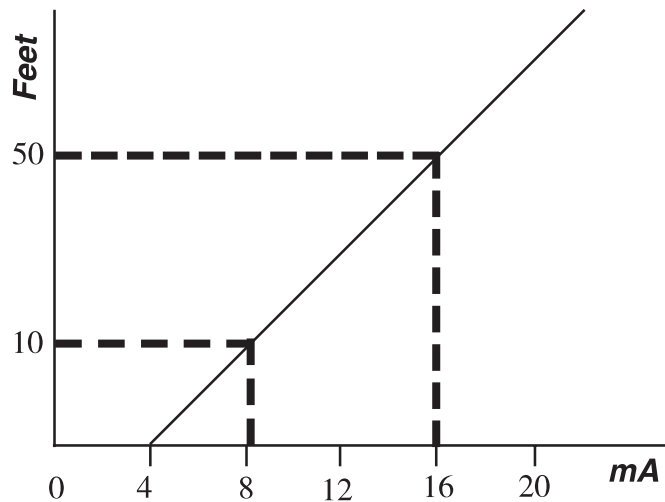

where m is the gain and b is the zero crossing point or Input (ma -> offset. The gain may be calculated from: m=(y2-y1)/x2-x1)

where x1, y1 is one coordinate pair on the graph and x2, y2 is the other.

Therefore, when you have chosen to enter non-default coordinates you are in fact setting the gain factor. This gain factor is taken along with the input signal type you have chosen which will define both the gain and offset.

Notice that each of the two points requires two separate coordinate pieces of information to define: the signal level and the corresponding water level. With two such points defined, an entire line or linear equation is defined, so that given any new signal level, we could use the graph to "look up" the corresponding water level. In operation, the Verbatim autodialer measures the signal level presented to it, and then calculates the corresponding physical value, all based on the line or linear equation defined by your entry of the high end and low end scaling information whether done by the System Specification Method or the Real World Method.

Be sure that the correct Input Signal Type setting is entered as described above, because changing the Signal Type setting will overwrite the programming described next.

System Specification Method of Programming Scaling Factors

The following four codes must be entered to invoke scaling:

◆ For the low-end portion of the data for channel ZZ, enter the following pair of codes:

```
5 ZZ 1 X.XXXX ENTER
```

where X.XXXX is the low input signal value chosen, within the bounds of input signal type.

```
5 ZZ 2 YYYY.YYYY ENTER
```

where YYYY.YYYY is the desired spoken numerical value

◆ Then to complete the scaling factors for this channel, enter the following pair of codes for the high-end portion of the data:

```
5 ZZ 3 X.XXXX ENTER
```

 or

```
5 ZZ 3 POINT ENTER
```

for the high-end signal value

```
5 ZZ 4 YYYY.YYYY
```

for the high-end corresponding spoken value

Note:

For all analog value entries you may enter up to four digits before an optional decimal point, and up to four digits after, but simple entries (such as -20, 3.45, 500, 4, etc.) work as well.

Alternative Real World Method of Programming Scaling Factors

If the system specifications for the scaling factors are not known, or if you wish to adjust a previous entry to reflect real-world as opposed to system specification conditions, wait until the input signal or the physical variable happens to be near the low end of the scale. Enter the following pair of codes:

```
5 ZZ 1 POINT ENTER
```

which will automatically accept the present moment signal value as the low input signal value, rather than having to enter the value shown as X.XXXX above. Then, enter:

```
5 ZZ 2 YYYY.YYYY ENTER
```

where YYYY.YYYY is the corresponding low-end physical value which you observe in real-world terms.

At another time, when the signal or physical variable is toward the high end of the scale, enter the following pair of codes:

```
5 ZZ 3 POINT ENTER
```

which accepts the present signal level as corresponding to the high-end physical value which you enter as:

```
5 ZZ 4 YYYY.YYYY ENTER
```

Example:

It may already be known from your system's specification that for channel 6, a low-end signal of 4 milliamps corresponds to a desired spoken value of 34.5 feet of tank water level. In such a case, you would use the System Specifications Method to enter:

- ◆ for 4 milliamps

  ```
  5 06 1 4 ENTER
  ```

- ◆ for a spoken reading of 20.5

  ```
  5 06 2 20.5 ENTER
  ```

- ◆ for 20 milliamps

  ```
  5 06 3 20 ENTER
  ```

- ◆ for a spoken reading of 34.6

  ```
  5 06 4 34.6 ENTER
  ```

Then, suppose with the system in operation, you observe that the tank level is 31.7 feet, but the Verbatim reports a value of 31.45 feet. The discrepancy will most likely be due to a discrepancy of the sensor's actual output versus the theoretical system specification. Regardless, to correct for it, keeping in mind that the signal is presently near the high end of the scale, you would use the Real-World Method, entering:

- ◆ To reference the present signal level

  ```
  5 06 3 POINT ENTER
  ```

- ◆ To recalibrate 31.7 as the corresponding spoken value

  ```
  5 06 4 31.7 ENTER
  ```

Continue the example, there might also be a discrepancy toward the low end of the scale. Suppose on another day you observe a tank level of 22.5 feet but the Verbatim report 2293 feet. Since this signal is at the low end of the range, you would enter:

```
5 06 1 POINT ENTER
```

and

```
5 06 2 22.5 ENTER
```

Note:

These Real-World Method adjustments did not require you to measure any actual signal levels!

From that time on, assuming that the sensor maintains its calibration and has a linear output, the spoken value should track the actual value very closely. The Verbatim itself is much more accurate and consistent than almost any sensor available to connect to it. Note that the signal does not need to be exactly at the end of its range (e.g. 4 ma or 20 ma) for these programming steps. However, in general the wider the spread between the signal levels used, the better informed the Verbatim will be to reflect the actual relationship between the sensor's output and the real value being measured.

Note:

While the unit reports with very high accuracy and resolution, you do not need to enter your programming value to the same high degree of accuracy unless you choose to.

For TS705 Temperature Sensor Inputs

Selecting signal type "2" (TS705 sensor) will automatically load scaling factors as describe earlier. However, these automatically loaded scaling factors are not adjustable. If you want to be able to do Real World calibration adjustments for temperature sensor inputs, then instead of selecting sensor type "2", select sensor type "1" (0-1 VDC input) and enter scaling factors as follows:

```
5 ZZ 7 1 ENTER  (Selects signal type 1)

5 ZZ 1 .843 ENTER

5 ZZ 2 -19.8 ENTER

5 ZZ 3 .316 ENTER

5 ZZ 4 120.1 ENTER
```

This gives the same scaling factors as would otherwise automatically result from selecting signal type 2, but it allows for subsequent adjustments using the Real-World adjustment method.

B.1.6   Programming High and Low Analog Setpoints

You should first enter the gain, offset and scaling factor programming described above before entering setpoints. Later, if you adjust the factors as described above, you may also need to adjust the setpoints correspondingly. Changing setpoint values after scaling is set could cause changes in the scaling values.

◆ To program a low limit setpoint for channel ZZ, use code:

    `5 ZZ 5 X.XX ENTER`

Note:

X.XX is the desired setpoint in terms of spoken units, rather than in terms of the signal value. You do not need to enter all four possible leading and trailing digits. Simple entries like 7 and 3.68 work as well.

◆ To program a high limit setpoint for channel ZZ, use code:

    `5 ZZ 6 X.XX ENTER`

Thereafter, whenever the measured value exceeds the setpoint for a continuous period exceeding the alarm trip delay, the unit will go into unacknowledged alarm and begin dialing to report the specific violation, also reporting the current measured value. As with contact inputs, if the input is no longer in violation at the moment of the report, the phrase "Now Normal" will be appended to that channel's report.

◆ To check an existing setpoint value, use the above codes but omit the value (X.XX).

◆ To turn off (completely disable) an unused analog channel so that it will not be included in status report, enter code:

    `5 ZZ 0 ENTER`

    where ZZ is the 2-digit channel number.

◆ To turn the channel on again, you must enter some high or low setpoint value for that channel.

◆ To turn off (disable) a high or low analog setpoint, while still leaving the channel able to report readings, enter a setpoint value of -0 for that particular setpoint. If you try to enter a setpoint value outside a wide signal range, the Verbatim will say "Error in number."

✏️ **Note**

> The scanning time required by the unit to check all analog readings against established setpoints increases with the number analog channels. With 16 channels, the time can total on the order of one second, and this imposes a limit on how fast the unit can detect analog setpoint violations. Normally, this will not be noticed unless you set Alarm Trip Delays of less than two seconds, and there is no effect on the trip delay for contact channels in any case.

Refer to the following section for recording the corresponding voice messages other than the spoken numerical values.

B.1.7   Summary of Analog Programming Codes

Code	Description
Signal Type:	
5 ZZ 7 N	Select input signal type. 0 is default for 4-20 ma
Scaling:	
5 ZZ 1 X.XX or POINT	Low end signal value
5 ZZ 2 YYYY.YYYY	Corresponding low end spoken value
5 ZZ 3 X.XX or POINT	High end signal value
5 ZZ 4 YYYY.YYYY	Corresponding high end spoken value
Setpoints:	
5 ZZ 5 X.XX	Low alarm limit setpoint
5 ZZ 6 X.XX	High alarm limit setpoint
5 ZZ 5(6) -0	Disable low (high) setpoint
Disable Channel:	
5 ZZ 0	Turn off (disable) channel ZZ

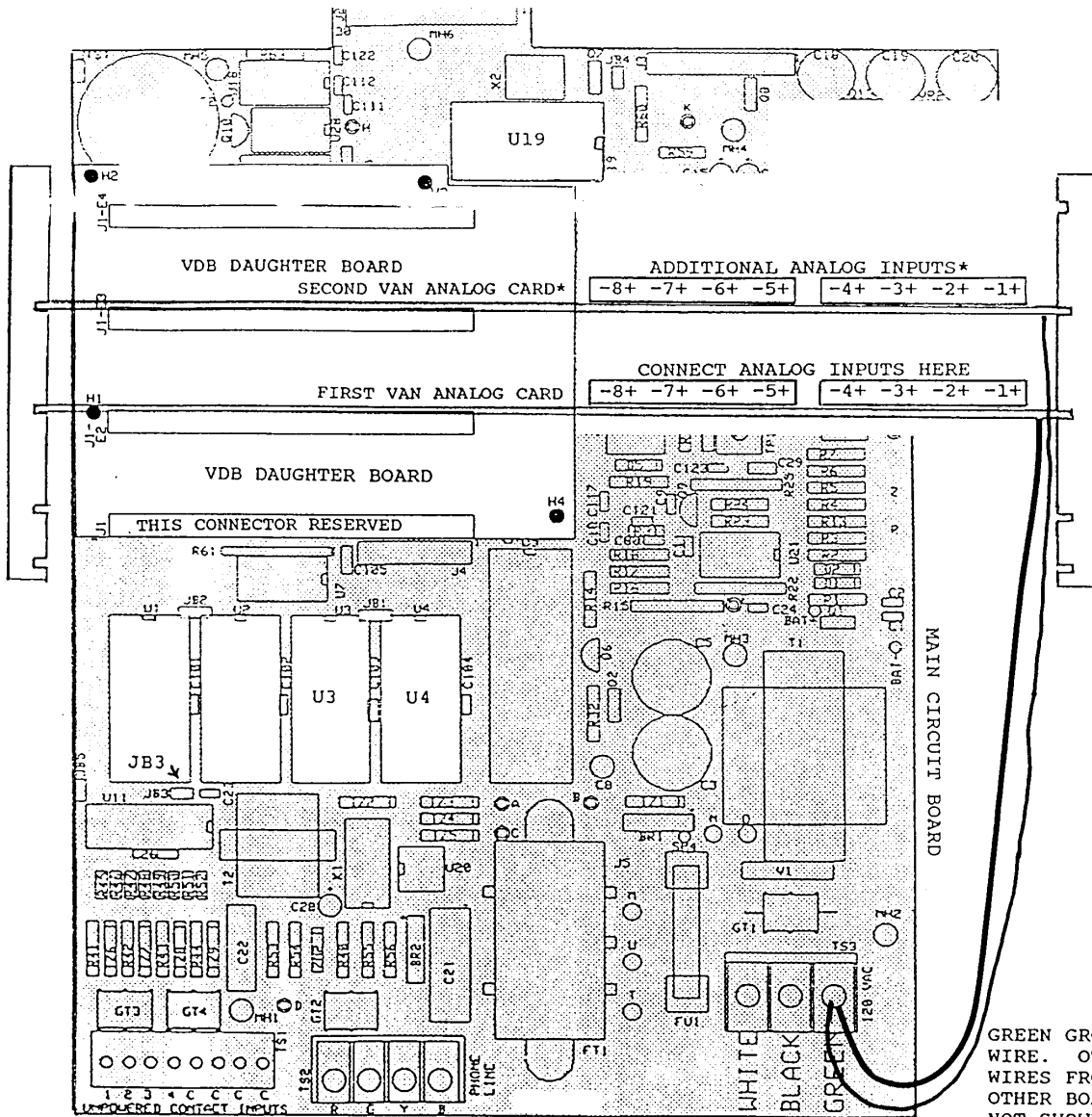## B.1.8   Recording Speech Messages for Analog Channels

This information supplements the basic information in the manual on recording speech messages. Refer to that information before attempting to record any speech messages.

For analog input channels, the default message is "The present channel N reading is ..."

For any analog inputs, in place of the default messages you may plan to record a preamble message of the general form "The total water flow in gallons is" or "the main tank water level in feet is."
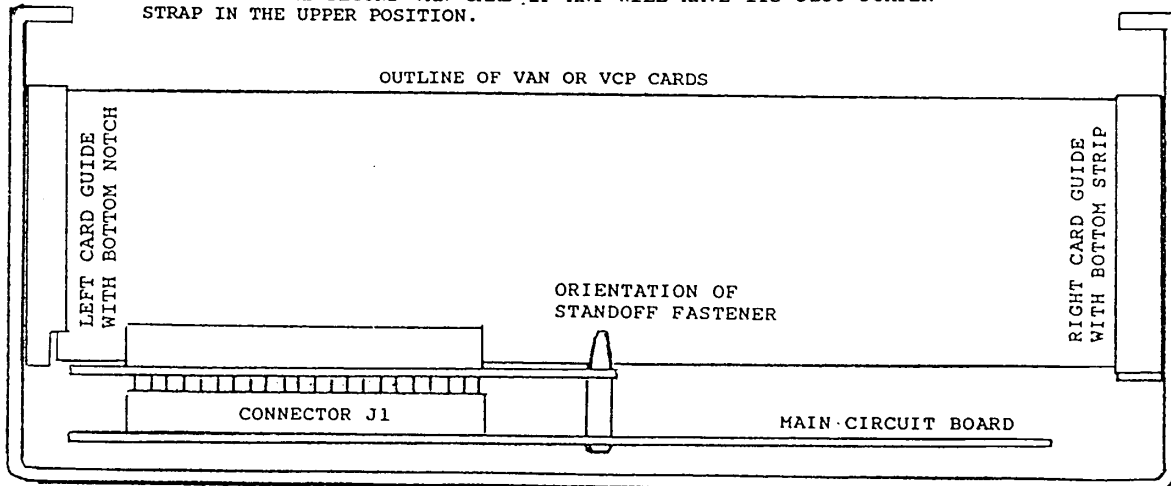
Use program code 1 ZZ to record the analog preamble message.

U19

VDB DAUGHTER BOARD

SECOND VAN ANALOG CARD*

ADDITIONAL ANALOG INPUTS*

| -8+ | -7+ | -6+ | -5+ | | -4+ | -3+ | -2+ | -1+ |

FIRST VAN ANALOG CARD

CONNECT ANALOG INPUTS HERE

| -8+ | -7+ | -6+ | -5+ | | -4+ | -3+ | -2+ | -1+ |

VDB DAUGHTER BOARD

THIS CONNECTOR RESERVED

U3 U4

JB3

MAIN CIRCUIT BOARD

WHITE BLACK GREEN

120 VAC

UNPOWERED CONTACT INPUTS

PHONE LINE

GREEN GROUND
WIRE. OTHER
WIRES FROM
OTHER BOARDS
NOT SHOWN.

*UNITS EQUIPPED FOR 16 ANALOG CHANNELS WILL REQUIRE 2 VAN CARDS.
THE SECOND (UPPER) CARD WILL BE FOR THE HIGHER NUMBERED ANALOG
CHANNELS. THE SECOND VAN CARD IF ANY WILL HAVE ITS JB50 JUMPER
STRAP IN THE UPPER POSITION.

OUTLINE OF VAN OR VCP CARDS

LEFT CARD GUIDE
WITH BOTTOM NOTCH

RIGHT CARD GUIDE
WITH BOTTOM STRIP

ORIENTATION OF
STANDOFF FASTENER

CONNECTOR J1

MAIN CIRCUIT BOARD

B.1.9   If Analog Inputs Do Not Work Correctly

Recheck programming settings, especially the Input Signal Type setting. Verify that the polarity of your input connections is correct.

In the case of 4-20 ma input, does the spoken value always reflect a 0 ma signal level? If so, the problem is presumably with the connection or the signal source. Use a DC meter to verify that both sides of the offending input are within 10 VDC of ground. A 4-20 ma current loop input should give a meter reading of about .07 volt per milliamp of current as measured across the two signal input terminals.

Are other instruments included in the same current loop? If they read correctly, temporarily disconnect the input to the Verbatim Autodialer. This should throw the readings of the instruments off scale. If there is no such effect, your wiring is not including the Verbatim autodialer in the loop. Verify that the type of signal source agrees with the physical configuration on the VAN card according to the marking on the back of the card.

B.1.10   Troubleshooting Analog Grounding Problems for Verbatim Analog

The most common analog signal type in use in the Verbatim marketplace is current loops, wherein the signal is a controlled DC current ranging from 4 to 20 milliamperes.

The loop consists of a current transmitter (consisting of a transducer and a supporting power supply which may or may not be packaged into one unit), and one or more receiving devices which measure and respond to the current signal they detect on the loop. The power supply voltage is typically 24 volts DC.

The terms "transducer" and "transmitter" are used interchangeably. The transmitter's job is to ensure that the current level accurately reflects the physical parameter which the transducer is measuring (typically a pressure or liquid level), regardless of what impedance it sees in the loop.

In order to do this, it presents whatever voltage across its terminals is needed to achieve the correct current flow. This voltage must be great enough to accommodate the total resistance in the loop. The typical resistance contribution presented by each receiving device is 250 ohms. However, the DC resistance presented by the Verbatim analog inputs is around 70 ohms (49.9 ohm precision resistor plus two 10 ohm surge standoff resistors).

In theory, all elements in the loop are isolated from any connection to electrical ground. This is intended to eliminate concerns about errors in the signal caused by conflicting ground or other conflicting connections.

In practice it is not unusual to have some element of the loop in fact tied to ground or to some other voltage source away from ground -- or if not directly tied, at least limited in its ability to depart from the ground or other voltage. As long as only one element in the loop is so committed, there is no problem since the other elements can freely accommodate as needed.

The Verbatim has its own limitations in this respect. It can only accommodate a departure from ground voltage potential, of 8 volts nominal, before its protective tranzorbs begin to conduct and clamp the signal. Such clamping when in direct conflict with some other voltage commitment in the loop, will not only cause incorrect readings by the Verbatim, but also cause the other elements in the loop to read and respond incorrectly.

This ability to accommodate departures of both sides (positive and negative) or the analog signal input, is called the common mode input voltage range. A truly isolated input would have as much common mode input voltage range as the voltage limitation of the isolation, typically over 1,000 volts.

The reason we do not provide isolated inputs is because it is bulky, and expensive to achieve accurate translation across the isolation barrier. Also, these days there has been a large shift to transformer and capacitive coupling schemes to achieve DC isolation, but these provide almost zero protection against the fast rise time transients induced by lightning. So, we need to be able to troubleshoot when a customer places one of our analog inputs into a current loop where there is another conflicting voltage commitment.

When this problem occurs, the customer will typically report that his loop works but is thrown off when our analog input is placed in the loop. Sometimes the disturbance takes the form of not just altering the DC current but causing parasitic oscillations in the loop. It may not be easily discernible whether the disturbance is or is not taking the form of a parasitic oscillation. Regardless, temporarily ungrounding the dialer or unplugging the analog card, will usually eliminate the disturbance.

The procedure for troubleshooting and correction of this problem is generally as follows: First we need to find out as much as we can about any preexisting, conflicting voltage commitments. To do this, have the customer unplug the card or unground the dialer so that the loop is not disturbed, and then use a voltmeter to check both the AC and the DC voltage readings at each node around the loop, with respect to electrical ground.

We hope there is not much AC signal present. If there is a strong enough AC component on top of the DC voltages, there will be disturbance to the extent that the peak level in the AC waveform exceeds the common mode input limitation of our analog input. In such a case the cause of the AC component of the signal needs to be found and eliminated, if the following procedure does not lead to a good result.

However, it is possible and even likely, that an observed AC signal is merely a "softly" induced hum that holds no sway when it meets any clamping introduced by our analog input. With this in mind, it may be best to defer even taking AC reading until after the DC oriented methods have proven unsuccessful.

With the main focus being the DC voltage readings, we are looking at some point on the loop that is much less than eight volts DC away from ground, and that is where the Verbatim input should be relocated in the loop. Chances are good that the Verbatim had previously been placed at a point on the loop well away from ground potential and that the relocation will end the problem.

An added step that may be useful in addition to the two sets of voltage readings (AC and DC), especially if the voltage readings seem to be erratic, is to have the customer use a jumper wire to temporarily connect some candidate point in the loop to electrical ground, and observe whether the loop is disturbed by this temporary grounding. If it is not, that is a good place to locate our input in the loop. In fact, this approach can be used without taking voltage readings at all. But if it does not work, then we do want the voltage readings in order to best understand what is going on.

Occasionally, something in the loop will cause there to be no available point in the loop that is close to ground potential. In such cases, if this cannot be changed, then the customer will need to install an optical isolator between the loop and our inputs. The customer may be referred to: Action Instruments, San Diego, CA, (619) 279-5726. Isolators cost $300 per loop.

C | Remote Supervisory Control Output

C.1 Remote Supervisory Control (VRSC) Output Installation and Operation Instructions

This option allows you to turn connected equipment on and off from any remote Touch Tone telephone, or from an non-Touch Tone telephone with the use of a portable tone generator. Option VRSC-4 provides 4 outputs, VRSC-8 provides 8 outputs. The unit's voice guides and confirms your operations. Advanced features such as programmable length momentary activations are included. Control operations may also be performed from the unit's keyboard.

Connections are normally made by means of optically isolated solid state relays housed in a separate Output Relay Enclosure which requires its own 120 VAC power connection. In some situations, the user may choose to make connections directly to the transition outputs within the main unit.

If your unit was not originally equipped with this option, refer to the separate instructions for adding this option.

C.1.1 Mounting and Wiring Connections for Remote Supervisor Control

If you are using the separate Output Relay Enclosure normally supplied with this option, mount the enclosure within 3 feet of the Verbatim Autodialer, and make your output connections to the left hand row of terminal strip points within the separate enclosure, as shown in the diagram of the VRSC Output Relay Enclosure. Be sure that the correct type of plug-in Opto 22 relays are in place. The available types are:

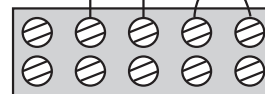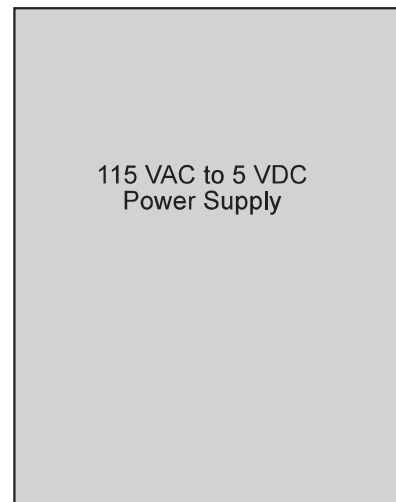| Type	Value
OAC5	12 to 140 VAC, 2 amps
OAC5A	24 to 280 VAC, 2 amps
OAC5A5	120/240 volt AC, Normally Closed
ODC5	5 to 60 VDC, 2 amps
ODC5A	5 to 200 VDC, 2 amps
ORR 5	Reed relay dry contact output

Remote Supervisory Control Output

RSC Supervisory Remote Control Output Box Diagram

(This upper board assembly present only in 8 output configurations)

Control 8 output*

Control 7 output*

Control 6 output*

Control 5 output*

Yel
Blu
Blk
Grn
Wht
Red

Plug-in Output Modules
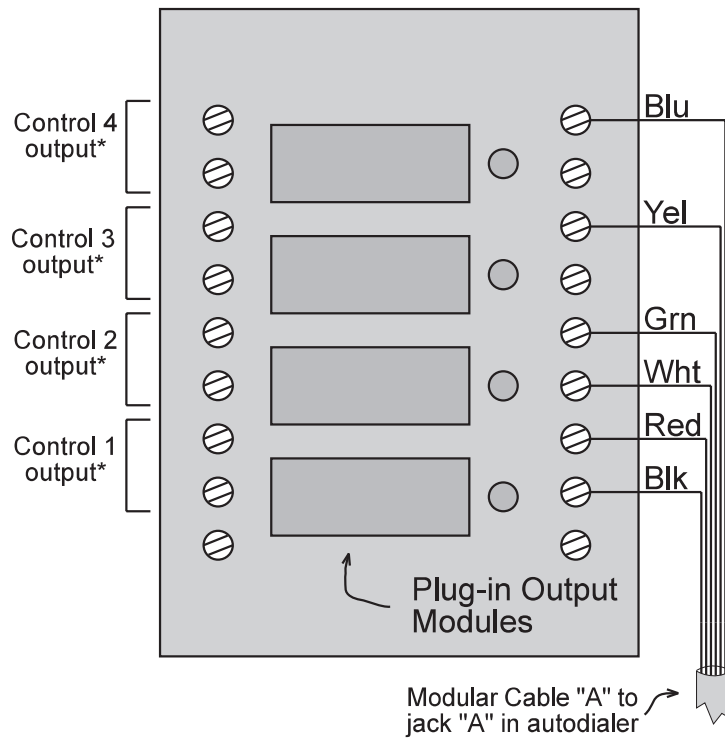
Modular Cable "B" to jack "B" in autodialer
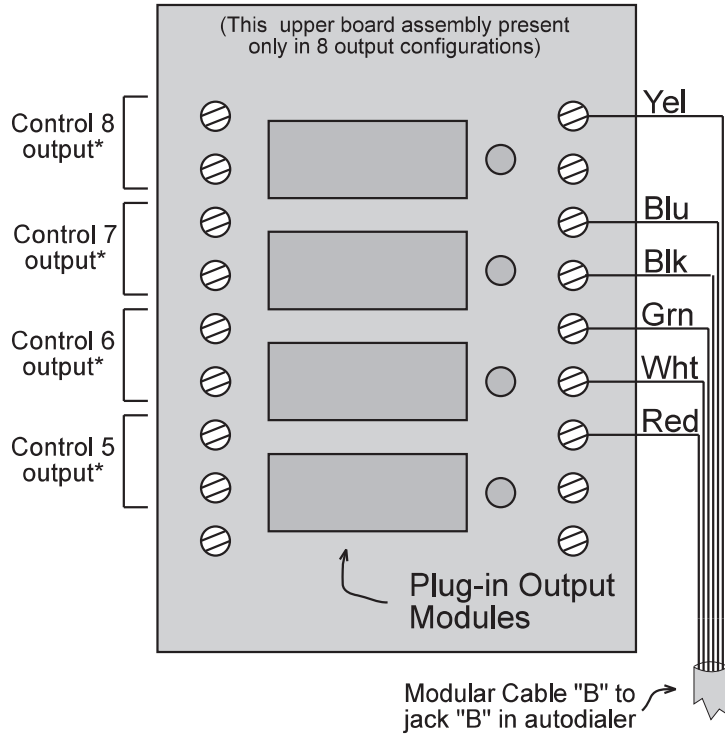
OUTPUT MODULE TYPES:

OAC5   12 to 140 VAC, 2 amps
OAC5A   24 to 280 VAC, 2 amps
ODC5   5 to 60 VDC, 2 amps
ODC5A   5 to 200 VDC, 0.67 amps
ORR5   Reed Relay Output

* If DC output modules are used, the lower terminal is the positive terminal, for each control output.

115 VAC to 5 VDC Power Supply

Control 4 output*

Control 3 output*

Control 2 output*

Control 1 output*

Blu
Yel
Grn
Wht
Red
Blk

Plug-in Output Modules

Modular Cable "A" to jack "A" in autodialer

WHITE   BLACK   GREEN

Connect 120VAC here

Unless ordered otherwise, type OAC5 is normally provided from the factory. Connect 120 VAC power as shown on this same diagram. Route modular "Cable A" through one of the entrance holes on the bottom of the Verbatim Autodialer, and plug it into J301 (the right-hand jack on the VCP circuit card, see diagram). The 8-output VRSC-8 option also includes a second modular "Cable B", connect this to the adjacent jack J302 on the VCP circuit card. Avoid routing these cables alongside power wiring and route them so that the front panel circuit board does not pinch them when the door is closed.

C.1.2   Optional Direct Connection Without Use of Output Relay Enclosure

The outputs on the VCP circuit card are NPN transistor open collectors capable of switching up to 12 volts DC at up to 500 ma, and thus these outputs may in some cases be connected directly to logic inputs of logic controllers, etc, although external pullup resistors may be required. Consult Raco for details. The color codes for VRSC cables "A" and "B" are:

Cable	Color Code
Cable A	
Common Return	Black
Output # 1	Red
Output # 2	Green
Output # 3	Yellow
Output # 4	Blue
Cable B	
Output # 5	Red
Output # 6	Green
Output # 7	Blue
Output # 8	Yellow

C.1.3   Remote Supervisory Control Operation

◆ To check the on/off status of output # N, use program code

   `9 5 N ENTER`

   where N is a 2 DIGIT output number (e.g. 01 for output # 1).

