



## **Model *ARi-100***

**MULTI-FORMAT SUB- MINIATURE ANI - ALARM ENCODER**

**For Mobile, Fixed and Portable Radio Applications**

**CES WIRELESS TECHNOLOGIES CORP.**  
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CES, Inc. warrants this product to be free from defects in material and workmanship for two years from date of shipment. If such malfunction occurs, it will be repaired or replaced (at our option) without charge for materials or labor if returned to the factory. This warranty does not apply to parts damaged due to improper use- including accident, neglect, unreasonable use, and improper installation - or to unauthorized alterations or modifications of the equipment. It does not extend to damage incurred by natural causes such as lightening, fire, floods, or other such catastrophes, nor to damage caused by environmental extremes, such as power surges and or transients. It does not extend to microprocessors if is determined that the failure of a micro is due to static damage, application of improper voltages to the unit, or other problems not related to circuit design. In such case or in the case of a desire to update the micro to a different version of software, such request must be specified in writing, and there will be a charge agreed upon by both parties.

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Smartnet is a trademark of Motorola Communications  
Windows and Windows '95 is a registered trademark of Microsoft  
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## Introduction

Welcome to the *ARi-100* programming manual.

The *ARi-100* is one of a range of premium CES products making up our **ARIS** (Automatic Radio Identification and Status) group of products for radio identification, remote monitoring, alarm and control applications. *ARIS* offers a complete suite of products to choose from in order to provide the necessary level of functionality for a given system requirement.

The *ARi-100* is suitable for new or existing conventional or trunked radio system installations. It is compatible with DTMF, 5-tone sequential or hexadecimal signaling formats. The device can be programmed to transmit:

1. ANI on PTT activation
2. autoCALL™ a “Base Call” to your dispatcher on PTT double-click, or other user definable status
3. Transmit three other user definable status messages

This product has been carefully engineered and manufactured to provide reliable service in virtually any wireless communications system. Occasionally, particular systems may require special functions not available in standard products. Please call your CES Applications Engineer to discuss special applications to meet other needs.

Because we are engaged in a program of continual product development, the specifications and descriptions outlined in this manual are subject to change. Please consult the amendment section for changes.

At CES, we strive to bring you products that meet your needs. If you have any comments about our products, manuals or service please call 407 -679-9440, and thank you for your continued support.

Communications Electronics Specialties

## 1.0 *ARI-100* Overview

### 1.1 Signaling Format

The CES Model *ARI-100* ANI/Alarm Encoder is designed to operate within a wide array of signaling formats such as:

|   |                               |
|---|-------------------------------|
| <b>DTMF</b> up to 16-digits                                     | <b>CCIR</b> Tone Sequential   |
| <b>EEA</b> Tone Sequential                                      | <b>EIA</b> Tone Sequential    |
| <b>ZVEI-1</b> Tone Sequential                                   | <b>ZVEI-2</b> Tone Sequential |
| <b>DZVEI</b> Tone Sequential                                    | <b>PZVEI</b> Tone Sequential  |
| <b>CUSTOM</b> User-Defined N-Tones up to 16-digits (400-3000HZ) |                               |

### 1.2 Inputs and Status

User-defined inputs for sending special STATUS functions include:

|  |
|--|
| ANI on PTT - Leading or Trailing                     |
| autoCALL™ - Double-Click of PTT for Base Call Status |
| Auxiliary Input # 1 - User definable                 |
| Auxiliary Input # 2 - User definable                 |
| Auxiliary Input # 3 - User definable                 |

**And** . . . . Where each may be of a different format than that of the ANI. For instance, the ANI could be set for a specified tone format such as ZVEI-1, and the Auxiliary #1 Input (from a user-provided switch input) could be set for DTMF. Further, each of the four functions may be set to transmit up to two additional digits. More information on this topic is included in the programming section of this manual. Also refer to the appropriate base end System Manual for discussion on system concepts and planning.

**And** . . . . The actual signaling format timing may also be tailored for operation in a system that is other than 'standard', for some European systems or for repeater access.

1st Tone Length (5/6 Tone Format)  
Intertone delay between tones (5/6 Tone and DTMF)

**And** . . . . A unique and different **Add-On** Tone may be included for each auxiliary external input(s) (up to three), in addition to the **autoCALL™** feature from the user PTT switch that also allows a user-definable purpose.

### ***1.3 Programming & Installation***

The Model *ARi-100* ANI module is designed for installation in most any mobile radio application, including many handheld personal portables. In addition to the small physical size, power consumption is also held at an absolute minimum within the realm of current technology.

All programmed information is retained by EEPROM memory that provides a specification of 100-year memory retention.

A common interface connector is provided for ease in programming and installation:

PC Programming - permits rapid user-friendly ability for the installing technician to program the ANI module with an IBM-compatible personal computer using Microsoft Windows 3.1 or Windows '95. Each *ARi-100* module configuration may be saved to an individual file for later retrieval, review, changes, and reprogramming of the module.

Installation - Facilitates a fleet-wide installation concept where the module may be pre-programmed, the radio interface wiring harness subsequently installed, followed by plugging in and activation of the ANI module. Similarly, an ANI module could be replaced at any time with another pre-programmed module for the purpose of changing the unit ID number, type of signaling format or other desired changes, resulting in minimal down-time of the vehicle.

It is highly recommended that this manual be reviewed before beginning with the actual programming of the *ARi-100* encoder module(s). Please call the CES support department at 407-679-9440 if you need additional assistance.

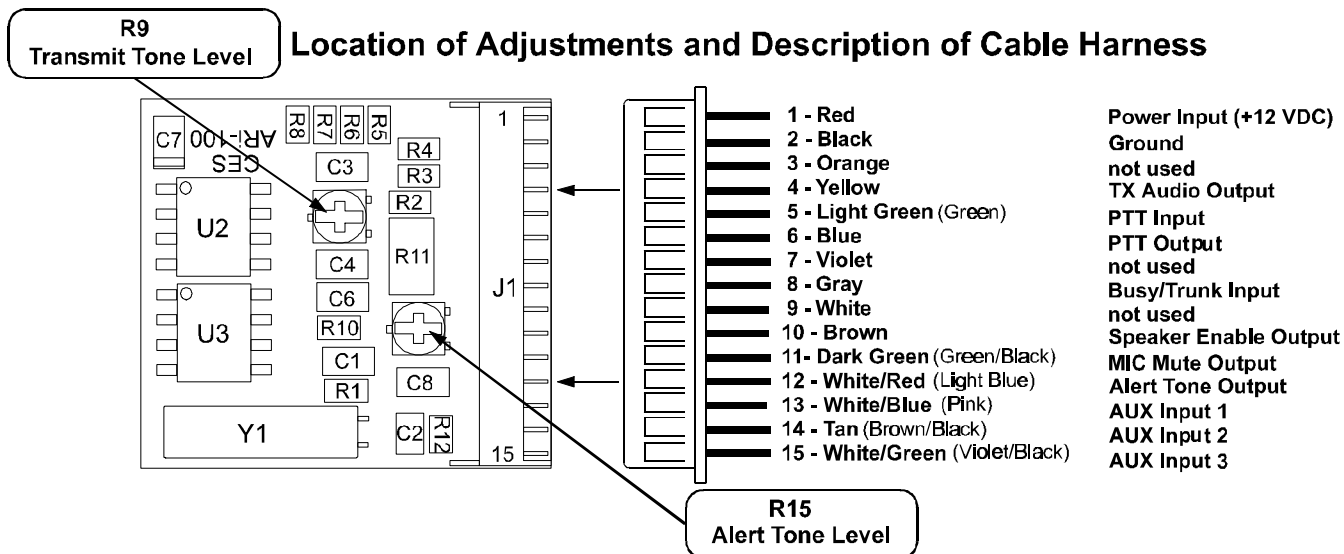
## 2.0 OPERATION

Operation of the *ARi-100* encoder module is entirely dependent upon how the module itself is programmed. This is dictated by the system configuration required. Remember, compatibility must be maintained at all times with the base end signaling system !

The CES Support Department is available to assist you in planning your system, please call 407-679-9440 for further information.

## 3.0 Installation

Installation and programming of this CES product must be completed by a qualified two-way radio technician or engineer. CES is not responsible for any operational problems caused by system design, outside interference, or improper installation. Observe normal static prevention practices.



### 3.1 Radio Application/Interface Notes

Application Notes for selected radio models may be obtained by contacting your CES sales representative. If not available, CES, at a nominal charge will prepare an application note for you. Please contact CES at 407-679-9440 for further information.

### 3.2 Before Installing

The ARi-100 may be installed in almost any mobile or portable radio model. The ARi-100 module should be programmed prior to performing the actual installation into the radio. See section 4 for Programming details.

Determine a suitable location for the module within the radio. Generally, it would not be advisable to permanently mount the module at this time, but only after necessary adjustments are accomplished and proper operation has been confirmed.

### 3.3 Required Equipment for Installation

- Communications service monitor or deviation meter with oscilloscope
- Temperature-controlled soldering iron (fine tip, if surface mount components are used in radio)
- Oscilloscope
- Volt-ohm-meter
- Flat blade (3/64" width) screwdriver or similar alignment tool

### 3.4 Wire Interface Overview

The ARi-100 can be interfaced to the radio by using just three wires. This however gives minimum features. Additional features are available as additional wires are connected. Please read through the following descriptions to decide on the level of functionality required before undertaking the actual installation. If you need help please call CES at 407-679-9440.

#### 3.4.1

(for future enhancement)

#### 3.4.2 Four or Five (4 or 5) Wire Interface with Additional Features and T-O-T

For operation in a conventional system making use of the Hold-Off Count (ANI only sent once during a predetermined period) and **autoCALL™**, only four wires are required. If T-O-T (Time Out Timer) is desired (see Note 2) this requires a 5 wire connection.

| Wire Color           | Function        | Connect To                             |
|----------------------|-----------------|--|
| Red                  | Vin             | Switched B+ (+6 volts to +17 volts DC) |
| Black                | Ground          | Radio Ground                           |
| Yellow               | TX Audio Output | Modulator with pre-emphasis (Note 1)   |
| Light Green or Green | PTT Input       | PTT switch                             |
| Blue                 | PTT Output      | PTT input to radio (note 2)            |

*Note (1): If connecting to a high impedance point in the radio, an appropriate resistor may be needed in series with this lead.*

*Note (2): The PTT Input and Output connection must be electronically separated. This is normally done by breaking the PTT circuit where it enters the radio from the microphone. This may be accomplished by a p.c. board plating cut, or other appropriate modification. The ARi-100 handles normal PTT requests from the PTT switch, and turns the transmitter on if the Busy logic is inactive or Channel Ready Logic is active.*

### 3.4.3 Seven (7) Wire Trunking Interface with Additional Features and T-O-T

For operation in a LTR™ or Smartnet™ system and to make use of the Hold-Off Count (ANI only sent once during a predetermined period) **autoCALL™** and TOT (Time-Out-Timer), seven wires are required for connection to the radio:

| Wire Color                | Function         | Connect To                             |
|---------------------------|------------------|--|
| Red                       | Vin              | Switched B+ (+6 volts to +17 volts DC) |
| Black                     | Ground           | Radio Ground                           |
| Yellow                    | TX Audio Output  | Modulator with pre-emphasis (Note 1)   |
| Light Green or Green      | PTT Input        | PTT switch                             |
| Blue                      | PTT Output       | PTT Input to radio (see note 4)        |
| Gray                      | Busy/Trunk Input | Channel Ready Logic (see Note 2)       |
| Dark Green or Green/Black | MIC Mute Output  | Microphone audio circuit (see Note 3)  |

*Note (1): If connecting to a high impedance point in the radio, an appropriate resistor may be needed in series with this lead.*

*Note (2): This logical level is active upon system acquisition and is normally available from the radio trunking logic board or TX. Volts. The logic level can be either an active high or low and is a programmable input to the ARi-100.*

*Note (3): For best reliability of the ANI signaling tones being decoded, the microphone should be muted during the period that the ANI is being sent by the ARi-100. Connect this wire to a point in the radio that will mute the microphone but not the ARi-100 encoder audio to the transmitter modulator. The logic output from the ARi-100 is programmable.*

*Note (4): The PTT Input and Output connection must be electronically separated. This is normally done by breaking the PTT circuit where it enters the radio from the microphone. This may be accomplished by a p.c. board plating cut, or other appropriate modification. The ARi-100 handles normal PTT requests from the PTT switch, and turns the transmitter on if the Busy logic is inactive or Channel Ready Logic is active.*

### 3.4.4 Other Available Inputs and Outputs:

| Wire Color                | Function              | Connect To                              |
|---------------------------|-----------------------|---|
| Brown                     | Speaker Enable Output | Radio receiver audio control (note 1)   |
| White / Red<br>Light Blue | Alert Tone Output     | Receiver audio power amplifier (Note 2) |
| White / Blue<br>Pink      | AUX Input 1           | External switch (see Note 3)            |
| Tan                       | AUX Input 2           | External switch (see Note 3)            |
| White / Green             | AUX Input 3           | External switch (see Note 3)            |

*Note (1): This logical function may be required to turn on the receiver audio circuitry, as would normally be disabled or muted while the radio is in a transmit condition - applicable only if the Alert Tone is being used and a speaker/audio amplifier input is required to enable the audio circuits.*

*Note (2): If connecting to a high impedance point in the radio, an appropriate resistor may be needed in series with this lead.*

*Note (3): Connect the desired AUX Input wire to a switch (user-provided). This switch may be configured to provide a logic high or low (default) when pressed. This logic level is programmable in the ARi-100. All AUX inputs incorporate 100K ohm pull-up resistors to +5V.*

### **3.5 ARi-100 Adjustments**

After programming the ARi-100, and connecting the radio interface harness to the radio transceiver, attach the module to the interface harness. Observe normal static prevention practices.

