



## **A3-06-2824 Handheld Programmer (8700/8707)**



### **Product User Manual Y1-03-0272 Rev. F**

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ARTEX/ACR Electronics, Inc.  
A3-06-2824 Handheld Programmer Operations Manual

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### Revision History

<b>REVISION</b>	<b>CHANGE</b>	<b>DATE</b>
A	RELEASE	01/06/2014
B	ECO #15605 CORRECT CROSS-REFERENCE ON PAGE 33 FOR INFORMATION ON PRINTING LABELS AND REPORTS.	07/14/2014
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## 1. Introduction

The Handheld Programmer and beacon reader module, installed in an Aceeca Meazura™ MEZ1500 unit using Palm/Garnet OS™, is designed to program any Artex 406 MHz Emergency Locator Transmitter (ELT), as well as decode and display the encoded 406 MHz message. When used as a reader, the programmer can be connected directly to the ELT or monitored “over the air” using the whip antenna, if allowed by local and/or national regulations. The reader will decode any 406 MHz aviation protocol for ELTs.

All instructions contained herein refer to Artex ELTs only. Familiarity with Palm™ devices and/or the Palm/Garnet OS™ software is highly recommended. The words “Meazura™ MEZ1500” are used throughout this document to describe the base Palm™ unit.

**NOTE:** The Artex Handheld Programmer does not program or decode PLBs or EPIRBs.

### 1.1 Application

The Handheld Programmer performs the functions of the Artex A3-06-2825 ELT Test Set, with the added capability of programming ELTs. In all instances where existing and/or previous Artex documentation makes reference to a 453-0131 Test Set, SARSAT Beacon Test Set, 453-1000, 453-2000 or A3-06-2825 ELT Test Set, the Artex Handheld Programmer P/N A3-06-2824 may be used as a direct substitute.

Follow the general directions for testing the 406 MHz signal, as directed in the applicable Artex ELT manual, using the operational instructions for the Handheld Programmer as outlined in this manual. Screen views depicted in ELT manuals for the previous testers (453-0131 or 453-1000) differ significantly from the Handheld Programmer. Refer to the screen views shown in this manual and the actual display on the Handheld Programmer when using documentation that refers to the 453-0131, 453-1000 or A3-06-2825 tester.

**NOTE:** The Handheld Programmer uses entirely new and distinct software and will not interface with the previous Artex Programming Software.

**NOTE:** This manual does not describe other functions of the Meazura™ MEZ1500/Palm™ platform or other Palm™ based applications that may be used. Contact Aceeca at [support@aceeca.com](mailto:support@aceeca.com) for details and user guides.

### 1.2 Differences

The primary differences between the Sartech test set (ARG 5410 or Artex P/N 453-0131) and the Handheld Programmer are:

- Ability to program the ELT, not just read it (except for P/N A3-06-2825)
- Ease of use
- Rapid signal acquisition and processing
- Display of all ELT 406 MHz message information on one screen
- Position data (when present) displayed in degree's, minutes, seconds
- Use of in-line attenuation not required
- Rechargeable long life battery
- Does not require periodic calibration

The primary differences between the previous Artex Programming Software (510-0406) with Level Shifter (500-0232) and the Artex software used in the Handheld Programmer are:

- Ease of use
- Portability
- Support of additional programming protocols
- Retention of programming information
- Rechargeable long life battery

**NOTE:** The Artex Handheld Programmer does **not** interface with the previous Artex Programming Software (510-0406) or Level Shifter (500-0232).

### 1.3 Features

The A3-06-2824 Handheld Programmer (Figure 1) has the following features and capabilities:

- Ability to program all Artex 406 MHz ELTs with supported protocols
- All ARTEX406 MHz aircraft protocols decoded
- Waterproof to IP67 standards
- Ruggedized case
- Internal database of received messages and programming
- Desktop application for database storage and review
- Long life rechargeable battery
- Built-in RF attenuator

### 1.4 Functionality

The heart of the Handheld Programmer is the Meazura™ MEZ1500 manufactured by Aceeca International, Ltd of Christchurch, NZ. The Meazura™ MEZ1500 uses the Palm/Garnet OS™ operating system.

Artex has customized operation of the Meazura™ MEZ1500 by utilizing the MZIO™ interface inside the Meazura™ MEZ1500 unit. The "off-the-shelf" Meazura™ MEZ1500 combined with a custom module containing the Artex programming hardware interface comprises the Artex Handheld Programmer.

