

# **ProTalk<sup>®</sup>** *Lone Worker Monitor*

## **Operating Manual**

***BE*** BARNETT ENGINEERING LTD.

[www.barnett-engg.com](http://www.barnett-engg.com)

# **ProTalk<sup>®</sup>** *Lone Worker Monitor*

## **Operating Manual**

### **Model B1291**

215, 7710 5th St. S.E.

Calgary, Alberta, Canada

T2H 2L9

Phone: (403) 255 9544

Fax: (403) 259 2343

Web: [www.barnett-engg.com](http://www.barnett-engg.com)

e-mail: [sales@barnett-engg.com](mailto:sales@barnett-engg.com)

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** BARNETT ENGINEERING LTD.**

## ACTA/IC Customer Instructions

The ProTalk Model B1291 meets and exceeds the necessary requirements for operation and connection to a PSTN telephone line in Canada and the United States. It currently holds the following approvals:

1. FCC part 15, subsection J/A
2. Industry Canada CS-03 Part I Issue 8
3. TIA/EIA-968
4. CSA C22.2 No 60950-00 / UL 60950, 3rd Edition

### FCC Regulations

1. This equipment complies with Part 68 of the FCC rules and the requirements adopted by ACTA. On the side of this equipment is a label that contains, among other information, a product identifier in the format US:AAAEQ##TXXXX. If requested, this information must be provided to the telephone company.

2. A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by ACTA. A compliant telephone cord and modular plug is provided with this product. It is designed to be connected to a compatible modular jack that is also compliant.

3. The ringer equivalence number (REN) is used to determine the number of devices that may be connected to a telephone line. The total number of all RENs on any one line should not exceed 5.0 in most cases. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the telephone company to determine the maximum REN for the calling area. The REN for this product is shown separately on the label and is also part of the product identifier that has the format US:AAAEQ##TXXXX. The digits represented by ## are the REN without a decimal point (e.g. 00 is a REN of 0.0).

4. If the model B1291 causes harm to the telephone network, the telephone company will notify you in advance that a temporary discontinuance of service may be required. But if advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

5. The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make the necessary modifications in order to maintain uninterrupted service.

6. If trouble is experienced with the B1291, please contact Barnett Engineering Ltd., 215 7710 5th Street SE, Calgary, Alberta, Canada T2H 2L9 for repair and/or warranty information. If the trouble is causing harm to the telephone network, the telephone company may request you remove the equipment from the network until the problem is resolved.

7. Repair work must be performed by Barnett Engineering Ltd.

8. This device must not be installed on coin-operated or multi-party telephone lines.

### **Class B Computing Device**

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/ TV technician for help.

### **FCC Part 68 Continuing Compliance**

The testing which will be performed on this equipment as part of the Part 68 compliance program will essentially follow the same format as the contained in the test data portion of this application. Testing and evaluation will be performed at least annually on a minimum of one production unit. Testing will be performed in-house or by a laboratory that has the proper facilities for verifying compliance to the requirements of Part 68. Should

such testing indicate the need for changes to the equipment under test, said changes will be demonstrated to comply with Part 68 by testing and evaluation and proper notification will be given to the FCC in the form of a modification filing.

Upon request from the FCC, copies of the reports showing Part 68 compliance for a recent production lot, or one or more units for Part 68 compliance verification inspection, will be supplied.

## Industry Canada Regulations

**NOTICE:** This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

**NOTICE:** The Ringer Equivalence Number (REN) for this terminal equipment is 0. The REN assigned to each terminal equipment provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed five.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas. *Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.*

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## Introduction

The ProTalk Lone Worker Monitor (*LWM*) model B1291 provides reliable, efficient monitoring of field personnel working at unattended sites. The Lone Worker Monitor is an unattended device; safety monitoring can be done without any extra personnel. Each user uses a unique set of codes to start, stop and maintain their individual monitoring activities. The operator activates the monitoring function by sending a unique 'Start' code to the *LWM*. This starts a timer that must be refreshed at periodic intervals; allowing the timer to lapse will create an alarm condition. Sending a 'Stop' code cancels the timer operation. Up to 16 independent operators can be handled at one time.

The operator also has the capability of initiating an immediate 'Emergency' alarm using a single code.

User control of the *LWM* can be through either a mobile radio system or over a dial-up phone line. The user is prompted and updated with voice messages throughout the setup and operation of the monitoring process. The amount of information required from the user when a timer is setup can be tailored to suit each application. Identification of the operators name and location can be by either voice messages or codes. A serial port with Modbus communications allows external equipment to retrieve all activity information from the *LWM*.

If an alarm condition occurs, the *LWM* makes announcements over radio and telephone.

The *LWM* can be completely customized for your application because all of the operating parameters are programmed by the user, including the voice messages. Stored voice in the *LWM* prompts you step-by-step when you are entering new voice messages or codes, and speaks back all the values that you have saved.

With the added feature of PC software, it is also possible to program the *LWM* from a computer. Using the PC software, all of the information in the *LWM* can be read, written and stored to disk.

The programming sections of this manual describe how the *LWM* is configured with a phone set. Instructions for programming with the software application are found in the Help section of the program.

## How to Use this Manual

The Lone Worker Monitor performs two functions that are described in the Operations section: processing the user timers and making alarm callouts when a user has an expired timer or declares an emergency.

At startup, if the programming phone is off-hook, a new *LWM* will go directly to the programming section and speak *Program Access - Enter Program Code*. Refer to the Programming section where the Program Codes are described in detail.

If you wish to change some of the default settings or have the *LWM* perform more advanced functions, continue on to the Programming chapter where the Program Codes are described in detail. Several step-by-step examples of programming the *LWM* into different configurations are given. The Troubleshooting chapter describes some of the problems most commonly experienced when the *LWM* is first installed.

# Hardware

## Description

The *LWM* is housed in metal case with plug-in terminal blocks and jacks for field wiring. Table 1 and Figure 1 show the connection points to the *LWM*. Figure 3 shows how wiring connections are made to the unit.

**Table 1: ProTalk Wiring Connections**

### RADIO

- 1 Radio TX
- 2 Radio RX
- 3 Output.
- 4 COS Input
- 5 Ground
- 6 ACK Input
- 7 Ground
- 8 +11.5 to +28 power

### INPUTS

- 1 Refresh Timer 1
- 2 Refresh Timer 2
- 3 Refresh Timer 3
- 4
- 5
- 6
- 7
- 8
- 9 Ground
- 10 Ground

### RELAY ALARM OUTPUTS

- 1 Relay 1 NC
- 2 Relay 1 Common
- 3 Relay 1 NO
- 4 Relay 2 NC
- 5 Relay 2 Common
- 6 Relay 2 NO
- 7 Relay 3 NC
- 8 Relay 3 Common
- 9 Relay 3 NO
- 10 Relay 4 NC
- 11 Relay 4 Common
- 12 Relay 4 NO

### POWER

2.5mm power, center ground

### PHONE

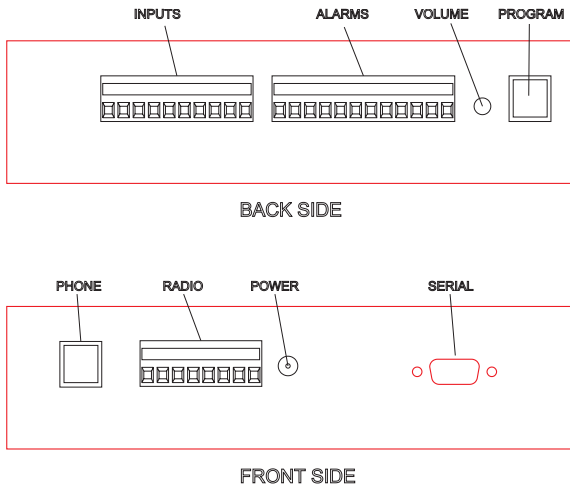
RJ11 Line 1

### PGM

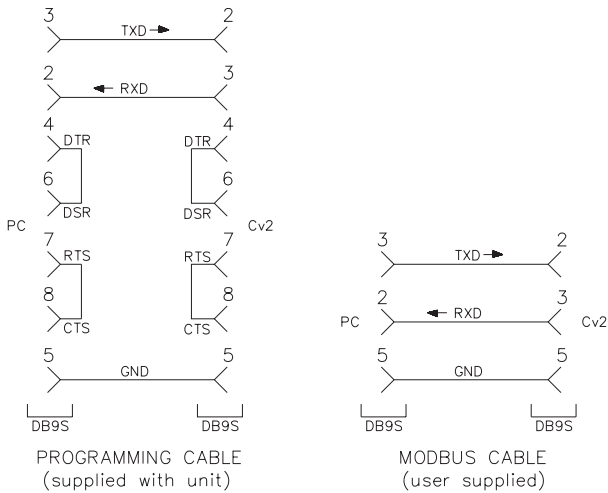
RJ11 Line 1

### SERIAL

- 2 RXD
- 3 TXD
- 4 DTR
- 5 GND
- 6 DSR



**Figure 1 Connector Locations**



**Figure 2 Serial Cable Wiring**

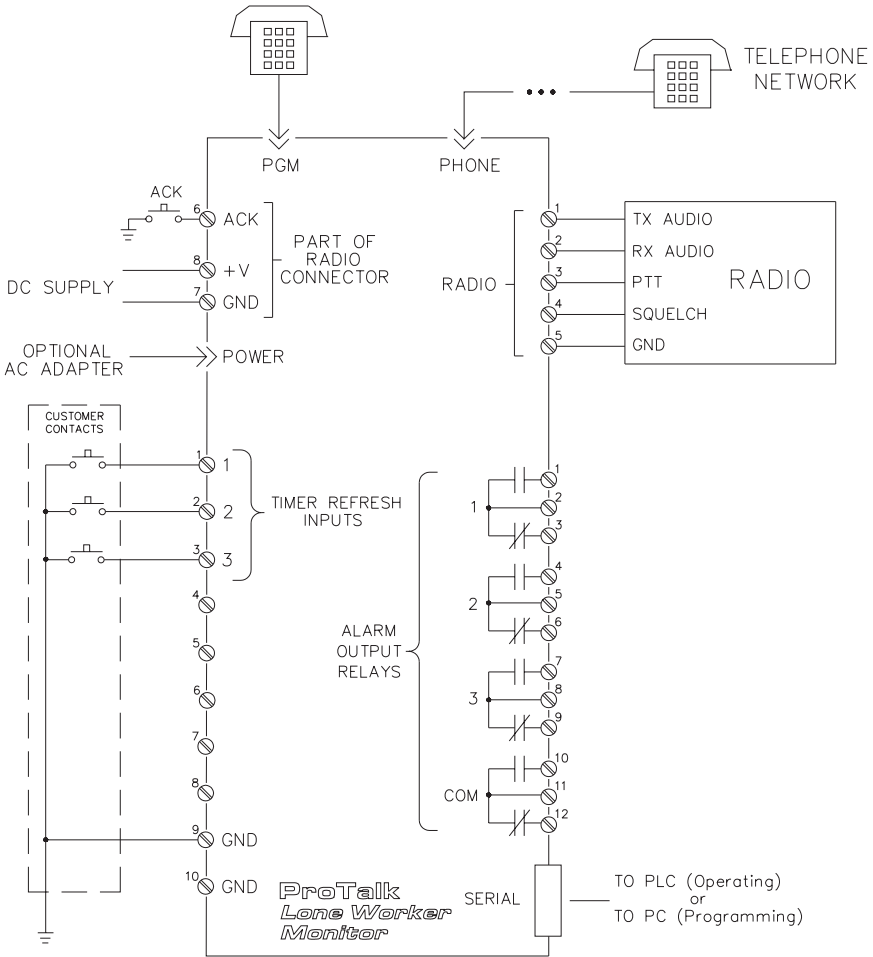


Figure 3 ProTalk LWM Wiring Diagram

## Power Requirements

The *LWM* will operate from a supply of +11.5 VDC to +28 VDC. The typical current requirement is 100 mA plus 10 mA per relay.

Connect power only to one of the two available inputs: the DC inputs on the Radio terminal block or the plug used with an AC adapter.

## Installation

*The LWM should be installed in a clean, dry place suitable for electronic equipment. The unit will operate from -40°C to +60°C.*

*Caution: Power and the telephone line should not be connected until the rest of the installation is complete.*

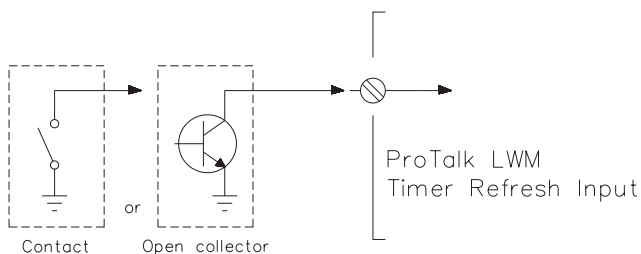
Use a flat blade screwdriver to make connections to the screw terminals on the sides of the enclosure.

## Inputs

The *LWM* looks for a ground closure at inputs 1, 2 or 3 to refresh the timers for operators 1, 2 or 3 respectively. Refer to Figure 4 for details on how to connect an input signal line.

Inputs are optically isolated and are operated from the *LWM*'s internal 12 volt supply.