◆ To turn output # N ON, use program code

   `9 5 N 1 ENTER`

◆ To turn output # N OFF, use program code

   `9 5 N 0 ENTER`

◆ To turn output # N on for a specific number of seconds, use code

```
9 5 N 2 XXXXX ENTER
```

where XXXXX is the desired number of seconds, from 1 to 99999.

◆ To turn output # N off for a specific number of seconds, use code

```
9 5 N 3 XXXXX ENTER
```

where XXXXX is the desired number of seconds, from 1 to 99999.

◆ To establish a default pulse time duration in seconds for a given output N (2 digits), use code

```
9 5 N 9 XXXXX ENTER
```

where XXXXX is 1 to 99999 seconds.

◆ Alternatively, to establish a default pulse time duration in minutes, for individual output N (2 digits), use code

```
9 5 N 8 XXXX ENTER
```

where XXXX is 1 to 1666 minutes.

Then you may use code 9 5 N 2 (or 3) without need to enter the digits. The unit will use the pre-stored value for that output's pulse length.

◆ To hear a report of the on/off status of ALL outputs in one operation, use program code

```
 9 5 0 0 ENTER
```

◆ To turn ALL outputs OFF in one operation, use code

```
9 5 0 0 0 ENTER
```

◆ To turn ALL outputs ON in one operation, use code

```
9 5 0 0 1 ENTER
```

◆ To establish a default pulse time duration for ALL outputs in one operation, use code

```
 9 5 0 0 8 XXXX (XXXX = 1 to 1666 minutes)
```

or

```
 9 5 0 0 9 XXXXX (XXXXX = 1 to 99999 seconds)
```

Warning:

Because the devices under control would not normally be operational during AC power failures, the Output Relay Enclosure does not include battery backup for the output relays during AC power failures. Upon restoration of AC power, the outputs will return to the state dictated by the Verbatim Autodialer.

When the Verbatim Autodialer itself is first turned on, and at certain other times when a microprocessor reset occurs, all the outputs will be turned ON for a fraction of a second, before assuming the state dictated by the Verbatim Autodialer. In some installations this could cause problems, and in such cases external time delay relays or other measures may be required to prevent unwanted momentary activation of controlled devices.

MM are the minutes (09 for 9 minutes)

SS are the seconds. Entry of SS is optional.

◆ To clear the time and date back to 00:00:00 on 01/01/89.

935 7 ENTER

D

Printer Options

D.1   Local Data Logger (Local Printer) Option

If your unit was not originally equipped with this option, refer to the separate instructions for installing this option. (See Section 2.3 for LDL parrallel). The local printer will automatically print out each activity that occurs: alarms, acknowledgments, programming entries, inquiry calls, etc.. A time and date stamp will be included with each report. The local printer may be either serial or parallel as discussed below.

D.1.1   Serial Printer Interface

- If your printer was obtained through Raco, it will have been properly configured and tested at the factory...

- If it was purchased independently, refer to the printer's instruction manual to configure it for 9600 baud, 8 data bits, 1 stop bit, and no parity.

- Improper configuration settings will result in "garbage" being printed, or possibly no printing at all.

- The printer must have a "serial" input.

- Printers not specified by or purchased through Raco are not guaranteed to be compatible for this application.

- Connect the DB-25 connector end of a Raco SER-01 cable (the specific type required will depend upon the printer type) to the input connector on the back of the printer.

- Route the small "modular" plug end of this same cable through one of the holes at the bottom of the Verbatim Autodialer, and plug it into modular jack J303 located near the left side of the Verbatim Autodialer, on the vertical VCP circuit card.

- Avoid routing this cable alongside power wiring, and route it so that the front panel circuit board does not pinch it when the door is closed.

D.1.2   Parallel Printer Interface

Some newer models of the VSS Series autodialer have a standard Parallel Printer Interface. This interface is accessed via the parallel printer port located on the inside of the unit front panel door. This printer port is already activated. (See Section F.3)

◆ To activate this port, attach a RACO VPPC-1 Parallel Printer Cable (or equivalent) to the front panel port and to the parallel port on your printer.

Caution:

Attach the parallel printer cable to the VSS front panel port with the "red striped edge" on the right side. If you connect any other way, you may damage the parallel connection on your printer.

D.1.3   Time and Date Setting

Time and date may be set or corrected with the following programming code entries:

◆ To check the date

    941 ENTER

◆ To set the date

    941 MM DD YY D ENTER

    where:

        MM is the month (03 for March)
        DD is the date (07 for the 7th day of the month)
        YY is the year (89 for 1989)
        D is the day of the week (1 for Sunday, 2 for Monday, etc.). Entry of D is optional.

◆ To check the time

    942 ENTER

◆ To set the time

    942 HH MM SS ENTER

    where:

        HH are the hours in military time (13 for 1 PM)

        MM are the minutes (09 for 9 minutes)

        SS are the seconds. Entry of SS is optional.

◆ To clear the time and date back to 00:00:00 on 01/01/89.

    935 7 ENTER

D.1.4   Printout at Regular Intervals

The unit may also be programmed to automatically log (printout) all input conditions at regular intervals, by entering code:

```
943 XXX.X ENTER
```

XXX.X is the desired printing interval in hours, from 0.1 to 999.9.

The first such printout will occur when the period elapses, rather than immediately upon programming.

◆ To check programmed printing interval

```
943 ENTER
```

◆ To turn off regular interval printing function

```
943 0 ENTER
```

◆ To printout All User-Entered Programming

```
944 ENTER
```

E | Data Acquisition/Central Data Logging

The following section describes commands used to configure features of the Data Acquisition/Central Data Logging options. The software is called SCADA.

E.1 | Return To Normal (RTN) Calling

You may program the unit to place calls upon an input returning to its normal state. This applies only to channels which have become acknowledged alarms. Return to Normal (RTN) calls may be placed to people, to a SCADA Central Station or to a Central Data Logger (CDL) printer.

- ◆ There are three modes of calling for RTN calls:
  Mode 0 = Data only
  Mode 1 = Voice only
  Mode 2 = Data and Voice

Return-to-normal (RTN) calls on units NOT configured for SCADA or CDL will always be mode 1, Voice only. RTN calls on SCADA or CDL configured units may be mode 0, mode 1 or mode 2. If mode 1 is set on SCADA/CDL units then data calls to the SCADA Central Computer or CDL printer will be skipped.   (See Appendix K for a discussion of the Return-to-Normal modes of operation.)

- ◆ To program Return to Normal Calls, press:

  ```
  981 V
  ```

  Where V is one of the following:

  - ● 0 = OFF - No return-to-normal calls will be made (Default is OFF)

  - ● 1 = ON - Return-to-normal calls will be made for channels in the ALARM, ACKNOWLEDGED state whose input returns to normal (non-violation).

  - ● 2 = used to manually reset all return to normal channel status - does not affect the return-to-normal calling ON/OFF state above or the calling modes below.

  - ● 3 = Sets return-to-normal mode to mode 0 - makes return to normal calls only in data mode to the SCADA Central Computer or to Central Data Logger Printer Entering this parameter does not affect the RTN ON/OFF state.

- 4 = Sets return-to-normal mode to mode 1 - makes return to normal calls only in voice mode (NO data calls to the SCADA Central Computer or Central Data Logger Printer. Entering this parameter does not affect the RTN ON/OFF state.

- 5 = Sets return-to-normal mode to mode 2 - makes both data and voice calls upon return to normal. Entering this parameter does not affect the RTN ON/OFF state.

E.2   Quick Intercall Delay & SCADA Units Connected to Cellular Phones

This section discusses two different but sometimes interrelating topics regarding SCADA configured autodialer/RTU units. One topic is the different ways in which the intercall delay operates in SCADA units. The other is the ability to interface SCADA units over cellular phones.

Units configured for SCADA operation may place and receive calls via cellular telephones instead of standard dial-up telephone lines. If purchased from RACO, the combination of autodialer/RTU, dial-up adaptor and cellular transceiver is called the CELLULARM™ package.

CELLULARM™ autodialers/RTUs may be used in cases where land lines are not available but cellular service is available in a particular area. CELLULARM™ units function nearly identically to land line based dial-up interfaced units.

❖ *Exceptions*

The *intercall delay* (time between calls) functions somewhat differently on SCADA units than on non-SCADA units. On SCADA units a shortened intercall delay takes effect under certain circumstances. These circumstances are:

1) There is a fixed, non-adjustable intercall delay of 35 seconds between:

a) multiple attempts at data calls to the SCADA Central Computer.

b) the last personnel (voice) number and "wrapping around" to the data number again.

2) The is also a special adjustable quick intercall delay taken only between the progression from data calls to the first personnel (voice) call.

The quick intercall delay is set to 35 seconds by default. The usual intercall delay taken between between one personnel number and the next personnel number is 2.0 minutes by default.

The purpose of the quick intercall delay is for more expedient in transitioning from data calls to voice calls. However, in certain cases the quick intercall delay may actually interfere with attempts to call the autodialer/RTU for acknowledgement. This is especially true for cellular interfaced units.

Cellular phone calls often take substantially more time to connect to the called party. Therefore, on cellular interfaced units you may need to lengthen the quick intercall delay to allow a longer time "window" for acknowledgement calls from the SCADA Central Computer.

◆ To set the quick intercall time, press:

    919 V

    Where V is 35 to 999 secs.
    Default is 60 secs.

Note:

Available ONLY on units with firmware revision between V1.36 to V1.99. Applies only when the autodialer/RTU is advancing to the first voice number. Does NOT apply to data call retries, calls between successive voice numbers or wrap-around from last voice number to data calls again.

E.3   Acknowledgment Calls To The SCADA Central Station

Units configured for SCADA operation may be programmed to make calls to the SCADA Central Computer to report alarms which were acknowledged by personnel. Alarm Acknowledgement which occurs during calls to personnel or when personnel call the unit will prompt a sequence of Acknowledgement calls made to the SCADA Central Computer. The purpose of Acknowlededment calls is simply to log the event of alarms being acknowledged by personnel.

◆ To program the unit for Acknowledgement Calls, press:

    982 V

    Where V is one of the following:

    ● 0= OFF - (Default)

    ● 1= ON - Make Acknowledgment calls

    ● 2= resets all alarm acknowledgement call status - inhibits all
         further attempts for this alarm acknowledgement occurence.

E.4 Modem Automatic Speed Select for SCADA units

Automatic speed selection of 1200 baud or 300 baud may be programmed ON or OFF. When programmed ON, the unit will attempt to make data calls at 1200 baud first. If 1200 baud cannot be automatically negotiated with the SCADA Central Computer's modem, fallback to 300 baud will occur. When programmed OFF, the modem speed will be determined by the 984 command (below).

❖ *Exception*

In some cases, 1200 baud may not provide reliable data communications due to phone line noise, etc. If necessary, use this command to force the unit's modem to use one specific speed only.

◆ To program the Automatic Speed Selection, press:

983 N

Where N is 1 (ON) or 0 (OFF)
Default is 1

🖉 *Note:*

This command is not applicable to Central Data Logger units.

E.5 Modem High Speed or Low Speed Selection

When the unit is programmed with Automatic Speed Select OFF use this command to fix the modem speed at either 1200 or 300 baud.

◆ To program the (non-Automatically selected) Modem Speed, press:

984 N

Where N is 1 (1200) or 0 (300)

🖉 *Note:*

When Automatic Speed Select is set to ON (command 983) this command has no effect on modem speed.

E.6 Number of Data Call Attempts Before Tripping a Communications Alarm

The autodialer can make multiple attempts to communicate in data mode to the SCADA Central Computer or to the Central Data Logger (CDL) printer. When all attempts to establish data communications have failed a Communications Failure Alarm will be tripped. If the unit is able to make voice calls (i.e. more than just the 1st phone number programmed) the Communications Alarm will be announced to personnel along with the usual alarm and status report messages. When a calling sequence is ended, for example by alarms getting acknowledged, the Communications Alarm is cleared.

If the Communications Alarm persists and successful data communications to the SCADA Computer or CDL printer is eventually established a Communications Alarm message will be logged and/or printed. After a Communications Alarm is logged and/or printed it will be cleared.

◆ To set the number of attempts before tripping a Communications Failure Alarm, press:

985 N

Where N is 1 to 10
Default is 3

Note:

If Automatic Speed Select is set ON the unit will actually make twice the programmed number of attempts before tripping a Communications Alarm; N attempts at 1200 baud and N attempts at 300 baud.

E.7 Answer Mode - VOICE ONLY or DATA-TO-VOICE

Most calls made to an autodialer/RTU will be polling calls from the SCADA Central Computer. By default the autodialer/RTU will be expecting a data call and answer with a modem answer tone. This is called DATA-to-VOICE answer mode. Personnel wishing to call an autodialer/RTU to get voice reports can just wait through the modem answer tone for a few seconds for the unit to fall back to voice mode and begin speaking.

The autodialer/RTU may also be programmed for VOICE ONLY answer mode. In VOICE ONLY mode the unit will never answer with a modem answer tone and voice annunciation will begin immediately upon answering.

Programming an autodialer/RTU for VOICE ONLY defeats polling calls from the SCADA Central Computer since the unit will only answer by voice and not assert a modem answer tone. However, VOICE ONLY answer mode does not affect data calls made FROM the RTU to the SCADA Central Computer or CDL Printer.

If your SCADA Central Computer is not operational you may wish to program the answer mode to VOICE ONLY. Customers who purchase the SCADA option for their autodialer/RTUs in advance of installing their SCADA Central Computer should use this programming command to make the unit function as a non-SCADA networked autodialer. In addition to programming the answer mode to VOICE ONLY make sure there is no 1st phone number programmed. (The 1st phone number does data only calls to the SCADA Computer.)

◆ To program the Answer Mode, press:

986 N

Where N is 0 (default) for DATA-to-VOICE or 1 for VOICE ONLY

Note:

Does not apply to Central Data Logger (CDL) units. CDL units never receive polling calls and always answer in VOICE ONLY mode. The 1st phone number must be programmed to call the CDL printer.

E.8   DATA/VOICE Autocall Calls for SCADA & Central Data Logger

Autocall calls may function substantially the same in SCADA and Central Data Logger (CDL) units as in standard, non-SCADA units. However, different operating modes of Autocall may be programmed in addition to the usual Autocall functionality.

Exceptions:

● Autocall calls may be restricted to only calling the SCADA Central Computer or CDL printer. Also, Autocall calls may be restricted to calling just the personnel numbers programmed into the unit (i.e. no calls to SCADA Computer of CDL printer). And finally, Autocalls may call both personnel numbers and SCADA Computer or CDL printer numbers.

● Autocall calls made to the SCADA Central Computer or CDL printer result in logging and printing of the Autocall session. No acknowledgement is required or is possible.

● Autocalls calls made to personnel numbers will be standard voice annunciation sessions.

◆ To program the DATA/VOICE Autocall mode, press:

`987 N`

Where N is 0 to 2

- 0 = (default) Autocall Calls made to SCADA Central Station only
- 1 = Autocall Calls made to personnel numbers only
- 2 = autocall Calls made to all numbers

F   MODBUS Interface

This section covers the PLC specific functions of the Verbatim autodialer. It is assumed the reader is already familiar with the basic operation of the Verbatim autodialer. If this is not the case, please take the time now to review the previous sections of this manual.

In the discussion that follows, there are many technical terms specific to PLC operation which may be unfamiliar to those not experienced with PLCs. Please refer to the Glossary section for definition of these terms.

F.1   Overview

The Verbatim autodialer allows direct connection to Programmable Logic Controllers (PLCs) via a serial interface or other network connection. No direct connections from PLC output points to the Verbatim input points are required in order to monitor or annunciate for the PLC. Also, in most cases, no changes in the PLC's ladder logic program are required.

In addition, the autodialer allows connection to any non-PLC equipment compatible with supported PLC network protocols. An example of this application is a SCADA or DCS system running software configured with a PLC network protocol driver module. The autodialer does not care if the devices are a real PLC network or a computer mimicking a PLC network. However, master/slave protocols will require the autodialer to assume the role of master.

The Verbatim autodialer may read or write any data register within the PLC network. The data registers accessed by the autodialer may be in a single PLC or may be arbitrarily spread over a number of PLCs on the network.

Obviously, the number of data table locations in even a single PLC may number into the thousands. To relieve the user of having to deal with a huge number of precisely notated data table addresses, the autodialer uses the artifice of Remote Channels (RCs). Simply stated, RCs are nothing more than a kind of speed-dial number like you might set up on your telephone. Once the full number sequence has been entered into memory, a shorter sequence of numbers may be used as an abbreviation for the long sequence stored in memory.

Through the Verbatim autodialer, the user associates the address of a PLC data register to a RC. Thereafter, the RC becomes a shorthand designation for that data register's address. Any register, whether digital, analog, or other miscellaneous type, may be associated with an RC.

Data registers may actually be spread over a network of PLCs. The autodialer does not care if RC #2 is associated with a data register in a different PLC from the data register associated with RC #1. Therefore, when programming the autodialer to associate a PLC data register with a RC, the node number of the PLC may be included in the description for the location of the data register.

Additionally, the amount of User Recorded Speech Memory is increased appropriately for each Remote Channel configuration. These different quantities of memory yield total message recording times consistent with each of the available RC configuration options.

F.2   General Operation

This section describes configuring the Verbatim autodialer to continuously monitor any data register on the PLC network. Additionally, under user command, the autodialer may read and write to any PLC data register. The autodialer will only perform these functions after it has been properly installed, connected to the PLC network, and programmed.

F.2.1   Associating a Remote Channel with a PLC Data Register

In order for the Verbatim autodialer to read, write or continuously monitor a PLC data register the address of the data register must be associated with a Remote Channel (RC). After a data register address has been associated with a RC the Verbatim autodialer then knows where to direct queries for the contents of a data register on the PLC network.

The data register's complete address description is called the *net address*. See section F.4.2 for information about net address formats.

Once a data register's net address has been associated with a RC, the alarm criteria may then be programmed. Only after an alarm criteria is entered will the PLC data register be scanned continuously by the Verbatim autodialer. When the content of the data register changes to match the alarm criteria, the RC associated with the data register goes into the alarm state.

RCs in the alarm state behave in exactly the same way as Verbatim autodialer internal or "physical" channels.

The Verbatim autodialer may be called at any time to receive an annunciation of the status of channels monitored. PLC registers associated to RCs may be read and written over-the-phone. Additionally, programming activities may be performed via the buttons on the user's phone.

When an operator calls the autodialer, the status of RCs will be reported and the user may reprogram parameters of RCs over-the-phone. When accessing the autodialer over-the-phone, all user functions that could result in the alteration of ANY data register can be made subject to correct entry of an access code.

Alarm criteria, trip delays and alarm call groupings are established in a fashion similar to normal physical channels. RCs associated with PLC discrete data registers support the normally open or closed criteria. RCs associated with PLC analog or integer data registers support high and low set points.

Associating a net address to a RC implicitly establishes the channel as digital or analog. For RCs, the default alarm criteria for both digital and analog channels is 'disarmed'. Attempts to set analog criteria on digital channels, and vice versa will cause an error announcement. If the net address for an RC already configured is re-programmed so that the type (analog or discrete) of data changes, the criteria will automatically be set to 'no alarm'. There is no run-time or totalizer capability for any of the RCs.

At the front panel, the LED channel status display shows all Remote and Physical Channels. Since the count of total Physical and Remote channels is greater than the usual 32 status LEDs, channels are combined into groups so that the status of all channels may be observed.

F.3   Connecting to the PLC Network

In most cases, the cable supplied by RACO will already be connected at the Verbatim autodialer end to a modular jack inside the unit. If this is not the case, please refer to the drawings in appendix H.

Note:

Refer to the cable drawings in the appendices to identify your type of PLC network connection.

Electrical Connection Diagram for PLC Network Connection

VSPE Speech Card

NET2

J303

NET1 →

J307

VCP Card

Expansion
Input Slot

1 2 3 4 C C C C C

R G Y B

WHT BLK GRN

Phone
Connections

Connect grounded
120 VAC power here

Connect unpowred contact
inputs here. C terminals
are common return.
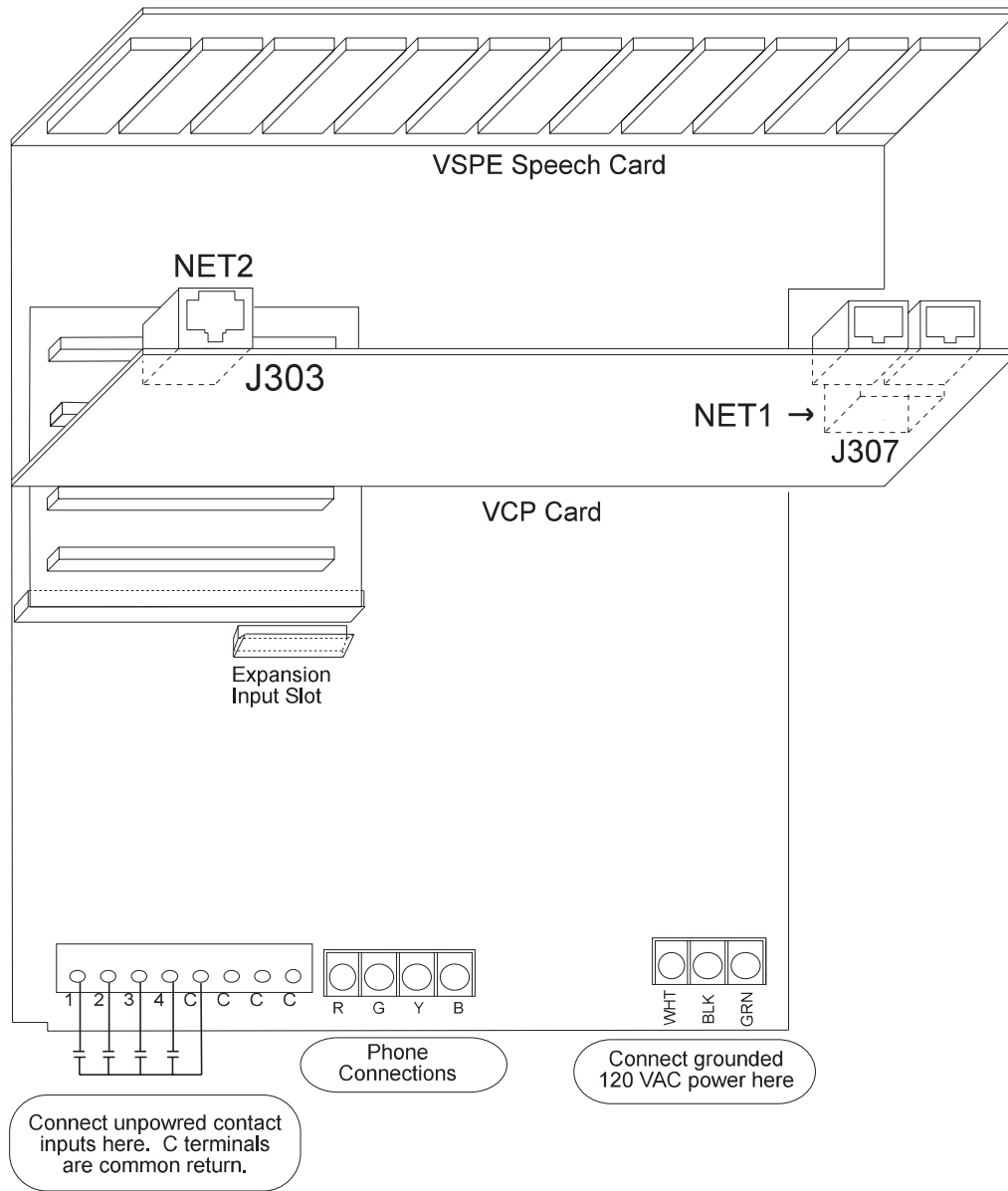
Cable connections for various PLC network protocols	
NET1	NET2
Modbus	NONE
Modbus	Serial LDL

F.3.1   Before Calling Technical Service Assistance

Programmable Logic Controllers have been used for several decades for process control applications. There is a large body of knowledge germane to using PLCs. RACO assumes that the user needing to monitor a PLC network with the Verbatim autodialer is already familiar with the PLCs being used for the application. It may also be assumed that the user has access to a PLC expert to help accurately identify the addresses of a PLC data register.

Before consulting the RACO Customer Service Department or your local RACO Representative for assistance in installation and configuration, please insure that the PLC details described in the next paragraph are readily available.

The user must have access to the PLC ladder logic program listing and know the location and properties of all data table locations which will be monitored by the Verbatim autodialer. Also the user must be able to determine the basic operating parameters of the PLC communications channel. This means being able to configure the PLC's parameters such as the node address, baud rate, data bits, parity and stop bits. Setting these parameters at the PLC may require the use of a PLC Hand Held Terminal, or a Personal Computer running PLC programming software available from the PLC's manufacturer.

The MODBUS communications protocol is a Verbatim autodialer firmware option and must have been properly configured at the factory. Parameters concerning link, frame and packet-level interfaces are configurable in the field.

F.4   Programming for Remote Channels

F.4.1   Remote Channel Programming Overview

The Remote Channels (RCs) behave fundamentally the same as their physical channel (PC) counterparts. Procedures for programming and recording messages for remote channels are very similar to the procedures described in the previous sections of this manual. There are some differences, however. These differences will be discussed in this section.

In general, all Verbatim autodialer commands that operate on remote channels will begin with the digit '4'. Commands that perform functions similar to non-Remote Channel specific commands use the same key sequence, preceded by the digit '4'.

◆ For example: to interrogate the alarm status for Physical Channel number 1 1, enter the command:

```
0 1 1 then <ENTER>
```

◆ To interrogate the alarm status for Remote Channel number 1 1 enter the command:

```
4  0  1  1  <ENTER>
```

The existing commands that apply globally to all channels will apply uniformly to the RCs as well. Specifically, these codes are: 900, 902, 904, 917N, 923N, 927N, 930, 935N, 966N, 9403, 9404. The 'CHECK STATUS' function, either from the front panel or over-the-phone, reports channel status for all channels both physical or remote.

The sub-sections that follow itemize all programming key sequences available to the user. A short description of each function is provided, together with longer notes when necessary. If a programming key sequence is not recognized by the Verbatim autodialer, or any parameter is invalid, the Verbatim autodialer simply says "Enter program code".

All commands that use a full network address may omit the network ID and/or the node address, in which case the default values (codes 4910, 4911) will be used. The user should then also omit the '*' delimiter associated with the omitted component. If the user does omit a field then all preceding fields must also be omitted. (See Section F.4.2 for more information on net address formats.)

The RCs on any specific network may be globally inactivated without erasing any of their configuration. An individual RC may be inactivated without erasing the network address by setting the no alarm or disarmed criterion. In this case, it will be necessary to reprogram the criterion in order to re-activate the channel.

F.4.2   Associating a Net Address with a Remote Channel

Note:

Remember that * = POINT when referenced in this manual.

The most important operation in configuring your Verbatim autodialer is associating a data register's net address to a RC. The net address is actually part of the complete command sequence entered by the user when programming the association of a RC and a data register. Consider the following example. Suppose the Verbatim's NET 1 is configured for the Modbus protocol and node 2 on that net is a PLC. To associate RC #01 with the 16 bit data register whose address is 40001 you would enter the following command sequence:

```
4  5  0  1  *  1  *  2  *  40001  *   then ENTER.
```

The first 4 digits from the above example are the programming command for RC association or RC alarm criteria. Thus, the sequence 4 5 0 1 refers to programming for RC #01. The net address portion of this command sequence is the remaining digits plus the '*' used for delimiting. The 16 bit data register has the address of 40001. The PLC's node number is 2 and the Verbatim's NET is 1.

The general net address syntax has the following form:

> * NET * node * address *

   where:

   NET is NET Number - 0, 1, or 2

>   Net 0 is Physical Channels

>   Net 1 is Modbus

>   Net 2 is serial printer

   node is PLC's Node Number

>   Modbus - 1 to 256

   address is Data Register Address - may be numbers. Syntax for the register
       address is very specific to the PLC brand.

In the previous example, certain simplifications were made. Simplifications in the net address may be made by using programmed defaults. The usual default for the Verbatim's NET number is 1. The default node number may be set to any value allowed by protocol. Therefore, in the previous example, the entry may be simplified further to the following:

> 4 5 0 1 * 40001 * <ENTER>

F.5   General MODBUS Requirements

This appendix provides information specific to Modicon's Modbus network. There are sections on PLC data table addressing, net address format, and global data. The paragraphs here describe general requirements and hints.

Modicon PLCs: Be sure that the DEF/MEM switch on compact 984 PLCs is set to 'MEM'. Otherwise, it will be impossible to change network communications parameters from the defaults.

Modbus Networks: All nodes on a Modbus network must use RTU protocol. There can be only one master on the network. The master must be the Verbatim Autodialer.

Use the link-level timer (command 4908) to insert a delay between query/response cycles. This will only be necessary if talking to a slow device.

F.6 | PLC Address Format

The table below shows how to address specific objects in Modicon PLCs. 'x' represents a digit in the range 0-9. The Verbatim autodialer User Interface will accept any values for 'xxxx'. If a value is out of range for a particular PLC, that PLC will issue an error diagnostic, which will be passed on to the user. This is to say, the remote PLCs enforce the validity of PLC addresses on their own.

Notes:

◆ Extended memory access is not currently implemented.

◆ Inputs may be written by the Verbatim autodialer, but will most likely be overwritten immediately by the PLC when it does its next scan of the ladder logic.

◆ The PLC memory protect switch will prevent a coil or register from being written.

Addressing Modicon PLC Objects	
Address	*Description*
0xxxx	Coil (1-bit Output) number xxxx
1xxxx	Input point (1-bit) number xxxx
3xxxx	Input register (16-bit) number xxxx
4xxxx	Output (holding) register (16-bit) number xxxx

F.7 | Potential Effects of Network Communications Failures

Physical channels only go into alarm state when their input matches programmed alarm criteria. Remote channels also support these criteria-based alarms.