**CAUTION: AS DELIVERED BY ARTEX, THE MZIO™ INTERFACE IS NOT ACCESSIBLE BY THE USER WITHOUT VOIDING THE ARTEX WARRANTY.**

**NOTE:** Aceeca International, Ltd refers to the Meazura™ MEZ1500 as an RDA™, which stands for "Rugged Digital Assistant". This terminology is encountered on the Aceeca web site and in their literature.

Additional operating information can be found at in the Aceeca documents MEZ1500 Quick Reference User Guide and MEZ1500 HotSync Configuration Guide available by contacting Aceeca at [support@aceeca.com](mailto:support@aceeca.com).



**Figure 1: A3-06-2824/8707 Handheld Programmer**

## **2. Hardware**

The Handheld Programmer allows communication with any Artex 406 MHz ELT. It inverts and raises the data signal from the ELT to an RS-232 signal level. This enables the ELT to "talk" to the Handheld Programmer for programming and diagnostic purposes.



## 2.1 Overview

The following subsections provide an overview of the Handheld Programmer hardware:

### 2.1.1 Connections

The Handheld Programmer is fitted with two connectors (Figure 2):

- A quick connect/disconnect circular connector for connecting the programming cables. This connector is push-on/pull-off type.

**CAUTION:** DO **NOT** TWIST THE CONNECTOR.

The built-in lock/release mechanism securely locks the mated connectors, while allowing quick disconnection by simply pulling on the plug release collar. Molded-in grooves prevent hand slippage when pulling on the connector.

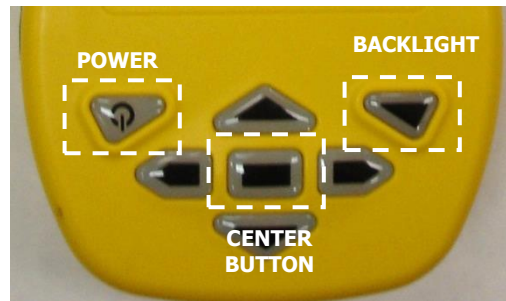
Three cables are supplied with the Handheld Programmer to facilitate connection to current Artex 406 MHz ELT models. The cables are:

- 611-0110 – For 110-406 and C406 Series; including the C406-1 and C406-2 Series, G406 series, B406 series (i.e., any Artex 406 MHz ELT using a 12-pin Molex connector).
- 611-0111 – For C406-N/PA Series
- 611-0112 – For ME406 Series, ELT 1000, and ELT 345
- A2-07-0270 – For ELT 3000/4000/PA series
- The ELT reader portion of the Handheld Programmer uses a BNC connector to allow connection of a 110-418 antenna or a direct-connect coax cable. See Subsection 11.2 for optional equipment.



**Figure 2: Handheld Programmer Connectors**

The Meazura™ MEZ1500 is controlled with the buttons shown in Figure 3.



**Figure 3: Controls**

- The Power button is used to turn the unit off and on and, when pressed with the Backlight button, for reset functions described later in this manual.
- Center button usage is discussed in detail later in the manual. The Arrow keys are used for vertical and horizontal scrolling.
- Operation of Palm/Garnet OS® functions are described in greater detail in the Aceeca Meazura™ MEZ1500 “User’s Guide” (contact [support@aceeca.com](mailto:support@aceeca.com)).

## 2.2 Battery

The Meazura™ MEZ1500 comes with a custom, rechargeable Lithium Ion battery pack that can only be purchased from Aceeca or Artex.

### 2.2.1 Warnings

- Do not heat or throw the battery into a fire.
- Do not use or store the battery close to fire or where the ambient temperature may be over 60°C.
- Do not put the battery in your pocket or in a bag together with metal objects. Do not store the battery with such objects.
- Do not short circuit the (+) and (-) terminals with a metal object.
- Do not pierce the battery with a sharp object.
- Do not hit with a hammer, step on, throw, drop, or allow the battery to undergo any strong shock.
- Do not disassemble or modify the battery.
- Do not solder the battery directly to the terminals.
- Do not use a battery that is severely scarred or deformed.