*Caution: DO NOT connect a voltage source to the inputs.*



**Figure 4 Timer Refresh Input Connection**

## Relays

Four form C relay outputs are available for external indication of alarm conditions for operators 1, 2 or 3 and a common output for any operator in an alarm state. These relays are rated for 1.0 A at 30 VDC, or 0.3 A at 120 VAC. Connect external devices to the contacts on the ALARM connector. When connecting to larger loads, connect an interposing relay between the *LWM* relay contact and the load.

## Radio

Connect TX to the transmit audio of the radio, and RX to the receive audio. *RX should always be connected to squelched audio.* Independent transmit level adjustments are available for voice, DTMF and tone signals. Adjust the levels of the transmit audio signals using the programming phone or the software setup. For the receive level adjustment, set the programmed level to match the level of the incoming signal: for a -10 dBm received signal from the radio the programmed value would be -10 dBm. The range of adjustment for both receive and transmit signals is -20 dBm to 0 dBm.

The PTT output provides a ground closure through an open collector to signal the radio to transmit. Connect this point to the radio's push-to-talk circuit. The maximum rating is 150 mA, 25V.

The COS input is used to indicate to the *LWM* whether the radio channel is busy. Connect this point to the output of the radio's carrier-operated switch or relay (COS or COR). In its default condition, the *LWM* looks for a high signal to indicate the channel is clear and a low signal when the channel is busy. The *LWM* may also be programmed to recognize the reverse polarity. To change this parameter, refer to the squelch polarity in System Settings - Program Code 6. This input is internally pulled up to work with open collector radio outputs. In its default program condition, the input is pulled high when clear and driven low when busy.

## Local Acknowledge

This input is used to acknowledge an alarm locally at the *LWM* without having to call in over the radio or telephone. Connect the ACK input to a normally open contact which will be grounded to acknowledge the alarm.

## Telephone

The telephone line is connected to the RJ11 jack labeled PHONE on the side of the *LWM*. The line should be using the inner (red/green) pair. Audio levels to the telephone line are fixed internally in conformance with FCC regulations.

The telephone should always be the last item connected.

*Caution: DO NOT plug the telephone line into the PGM jack, as damage could result to the LWM.*

## Serial Port

The connection between the *LWM* and a PLC with Modbus communications is done using the 3 wire cable shown in Figure 2. Do not use a cable that has the flow control lines RTS/CTS or DSR/DTR. The settings for the Modbus port are done with the PC programming software; these settings are not available through the telephone set programming.



## Power-up Sequence

Once the installation is complete, DC power can be connected to the *LWM*. On start-up, the *LWM* will go through the following self-test sequence:

1. LED Test
  - VOICE, TONE and HOOK LEDs On.
  - PTT LED Off
  - RUN LED Flashing
2. Hardware Test
  - Active, Warning, Busy, RXD and TXD LEDs On
  - Memory test
  - One second dwell time for this test
3. Vocabulary Voice Test
  - Active, Warning, Busy and, RXD LEDs On
4. User Voice Message Test
  - Active, Warning and, Busy LEDs On
5. Database Setup
  - Active and Warning LEDs On
6. End of Test
  - Active, Warning, Busy, RXD and TXD LEDs Off
  - One second dwell time
  - Software version spoken over the speaker
7. Normal Operation
  - RUN LED Steady

The telephone line may then be plugged in as the last connection. *Ensure that the telephone is connected into the PHONE port on the LWM.*

## Error Messages

The *LWM* will speak error messages when it is called on the phone line, interrogated over the radio port or when the local program phone is used.

### Hardware Error

The *LWM* speaks *Alert - Site Error* when either the user voices or the vocabulary memory space is corrupt.

### Database Error

The *LWM* speaks *Alert - Program Error* when either the configuration or database is corrupt.

### Phone Error

The *LWM* speaks *Alert - Telephone Access Error* when there has been a call progress error such as no dial tone during a phone call.

## Front Panel

The front panel of the *LWM* is shown in Figure 5. The description of the front panel indicators will assist you in verifying the correct operation of the unit.

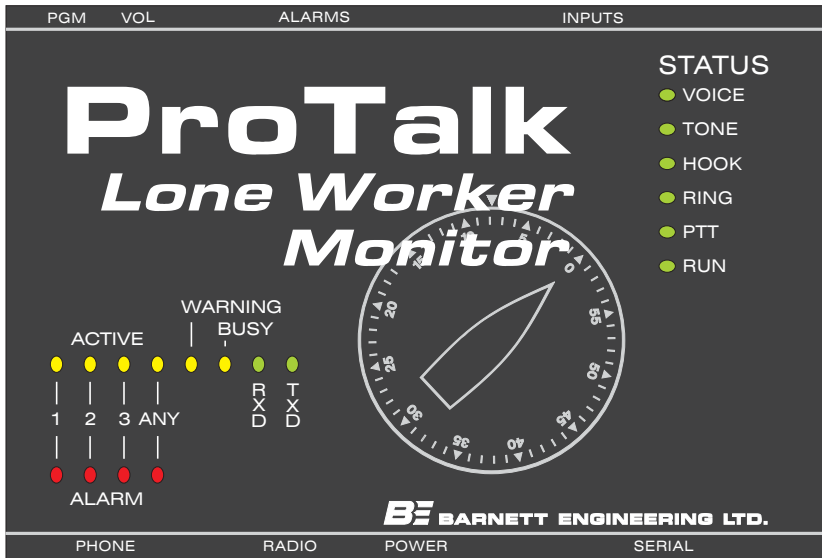


Figure 5 ProTalk *LWM* Front Panel

### Alarm LEDs

Individual Alarm LEDs are available for the first three user timers. One common LED is used to indicate an alarm on any timer.

### Active LEDs

Individual Active LEDs are available for the first three user timers. One common LED is used to indicate activity for any user.

### Warning

The indicator will be on steady if any user has been issued a warning and has not refreshed or stopped the timer.

### Busy

The Busy LED is on solid when the *LWM* is calling out or has been called on the phone line. The LED flashes during user programming.

### **RXD**

This LED is on when the LWM is receiving data on the serial port.

### **TXD**

This LED is on when the LWM is transmitting data on the serial port.

### **Voice**

The Voice LED is on whenever the *LWM* is recording or playing user messages. It flashes when vocabulary messages are being played or when there is an error in the user voices.

### **Tone**

The Tone LED is on for the duration of a transmitted DTMF digit or other generated tone. It will also be on when call progress tones are detected on the phone line. It will flash once for each received DTMF digit.

### **Hook**

The Hook LED comes on whenever the *LWM* goes off hook, to dial or answer the telephone. It will flash if a phone port error is detected (no dial tone or other expected call progress signal). The hook LED will also flash during pulse dialing.

### **Run**

The Run LED will be on steady when the *LWM* is operating correctly. This LED will flash if an error condition is present.

### **Ring**

When ringing is detected on the telephone line, the Ring LED illuminates. Since answering the telephone is a low priority task to the *LWM*, it may ignore the ringing if it is processing other tasks (e.g. speaking on the radio).

### **PTT**

The PTT LED will light when the *LWM* generates a push-to-talk signal to the radio.

## Operation

This chapter gives a detailed description of exactly how the *LWM* will operate according to the program setup.

There are two components involved in the unit's operation: timer processing and alarm callout. Starting, stopping and monitoring the user timers are the most active functions in the *LWM*; alarm callout occurs only when a user timer has expired or an emergency has been declared.

### Timer Operations

The actions that are associated with a user timer are very flexible and need to be configured during the programming process. Programming sets the state for a number of flags that determine how the *LWM* will respond when it receives a Start Code.

<code>play_settings</code>	All of the current settings are spoken when the Start Code is received.
<code>ask_name</code>	Prompt the user to record their name
<code>ask_timer</code>	Prompt the user to enter a timer value.
<code>ask_location</code>	Prompt the user to record their location.
<code>name_code</code>	A DTMF code is used for the name identifier.
<code>location_code</code>	A DTMF code is used for the location identifier.
<code>location_voice</code>	A voice message is used as the location identifier.
<code>name_voice</code>	A voice message is used as the name identifier.
<code>ask_accept</code>	All of the current settings are spoken before the timer is started.
<code>confirm_emerg</code>	Prompt the user for a confirmation that an emergency is being declared.
<code>enable_timeset</code>	Allows the user to modify the timer setting

In describing the operations the terms `NAME` and `LOCATION` are used to denote the user programmed voice messages for their name and location. `TIMER` denotes the value the user has entered for the timer interval. If the *LWM* has been programmed to use DTMF codes to identify the user's name and location, `NAME CODE` and `LOCATION CODE` will indicate these variables. `PHONE NUMBER` denotes the user's phone number for a setup done over the phone line.

The *LWM* can be programmed to use voice messages and strings as identifiers for the user name and location. The two processes are shown in flowchart form in Figure 6 and are described below. There are 16 individual timers and associated control codes, each operating independently from the others. The four control codes, Start, Stop, Emergency and Interrogate, can be up to 8 digits in length. Run time codes used for name and location can also be up to 8 digits long.

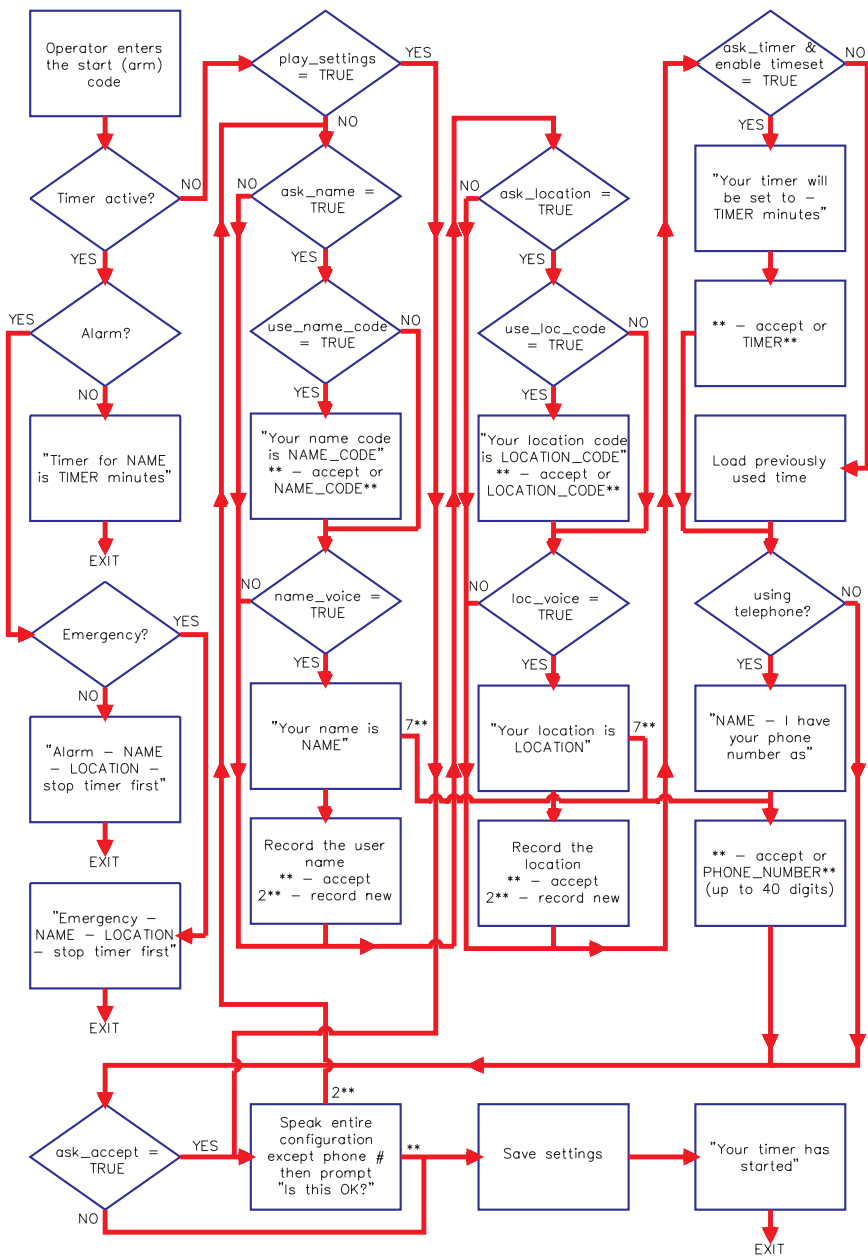


Figure 6 Timer Setup Flowchart

## Start Code - Activation

The user sends a “Start Timer” message with the DTMF string that is programmed as the Start Code for this timer. The Start Code is used to enter the timer setup routine as well as to refresh the timer during operation.

If the timer is already active but not in the alarm state, the timer is reloaded and the response is “Timer for NAME is ZZ minutes” where ZZ represents the current timer setting.

If the timer is already active and in the alarm state, the response is “Alarm - NAME at LOCATION - stop timer first”. No other action takes place.

If the timer is in the emergency state, the response is “Emergency - NAME at LOCATION - stop timer first”. No other action takes place.

When starting up a new timer session, the *LWM* checks the programming to determine what variables are expected to be modified.

If *play\_settings* is on, the current settings that are being used by the operator will be spoken. The recorded voice message for NAME is always spoken and the recorded voice message for LOCATION is always spoken. The DTMF code for NAME\_CODE is spoken if *name\_code* is on and the DTMF code for LOCATION\_CODE is spoken if *location\_code* is on. The timer value is always spoken.