1. Apply power to the radio and turn the power switch on.
2. Set the service monitor to receive on the transmitter frequency. If the service monitor does not incorporate an oscilloscope, connect an external oscilloscope to the demodulation output.
3. If the radio is being used on a conventional system, connect an RF dummy load to the radio. Go to step (5).
4. If the radio is being used on an LTR or Smartnet system, connect the radio to a suitable antenna.
5. Press the PTT button and observe that the ANI modulation is between 3.5 and 5.0 kHz deviation (or 1.8 and 2.5 kHz if being used on a 12.5 kHz system). Adjust R9 on the ARi-100 module as necessary. If CTCSS or DCS is also being transmitted by the radio, ensure that this level is also set correctly. Verify that the modulation does not go into limiting upon the ANI being sent.
6. If the Transmit Timer and Alert Tone features are being used: Press and hold the PTT switch continuously in excess of the Transmit Timer period as programmed in the ARi-100. At that time, the Alert Tone should be audible from the radio speaker and the transmitter should now be off. Continue to hold the PTT switch and adjust R15 on the ARi-100 module for a suitable volume level as heard on the radio speaker.

Congratulations, this completes necessary adjustments to the ARi-100 encoder module. It is recommended that the radio is tested for correct mobile to base operation prior to leaving the programming location.

### **3.6 Mounting the ARi-100**

Place the provided heat shrink tubing around the ARi-100 module and shrink the tubing with a heat gun (preferred). Affix the module to a suitable location in the radio with the provided double-sided tape.

(Note: Do not overheat the encoder while using a heat gun. You will melt the solder and the SMD components on the circuit board will become dislodged, causing failure of the encoder, and voiding of the warranty.)

## 4.0 Programming

### 4.1 Setting up the Computer

The *ARi-100* ANI/Alarm encoder is programmed using an IBM-compatible computer, Microsoft Windows, together with the CES *ARi-100S* programming software and the *ARi-199P* hardware interface.

The personal computer must be:

IBM-compatible 386-33 MHz or better

Microsoft Windows 3.1 or Windows '95

Hard disk drive with 1.0 Megabyte free space

3.5" high-density floppy disk drive

4 MB RAM memory

An RS232 COM port with either a DB25 or DB9 type connector

### 4.2 Installing *ARi-100S* Software

Place the floppy diskette into the 3.5" HD computer drive. From the Windows Program Manager select **File** and then **Run**. In the Command Line box, enter:

```
a:\setup
```

or, for drive B:

```
b:\setup
```

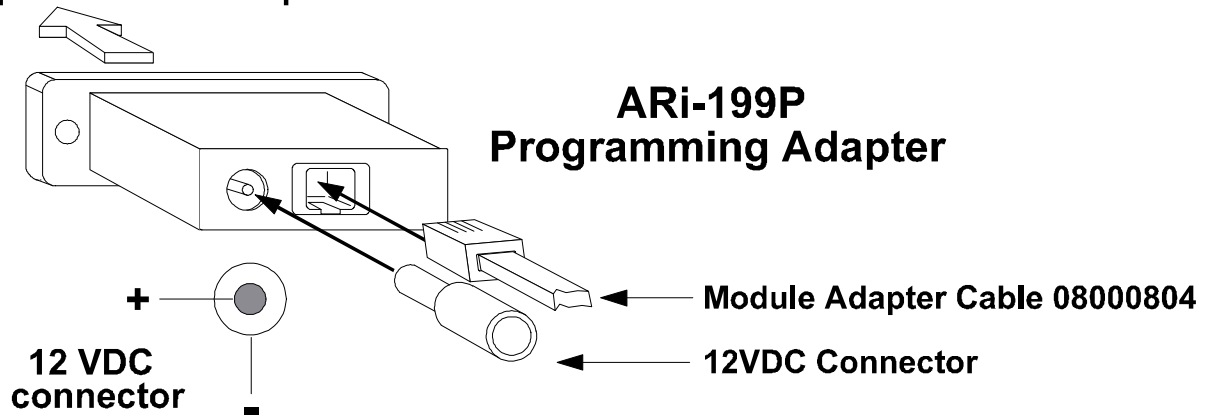
Then click on <OK> or press <Enter>

Follow the displayed installation instructions, selecting a different directory to install the programming software if desired. A new Program Group and icon will be created.

During installation of the software, the instructions may prompt you to close other applications. This prompt will be displayed whether you have other applications open or not. If you have other applications open you must close them before continuing. If you have no other applications open, just proceed.

#### 4.2.1 ARi-199P Programming Adapter

##### Plug Adapter into PC serial port



Install the *ARi-199P* programming interface adapter to the personal computer by plugging the DB25 female connector end of the *ARi-199P* into an unused serial port connector on the computer. If the PC connector is of the DB9 type, then use the enclosed DB-25 to DB-9 adapter.

*Note: If it is desired to extend the ARi-199P Programming Adapter, then connect a standard serial cable (not provided) between the PC and the ARi-100. Do not use a serial cable longer than 25-feet in length.*

#### 4.2.2 DC Power

For 110 VAC only - insert the AC adapter plug into the mating connector on the *ARi-199P*. Plug the supplied 110V AC adapter into a nearby AC outlet.

If the AC voltage is other than 110V AC do not use the supplied AC adapter. The *ARi-199P* must be provided with 12 VDC. Using either a regular 12 V DC power source or a suitable wall adapter. The *ARi-199P* DC mating adapter is configured as outlined above.

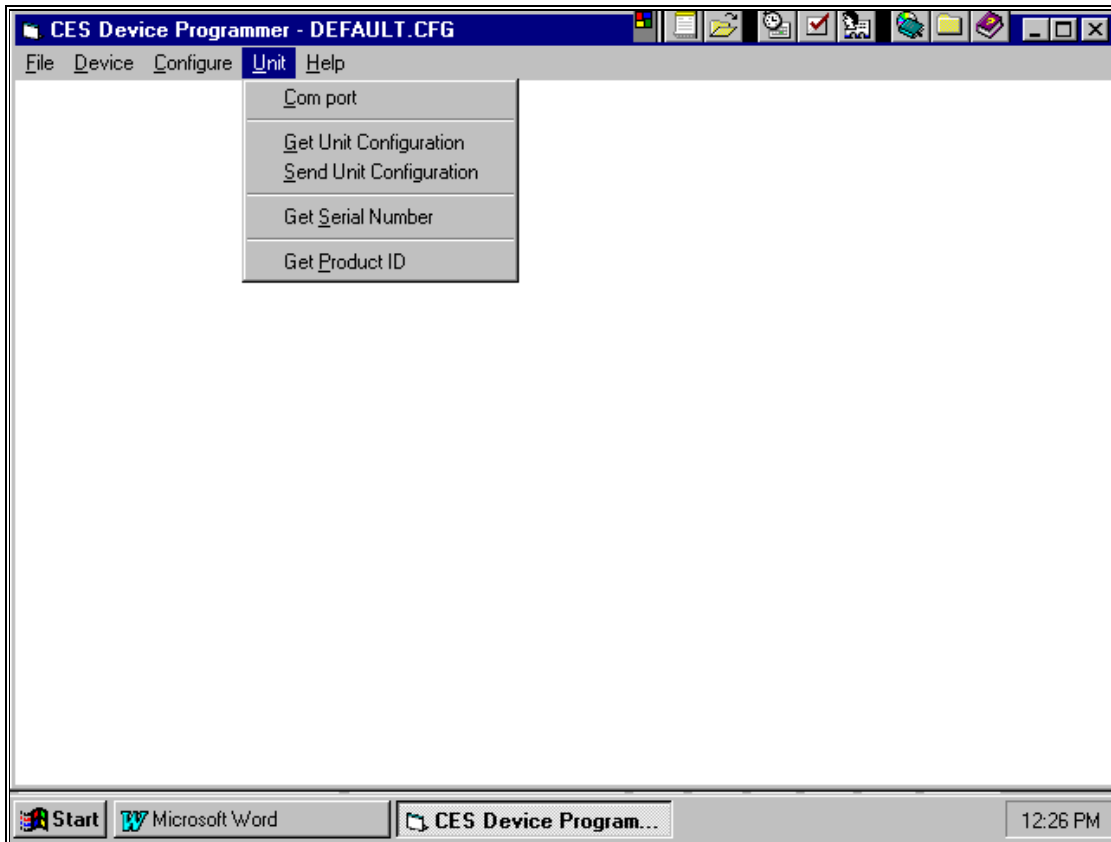
#### 4.2.3 Connecting *ARi-100* Module to *ARi-199P* Programming

Plug the *ARi-100* Interface Cable RJ11 connector into the mating receptacle on the *ARi-199* as outlined above.

Connect the *ARi-100* ANI encoder module to the programming interface cable connector. See Section 3 for diagram and proper positioning of this connector with the *ARi-100*.

## 4.2.2 Initialize Software & Select Comms Port

Run the *ARi-100* program by double-clicking on the icon. Select **Unit** from the menu bar.



Select **Com Port**. Select the COM Port that the Interface Adapter is connected to:

- Com 1
- Com 2
- Com 3
- Com 4

If the Com Port selected is not valid for this computer, the message "Com Port not available" will be displayed.

Once selected, the COM port configuration will be saved for future programming sessions.

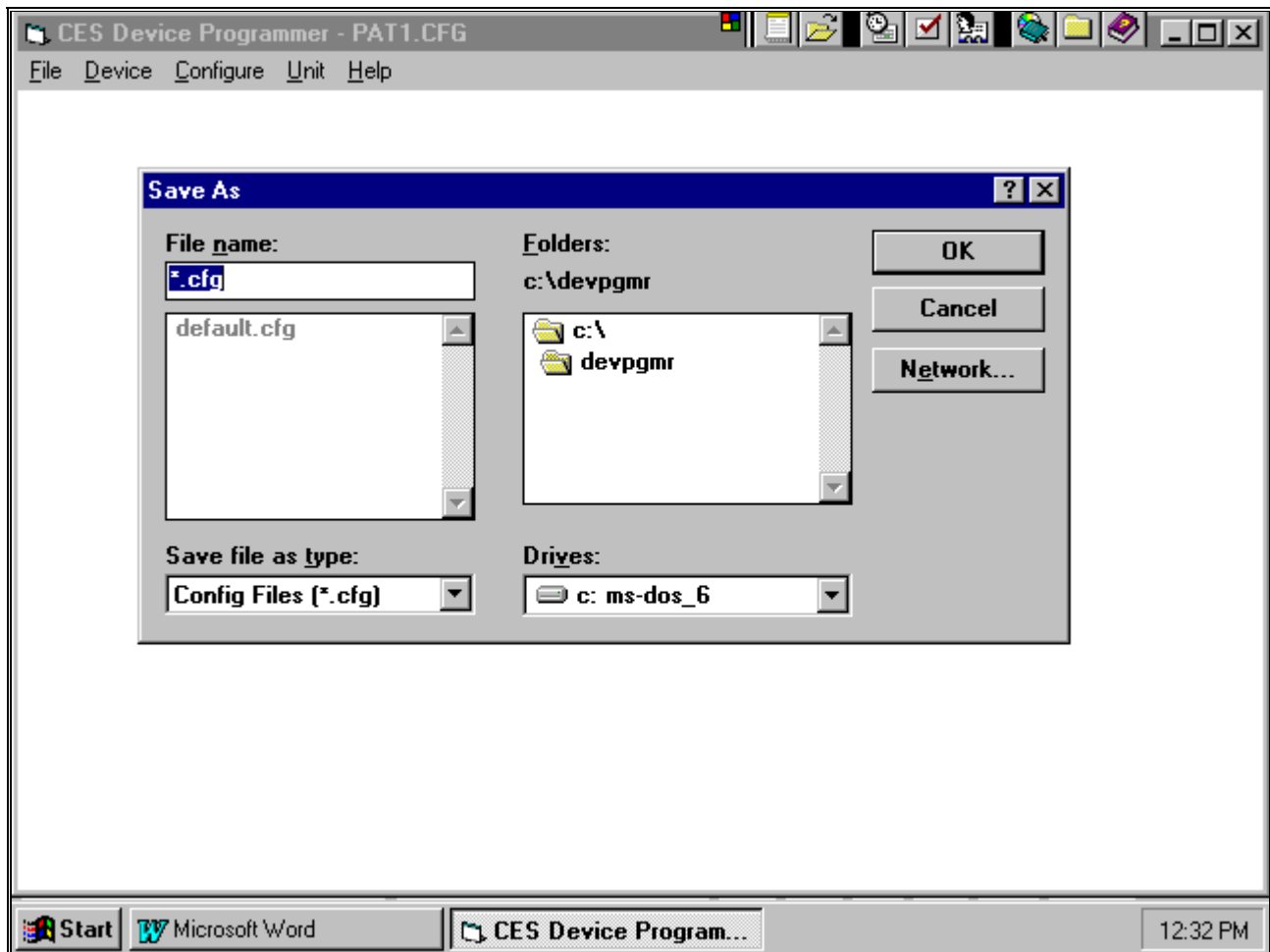
### 4.2.3 Get Unit Configuration

Connect the *ARi-100* ANI encoder module to the programming interface cable connector. See Section 3 for diagram and proper positioning of this connector with the *ARi-100*.