It must be remembered however, that the channel data compared against the criteria must first be received from the network being monitored. Since the remote channel's data is being transferred over a network, alarming may be affected by various network failures.

If such a failure occurs, and the data cannot be received, it is no longer possible to reliably compare the channel against the alarm criteria. As a result, the remote channels will enter the alarm state even though their channel data may not have changed. The term "COMALARM" is used to distinguish this sort of alarm scenario from the criteria based alarms.

More precisely, an RC will register a COMALARM whenever the following two conditions are met:

1. The RC is configured with alarmable criteria.
2. All attempts to poll the RC have failed for the COMALARM trip delay period (code 4907).

For status reports, alarm calls, LED indicators and acknowledgments, the COMALARMs are treated in the same way as criteria alarms. They are annunciated in the following manner:

1. The COMALARM message will override any criteria alarm message.
2. The COMALARM message is not user recordable. It always consists of "Remote Channel Number ZZ Communication Failure Code XXX."

The failure code annunciated by the Verbatim autodialer serves as an aid in troubleshooting the network problem causing the failure. They are listed in section F.17.

To further assist in network troubleshooting several diagnostic commands are provided. It is possible to:

1. Perform a complete network self-test.
2. Read the communications status for any RC.
3. Read and reset the COMALARM count for any RC.
4. Read a list of the last 10 COMALARM codes on the network.
5. List all RCs currently in the COMALARM state.
6. List the nodes (PLCs) on the net that have all of their RCs in the COMALARM state.

The Verbatim autodialer provides several other features to help the user with the inevitable complexities of a networked environment. One is the ability to suspend/resume all queries initiated by the Verbatim autodialer without altering any RC programming. The status reports will inform the user when a network is globally disabled in this fashion.

Another diagnostic tool is the front panel Network Status Indicator LED for each network. Each LED is like a channel which monitors the overall health of each network. This is accomplished by accumulating all the COMALARM codes into a single value. The value is compared against a threshold. See code 492 in Section F.16 for details.

If the threshold is exceeded, then the LED will blink and status reports will annunciate the current value of the network status code. If the network has been globally disabled the LED is off. Otherwise the LED is steadily ON, indicating the network is operating within programmed parameters. See Section F.17.

The Verbatim autodialer keeps a count of the threshold violations. Programming commands are available to announce and reset these counts. It is also possible to announce the current value of the status code and set the threshold to any severity level. See section F.16 for details.

F.7.1   Abbreviations and Typographic Conventions

In the following sub-sections, the verbal response expected from the Verbatim autodialer will be given following the program code that the user is to enter for each programmable function. This verbal response will be differentiated by being in italics in the following way: *Remote Channel Number TEN, Alarm, Acknowledged*. The following table describes the abbreviations used in the code listings and elsewhere in this document:

Code Listing Abbreviations	
Code	*Description*
ZZ	Any two-digit remote channel number, from 01 to 96, depending on the hardware configuration.
yy	Same as above
N	An integer from 0 to 65535, or as specifically noted.
net	The network ID: 1 to 5
node	The node address, as appropriate for a given network.
addr	The PLC address, as appropriate for the given PLC. (Details on specific PLCs and protocols are found in the appendices.)
DN	A two-digit code indicating a specific phone number.
V	An arbitrary floating point number of the form: 1.23. If 3 or more digits to the right of the decimal point, V is truncated to the nearest .005.
*	Same as 'point' key
#	Same as 'minus' key

F.8   Remote Channel Status, Reading, and Writing

4 0 ZZ

      Function   Read alarm status of Remote Channel ZZ. (See code 49402 for Network Alarm Status)

      Response   *remote channel <ZZ> <alarm status>*

If ZZ=00 in the following two commands, then the command applies to the net address specified by the most recent 4500 command. In that case, the "remote channel ZZ" responses are replaced with the explicit net address.*

*4 0 ZZ **

      Function   directly read PLC address associated with Channel ZZ

Response   *remote channel <ZZ> is <N>*   or
                                  remote channel <ZZ> communications error <code>

*4 0 ZZ * N*

          Function   write value N to PLC address associated with channel ZZ

          Response   *remote channel <ZZ> set to <N>* or

                                    remote channel <ZZ>communications error <code>

Notes:

◆ This command will execute without any "are you sure?" checking. Users must make sure the address and value being written will not create an unsafe condition.

◆ Writing a value greater than 1 to a digital or net address will result in the value 1 being written.

F.9   Remote Channel Message Recording and Reviewing

4 1 00 net

          Function   Record network ID message for specified net. Append a '*' to the command to return to default network ID message.

          Response   whatever was recorded or the default message: *NET <net>*

Notes:

◆ For the following 2 commands, N is optional. If present, it must be in range 1-4 and sets the recording rate for that particular message. User Messages for the remote channels are used in the same way as user messages for the physical channels.

◆ For analog channels, the alarm message is always the default: "<high> <low> set-point exceeded". The user messages form a preamble and epilogue for the data value recitation during alarm messages. The default epilogue for remote channels is null.

4 1 ZZ N

          Function   Record channel ZZ alarm/preamble message. *N*, if present, specifies the recording rate to use. If *N* is not present, the default recording rate is used. Append command with a '*' or '0' to return to default alarm message

          Response   whatever was recorded or the default message: *remote channel <ZZ> alarm*

4 2 ZZ N

          Function   Record channel ZZ normal/epilogue message. *N*, if present, specifies the recording rate to use. If *N* is not present, the default recording rate is used. Append command with a '*' or '0' to return to default normal message.

Response whatever was recorded.
The default message for discrete channels is: *remote channel <ZZ> normal* . The default message for analog channels is silence (no epilogue).

4 3 ZZ

Function Review both messages for channel ZZ. If ZZ is 00 then all network ID messages are reviewed.

Response whatever was recorded or the default messages.

F.10 Remote Channel Configuration

Commands in the series "4 5 ZZ," are used for Remote Channels as follows:

◆ Associate a PLC net address to a Verbatim Remote Channel. This step tells the Verbatim autodialer where on the PLC network to look for the point to be monitored.

◆ Establish the alarm criteria for a Remote Channel. This step tells the Verbatim autodialer what constitutes an alarm condition in the monitored PLC point.

◆ Link a Remote Channel to a phone number or group of phone numbers. When an alarm occurs in the monitored PLC point only the phone numbers linked to the Remote Channel will be called. (By default, all phone numbers will be called.)

Note that you must first assign a net address to a Remote Channel before any alarm criteria may be configured.

F.10.1 Assigning PLC Net Addresses to Remote Channels

Command "45ZZ" associates a remote channel with a network address and, as such, is essential for activating an RC. When issued, this command will cause the Verbatim autodialer to immediately access the specified network address. Any communications errors at this point will generate the message: *communication error code <diagnostic>*. Any command in this section will support ZZ=00.

If the data type (analog, discrete) of the new address is incompatible with the existing alarm criteria, then the NOALARM criteria will replace them. Otherwise, the existing criteria are untouched. The Verbatim will announce this action. Any links to other RCs are always preserved.

Notes:

See section F.4.2 for an overview of net addresses.

4 5 ZZ *

    Function   Read the network address which is currently associated with RC number ZZ.

    Response   *remote channel <ZZ> NET <net> NODE <node> ADDRESS <addr> or*
                       communication error code <diagnostic>

4 5 ZZ * net *node *addr *

    Function   Associate RC <ZZ> with specified network address. Does not alter any other parameters.

    Response   *remote channel <ZZ> NET <net> NODE <node> ADDRESS <addr> or communication error code <diagnostic>*

F.10.2   Remote Channel Alarm Criteria

4 5 00

    Function   The criteria for all "eligible" RCs are set so that the channel is normal in its current state. An RC is NOT eligible if any of the following conditions apply:
                       Channel's net address type is analog or floating point
                       Channel has NOALARM criteria already configured
                       Channel is already the destination channel in a linked pair

    Response   *present input condition is programmed to be normal for all remote channels*

4 5 ZZ

    Function   Read alarm criteria for channel ZZ

    Response   *remote channel <ZZ> <criteria> or remote channel <ZZ> no net address programmed*

4 5 ZZ 0

    Function   Disarms <ZZ> (i.e. eliminates all status reporting for the channel). All other configuration information is preserved.

    Response   *remote channel <ZZ> disarmed*

4 5 ZZ 1

    Function   Set channel number ZZ alarm criteria to normally 1.

    Response   *remote channel <ZZ> normally 1*

4 5 ZZ 2

    Function   Set channel number ZZ alarm criteria to normally 0.

    Response   *remote channel <ZZ> normally 0*

4 5 ZZ 3

    Function   Set channel number ZZ alarm criteria to no alarm. The channel is still listed in all status reports.

    Response   *no alarm condition for remote channel <ZZ>*

4 5 ZZ 4

    Function   Set channel number ZZ to NETERR mode — alarm if and only if a communications alarm occurs.

    Response   *remote channel <ZZ> alarm on communication failurec.*

4 5 ZZ 5 N

    Function   Set channel number ZZ analog low alarm set point to N. Use
                       N = -0 to clear. Omit N to read current set point value.
    Response   *remote channel <ZZ> low set point is <N>*

4 5 ZZ 6 N

    Function   Set channel number ZZ analog high alarm set point to N. Use
                       N = -0 to clear. Omit N to read current set point value.
    Response   *remote channel <ZZ> high set point is <N>*

F.10.3   Linking Remote Channels to Phone Numbers

4 5 ZZ 9

    Function   Read RC number ZZ alarm call grouping linkage.
    Response   *remote channel <ZZ> calls <list>*

4 5 ZZ 9 DN

    Function   Link RC number ZZ to phone number list DN
    Response   *remote channel <ZZ> calls <list>*

4 5 ZZ 9 *

    Function   Clear all RC number ZZ phone number linkages
    Response   *remote channel <ZZ> calls all phone numbers*

Note:

Linking Remote Channels to phone numbers is different than linking one
Remote Channel to another Remote Channel. The latter is discussed in
section F.12.

F.11   Alarm Trip Delays

The alarm trip delay commands here apply only to criteria violations. See code
4907 for the COMALARM trip delay. See codes 4921 and 4922 for network
alarming.

4 6 ZZ

    Function   Reads channel number ZZ alarm trip delay.
    Response   *remote channel <ZZ> alarm trip delay is <v> seconds*

4 6 ZZ *

    Function   Sets channel number ZZ alarm trip delay to 2.0 seconds.
    Response   *remote channel <ZZ> alarm trip delay is 2.0 seconds*

4 6 ZZ V

    Function   Sets RCZZ individual alarm trip delay to V.
    Response   *remote channel <ZZ> alarm trip delay is <V> seconds*

F.12 RC Linking/Network Bridging

The commands detailed in this section allow data to be passed between any two remote channels. Applications include passing data between nodes on compatible and incompatible networks, updating status registers in DCS systems, or exporting the Verbatim physical I/O to remote nodes. One channel acts as a data "source" and the second as a data "destination". Data is read from the source channel's net address and then written to the destination channel's net address once per scan loop. The destination and source are said to be "linked".

F.12.1 Linking Modes

The linking functions can work in one of two modes. In Data Link mode, the data read from the source is written directly to the destination. In the absence of communication problems, each destination channel is updated with a frequency equal to the Verbatim scan time. If there is a communications problem reading data from the source, then nothing is written to the destination.

In Alarm Link mode, the source channel data is first interpreted against the configured alarm criteria. If any alarm condition exists at the SRC channel, then a 1 is written to the DST. Otherwise, 0 is written. Any communications problem reading from the source will be reflected.

For both modes, the reads and writes are attempted once per scan loop. Any required protocol conversions are handled automatically. Any problems getting data for or writing data to the destination will appear as communications errors on the source or destination RCs. The data read or written is subject to RC initialization and the worst-case scan loop latencies. See Section F.7 for details.

F.12.2 Commands & Limitations

The commands below establish the channel linkage configurations. There are several rules and restrictions as follows:

1. Both the source and destination RCs must already be configured with net addresses. If this is not the case, then an error message is given. The net address for either channel in a linked pair may be reconfigured at any time, without altering the link.

2. If the RC specified as source is already configured as destination for any other linked pair, then an error message is given. Similarly, if the RC specified as destination is already configured as source for any other linked pair, an error message is given. This prevents "chaining" of linked pairs.

3. If the RC specified as destination is already configured as the destination for another source, then the new configuration supersedes the old one. No error message is given. This prevents the configuration of multiple sources for a single destination. The user must take care that distinct destination channels do not have identical net addresses. Multiple destinations for a single source are allowed.

4. If either the source or destination RC are "DISARMED", then its criteria will be reset to "NETERR". This alteration will be announced. All other existing criteria are accepted without alteration. Once a link is configured, any attempt to DISARM either the source or destination results in an error message. All other criteria modifications are allowed. Note however that it rarely makes sense to have destination criteria of anything other than "NETERR" or "NOALARM".

5. The linking of channels with different data types is allowed. For example, it is OK to have a discrete source linked to an analog destination. Special data conversion rules apply and are presented in the table below.

Conversion Rules		
Source	*Dest.*	*Destination Value*
16 or 32 bit	1 bit	0 if source is 0, otherwise 1
1 bit	16 bit	0 if source is 0, otherwise 1
1 bit	32 bit	0.0 if source is 0, otherwise 1.0
16 bit	32 bit	floating point number with integer value equal to the source value
32 bit	16 bit	garbage: least significant 16 bits of the source value, however encoded

6. If the destination channel is read-only (i.e. a PLC input register) then a COMALARM will result.

*4 7 ZZ * YY*

    Function   Establishes an alarm mode link with RC ZZ as the source channel and YY as the destination channel. Channel ZZ's alarm status will be written to YY's net address once per scan loop. A 1 is written if any alarm exists, otherwise zero.

    Response   *remote channel ZZ alarm link to remote channel YY* or, *remote channel (ZZ,YY) not programmed*, if no net address, or, *remote channel (ZZ,YY) already linked*, if multiple sources, or link chain would result.

*4 7 ZZ * YY **

    Function   Establishes a data mode link with RC ZZ as the source channel and YY as the destination. The value from ZZ's net address is written to YY's net address once per scan loop.

> Response   *remote channel ZZ data link to remote channel YY* or,
> *remote channel (ZZ,YY) not programmed*, if no net address, or,
> *remote channel (ZZ,YY) already linked*, if a link chain would
> result.

The commands listed below report or clear existing link configurations. When a link is cleared, the net address and criteria for both channels are untouched. Operation of the source channel is unchanged. In fact, the only change is that the destination channel will no longer write any data to the remote address. Rather, it begins to read the remote address and will alarm according to the existing criteria, just like the source or any other remote channel.

4 7 ZZ

> Function   Reports all linked channel pairs using ZZ as either source or destination channel. If ZZ is 00, then the set of all linked channel pairs is listed.
>
> Response   *remote channel <ZZ,XX> <data,alarm> link to remote channel <YY,ZZ>*

4 7 ZZ-0

> Function   Clears all linked channel pairs using ZZ as either source or destination channel. If ZZ is 00, then the set of all linked channel pairs is cleared.
>
> Response   *remote channel ZZ link to remote channel YY is cleared* or, *remote channel ZZ is not linked*, if no such link existed, or, *all remote channel links cleared*, if ZZ is 00.

*4 7 ZZ * YY-0*

> Function   Clear specific link using ZZ as source and YY as destination.
>
> Response   *remote channel ZZ <data,alarm> link to remote channel YY is cleared*. or, *no link*, if such a link does not exist.

F.13   Communications Parameters

All commands in this section allow the 'net' parameter to be omitted, in which case the default network is used. If either 'net' or the default net (see code 4910) is 0, the command has no effect. If the '*' is omitted, then the current setting is spoken. If '*' is present and 'N' omitted, then the parameter is set to it's default. If 'N' is present, then '*' must precede it.

If the protocol currently configured on any specific net forbids alteration of a parameter, then the command is ignored and the "Enter program code" message is announced. The defaults for each parameter are also network dependent.

4 9 00 net

> Function   Announces the current setting of all applicable parameters.
>
> Response   See all codes below

*4 9 00 net ***

Function	Resets all applicable parameters to their factory default.
Response	See all codes below

F.13.1   Serial Port Parameters

*4 9 01 net * N*

Function	Read/set baud rate for net to N. If present, N must be: 50, 75, 110, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600, 14400, 19200, 28800, 57600. Any other values are ignored.
Response	*<net ID message> baud rate is <N> .*

*4 9 02 net * N*

Function	Read/set data bits for net to N. If present, N must be one of: 5, 6, 7, or 8. Any other values will be ignored.
Response	*<net ID message> data bits are <N>*

*4 9 03 net * N*

Function	Read/set stop bits for net to N. N must be 1 or 2. Any other values will be ignored.
Response	*<net ID message> stop bit is <N>*

*4 9 04 net * N*

Function	Read/set parity for net. If present, N=0 is NO parity, N=1 sets ODD parity and N=2 sets EVEN parity for net, N=3 for SPACE parity, N=4 for MARK parity. Any other values will be ignored.
Response	*<net ID message> parity is <even, odd, space, mark>*

F.13.2   Network Parameters

*4 9 05 net * N*

Function	Read/set local node address for net to N. The allowable range for N is protocol dependent. Illegal values are ignored.
Response	*<net ID message> node number is <N>*

4 9 06 net

Function	Read protocol for network.
Response	*<net ID> protocol is <current protocol>*

F.13.3   Timing Parameters

*4 9 07 net * V*

Function	Reads/sets communications alarm trip delay. Communications errors for all RCs on net must persist continuously for V seconds before a COMALARM violation is registered.
Response	*<net ID> communication alarm trip delay is <V> seconds*

*4 9 08 net * N*

    Function   Reads/sets link-level timer. Units are milliseconds. Usage of this timer is protocol dependent and described in the appendices. In general, this parameter is the maximum time the Verbatim will wait for the response from a communications co-processor or interface module.

    Response   *<net ID> link limit time is <N> mseconds*

*4 9 09 net * N*

    Function   Reads/sets application-level timer. Units are milliseconds. This value is the maximum amount of time the Verbatim will wait for another node to respond to any command.

    Response   *<net ID> message limit time is <N> mseconds*

F.14   Miscellaneous

4 9 *

    Function   Repeats the previous command which began with a '4'. It is possible to add key strokes after the * and before enter, subject to limit of 65 total keystrokes. The added key strokes are not concatenated for subsequent 49* commands.

    Response   appropriate to actual command resulting

In the following, N may be omitted, in which case the current value is only announced, not altered. The values apply to all commands expecting a net or node value to be specified. They allow fewer keystrokes to be used when programming net addresses and other commands.

4 9 10 N

    Function   Read/set default net number to N. N must be 0-5, consistent with the hardware options.

    Response   *Default net address network is N*

4 9 11 N

    Function   Read/set default node number to N. Allowable values for N are protocol dependent.

    Response   *Default net address node is <N>*

F.15   Clear-Out Operations

*4 9 3 * net*

    Function   Globally disables/enables RC polling on the specified network. Acts as a toggle, so two consecutive entries cancel each other out. No RC programming is erased.

    Response   *<net ID> communication is (off, on)*

4 9 35 4

    Function   Clears all RC user recorded messages.

Response   *All remote Channel messages cleared*

4 9 35 5

    Function   Clears all RC configuration data: network addresses, criteria, links.

    Response   *All remote channels reset*

4 9 35 8

    Function   Clears out all communications failure codes and counts.

    Response   *Communication error count overall reset*

4 9 35 9

    Function   Does all the 4935 functions. NOTE, ONLY the RC configuration is affected.

    Response   *Verbatim RC programming requires Firmware Revision*

F.16   Diagnostic Readouts

In the following, N may be omitted, in which case the current value is only announced, not altered.

4 9 2 <net>

    Function   Reads current value for Network Failure threshold. The LED indicator will blink and a Network Failure Alarm will register when this value is exceeded.

    Response   *<net ID> network status alert setpoint is <N>*

4 9 2 <net> <<N>>*

    Function   Sets current value for Network Failure threshold. Use N=200 to disable the network failure indicator.

    Range for N   0-200

    Default   0

    Response   *<net ID> network status alert setpoint is <N>*

*4 9 30 * net*

    Function   Perform a diagnostic self-test on specified network. Depending on protocol and LDL configuration, diagnostic counters may be printed and/or reset.

    Response   *<net ID> communication test is <normal, errcode>*

4 9 40

    Function   Read all 4940x diagnostic info for all networks.

    Response   See error/diagnostic code list in section F.17.

Note:

In the following, 'net' may be omitted, in which case the information for the default network is annunciated.

*4 9 40 * net*

    Function   Read all 4940 diagnostic info for <net>

    Response   see commands below

4 9 40 1

    Function   Read time to complete RC table scan

    Response   *scan time is \<time\> seconds*

4 9 40 2 net

    Function   Read network status code for specified network

    Response   *\<net ID \> network status code is \<code\>*

4 9 40 3 net

    Function   Read network alert count.

    Response   *\<net ID \> network alert count is \<count\>*

4 9 40 4 net

    Function   List all the node addresses whose RCs are currently experiencing communication failure.

    Response   *\<net ID \> communication failure at node(s) \<list\>*

4 9 40 5 net

    Function   List all RCs on net currently having communications failure.

    Response   *\<net ID \> remote channel(s) now in communication alarm are \<list\>*

Note:

49405 does not report criteria-tripped alarms. The check status command (4 0 ZZ) checks all alarm conditions, communication or otherwise.

4 9 40 6 net

    Function   Read diagnostic codes for last 10 network problems. Append -0 to clear the history stack.

    Response   *recorded error numbers are code \<n\>...*

4 9 41 ZZ

    Function   Read current communications status for channel number ZZ. Status reported is result of latest scan loop poll, not the communications alarm status (see 40zz)..

    Response   *remote channel \<ZZ\> communication alarm code is \<diag code\>*

4 9 41 ZZ *

    Function   Read count of communication alarms for RC ZZ (add -0 to clear)

    Response   *remote channel \<ZZ\> communication alarm count is \<count\>*

4 9 42 net

    Function   Read list of disarmed (see code 45ZZ0) RCs

    Response   *\<net ID\> remote channels now disarmed are \<list\>*

4 9 43

    Function   Read list of uninitialized RCs.

    Response   *remote channel(s) not programmed are \<list\>*

4 9 44

    Function   Read list of all RCs not using the default criterion.

    Response   *remote channels armed are <list>*

4 9 45 ZZ

    Function   Reports net address, criterion, setpoints, links, and alarm status for channel number ZZ.

    Response   See commands 45zz*, 45zz, 47zz*, 4941zz

F.17   Status, Diagnostic & Error Code Listing

This section lists all network status, diagnostic and communications error codes likely to be of use for customer troubleshooting. Other codes may be reported in rare instances, and information about their interpretation may be obtained from RACO customer support.

F.17.1   Network Status Codes

The Network Status code reflects the overall health of all devices connected to a specific net. The values for these codes are used both for programming the alert threshold and in reporting the current status. Whenever a specific network's status code exceeds the alert threshold the network status LED will blink and an alert message is included in all reports. There is a distinct LED and status code and threshold for each net.

The table below lists the values and interpretation for the Network Status codes and thresholds.

0	No error. All RCs and scanned nodes are operating within scan timing parameters.
1-96	Some RCs are in communications failure and have not been successfully scanned for the COMALARM trip delay period. The number of such failed RCs is equal to the code value.
101-196	Some nodes on the net have quit responding to scanning. The number of such failed nodes is computed by subtracting 100 from the code. All RCs on those nodes are in COMALARM.
200	The scan of all nodes on the network is failing.

F.17.2 | ## Diagnostic & Communications Error Codes

The diagnostic and communications error codes are registered whenever the scan for a particular RC fails. When such an event occurs, the code is pushed onto the diagnostic history stack (see code 49406) and copied into the RC status word (see code 4941zz). These may be interrogated at any time.

If the problem occurs during selftesting or configuration, the code is reported immediately. During normal scanning, the problem must continue for the COMALARM trip delay period before a communications alarm for that RC is triggered. The report for that alarm will then mention the code. The network status code is then updated appropriately. See table on next page.

The table below lists the values and interpretations for the most common error situations. Note that some codes are derived directly from standard error codes supported by specific protocols. The documentation for those products is then necessary for interpretation.

0	no error condition detected
352	specified net is invalid
354	protocol doesn't support the net address format
356	request timed out with no feedback
357	node address is invalid for selected protocol
359	node/driver incompatible with address mode
360	miscellaneous error parsing address string
361	some field was duplicated in address string
362	file type specifier in address string not supported
363	couldn't parse file number field in address string
364	couldn't map the I/O slot specified in address string
365	couldn't parse element field in address string
366	couldn't parse subelement field in address string
367	couldn't parse bit field in address string
368	too many routing nodes specified in address string
369	some routing node has illegal syntax
370	transaction aborted at user request
390	source channel data not available for RC link
410	no traffic received from the net
430	timeout with no recognizable response
431	timeout with no response at all
501	transaction took too long to transmit
601- 608	AEG/MODICON exception codes.
	That code can be determined by subtracting 600 from this code.

Refer to F.5, "General Modbus Reauirements," for details.

700	device has not been opened
705	DUART not present
710	net not configured with PLC-type protocol
715	bad serial io configuration parameter
725	background noise on network substrate
730	another modbus master already active
731	mbplus peer in monitor-on-line state
732	mbplus peer never getting token
735	diagnostic loopback test failed
750	a remote node has same node address
755	could not find any nodes on network
1540	NAK count limit exceeded for transmit msg
1541	ENQ count limit exceeded for transmit msg
1561	timeout waiting for response to command
2278	RAM allocation failed
2279	hardware failed self-test at warmstart
2280	cannot access net hardware

PLC Programming Code Table (Page 1 of 4)

Code	Description	Default	Range	Section
Remote Channel Status, Reading and Writing to PLC Data Register				
40ZZ	Read alarm status of Remote Channel ZZ		ZZ=0 to 96	F.8
40ZZ*	Read data register associated with RC ZZ		ZZ=0 to 96	F.8
40ZZ*N	Write value N to data register associated with RC ZZ		ZZ=0 to 96, N=0 to 65535	F.8
Remote Channel Message Recording and Reviewing				
4100 net	Record network ID message		net=1 to 5	F.9
41ZZ N	Record Remote Channel ZZ ALARM/PREAMBLE message at recording rate N (N is optional)	See Code 913	ZZ=1 to 96, N=1 to 4	F.9
42ZZ N	Record Remote Channel ZZ NORMAL/EPILOGUE message at recording rate N (N is optional)	See Code 913	ZZ=1 to 96, N=1 to 4	F.9
43ZZ	Review both Remote Channel ZZ messages (ZZ=0 for network ID messages)		ZZ=1 to 96	F.9
Remote Channel Programming (Configuration)				
4500	Sets current status as NORMAL for all RCs			F.10.2
45ZZ	Reads alarm criteria for RC ZZ		ZZ=1 to 96	F.10.2
45ZZ * net *node *addr *	Associate RC ZZ with specified network address		ZZ=1 to 96	F.10.1
45ZZ *	Read back the net address (net/node/addr) assoc. with RC ZZ		ZZ=1 to 96	F.10.1
45ZZ0	Disables Remote Channel ZZ		ZZ=1 to 96	F.10.2
45ZZ1	Sets alarm criteria to NORMALLY 1		ZZ=1 to 96	F.10.2
45ZZ2	Sets alarm criteria to NORMALLY 0		ZZ=1 to 96	F.10.2
45ZZ3	Sets alarm criteria to NO ALARM Status reporting only		ZZ=1 to 96	F.10.2
45ZZ4	Sets alarm criteria to NETERR mode		ZZ=1 to 96	F.10.2
45ZZ5 N	Sets analog low setpoint to N		ZZ=1 to 96, N=0 to 65535	F.10.2
45ZZ6 N	Sets analog high setpoint to N		ZZ=1 to 96, N=0 to 65535	F.10.2

PLC Programming Code Table (Page 2 of 4)

Code	Description	Default	Range	Section
Alarm Call Grouping				
45ZZ 9	Reads RC ZZ alarm call grouping linkage			F.10.3
45ZZ 9 DN	Links RC ZZ to phone numbers DN			F.10.3
45ZZ 9 *	Clears all RC ZZ alarm call linkages.			F.10.3
Alarm Trip Delays				
46ZZ	Reads Remote Channel ZZ alarm trip delay			F.11
46ZZ V	Set RC ZZ individual alarm trip delay to V	none	.1 - 9999.9 sec	F.11
46ZZ *	Resets RC ZZ individual alarm trip delay back to default of 2.0 sec.			
Remote Channel Linking/Network Bridging				
47ZZ * YY	Establish Alarm Link. ZZ source, YYdestination			F.12
47ZZ * YY *	Establish Data Link. ZZ source, YYdestination			F.12
47ZZ	Report all linked channel pairs using ZZ as source or destination. If ZZ=0 reports all linked channel pairs.			F.12
47ZZ -0	Clears all linked pairs using ZZ as source ordestination If ZZ=0 clears all linked channel pairs.			F.12
47ZZ * YY -0	Clear Specific Link using ZZ as source and YY as dest.			F.12
Serial Communications Parameters				

Note: See Code 4910 for default value for "net" in all of the following

Code	Description	Default	Range	Section
4900 net	Announces the current settings of all serial parameters for "net"			F.13
4900 net *	Resets all serial parameters for "net" to their factory defaults		See Below	F.13
4901 net *N	Read/Set baud rate for net to N	9600	50-57600	F.13.1
4902 net *N	Read/Set data bits for net to N	8	7 or 8	F.13.1
4903 net *N	Read/Set stop bits for net to N	1	1 or 2	F.13.1

PLC Programming Code Table (Page 3 of 4)

Code	Description	Default	Range	Section
Serial Communications Parameters . . . *Continued from p. F-26*				

Note: See Code 4910 for default value for "net" in all of the following

Code	Description	Default	Range	Section
4904 net *N	Read/Set parity for net	protocol dependent	odd, even, none	F.13.1
4905 net *N	Read/Set local node address for net to N	1	1-256	F.13.2
4906 net	Read protocol type for net N	Factory Configured	Not user settable	F.13.2
4907 net *N	Read/Set COMALARM Trip Delay	30 sec.	N=0.1-999.9 sec.	F.13.3
4908 net * V	Read/Set link-level timer.	Protocol Specific	V is in msec.	F.13.3
4909 net * V	Read/Set applications-level Timer	Protocol Specific	V is in msec.	F.13.3
49 50	Reads/Sets all protocol	varies	See applicable notes	F.13.4,

Code	Description	Default	Range	Section
Miscellaneous				
49 *	Repeat the previous command which began with a '4'			F.14
4910 N	Read/Set default net to N	1	1 to 5	F.14
4911 N	Read/Set default node to N	1	protocol dependent	F.14

Code	Description	Default	Range	Section
Clearout Operations				
493 *net	Globally disables/enables network communications		Acts as toggle	F.15
4935 4	Clears all RC user recorded speed messages			F.15
4935 5	Clears all RC net addresses and criteria			F.15
4935 8	Clears out all communications failure codes and counts			F.15

Code	Description	Default	Range	Section
Diagnostic Readouts				

Note: See Code 4910 for default value for "net" in all of the following

Code	Description	Default	Range	Section
49 2 net	Reads current Network Failure threshold for net			F.16
49 2 net *N	Set Network Failure threshold to N		0 - 200	F.16
49 30 *net	Perform diagnostic self-test on specified net			F.16
49 40	Reads all 4940 X diagnostic for all networks			F.16
49 40 *net	Reads all diagnostic information for net			F.16

PLC Programming Code Table (Page 4 of 4)

Code	Description	Default	Range	Section
Diagnostic Readouts . . . *Continued from p. F-27*				
Note: See Code 4910 for default value for "net" in all of the following				
49 40 1	Reads time to complete RC table scan			F.16
49 40 2 net	Reads communications alert status for net			F.16
49 40 3 net	Reads communications alert count for net (Append with 0 to clear count)			F.16
49 40 4 net	Reads all node address whose RCs have current communications failure			F.16
49 40 5 net	Reads all RCs on net currently having communications failure			F.16
49 40 6 net	Reads diagnostic codes for last 10 network problems			F.16
49 41 ZZ	Reads communicatons status for RC ZZ			F.16
49 41 ZZ*	Reads count of COMALARMS for RC ZZ			F.16
49 42 net	Reads list of disarmed (code 45ZZ0) RCs			F.16
49 43	Reads list of uninitialized RCs			F.16
49 44	Reads list of all RCs not using the default alarm criteria			F.16
49 45 ZZ	Reports net address, alarm criteria, setpoints, links and alarm status for RC ZZ			F.16

G | Cabling Diagrams

G.1 RACO VSER-01 Serial Cable Connection Diagram

REAR (SOLDER SIDE) OF
DB25P (MALE) CONNECTOR

Used for local RS-232 or LDL serial printer option.