After the settings have been spoken, the *LWM* waits to receive either \*\* to continue or 2\*\* to go back and make changes. Receipt of \*\* starts the timer and the *LWM* speaks “NAME - Timer has started”.

The next step in the timer activation process occurs either by having the *play\_settings* control off or by returning after the *play\_settings* section by using the 2\*\* command to make changes. If making changes is the requested action, prompts to modify the name, location and timer settings will all be issued regardless of the programmed settings for these prompts otherwise only prompts that are programmed on will be provided. If *enable\_timeset* is off, the prompt to change the timer will not occur.

The user will be prompted to enter NAME information if *ask\_name* is on.

“Your name code is NAME\_CODE” is spoken if *name\_code* is on. To change this code enter the new one followed by \*\* or accept the current code by entering \*\*. The *LWM* will play back the new entry and you can either change or accept it.

“Your name is NAME” is spoken if *name\_voice* is on. To replace the recording with a new one, enter 2\*\* or enter \*\* to accept the current one. If 2\*\* is entered the *LWM* will respond with a short beep after which you may speak the new NAME message. The new message will be played back and you can either accept it or change it. Entering the special code 7\*\* will cause the timer startup routine to jump to the end of the routine, bypassing any other entry prompts.

If *ask\_name* is off, no name related prompts occur.

“Your location code is LOCATION\_CODE” is spoken if location\_code is on. To change this code enter the new one followed by \*\* or accept the current code by entering \*\*. The LWM will play back the new entry and you can either change or accept it. Entering the special code 7\*\* will cause the timer startup routine to jump to the end of the routine, bypassing any other entry prompts.

The next section concerns the entries for the user’s location; location entry prompts will occur when ask\_location is on. If location\_voice is on “Your location is LOCATION” is spoken. To replace the recording with a new one, enter 2\*\* or enter \*\* to accept the current one. If 2\*\* is entered the LWM will respond with a short beep after which you may speak the new LOCATION message. The new message will be played back and you can either accept it or change it.

If ask\_location is off, no location related prompts occur.

If ask\_timer is on and enable\_timeset is on, the prompt “Your timer will be set to TIMER minutes” is spoken. To change this value enter the new setting followed by \*\* or accept the current value by entering \*\*.

The step described in this paragraph will only occur if the Start Code was received as a result of an incoming phone call to the LWM. In this case the prompt “NAME - I have your phone number as PHONE NUMBER”. This phone number is the one that the LWM calls to speak a timer warning. To change this value, enter the new number followed by \*\* or accept the current number by entering \*\*.

When the timer has been activated by a telephone call, the telephone number is stored for use with the next telephone activation. If a subsequent activation is done over the radio, the LWM will inform the caller that the previously stored phone number has been deleted.

If ask\_accept is on, the settings will be replayed followed by the phrase “Is this OK?”. The LWM waits to receive either \*\* to continue or 2\*\* to go back and make changes. Receipt of \*\* starts the timer and the LWM speaks “Your timer has started”. If ask\_accept is off, “Your timer has started” is spoken and the timer started.

### **Stop Code - Deactivation**

The user sends the Stop Code to cancel timer operations. On receipt of this code, the LWM speaks the phrase “Timer for NAME is off” and places the timer for that user into the idle mode. Once a timer has expired or an emergency has been declared, the Stop Code must be used to clear the alarm or emergency condition.

## Emergency Code

The user sends the Emergency Code to create an immediate emergency alarm condition. This can be done either over the radio system or by calling the LWM on the phone line.

When an emergency is declared, the *LWM* will announce the message “Emergency for NAME will be declared in 10 seconds”. After 10 seconds the emergency will be an alarm condition. You may enter \*\* to bypass the 10 second wait or 2\*\* to clear the emergency. If the emergency is cleared the LWM will speak “Emergency Aborted”.

## Interrogate Code

To obtain the current state of the users timer the Interrogate Code is used. When this code is received the LWM will respond with one of the following phrases:

Idle	“Timer for NAME is off”
Running	“Timer for NAME is ZZ minutes”, where ZZ is the time remaining on the timer
Alarm	“Alarm NAME at LOCATION - stop timer first”
Emergency	“Emergency NAME at LOCATION - stop timer first”

## Warning

A warning that the timer for this user is going to expire is sent out at the programmed interval before the actual timeout. The *LWM* speaks the phrase “Warning timer for NAME at LOCATION will expire in ZZ minutes”. A ten second interval is provided for the user to enter the codes to either refresh or stop the timer. This warning will be sent out on either the radio or by calling the user on the phone line depending on how the timer was started.

The Start Code to refresh the timer can be entered at any time on the radio or telephone system.

## Timeout

When a timer gets within 10 seconds of the expiry time, the announcement “NAME at LOCATION, timer will expire in 10 seconds” will be issued. The user then has 10 seconds to refresh or stop the timer. If the timer was started on the radio system, the announcement will be made over the radio. If the timer was started by a phone call, the telephone number that was stored by the user when the timer was started will be used for this announcement.

If no action is taken during the 10 second interval an alarm will be set.



## System Busy

When the *LWM* is using the phone line to make alarm callouts or if it is being accessed on the phone line for timer control, the radio port is unavailable to the user. Before the *LWM* uses the telephone line it will announce the phrase “*Alert - System unavailable - please standby*”. When the radio port is available again the *LWM* announces “*System Available*”. This function can be disabled using the Radio Warning setting.

## Alarm Sequence

The following description assumes that the alarm reporting function will be done by calling out over the phone line. Refer to the Programming section for additional details on how to setup alarm reporting cycles over the radio.

When the *LWM* detects one of the 16 timers going into the alarm state, it goes off hook and listens for dial tone. If dial tone is not present, the *LWM* will hang up and try again. After three unsuccessful attempts to detect dial tone, the *LWM* will conclude there is a problem with the line and stop dialing. When this occurs the unit will report *Telephone Access Error* over the radio and flash the RUN and HOOK LEDs.

If dial tone is detected, the *LWM* dials the first telephone number stored in Directory A using tone dialing. When the telephone line is answered, the *LWM* will announce the alarm in this form: *Site ID, Alarm NAME at LOCATION has not reported, Enter Acknowledge Code*.

[The actual spoken phrases used for name and location depend on what has been set during programming for voice message and code usage. If both voice messages and codes have been enabled for either name or location, only the voice message, if recorded, will be used during the alarm reporting process. If the system is set to use codes only, then the codes will be spoken during alarm reporting.]

It will repeat this message a minimum of three times, pausing five seconds after each announcement to wait for an acknowledgment. When the Acknowledge Code is detected, the *LWM* will announce *Alarms Acknowledged* and then prompt *Enter Control Code*.

If the line is busy, if there is no answer, or if the *LWM* does not receive the Acknowledge Code after announcing the alarm, it will hang up the telephone line, then go off hook again and dial the next number in the directory. If the *LWM* dials all the way through the directory without being acknowledged, it will wait two minutes (Interval Timer A), then start dialing again from the top of the directory. After three tries (Times A) at two minute intervals, the *LWM* will retry the list every ten minutes (Interval Timer B) thereafter, not stopping until it is acknowledged.

All of the timers and intervals mentioned above are adjustable. In addition, the *LWM* may be programmed to announce the alarm a number of times over radio as well as dialing on the telephone.

## **Acknowledging an Alarm**

When the *LWM* calls you on the telephone, it may take up to five seconds before it starts speaking. After it announces the alarms, it prompts you to *Enter Acknowledge Code*. You have five seconds to begin entering the digits.

After the *LWM* has detected the Acknowledge Code, it will speak the phrase *Alarms Acknowledged* and return to the “Enter Control Code” level. If no activity occurs for 5 seconds it will hang up.

Appending the # digit at the end of the Acknowledge code allows you to acknowledge the alarm for sixty minutes only. After one hour, the *LWM* will check the alarm inputs again, and if the same alarm is still present, it will begin the reporting cycle just as if it was a new alarm.

Any series of digits entered immediately after the acknowledge code will be echoed back to the user. This feature is sometimes used in systems applications.

To acknowledge the *LWM* locally, activate the local acknowledge switch connected to the unit (see the section on “Installation - Local Acknowledge”). The alarms may be acknowledged at any time. The *Alarms Acknowledged* announcement will occur whenever the *LWM* is available to speak.

## **Telephoning the LWM**

When you call the *LWM* on the telephone, it will answer after four rings (Rings before Answer) and announce its site ID and any alarms which are present. After this announcement, the *LWM* will prompt you to *Enter Control Code*. The *LWM* then waits ten seconds for you to enter a code. This could be a Timer Control Code, an Acknowledge Code, a Status Code, or an Access Code which would allow you to go into the programming mode. If an Access Code (password) has not been programmed, the *LWM* will automatically go into the programming mode after five seconds, prompting you to *Enter Program Code*. You may then program the *LWM* from your telephone, the same as you would from a local programming phone.

The *LWM* will hang up whenever it has waited for more than ten seconds without receiving a code.

## Changing Telephone Directories

Telephone directories can be changed remotely without entering the programming mode. The directory can be changed by entering the Directory Control Code over the telephone system, local programming telephone, or two-way radio.

Refer to the Directory section, Program Code 2, for a description of the directory format and its uses.

This example uses the local programming phone to change the telephone format from DIRECTORY A to DIRECTORY B and then to DIRECTORY C. A typical installation may use a programming telephone mounted permanently at the site to make this procedure as simple as possible.

LWM: Enter Directory Code

YOU:

LWM: Directory is B

YOU:

LWM: Directory is C

It is also very common to enter this code using a keypad over the radio system when the operators at the site change shift.

The *LWM* will not allow an empty directory to be selected.

## Programming

### How to Enter the Programming Mode

To begin programming, you must hear the prompt *Enter Program Code* from the *LWM*. This prompt is issued following the prompt *Enter Control Code* when the unit is called on the phone line or when the local program phone goes off-hook.

Before you start programming, there are a few points with which you must be familiar. First, although it is possible to program the *LWM* remotely by calling it up over the telephone line, it is assumed that when you initially install the unit you will be using a local programming phone. The *LWM* must be programmed with a phone which sends DTMF tones (Touch Tone); it will not recognize the signals from a phone which sends dial pulses.

The *LWM* is designed to be user friendly. When you listen in the earpiece of the programming phone, you will hear spoken messages. These are called voice “prompts”, and they tell you what information the *LWM* is expecting you to enter. Whenever you program a new value, the *LWM* will immediately speak that parameter back to you, so you will know right away whether the code was entered correctly. You can change a parameter as many times as you like before going on to the next one. If you make a mistake, such as entering a value outside the range for that parameter, the *LWM* will immediately let you know by announcing *Error*. And if you get confused, just hang up the phone and start again. The *LWM* will start again at the beginning when you pick up the handset.

The other feature you need to know is how to enter data. If you were entering information from a keyboard or other terminal, you would use the “Enter” key or a “Carriage Return”. A telephone does not have this key, so we substitute the code **\*\*** for “Enter”. The two “stars” (asterisks) must be entered one after the other, with no more than one second between the beginning of the first digit and the beginning of the second. This is a much longer time than most people think, and there is no need to rush when entering the code. If you enter the digits too fast, the telephone will only recognize one **\***. You may get an *Error* message if this happens or else the *LWM* will ignore the entry and wait for another **\*\***. The **\*\*** code is used throughout the programming sequence to enter information or proceed to the next step. With practice you will soon determine the correct speed.

Where the # digit is used in a DTMF code or a telephone number it must be entered as two # digits. For example, the DTMF code #2# would be entered as ##2##. Note: Use of the double # is only necessary in directories.

Throughout the programming sequence, the unit will speak stored parameters using a prompt, followed by the word “is”, then the stored data. For example, to tell you the Acknowledge Code is set to 1234, the *LWM* says *Acknowledge Code is 1234*. Input from the telephone’s keypad is expected fol-

lowing this message. Whenever voice messages are required, the unit will beep twice, prompting the user to speak into the telephone handset.

If you call up a *LWM* over the phone once it has been programmed, it will answer after four rings (default) and announce its site ID, any alarms present and any error status messages. Then it will prompt you to *Enter Control Code*. If the unit has been programmed to operate with a password, you must enter the Access Code at this time. The *LWM* will reply with *Program Access* and prompt you to *Enter Program Code*. If an Access Code has not been programmed, the *LWM* will time out after five seconds and automatically enter the programming mode. You will hear the prompt *Program Access; Enter Program Code*.

When you connect a local programming phone, the *LWM* will automatically prompt you with *Program Access; Enter Program Code*.

*IMPORTANT: Remember that all programming codes must be followed by the “\*\*” code to enter them.*

The procedure for programming a voice message and a directory are described in the following two examples:

### **Program Example: Site ID and User Name Messages**

Plug any standard tone telephone into the jack labeled “PGM”.

Lift the handset to your ear and wait for the *LWM* to prompt Enter Program Code. Enter the code for programming voices.

YOU:

The *LWM* will respond with

LWM: Enter Voice Code

To get to the Site ID section.

YOU:

LWM: Site is ....

The *LWM* is prompting you to enter the name of the site. The name you program will be announced at the start of every message along with the list of alarms (unless Site ID is programmed to be off).

To record the voice message, enter the record code (2).

YOU:

After you hit the second star, the *LWM* will prompt you with a beep-beep tone.

LWM: beep-beep

As soon as you hear the tone, you can begin to record your message. The VOICE LED on the front panel will light while the *LWM* is recording.