Select **Unit** from the menu bar and then **Get Unit Configuration**. After a few moments, the "..... . Successful" message will be seen. Click on the <OK> button. This will allow you to set up each successive session for programming the *ARi-100* Encoders.

### 4.2.4 Saving File

Click on **File** on the Menu Bar, and then **Save As**.



Enter from the keyboard

**FACTORY** (using the default **.cfg** extension)

Click on <OK> or <Enter> to save the configuration for future reference. The saving of this file need only be accomplished for the first *ARi-100* module.

#### 4.2.5 Serial Number & Product ID

The particular factory-preset Product Code and Serial Number for any module may be obtained by selecting **Unit** from the menu bar and then the selection choice:

|                          |
|--------------------------|
| <b>Get Serial Number</b> |
| <b>Get Product ID</b>    |

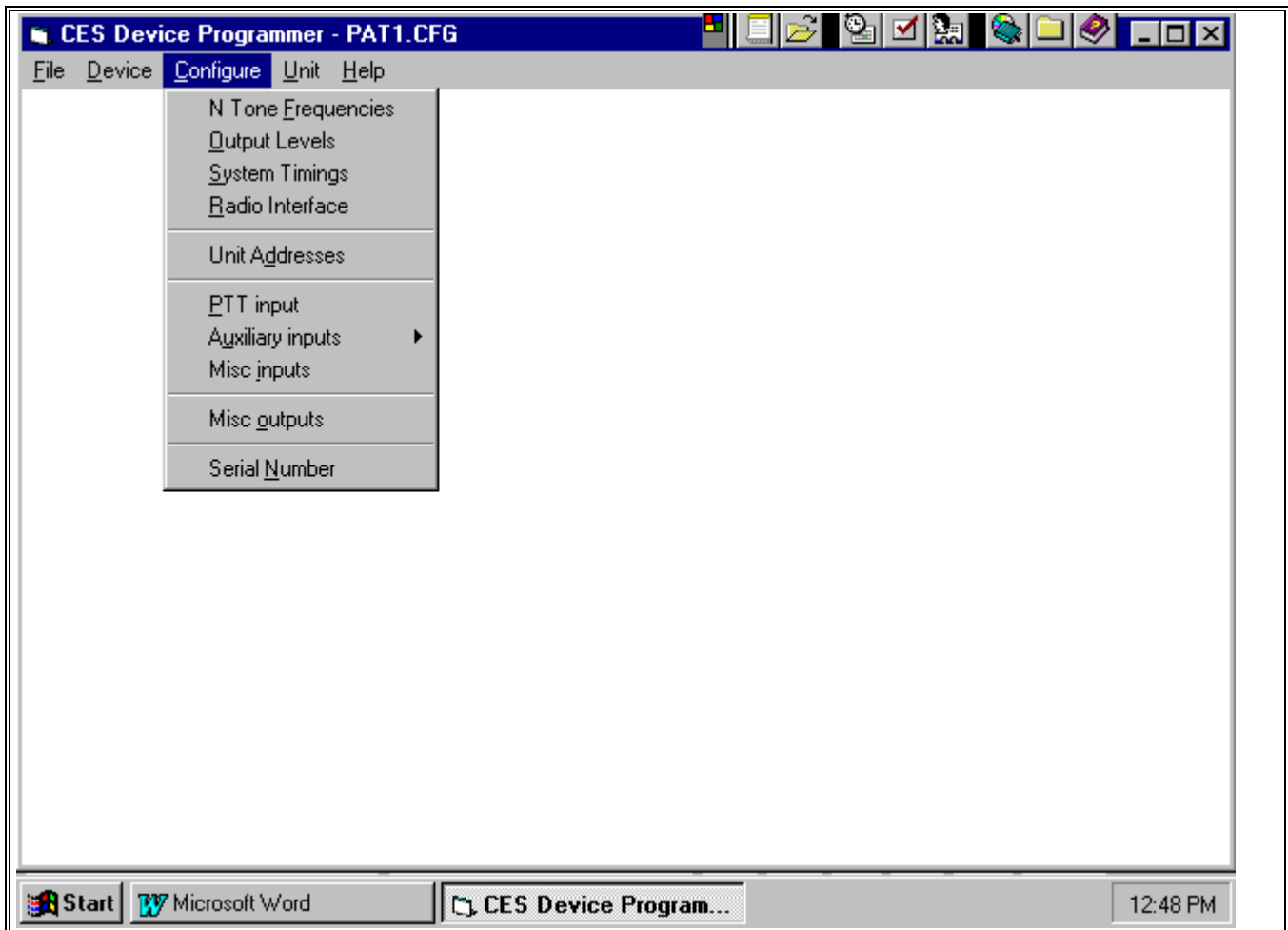
The selected item will be then displayed for your reference (each will be of 16-digits in length).

In the case of the Serial Number, once read from the *ARi-100* module it will be included in the current configuration. If the current configuration is saved to a file, the serial number will also be included in the saved file.

## 5.0 CONFIGURING THE *ARi-100*

Once the overall system specification is established, the *ARi-100* software default parameters may be adjusted as required. Programming the individual modules is then a simple affair. (*For details on “programming subsequent modules” and “programming One or More Modules At a Later Time” see section 8.*)

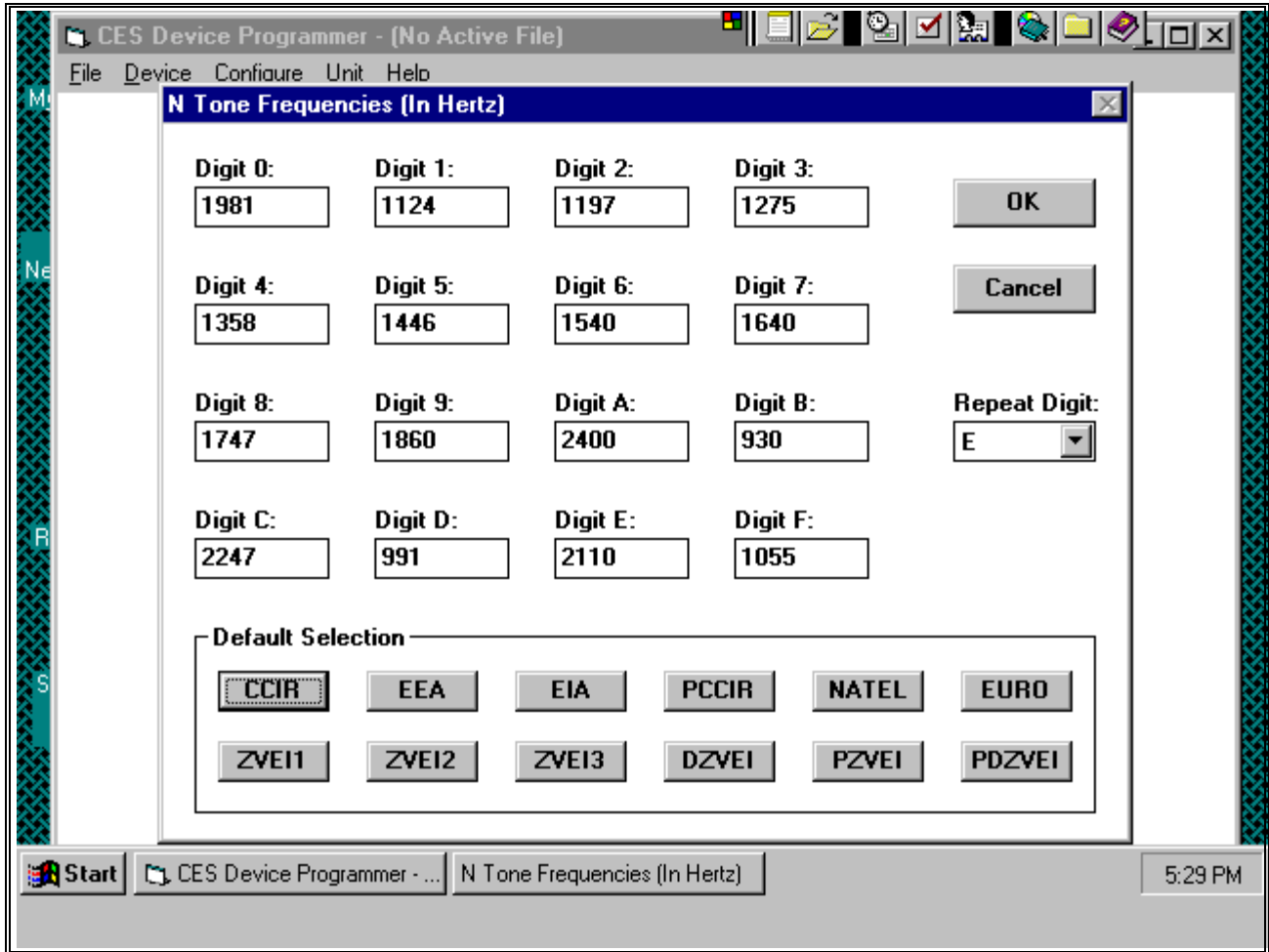
The personality parameters for each individual system are entered using **Configure** on the main menu bar:



### 5.1 N-TONES

*This relates to tone sequential commonly know as 5-tone and hexadecimal sequential. If DTMF signaling only is to be used, the following step may be omitted. The type of signaling used for each individual input (PTT ANI, Aux. inputs etc.) is programmed later. You are simply now defining the type of tones used for 5-tone and n-tone using this window.*

Click on the **N-Tones** item on the menu bar. Select the desired tone signaling format default type to be used by clicking on the respective button at the bottom of the N-Tone window:



If your system uses tones that are different than that displayed, then click on the appropriate **Default Selection**.

*Or*

For a non-standard or custom signaling format, enter in each digit position the specific tone frequency (400Hz - 3000Hz.) that is to be generated for that digit. Remember to maintain compatibility with all other units and particularly the base decoder. **CAUTION:** If your radio repeater/line system uses notch filters, identify the frequencies and bandwidth of the filters before choosing the tone signaling format.

Select the **Repeat Digit** if different to the default value

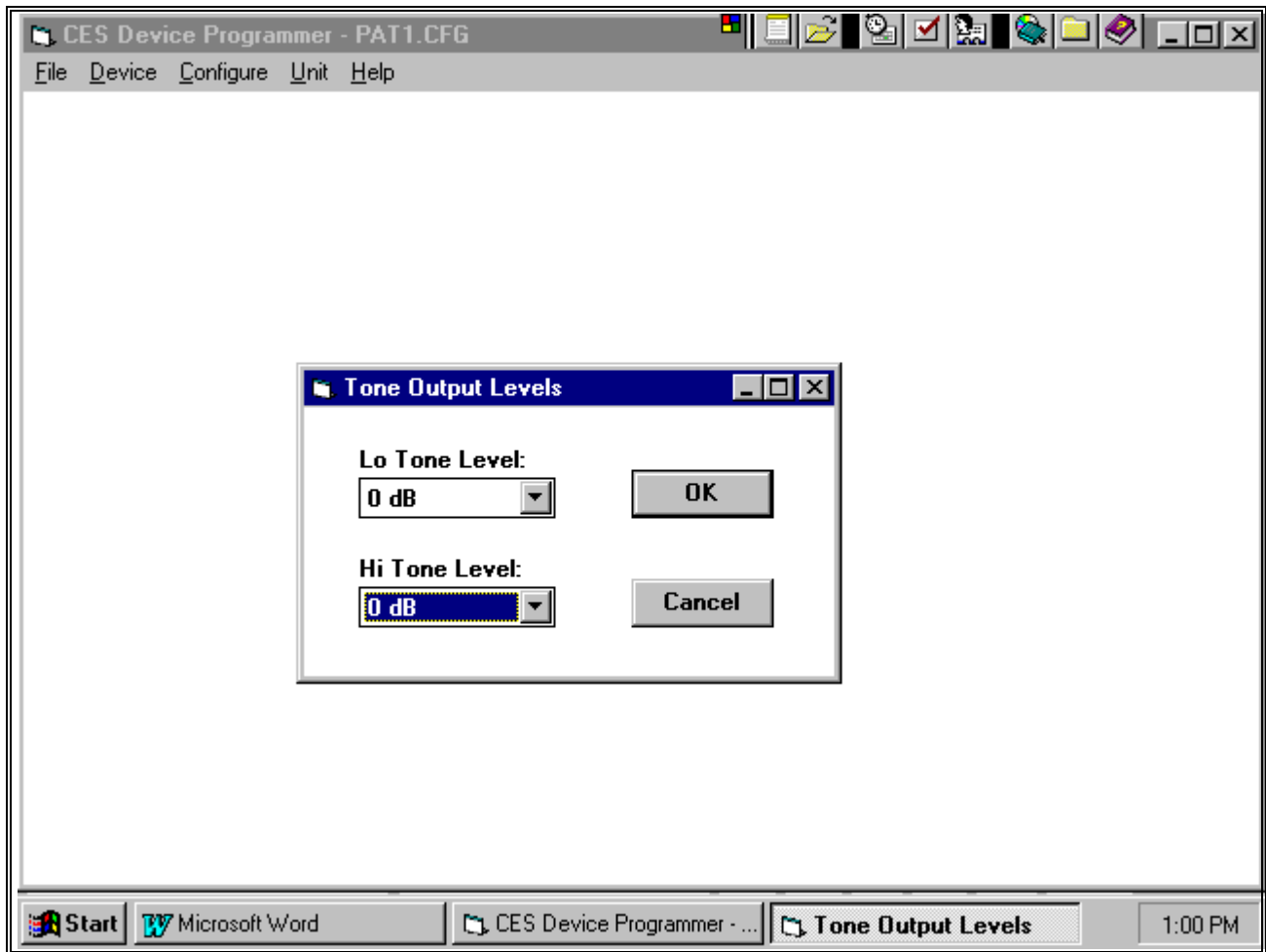
Click on <OK> to save the changes made and return to the main menu.