### 2.2.2 Storage

Unlike NiCad (Nickel Cadmium) batteries or NiMH (Nickel-metal Hydride) batteries, lithium-ion batteries should be charged early and often. Never use battery maintenance software to maintain your battery as this can reduce the life of your battery. Li-ion batteries should be kept cool. They should not be subjected to freezing temperatures. Aging will occur much faster at high temperatures and will reduce the

life of your battery.

Purchase a Li-Ion battery pack only when you need a replacement, thus ensuring you receive a fresh battery pack.

- Stop using the battery if it exhibits abnormal heat, odor, color, deformation or is in an abnormal condition.
- Keep away from fire immediately when leakage or foul odor is detected.
- If liquid leaks onto your skin or clothing wash well with fresh water immediately.
- If liquid leaking from the battery gets into your eyes; do not rub your eyes. Rinse well with clean water and consult a doctor immediately.
- Before using the battery, be sure to read the user's manual and cautions on handling thoroughly.
- For information on installing and removing the battery from equipment, thoroughly read the user's manual for the specific equipment.
- Batteries have life cycles, so if the time that the battery is powering the equipment becomes much shorter than usual, the battery life is at an end. Replace the battery with a new one.
- Remove a battery whose life cycle has expired from equipment immediately.
- When the battery is discarded, make it non-conducting by applying vinyl tape to the (+) and (-) terminals. The battery must either be discarded as specified by local regulations or put it in the recycling box of a store that is cooperating in the recycling of rechargeable batteries.
- When not using the battery for an extended period, remove it from the equipment and store it in a place with a low humidity and low temperature.

### **2.2.3 Installation**

Reference Figure 4.

1. Place the battery pack with the top end in first.
2. Push down on the bottom end of the battery ensuring that it is firmly in place.
3. Push the clip firmly towards the bottom of the test set until it clicks into place.
4. Charge the battery in accordance with Subsection 2.2.4.

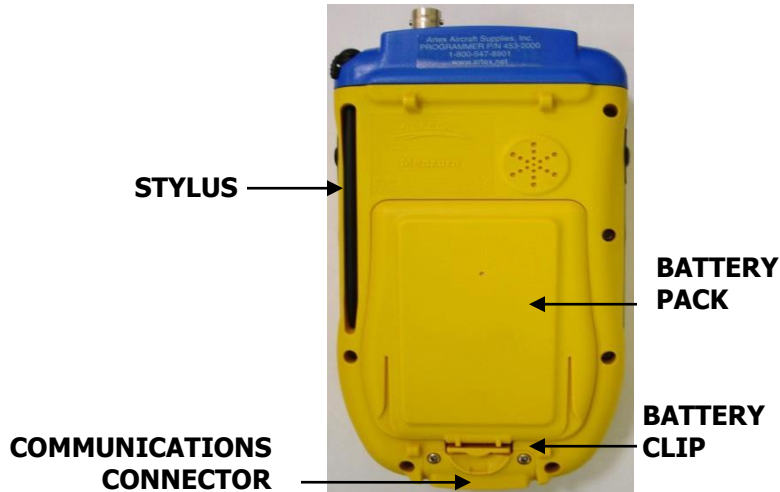


Figure 4: Back Side View

## 2.2.4 Charging

The lithium-ion battery can provide between 300-500 charge/discharge cycles. The lithium-ion battery is different from most other rechargeable batteries as charging from a partially charged battery keeps the battery in great condition, whereas other batteries prefer to be fully discharged each time before recharging. Fully discharging the lithium-ion battery should be avoided wherever possible.

For most users, charging the battery at the end of each day would be the ideal choice. The lithium-ion battery pack typically lasts about 2-3 years, but potentially longer if cared for correctly.