Speak the name of the site, e.g. Ajax Treatment Station. The *LWM* detects when you stop speaking and automatically plays back the message. Pauses between words may cause the recording to terminate. The VOICE LED will light while it is playing back.

YOU: *Ajax Treatment Station*

LWM: Site is Ajax Treatment Station.

Did the message played back sound acceptable? If you think it could be improved, enter the record code (2) followed by **\*\*** again and repeat the message as many times as you like. Once you are satisfied with the way the message sounds, hit the enter code (**\*\***).

YOU:

The *LWM* will prompt you for the next entry.

LWM: ID Zero One is...

Repeat the above steps to record the user name message, e.g. Bob Smith. The user names can also be recorded during the timer start-up at run time.

YOU:

LWM: beep-beep

YOU: *Bob Smith*

LWM: User One is Bob Smith.

YOU:   *Next*

### **Program Example: Telephone Numbers**

At the *Enter Program Code* prompt

YOU:    *Enter directory programming*

LWM: Enter Directory

YOU:    *Directory A*

LWM: Directory A, Line One is Radio Alert Voice. (default)

The *LWM* has just spoken the actions that will occur from the commands on the first line in Directory A. The default radio announcement will now be replaced with a phone call-out command. Enter **2\*\*** to indicate you want to program the line with new commands.

YOU:    *Change line*

LWM: beep

Details on how directory commands are entered are shown in Program Code 2 Directories.

Enter the phone number using the pushbuttons on your telephone. The entry shown below will result in the *LWM* dialing the selected number and then speaking the alarm messages. The #0 at the beginning is the DIAL command, followed by a #8 command for VOICE.

YOU:

LWM: Directory A, Line One is DIAL 2559544 VOICE.

If there is an error in the entry, input 2\*\*\* and try again. If the sequence is played back correctly, hit the enter code.

YOU:   Next

LWM: Directory A, Line Two is empty

The *LWM* is prompting you for the second directory line. The commands entered for line 2 are what will occur if there is no acknowledgement after the first line commands are completed during operation.

YOU:    Change line

LWM: beep

YOU:

LWM: Directory A, Line Two is DIAL 2552343 VOICE.

YOU:

LWM: Directory A, Line Three is empty.

The *LWM* is prompting you for a third telephone number to dial if it cannot get an answer at the first two. Continue entering telephone numbers up to a maximum of twenty. If you are not using twenty numbers, enter the Quit code (#) at the prompt. If you hit the Enter code (\*\*\*) for an empty telephone number, the *LWM* assumes that you have no more telephone numbers to enter and will jump to the next function.

YOU:

or

YOU:

The next time you lift the programming phone off hook, the *LWM* will announce its status and prompt you to *Enter Control Code*. DO NOT enter any codes from the telephone. WAIT five seconds; the *LWM* will time out and automatically enter the programming mode. When you hear the prompt *Program Access; Enter Program Code*, you may begin programming.

**Do not remove power from the *LWM* while you are programming. Always put the telephone handset back on-hook before removing power.**

The following chapter, **Programming Reference**, divides the programming parameters into functional blocks. Refer to that chapter to determine the parameter changes required for a specific function.

Appendix D is a **Programming Tree** for the *LWM*. It gives an overview of the parameters which may be programmed and how they are organized. The Program Codes are explained in detail in the next section.

## Program Code 1 \*\*: Voices

When you enter Program Code 1, you will hear the following prompt:

LWM: Enter Voice Code

YOU:    *Record Site ID and user names*  
   *Record locations*  
   *Erase all messages*  
  *Exit to Enter Program Code prompt*

### 1 \*\*: Record Site ID and User Names

Record the voice messages associated with the unit (site ID) and each individual user name.

LWM: Site is Ajax Treatment Station

YOU:    *Record*  
   *Quit*  
  *Enter/Next*

Default: empty

If the message is OK, continue by hitting Enter. If you would like to record a new message, enter 2\*\* to record. As soon as you hit the second asterisk of the Enter code, the *LWM* will prompt you to record a voice message. When you stop speaking, the *LWM* will immediately play back the message that you recorded. Pauses between words may cause the recording to terminate. Repeat as many times as you need until the voice message sounds acceptable. Then hit Enter (\*\*) to proceed, or #\*\* to exit back to the Enter Voice Code prompt.

Entering \*\* advances to the user name message section and the first alarm message will be spoken

LWM: ID Zero One is ...

YOU:    *Record*



# \* \* *Quit*\* \* *Enter/Next*

If you enter messages for all 16 names, the *LWM* will automatically exit to the Enter Voice Code prompt.

Default: empty

### **2\*\***: Record Locations

Record the voice messages associated with each individual user location.

LWM: Location One is ...

YOU: 2 \* \* *Record*# \* \* *Quit*\* \* *Enter/Next*

If the message is OK, continue by hitting Enter. If you would like to record a new message, enter **2\*\*** to record. As soon as you hit the second asterisk of the Enter code, the *LWM* will prompt you to record a voice message. When you stop speaking, the *LWM* will immediately play back the message that you recorded. Pauses between words may cause the recording to terminate. Repeat as many times as you need until the voice message sounds acceptable. Then hit Enter (\*\*) to proceed, or **#\*\*** to exit back to the Enter Voice Code prompt.

If you enter messages for all 16 names, the *LWM* will automatically exit to the Enter Voice Code prompt.

Default: empty

### **3\*\***: Erase All Voices

LWM: Enter Voice Empty Code

YOU: # 3 1 \* \* *Erase (exit with any other entry)*

LWM: Voice is Empty

\* \* *Enter/Next*

## Program Code 2 \*\*: Directories

There are four directories in the *LWM*. Each directory defines a unique sequence of actions. There is also a Directory Control Code that modifies the directory selection. When the Directory Control Code is received, the directory usage is modified such that the alarms now use the next directory with commands in it. If Directory B has commands then it will be used. When the Directory Control Code is received again, directory usage advances to the next directory with commands in it. All alarms use the same directory.

If all four directories have commands in them, then the Directory Control Code will simply advance to the next directory each time it is received. If the current setting is Directory D when the code is received, then it will return to Directory A. If the next directory is unused, it will be skipped.

The directory structure is made up of a list of lines with each line containing a sequence of instructions. The *LWM* performs the actions defined in each line then waits for a response. If the expected response is not received, the actions in the next line are carried out

Commands are placed into the directory line-by-line with a series of digits representing the required actions.

Commands that can be used in the directory and the digits used to select them are:

- # 0 Dial + digits
- # 1 Radio
- # 2 Wait + 1-3 digits (seconds)
- # 3 Alert
- # 4 Two Tone Paging + (4 or 5 digits) + \*+ (4 or 5 digits)  
(frequencies in .1 Hz. : 12345 would be 1234.5 Hz)
- # 5 Five Tone Paging + 5 digits (5 digit cap code)  
or Five Tone Paging + 1digit + \* + 5 digits (preamble+ cap code)
- # 6 Single tone + (4 or 5 digits)  
(frequency in .1 Hz. ie: 12345 would be 1234.5 Hz)
- # 7 DTMF + 1-16 digits
- # 8 Voice
- # 9 Answer

When Program Code 2 is selected the *LWM* responds with the prompt:

LWM: Enter Directory

YOU:       *Directory A*

   *Directory B*

   *Directory C*

   *Directory D*

   *Help (speaks a summary of commands)*

   *Quit*

If one of the directories is selected a typical response would be:

LWM: Directory A, Line One is DIAL 2559544 WAIT 3 SEC VOICE

This is the command sequence in the first line of the directory and would result in the *LWM* dialing the number 2559544, waiting for 3 seconds and then speaking the voice messages. At this time the following options are available:

   Change this line

   Delete this line

   Insert a new line before the current line

   Quit

   Next

YOU:       *Change this line*

LWM: 'beep'

To change the line, a complete sequence of commands and values must be entered. For example, if the setting was to be changed so that the wait time was 5 seconds instead of 3, the entry would be:

YOU:

LWM: Directory A, Line One is DIAL 2559544 WAIT 5 SEC VOICE

Which is the same as [DIAL]2559544 [WAIT]5 [VOICE] for this line in the PC programming software.

For an invalid entry, the *LWM* will speak the word "Error" at the end.

YOU:       *Delete this line*

LWM: 'beep' if the next line in the directory is empty

or

LWM: Directory A, Line One is DIAL 2559544 DTMF 1234 VOICE

if there is another line in the directory. This was the content of line 2 before the current line was removed. All of the lines move up one line. You can either accept this entry or edit the line.

YOU:    *Insert a new line*

LWM: 'beep'

YOU:              *(new entry)*

LWM: Directory A, Line One is DIAL 2559544 VOICE

YOU:   *Next*

The *LWM* advances to the next line in the directory

YOU:    *Quit*

The *LWM* returns to the Enter Directory Code prompt.

Limits: Each phone number may contain up to 39 digits.

Default: Directory A has the single command to turn on the radio and speak the voice messages; the other three directories are empty.

If a pause is required when dialing, use the Wait command to insert a delay interval followed by a DTMF command with more digits. This feature is most often used when communicating with devices which require special signaling, such as paging terminals. The # (pound) digit, has no special meaning and is dialed as a #.

When calling a paging terminal or someone who cannot acknowledge the call from their phone, it may be useful to wait before starting the next telephone call. This allows the called party to get to a phone and call the *LWM* to acknowledge it before it calls out again. To do this, put a Wait command with the required delay on the next directory line and then a Dial command on the following line.

To send group call with 2 Tone Paging, set tone A equal to tone B.

Do not use the Answer command immediately following a Dial command in the directories when Call Progress is enabled. This is the equivalent of two Answer commands and may result in unreliable operation.

### Program Code 3 \*\*: DTMF Codes

The *LWM* is capable of decoding, storing, and transmitting all DTMF codes, including codes received from a 4x4 keypad.

LWM: Enter DTMF Code

YOU:    *Acknowledge Code*



Access Code



Status Code



Directory Control Code




Exit to Enter Program Code prompt

### 1 \*\*: Acknowledge Code

The Acknowledge Code is sent by the called party to indicate that the alarm message has been received. This stops the calling sequence of the *LWM*.

LWM: Acknowledge Code is ...


YOU:  ( x = 1 to 8 DTMF digits )

Default: 1234

### 2 \*\*: Access Code

The Access Code is used as a password to prevent unauthorized callers from altering the programming of the *LWM*. If an Access Code has been programmed, it must be entered before a telephone caller will receive the *Enter Program Code* prompt. The Access Code is not required for local programming.

LWM: Access Code is ...


YOU:  ( x = 1 to 8 DTMF digits, # = clear )

Default: empty

### 3 \*\*: Status Code

The Status Code is used to call the *LWM* and find out the current status of the alarms. When it receives the code, the unit reports its site ID, any alarms which are present and any error messages. Only the voice messages are repeated; no signaling is sent. As the *LWM* always announces its status when it is telephoned. This code is used primarily for querying over radio.

LWM: Status Code is ...

YOU:  ( x = 1 to 8 DTMF digits, # = clear )

Default: 5678

### 4 \*\*: Directory Control Code

The Directory Control Code is used to call up the *LWM* and change the way that the alarms are using the directories. When it receives the code, the directory usage is modified. If the Directory Control Code is used there are restrictions on what directories are available - refer to Program Code 2 Directories for details.

LWM: Directory Control Code is ...

YOU:  (  $x = 1$  to 8 DTMF digits, # = clear )

Default: 5678

## Program Code 4 \*\*: Timer Configuration

When you enter Program Code 4, the *LWM* will automatically cycle through the following parameters. After the last one, "Times A", it will go back to the Enter Program Code prompt.

### Rings Before Answering

When the *LWM* is dialed, this parameter sets the number of times it will let the telephone ring before it answers.

LWM: Answer rings is ...

YOU:  no answer

number of rings (  $x = 1$  to 8 )

answer and automatically acknowledge after 8 rings

Default: 4 (answer after 4 rings)

If the *LWM* is on its own telephone line, it will normally be programmed to answer right away, after one or two rings. However, if the line is shared with other users, it should be programmed to answer after 6 to 8 rings, giving people lots of time to pick up the phone before the *LWM* automatically answers.

The # is used when the called parties have dial pulse phones. They cannot acknowledge receipt of an alarm using a code. Instead the *LWM* recognizes 8 rings on the telephone line as an Acknowledge Code. In the directory, a Wait command with the required delay, is placed on the line following the Dial command. This gives the called party time to hang up the phone, call the *LWM* back and let the phone ring 8 times to acknowledge receipt of the alarm (refer to Program Code 2 - Phone Directory).

### Interval Timer A

If an alarm is not acknowledged after one pass through the directory, this timer determines how often the *LWM* will repeat the reporting sequence.

LWM: Timer A is 2 minutes

YOU:  minutes (  $x = 1$  to 249 )

Default: 2 minutes

**Interval Timer B**

After the Timer A cycle has completed, this timer determines how often the *LWM* goes through its alarm reporting sequence.

LWM: Timer B is 10 minutes

YOU:    automatically acknowledge after Interval A

minutes ( $x = 1$  to 249)

0 would be selected if there is no way for the alarms to be acknowledged.

Default: 10 minutes

**Cycles Through Timer A (Times A)**

This number determines how many times the *LWM* will cycle through its alarm reporting sequence at A intervals before switching to B intervals. With its default settings, the *LWM* will try 3 times at 2 minute intervals, then switch to reporting at 10 minute intervals. The switch to the B interval is primarily to conserve air time on busy radio systems.