Click on <CANCEL> to exit this submenu without saving any changes made.

## 5.2 OUTPUT LEVELS

NOTE: Use the on board potentiometer R9 for adjusting the deviation levels for, DTMF, n-tone and 5-tone.

Select **Configure** and then **Output Levels** to view or change this feature.



This feature is generally used to compensate for twist that may occur in certain radio systems. DTMF signals must be within 6db of the high and low tone for proper operation. The tone output level setting may be used to adjust the ARi-100 module if required. Normally no adjustment will be required. **Don't use this setting for adjusting normal deviation levels use potentiometer R9!!!**

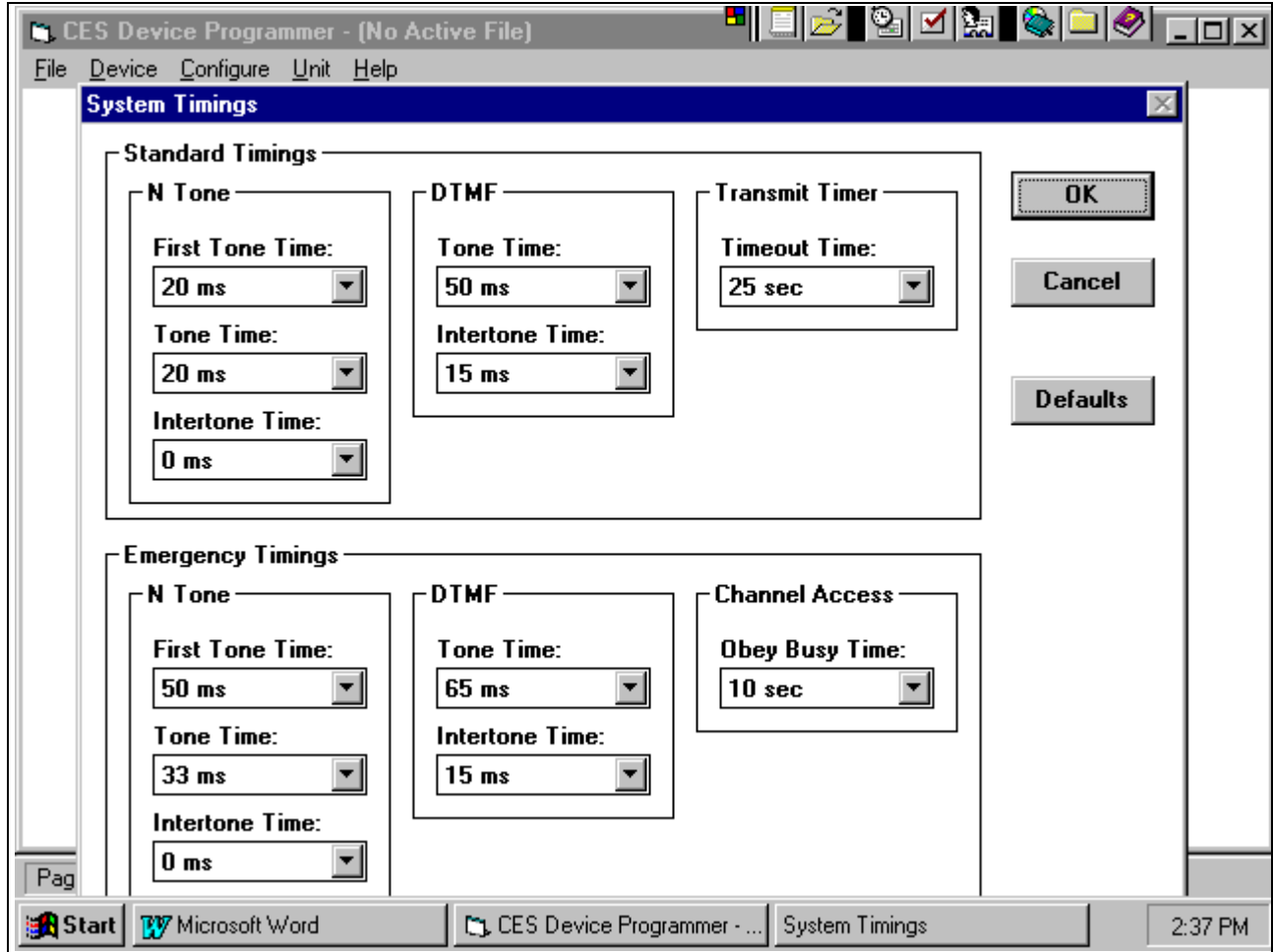
Determine if any change is necessary by programming the first module and installing it into the radio. All subsequent modules will be set to the same output level parameters as the new default if using this configuration file as a source or reference.

Click on <OK> to save the changes made and return to the main menu.

Click on <CANCEL> to exit this submenu without saving any changes made.

### 5.3 SYSTEM TIMINGS

Select **Configure** and then **System Timings** from the menu bar. Review the timing parameters for the signaling method(s) to be used:



If any of these timing parameters are known to be different for the particular system where the ARi -100 is to be used, then modify to the desired value; otherwise, leave the parameters set to the default values.

If you make a mistake, simply click on **Defaults** to return the screen to the original default settings.

#### 5.3.1 First Tone Time

This determines the tone period of the first tone in a sequence transmitted.

#### 5.3.2 Tone Time

This determines the tone period of the second and subsequent tones transmitted

### 5.3.3 Inter-tone Time

This determines the time period between each tone transmitted

### 5.3.4 Transmit Timer

This timer will inhibit the transmitter should the microphone PTT becomes "stuck" or the user continuously transmits beyond the time period programmed here. If the radio already has a time-out-timer, either disable it or set the *ARi-100* Transmit Timer to the same time. The *ARi-100* must control the radio transmit line for the Transmit Timer to operate. Please consult the Installation Section for further details.

### 5.3.5 Emergency

A separate timing protocol can be programmed for inputs designated as Emergency.

If the **Emergency** feature is being used, change the default values to the desired parameters as necessary for the type of signaling format that is to be used (N-Tone or DTMF).

### 5.3.6 Channel Busy Access

Set **Obey Busy Time** the maximum permissible time to wait during a busy-channel condition to send the Emergency sequence. If this feature is not possible within the system, then set to "Infinity".

Click on **<Defaults>** to return parameters to factory default settings.

Click on **<OK>** to save the changes made and return to the main menu.

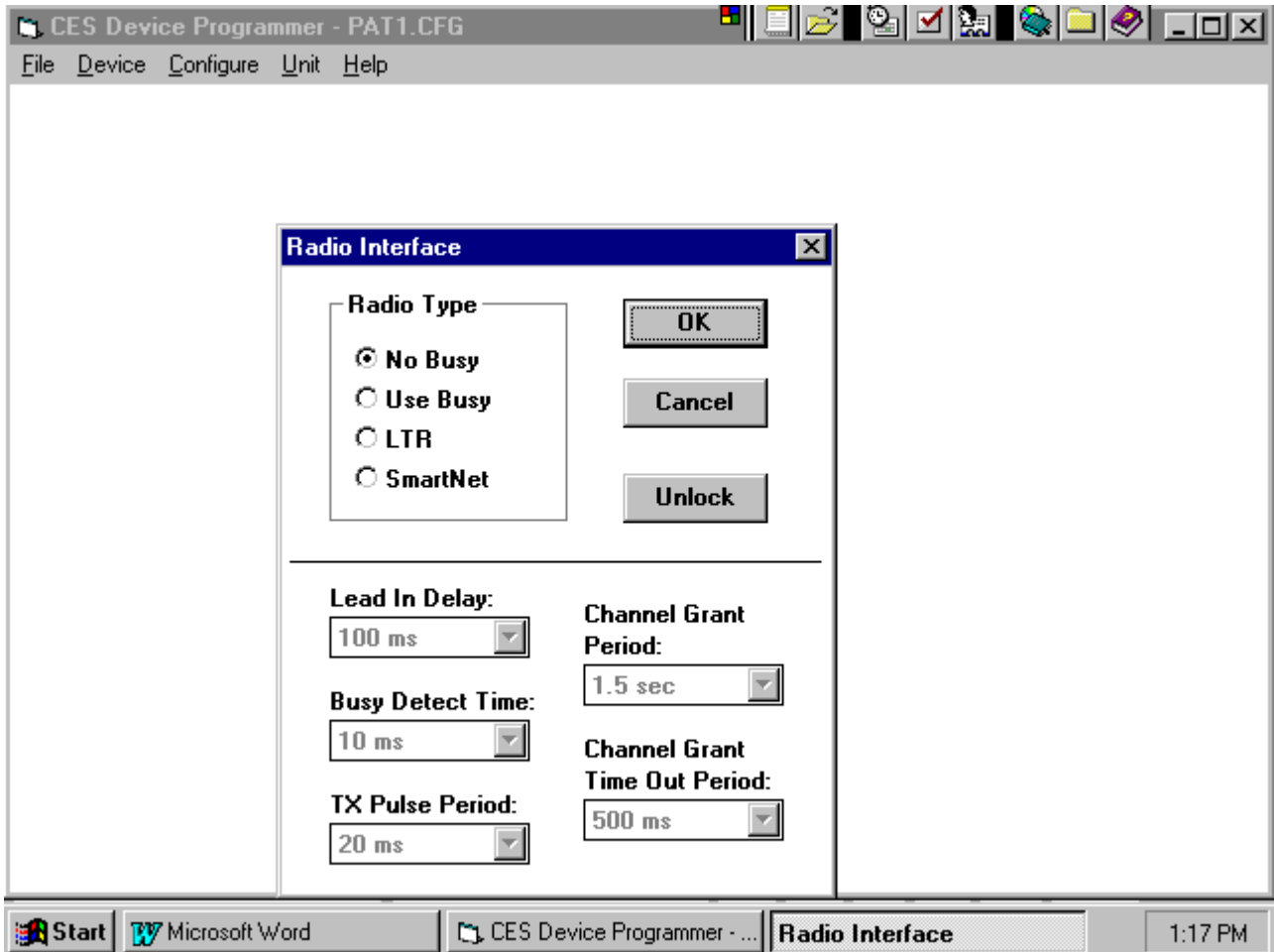
Click on **<CANCEL>** to exit this submenu without saving any changes made.

## 5.4 RADIO INTERFACE

### 5.4.1 Type of Radio System

Select **Configure** and then **Radio Interface** from the menu bar.

Select the type of system the *ARi-100* module will be used with:



The first two radio types apply to conventional channels. The latter two are trunking type systems. Please call CES at 407-679-9440 if your trunking system type is not detailed above.

Once selected, leave the other options at the default values unless otherwise known. Should difficulty be realized upon installation testing, parameters such as Lead In Delay may be changed to accommodate requirements for the particular system or radio. To change the default settings click on <Unlock> first. After changing you may <Lock> the programmed parameters to prevent accidental change.

### 5.4.2 No Busy

The *ARi-100* will ignore the radio busy signal condition if **No Busy** is selected.

### **5.4.3 Use Busy**

If the *ARi-100* Busy input is connected to the radio, the *ARi-100* will not transmit when the radio channel is busy, or in the case of an Emergency, will wait the "obey busy time" period programmed under "System Timings".

### **5.4.4 Unlock**

Allows the programmer to change the factory default timing parameters for radio interface access protocols.

### **5.4.5 Lead In Delay**

This is the period of time that the *ARi-100* will cause the radio or transmitter to key prior to encoding the ANI or status information. This is necessary to give repeaters, line equipment or base stations sufficient time to settle prior to reception of the signal information.

### **5.4.6 Busy Detect Time**

This is the time period busy input must remain inactive before the *ARi-100* decides the channel is in fact inactive.

### **5.4.7 Trunking - LTR™ & Smartnet™**

The *ARi-100* is LTR™ and Smartnet™ trunking compatible. Interfacing to a trunking radio is more complex than interfacing to a conventional radio, since the *ARi-100* must first request a channel from the network before transmitting status information. This communication period can take hundreds of milliseconds and may result in denial of channel access.

If interfacing to a Trunking radio, make sure that the *ARi-100* Trunk/Busy Detect input is connected to a suitable point on the radio.

The factory default settings should be sufficient for most LTR or Smartnet systems. However, you can optimize the system by changing the following.

*The following parameters are used to define trunking operation. When the ARi-100 wants to transmit, it will activate the PTT output. It then monitors activity on the Trunk/Busy detect input to see if the radio gained access to the system. The programming parameters used to accomplish this are as follows.*

### **5.4.8 TX Pulse Period**

When monitoring the state of the radio, it is necessary for the *ARi-100* to know when the radio is transmitting data to the trunking controller/repeater in an attempt to gain access to the system. This parameter is the minimum amount of time to consider a pulse on the busy/trunk input a valid request.