RJ45 MOD PLUG

GOLD
CONTACT
END

10 FT. CORD
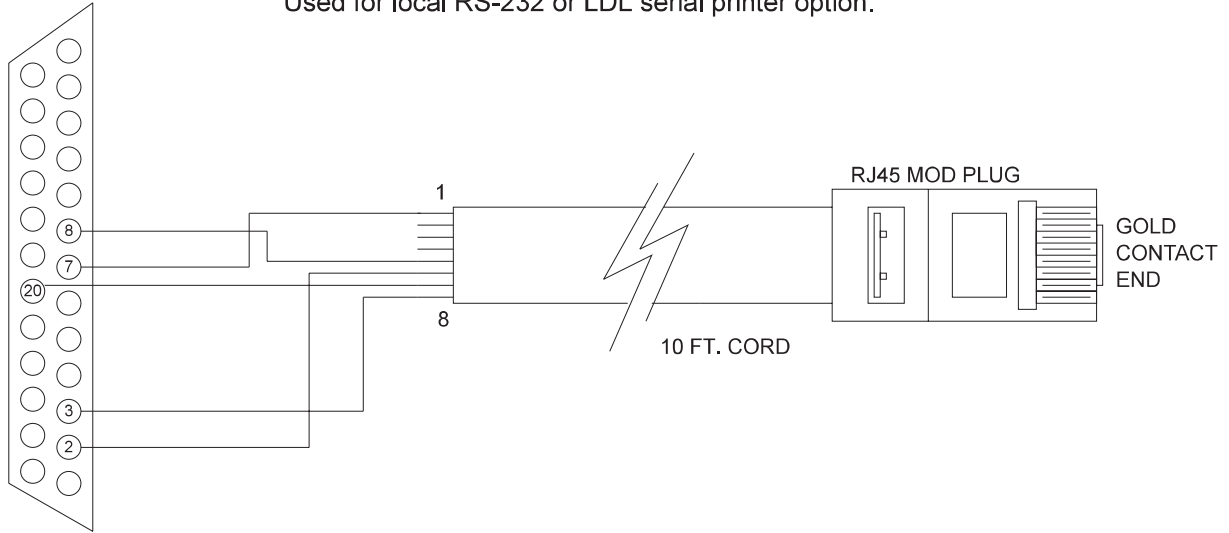
25 Pin Connector Pin-Out		
2	RXD	Data to VB
3	TXD	Data from VB
7	SGND	Signal Ground
8	DCD	Carrier Detect - Handshake Out (not used)
20	DTR	Data Terminal Ready - Handshake In (not used)

G.2 RACO VPPC-1 Parallel Cable Connection Diagram

Used for LDL parallel printer option
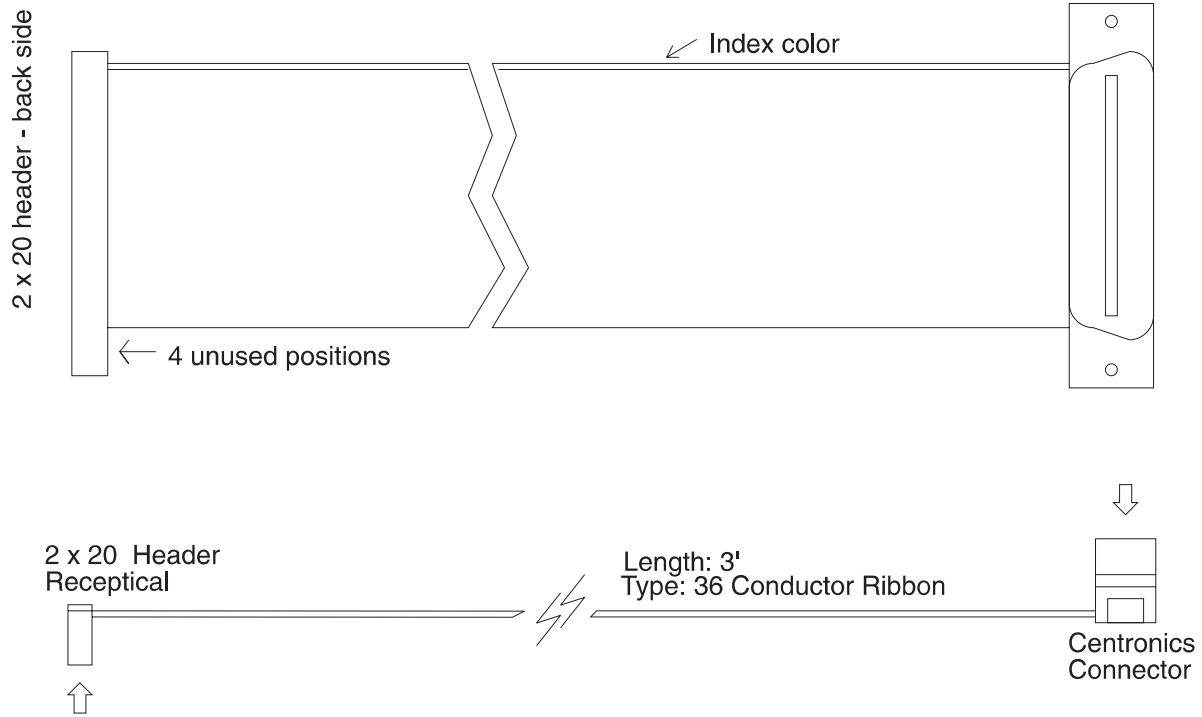
G.3 Verbatim PLC Network Connections Diagram

Monitoring a single PLC

Monitoring a system with compatible device interface

Monitoring a PLC Network
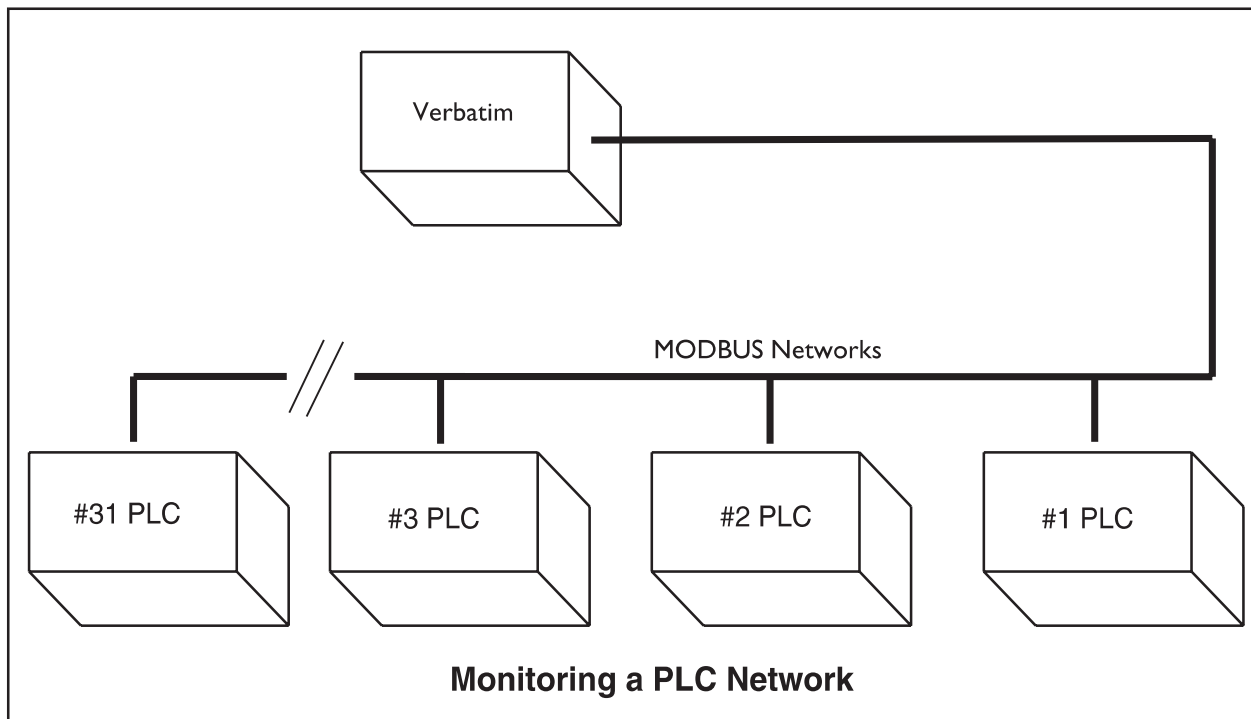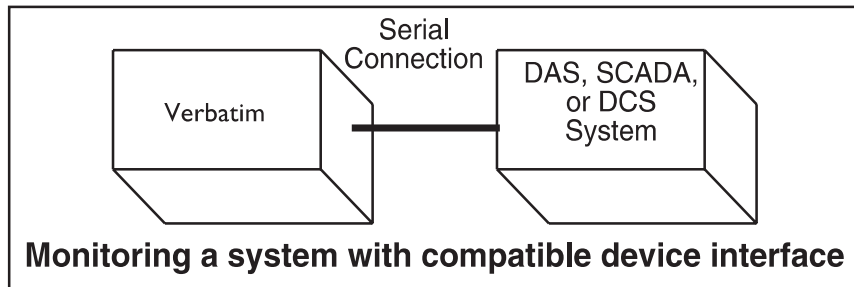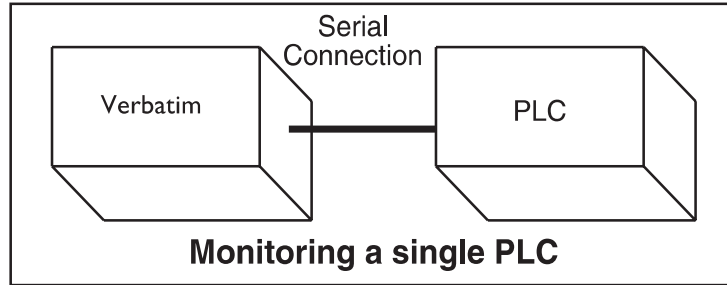
G.4 RACO VMB-2 Serial Cable Connection Diagram

for use with Modicon PLC's using Modbus Protocol

9 PIN MALE
RS232 CONNECTOR

RJ45 MOD PLUG

GOLD
CONTACT
END

6 FT. CORD

9 Pin Connector Pin-Out		
2	TXD	Data from Verbatim
3	RXD	Data to Verbatim
4	DSR	Data Set Ready - Jumpered to DTR at 9 pin conn. only
5	SGND	Signal Ground
6	DTR	Data Terminal Ready - Jumpered to DSR at 9 pin conn. only
7	RTS	Request to Send - Jumpered to CTS at 9 pin conn. only
8	CTS	Clear To Send - Jumpered to RTS at 9 pin conn. only

G.5 RACO VMBM-1 Serial Cable Connection Diagram

for use with Modicon Micro PLC's using Modbus Protocol

9 PIN MALE
RS232 CONNECTOR

RJ45 MOD PLUG

GOLD
CONTACT
END

1

8

6 FT. CORD
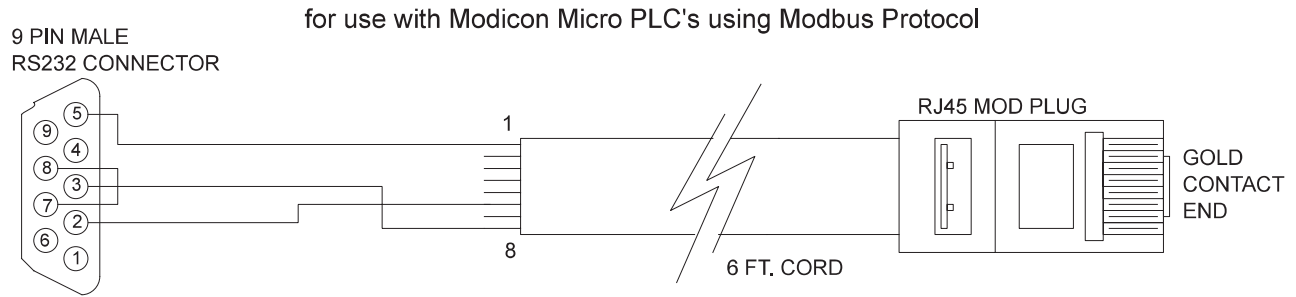
9 Pin Connector Pin-Out		
2	RXD	Data to Verbatim
3	TXD	Data from Verbatim
5	SGND	Signal Ground
7	RTS	Request to Send - Jumpered to CTS at 9 pin conn. only
8	CTS	Clear To Send - Jumpered to RTS at 9 pin conn. only

✎ *Note:*

Connection to Modicon Micro PLC requires use of Modicon Cable Part Number 110XCA28201, 110XCA28202, or 110XCA28203 plus adaptor 110XCA20300. This combination of cable plus adaptor mates with above RACO cable. The Modicon cable is a flat, eight wire cable with RJ-45 male connectors on each end. The Modicon adaptor is an RJ-45 female to D-sub 9 Pin female adaptor.

G.6 RACO VBB-1 Serial Cable Connection Diagram

for use with Bristol Babcock DPC 3330 or 3335
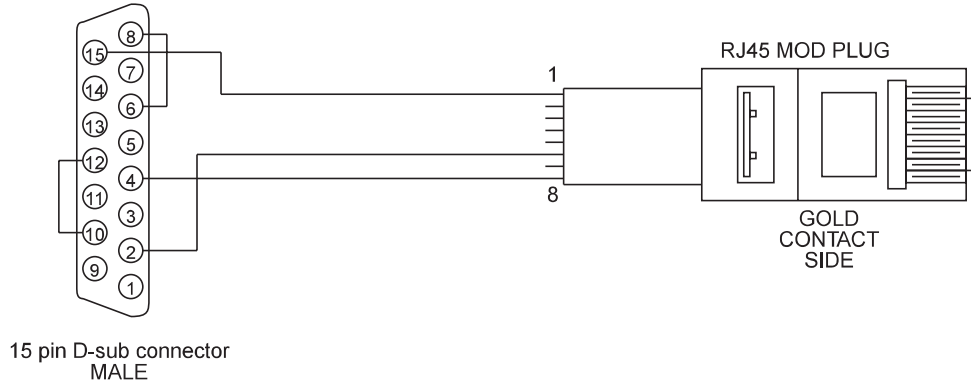
15 Pin Connector Pin-Out		
2	RXD	Data to Verbatim
4	TXD	Data from Verbatim
6	JUMP	Jumpered to pin 8
8	JUMP	Jumpered to pin 6
10	JUMP	Jumpered to pin 12
12	JUMP	Jumpered to pin 10
15	SGND	Signal Ground

G.7 VTI 405/505-DCM Serial Cable Connection Diagram
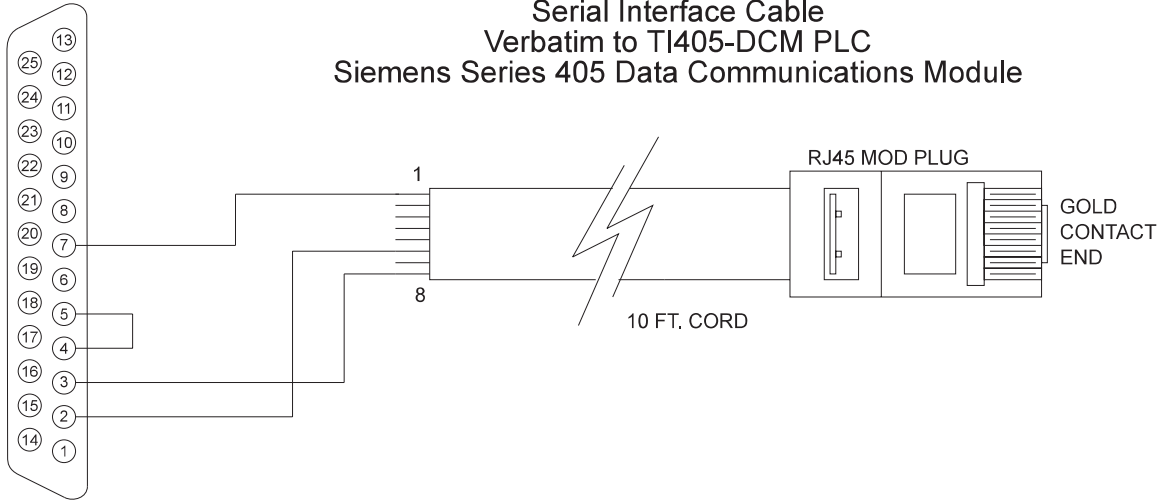
25 Pin Connector Pin-Out		
2	RXD	Data to VB
3	TXD	Data from VB
7	SGND	Signal Ground

H

Verbatim Floobydust

H.1 Adjusting Internal Speaker Volume

Speaker volume may be adjusted via the trimpot marked SPKR VOL located in the upper right hand area of the main circuit board.

This trimpot also adjusts the level of the audio signal that can be obtained via jack AJ1. However, sensitive audio systems may require an additional signal level attenuator in order to prevent overloading.

SPKR
VOL

AJ1   JB8

MINI PLUG

HOT

COMMON
GROUND
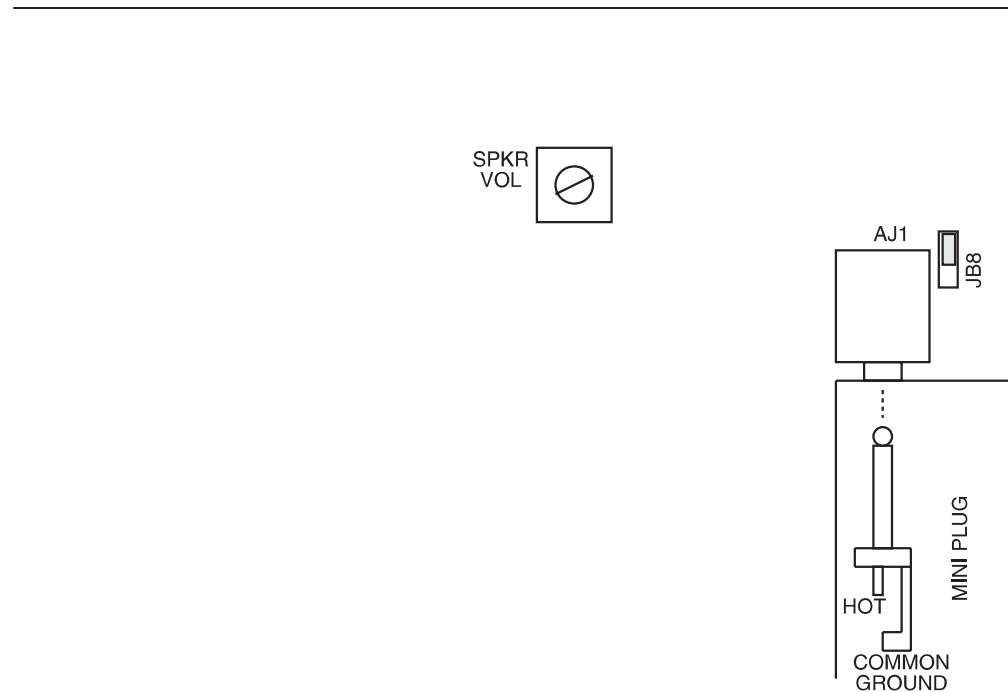
H.2 | External Speaker Connections

An audio output suitable for driving an external speaker of 4 to 16 ohms impedance, headphones, or other audio system, is available via jack AJ1, located in the upper right hand area of the main circuit board. This jack must be configured to deliver audio signal output by placing a jumper shunt across the upper pair of pins on the three-pin header JB8, located next to AJ1.

Note that AJ1 is a dual purpose jack which may be used either for audio output or DC power input, but not for both simultaneously.

To make connection with AJ1, use a standard single-circuit "MINI" plug. The tip end will be the audio signal; the shell will be ground.

The output signal has a nominal impedance of 8 ohms and a nominal average amplitude of 1 volt RMS, when the audio level trimpot, described below, is set to full clockwise position.

H.2.1 | Specifications for Audio Output from Jack AJ1

Nominal output impedance	8 ohms
Nominal average output amplitude with 8 ohm load	1 VRMS
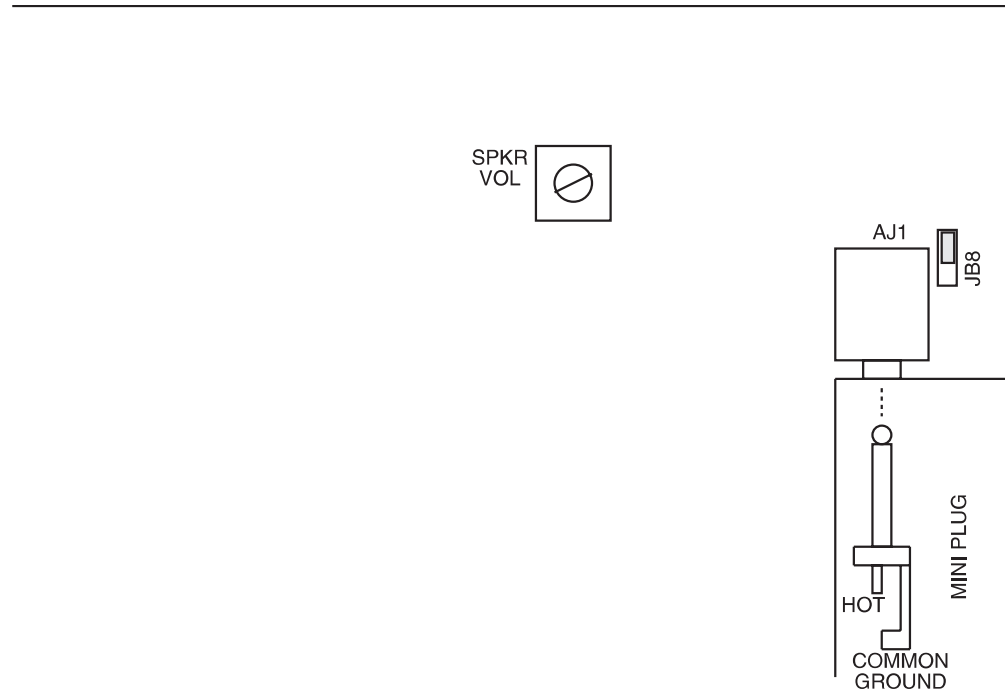
H.3 Alternative Power Sources

As an alternative to the 120 VAC input, an external DC power source can be used. The DC power source should have a current capacity of at least 500 ma DC and a voltage from 8 to 14 VDC. Actual current consumption will be approximately 250 ma standby and 375 ma while phoning and speaking, plus whatever current is required to charge the internal 6 volt, 4 AH gel-cell battery. This supplemental charging current will be roughly 25 ma when the battery is already fully charged, and up to 200 ma if the battery is being recharged after a discharge. Option cards such as analog, remote supervisory control etc. will also moderately increase the current being drawn.

DC power should be connected via a standard single-circuit "MINI" plug, inserted into jack AJ1 located in the upper right hand corner of the main circuit board. This jack must be configured to accept DC power input by placing a jumper shunt across the lower pair of pins on the three-pin header JB8, located next to AJ1. **The positive (plus) side of the power source must go to the end "tip" of the plug; reversing this polarity can damage the product.**

Note:

Note that AJ1 is a dual purpose jack which may be used either for audio output or DC power input, but not for both simultaneously. Note also that the AC power fuse FU1 is bypassed with this configuration. It should be removed to avoid confusion.

The front panel ON/OFF control will operate as with standard 120 VAC power input. If the external power source is interrupted, the unit will switch to gel cell battery power and go into power failure alarm.

The Verbatim autodialer is capable of being powered by other types of power source, including 240 VAC, on special order. Contact factory for details.

H.3.1 Standard DC Power Power Specifications

Input voltage range	8-14 VDC
Recommended minimum current capacity	500 ma DC
VSS-4C-32 current drawn, less battery, standby	275 ma
VSS-4C-32, less battery, phoning/talking	400 ma
Added current to maintain charged battery	25 ma
Added current to charge discharged battery	200 ma

DC Power Connection Diagram

AJ1

JB8

MINI PLUG

+

−
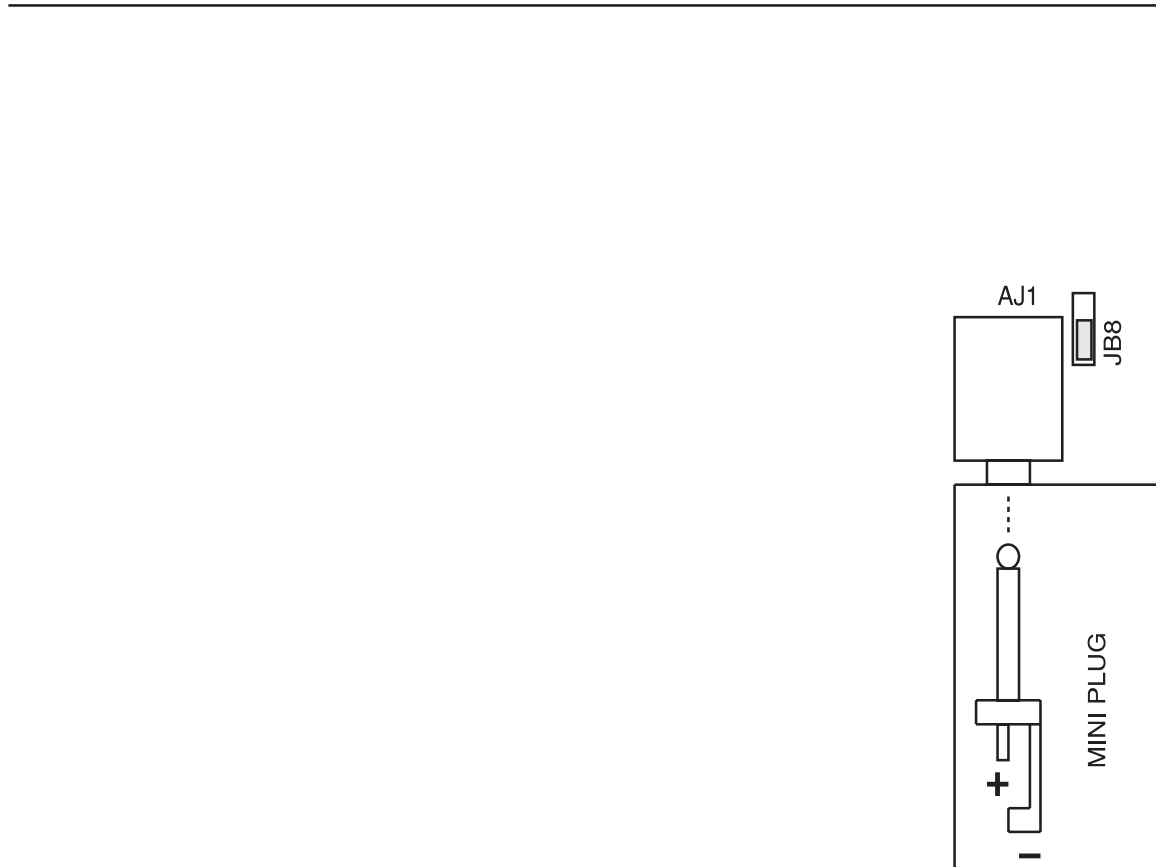
H.4 Speech Recording Times

The following is a table of available speech recording times on Verbatim autodialer.