LWM: Times A is ...

YOU    times ( $x = 1$  to 8 )

Default: 3

**Program Code 5 \*\*: User Configuration**

With Program Code 5, the *LWM* will prompt for the ID number of the user that is to be configured. Once the user number has been entered, the *LWM* will step through the parameters as you hit Enter (\*\*). After completing the configuration for the selected user, the *LWM* will go back to the *Enter ID* prompt.

LWM: Enter ID

YOU:    User 1 Setup

YOU:    User 2 Setup

...

YOU:     User 16 Setup

Exit to Enter Program Code prompt

**Interrogate Code**

Each user has an code that causes the *LWM* to speak the current state of the user timer

LWM: Interrogate Code is ...

YOU:    ( $x = 1$  to 8 DTMF digits, # = clear)




*Next*

Default: empty

**Start Code**

The Start Code is used to activate or refresh the user timer.

LWM: Start Code is ...




YOU:    ( *x = 1 to 8 DTMF digits, # = clear* )*Next*

Default: empty

**Stop Code**

The Stop Code is used to de-activate the user timer.

LWM: Stop Code is ...




YOU:    ( *x = 1 to 8 DTMF digits, # = clear* )*Next*

Default: empty

**Emergency Code**

The Emergency Code is used to create an immediate alarm.

LWM: Emergency Code is ...




YOU:    ( *x = 1 to 8 DTMF digits, # = clear* )*Next*

Default: empty

**Timer Setting**

The Timer Interval is the time period, in minutes, that is loaded into the user timer when the Start Code is received. The value is 1 to 4095.

LWM: Timer is ...

YOU:    ( *x = 1 to 4 DTMF digits, # = clear* )*Next*

Default: 0

**Warning Interval**

The Warning Interval is the time period, in minutes, that is used to warn the user that the timer is going to run out. The value is 1 to 255.

LWM: Warning Interval is ...



YOU:  (  $x = 1$  to 3 DTMF digits, # = clear )

Next

Default: 5

### Enable Timeset

The setting of Enable Timeset controls whether or not the user is allowed to change the timer value.

LWM: Enable Timeset is ...

YOU:  ( the user cannot change the timer value)

YOU:  ( the user can change the timer value)

Next

Default: 1

### Enable Callout

The setting of Enable Callout controls whether or not an alarm condition will initiate a callout sequence.

LWM: Enable Callout is ...

YOU:  ( alarm callout will not occur)

YOU:  ( alarm callout will occur)

Next

Default: 1

### Confirm Emergency

The setting of Confirm Emergency controls whether or not LWM asks the user for confirmation after the Emergency Code has been received.

LWM: Confirm Emergency is ...

YOU:  ( confirmation is not requested)

YOU:  ( confirmation is requested)

Next

Default: 1

### Name Code

The setting of Name Code controls if a DTMF code is used for the user name.

LWM: Name Code is ...

YOU:    ( *DTMF code is not used for the name* )

YOU:    ( *DTMF code is used* )

*Next*

Default: 0

### Location Code

The setting of Location Code controls if a DTMF code is used for the location.

LWM: Location Code is ...

YOU:    ( *DTMF code is not used for the location* )

YOU:    ( *DTMF code is used* )

*Next*

Default: 0

### Name Voice

The setting of Name Voice controls if the user is asked to record a message for the name.

LWM: Name Voice is ...

YOU:    ( *No voice message for the users name* )

YOU:    ( *ask for a voice recording for the name* )

*Next*

Default: 1

### Location Voice

The setting of Location Voice controls if the user is asked to record a message for the location.

LWM: Location Voice is ...

YOU:    ( *No voice message for the users location* )

YOU:    ( *ask for a voice recording for the location* )

*Next*

Default: 1

### Ask Name

Ask Name controls if the user is prompted to record the voice message for the name each time the timer is started.

LWM: Ask Name is ...

YOU:    ( the user will not be prompted to record the name)

YOU:    ( the user will be prompted to record the name )

Next

Default: 1

### Ask Location

Ask Location controls if the user is prompted to record the voice message for the location each time the timer is started.

LWM: Ask Location is ...

YOU:    ( the user will not be prompted to record the location)

YOU:    ( the user will be prompted to record the location )

Next

Default: 1

### Ask Timer

Ask Timer controls if the user is prompted to record a value for the timer when the timer is started.

LWM: Ask Timer is ...

YOU:    ( the user will not be prompted to enter the timer)

YOU:    ( the user will be prompted to enter the timer )

Next

Default: 1

### Play Settings

Play Settings controls if the settings are played to the user when the timer is first started.

LWM: Play Settings is ...

YOU:    ( the settings will not be replayed)

YOU:    ( the settings will be replayed )

Next

Default: 1

### Ask Accept

Ask Accept controls if the LWM prompts for acceptance of the new settings before continuing when the timer is started.

LWM: Ask Accept is ...

YOU:    ( the LWM will not ask for confirmation)

YOU:    ( the LWM will ask for confirmation )

Next

Default: 1

### Program Code 6 \*\*: System Settings

With Program Code 6, the LWM will automatically cycle through the following parameters as you hit Enter (\*\*). When it has completed the whole list, it will return to the *Enter Program Code* prompt.

#### Dial Format

This parameter determines the method of dialing telephone numbers. Tone format dials using DTMF tones ( Touch-Tone). Pulse format dials using pulses as a rotary phone would.

LWM: Dial Format is ...

YOU:    Tone dialing

Pulse dialing

Next

Default: 0 (tone dialing)

#### Squelch Polarity

This setting changes the polarity of the signal used to indicate a busy radio channel.

LWM: Squelch is ...

YOU:    Busy when the input is low

Busy when the input is high

Next

Default: 0 (transmit on high)

#### System Busy

This setting controls whether or not the LWM announces that the radio system is unavailable when it is busy on the phone line.

LWM: Radio Alert voice is ...

YOU:    *Turn this announcement off*

*Turn this announcement on*

*Next*

Default: 1 (on)

### Acknowledge Request

This setting enables or disables the *LWM's* voice prompt *Enter Acknowledge Code*. If the alarm announcement is over a public address system, for example, acknowledgment is not possible. The *LWM* would be programmed for automatic acknowledge (see Interval Timer B, Program Code 4) and the request for an Acknowledge Code would be disabled.

The *LWM* will continue transmitting its alarms until it receives some form of acknowledgment, automatic or otherwise, even if it does not request one.

LWM: Acknowledge Voice is ...

YOU:    *Acknowledge request is not used*

*Acknowledge request is used*

*Next*

Default: 1 (enabled)

### Call Progress (Dial Tone Enable)

The *LWM* monitors the audio activity on the phone line when it places a call. If enabled, Call Progress will cause the *LWM* to look for dial tone before dialing, watch for a busy signal on the called line and then wait until the called party speaks before the alarm announcement begins. Without Call Progress enabled, the *LWM* will perform the dial-out operation and speak regardless of the signals encountered on the phone line.

Do not use the Answer command immediately following a Dial command in the directories when Call Progress is enabled. This is the equivalent of two Answer commands and may result in unreliable operation.

LWM: Dial Tone is ...

YOU:    *Call Progress is not used*

*Call Progress is used*

*Next*

Default: 1 (enabled)

### Enable Site ID

This setting enables or disables the feature where the *LWM* speaks the recorded site identifier when alarms are announced.

LWM: Site is ...

YOU:    Site ID announcement is not used  
   Site ID announcement is used  
  Next

Default: 1 (enabled)

### Default Timer

The Default Timer is substituted for the Interval Timer if the user has not programmed a value at run time. The value is 1 to 4095 minutes.

LWM: Default Timer is ...

YOU:    (*x = 1 to 4 DTMF digits, # = clear*)  
  Next

Default: 20

### Program Code 8 \*\* : Reset Database

This code is used to reset all of the programmed parameters (excluding voices) to their default values.

LWM: Enter Empty Code

YOU:      Clear Database  
  Next

Any other entry will leave the database unchanged.

### Program Code 9 \*\* : Audio Levels

This code is used to adjust audio levels for specific signals. For receive levels the setting should correspond to the level of the signal that is coming from the attached equipment. Receive levels can be in the range between -20 dBm and 0 dBm. For transmit levels the setting determines the amplitude of the signal that will be produced at the output of the *LWM*. Transmit levels can be set in the range between -20 dBm and 0 dBm. The negative sign is automatically applied to any non-zero value.

The settings for the audio levels are presented in the following order for modification

LWM: Radio Code One is . . .(Radio Transmit Tone Level)

YOU:     Level setting ( x = 20 to 0 )

Next

Default: 0

LWM: Radio Code Two is . . .(Radio Transmit DTMF Level)

YOU:     Level setting ( x = 20 to 0 )

Next

Default: 0

LWM: Radio Code Three is . . .(Radio Transmit Voice Level)

YOU:     Level setting ( x = 20 to 0 )

Next

Default: 0

LWM: Radio Code Four is . . .(Radio Receive Level)

YOU:     Level setting ( x = 20 to 0 )

Next

Default: 0

LWM: Telephone Code Five is . . .(Telephone Receive Level)

YOU:     Level setting ( x = 20 to 0 )

Next

Default: 0

## Programming Reference

This chapter organizes the programming parameters by their functions. See the chapter on **Program Codes** for more detail on the use and meaning of the referenced parameters.

### 1. Alarm Announcement

This section identifies all of the parameters that determine WHAT is sent when an alarm occurs. By programming these parameters, you may send voice, signaling, and paging tones.

*Directories (Program Code 2)*

*Record User Voices (Program Code 1.1)*

*Acknowledge Request (Program Code 6)*

*Speak Voices (Program Code 2)*

*Enable Alarm Callout (Program Code 5)*

### 2. Alarm Operation

This section identifies all of the parameters that determine WHEN an alarm will be announced. By programming these parameters, you control when an alarm is recognized and announced by the LWM.

*Interval Timer A (Program Code 4)*

*Interval Timer B (Program Code 4)*

*Cycles Through Timer A (Program Code 4)*

### 3. Operation Codes

These parameters control how the unit operates when performing a callout.

*Acknowledge Code (Program Code 3.1)*

*Access Code (Program Code 3.2)*

*Status Code (Program Code 3.6)*

*Directory Control Code (Program Code 3.7)*

### 4. User Configuration

These parameters control how the user timer will operate.

*Interrogate Code (Program Code 5)*

*Start Code (Program Code 5)*

*Stop Code (Program Code 5)*

*Emergency Code (Program Code 5)*

*Timer Setting (Program Code 5)*

*Warning Interval (Program Code 5)*



- Enable Timeset (Program Code 5)*
- Enable Alarm Callout (Program Code 5)*
- Name Code (Program Code 5)*
- Location Code (Program Code 5)*
- Name Voice (Program Code 5)*
- Location Voice (Program Code 5)*
- Ask Name (Program Code 5)*
- Ask Location (Program Code 5)*
- Ask Timer (Program Code 5)*
- Play Settings (Program Code 5)*
- Ask Accept (Program Code 5)*
- Default Timer (Program Code 6)*
- Enable Site ID (Program Code 6)*

## **5. Telephone Specific Parameters**

This section describes the parameters used when the unit is required to transmit alarms or signaling over the telephone system.

- Using Directory (Program Code 5.2)*
- Directory Telephone Numbers (Program Code 2)*
- Access Code (Program Code 3.2)*
- Rings Before Answering (Program Code 4)*
- Dial Format (Program Code 6)*

## **6. Radio Specific Parameters**

These parameters control the operation of the unit when it is connected to a two-way radio. Refer to the installation section in *Getting Started* for the required connections to the radio.

- Directory Radio Command (Program Code 2)*
- Squelch Polarity (Program Code 6)*
- Radio Warmup (Program Code 2)*

## **7. Audio Levels**

- Audio Levels (Program Code 9)*

## Modbus Access

Status and activity information for all of the users is held in Modbus registers that can be accessed through the serial port. The correct baud rate and address for the *LWM* must be set during PC programming. The serial format is always set for no parity and the Modbus protocol is always RTU mode. Cable wiring for the connection between the *LWM* and the PLC is shown in Figure 2.

### Status Registers

Registers 40001 to 40016 hold the current state for each of the 16 users. These registers are read-only and hold the following codes representing the user state:

0	Idle after power-up
10	Idle by user command when not in alarm
20	Idle by user command from alarm state
30	Active but not in alarm
40	Active, in the warning time but the warning has not been sent
50	Active, in the warning time and a warning has been sent
60	Acknowledged during operation
70	Active and in the alarm state
80	In the emergency state

### Activity Registers

Registers 40017 to 40032 hold the last action performed by the user. The contents of the registers reflect the codes that have been received from the user. The last command will be held in the register until it is read and then cleared by the connected equipment. Values returned for the codes received are:

0	No activity
1	Start Code received to activate the timer
2	Start Code received to refresh the timer
3	Stop Code received to stop or reset the timer
4	Emergency Code received
5	Interrogate Code received

### Timer Registers

Registers 40033 to 40048 contain the current value of the user timer. When the timer is not active the value will be the programmed timer setting. During operation the value will be the current count for the timer. If a timer expires and goes into alarm the value will be zero.

### **Name Code Registers**

Registers 40049 to 40304 contain the user Name Code that is entered if the LWM is programmed to use DTMF strings instead of voice messages to identify the user name. Each of these codes is formatted into 16 register locations with the first 8 registers holding the DTMF digits and the last register holding the length of the string.