### **5.4.9 Channel Grant Period**

The amount of time the trunk detect input is active to indicate the trunking radio has gained access to the system.

#### **5.4.10 Channel Grant Time out Period**

The maximum amount of time the trunking radio has to gain access to the system. If this period is exceeded, it is assumed the radio could not gain access.

Click on <**OK**> to save the changes made and return to the main menu.

Click on <**CANCEL**> to exit this sub menu without saving any changes made.

## 5.5 UNIT ADDRESSES

A specific and different Unit Address or ANI is assigned to each mobile or portable within the fleet. Generally, these assigned numbers are sequential beginning at a desired number such as "1012, 1013, and so forth. The actual number of digits in the ANI string depends on the type of format selected for this system: DTMF, Tone Sequential or N-Tone. An ANI length of four digits or more is recommended.

**Note: The DTMF digits Star (\*) and Pound (#) are entered as E and F respectively.**

It is important to note the following:

1. All ANI's within the system must be of the same length for that particular format.
2. CES recommends the use of tone sequential /n-tone format over DTMF
3. ANI lengths do not have to be the same if both DTMF and tone sequential signaling are being used in the system.
4. The shorter the ANI string, the faster the signaling sequence is accomplished. In other words, a 4-digit ANI takes less time to transmit than a 6-digit ANI.
5. If there is a possibility that the system could be expanded in the future, then an ANI length should be selected that will accommodate the additional ANI's. If both DTMF and tone sequential formats are being used, ANI numbers should not be duplicated, from the standpoint of fleet management visual recognition.
6. Use good coding techniques, CES recommends the first two digits have widely spaced tone frequencies.

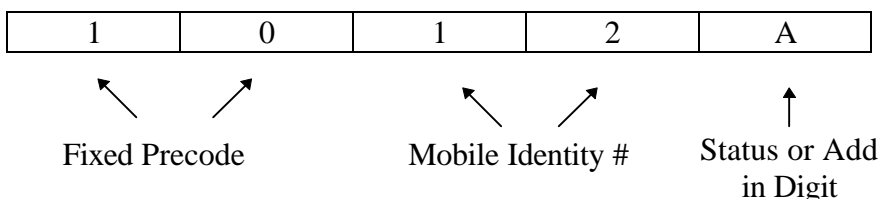
### 5.5.1 Setting the Unit Identity

Click on Configure and then Unit Addresses. Place the cursor on the Unit Address window and press the left mouse button. Edit the displayed ANI number as necessary for the desired ANI number to program for this *ARi-100* module. (NOTE - the Status or Add in Digit is selected later)

Click on <OK> to save the changes made and return to the main menu.

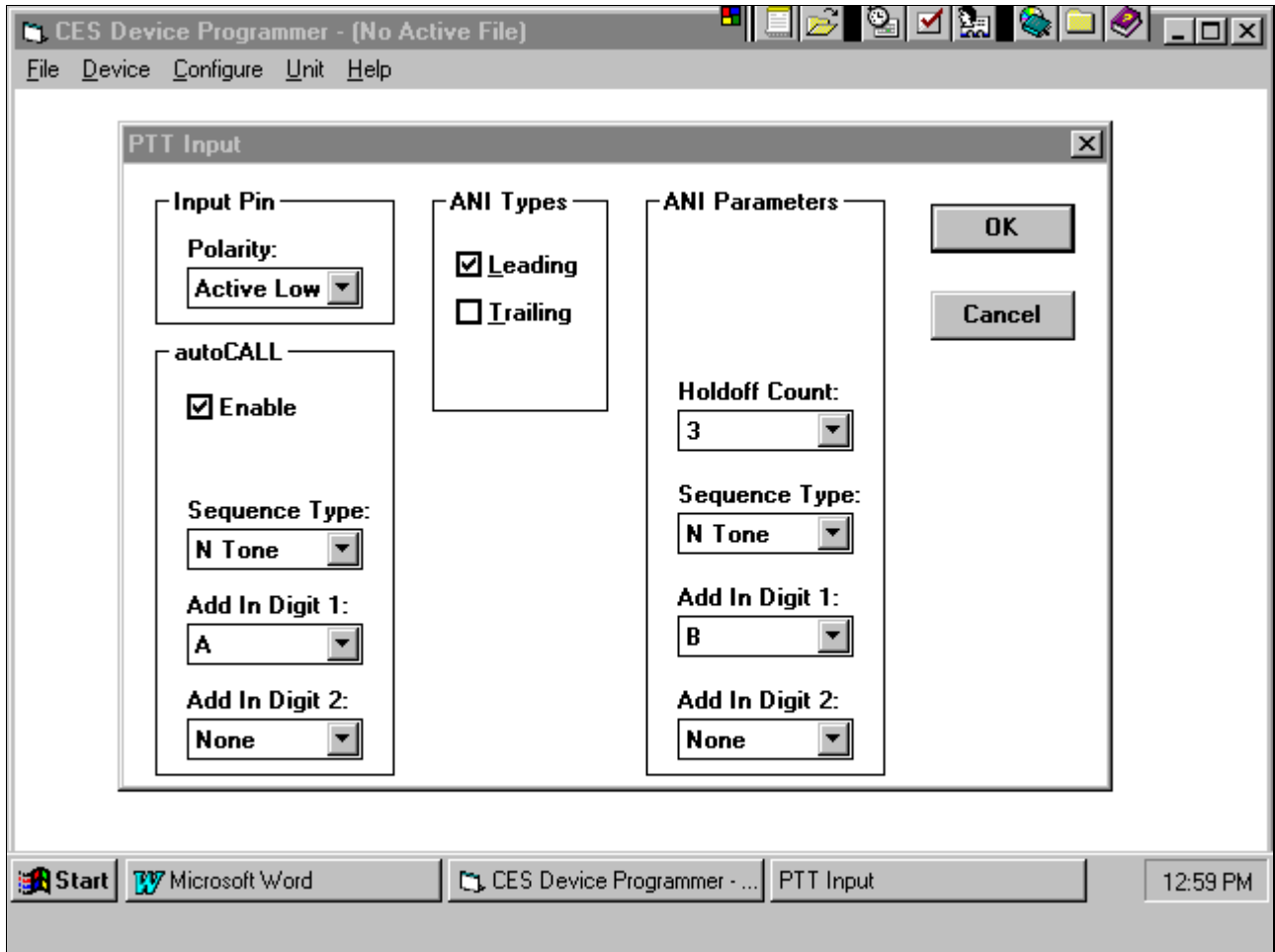
Click on <CANCEL> to exit this submenu without saving any changes made.

#### Unit address and Add On Status digit example:



## 5.6 PTT INPUT

Click on **Configure** and then **PTT Input**.



### 5.6.1 Polarity

Most mobile or portable radios utilize an **Active Low** (logic low or ground when microphone PTT is depressed) to invoke a transmit condition. Select **Active High** if it applies to the radio interface PTT circuit (the logical input to the ARi-100 must go from a low state to a high state upon the user depressing the PTT switch).

### 5.6.2 autoCALL™

As described earlier the user can transmit an ANI status on each PTT activation. Double clicking however on the PTT sends a different status message to the base dispatcher, adding enormous convenience to the user who may wish to send a frequent status to the dispatcher. This is called autoCALL™, and can be used as a “base call” or “request to talk” or any other user definable status.

If the **autoCALL™** feature is desired, then click on the Enabled associated box. A ✓ in the box indicates that the feature is enabled.

Click **Sequence Type** to set the desired signal format type to be sent (DTMF or N-Tone) upon the user quickly pressing twice the radio PTT switch. This feature could be utilized for a number of various fleet applications such as:

- Request to talk
- Base Call
- User has priority message for dispatcher
- User has emergency
- Or any other desired use

*Note: If using Double Click for emergency, the attributes otherwise allowable with the use of any of the AUX 1 through 3 inputs do not apply, including Number of Retries to Send, and the Obey Busy feature to allow the users radio to transmit the emergency signaling even though the channel is busy with other radio traffic.*

Click on **Add In Digit 1** to change the desired first additional digit to be sent upon the user double-clicking the PTT switch. Select a digit 0-9 or A-F, or none.

Click on **Add In Digit 2** to change the desired 2nd additional digit, if any, to be sent upon the user double-clicking the PTT switch. If None was selected in Add In Digit 1, then this parameter automatically is set to None.

### 5.6.3 ANI Types

Click on the box next to **Leading** if it is desired that the ANI be sent upon the user depressing the PTT switch. This is normally the method used in most applications. In trunking applications, the ANI is sent after channel acquisition has been made.

If it is desired that the ANI be sent *after* the user has made a voice transmission, then click on the box next to **Trailing**. This means that the ANI is sent upon the user releasing the PTT switch.

### 5.6.4 ANI Parameters

The actual signaling format type (DTMF, 5/6-tone or N-tone) used for the ANI (as a function of PTT switch activation) is programmed here.

First, click on the box under **Sequence Type**. Select the desired format (N-Tone or DTMF).

Click on **Add In Digit 1** to change the desired first additional digit, if any, to be sent upon normal user activation of the PTT switch. If no additional digit is desired, select None.

Click on **Add In Digit 2** to change the desired 2nd additional digit, if any, to be sent upon normal user activation of the PTT switch. If None was selected in Add In Digit 1, then this parameter automatically is set to None.

*Note: For most systems, additional digits are generally reserved for special functions as are otherwise provided for with the ARi-100 **autoCALL**<sup>TM</sup> and AUX 1 through 3 features.*

### **5.6.5 Holdoff Count**

This feature is used to set the number of times the PTT switch can be activated within a 30 second period without sending a new ANI. This feature is useful when you have fairly short back and forth conversations and don't want to keep sending the ANI with each PTT.

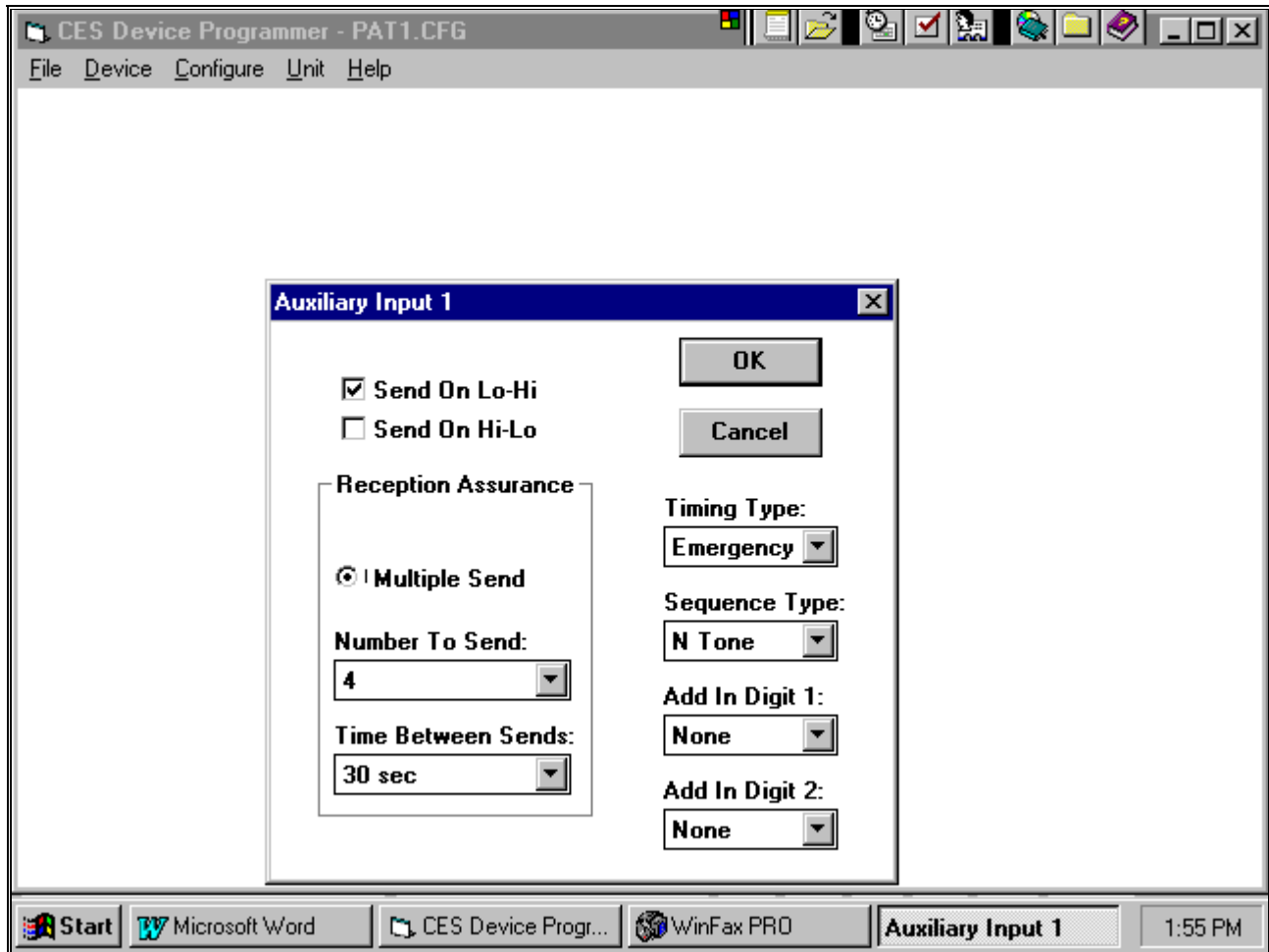
Click on **<OK>** to save the changes made and return to the main menu.