To find the available amount of speech recording time, first determine the <u>total</u> number of channels on the unit, then find the corresponding row indicating the number of seconds of speech recording time at the various recording rates.

Example: A VSS-4C-32, has a total of 36 channels (4 contact and 32 plc channels). Therefore the available recording times are 130, 200, 270 or 399 seconds, depending upon which recording rate is selected by the user.

Total# OF Channels	# OF RAM CHIPS	# OF Seconds @ Rate1	# OF Seconds @ Rate2	# OF Seconds @ Rate3	# OF Seconds @ Rate4
1-8	1	26	40	54	79
9-16	2	52	80	108	159
17-24	3	78	120	162	237
25-32	4	104	160	216	318
33-40	5	130	200	270	399
41-48	6	156	240	324	476
49-56	7	182	280	378	555
57 UP	8	208	320	432	624

The above table indicates the recording times that are shipped standard. However on special order, the available recording time can be increased to correspond with any row in the table.

H.5 PBX Support

Interfacing the Verbatim to PBX or PABX phone systems can occasionally present problems. Some PBXs have a non-standard dialtone. Additionally, in many PBXs, you must first press a special key, like a '9' to get an outside line. After pressing the '9' there may be a short delay followed by the dialtone for the outside line.

By turning OFF Phone Fault Detection you can avoid problems with non-standard dialtones from your PBX system. Then Phone Fault Detect will not falsely indicate a telephone line interruption.

Even with Phone Fault Detect OFF you can still accomplish dialtone detection on outside lines. Simply add the Tone Detect key sequence to the phone number string after the '9' or other digit to request an outside line.

H.5.1 Cautionary Notes About Interfacing to PBXs

Must Be an Analog Line

Some PBX systems are either partially or entirely digital. That is, voice and signaling information is converted to a digital representation. Voice information arriving at the PBX from the outside is converted from analog to digital. Voice information leaving the PBX to the outside is converted from digital to analog. Phone sets within a digital system may be interfaced by digital signals only. In such systems it may be difficult, but usually not impossible, to obtain a "standard" analog phone line to use in interfacing devices such as a Verbatim . It may be necessary to contact the vendor of your PBX system for information on addition of analog lines.

Lines Can Cause Damage

Caution is advised. Some telephone lines within digital PBXs present voltages which can be dangerous to RACO's equipment. If you are attempting to interface a Verbatim inside of a PBX it would be a good practice to have the phone line you intend to use checked for "unusual" voltages and signals.

With few exceptions, if you can get a standard telephone set to word on a PBX line then you will be able to make the Verbatim work as well.

H.6 Local Alarm Relay Option

The Verbatim provides a 5 volt output that is turned on whenever the unit goes into alarm. This is available at JB4, located at the top center of the main board. Use a molex style 2 pin connector to plug onto the JB4 pins. This output can activate a sensitive (500 ohm +) relay such as a Potter & Brumfield KHU-17D11-6). Connect a 150 ohm,1/4 watt resistor across the relay coil. The Potter & Brumfield relay plugs into a socket (#27E166) which is shown in the accompanying figures. Note that it has four separate circuits in SPDT form. This relay may be used for local alarm, line seizure, or both.

H.6.1 Local Alarm Relay Configuration

1. Wire the relay coil as described in the introduction.

2. Wire the local alarm to one of the four circuits of the relay. In the illustration, the numbers refer to the four separate circuits, and C refers to the coil terminals.

3. Note that the Verbatim does not provide the power for the alarm, it functions only as a switch.

4. The program code for Local Alarm Relay configuration is
   960 00   ENTER
   which is the factory default.

Inside the Verbatim

Relay Socket
P&B 27E166

To Power
for Alarm
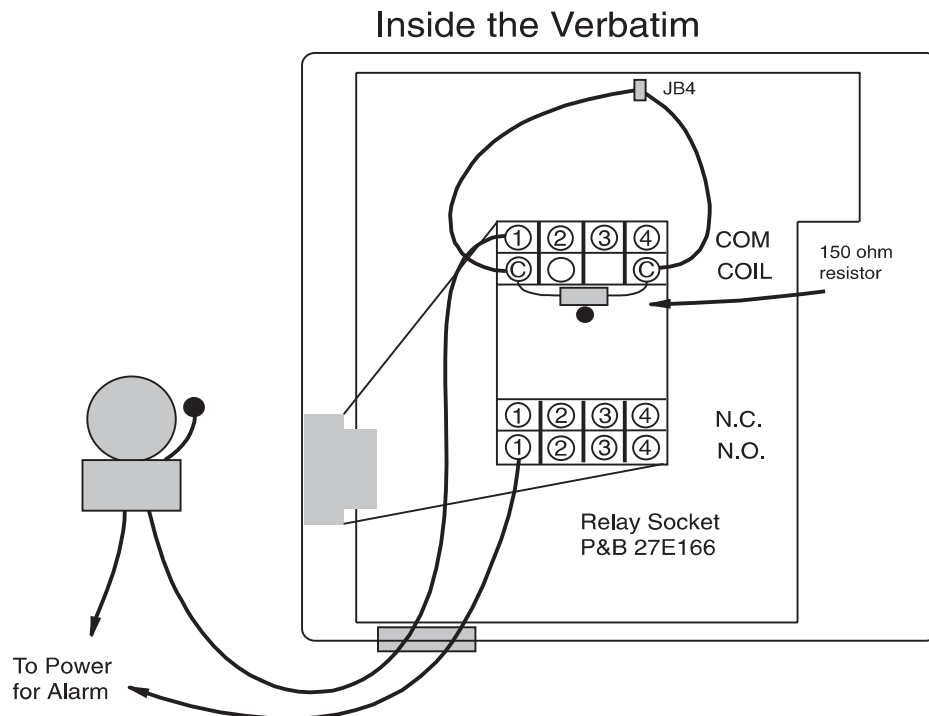
H.7 | Line Seizure Option

Line Seizure is a feature that ensures that the dialer will seize the phone line when it goes into alarm, cutting off any phones, FAX, or answering machines that may be on line at the time (these are called the *downstream* phones, as they are *downstream* from the Verbatim). The unit waits two seconds to allow a dial tone to come up, then dials out. These phones will remain cut off until the alarm is acknowledged.

The Verbatim provides a 5 volt output that is turned on whenever the unit goes into alarm. This is available at JB4, located at the top center of the main board. Use a molex style 2 pin connector to plug onto the JB4 pins. This output can activate a sensitive (500 ohm +) relay such as a Potter & Brumfield KHU-17D11-6. Connect a 150 ohm, 1/4 watt resistor across the relay coil. The Potter & Brumfield relay plugs into a socket (#27E166) which is shown in the accompanying figures. Note that it has four separate circuits in SPDT form. This relay may be used for local alarm, line seizure, or both.

The phone jack must be an RJ-31X, which is available from the phone company or a phone supply outlet. In operation, the Verbatim plugs into the RJ-31X jack and makes contact with the middle four pins, which are the standard red, green, yellow and black wires.

Note that you may combine the Local Alarm Relay with Line Seizure feature simply by using one of the spare circuits (3 or 4) for the local alarm. It breaks the downstream connections, thereby seizing the line, then waits two seconds to allow a dial tone to come up, then dials out.

H.7.1   Line Seizure Installation

1. Wire the relay coil as described in the introduction.

2. Wire the four terminals of the telephone input terminal strip to the relay a follows (please refer to accompanying figures):

Terminal Strip	Relay	
R	COM	circuit #2
G	COM	circuit #1
Y	N.C.	circuit #1
B	N.C.	circuit #2

3. Wire the special RJ-31X line seizure jack as follows (refer to the accompanying figures):

   Connect a jumper wire from terminals 1 to 3 and a second jumper wire from terminals 6 to 8.

   Connect the incoming telephone line red wire to terminal 4 and the green wire to terminal 5.

   Connect the downstream extension phones to terminals 1 and 8.

4. Plug the Verbatim into the RJ-31X socket.

5. Program the Verbatim with code:
   960 01 ENTER
   This is the code for Line Seizure configuration of the Local Alarm Relay.

Wiring the RJ-31X Line Seizure Jack Diagram

Telephone Line In

Red   Green

4   5

3   6

RJ-31X

2   7

jack

1   8

Verbatim

Verbatim
Phone Plug

Downstream Phones

Inside the Verbatim

JB4

① ② ③ ④   COM
ⓒ ○ ⓒ   COIL

150 ohm
resistor

① ② ③ ④   N.C.
① ② ③ ④   N.O.

Relay Socket
P&B 27E166

R G Y B
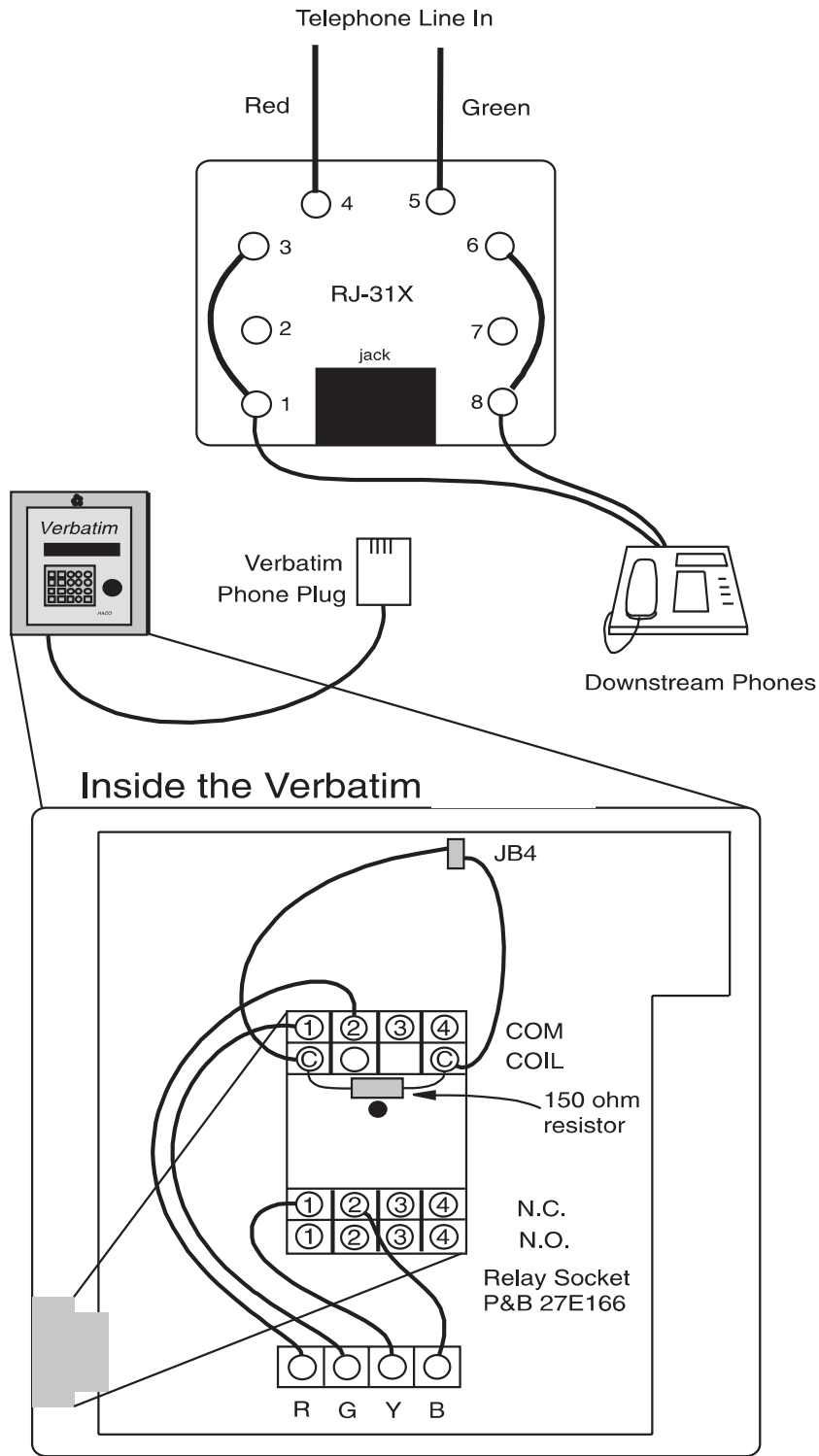
H.8 | Heater / Thermostat Option

The heater/thermostat option is intended to provide warming of the product when it is exposed to particularly cold ambient temperatures.

The thermostat applies 120 VAC power to two chassis-mounted resistors, when it senses temperatures below approximately 40 degrees F. The resistors dissipate a combined 75 watts of power. The amount of temperature elevation above ambient temperature that this provides depends on the thermal insulation of the enclosure and "heat sinking" into the surface which the unit is mounted to. The unit's aluminum enclosure provides relatively little thermal insulation by itself. However if RACO's fiberglass NEMA 4X enclosure option is used, a temperature elevation of about 75 degrees is provided.

If the unit is to be powered by something other than 120 VAC and you need a heater/thermostat, consult factory.

Heater/Thermostat Option	
Power source required	120 VAC
Power dissipated when activated	75 watts
Nominal activation temperature	40 deg F
Nominal heat rise in fiberglass NEMA 4X enclosure	75 deg F

Heater/Thermostat Mounting and Wiring Diagram

Left

Top

Thermostat

Right

JB4

Local
Alarm
Relay

3.8"

5.35"

1.29"

Resistor

1.6"

1.2"

2.6"

COM
COIL

150 ohm
resistor

0.46"

N.C.
N.O.

2"

1"

W | B | G

3.34"

Relay Socket
P&B 27E166

Resistor

Bottom

3.225"

2.35"

4.4"

2.85"
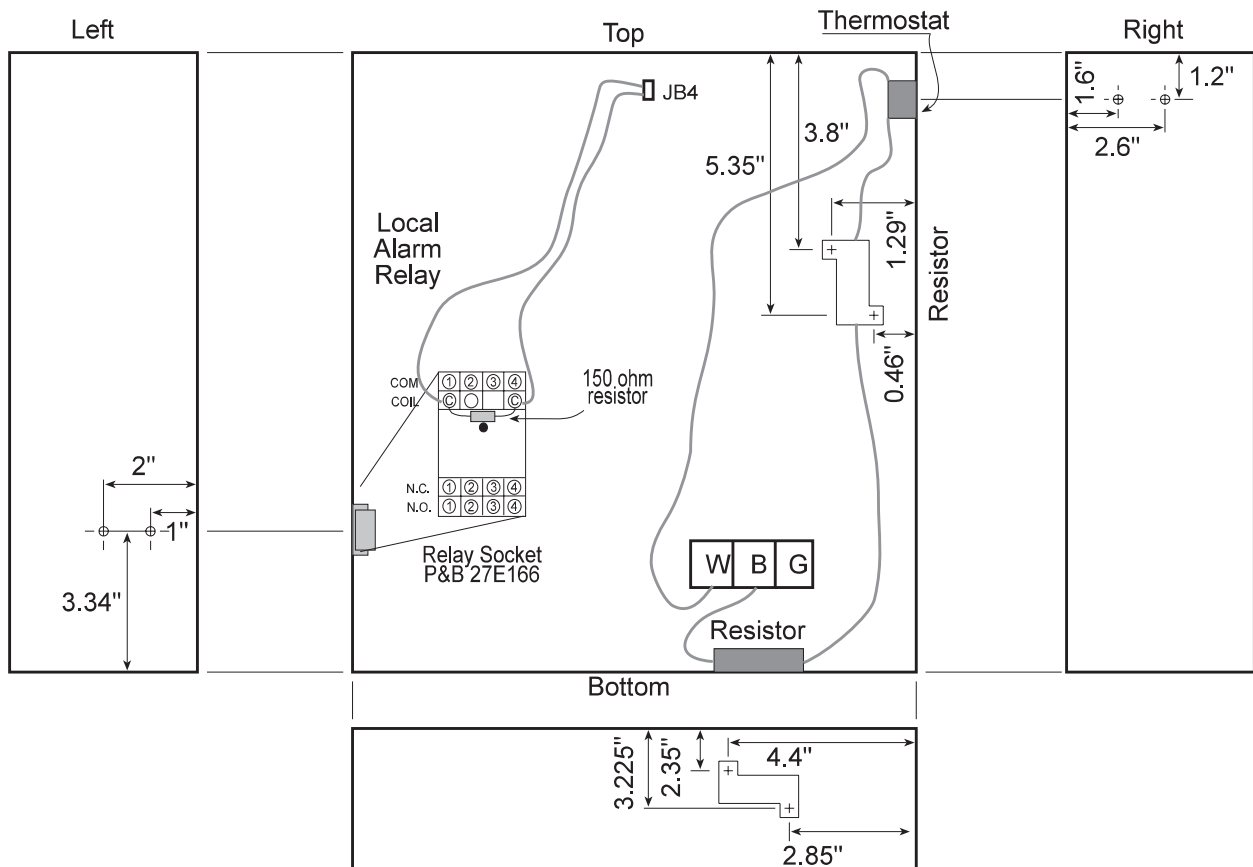
H.9 Connecting to a Radio Transmitter

If you have a radio transmitter that can provides for external connection of an audio signal input and also for connection of an external contact closure to key on the transmitter, you may connect it to the Verbatim autodialer. However you should also consider the alternative of using RACO's CELLULARM cellular phone system, which provides a superior means of signalling where regular land line phone service is not available.

Note that the radio operation described below is not compatible with installation of the Telephone Line Seizure option.

To obtain the contact closure used to key on the transmitter, it is necessary to solder some special connections on the back of the main circuit board. **This step is not necessary if your unit has been supplied from the factory with the RF Interface option.**

First, disconnect the gel cell battery and remove all AC power connections. Remove any option cards. Then carefully remove the speech card located at the top of the unit, via its two mounting screws. Be careful to retain the plastic spacers located behind these screws, for use when replacing this speech card. Flex the card slightly to clear the two mounting pegs and pull the card straight outward.

Remove the main circuit board by removing the six 6-32 mounting screws. You may also wish to unplug the contact input terminal strips and the ribbon cable which leads to the front panel. Solder a pair of jumper wires to the back of the board as indicated in the Jumper Wires for RF Link Diagram. This step connects the auxiliary contacts of off-hook relay K1, to the Y and B terminals of telephone terminal strip TS2.

Re-assemble the unit and restore any connections which were removed. Be sure that the ribbon cable's connector is accurately and firmly seated.

Connect the Y and B terminals on TS2, to the external keying input of your transmitter. The transmitter will now be keyed on whenever the off-hook relay is activated.

The method of audio connection depends on whether the product is to be connected to a regular phone line in addition to the radio transmitter. If a sensitive microphone input is used, additional attenuation may be required to avoid overloading the audio input.

If phone line operation is required in addition to radio operation, establish the audio connection into the transmitter via jack AJ1, as described in the section on EXTERNAL SPEAKER CONNECTIONS.

If no phone line operation is required, you may instead remove the phone cord and obtain an isolated 600 ohm, line-level audio signal at the TIP and RING terminals of TS2.

In operation, the transmitter will be keyed on whenever the off-hook relay is activated -- i.e. whenever the product is attempting to place or answer a phone call. Thus, if an ordinary phone line is also used, all phone activity will also be transmitted.

If no phone line is used, it will still be necessary to program a "dummy" phone number consisting of a single digit "1", using program code 7 0 1 1. Also, program for touch tone dialing using program code 9 0 1 1. When the unit goes into alarm, it will activate the off-hook relay and therefore the transmitter. Then it will issue the single digit tone, and a few seconds later it will begin the speech message, continuing as it would for a regular phone call. The number of message repeats may be altered if desired, using program code 907.

If a phone line is also used, program the appropriate phone numbers as you would ordinarily do. All phone calls will also be transmitted by radio. If you desire to have selected "calls" go out only over the air and not to any real phone number, program the single "dummy" phone number as described above. This single digit will silence the dial tone which would otherwise be broadcast along with the speech message.

Alarm calls will continue until acknowledged, unless the unit is programmed to cease calling when the alarm violation ceases, using program code 9 2 3 2.

In order to acknowledge alarms, it will be necessary to phone the unit back (if a phone line connection is also being used), or else press one of the keys on the front panel.

If a two-way transceiver is available which includes some kind of tone signalling and detection feature that results in momentary closure of a local relay contact at the autodialer locations, this contact may be used to place inquiry calls to the unit and also to acknowledge alarms, by radio. Contact factory for details.

Note that it will not be possible to perform remote programming of the unit with these radio connections.
A CELLULARM cellular system eliminates all such contraints.

TS2 Connection Diagram

TS2

TIP   RING   Y   B

| AUDIO INPUT | XMITTER KEY ON |

TRANSMITTER
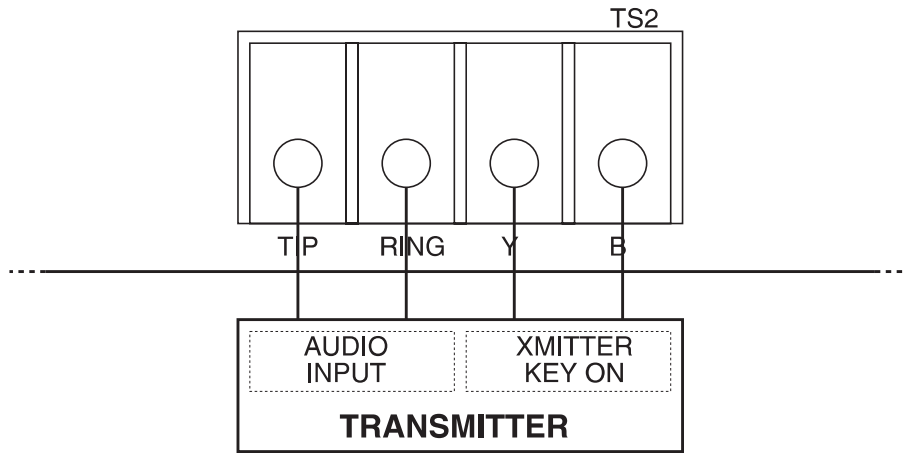
Jumper Wires For RF Link Diagram
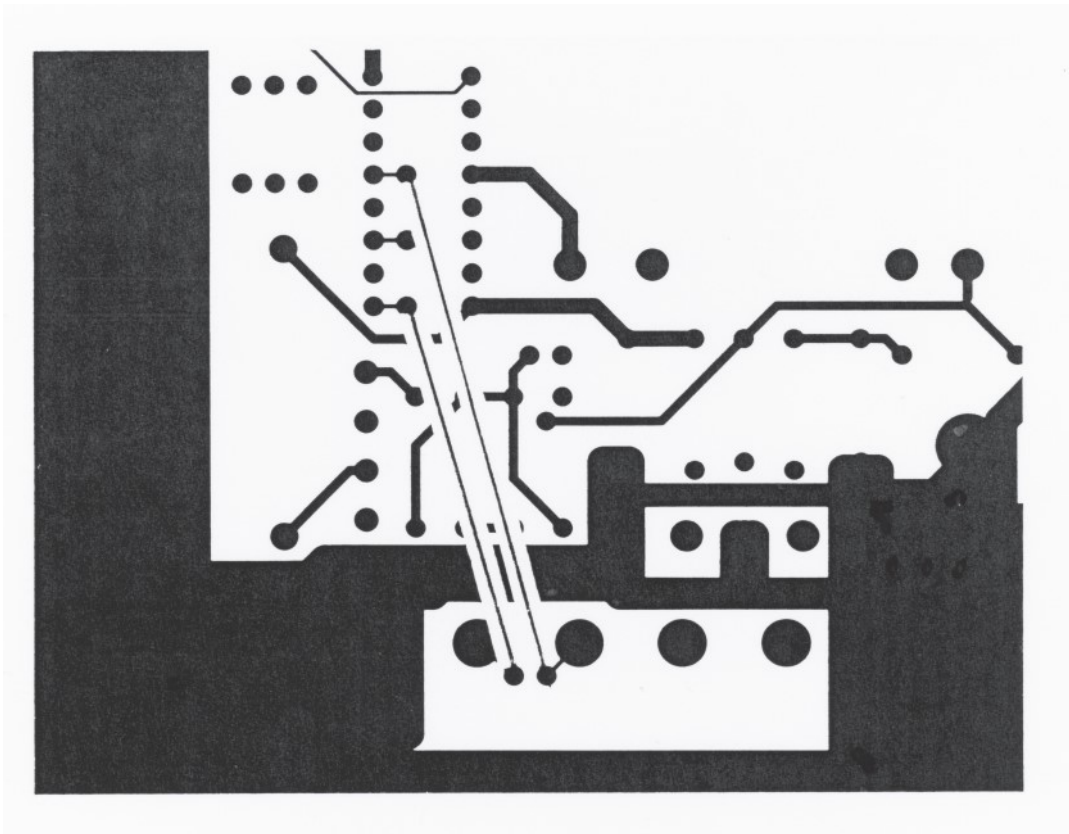
H.10 | Calling a Pager

H.10.1 | Introduction

It has become fairly common to have the autodialer call a pager system with an alarm call. The dialer is well equipped to handle many of the current pager protocols, and an overall understanding of the sequence of events will make the required programming go smoother.

Typically, a call to the pager is placed. After a short period (usually 5-12 seconds), the pager answers then gives a beep or a short burst of beeps. This is the signal to begin entering the number you want to be received and displayed by the beeper. When the information is complete, the pager terminal will hang up.

Note:

RACO strongly recommends that you program other personnel phone numbers at the appropriate place in the dialing list. This is to insure that if for some reason the pager system cannot be activated, you will get a timely warning from your autodialer.

H.10.2 | General Programming Considerations

In most cases, the entire pager calling sequence is handled within the dialing string of the Verbatim. That is, it is all part of the phone number.   The unit will handle up to 60 digits, including any timing delays you insert. The dialer must be programmed for touch tone dialing (program code 9011), as a pager terminal will not recognize pulse dialing.

Numeric Pager Support

Support for Numeric Pagers is comprised of a number of Verbatim autodialer features:

- Ability to add delays into a phone number string

  Often needed to pause after dialing the pager system's digits and emitting the caller's ID digits in the phone string.

- Ability to add DTMF # (or DTMF*) into a phone number string

  Often needed as a terminator character to inform the paging system that the last digit has been entered.

- Ability to add a pause for tone detect anywhere in the phone number string

  Sometimes used to detect the paging system's beep(s) heard after it answers.

- Ability to defeat voice annunciation for a specific phone number

    Often just dialing the pager system and emitting a DTMF ID sequence is sufficient for that phone call. Voice reports only delay the calling of subsequent numbers.

- Ability to add DTMF A, B, C, and D tones to phone number string

    These DTMF characters don't appear on standard telephones and may be used to differentiate automation equipment from humans calling the paging system.

Except for simple delays, entry of these additional digits into a phone number string requires a two key sequence. For example, to enter a '#' character into a phone number string, either at the front panel or over the phone, press the '*' key followed by the 8 key. This two key sequence will enter the single '#' character into phone number string.

The complete list of special digits is as follows:

Desired Result	User Enters	Voice Speaks
DTMF 'A' in phone string	*1	A
DTMF 'B' in phone string	*2	B
DTMF 'C' in phone string	*3	C
DTMF 'D' in phone string	*4	D
No voice annunciation for this number	*5	PHONE
Pause for tone detect	*6	TONE
DTMF '*' in phone string	*7	STAR
DTMF '#' in phone string	*8	POUND

Case 1: Simplest Case Pager

The simplest case is when you only have to call the pager and can hang up as soon as it answers, with no information being passed to the pager except that someone called. If you have only one dialer (and no one else uses the number!) you assume that any call from the pager is a Verbatim alarm call, and proceed from there. Of course, if you had two possible callers, you wouldn't know which one had called.

Example:

Set the first phone number to call the pager, the second phone number to call the plant foreman. Program 701 9 *6 1 713 235 3456 ENTER. (here, 701 signifies the first phone number, 9 to get an outside line, *6 to get an outside line dial tone, 1 713 235 3456 our hypothetical long distance call to a pager, and ENTER to complete the phone number). Program 702 9 *6 548 7632 ENTER (this is the second phone number, to call the foreman in case the pager call doesn't get through).

Case 2: Passing a Phone Number to a Pager

Some pager systems will allow the caller to enter a phone number (or other ID number), which is then relayed on to the beeper. When the person with the beeper gets the call, he will know immediately from the number which dialer has called. This is a good system if you are using multiple dialers, or have other pager calls in addition to autodialers.

Example:

Consider the following example of initiating a call to a paging system. We will assume here we don't have to dial 9 to get an outside line for this example. The paging terminal phone number is entered, followed by a CPM wait *6 to wait for the pager to beep. After that, an ID number is entered. Often the ID number is simply the phone number at the Verbatim autodialer site.
A # terminator *8 is inserted. Finally, the characters *5 are added to designate this phone session as a pager call and not a voice annunciation. Entry of additional delay digits may be required for proper timing of the pager call session.

The phone number string for this example with the first phone number calling a pager, is:

```
701 2352456 *6 5481234 *8 *5
```

Program 702 548 7632 ENTER (this is the second phone number, to call the foreman in case the pager call doesn't get through).

❖ *Exception:*

With some pager systems, Call Progress Monitoring (CPM) on may cause a delay that will not allow the pager message to be transmitted in the time allowed. If this is the case with your paging system, either have CPM in the default off state or, if you want CPM on, time delays can be used in the place of *6 pause for tone detect. The critical task here is to time the delay from the last digit dialed until the pager beeps. The delay time needed can be determined by using a stopwatch or a clock with a second hand. You want to time this delay to the nearest second, then add 1 second to be sure. Consult the diagram on page H-20 to see the time line of events, then program the dialer.