The DTMF digits are in ASCII format.

Starting locations for each set of Name Code registers are:

User 1: 40049	User 5: 40113	User 9: 40177	User 13: 40241
User 2: 40065	User 6: 40129	User 10: 40193	User 14: 40257
User 3: 40081	User 7: 40145	User 11: 40209	User 15: 40273
User 4: 40097	User 8: 40161	User 12: 40225	User 16: 40289

### **Location Code Registers**

Registers 40305 to 40560 contain the user Location Code that is entered if the LWM is programmed to use DTMF strings instead of voice messages to identify the user location. Each of these codes is formatted into 16 register locations with the first 8 registers holding the DTMF digits and the last register holding the length of the string.

The DTMF digits are in ASCII format.

Starting locations for each set of Location Code registers are:

User 1: 40305	User 5: 40369	User 9: 40433	User 13: 40497
User 2: 40321	User 6: 40385	User 10: 40449	User 14: 40513
User 3: 40337	User 7: 40401	User 11: 40465	User 15: 40529
User 4: 40353	User 8: 40417	User 12: 40481	User 16: 40545

## Programming Examples

### Example 1: Reporting Alarms over Radio and Telephone

In this example, assume that your company has a mobile radio system which is monitored by field personnel. Radio operators have DTMF pads on their mics so they can acknowledge an alarm from the *LWM*. They would like to have the alarm reported over the radio system three times with a 2 minute interval between transmissions, then dialed out over the telephone if it is not acknowledged. If the alarm is not acknowledged, the *LWM* should try again in ten minutes. After six tries at ten minute intervals, the *LWM* should switch to trying once an hour. The COS on the radio used with the *LWM* gives a high signal when the channel is busy.

LWM: Enter Program Code

YOU:    *Directory Code*

LWM: Enter Directory

YOU:    *Directory A*

LWM: Directory A, Line One is...

YOU:    *Change*

LWM: 'beep'

YOU:       *[RADIO] [VOICE]*

LWM: Directory A, Line One is RADIO VOICE

YOU:   *Next*

LWM: Directory A, Line Two is...

YOU:    *Change*

LWM: 'beep'

YOU:        *[WAIT]120 (seconds)*

LWM: Directory A, Line Two is WAIT 120

YOU:   *Next*

LWM: Directory A, Line Three is...

YOU:    *Change*

LWM: 'beep'

YOU:       *[RADIO] [VOICE]*

LWM: Directory A, Line Three is RADIO VOICE

YOU: \* \* Next

LWM: Directory A, Line Four is...

YOU: 2 \* \* Change

LWM: 'beep'

YOU: # 2 1 2 0 \* \* [WAIT]120 (seconds)

LWM: Directory A, Line Four is WAIT 120

YOU: \* \* Next

LWM: Directory A, Line Five is...

YOU: 2 \* \* Change

LWM: 'beep'

YOU: # 1 # 8 \* \* [RADIO] [VOICE]

LWM: Directory A, Line Five is RADIO VOICE

YOU: \* \* Next

LWM: Directory A, Line Six is...

YOU: 2 \* \* Change

LWM: 'beep'

YOU: # 2 1 2 0 \* \* [WAIT]120 (seconds)

LWM: Directory A, Line Six is WAIT 120

YOU: \* \* Next

LWM: Directory A, Line Seven is...

YOU: 2 \* \* Change

LWM: 'beep'

YOU: # 0 2 5 5 9 5 4 4 # 8 \* \*

[DIAL]2559544 [VOICE]

LWM: Directory A, Line Seven is DIAL 2559544 VOICE

YOU: \* \* Next

LWM: Directory A, Line Eight is...

YOU: # \* \* Quit

LWM: Enter Directory

YOU: # \* \* *Quit*

LWM: Enter Program Code

YOU: 4 \* \* *Configuration*

LWM: Answer Rings is 4

YOU: \* \* *Next*

LWM: Timer A is 2 minutes

YOU: 1 0 \* \* *Enter 10 minutes*

LWM: Timer A is 10 minutes

YOU: \* \* *Next*

LWM: Timer B is 10 minutes

YOU: 6 0 \* \* *Enter 60 minutes*

LWM: Timer B is 60 minutes

YOU: \* \* *Next*

LWM: Times A is 3

YOU: 6 \* \* *Enter 6 times*

LWM: Times A is 6

YOU: \* \* *Next*

LWM: Enter Program Code

YOU: 6 \* \* *Select System Settings*

LWM: Dial Format is 1

YOU: \* \* *Next*

LWM: Squelch is 0

YOU: 1 \* \* *Enter busy when high*

LWM: Squelch is 1

YOU: \* \* *Next*

LWM: Relay Voice is On

At this point you are finished programming and may hang up the telephone. The directory is programmed with the voice message repeated three times on the radio and then once on the phone line. Another method of programming the radio announcement would be to have an alert tone

followed by the message repeated twice. In this case the entry for each of the radio related commands would be:

LWM: Directory A, Line One is...

YOU:

[RADIO][ALERT] [VOICE][VOICE]

LWM: Directory A, Line One is RADIO ALERT VOICE VOICE

Over the telephone, the message will be repeated only once.

If this programming is used, when the *LWM* registers an alarm, the reporting cycle will be as follows:

Over radio: Alert tone  
SITE ID; NAME at LOCATION has not reported  
Enter Acknowledge Code  
SITE ID; NAME at LOCATION has not reported  
Enter Acknowledge Code  
pause for 2 minutes

Alert tone  
SITE ID; NAME at LOCATION has not reported  
Enter Acknowledge Code  
SITE ID; NAME at LOCATION has not reported  
Enter Acknowledge Code  
pause for 2 minutes

Alert tone  
SITE ID; NAME at LOCATION has not reported  
Enter Acknowledge Code  
SITE ID; NAME at LOCATION has not reported  
Enter Acknowledge Code  
pause for 2 minutes

Over telephone: dial 2559544  
SITE ID; NAME at LOCATION has not reported  
Enter Acknowledge Code  
pause for 5 seconds -waiting for acknowledge code  
SITE ID; NAME at LOCATION has not reported  
Enter Acknowledge Code  
pause for 5 seconds -waiting for acknowledge code

This sequence repeats for 60 seconds.

If the Acknowledge Code is not received over the telephone, the *LWM* will wait ten minutes and try the complete sequence again, starting with the radio cycle. If no Acknowledge Code is received after six tries at ten minute intervals, the *LWM* will switch to reporting every hour until the alarm is acknowledged.

**Example 2: Dialing from Two Different Telephone Directories**

In this example, the *LWM* is programmed to telephone whoever is on call if there is an alarm. The company has two groups of employees which take turns being on call alternate weeks. Instead of reprogramming the *LWM* directory every week, two directories are programmed. When the Directory Control Code is received, the *LWM* is directed to dial from the other directory. The directory may be switched with the Directory Control Code over the telephone, local programming phone, or two-way radio.

LWM: Enter Program Code

YOU:    *Directory Code*

LWM: Enter Directory

YOU:    *Directory A*

LWM: Directory A, Line One is...

YOU:    *Change*

LWM: 'beep'

YOU:               
*[DIAL]2559544 [VOICE]*

LWM: Directory A, Line One is DIAL 2559544 VOICE

YOU:   *Next*

LWM: Directory A, Line Two is...

YOU:               
*[DIAL]2559598 [VOICE]*

LWM: Directory A, Line Two is DIAL 2559598 VOICE

YOU:   *Next*

LWM: Directory A, Line Three is...

YOU:    *Quit*

LWM: Enter Directory

YOU:    *Select Directory B*

LWM: Directory B, Line One is...

YOU:    *Change*

LWM: 'beep'



YOU:

*[DIAL]7664422 [VOICE]*

LWM: Directory B, Line One is DIAL VOICE

YOU:   *Next*

LWM: Directory B, Line Two is...

YOU:

*[DIAL]7668901 [VOICE]*

LWM: Directory B, Line Two is DIAL 7668901 VOICE

YOU:   *Next*

LWM: Directory B, Line Three is...

YOU:    *Quit*

LWM: Enter Directory

YOU:    *Quit*

The telephone numbers have now been programmed. Now enter the Directory Control Code

LWM: Enter Program Code

YOU:    *DTMF Codes*

LWM: Enter DTMF Code

YOU:    *Directory Control Code*

LWM: Directory Control Code is...

YOU:     *Enter Control Code*

LWM: Directory Control Code is 78

YOU:   *Next*

LWM: Enter Program Code

Right now the LWM is programmed with dialing commands in Directory A and Directory B.

When you wish to dial from the B directory, call up the LWM and follow these steps:

LWM: Enter Control Code

YOU:   *Directory Control Code*

LWM: Directory is B

And to change it back:

LWM: Enter Control Code

YOU:  *Directory Control Code*

LWM: Directory is A

### Example 3: Operating a Radio Pager

In this example, when an alarm is received you want to contact the person on call, who is carrying a two-tone radio pager which operates on the company's private radio system. If the person does not call back to acknowledge the alarm, you want the *LWM* to start dialing telephone numbers.

LWM: Enter Program Code

YOU:  *Directory Code*

LWM: Enter Directory

YOU:  *Directory A*

LWM: Directory A, Line One is...

YOU:  *Change*

LWM: 'beep'

YOU:

*[RADIO][2TONE]855.5/1433.4 [VOICE]*

LWM: Directory A, Line One is RADIO 2 TONE 855.5 Hz 1433.4 Hz  
VOICE

YOU:  *Next*

LWM: Directory A, Line Two is...

YOU:  *Change*

LWM: 'beep'

YOU:

LWM: Directory A, Line Two is DIAL 2559544 VOICE

YOU:  *Next*

LWM: Directory A, Line Three...

You are finished programming and may hang up the phone.

**Example 4: Dialing a Paging Terminal**

In this example, rather than using a private radio system, the company's employees utilize a city-wide paging service. Normally when you dial the paging terminal, you are prompted to enter your own telephone number. Your number is then displayed on the digital read-out of the pager, so the paged party knows what number to call back. We are going to program the *LWM* to call this paging terminal when it reports an alarm.

LWM: Enter Program Code

YOU:    *Directories*

LWM: Enter Directory

YOU:    *Directory A*

LWM: Directory A, Line One is...

YOU:                     
*[DIAL]2559544 [WAIT]4 [DTMF]734*

LWM: Directory A Line One is DIAL 2559544 WAIT 4 seconds

YOU:   *Next*

You are finished programming and may hang up the phone.

When an alarm occurs, the *LWM* will dial the number of the paging terminal, 255-9544; wait for the terminal to answer, wait 4 seconds while the terminal is prompting, then send the DTMF string 734 which represents the calling site. Any alarm will result in the paging message 734.

This example also assumes that the pager could be dialed directly. Sometimes a separate number for the pager must be dialed after the number for the paging terminal. In that case, you might need to insert another delay, and there might not be room to include the site identifier as part of the telephone number.

## Troubleshooting

**Problem: I've hooked up the *LWM* as per the installation instructions but nothing happens.**

- Use a voltmeter to check that the power supply is properly connected. If an AC adapter is being used, it should have an output of at least 12 volts DC with a center-negative power connector. If the DC power source is connected to the RADIO terminal block, it should have the positive lead connected to terminal 8 and the negative lead to terminal 7.

- Do not attach power to both inputs at the same time.

**Problem: The *LWM* will not program from a local programming phone.**

- If you do not hear the voice prompt to begin programming, check that the programming phone is plugged into the PGM jack and not the PHONE jack.

- If you hear the voice prompt to begin programming, but the *LWM* does not register your entries, check that you are using a tone phone. Sometimes a pushbutton phone actually sends dial pulses rather than DTMF. You can tell the difference by listening in the earpiece; pulse dialing sounds like clicking, DTMF like tones.

- Check for the TONE LED on the front panel when a digit is being received. Some phones send short bursts of tone rather than continuous tone while the key is depressed. If the *LWM* is not detecting DTMF, try another phone.

- Check the setting of the receive level for the phone port. Since it is not possible to do this using the programming phone, it will have to be done with the programming software.

- Disconnect the RX input from the radio. Audio received from this input is summed with the audio from the programming phone. If noise is being received, it will affect the decoding of tones and the programming of the voices. The RX input should always be connected to squelched audio.

**Problem: The *LWM* does not dial out over the telephone line when an alarm occurs.**

- Check that the phone line is plugged into the correct jack. The jack labeled PGM is for a local programming phone; the telephone line should be plugged into the PHONE jack.

- Check that the telephone is dialing from the correct directory (Program Code 2). The *LWM* has four separate directories: A, B, C and D. Check that the telephone numbers are entered correctly in the selected directory, and that the directory is not empty.

- Check that an alarm is actually present, as indicated by the LEDs on the front panel.

**Problem: The *LWM* waits a long time before announcing the alarm over the radio.**

- The *LWM* will wait for one minute when the COS input is busy and then transmit anyway. This is done to ensure that an open squelch on the radio does not disable the reporting operation. Check the Squelch Polarity setting to make sure that it matches the operation of the radio's COS output. If the COS input to the *LWM* is left open the Squelch Polarity should be set to 0 using Program Code 6.

- Check the directory programming to make sure that there is not an unwanted Wait command present.