Click on **<CANCEL>** to exit this submenu without saving any changes made.

## 5.7 AUXILIARY INPUTS

If any of these features are to be used, click on **Configure** and then **Auxiliary Inputs**.

Click on the desired **Input 1**, **Input 2** or **Input 3** submenu item.



Select the logic method that is to be used:

Click on: **Send On Lo-High** if signal is to be sent upon a low to high transition

Click on: **Send On High-Lo** if signal is to be sent upon a high to low transition from the user-supplied switch.

- Notes:
- (1) Ensure that Add In Digit(s) are not replicated with "Autocall" and other Auxiliary Inputs, unless your system signaling are in accordance.
  - (2) If the external switch for the particular Auxiliary Input is only a momentary closure to ground (logical low), then set to **Send On Lo-High**.
  - (3) If the external switch makes continuously to a logical ground upon activation, then set to **Send On High-Lo**. This parameter is important in consideration of 'man down' or for

other similar activation techniques. If the external switch provides a normal closure to open-circuit (logical high) upon activation, then set the Auxiliary Input to **Send on Lo-High**.

#### 5.7.1 Reception Assurance

If more than one (1) event of sending the Auxiliary Input ANI encoding signal is desired then activate Multiple Send.

#### 5.7.2 Number To Send

Click on the box under Number To Send to alter the desired number of retries to be sent to the point of dispatch upon user activation of this Auxiliary Input.

#### 5.7.3 Time Between Sends

Click on this box to change the period between the first and each successive send of the encoding signal.

#### 5.7.4 Timing Type

Click on and select the desired signaling type to be used for this function:

|  |
|--|
| <b>Standard<br/>Emergency<br/>N Tone</b> |
|--|

*Note: The default parameter for Auxiliary Input 1 is Emergency*

#### 5.7.5 Sequence Type

Click on Sequence Type and select the desired encode method to be sent upon activation of this Auxiliary Input:

|                                 |
|---------------------------------|
| <b>DTMF<br/>N Tone<br/>None</b> |
|---------------------------------|

#### Add In Digit 1

Click on **Add In Digit 1** to change the desired first additional digit to be sent upon activating this Auxiliary Input. Select a digit 0-9 or A-F, or none.

#### Add In Digit 2

Click on **Add In Digit 2** to change the desired 2nd additional digit, if any, to be sent upon activating this Auxiliary Input. If None was selected in Add In Digit 1, then this parameter automatically is set to None; otherwise select a digit 0-9 or A-F.

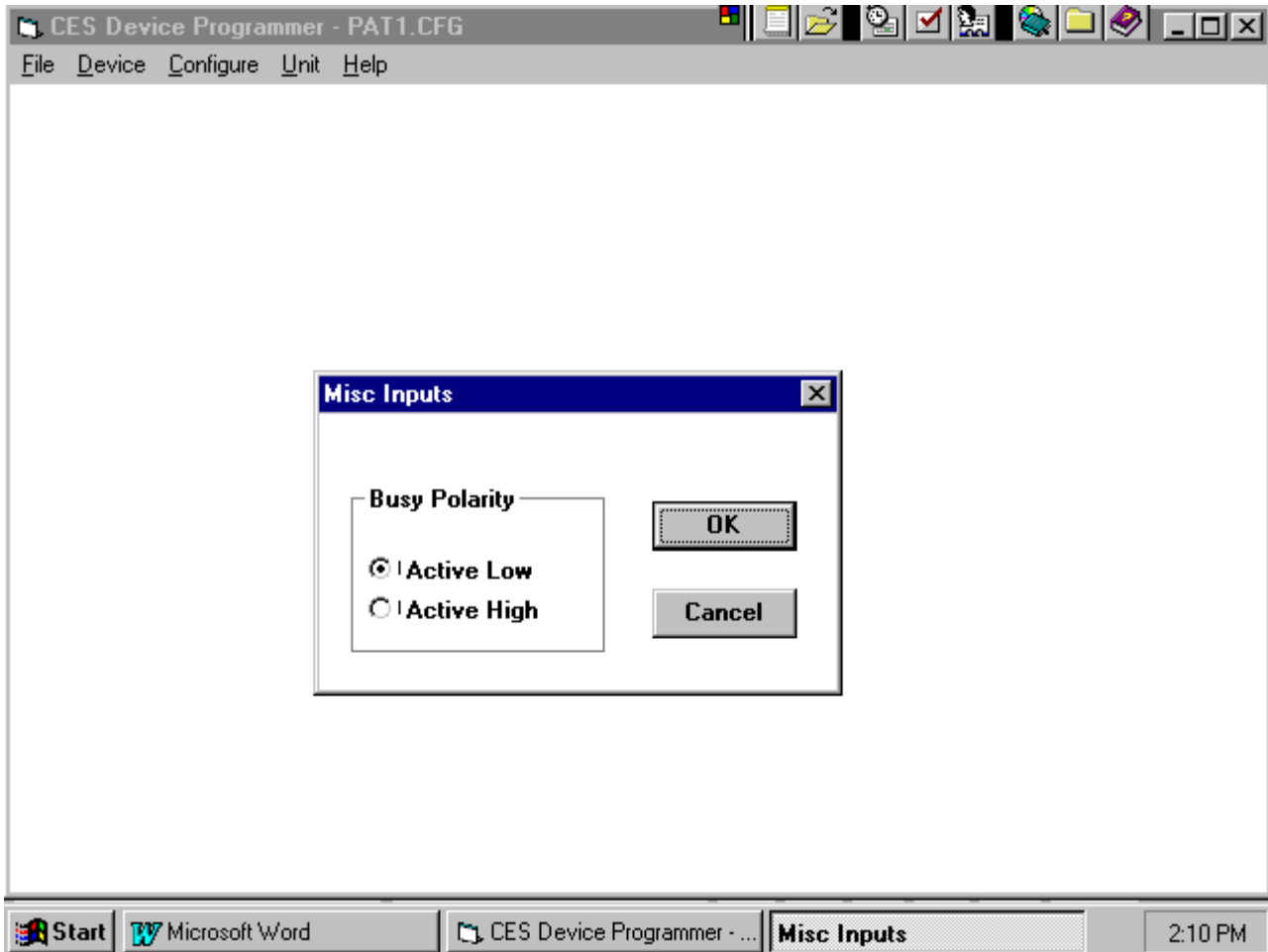
Click on **<OK>** to save the changes made and return to the main menu.

Click on <**CANCEL**> to exit this submenu without saving any changes made.

If using another Auxiliary Input, then enter that respective Auxiliary Input submenu and make the desired changes.

### 5.8 Misc. Inputs

Click on **Configure** and then **Misc. Input**.



#### 5.8.1 Busy Polarity

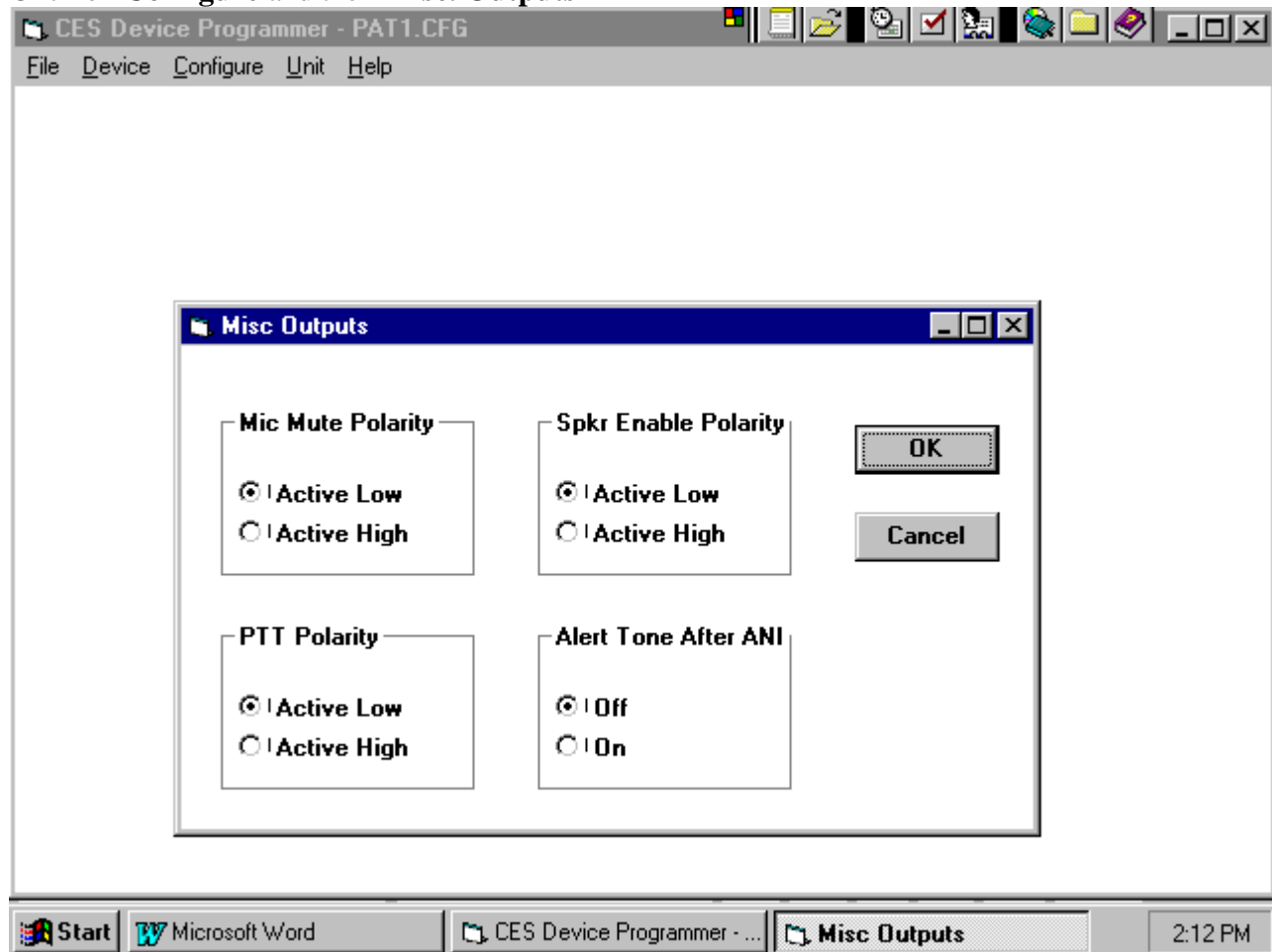
Busy Polarity can be programmed to suit the radio transceiver in use. Select high or low.

Click on <**OK**> to save the changes made and return to the main menu.

Click on <**CANCEL**> to exit this submenu without saving any changes made.

## 5.9 Misc. Outputs

Click on **Configure** and then **Misc. Outputs**



### 5.9.1 Mic Mute Polarity

Mic Mute Polarity can be programmed to suit the radio transceiver in use. Select high or low.

### 5.9.2 PTT Polarity

PTT Polarity can be programmed to suit the radio transceiver in use. Select high or low.

### 5.9.3 Speaker Enable Polarity.

This output is used on radio models that require an input to turn on the audio amplifier in order that the user can hear the alert tones.