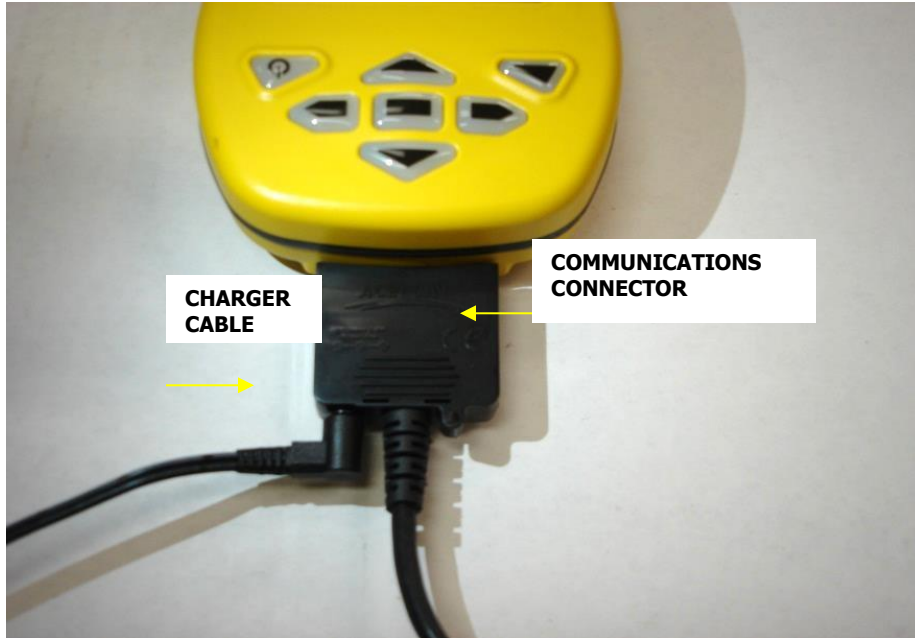
When charging the battery, use a dedicated charger and follow the specified conditions.

- Do not use or charge the battery close to fire or inside a car in which the temperature may exceed 60° C.
- Stop charging the battery if charging is not completed within the specified time.
- Thoroughly read this manual before charging the battery.
- The battery can be charged within a 0° C to 45° C temperature range.
- Use the battery only in the specified equipment.
- Do not charge the battery in a place where static electricity is generated, or let the battery touch something that is statically charged.

Charge the battery as follows:

1. Connect the charger cable to the communications cable (Figure 5).
2. Connect the communications cable to the unit (Figure 5).
3. Charge for a minimum of 2 hours, but no more than 3 hours.

**CAUTION**: DO NOT OVERCHARGE.



**Figure 5: Charging Connection**

### 2.2.5 Recycle and Disposal Methods

Lithium ion batteries, like all rechargeable batteries are recyclable and should be recycled.

**CAUTION:** IF A BATTERY IS DAMAGED, OR IF IT NO LONGER HOLDS A CHARGE, DISPOSE OF IT PROMPTLY AND PROPERLY. DO NOT DISPOSE OF IT ALONG WITH GENERAL WASTE. CALL YOUR LOCAL WASTE DISPOSAL AGENCY OR ENVIRONMENTAL AGENCY FOR ADVICE ON BATTERY DISPOSAL.

### 2.3 Unit Initialization

1. Turn on the unit by pressing the Power button.
2. Follow the on-screen instructions for initialization and setting the date and time.  
**NOTE:** The initialization routine is very important to ensure proper function of the stylus.
3. Refer to the Meazura™ MEZ1500 User's Guide for greater details on initialization.

### 3. Palm™ Desktop Software

Prior to use, the Palm™ Desktop, as supplied on the CD-ROM disc (Artex P/N 510-1200), must be installed on the Windows XP-SP3 or later, Windows 7 PC that will be used to interface with the Handheld Programmer. Follow the on-screen instructions for installation.

If the CD-ROM disc cannot be found, follow these instructions:

1. Open desktop browser and go to [www.acrartex.com](http://www.acrartex.com)
2. From the top menu, click **Support**.
3. From the left side Support menu, click **ARTEX Support**.
4. Go to **Downloads** and click **Palm Desktop Drivers**.
5. Unzip File Folder **SFW\_WINX32\_PALM-DESKTOP\_V4.1\_20110322.ZIP**
6. Double click **Palm Desktop Installation**.
7. Double click **Palm Desktop**.
8. Pop-up appears. Select **Run**.
9. **Install Shield Wizard** will open. Select **Next**.
10. Read the **SOFTWARE LICENSE AGREEMENT**.
11. Select **I accept the terms in the license agreement**, then **Next**.
12. When asked **Complete** or **Custom**, select **Complete**.
13. Select **Existing User** or **Create New User**.
14. When asked about **Connections**, select **USB**.
15. Select **Install**, then **Finish**.
16. Open Palm Desktop.

**NOTE:** The Palm desktop software works most amiably if a single Meazura™ (Palm) device is associated with a single computer. It is possible to use more than one Meazura™ device with the same computer, but attention must be given to selection of appropriate user names when transferring data to and from different units.