**Problem: The *LWM* continues dialing even after the alarms have been acknowledged.**

- Check if any new alarms are announced when the *LWM* continues to dial after it has been acknowledged. The *LWM* will start dialing when it receives the first alarm, but if another alarm occurs in the meantime, it will keep dialing until all the alarms are acknowledged.

**Problem: The *LWM* won't answer the phone.**

- Check that the phone line is plugged into the PHONE jack and not the PGM jack.

- Check that the phone line is using the inner red/green pair, and not the outer black/yellow pair (normally reserved for line 2).

- Check that the *LWM* is configured to answer the phone, using Program Code 4. If the number of rings before answering is set to 0, the *LWM* will never answer the phone.

- Answering the telephone will not occur if the *LWM* is engaged in any of these activities: speaking on the radio, in local programming mode and when it is using the phone line to call out. Counting of rings only begins once the unit is in its idle state.

- Check that the ringing voltage on the telephone line exceeds 40 VAC at 20 Hz. The RING LED located on the front panel will indicate if proper ringing voltage is being received.

- Check that the telephone line has a standard ringing cadence of two seconds on, four seconds off. If the ringing cadence is greatly different, it may not be detected.

**Problem: The *LWM* will not acknowledge.**

- Check that you are sending the correct digits. The acknowledge code can be changed using Program Code 3.

- If the *LWM* is not acknowledging over radio, it may be necessary to adjust the receive level setting for the radio port.
- If the *LWM* is not acknowledging over the telephone line, it may be necessary to adjust the receive level setting for the phone port.
- Check that the TONE LED on the front panel of the *LWM* lights when a digit is received.

**Problem: Our operators live in an area which has a dial pulse exchange. How can they acknowledge the *LWM* when it calls?**

- Even though the operators have rotary phones, they can still send tone codes if they have a DTMF pad, purchased separately, which sits by the phone.
- The *LWM* may be programmed to automatically acknowledge after eight rings. Thus if the *LWM* calls an operator with a dial pulse phone, the operator can hang up after he hears the message, call the *LWM* right back, let the phone ring eight times, and the *LWM* will recognize that as an acknowledgment. Set the number of rings before answering to # in the Configuration section (Program Code 4), and put a Wait command in the next directory line to allow time for them to call the *LWM* back.

**Problem: How can I prevent unauthorized personnel from calling up the *LWM* and altering its programming?**

- In its default condition, the *LWM* does not require any type of password. If you wish to enter one, refer to the Access Code in the DTMF Codes section (Program Code 3). If an Access Code is programmed, anyone calling the *LWM* will receive a report of its status, but it will prompt the caller to enter the Access Code before allowing them into the programming mode.

**Problem: Can I use the \* character as part of my DTMF strings? Won't this be confused with the "Enter" code?**

- The # and \* characters may be used as a part of any programmable DTMF string. The only time you must be careful is when entering an asterisk (\*) as the last digit in a string. Be sure to wait more than one second after entering the last digit before hitting Enter (\*\*); otherwise the last \* will be interpreted as part of the Enter code.

**Problem: The *LWM* has lost its programming.**

- As it runs, the *LWM* is constantly performing internal self-checks, and on rare occasions it may find that a memory location has been corrupted. If that happens, the *LWM* resets all programmed parameters (except the voice messages) to the default values. At the same time, it will announce *Program Code Error* over the radio. As the telephone directories have been lost, the *LWM* cannot dial out to report the failure over the phone. The only

way you will be able to tell that something has gone wrong is by phoning the *LWM*; it will announce a *Program Code Error* as soon as it answers the phone. In order to have some local indication that an error has occurred, hook a local speaker into the radio connections.

The most common causes of a memory loss are power spikes which enter the board through the power, ground, telephone line, or radio connections.

**Problem: I tried to change the telephone numbers and now the *LWM* will not dial out at all.**

- Check the programming for Directory A to be sure that the correct command sequence is entered. If a Directory Control Code is being used, make sure that the *LWM* has not been changed to a directory that disables the alarm reporting. This would be the case where a directory contains the single Wait command or possibly commands for only the radio port.

## Warranty Statement

Barnett Engineering Ltd. warrants that all equipment supplied shall be free from defects in material or workmanship at the time of delivery. Such warranty shall extend from the time of delivery for a period of one year. Buyer must provide written notice to Barnett Engineering Ltd. within this prescribed warranty period of any defect. If the defect is not the result of improper usage, service, maintenance, or installation and equipment has not been otherwise damaged or modified after delivery, Barnett Engineering Ltd. shall either replace or repair the defective part or parts of equipment or replace the equipment or refund the purchase price at Barnett Engineering Ltd.'s option after return of such equipment by buyer to Barnett Engineering Ltd. Shipment to Barnett Engineering Ltd.'s facility shall be borne on account of buyer.

(1)Consequential Damages: Barnett Engineering Ltd. shall not be liable for any incidental or consequential damages incurred as a result of any defect in any equipment sold hereunder and Barnett Engineering Ltd.'s liability is specifically limited to its obligation described herein to repair or replace a defective part or parts covered by this warranty.

(2)Exclusive Warranty: The warranty set forth herein is the only warranty, oral or written, made by Barnett Engineering Ltd. and is in lieu of and replaces all other warranties, expressed or implied, including the warranty of merchantability and the warranty of fitness for particular purpose.



## Specifications

<b><i>Timer Refresh Inputs</i></b>	3, optically isolated, 2mA to operate, ground closure required.
<b><i>Relay Alarm Outputs</i></b>	4 independent form C outputs Rated: 1 Amp at 30 Volts
<b><i>Telephone Connection</i></b>	RJ11; tone or pulse line.
<b><i>Programming Connection</i></b>	RJ11; accepts a standard telephone.
<b><i>Receive Audio</i></b>	-20 dBm to 0 dBm, 10 k ohm impedance; unbalanced, AC coupled.
<b><i>Transmit Audio</i></b>	-20 dBm to 0 dBm, 600 ohm impedance, unbalanced, AC coupled.
<b><i>Channel Busy (COS)</i></b>	Ground closure.
<b><i>PTT</i></b>	Open collector, 25 V max, 150 mA max.
<b><i>Acknowledge Input</i></b>	Ground closure.
<b><i>Voice Quality</i></b>	Digitized, toll quality, 32 kbps.
<b><i>Power</i></b>	+11.5 VDC to +28 VDC, 100 mA standby current, 10 mA per active relay.
<b><i>Environment</i></b>	-40°C to + 60°C, 95% relative humidity, non-condensing.
<b><i>Physical</i></b>	6.5" x 8.5" x 2" Plug-in terminals
<b><i>Approvals</i></b>	FCC Part 68, FCC Part 15 - Class A Industry Canada CS-03 Part I Issue 7, C22.2 No 60950-00 / UL 60950, 3rd Edition

## Appendix A - Programmable Features

### Timer Operations

Interrogate Code	Retrieves current timer status: 1 to 8 digits
Start Code	Starts or refreshes the timer: 1 to 8 digits
Stop Code	Stops the timer: 1 to 8 digits
Emergency Code	Sets an emergency: 1 to 8 digits
Timer Setting	The timer value set with the Start Code
Warning Interval	Time between warning message and the timeout
Enable Timeset	Allows the user to change the timer value
Enable Callout	Enables alarm reporting functions
Confirm Emergency	Enables emergency confirmation prompt
Name Code	Use a DTMF code as a name identifier
Location Code	Use a DTMF code as a location identifier
Name Voice	Voice message as a name identifier
Location Voice	Voice message as a location identifier
Ask Name	Enables name prompt each timer startup
Ask Location	Enables location prompt each timer startup
Ask Timer	Enables timer prompt each timer startup
Play Settings	Enables setting summary for timer startup
Confirm Settings	Enables setting confirmation after changes
Use Site ID	Enables playing the Site ID with alarms
Default Timer	Timer value substituted for a zero value
Radio Warning	Enables the warning when the <i>LWM</i> is busy on the phone and the radio port is not available

### Alarm Reporting Features

Alarm Messages	Unique Site ID plus individual messages for each users name and location. Message length is variable
Alarm Directory	Selects one of four directories that contain command actions to be taken when the alarm is active.
Interval Timer	Two stage timer that uses 'A' interval 'A' times before switching to 'B' interval. Both

---

	'A' and 'B' interval are adjustable between 1 and 249 minutes.
Acknowledge Code	Stops the reporting sequence: 1 to 8 digits
Status Code	Speaks alarms: 1 to 8 digits
Directory Control Code	Changes the alarms to use different directories; also referred to as shift change.
Directory Commands	Each directory can have up to 20 lines of command sequences. The commands are executed when an alarm using the directory is active. The commands are: <ul style="list-style-type: none"><li>▶ Dial - phone the programmed number.</li><li>▶ Voice - Speak the alarm messages</li><li>▶ Radio - turn on the radio transmitter</li><li>▶ Wait - Insert a pause: 1 to 249 seconds.</li><li>▶ 2 Tone - send a two tone page</li><li>▶ 5 Tone - send a five tone page</li><li>▶ 1 Tone - send a single tone</li><li>▶ Alert - send a beeping tone</li><li>▶ DTMF - send a string of digits</li><li>▶ Answer - monitor the call progress signals and wait for the called party to speak before announcing the alarm message.</li></ul>
Access Code	Password for dial-up access to programming: 1 to 8 digits
Acknowledge Request	The acknowledge request at the end of the alarm annunciation can be disabled for use with public address systems.
Number of Rings	Sets the number of rings before the <i>LWM</i> will answer the line: 1 to 8 rings or never.
Squelch Polarity	Sets the radio busy monitor to either high or low when busy.
Pulse Dial	Forces dialing to be pulse instead of tone.
Audio Levels	Sets the gain for audio signals in the <i>LWM</i>

## Appendix B - Options

B1256 AC Adapter

Option 004 External power pack with 120 VAC power supply, sealed battery and charger. 12 hour capacity in standby. Connection of the Option 004 power supply is shown in Figure 7.