### 5.9.4 Alert Tone after ANI

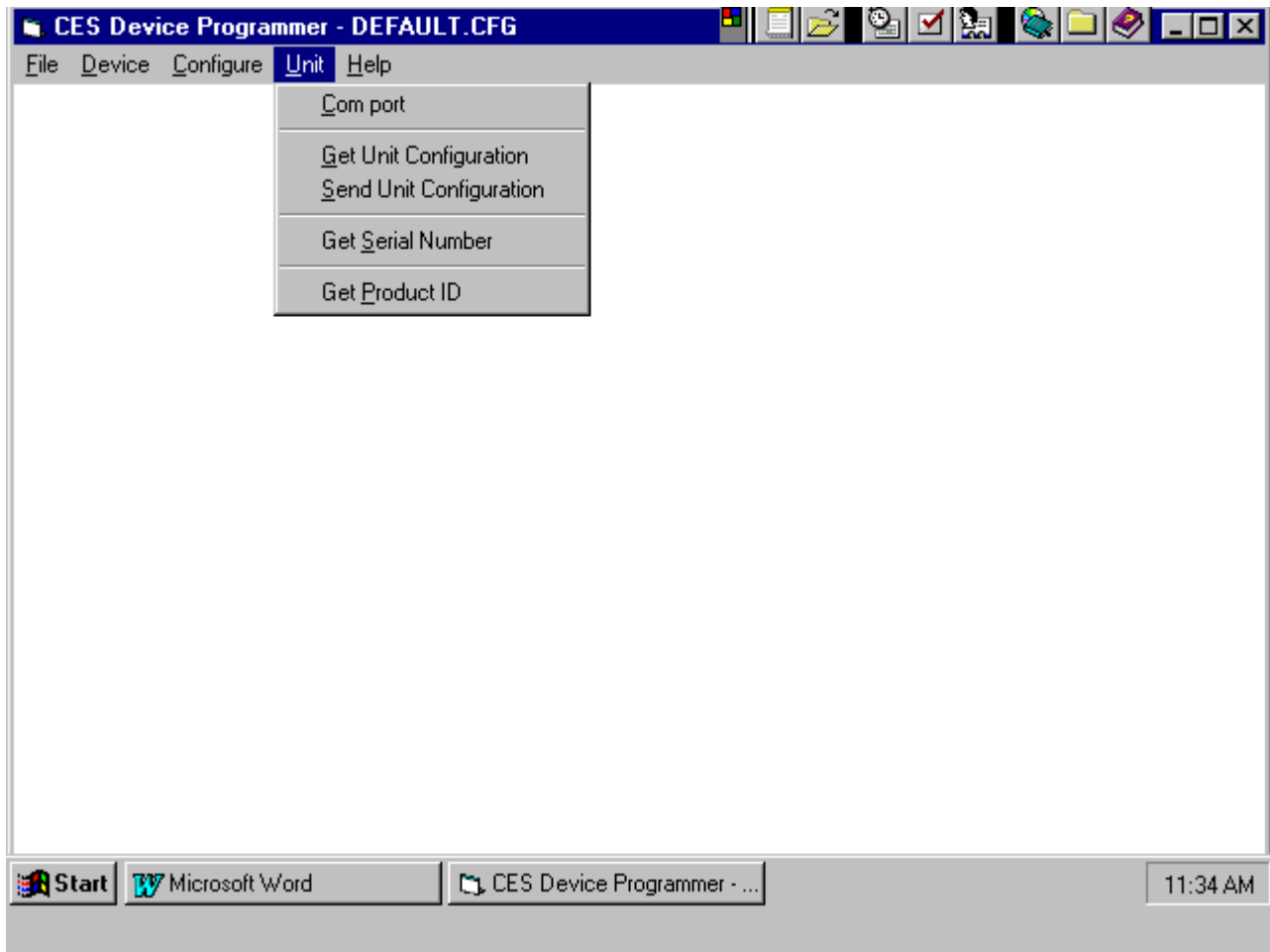
Enable this feature if you wish to hear an alert tone after the transmission of the ANI.

Click on <**OK**> to save the changes made and return to the main menu.

Click on <**CANCEL**> to exit this submenu without saving any changes made.

## 6.0 Unit

To program, read, change communications ports, get the product ID or serial number, click on **UNIT** from the main menu.



### 6.1 Get Unit Configuration

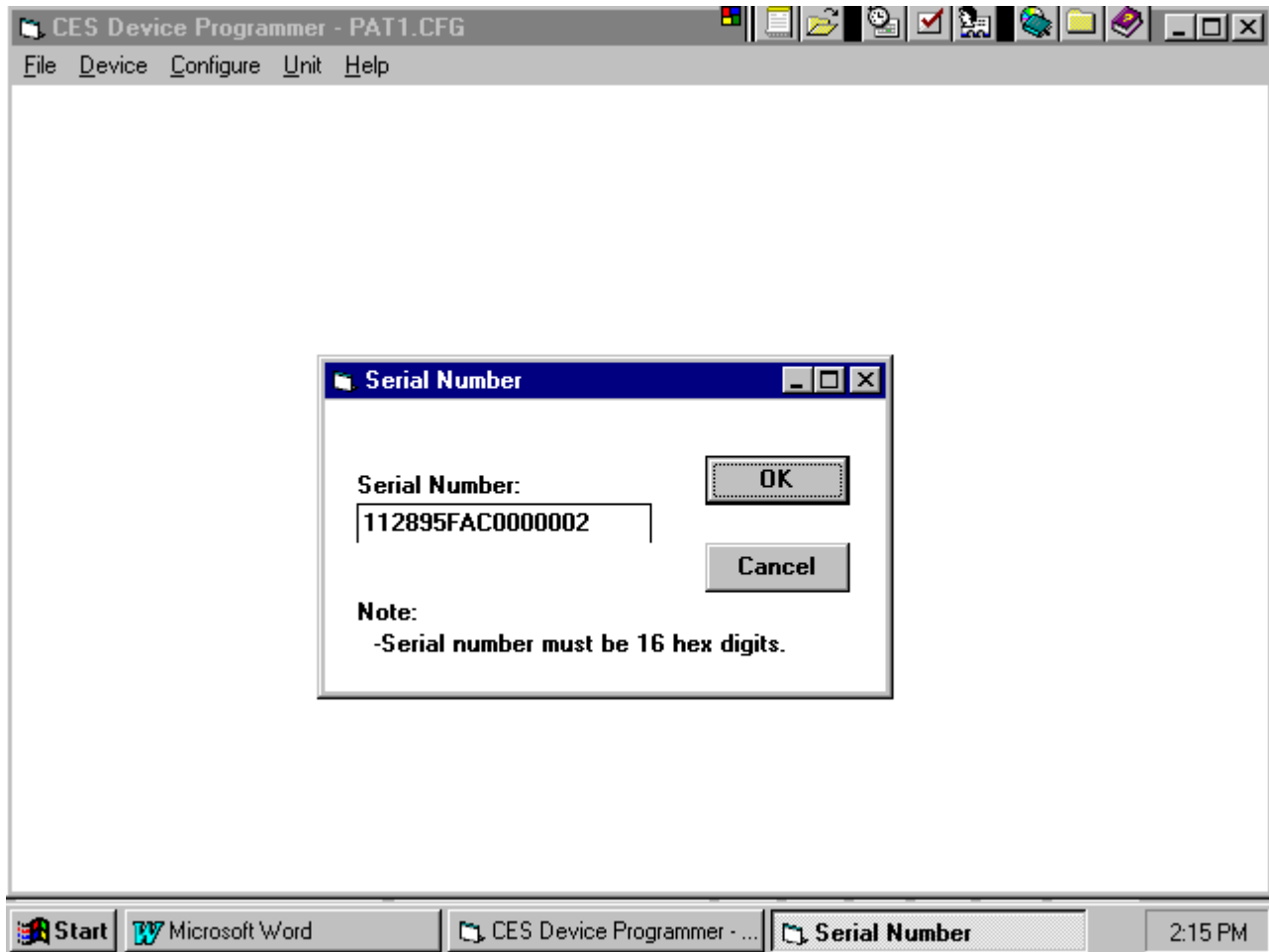
Select **Unit** and then click on **Get Unit Configuration**.

Select this item only if the module connected is to be edited. When programming a fleet-wide system, it is recommended that this utility not be selected, as all other parameters already set in the personal computer will be overwritten by the factory default parameters. After a few seconds, a report of successful data transfer will be displayed on the screen.

### 6.2 Send Unit Configuration

Select **Unit** and then click on **Send Unit Configuration**. To update the connected module with all changes made, select this item. After a few seconds, a report of successful data transfer will be displayed on the screen.

### 6.3 Serial Number



Click on Serial Number to view the Serial Number of the module. (Note: The currently connected module must have previously been read using the Unit menu item and Get Serial Number; otherwise, the displayed Serial Number will be the default value of sixteen zeros or the Serial Number of the previous module read.)

Click on <OK> or <CANCEL> to return to the main menu.

### 6.4 Get Product ID

Select **Unit** and then click on **Get Product ID**.

This information is important when contacting CES customer service with inquiries.

## 7.0 Help / About

Displays the Version Number of the current software in use. This reference is important when contacting CES customer service with inquiries and questions.

## 8.0 Programming the ARI-100

After altering the appropriate parameters, select **Unit** from the main menu followed by **Send Unit Configuration** to write this data.

- (1) *Recommended:* Before continuing, save this configuration file by selecting **File** and then **Save As** entering a filename (up to 8-digits) that is unique to this module configuration such as the **Unit Address** ANI number. The file extension .cfg default will always be the same for each saved file. Suggestion: If the radios within the system are different model radios and have different operating parameters: use a filename that will depict the model type as well as the programmed ANI number.

### 8.1 Programming subsequent modules

After programming the first module, use the following guidelines for ease of programming subsequent modules, as well as supporting each module after the initial installation (this method assumes that each module is to be installed in the same model of radio and with the same hardware operating parameters.):

1. Click on **Configure** and then **Unit Address**. Click the mouse cursor at the end of the existing displayed number. Backspace as necessary and enter from the keyboard the ANI number of the module to be programmed  
*programming subsequent ARI-100 modules in the same session, only the Unit Address need be changed (usually sequentially) for most system integration.*
2. Click on **Unit** and then **Get Serial Number** of the new unprogrammed module.
3. Select **Unit** from the main menu followed by **Send Unit Configuration** to write this data.
4. *Recommended:* Before continuing, save this configuration file by selecting **File** and then **Save As**, entering a filename (up to 8-digits) that is unique to this module configuration such as the **Unit Address** ANI number. The file extension .cfg default will always be the same for each saved file. Suggestion: If the radios within the system are different model radios and have different operating parameters: use a filename that will depict the model type as well as the programmed ANI number.
5. Repeat steps (1) through (4) as necessary for each new module.

### 8.2 Programming One or More Modules At a Later Time

1. When programming a module after the initial fleet of modules were programmed, use this suggestion as a guide:
2. Retrieve a configuration file that has same hardware configuration as that desired to be programmed into the new module by clicking on **File** and then **Open**. Click on the desired file and then **OK**.
3. Make any required changes for this new module, such as:
  - PTT Input (Input Pin),
  - Auxiliary Input (1 through 3),
  - Misc. Inputs (Busy Input logic)
  - Misc. Outputs
4. Continue with steps (1) through (4), or steps (1) through (5), in the above section.

## 9.0 Factory Programming Defaults

The following parameters are set at the factory. It is the responsibility of the installer/programmer to set or otherwise disable features not desired. In certain cases, such as a special order, these factory defaults may be different than that depicted here. In this event, refer to the attached addendum.

### Under the Main Menu Item: Configure

#### N-Tone Frequencies

|                          |      |
|--------------------------|------|
| <b>Default Selection</b> | CCIR |
| <b>Repeat Digit</b>      | E    |

#### DTMF Output Levels

|                      |      |
|----------------------|------|
| <b>Lo Tone Level</b> | 0 dB |
| <b>Hi Tone Level</b> | 0 dB |

#### System Timings

|                                 |                 |        |
|---------------------------------|-----------------|--------|
| <b>N-Tone</b>                   | First Tone Time | 33 ms  |
|                                 | Tone Time       | 33 ms  |
|                                 | Intertone Time  | 0 ms   |
| <b>DTMF</b>                     | Tone Time       | 65 ms  |
|                                 | Intertone Time  | 15 ms  |
| <b>Transmit Timer</b>           |                 | 35 sec |
| <b>Emergency Timings N-Tone</b> | First Tone Time | 33 ms  |
|                                 | Tone Time       | 33 ms  |
|                                 | Intertone Time  | 0 ms   |
| <b>Emergency Timings DTMF</b>   | Tone Time       | 65 ms  |
|                                 | Intertone Time  | 15 ms  |
| <b>Channel Access</b>           | Obey Busy Time  | 10 sec |

|                        |                                      |         |
|------------------------|--------------------------------------|---------|
| <b>Radio Interface</b> | <b>Radio Type</b>                    | No Busy |
|                        | <b>Lead In Delay</b>                 | 100 ms  |
|                        | <b>Busy Detect Time</b>              | 50 ms   |
|                        | <b>TX Pulse Period</b>               | 50 ms   |
|                        | <b>Channel Grant Period</b>          | 200ms   |
|                        | <b>Channel Grant Time Out Period</b> | 2 sec   |

|                     |       |
|---------------------|-------|
| <b>Unit Address</b> | 10101 |
|---------------------|-------|

|                  |                                       |             |
|------------------|---------------------------------------|-------------|
| <b>PTT Input</b> | <b>Input Pin</b>                      | Active Low  |
|                  | <b>Double Click</b>                   | Not Enabled |
|                  | <b>ANI Types</b>                      | Leading     |
|                  | <b>ANI Parameters: Hold-Off Count</b> | 3           |
|                  | <b>Sequence Type</b>                  | n-tone      |
|                  | <b>Add In Digit 1</b>                 | None        |
|                  | <b>Add In Digit 2</b>                 | None        |