Example 1:

MINUS
#

Delays are added by pressing the MINUS # key on the front panel. Each delay is normally 1 second, but can be programmed (using 928 N) to be any length from 1 to 10 seconds.

We made each delay 2 seconds long by programming code 928 to be 2 seconds for each delay used: program 928 2 ENTER. We then called the pager, and determined timed the delay between the last digit dialed and the pager beep was 6 seconds.

We programmed our pager phone number: 701 6586713 ### 18007226999 *8 *5, where # are delays inserted.

Example 2:

In this example we will enter an ID number before entering a phone number into the pager. The pager phone number is 1 713 2352456. The ID number is 7711.   The dialer is at 5481234. Calling the pager by hand from the dialer site, we find the following:

- dial pager
- wait for pager to answer (6 seconds)
- pager beep
- enter ID (7711)
- wait for new pager prompt (2 seconds)
- enter dialer phone number (5481234)
- hang up

     The phone number to enter will look something like:

     1 713 235 2456 (delay 1) 7711 (delay 2) 548 1234

- In our example we programmed Phone #1:

     701 1 713 235 2456 ### 7711 # 548 1234 ENTER

     (Remember that each # represents a 3 second delay).

- and Phone #2:

     702 548 7632 ENTER (our foreman again)

Case 2: Pager Calling Sequence Using Delays (Example 1)
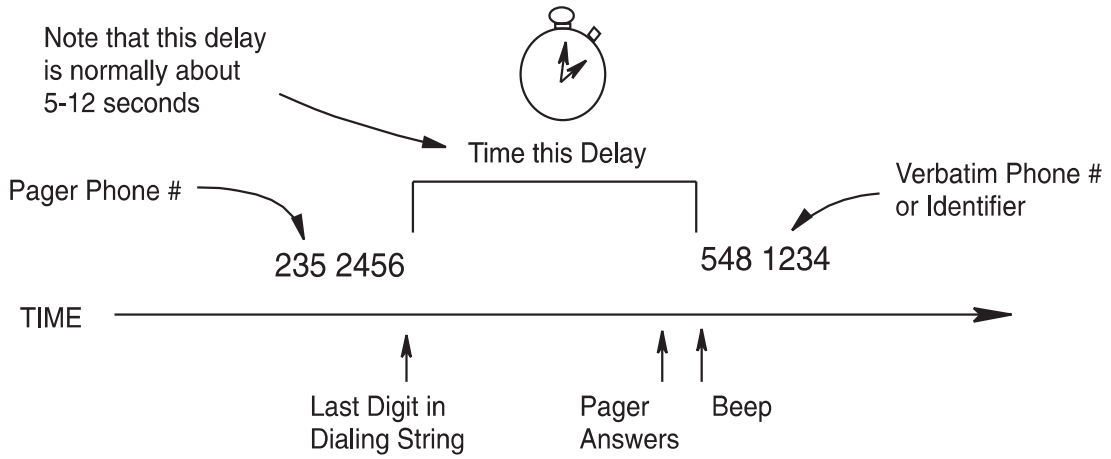
Note that this delay
is normally about
5-12 seconds

Time this Delay

Pager Phone #

Verbatim Phone #
or Identifier

235 2456   548 1234

TIME

Last Digit in
Dialing String

Pager   Beep
Answers

Case 2: Pager Calling Sequence Using Delays (Example 2)

Note that this delay
is normally about
5-12 seconds

Time this Delay

Access
ID#

Pager
Delay

Verbatim Phone #
or Identifier

Pager Phone #

1 713 235 2456   7711   1234

TIME

Last Digit in
Dialing String

Pager
Answers

Beep
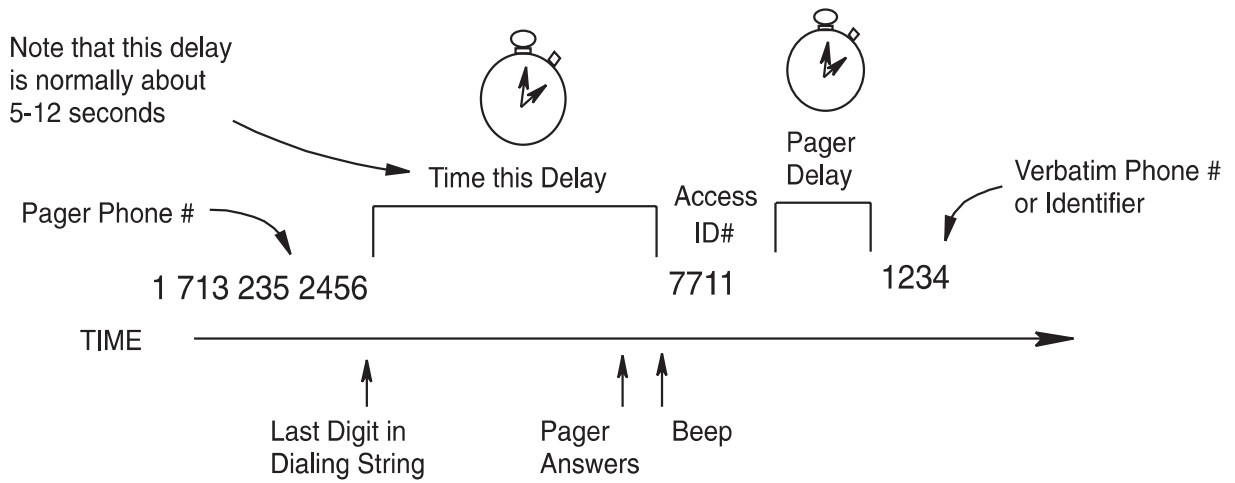
Cellularm Cellular Communications Diagram (AC Only)
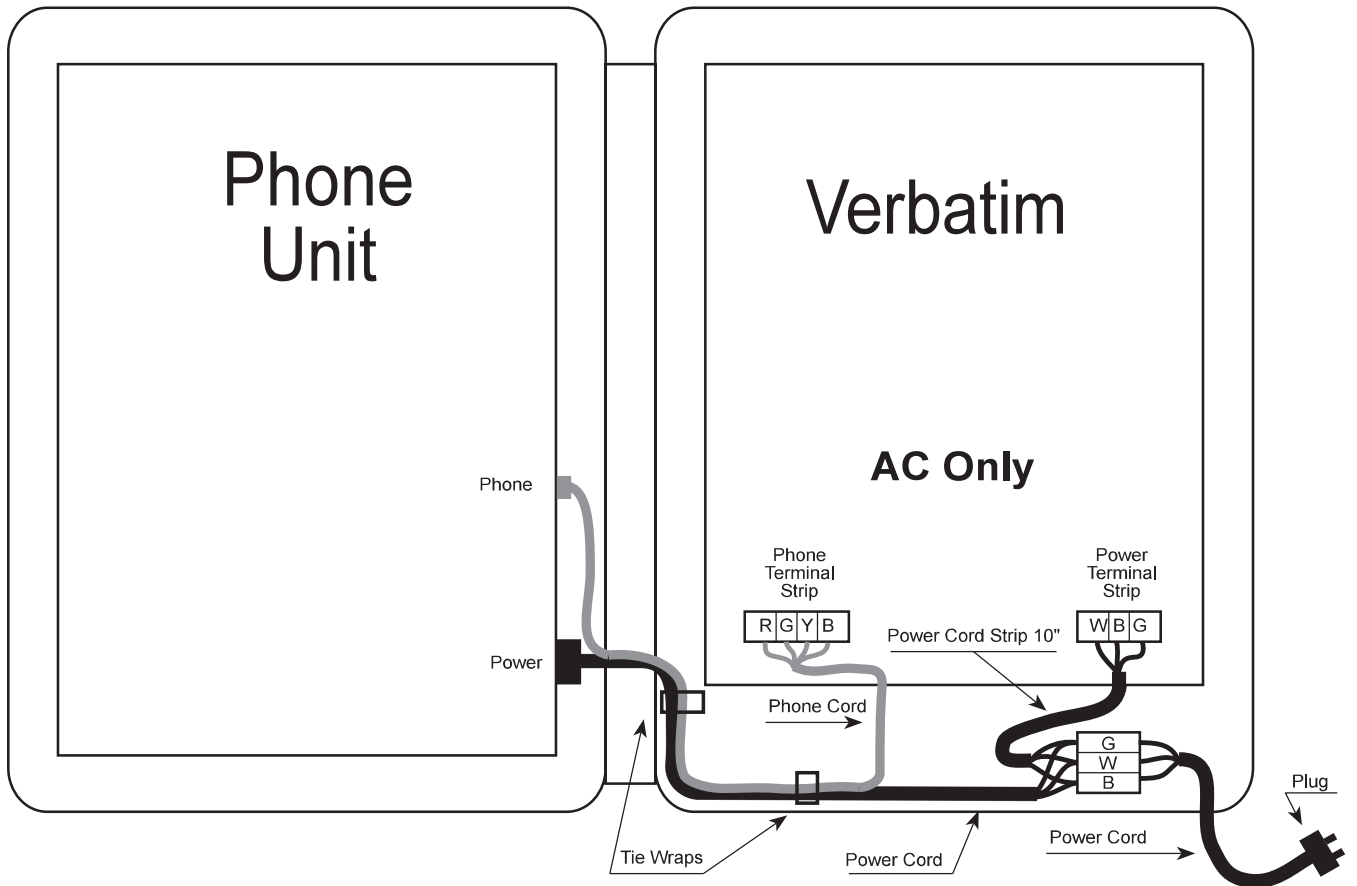
'ularm Cellular Communications Diagram (12V DC Only)
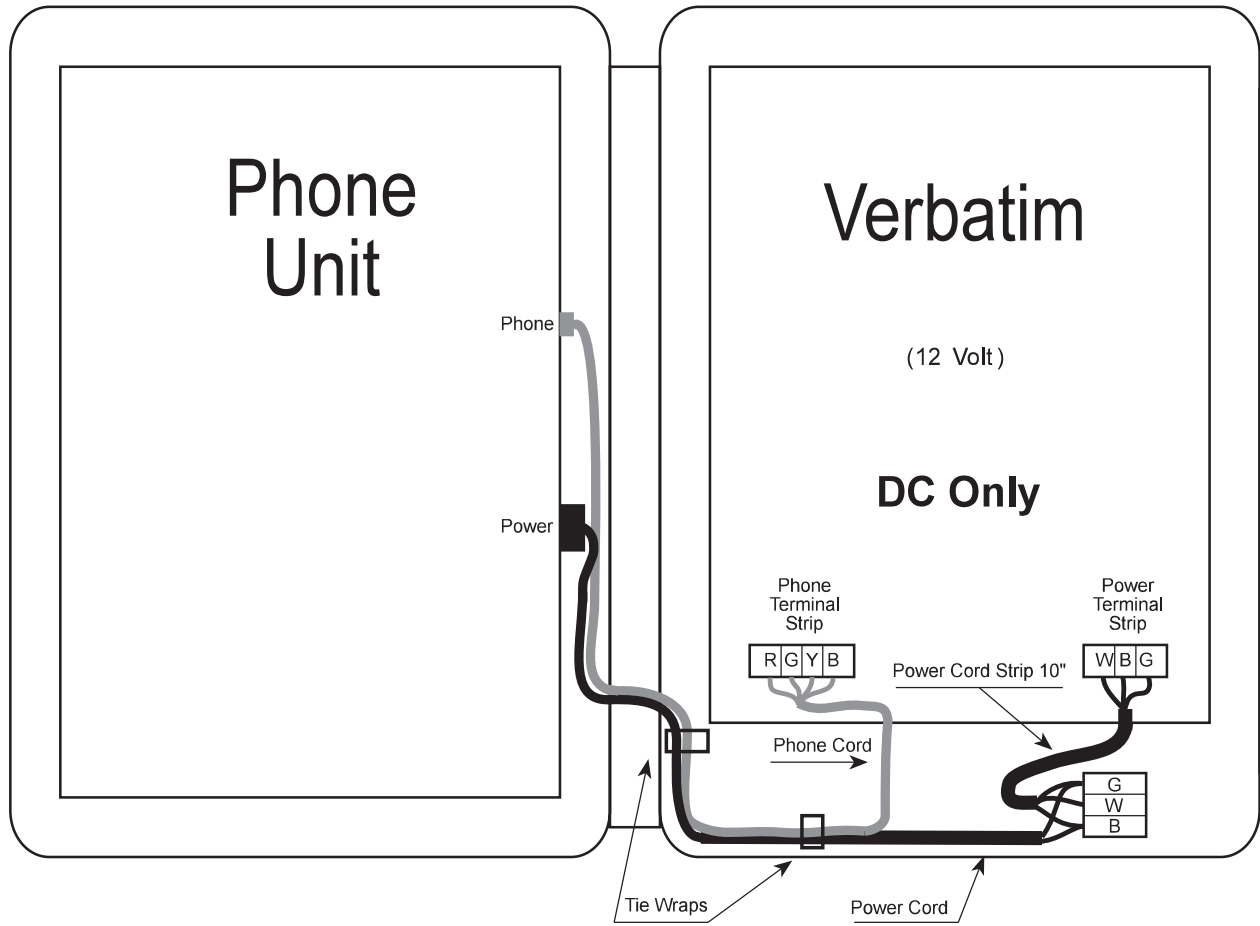
Cellularm Cellular Communications Diagram (24V DC Only)
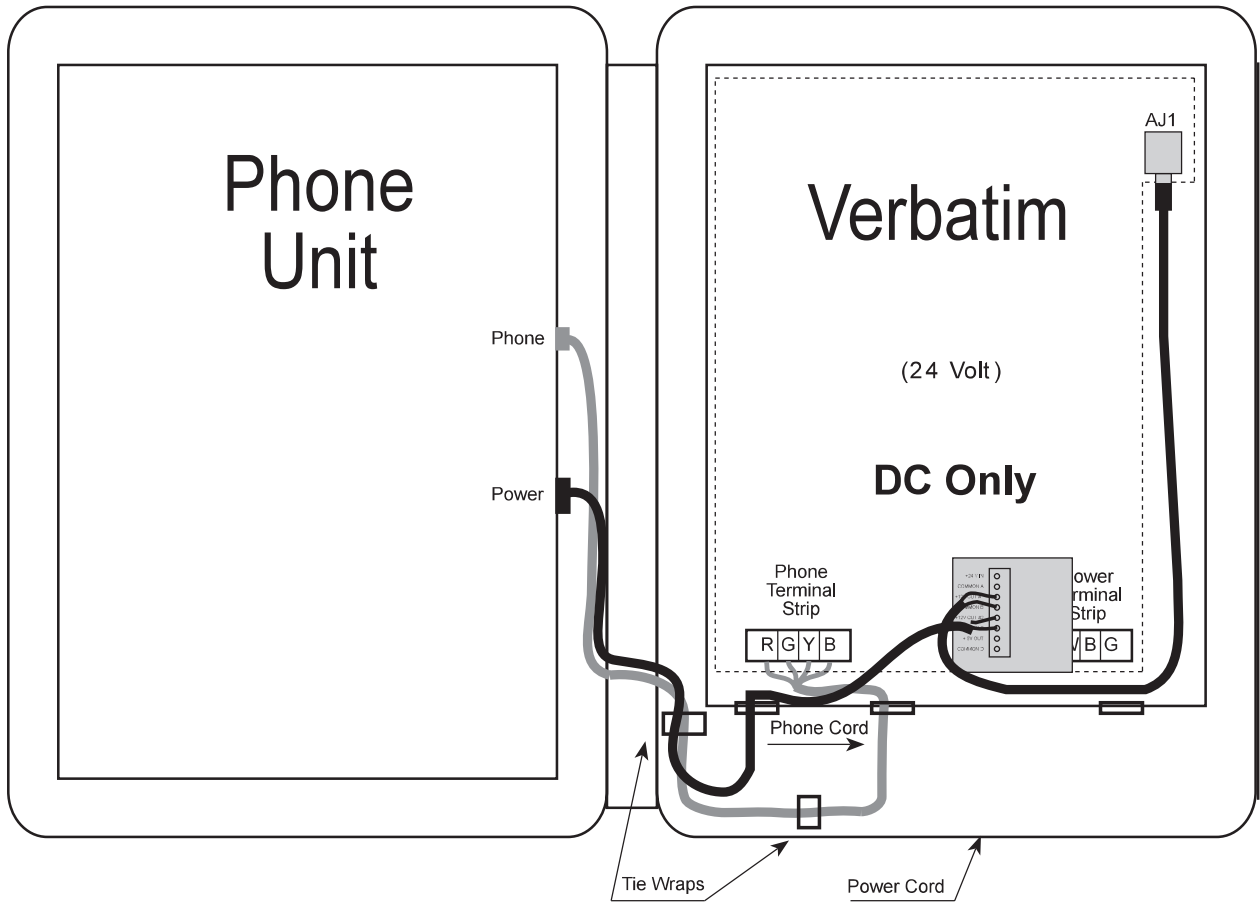
Verbatim Enclosure Diagram

6"

Verbatim

11-3/8"

11-7/8"

re

9-3/4"
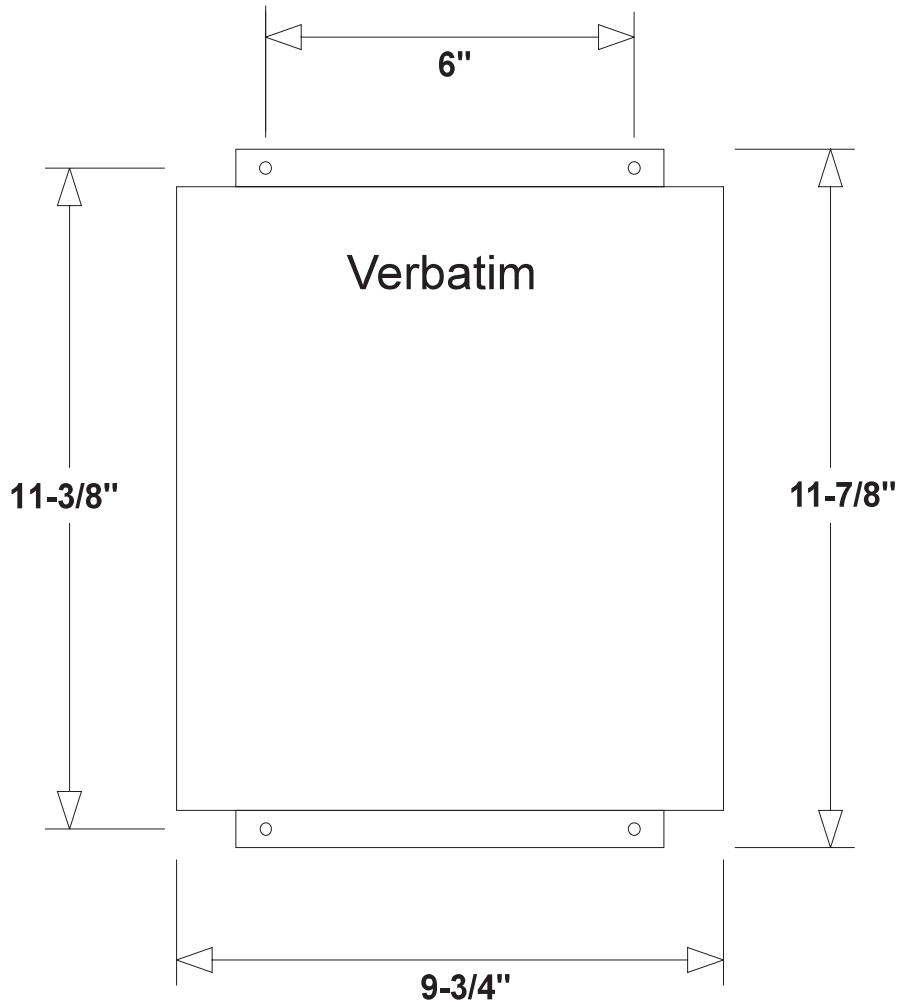
RECTANGULAR MOUNTING CENTERS: 6" W x 11-3/8" H
OVERALL DIMENSIONS: 9-3/4" W x 11 7/8" H x 5" D

NEMA 4X Enclosure Diagram

11.5"

12.5"   NEMA 4X ENCLOSURE   13.5"

8"
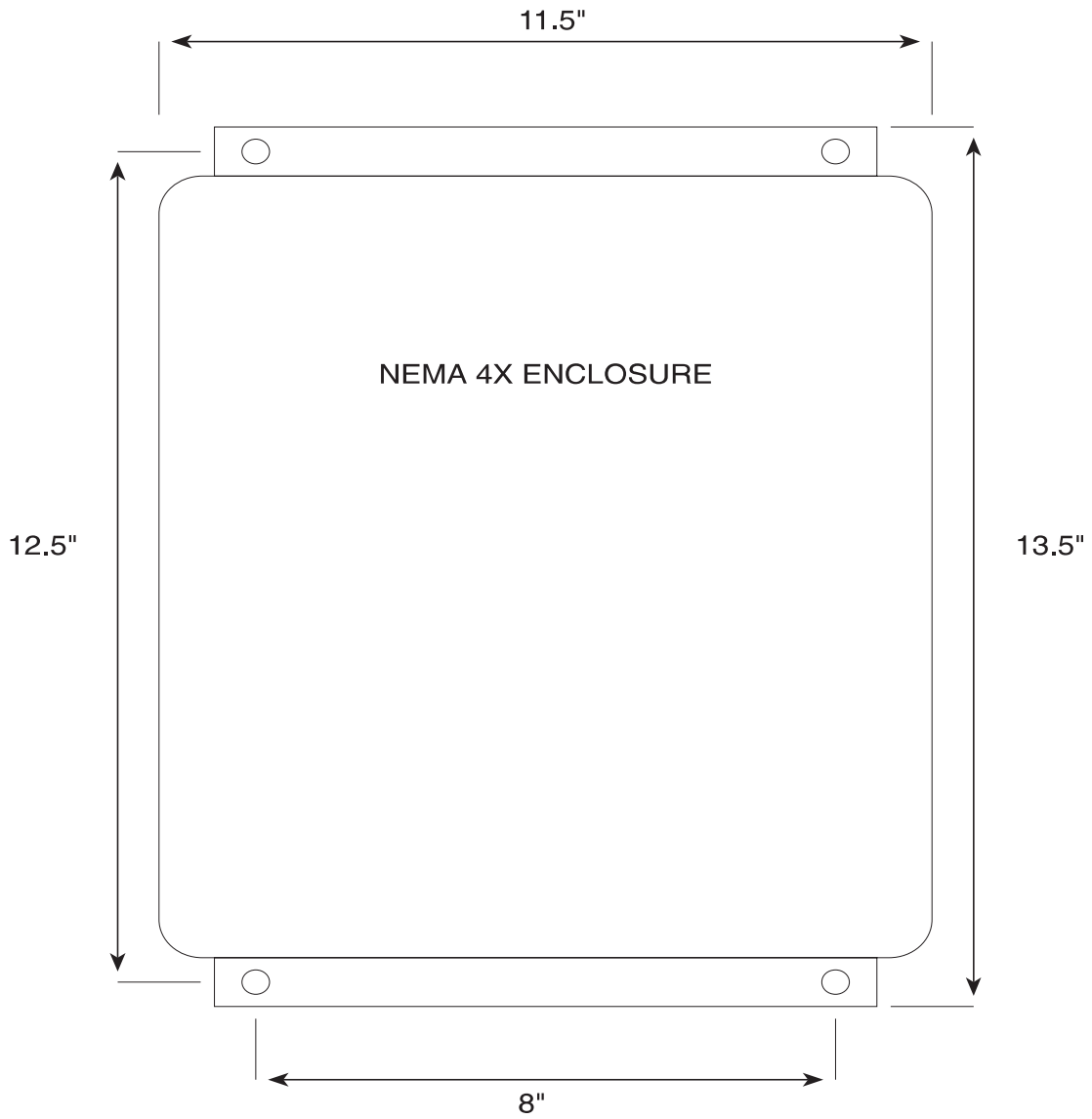
RECTANGULAR MOUNTING CENTERS: 8" W x 12.5" H
OVERALL DIMENSIONS 11.5" W x 13.5" H x 5.5" D

Motherboard Component Diagram

Jumper Block Diagram

JB4

JB8

JB7

JB6

JB2   JB1

JB5

JB3
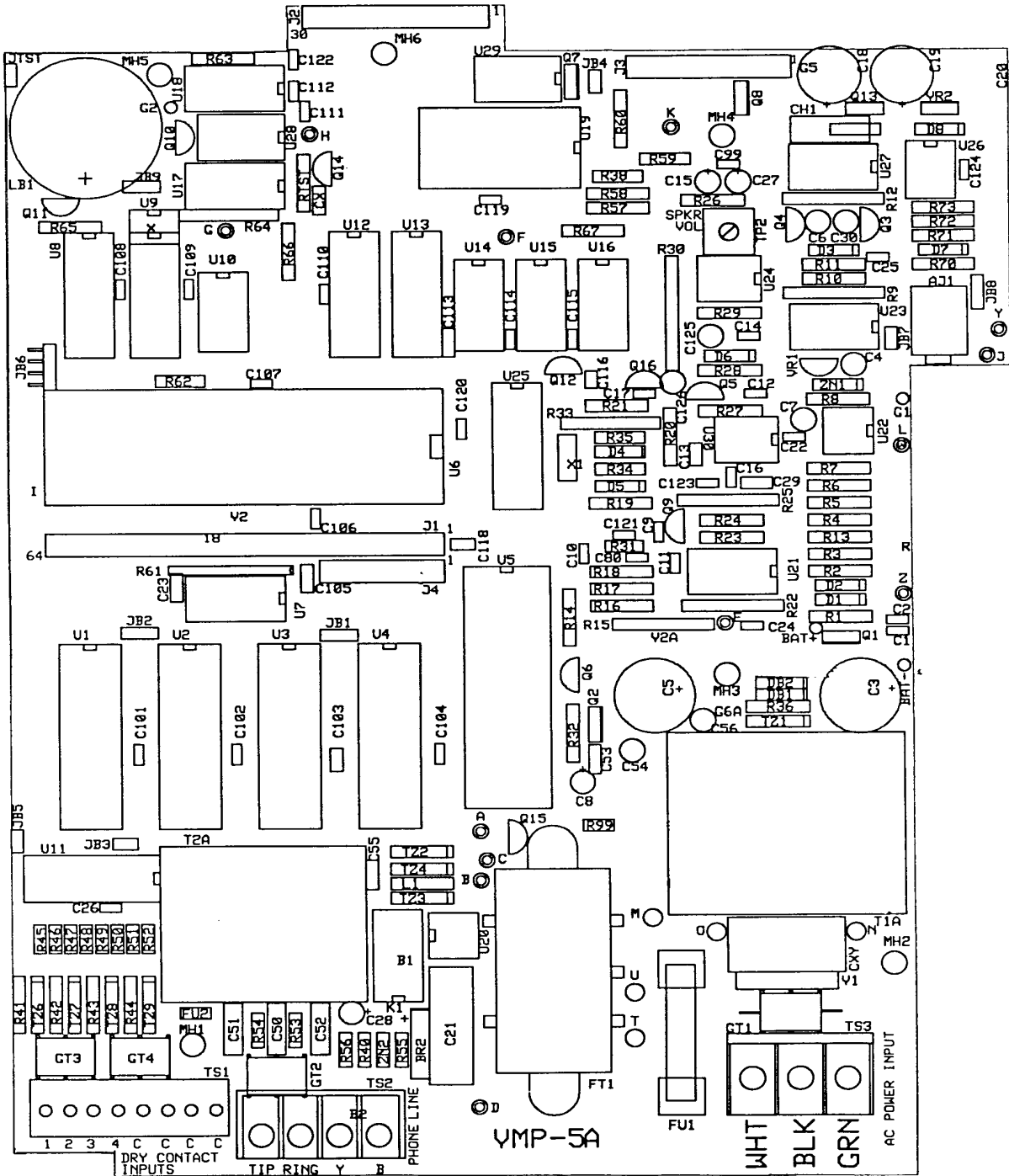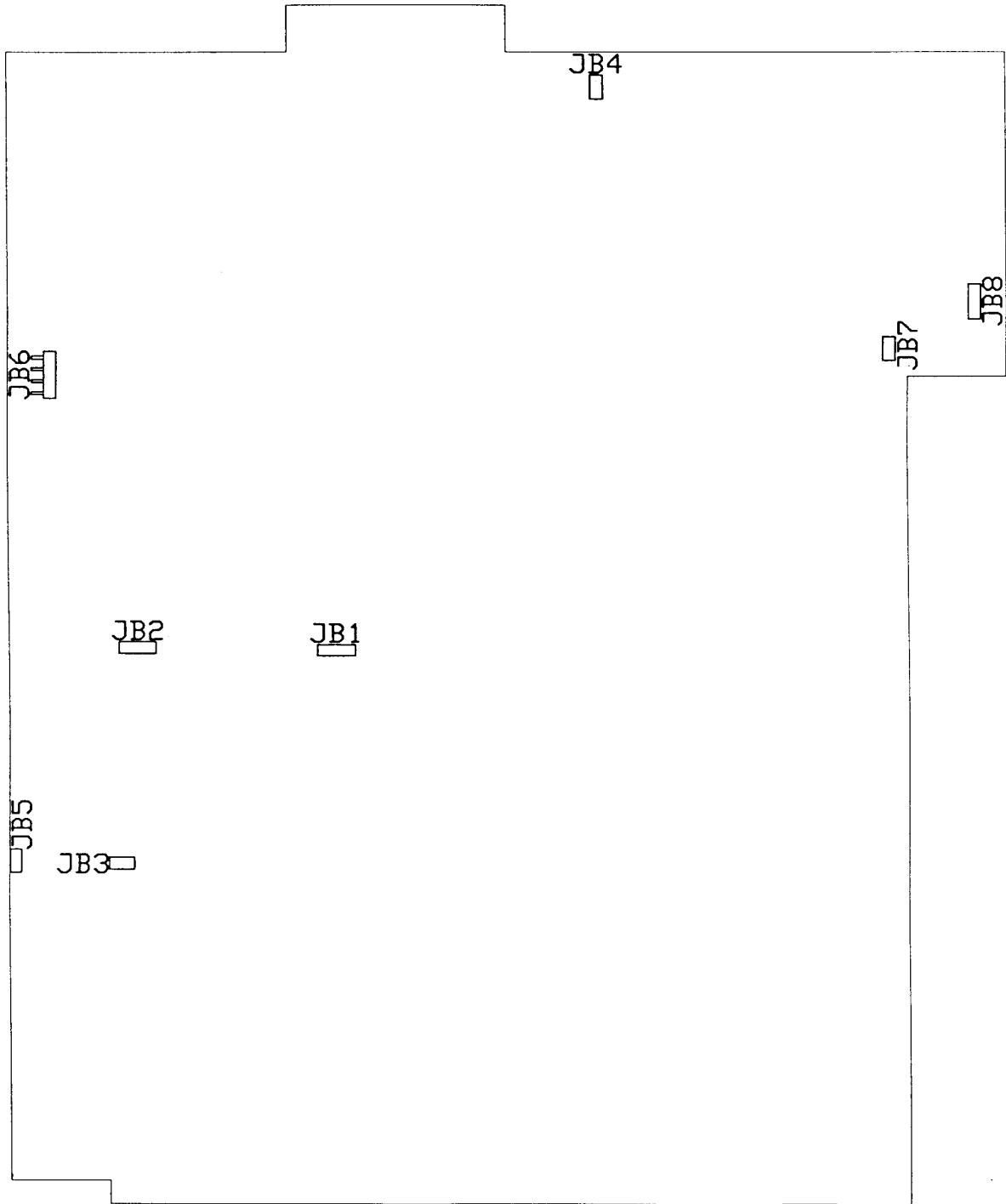
H.11 | Jumper Configurations

Main Board VMP-5A

◆ JB1 - configures sockets U3 and U4 for the size of EPROM chip used.
Placement of shorting block:
- left hand two pins- 2 meg EPROMs (for future use)
- right hand two pins- 1meg and 512k EPROMs (factory default)

◆ JB2 - configures sockets U1 and U2 for the size of RAM chip used.
Placement of shorting block:
- left hand two pins- 1 meg or 256k RAMs (factory default)
- right hand two pins- 2 meg RAMs (for future use)

◆ JB3 - RESET. Short these two pins together for about 2 seconds (a screwdriver works fine) to clear the programming back to factory defaults.