## Appendix C - Mounting

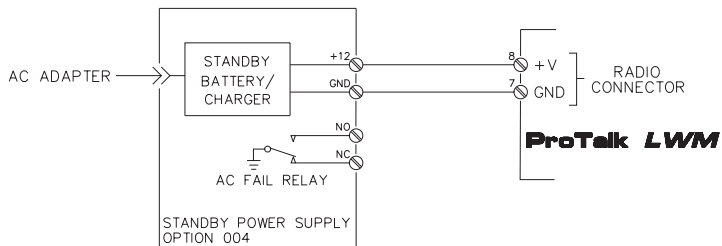


Figure 7 Option 004 Connections

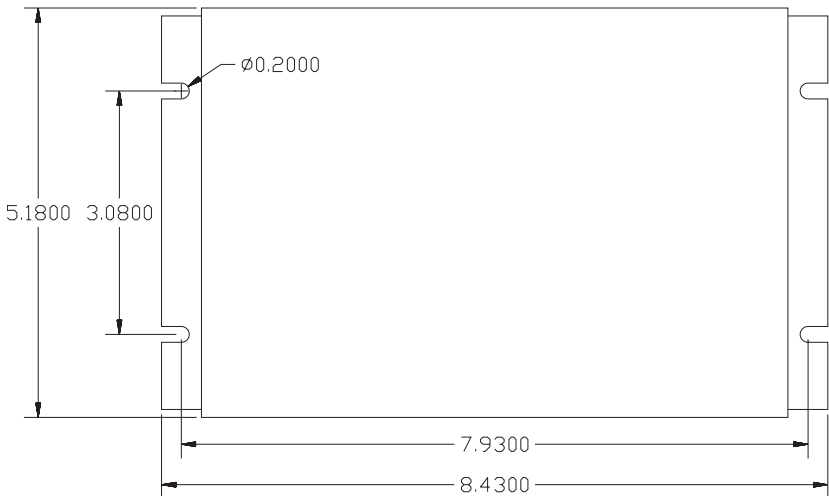
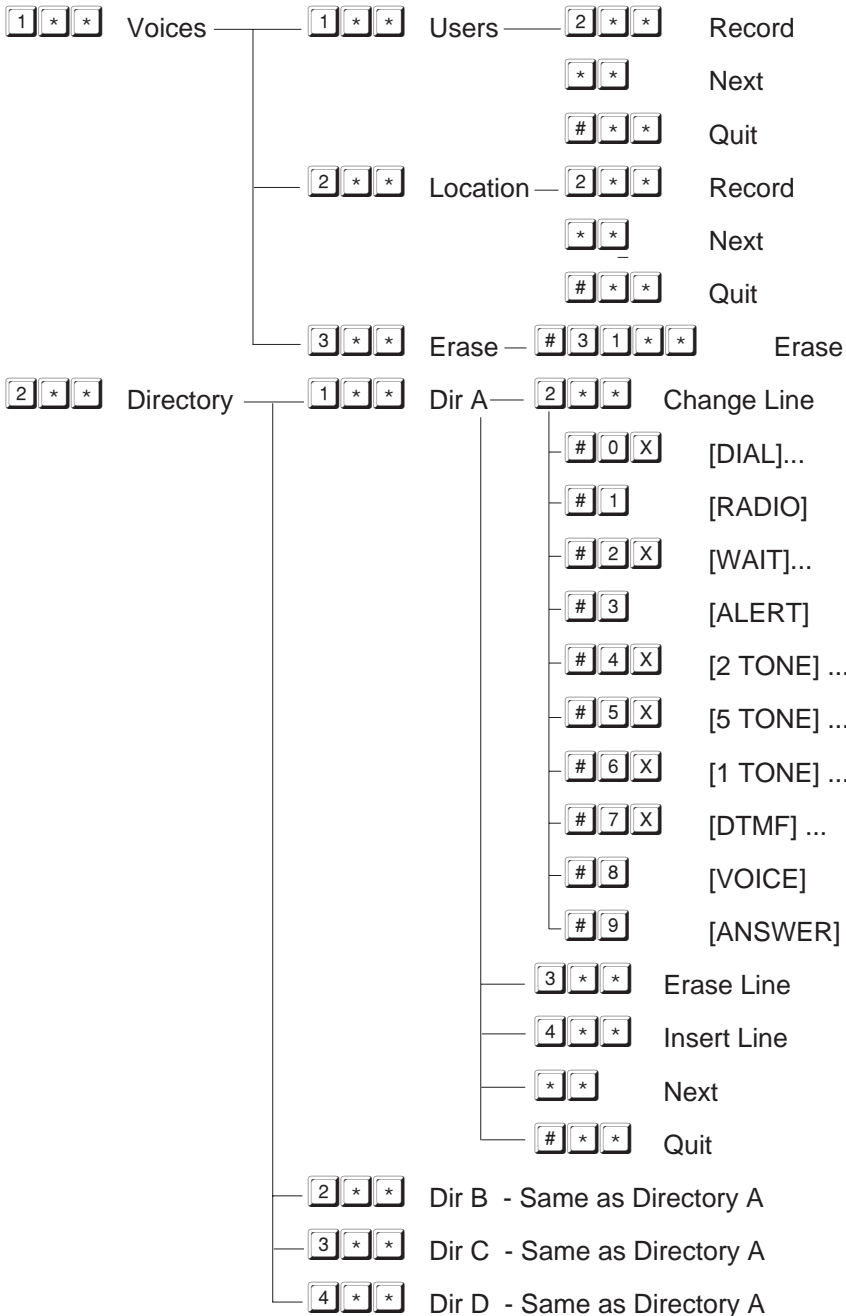
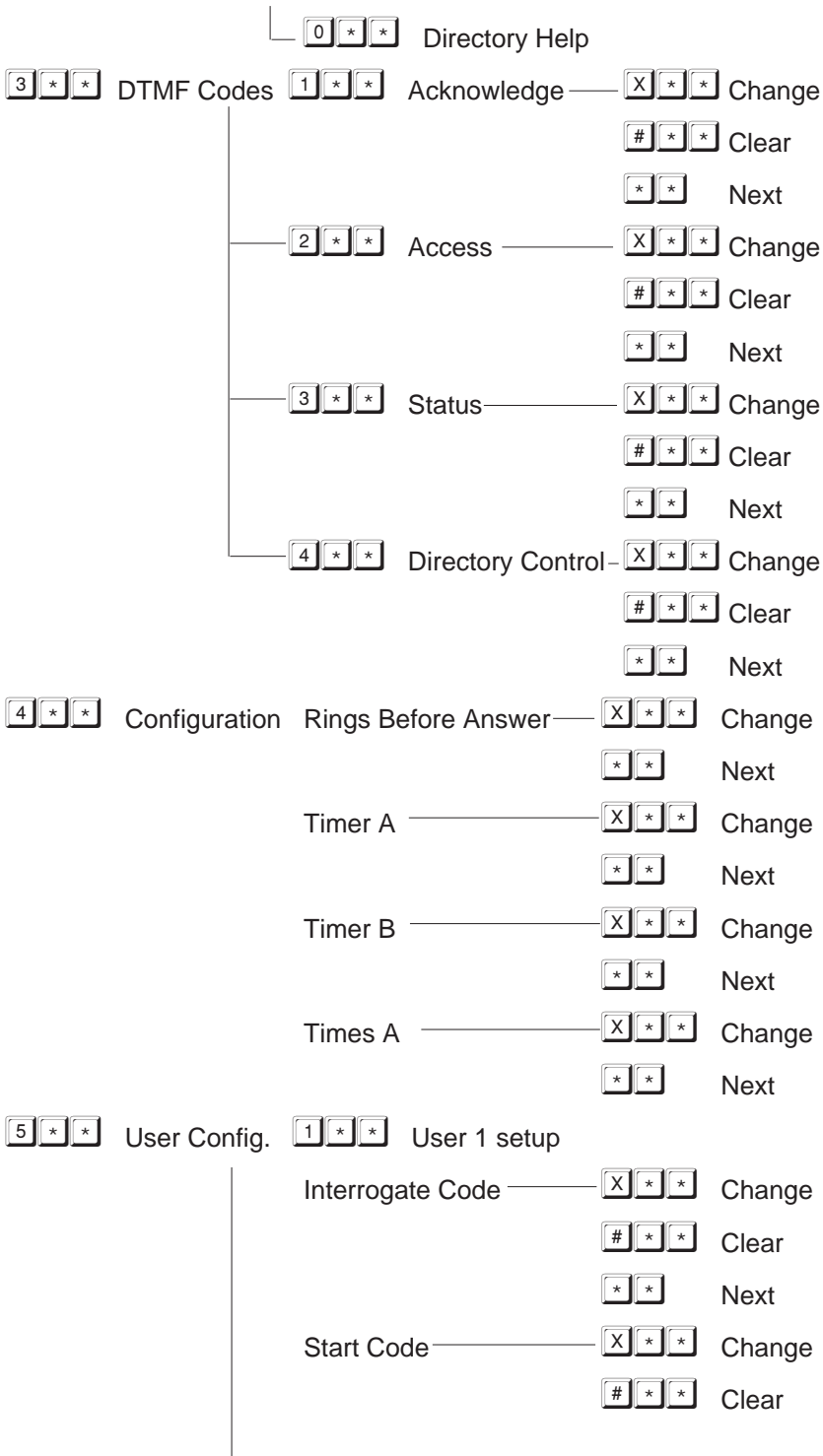


Figure 8 Mounting Detail

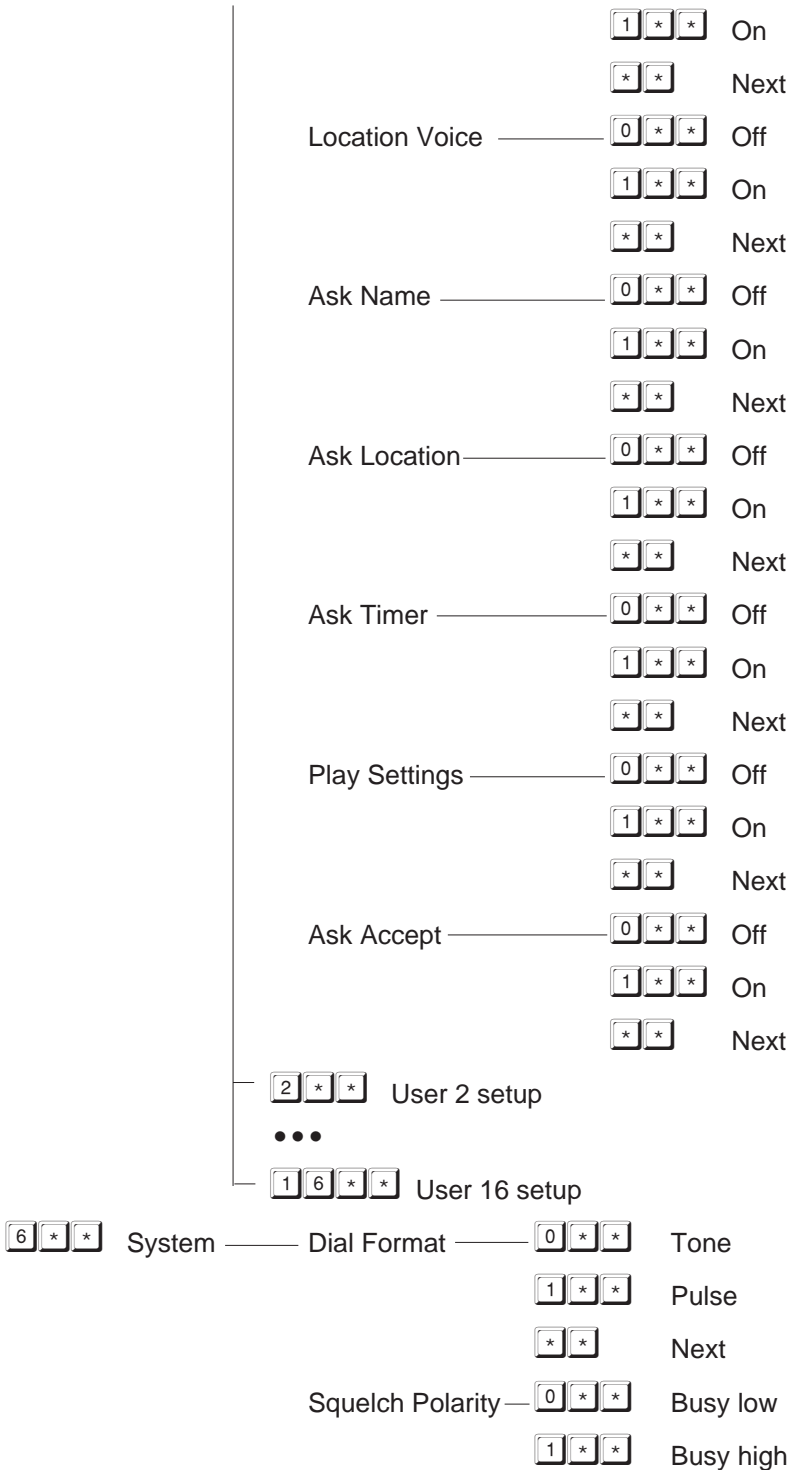
## Appendix D - Programming Tree

The parameters used to program the ProTalk *LWM* are given as a summary below. Where  appears, user data is entered





		<input type="button" value="*"/> <input type="button" value="*"/>	Next
Stop Code	—————	<input type="button" value="X"/> <input type="button" value="*"/> <input type="button" value="*"/>	Change
		<input type="button" value="#"/> <input type="button" value="*"/> <input type="button" value="*"/>	Clear
		<input type="button" value="*"/> <input type="button" value="*"/>	Next
Emergency Code	—————	<input type="button" value="X"/> <input type="button" value="*"/> <input type="button" value="*"/>	Change
		<input type="button" value="#"/> <input type="button" value="*"/> <input type="button" value="*"/>	Clear
		<input type="button" value="*"/> <input type="button" value="*"/>	Next
Timer Setting	—————	<input type="button" value="X"/> <input type="button" value="*"/> <input type="button" value="*"/>	Change
		<input type="button" value="*"/> <input type="button" value="*"/>	Next
Warning Interval	—————	<input type="button" value="X"/> <input type="button" value="*"/> <input type="button" value="*"/>	Change
		<input type="button" value="*"/> <input type="button" value="*"/>	Next
Enable Timeset	—————	<input type="button" value="0"/> <input type="button" value="*"/> <input type="button" value="*"/>	Off
		<input type="button" value="1"/> <input type="button" value="*"/> <input type="button" value="*"/>	On
		<input type="button" value="*"/> <input type="button" value="*"/>	Next
Enable Callout	—————	<input type="button" value="0"/> <input type="button" value="*"/> <input type="button" value="*"/>	Off
		<input type="button" value="1"/> <input type="button" value="*"/> <input type="button" value="*"/>	On
		<input type="button" value="*"/> <input type="button" value="*"/>	Next
Confirm Emergency	—————	<input type="button" value="0"/> <input type="button" value="*"/> <input type="button" value="*"/>	Off
		<input type="button" value="1"/> <input type="button" value="*"/> <input type="button" value="*"/>	On
		<input type="button" value="*"/> <input type="button" value="*"/>	Next
Name Code	—————	<input type="button" value="0"/> <input type="button" value="*"/> <input type="button" value="*"/>	Off
		<input type="button" value="1"/> <input type="button" value="*"/> <input type="button" value="*"/>	On
		<input type="button" value="*"/> <input type="button" value="*"/>	Next
Location Code	—————	<input type="button" value="0"/> <input type="button" value="*"/> <input type="button" value="*"/>	Off
		<input type="button" value="1"/> <input type="button" value="*"/> <input type="button" value="*"/>	On
		<input type="button" value="*"/> <input type="button" value="*"/>	Next
Name Voice	—————	<input type="button" value="0"/> <input type="button" value="*"/> <input type="button" value="*"/>	Off





			*	*	Next					
Busy Warning	—	0	*	*	Off					
		1	*	*	On					
		*	*	Next						
Ack Request	—	0	*	*	Off					
		1	*	*	On					
		*	*	Next						
Dial Tone	—	0	*	*	Off					
		1	*	*	On					
		*	*	Next						
Speak Site ID	—	0	*	*	Off					
		1	*	*	On					
		*	*	Next						
Default Timer	—	X	*	*	Change					
		*	*	Next						
8	*	*	Reset Database	—	#	3	1	*	*	Reset
					*	*	Next			
9	*	*	Audio Levels	Radio TX Tone	—	X	*	*	Change	
						*	*	Next		
				Radio TX DTMF	—	X	*	*	Change	
						*	*	Next		
				Radio TX Voice	—	X	*	*	Change	
						*	*	Next		
				Radio RX	—	X	*	*	Change	
						*	*	Next		
				Phone RX	—	X	*	*	Change	
						*	*	Next		