### Auxiliary Inputs

|                          |                            |                     |
|--------------------------|----------------------------|---------------------|
| <b>Auxiliary Input 1</b> | <b>Send type</b>           | OFF                 |
|                          | <b>Send On Lo-Hi</b>       | (off)               |
|                          | <b>Send On Hi-Lo</b>       | (off)               |
|                          | <b>Timing Type</b>         | Emergency (off)     |
|                          | <b>Sequence Type</b>       | n-tone (off)        |
|                          | <b>Add In Digit 1</b>      | none                |
|                          | <b>Add In Digit 2</b>      | None                |
|                          | <b>Reception Assurance</b> | Multiple Send (off) |
|                          | <b>Number to Send</b>      | 4 (off)             |
|                          | <b>Time Between Sends</b>  | 30 sec (off)        |
| <b>Auxiliary Input 2</b> | <b>Send type</b>           | OFF                 |
|                          | <b>Send On Lo-Hi</b>       | (off)               |
|                          | <b>Send On Hi-Lo</b>       | (off)               |
|                          | <b>Reception Assurance</b> | Multiple Send (off) |
|                          | <b>Number to Send</b>      | 4 (off)             |

|                                 |                            |                     |
|---------------------------------|----------------------------|---------------------|
| <i>Auxiliary Input 2 cont'd</i> | <b>Time Between Sends</b>  | 30 sec (off)        |
|                                 | <b>Timing Type:</b>        | Standard (off)      |
|                                 | <b>Sequence Type</b>       | n-tone (off)        |
|                                 | <b>Add In Digit 1</b>      | None                |
|                                 | <b>Add In Digit 2</b>      | None                |
|                                 |                            |                     |
|                                 |                            |                     |
| <b>Auxiliary Input 3</b>        | <b>Send type</b>           | OFF                 |
|                                 | <b>Send On Lo-Hi</b>       | (off)               |
|                                 | <b>Send On Hi-Lo</b>       | (off)               |
|                                 | <b>Reception Assurance</b> | Multiple Send (off) |
|                                 | <b>Number to Send</b>      | 4 (off)             |
|                                 | <b>Time Between Sends</b>  | 30 sec (off)        |
|                                 | <b>Timing Type</b>         | Standard (off)      |
|                                 | <b>Sequence Type</b>       | n-tone (off)        |
|                                 | <b>Add In Digit 1</b>      | None (off)          |
|                                 | <b>Add In Digit 2</b>      | None (off)          |

|                     |                      |            |
|---------------------|----------------------|------------|
| <b>Misc. Inputs</b> | <b>Busy Polarity</b> | Active Low |
|---------------------|----------------------|------------|

|                      |                                |            |
|----------------------|--------------------------------|------------|
| <b>Misc. Outputs</b> | <b>Mic Mute Polarity</b>       | Active Low |
|                      | <b>Speaker Enable Polarity</b> | Active Low |
|                      | <b>PTT Polarity</b>            | Active Low |
|                      | <b>Alert Tone After ANI</b>    | Off        |

## 10.0 Specifications

### SPECIFICATIONS

#### Mechanical

Physical size (less cable harness) 20 x 21 x 5.5 mm (0.82" x 0.84" x 0.26")

#### Environmental

Ambient operating temperature range -40°C to +85°C

#### Electrical

Power requirements 6 to 17 VDC

Memory retention Non-volatile EEPROM

Encode and Alert Tone Output Impedance 1K Ohm

Encode and Alert Tone Output Level 0 - 3.5 Volts peak-to-peak

PTT Input (programmable logic) 100K Ohm resistor pull-up to 5V

AUX Inputs x 3 (programmable logic) 100K Ohm resistor pull-up to 5V

Open collector outputs (programmable logic) Current sinking to 100 mA

PTT Output

Speaker Enable Output

Microphone Mute Output

## 11.0 In Case of Difficulty

### In Case Of Difficulty

*Module appears to be inoperative, although programming was successful.*

- (1) Ensure that the power and ground connections are properly connected.
- (2) Verify that PTT Input and PTT Output connections are correct.
- (3) Verify correct PTT Input and Output logic by reading the module configuration.
- (4) Verify that the Busy or Trunking Input is operating correctly, and that the appropriate active logic level is programmed in the ARi-100.

*Module is sending an ANI of the correct type (DTMF or 5/6-Tone) but is not being decoded at the point of dispatch.*

- (1) Verify in the dispatch software setup has been validated to receive this ANI.
- (2) Verify with a service monitor that the encoded level is set correctly. If set too high the modulated tones may be clipped or distorted. Readjust R9 on the ARi-100 module as necessary to correct.
- (3) Get Unit Configuration by reading the module with the PC software. Ensure that an “Add-In Digit” (alpha or numeric) was not inadvertently programmed into the module (PTT Input menu item). If no Add-In Digit is desired, then select “None” and Send Unit Configuration to update.
- (4) Review the Lead In Delay as set in the module. This particular radio may require a longer period of time before sending the ANI.

### **If you need to call CES for HELP !**

Call 407-679-9440, and ask for product support.

Product support may ask you to **PRINT** a copy of the programmed parameters, and fax to CES for analysis. To do this go to **FILE** on the main menu, and click on **PRINT**.

Have information available on:

- ◆ the type of radio transceivers in use
- ◆ the configuration of the radio system
- ◆ setup of the base controller or base display console
- ◆ details of the repeaters or line control in use

## 12.0 Parts Location

See section 3 for layout diagram.

## 13.0 Parts List

|                  |  |
|------------------|--|
| <i>ARi-100</i>   | ANI/ALARM Encoder                        |
| HRNS01           | Radio Interface harness                  |
| TAPE5            | Double side 1 inch installation tape     |
| LABEL125         | Identity Code label                      |
| SHRINK01         | ¾ x 1 inch Heat shrink                   |
| <br>             |  |
| <i>ARi-100S1</i> | Programming Software Windows 3.1 English |
| <i>ARi-100S2</i> | Programming Software Windows 95 English  |
| <i>ARi-100S3</i> | Programming Software Windows 3.1 Spanish |
| <i>ARi-100S4</i> | Programming Software Windows 95 Spanish  |
| <br>             |  |
| <i>ARi-199P</i>  | Programming Interface Adapter            |
| 08000804         | Programming Interface harness            |
| TRAN19           | 110V AC Adapter                          |
| <br>             |  |
| MANUAL67         | Programming & Installation Manual        |
| CONV01           | DB-9 to DB25 Adapter                     |

## 14.0 Programming Worksheet

Copy and use this worksheet to assist with overall system configuration.

Customer Name \_\_\_\_\_

Radio type \_\_\_\_\_

### N-Tone Frequencies

|                          |  |
|--------------------------|--|
| <b>Default Selection</b> |  |
| <b>Repeat Digit</b>      |  |

### DTMF Output Levels

|                      |  |
|----------------------|--|
| <b>Lo Tone Level</b> |  |
| <b>Hi Tone Level</b> |  |

### System Timings

|                                 |                 |  |
|---------------------------------|-----------------|--|
| <b>N-Tone</b>                   | First Tone Time |  |
|                                 | Tone Time       |  |
|                                 | Intertone Time  |  |
| <b>DTMF</b>                     | Tone Time       |  |
|                                 | Intertone Time  |  |
| <b>Transmit Timer</b>           |                 |  |
| <b>Emergency Timings N-Tone</b> | First Tone Time |  |
|                                 | Tone Time       |  |
|                                 | Intertone Time  |  |
| <b>Emergency Timings DTMF</b>   | Tone Time       |  |
|                                 | Intertone Time  |  |
| <b>Channel Access</b>           | Obey Busy Time  |  |

|                        |                                      |  |
|------------------------|--------------------------------------|--|
| <b>Radio Interface</b> | <b>Radio Type</b>                    |  |
|                        | <b>Lead In Delay</b>                 |  |
|                        | <b>Busy Detect Time</b>              |  |
|                        | <b>TX Pulse Period</b>               |  |
|                        | <b>Channel Grant Period</b>          |  |
|                        | <b>Channel Grant Time Out Period</b> |  |

|                     |  |
|---------------------|--|
| <b>Unit Address</b> |  |
|---------------------|--|

|                  |                                       |  |
|------------------|---------------------------------------|--|
| <b>PTT Input</b> | <b>Input Pin</b>                      |  |
|                  | <b>Double Click</b>                   |  |
|                  | <b>ANI Types</b>                      |  |
|                  | <b>ANI Parameters: Hold-Off Count</b> |  |
|                  | <b>Sequence Type</b>                  |  |
|                  | <b>Add In Digit 1</b>                 |  |
|                  | <b>Add In Digit 2</b>                 |  |

### Auxiliary Inputs

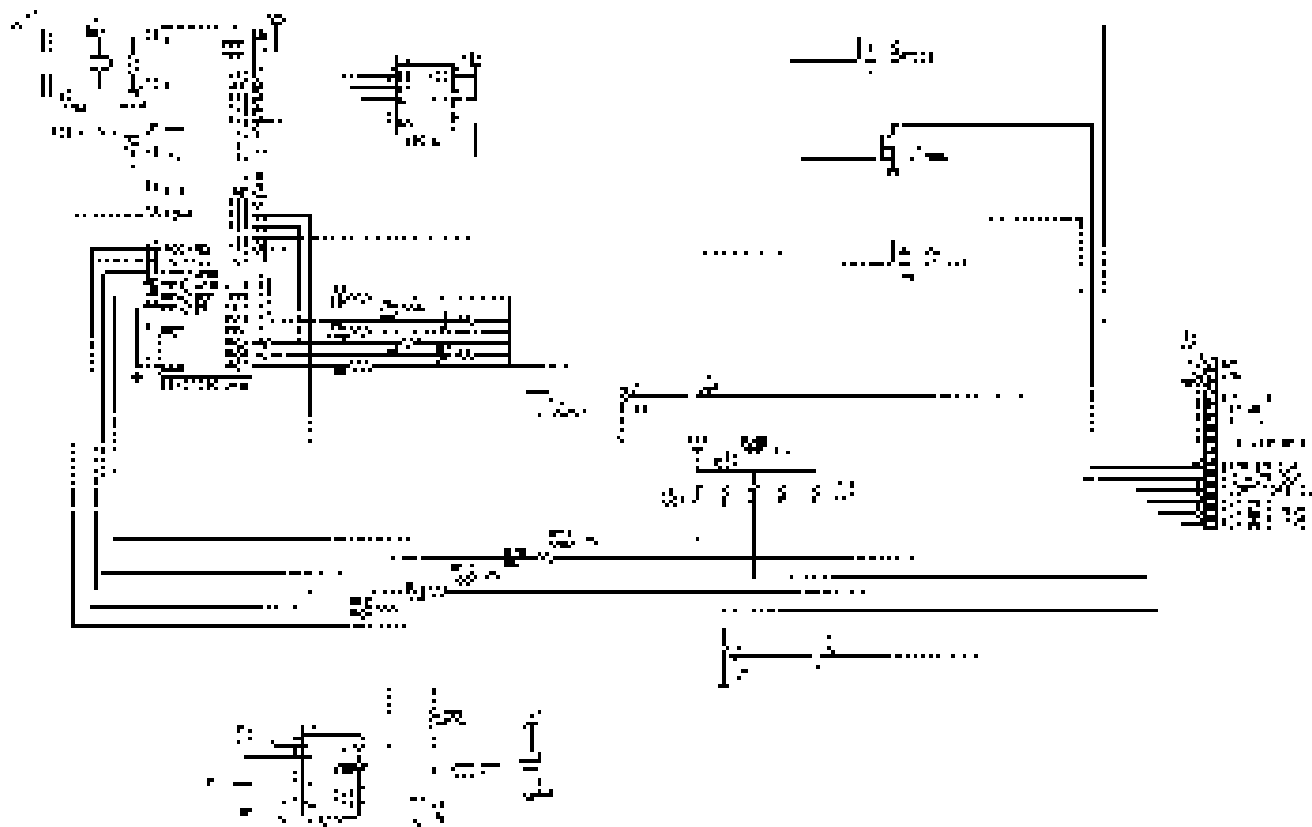
|                          |                            |  |
|--------------------------|----------------------------|--|
| <b>Auxiliary Input 1</b> | <b>Send type</b>           |  |
|                          | <b>Send On Lo-Hi</b>       |  |
|                          | <b>Send On Hi-Lo</b>       |  |
|                          | <b>Timing Type</b>         |  |
|                          | <b>Sequence Type</b>       |  |
|                          | <b>Add In Digit 1</b>      |  |
|                          | <b>Add In Digit 2</b>      |  |
|                          | <b>Reception Assurance</b> |  |
|                          | <b>Number to Send</b>      |  |
|                          | <b>Time Between Sends</b>  |  |
| <b>Auxiliary Input 2</b> | <b>Send type</b>           |  |
|                          | <b>Send On Lo-Hi</b>       |  |
|                          | <b>Send On Hi-Lo</b>       |  |
|                          | <b>Reception Assurance</b> |  |
|                          | <b>Number to Send</b>      |  |

|                                 |                            |  |
|---------------------------------|----------------------------|--|
| <i>Auxiliary Input 2 cont'd</i> | <b>Time Between Sends</b>  |  |
|                                 | <b>Timing Type:</b>        |  |
|                                 | <b>Sequence Type</b>       |  |
|                                 | <b>Add In Digit 1</b>      |  |
|                                 | <b>Add In Digit 2</b>      |  |
|                                 |                            |  |
|                                 |                            |  |
| <b>Auxiliary Input 3</b>        | <b>Send type</b>           |  |
|                                 | <b>Send On Lo-Hi</b>       |  |
|                                 | <b>Send On Hi-Lo</b>       |  |
|                                 | <b>Reception Assurance</b> |  |
|                                 | <b>Number to Send</b>      |  |
|                                 | <b>Time Between Sends</b>  |  |
|                                 | <b>Timing Type</b>         |  |
|                                 | <b>Sequence Type</b>       |  |
|                                 | <b>Add In Digit 1</b>      |  |
|                                 | <b>Add In Digit 2</b>      |  |

|                     |                      |  |
|---------------------|----------------------|--|
| <b>Misc. Inputs</b> | <b>Busy Polarity</b> |  |
|---------------------|----------------------|--|

|                      |                                |  |
|----------------------|--------------------------------|--|
| <b>Misc. Outputs</b> | <b>Mic Mute Polarity</b>       |  |
|                      | <b>Speaker Enable Polarity</b> |  |
|                      | <b>PTT Polarity</b>            |  |
|                      | <b>Alert Tone After ANI</b>    |  |

## 15.0 Circuit Diagram - *ARi-100*



## 16.0 Amendments

17 November, 1998 no amendments issued