◆ JB4 - Local Alarm Relay/ Line Seizure Relay output. Upper pin is ground, lower pin supplies 5vdc on alarm to activate the relay.

◆ JB5 - SYSTEM RESET. Short these two pins together for about two seconds to reset the system hardware.

◆ JB6 - factory use only

◆ JB7 - factory use only

◆ JB8 - configures jack AJ-1 to be either an audio output jack or a 12vdc power input jack.
Placement of shorting block:
- upper two pins makes AJ-1 an audio output jack, for using an external speaker or connecting to another audio system.
- lower two pins makes AJ-1 a 12vdc power input jack for powering the unit from an external source.

◆ JB9 - factory use only

Speech Board VSPE-2

◆ JB101 - position of jumper varies with the firmware version
Placement of shorting block:
- left hand two pins if the firmware version is 2.00 or higher. Speech RAM is to be placed in the board beginning with U103 then U104 and so on up to 8 RAM chips.
- right hand two pins if the firmware version is 1.36 or below. A maximum of two speech RAM may be used. If using just one RAM chip, it goes in socket U104. A second one if used can go in U105 (U103 is skipped).

I

Verbatim™ Series VSS Autodialer Specification

I.1 Description & Phone Number Dialing

The autodialer shall be a solid state component capable of dialing up to 16 phone numbers, each up to 60 digits in length. Phone numbers and Standard pulse dialing or Touch Tone DTMF dialing are user programmable via the system's keyboard or Touch Tone phone. Further, the autodialer shall be capable of connecting, via a single serial interface cable, to a variety of Programmable Logic Controllers (PLCs), Distributed Control Systems (DCSs) & SCADA systems. Serial interfacing methods shall incorporate commonly used standard industrial network protocols such as Modicon, Inc. Modbus RTU

I.2 Solid State Voice Message Recording and Playback

The unit shall have two different categories of speech message capability, all implemented with permanent non-volatile solid state circuitry with no mechanical tape mechanisms. The unit shall allow for message recording from a remote telephone as well as from the front panel.

I.2.1 User Field Recorded Messages

The user may record and re-record his own voice messages, for each input channel and for the Station ID.

1. *There shall be no limit on the length of any particular message*, within the overall available message recording time, which shall be 409 seconds for 36 total channel units and 624 seconds for 57 total or more channel units.

2. The unit shall allow selective recording of *both Normal and Alarm advisory messages* for each input channel.

3. The unit shall provide for *automatic setting of the optimum speech memory usage rate* for the total set of messages recorded, in order to achieve optimum recording sound quality.

4. Circuit board switches or jumper straps shall not be acceptable means of manipulating message length or recording rates.

I.2.2   Permanent Resident Non-Recorded Messages

Permanent built-in messages shall be included to support user programming operations, to provide supplemental warning messages such as advising that the alarms have been disabled, and to allow the unit to be fully functional even when the installer has not recorded any messages of his own.

I.3   Local & Remote Programming Capabilities

The user may optionally elect to alter the following parameters from their standard normal default values via keyboard entry or remotely from any Touch Tone phone.

Capability	Setting/Description
Alarm Call Grouping	On alarm, system shall selectively call the correct phone numbers according to the current alarm(s).
Alarm response delay	.1 to 9999.9 seconds.
Delay between alarm call outs	.1 to 99.9 minutes.
Alarm reset time:	0.1 to 99 hours or "NO RESET".
Incoming ring response (answer) delay	1 to 20 rings.
Input alarm criteria	Each channel shall be independently configured for "Normally Closed," "Normally Open," "No Alarm," or "Disabled."
Autocall Test	When enabled, the unit shall place a single round of test calls, both at the time this function is enabled and also at regular subsequent intervals until this function is disabled at the keyboard.
Run Time Meter	Selected physical channel inputs shall accumulate and report the number of hours that its input contacts have been closed.
Remote system microphone activation.	
Remote and local arming and disarming of system.	
Pulse Totalizer Function.	Selected physical input channels shall be capable of counting pulses of up to 100Hz. at 50% duty cycle.

I.4   Nonvolatile Program Memory Retention

User-entered programming and voice messages shall be kept intact even during power failures or when all power is removed for up to ten years.

I.5   Acknowledgment

Acknowledgment of an alarm phone call is to be accomplished by pressing a Touch Tone® "9" as the alarm call is being received, and/or by returning a phone call to the unit after having received an alarm call.

I.6   Remote (PLC) Channel Monitoring Function

The unit shall continuously scan all properly configured Remote Channels. The unit shall monitor remote channels which physically reside in other industrial equipment interfaced to the Verbatim via the serial interface. The unit shall be capable of interfacing to at least two PLC networks simultaneously. The unit shall be capable of monitoring any PLC data register regardless of register type, whether digital, analog, input, output or status point. Alarm criteria shall be settable according data register type. For digital remote channels, alarm criteria shall be settable for normally '0' or normally '1'. For analog remote channels, both a high setpoint and a low setpoint alarm criteria shall be settable. Violation of alarm criteria at any remote channel shall cause the unit to go into alarm state and begin dial-outs. All remote channel alarm criteria shall be settable either at the front panel of the unit of over the telephone using touch-tone commands. The unit shall be capable of writing data to any PLC data register to which writing data is a legal operation. The unit shall monitor any failure of the active serial communications channels. Upon failure of any communications channel the unit shall enter the alarm state and begin dial-outs. The unit shall be capable of transferring data between one remote channel on one serial communications network and another remote channel on a second serial communications network. The unit shall also be capable of transferring data between remote channels on a serial communications network and physical channels within the unit. The unit shall be optionally upgradable to incorporate provision for 32, 64 or 96 total remote channels.

I.7 Input Monitoring Function

The unit shall continuously monitor the presence of AC power and the status of four contact closure inputs. Unit shall optionally be field upgradeable to incorporate a total of 8, 16, 24, or 32 dry contact inputs. AC power failure, or violation of the alarm criteria at any input, shall cause the unit to go into alarm status and begin dial-outs. Unit shall, upon a single program entry, automatically accept all input states as the normal non-alarm state, eliminating possible confusion about Normally Open versus Normally Closed inputs. Further, as a diagnostic aid, unit shall have the capability of directly announcing the state of any given input as currently "Open Circuit" or "Closed Circuit," without disturbing any message programming. Each input channel shall also be independently programmable, *without need to manipulate circuit board switches or jumpers*, as Normally Open or Normally Closed, or for No Alarm (Status Only), or for Pulse Totalizing, or for Run Time Metering.

I.8 Run Time Meter Inputs

Any dry contact input can be programmed to accumulate and report the number of hours their respective input circuits have been closed. Any such channels will never cause an alarm, but on inquiry will recite the channel's message according to the status of the input and then report the closed circuit time to the tenth of an hour. The input will accumulate and report in tenths of hours up to a total accumulated running time of 99,999.9 hours. The initial value of the Run Time Meter shall be programmable in order to agree with existing electromechanical Run Time Meters. Up to a total of 8 Run Time Meters may be programmed.

I.9 Pulse Totalizer Inputs

Any dry contact input can be programmed to accumulate the number of pulses (momentary contact closures) occurring at the input. The maximum input pulse rate must not exceed 100 pulses per second, and if the rate is over 50 pulses per second, the pulses must have a 50% duty cycle. The user shall be able to program an initial starting value and a scale factor for each pulse totalizer input. The pulse totalizer input shall cause an alarm call upon reaching a user defined alarm setpoint.

I.10 Alarm Message

Upon initiating an alarm phone call, the system is to "speak" only those channels that are currently in "alarm status".

I.11   Communications Protocol

The unit shall interface to standard networks commonly used in industrial installations. The unit shall be capable of network communications using the Modbus RTU protocol.

I.12   Diagnostics

The unit shall include user commands to execute diagnostics of the PLC network to determine the health of the network. The unit shall inform the user of the length of scan time for the set of all configured remote channels. The unit shall provide a complete verbal report of all programmable functions and their programmed values on command form any remote Touch Tone phone.

I.13   Speakerphone

The unit shall be capable of dialing any phone number on command and function as a speakerphone.

I.14   Inquiry Message and Function

Inquiry phone calls can be made directly to the unit at any time from any telephone, locally or long distance, for a complete status report of all variables being monitored, including power status.

I.15   Power Battery Backup

Normal power shall be 105-135 VAC, 15 watts nominal. The product is to contain its own gel cell rechargeable battery which is automatically kept charged when AC power is present. The system shall operate on battery power for a minimum of 13 continuous hours in the event of AC power failure. A shorter backup time shall not be acceptable. The built-in charger shall be precision voltage controlled, not a "trickle charger," in order to minimize recharge time and maximize battery life available.

I.16   Phone Line

The autodialer is to use a standard rotary pulse or Touch Tone "dial-up" phone line (direct leased line _not_ to be required) and is to be F.C.C. approved. Connection to the telephone is through a 4-pin modular jack (RJ-11).

the main circuit board shall not be an acceptable substitute. The installer shall provide a good electrical ground connection point near the unit to maximize the effectiveness of the surge protection.

I.17   Local Data Logging

The system shall include a parallel printer interface for local data logging. The local printer will automatically print out, with date and time stamp, each activity that occurs; alarms, acknowledgements, programming entries, inquiry calls, etc.. For the purpose of easy program review the user shall be able to printout on demand all user entered programming.

I.18   Public Address Broadcast

The standard dialer shall provide a mini phone jack for optional connection to a local public address system. If connected to the PA system the dialer shall broadcast all alarm messages over the PA system and the telephone simul-taneously.

I.19   Integral Surge Protection

All power, phone line, dry contact, and analog signal inputs shall be protected at the circuit board to IEEE Standard 587, category B (6,000 volts open circuit/ 3,000 amps closed circuit). Gas tubes followed by solid state protectors shall be integral to the circuit board for each such line. Protectors mounted external to the main circuit board shall not be an acceptable substitute. The installer shall provide a good electrical ground connection point near the unit to maximize the effectiveness of the surge protection.

I.20   Warranty

The dialer shall be covered by a five (5) year warranty covering parts and labor performed at the Factory.

I.21   Modular Upgrades

The system shall include expansion connectors to accommodate field upgrades for additional internal dry contact inputs, remote supervisory control outputs, and internal analog inputs, CDL, SCADA.

I.22 Additional Features: Sealed Switches, LED Indicators, Alarm Disable Warning, TalkThrough

All keyboard and front panel switches shall be sealed to prevent contamination. Front panel LED's shall indicate: Normal Operation, Program Mode, Phone Call in Progress, Status for each channel, AC Power Present, AC Power Failure, and Low, Discharging or Recharging Battery. On any Inquiry telephone call or On Site status check, the voice shall provide specific warning if no dialout phone numbers are entered, or if the unit is in the "alarm disable" mode, or if AC power is off or has been off since last reset. A built-in microphone shall allow anyone at a remote phone to listen to local sounds and have a two-way conversation with personnel at the dialer.

I.23 Special Order Items

The following options shall be available on specific order:

    a) 4, 12, 20, or 28 extra contact channels (8,16,24, or 32 respectively, total.)

    b) 32, 64, 96 remote channels

    c) 1, 4, 8, or 16 analog channels.

    d) Remote supervisory control (4 or 8 outputs).

    e) Cellular telephone communications.

    f) Radio communications interface.

    g) NEMA 4X (sealed) enclosure.

    h) Thermostatically controlled heater.

Specifications subject to change without notice.

J | Worksheets

Worksheet A Programming
Part 1: Phone Number Programming

2-Digit Phone Number Designation	Use Program Code	Phone Number (Including any necessary prefixes or area codes)	Person
01 (First)	701		
02 (Second)	702		
03 (Third)	703		
04 (Fourth)	704		
05 (Fifth)	705		
06 (Sixth)	706		
07 (Seventh)	707		
08 (Eighth)	708		
09 (Ninth)	709		
10 (Tenth)	710		
11 (Eleventh)	711		
12 (Twelfth)	712		
13 (Thirteenth)	713		
14 (Fourteenth)	714		
15 (Fifteenth)	715		
16 (Sixteenth)	716		

Part 2:   Optional Programing

Record of any optional programming to alter selected parameters from their normal default values. *(Sample highlighted)*

Program Code	Parameter Description	Default Value	Write In Any Altered Values YouProgram
902	*Alarm Trip Delay*	*2 seconds*	*40 seconds*

Worksheet B Alarm Call Grouping Programming

Purpose: To "link" certain input channels to call only selected phone numbers.
See Section 6.2.13

Part 1: Group Description Naming

As an organizational step, write in a Group Description Name (Electrical, Security, etc.) for each of your phone number groups, and the two-digit designation number of the phone numbers you want included in each group. Refer to the filled-in example below. This should be done only after you have already entered your entire list of up to 16 phone numbers on Worksheet A. (*Sample highlighted*)

Group Description (Electrical, etc.)	2-Digit Phone # Designation (Taken from Worksheet A)
Maintenance	*01, 04, 05, 06*
Electrical	*03, 04*
Security	*02, 05*

Worksheet B Alarm Call Grouping Programming Cont. . .

Part 2:   Linking Channels To Groups

For each input channel that you wish to have "linked" to one of your groups, write in your chosen Group Description Name (Electrical, etc.), and the corresponding set of 2-digit Phone Number Designations which you established above. Finally, write in these same sets of 2-digit codes, without the separating commas, to the right of the printed program code (501, etc.). This establishes the complete program code to enter for each channel that you want "linked" to call only a selected group of phone numbers. (*Sample highlighted*)

The filled-in sample, below, is for an 8-channel unit. Three groups were established, and 5 of the channels were linked to a group. The remaining 3 channels were not linked to any group, and therefore, those 3 "unlinked" channels would dial the entire list of phone numbers in regular order.

✎   *Note:*

Any channels that you do not enter such a program code for, will cause dialing of the entire list of phone numbers, when that channel goes into alarm.

Channel	Linked to Group	Corresp. Phone # Desig's Est. Above	Program Code to Enter
01	Security	02, 05	501 9 02 05
02	Security	02, 05	502 9 02 05
03	Electrical	03, 04	503 9 03 04
04	Maintenance	01, 04, 05, 06	504 9 01 04 05 06
05	_____	_____	505 9
06	Electrical	03, 04	506 9 03 04
07	_____	_____	507 9
08	_____	_____	508 9

Worksheet B Alarm Call Grouping Programming Cont. . .
(Page 1 of 6)

Internal Input Channels	Linked to Group	Corresp. Phone # Desig's Est. Above	Program Code to Enter
01			501 9
02			502 9
03			503 9
04			504 9
05			505 9
06			506 9
07			507 9
08			508 9
09			509 9
10			510 9
11			511 9
12			512 9
13			513 9
14			514 9
15			515 9
16			516 9
17			517 9
18			518 9
19			519 9
20			520 9
21			521 9
22			522 9
23			523 9
24			524 9

Worksheet B Alarm Call Grouping Programming Cont. . .
(Page 2 of 6)

Internal Input Channels	Linked to Group	Coresp. Phone # Desig's Est. Above	Program Code to Enter
25			525 9
26			526 9
27			527 9
28			528 9
29			529 9
30			530 9
31			531 9
32			532 9
33			533 9
34			534 9
35			535 9
36			536 9
37			537 9
38			538 9
39			539 9
40			540 9
41			541 9
42			542 9
43			543 9
44			544 9
45			545 9
46			546 9
47			547 9
48			548 9

Worksheet B Alarm Call Grouping Programming Cont. . .
(Page 3 of 6)

Remote Channels	Linked to Group	Corresp. Phone # Desig's Est. Above	Program Code to Enter
01			4501 9
02			4502 9
03			4503 9
04			4504 9
05			4505 9
06			4506 9
07			4507 9
08			4508 9
09			4509 9
10			4510 9
11			4511 9
12			4512 9
13			4513 9
14			4514 9
15			4515 9
16			4516 9
17			4517 9
18			4518 9
19			4519 9
20			4520 9
21			4521 9
22			4522 9
23			4523 9
24			4524 9

Worksheet B Alarm Call Grouping Programming Cont. . .
(Page 4 of 6)

Remote Channels	Linked to Group	Corresp. Phone # Desig's Est. Above	Program Code to Enter
25			4525 9
26			4526 9
27			4527 9
28			4528 9
29			4529 9
30			4530 9
31			4531 9
32			4532 9
33			4533 9
34			4534 9
35			4535 9
36			4536 9
37			4537 9
38			4538 9
39			4539 9
40			4540 9
41			4541 9
42			4542 9
43			4543 9
44			4544 9
45			4545 9
46			4546 9
47			4547 9
48			4548 9

Worksheet B Alarm Call Grouping Programming Cont. . .
(Page 5 of 6)

Remote Channels	Linked to Group	Corresp. Phone # Desig's Est. Above	Program Code to Enter
49			4549 9
50			4550 9
51			4551 9
52			4552 9
53			4553 9
54			4554 9
55			4555 9
56			4556 9
57			4557 9
58			4558 9
59			4559 9
60			4560 9
61			4561 9
62			4562 9
63			4563 9
64			4564 9
65			4565 9
66			4566 9
67			4567 9
68			4568 9
69			4569 9
70			4570 9
71			4571 9
72			4572 9

Worksheet B Alarm Call Grouping Programming Cont. . .
(Page 6 of 6)

Remote Channels	Linked to Group	Corresp. Phone # Desig's Est. Above	Program Code to Enter
73			4573 9
74			4574 9
75			4575 9
76			4576 9
77			4577 9
78			4578 9
79			4579 9
80			4580 9
81			4581 9
82			4582 9
83			4583 9
84			4584 9
85			4585 9
86			4586 9
87			4587 9
88			4588 9
89			4589 9
90			4590 9
91			4591 9
92			4592 9
93			4593 9
94			4594 9
95			4595 9
96			4596 9

Worksheet C Message Planning & Recording (Page 1 of 11)

Input Channel Message Designation	Program Code	Message Content	Approx. Length
Station ID	*100*		
Ch 01 Alarm	*101*		
Ch 01 Normal	*201*		
Ch 02 Alarm	*102*		
Ch 02 Normal	*202*		
Ch 03 Alarm	*103*		
Ch 03 Normal	*203*		
Ch 04 Alarm	*104*		
Ch 04 Normal	*204*		
Ch 05 Alarm	*105*		
Ch 05 Normal	*205*		
Ch 06 Alarm	*106*		
Ch 06 Normal	*206*		
Ch 07 Alarm	*107*		
Ch 07 Normal	*207*		
Ch 08 Alarm	*108*		
Ch 08 Normal	*208*		
Ch 09 Alarm	*109*		
Ch 09 Normal	*209*		
Ch 10 Alarm	*110*		
Ch 10 Normal	*210*		
Ch 11 Alarm	*111*		
Ch 11 Normal	*211*		
Ch 12 Alarm	*112*		
Ch 12 Normal	*212*		
Ch 13 Alarm	*113*		
Ch 13 Normal	*213*		
Ch 14 Alarm	*114*		
Ch 14 Normal	*214*		

Total estimated recorded message length in seconds, this page _____

Worksheet C Message Planning & Recording (Page 2 of 11)

Input Channel Message Designation	Program Code	Message Content	Approx. Length
Ch 15 Alarm	115		
Ch 15 Normal	215		
Ch 16 Alarm	116		
Ch 16 Normal	216		
Ch 17 Alarm	117		
Ch 17 Normal	217		
Ch 18 Alarm	118		
Ch 18 Normal	218		
Ch 19 Alarm	119		
Ch 19 Normal	219		
Ch 20 Alarm	120		
Ch 20 Normal	220		
Ch 21 Alarm	121		
Ch 21 Normal	221		
Ch 22 Alarm	122		
Ch 22 Normal	222		
Ch 23 Alarm	123		
Ch 23 Normal	223		
Ch 24 Alarm	124		
Ch 24 Normal	224		
Ch 25 Alarm	125		
Ch 25 Normal	225		
Ch 26 Alarm	126		
Ch 26 Normal	226		
Ch 27 Alarm	127		
Ch 27 Normal	227		
Ch 28 Alarm	128		
Ch 28 Normal	228		

Total estimated recorded message length in seconds, this page _____

Worksheet C Message Planning & Recording (Page 3 of 11)

Input Channel Message Designation	Program Code	Message Content	Approx. Length
Ch 29 Alarm	129		
Ch 29 Normal	229		
Ch 30 Alarm	130		
Ch 30 Normal	230		
Ch 31 Alarm	131		
Ch 31 Normal	231		
Ch 32 Alarm	132		
Ch 32 Normal	232		
Ch 33 Alarm	133		
Ch 33 Normal	233		
Ch 34 Alarm	134		
Ch 34 Normal	234		
Ch 35 Alarm	135		
Ch 35 Normal	235		
Ch 36 Alarm	136		
Ch 36 Normal	236		
Ch 37 Alarm	137		
Ch 37 Normal	237		
Ch 38 Alarm	138		
Ch 38 Normal	238		
Ch 39 Alarm	139		
Ch 39 Normal	239		
Ch 40 Alarm	140		
Ch 40 Normal	240		
Ch 41 Alarm	141		
Ch 41 Normal	241		
Ch 42 Alarm	142		
Ch 42 Normal	242		

Total estimated recorded message length in seconds, this page _____

Worksheet C Message Planning & Recording *(Page 4 of 11)*

Input Channel Message Designation	Program Code	Message Content	Approx. Length
Ch 43 Alarm	*143*		
Ch 43 Normal	*243*		
Ch 44 Alarm	*144*		
Ch 44 Normal	*244*		
Ch 45 Alarm	*145*		
Ch 45 Normal	*245*		
Ch 46 Alarm	*146*		
Ch 46 Normal	*246*		
Ch 47 Alarm	*147*		
Ch 47 Normal	*247*		
Ch 48 Alarm	*148*		
Ch 48 Normal	*248*		
Remote Channel Message Designation	Program Code	Message Content	Approx. Length
NET 1 ID	*41001*		
Ch 01 Alarm	*4101*		
Ch 01 Normal	*4201*		
Ch 02 Alarm	*4102*		
Ch 02 Normal	*4202*		
Ch 03 Alarm	*4103*		
Ch 03 Normal	*4203*		
Ch 04 Alarm	*4104*		
Ch 04 Normal	*4204*		

Total estimated recorded message length in seconds, this page _____

Worksheet C Message Planning & Recording *(Page 5 of 11)*

Remote Channel Message Designation	Program Code	Message Content	Approx. Length
Ch 05 Alarm	4105		
Ch 05 Normal	4205		
Ch 06 Alarm	4106		
Ch 06 Normal	4206		
Ch 07 Alarm	4107		
Ch 07 Normal	4207		
Ch 08 Alarm	4108		
Ch 08 Normal	4208		
Ch 09 Alarm	4109		
Ch 09 Normal	4209		
Ch 10 Alarm	4110		
Ch 10 Normal	4210		
Ch 11 Alarm	4111		
Ch 11 Normal	4211		
Ch 12 Alarm	4112		
Ch 12 Normal	4212		
Ch 13 Alarm	4113		
Ch 13 Normal	4213		
Ch 14 Alarm	4114		
Ch 14 Normal	4214		
Ch 15 Alarm	4115		
Ch 15 Normal	4215		
Ch 16 Alarm	4116		
Ch 16 Normal	4216		
Ch 17 Alarm	4117		
Ch 17 Normal	4217		

Total estimated recorded message length in seconds, this page _____

Worksheet C Message Planning & Recording *(Page 6 of 11)*

Remote Channel Message Designation	Program Code	Message Content	Approx. Length
Ch 18 Alarm	4118		
Ch 18 Normal	4218		
Ch 19 Alarm	4119		
Ch 19 Normal	4219		
Ch 20 Alarm	4120		
Ch 20 Normal	4220		
Ch 21 Alarm	4121		
Ch 21 Normal	4221		
Ch 22 Alarm	4122		
Ch 22 Normal	4222		
Ch 23 Alarm	4123		
Ch 23 Normal	4223		
Ch 24 Alarm	4124		
Ch 24 Normal	4224		
Ch 25 Alarm	4125		
Ch 25 Normal	4225		
Ch 26 Alarm	4126		
Ch 26 Normal	4226		
Ch 27 Alarm	4127		
Ch 27 Normal	4227		
Ch 28 Alarm	4128		
Ch 28 Normal	4228		
Ch 29 Alarm	4129		
Ch 29 Normal	4229		
Ch 30 Alarm	4130		
Ch 30 Normal	4230		

Total estimated recorded message length in seconds, this page _____

Worksheet C Message Planning & Recording *(Page 7 of 11)*

Remote Channel Message Designation	Program Code	Message Content	Approx. Length
Ch 31 Alarm	4131		
Ch 31 Normal	4231		
Ch 32 Alarm	4132		
Ch 32 Normal	4232		
Ch 33 Alarm	4133		
Ch 33 Normal	4233		
Ch 34 Alarm	4134		
Ch 34 Normal	4234		
Ch 35 Alarm	4135		
Ch 35 Normal	4235		
Ch 36 Alarm	4136		
Ch 36 Normal	4236		
Ch 37 Alarm	4137		
Ch 37 Normal	4237		
Ch 38 Alarm	4138		
Ch 38 Normal	4238		
Ch 39 Alarm	4139		
Ch 39 Normal	4239		
Ch 40 Alarm	4140		
Ch 40 Normal	4240		
Ch 41 Alarm	4141		
Ch 41 Normal	4241		
Ch 42 Alarm	4142		
Ch 42 Normal	4242		
Ch 43 Alarm	4143		
Ch 43 Normal	4243		
Ch 44 Alarm	4144		
Ch 44 Normal	4244		
Ch 45 Alarm	4145		
Ch 45 Normal	4245		

Total estimated recorded message length in seconds, this page _____

Worksheet C Message Planning & Recording *(Page 8 of 11)*

Remote Channel Message Designation	Program Code	Message Content	Approx. Length
Ch 46 Alarm	*4146*		
Ch 46 Normal	*4246*		
Ch 47 Alarm	*4147*		
Ch 47 Normal	*4247*		
Ch 48 Alarm	*4148*		
Ch 48 Normal	*4248*		
Ch 49 Alarm	*4149*		
Ch 49 Normal	*4249*		
Ch 50 Alarm	*4150*		
Ch 50 Normal	*4250*		
Ch 51 Alarm	*4151*		
Ch 51 Normal	*4251*		
Ch 52 Alarm	*4152*		
Ch 52 Normal	*4252*		
Ch 53 Alarm	*4153*		
Ch 53 Normal	*4253*		
Ch 54 Alarm	*4154*		
Ch 54 Normal	*4254*		
Ch 55 Alarm	*4155*		
Ch 55 Normal	*4255*		
Ch 56 Alarm	*4156*		
Ch 56 Normal	*4256*		
Ch 57 Alarm	*4157*		
Ch 57 Normal	*4257*		
Ch 58 Alarm	*4158*		
Ch 58 Normal	*4258*		

Total estimated recorded message length in seconds, this page _____

Worksheet C Message Planning & Recording *(Page 9 of 11)*

Remote Channel Message Designation	Program Code	Message Content	Approx. Length
Ch 59 Alarm	4159		
Ch 59 Normal	4259		
Ch 60 Alarm	4160		
Ch 60 Normal	4260		
Ch 61 Alarm	4161		
Ch 61 Normal	4261		
Ch 62 Alarm	4162		
Ch 62 Normal	4262		
Ch 63 Alarm	4163		
Ch 63 Normal	4263		
Ch 64 Alarm	4164		
Ch 64 Normal	4264		
Ch 65 Alarm	4165		
Ch 65 Normal	4265		
Ch 66 Alarm	4166		
Ch 66 Normal	4266		
Ch 67 Alarm	4167		
Ch 67 Normal	4267		
Ch 68 Alarm	4168		
Ch 68 Normal	4268		
Ch 69 Alarm	4169		
Ch 69 Normal	4269		
Ch 70 Alarm	4170		
Ch 70 Normal	4270		
Ch 71 Alarm	4171		
Ch 71 Normal	4271		

Total estimated recorded message length in seconds, this page _____

Worksheet C Message Planning & Recording *(Page 10 of 11)*

Remote Channel Message Designation	Program Code	Message Content	Approx. Length
Ch 72 Alarm	4172		
Ch 72 Normal	4272		
Ch 73 Alarm	4173		
Ch 73 Normal	4273		
Ch 74 Alarm	4174		
Ch 74 Normal	4274		
Ch 75 Alarm	4175		
Ch 75 Normal	4275		
Ch 76 Alarm	4176		
Ch 76 Normal	4276		
Ch 77 Alarm	4177		
Ch 77 Normal	4277		
Ch 78 Alarm	4178		
Ch 78 Normal	4278		
Ch 79 Alarm	4179		
Ch 79 Normal	4279		
Ch 80 Alarm	4180		
Ch 80 Normal	4280		
Ch 81 Alarm	4181		
Ch 81 Normal	4281		
Ch 82 Alarm	4182		
Ch 82 Normal	4282		
Ch 83 Alarm	4183		
Ch 83 Normal	4283		
Ch 84 Alarm	4184		
Ch 84 Normal	4284		

Total estimated recorded message length in seconds, this page _____

Worksheet C Message Planning & Recording *(Page 11 of 11)*

Remote Channel Message Designation	Program Code	Message Content	Approx. Length
Ch 85 Alarm	4185		
Ch 85 Normal	4285		
Ch 86 Alarm	4186		
Ch 86 Normal	4286		
Ch 87 Alarm	4187		
Ch 87 Normal	4287		
Ch 88 Alarm	4188		
Ch 88 Normal	4288		
Ch 89 Alarm	4189		
Ch 89 Normal	4289		
Ch 90 Alarm	4190		
Ch 90 Normal	4290		
Ch 91 Alarm	4191		
Ch 91 Normal	4291		
Ch 92 Alarm	4192		
Ch 92 Normal	4292		
Ch 93 Alarm	4193		
Ch 93 Normal	4293		
Ch 94 Alarm	4194		
Ch 94 Normal	4294		
Ch 95 Alarm	4195		
Ch 95 Normal	4295		
Ch 96 Alarm	4196		
Ch 96 Normal	4296		

Total estimated recorded message length in seconds, this page _____

See next page to complete calculations

Worksheet C Message Planning & Recording Calculations:

Total estimated recorded message length in seconds, page 11 of 11 _____
Total estimated recorded message length in seconds, page 10 of 11 _____
Total estimated recorded message length in seconds, page 9 of 11 _____
Total estimated recorded message length in seconds, page 8 of 11 _____
Total estimated recorded message length in seconds, page 7 of 11 _____
Total estimated recorded message length in seconds, page 6 of 11 _____
Total estimated recorded message length in seconds, page 5 of 11 _____
Total estimated recorded message length in seconds, page 4 of 11 _____
Total estimated recorded message length in seconds, page 3 of 11 _____
Total estimated recorded message length in seconds, page 2 of 11 _____
Total estimated recorded message length in seconds, page 1 of 11 _____

Total estimated recorded message length in seconds, **all** pages _____
See Code 912 for alternate method of timing spoken messages.

Note:

For any channels that you have programmed for Status Report Only or for
Run Time Metering, the message to be spoken on Open Circuit input is
recorded with the Program Code ordinarily used for the Alarm Message;
the message to be spoken on Closed Circuit input is recorded with the
program code ordinarily used for the Normal Message.

K

Annunciator Sequences and Options

This appendix discusses Verbatim operations in the context of the *ANSI/ISA-S18.1 Annunciator Sequences and Specifications* standard. It also describes the options available for configuring the Verbatim to support a variety of sequence models. This information will be useful for users needing calling sequences different from the one discussed in Section 5.

Note that the ANSI specification uses slightly different terminology from that used here and elsewhere in this manual. Hopefully, this won't cause much confusion.

One concept central to this discussion is that of *channel state*. At any given time every armed channel is in one of the following 5 states: *normal, alarm, acknowledged alarm, return to normal (RTN), acknowledged RTN*. The precise meaning of these terms will be clarified later on.

The term *annunciator state* is used here to describe the actions and indications of the Verbatim . These include LED illumination,voice reporting and status logging.

An *annunciator sequence* consists of specifying how transitions between the channel states occur and how they impact the annunciator state. The Verbatim supports three distinct types of annunciator sequences. These are each discussed in the subsections below. The next several paragraphs discuss the properties they all share in common.

The normal, alarm and RTN states are determined by comparing the channel's value with the criteria settings. A transition into these states requires that the condition persist for a time period referred to as the *alarm trip delay*. This provides hysteresis, or debouncing between the real-world signals and the channel state.

The two acknowledged states are determined by operator actions. Unacknowledged alarms and RTNs transit to the acknowledged states by pressing keys on the front panel or entering DTMF tones over the phone.

The Verbatim gives visual indications for the state of each channel or group of channels. If normal, the LED is OFF. When alarmed, the LED is blinking. When acknowledged the LED is steady ON. The visual indications for the RTN states are sequence dependent, and described later.

Audible indications for the channel states are also given. These take the form of voice reports either from the speaker or over the phone. These reports may be requested at any time by pressing the CHECK STATUS key, or phoning the unit.

Whenever any channel is in the unacknowledged alarm or RTN state, the Verbatim will solicit acknowledgment by phoning personel. The calling sequence itself is determined by the alarm call grouping and alarm ready scheduling configuration.

All audible indications can be silenced by pressing the ARM/DISARM key on the front panel. This action will also always acknowledge all unacknowledged conditions. Also, all annunciator state transitions and actions are suspended whenever the box is in program mode. Channel state transitions will still occur.

The annunciator state may at any time be completely reset by pressing the ARM/DISARM key twice. This action will also reset the state of each channel.

In terms of *ANSI/ISA-S18.1*, there is one more property that all Verbatim annunciator sequences share: there is no support for the *first out* sequence designations (**F1, F2, F3**). Groups of alarms and RTNs are always registered, reported and reset without regard to which one tripped out first.

K.1   Standard Annunciator Sequence (Manual Reset)

This section describes the default annunciator sequence used by the Verbatim . It is a minor variant of the *ANSI/ISA-S18.1* designation **M-1** (Manual Reset with silence pushbutton). It may be configured by entering code **923 1** in program mode.

Operations in this sequence are detailed in Section 5. Briefly, channel states transit from normal to alarm when criteria violations persist for the trip delay. The alarm state is then locked in until acknowledgment is made. The transition from acknowledged back to normal happens upon manual reset or expiration of the alarm reset timer. The RTN states are omitted from the sequence.

The annunciator states include only those visual and audible indications described above. Also, the annunciator sequence follows the transitions described there too.

This sequence differs from the vanilla **M-1** designation in two ways. The first involves the operation of the automatic reset timer. The true **M-1** sequence is obtained by turning the alarm reset timers off (code **922**). The second distinction involves configurations where no phone numbers are programmed. Here the transition from alarm to acknowledged happens automatically and immediately. There are never any audible or visual indications of the unacknowledged state. This sequence has ANSI designation **M-1-5-6**.

K.2   Clear On Return To Normal (Automatic Reset)

This section describes annunciator sequence options that are variants of the ANSI designation **A-1** (automatic reset with silence pushbutton). The main distinction of these from the **M-1** sequence is that the alarm state is automatically reset when the channel enters the RTN state. The Verbatim sequences in this category differ amongst themselves mainly in when this RTN transition is allowed to occur.

The basic **A-1** sequence is obtained by executing code **923 3**. Channel states transit from normal to alarm when criteria violations persist for the trip delay. The alarm state is then locked in until acknowledgment is made. If no phone numbers are configured, then this transition happens automatically and immediately (**A-1-5-6**). Otherwise, operator action is required. The transition from acknowledged back to normal happens via manual reset or expiration of the alarm reset timer. It also happens whenever the criteria violation for an acknowledged alarm returns to normal.

Designation **A-1-4** is obtained by code **923 2**. This sequence differs from **A-1** only in that the unacknowledged alarms are not locked in. All visual and audible indications are automatically reset whenever the criteria violations return to normal for the trip delay period.

A minor variant of **A-1-4** is obtained by code **923 4**. Here, the indications for an acknowledged alarm will not be reset until it has been reported once, regardless of RTN status. Unacknowledged alarms will be reset completely without any lock-in whatsoever.

The implementation of these **A**-designates involves one wrinkle. The check for RTN condition is not performed continuously, but rather only at specific times. Hence, changes that happen in the midst of a report may not be reflected in the annunciator state until some time later.

K.3   Report Return To Normal (Ringback)

This section describes the annunciator sequence option that provides explicit indications of RTN conditions. This is a variant of the **R-1-8** designation (ringback with silence pushbutton and common ringback audible). There are two differences between **R** and **M** or **A** designations. First is that the RTN state can be entered only from the acknowledged alarm state. **M** has no notion of RTN at all, and **A** allows the transition at any time. Second is that **R** locks in RTN states until acknowledged, whereas **A** immediately resets.

A variant of the **R-1-8** sequence is obtained by executing code **981 1**. Channel states transit from normal to alarm when criteria violations persist for the trip delay. The alarm state is then locked in until acknowledgment is made. If no phone numbers are configured, then this transition happens automatically and immediately (**R-1-5-6**). Otherwise, operator action is required.

The transition from acknowledged alarm to unacknowledged RTN is made whenever the criteria violation goes away for the trip delay period. The RTN state is then locked in until acknowledged. RTN acknowledgment is made in the same fashion as alarm acknowledgments. The channel states are reset either manually or by expiration of the reset timer. The reset timer begins running when the original alarm condition is acknowledged. This means that if a sufficiently long interval exists between acknowledgment of the alarm and the RTN, then the reset will happen immediately.

The main differences between this variant and the standard **R-1-8** sequence are as follows. First, there is no registration of momentary alarms once the RTN state is entered. Once the RTN state is acknowledged, no further calls will be triggered until the channel is reset. This is to say transitions in the channel state may continue, but will not be reflected in the annunciator state. Still, all reports will reflect the current state of the channels. Second, there is no visual indication for the RTN states. The LEDs will continue to reflect the acknowledged alarm status. Third, the silence pushbutton stops all flashing LED indications. Fourth, there is the automatic reset timer.

Unlike the implementation for the **A** designations, RTN conditions are checked continuously for all channels. So long as any unacknowledged alarm or RTN condition exists, the Verbatim will be making calls. Alarm conditions have priority. Hence, if an alarm is one call group and an RTN is in another, no calls will be placed to the RTN group until the alarm is acknowledged.

If the trigger for a call is an RTN, then the report will explicitly mention this before reporting the status of all channels in the group. An RTN report mentions RTN conditions only. Any acknowledgment while in RTN calling state acknowledges RTN conditions only. In contrast, any operator acknowledgment during an alarm call will also acknowledge all RTNs. But, the alarm reports do mention all unacknowledged RTN conditions.

If a new alarm occurs on any channel while in the RTN calling state, a change from RTN to alarm calling will occur as soon as possible. This can happen no sooner than the completion of any report in progress. Such reports may or may not include mention of the new condition depending on whether that channel has already been announced.

K.4 | Annunciator Sequence Option Summary

The following paragraphs provide a concise summary of the available annunciator sequence options. The ANSI designator is given, along with the Verbatim configuration code, followed by a short functional description.

M-1: Manual Reset with Silence Pushbutton.
Code (923 1)

Alarm states are registered directly from configured criteria without regard for return to normal conditions. Alarm states are locked in and dialer will continue to call until acknowledged. Acknowledged alarms are reset via automatic timer. Total dialer reset andsilence via arm/disarm key.

M-1-5-6: Manual Reset with Silence Pushbutton, No Flashing, and No Audible.
Code (923 1) - *with no phone numbers programmed*

Same as **M-1**, except the alarm state is immediately converted to acknowledged state.

A-1: Automatic Reset with Silence Pushbutton.
Code (923 3)

Same as **M-1** except the acknowledged alarm state will be cleared if the channel returns to normal. The check for this transition occurs only when all alarms have been acknowledged.

A-1-5-6: Automatic Reset with Silence Pushbutton, No Flashing, and No Audible.
Code (923 3) - *with no phone numbers programmed.*

Same as **A-1**, except the alarm state is immediately converted to the acknowledged state.

A-1-4: Automatic Reset with Silence Pushbutton and No Lock-in.
Code (923 2)

Same as **M-1** except BOTH the acknowledged and unacknowledged alarm states will be cleared if the channel returns to normal. The check for this transition occurs only in between alarm calls.

A-1-4 variant: Automatic Reset with Silence Pushbutton, No Lock-in, and Single Acknowledge Report.
Code (923 4)

Same as **A-1-4** except the clearing for the acknowledged alarm can't happen until after a single report has been made.

R-1-8: Ringback with Silence Pushbutton and Common Ringback Audible. *Code (981 1)*

Alarm and Return to normal states are registered from criteria and locked-in. Dialer will continue to call until all alarm and RTN states are acknowledged. Acknowledged alarms and RTNS are reset via automatic timer. Total dialer reset and silence via arm/disarm key.

R-1-5-6: Ringback with Silence Pushbutton, No Flashing, and No Audible. *Code (981 1)* - *with no phone numbers programmed.*

Same as **R-1-8** except all unacknowledged alarm and RTN states are immediately converted to the acknowledged state.

Glossary

ACCESS CODE   See Security Access Code.

ACKNOWLEDGMENT   The act of advising the Verbatim autodialer that its alarm message has been heard. This is done either by pressing a touch tone 9 at the prompting beep, or by calling the unit back after the alarm call has ended. Once acknowledged, further activity on that particular channel will not cause further dialing until the expiration of the Alarm Reset Time. See Section 5.1, "Placing Inquiry Calls to the Verbatim autodialer," and Section 5.5, "Acknowledging the Alarm Call."

ALARM CALL GROUPING   Special programming established to cause specific input channels to cause dialing of only selected phone numbers. Used to provide separate alarm functions according to category of personnel, such as maintenance, security, plumbing, etc. See Section 6.1, "Program Codes."

ALARM CONDITION   For contact input channels, the Alarm Condition is the Open or Closed circuit condition opposite to that which was established as the Normal Condition for that channel. For example, for a channel programmed as Normally Open, the Alarm Condition would be Closed Circuit. Also see Violation. See Sections 3.3, "Programming Input Channels" and 5.3, "Receiving Alarm Calls."

ALARM CRITERIA   The chosen determination of what will constitute an alarm condition (violation) for a given channel. See Normally Closed.

ALARM READY SCHEDULING   A program setting which causes the Verbatim autodialer automatically disarm for certain time periods. This function prevents the product from sending alarm telephone calls during periods when personnel are stationed at the site and are able to deal with the problem directly.

ALARM RESET TIME   The period of time, beginning at the moment an alarm is acknowledged, during which alarm dialing on behalf of that specific channel is suspended regardless of further activity of its input circuit. At the end of this period, the Acknowledged Alarm status is cleared for that channel. See Section 5.6, "Alarm Reset Timeout After Acknowledgment" and Section 6, "Advanced Programming."

ALARM TRIP DELAY   The time required for an input violation to remain in violation before the unit trips into the Unacknowledged Alarm state. See Section 6, "Advanced Programming."

ANALOG   Analog signals have variable values of current or voltage, with the specific value generally representing some physical parameter such as water level or pressure. The most common type of analog signal is a 4-20 milliampere current loop, with a transmitter (transducer and associated power supply) governing the current in a loop.   This current is detected by one or more receiving devices in the loop, such as an optional analog input channel on a Verbatim autodialer.

AUTOCALL   A special test calling function. When Autocall is turned on, the unit places test calls at regular intervals to provide ongoing assurance of Verbatim autodialer and phone line operation. See Section 6, "Advanced Programming."

AUTODIALER   A device which constantly monitors a set of inputs from various external sensors, and places outgoing alarm calls when there is an alarm condition. It also allows inquiry calls.

AUTOEXTEND   A unique feature on the Verbatim autodialer which automatically extends the available message recording time as required, selecting the optimum speech memory rate for the user's voice message recording. See Section 4.2.1, "Verifying/Extending Recording Time."

CALL BACK   See Call Forward.

CALL FORWARD   The unit may be commanded from the panel or over the phone, to place a call to a specific phone number. This is called Call Forwarding. If the number called is that of the person commanding the call from a remote telephone, then it is termed Call Back. This is typically done for test purposes. See Section 5.8, "Dialing Out and Conversing Through the Verbatim autodialer," and Section 6, "Advanced Programming."

CALL OUT   The action of the Verbatim autodialer placing calls to outside personnel or facilities.

CDL (Central Data Logger)   The combination of a modem, a serial interfaced printer and a special Raco-built interface box is called a Central Data Logger (CDL). A Raco autodialer/RTU may be configured to call and log data to the CDL printer. CDL RTUs first call the CDL printer to log alarm and status information then proceed on to calling personnel by voice.

CLOSED CIRCUIT CONDITION   One of two possible states of a contact closure input circuit. Closed Circuit is the condition in which the contacts complete the electrical circuit connection. Open Circuit is the opposite condition, in which the contacts do not complete the electrical circuit connection. The Open Circuit condition is electrically equivalent to having no connection to the input circuit. A Closed Circuit input will measure zero volts DC from the input connection to the common connection point. An Open Circuit input will measure 5 volts DC. The Open or Closed Circuit status may

also be read without a voltmeter, by use of Program Code 0 ZZ 0, where ZZ is the 2-digit channel number. See Section 3.3, "Programming Input Channels" and 5.3, "Receiving Alarm Calls".

COMMON   The combined electrical return connection point for all contact closure inputs. One side of all contact inputs are connected to Common. Physically, this Common connection point is any of the 4 terminals marked C on terminal strip TS1. The circuit board internally connects Common to the AC ground (GREEN) terminal on terminal strip TS3. See Section 2, "Installation."

DEFAULT   Programming values which are built into the unit and remain in effect until the user alters them. Also, permanently available speech messages which are utilized when the user has not recorded his own messages.

DELAY BETWEEN DIGITS   In some applications, an extra waiting time is needed between dialed digits. For example in some PBX systems, a 9 must be dialed, followed by a waiting time of several seconds before the main phone number may be dialed. See Section 3.2, "Programming Phone Numbers," Appendix F, "MODBUS Interface," and Section 6, "Advanced Programming."

DESIGNATION NUMBER   The two-digit "order number" of a phone number in the overall set of phone numbers programmed. For example, the designation number for the third phone number is 03. See Programming Worksheet A. See Section 3.2, "Programming Phone Numbers," 6.1, "Program Codes," and 6.2, "Programming Operations."

DIALER   See autodialer.

DRY   Description of a sensor contact circuit that is not connected to any power source.

EXIT DELAY   A delay period after a user arms the unit, before the unit will actually accept new alarms. Used to allow user to exit a protected entrance without tripping the unit into alarm. See Section 6, "Advanced Programming."

GLOBAL   Essentially "over all" or "universal". Programming that simultaneously sets the same value for all channels, but excluding the Power Failure Alarm function.

GROUPING   See Alarm Call Grouping.

ID MESSAGE   See Station ID Message.

INQUIRY CALL   A call placed by personnel to the Verbatim autodialer. See Section 5.1, "Placing Inquiry Calls to the Verbatim autodialer."

LED   A lighted legend indicator on the front panel.

LINK   See Alarm Call Grouping.

MEMORY USE RATE   See Speech Memory Rate.

MODEM   A device which allows digital data (as opposed to voice) to be transmitted between two sites, usually via public telephone lines. In the case of a Verbatim autodialer equipped with the CDL or SCADA option, a modem is built into the option card so that no external modem is required.

NETWORK   The physical and higher level protocols for a specific vendor's PLC data communications. The Verbatim can support a maximum of 3 networks simultaneously. The actual number of networks and type of protocol are hardware options.

NETWORK ADDRESS   The concatenation of the network ID, node, and PLC address. It is sometimes symbolized by '/net/node/addr' where net is the network ID, node is the node address, and addr is the PLC address. The network address suffices to uniquely identify any data object which the Verbatim can access.

NETWORK ID   A voice message identifying a specific network. By default, the message is "Verbatim Net X", where 'X' is a number from 0 to 5. Custom messages, such as "Building 320 LAN" may be recorded. See 'NETWORK' entries below for more details.

NETWORK 0   Refers to the discrete, analog, and RSC points internal to the VSS.

NETWORK 1   Refers to devices connected to the 'NET1' port on the serial communications card. Protocols may vary.

NETWORK 2   Refers to devices connected to the 'NET2' port on the serial communications card. Protocols may vary.

NETWORK 3   Refers to devices connected to the MBPLUS port on the MBPLUS communications coprocessing card.

NETWORK 4   Refers to devices connected to the Parallel port.

NETWORK 5   Refers to devices connected to the Modem port on the serial communications card.

NODE   The address of a specific PLC on the network. Each PLC is already configured with a unique integer as its node address. The Verbatim must also be given a unique number as its node address on each network to which it interfaces. The network ID and node together suffice to uniquely identify any PLC.

NORMAL CONDITION   For contact closure inputs, the Normal Condition is that condition (open or Closed Circuit) which normally exists. The opposite condition would create an alarm. See Section 3.3, "Programming Input Channels" and 5.3, "Receiving Alarm Calls."

NORMALLY CLOSED   Describes a monitored "contact type" input signal circuit, for which the normal, non-alarm state is associated with the circuit being closed (i.e. a completed connection being established between the two conductors of the input circuit). An alarm condition causes the circuit to be opened (broken), which the Verbatim autodialer would detect and begin placing alarm calls. This requires that this input be programmed as Normally Closed on the Verbatim autodialer.

NORMALLY OPEN   Opposite of a Normally Closed circuit. The input signal is open in the normal, non-alarm state and closes when an alarm occurs. This requires that this input be programmed as Normally Open on the Verbatim autodialer, which is the default setting for a contact type input.

NON-VOLATILE MEMORY   When AC power fails, the unit continues to operate for several hours on its internal Gel Cell battery. When this battery is near discharge, the unit automatically turns itself off. However all the user's programming and all user recorded messages are kept intact by Non-volatile Memory for up to ten years, so when power is later restored, no reprogramming or message recording will be required.

OPEN CIRCUIT CONDITION   See Closed Circuit Condition.

PHYSICAL CHANNEL OR PC   Internal inputs are sometimes call Physical Channels (PCs). PCs monitor user-supplied external sensors such as float switches, limit switches, etc. In most cases, the outputs of logic controllers may be connected directly to Physical Channel inputs without the need for interfacing relays or other signal conditioning. The normal Verbatim inputs, as distinguished from the RCs when necessary. The semantics are such that all RCs on network 0 are PCs.

PLC ADDRESS   The data table location of an object within a specific PLC's internal memory. The format of the PLC address is vendor dependent. For network 0, the PLC address is the physical channel number.

POWER FAILURE   The disappearance of 120 VAC power to the unit. The unit will continue to operate under power failure until its internal Gel Cell battery is discharged.

PULSE TOTALIZER   The totalizer function accumulates a continuing count of the number of cycles of a train of pulses presented to the input. The pulses may be in the form of an open and closed circuit, or they may be in the form of a 5-volt logic signal.

RECORDING RATE   In the process of digitally recording the user's voice messages into speech memory, the message is recorded into memory at one of four possible rates. The faster this rate of memory usage, the higher the recording fidelity. However, this results in less total available recording time than at slower rates. Rate 1 is the fastest rate giving the best sound quality. The Auto-

extend feature automatically selects the optimum rate to allow adequate recording time for the user's own set of messages at the best possible sound fidelity. See Section 4.2.1, "Verifying/Extending Recording Time," and Section 4.3, "Record Your Messages."

REMOTE CHANNEL OR RC   A Verbatim I/O point whose value mirrors the value at some network address. Each active RC is associated with one and only one network address. The RC number can be viewed both as a 'speed dial' abbreviation for the lengthy network address and as a 'virtual' I/O point that supports alarm criteria. Different RCs can refer to the same network address. All data objects referenced by any RC are either 1 or 16 bits in length. 1-bit objects are termed "discrete" or "digital" points. 16-bit objects are sometimes termed "analog" points even though the data may actually be a discrete counter or timer. The type of object is implicit in the RC's network address. This is to say, any RC can be either discrete or analog.

Analog RCs are NEVER scaled to engineering units within the Verbatim Gateway. They can only have decimal integer values in the range 0 to 65535. Any desired must be done within the PLCs program. Floating point, hexadecimal, and octal data formats are not supported.

REPEATS   The number of times a series of messages (including Station ID message) is spoken when an alarm call is placed. As used here, this number includes the first recital of the messages. For example, 3 repeats means 3 times total, not 4. See Section 5.3, "Receiving Alarm Calls" and Section 6.1, "Program Codes."

RING ANSWER DELAY   The number of rings required before the Verbatim autodialer will answer an inquiry call. See Section 5.3, "Receiving Alarm Calls," and 6.1, "Program Codes."

RTU (Remote Telemetry Unit)   A monitoring device, interfaced to a communications medium, whose mission is to communicate conditions at a remote or inaccessible site. RTUs are usually polled by a central computer on some schedule or interval. Additionally, RTUs may request polling to report any exceptions such as alarms or other events which require the attention of the central computer or its operators. When a Raco Verbatim autodialer is configured with the asynchronous communications module it is known as an RTU. The Verbatim RTU does not loose any of the basic features of the Verbatim autodialer. In addition, the Verbatim RTU is capable of receiving polling calls from the Raco SCADA Central Computer. Furthermore, alarms may be communicated to the Raco SCADA Central Computer or to a Raco Central Data Logger (CDL) printer.

RUN TIME METER   A feature which, when turned on, accumulates the total number of hours that an input channel is in the Closed Circuit condition. Typically used to monitor equipment operation time, particularly alternating pump systems. See Section 3.3, "Programming Input Channels," and Section 6, "Advanced Programming."

SCALE FACTOR   A translation factor which may optionally be entered in conjunction with the Pulse Totalizer function. The spoken Totalizer reading will be the actual number of pulses accumulated, divided the programmed scale factor. See Section 6, "Advanced Programming."

SECURITY ACCESS CODE   A code optionally programmed by the user at the front panel. Once programmed, this code is required in order to perform any program operations over the phone. See Section 5.7, "Programming by Phone," and Section 6, "Advanced Programming."

SPEECH MEMORY RATE   See Recording Rate.

STATION ID MESSAGE   A message which is always included in all phone calls to or from the unit, intended to identify the unit. The default Station ID Message is "ID number is 1". See Section 4.1, "Planning Messages" and 4.3, "Record Your Messages."

TIME BETWEEN ALARM CALLS   With the unit in Unacknowledged Alarm status, the waiting time from the time the unit terminates a given alarm call, until the time when the unit again accesses the phone line to place the next call. During this interval (default 2 minutes), personnel may call the unit back, which will acknowledge the alarm and suspend further calling. See Section 5.4, "Continued Dialing in the Absence of Acknowledgment," and Section 6, "Advanced Programming."

VIOLATION   For contact closure inputs, a violation (also called Alarm Condition) is the Open or Closed Circuit condition which is opposite the condition which has been programmed as Normal for that channel. For example, if a given input channel is programmed for Normally Open operation, then a Closed Circuit is a violation for that input. If the violation persists for the Alarm Trip Delay time, the unit will go into Unacknowledged Alarm state and begin placing alarm calls. See Section 3.3, "Programming Input Channels, " 5.3, "Receiving Alarm Calls," and 5.6, "Alarm Rest Timeout After Acknowledgment."

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FCC Notice to Users

1. You must notify your telephone utility as follows:

    a. Intention to install an FCC Part 68-registered device.

    b. The FCC registration number: HKS-23J06304-AL-R

    c. The ringer equivalence number: 0.3A

    d. When the device is disconnected from the telco network and will not be reconnected.

2. These units may not be used on party lines.

3. The telco has the right to make changes in their network which may affect the operation of your unit, provided adequate notice is given to you in advance to permit continued correct operation.

4. In the event of operational problems, disconnect your unit by removing the modular plug from the modular telephone jack. To test the phone line, temporarily plug a working rotary-dial telephone into the jack normally used by the Verbatim. If the substitute telephone works correctly, your Verbatim has a problem and should be returned for repairs (in or out of warranty). If the substitute telephone does not work correctly, notify the telco that they have a problem and request prompt repair service (at no cost to the user).

5. The user may not under any circumstances (in or out of warranty) attempt any service or repairs on the Verbatim. It must be returned to RACO for all repairs.

Warranty Registration Card

Important:

Within 14 days of purchase, please complete this Warranty Registration. Detach the top portion, fold in half and drop in the mail. Postage is paid if mailed in the U.S. Otherwise, please return to:

RACO Manufacturing and Engineering Co. Inc.
Service Department
1400 62nd Street
Emeryville, California 94608

Detach here before mailing

Model	**VERBATIM**
Serial number	
Date of Purchase	
Name	
Title/position	
Company/Organization	
Division/Department	
Address	
Telephone	
Dealer's Name	
Address	

Response Card

The following additional information will assist us in our continuing efforts to provide you with products that meet your specific requirements.

Please send me more information on the following quality products from RACO Manufacturing:

1. This Autodialer is used in:

   _ wastewater   __ gas pipeline

   _ cold storage   __ chemical manufacture

   _ energy generation   __ agriculture

   _ remote equipment   _____ other

2. It uses the following types of transducers:

   _ pressure   __ temperature

   _ electrical detection   __ gas (all types)

   _ intrusion   __ flow

   _ float level   _____ other

3. I first became aware of this Autodialer from:

   _ dealer showroom   __ colleague

   _ Central Data Logging   __ trade show

   _ professional association   __ magazine inquiry

   _ _____ other.

4. I read the following publication(s) regularly:

   _____

   _____

   _____