The Palm™ software identifies the User Name when the Palm™ Desktop application is installed on a PC. Only one User Name can be used with the Artex applications.

Once installed and configured, the Palm™ Desktop software allows installation of additional software applications, as well as performing the hot sync function to transfer data to and from the Handheld Programmer (Meazura™ MEZ1500). ACR/ARTEX provides a USB cable (452-0103) to connect to a PC.

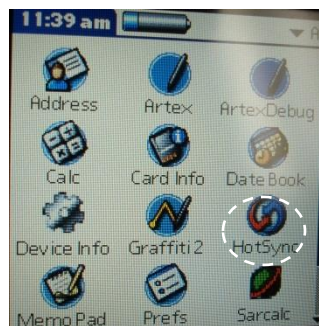
#### 3.1 Hot Sync

Once installed and configured, the Palm™ Desktop software allows installation of additional software applications, as well as performing the hot sync function to transfer data to and from the Handheld Programmer (Meazura™ MEZ1000). ARTEX provides a USB cable (452-0103) to connect to a PC.

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1. Connect programmer to PC using USB Cable. Windows may not recognize the device and will require a driver.
2. Open desktop browser and go to [www.acrartex.com](http://www.acrartex.com)
3. From the top menu, click **Support**.
4. From the left side Support menu, click **ARTEX Support**.
5. Go to **Downloads** and click **Hot Sync Drivers**.
6. Unzip file folder **DVR\_WINX64\_USB\_GN4-GN5\_20110322.ZIP**
7. Double click **64bit USB Installation Guide 20110607**.
8. Follow instructions found in the guide.
9. Ensure Palm Desktop is open.

The hot sync function is accessed by tapping the HotSync icon on the main Meazura screen as shown in Figure 6.



**Figure 6: Hot Sync Icon**



## 4. Artex Programming Software

The following subsections describe the functionality and operation of the Artex programming software.

### 4.1 Overview

The Artex software is a custom package designed to simplify reading and programming data to and from Artex ELTs. The Artex software builds a custom 406 MHz hex message for the user from simple data input provided by the user. This data is then programmed into the ELT. The Artex software allows the user to print the 406 MHz hex message and its decoded breakdown for record keeping.

### 4.2 Opening the Artex Software

To open the Artex software:

1. Tap the "Artex" icon on the home screen.
2. The Artex main screen is shown in Figure 7.

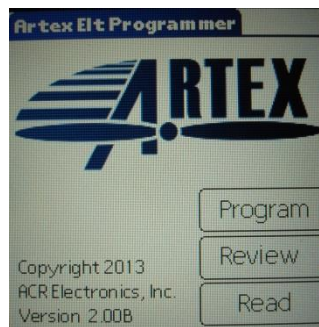


Figure 7: Artex Software Main Screen

### 4.3 Selecting Preferences

The Artex software has several preferences that may be selected prior to use.

1. Tap the upper left-hand corner of the Artex main screen (Artex ELT Programmer header) to get the Screens drop-down menu (Figure 8).

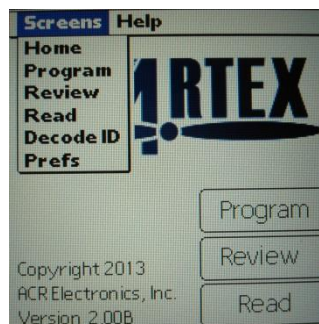


Figure 8: Screens Drop-Down Menu

2. Tap "Prefs" on the drop-down menu and select the following preferences, as applicable:

- 24-Bit Address Format – Select either Octal or Hex
  - Clear Database – Erases all saved programming messages
3. Tap “Done” when finished to return to main menu.

#### 4.4 Programmer Database

The Handheld Programmer retains up to 1000 records of programmed ELTs.

**NOTE:** The programming operation must be successfully completed in order for the record to be stored in the database.

- The database may be deleted at any time by accessing the “Prefs” drop-down menu and selecting “Clear Database” (Subsection 4.3).
- Stored records may be viewed by tapping “Review” on the main screen (Subsection 4.2).
- Stored records may also be programmed into an ELT following the instructions given herein.
- The stored programming may also be viewed using Sarcalc Desktop V3.01. See Subsection 6.2 for a detailed description of this function.

#### 4.5 ELT Programming

**IMPORTANT:** When working with any ELT, keep a 121.5 MHz receiver nearby, on, and at adequate volume. This is necessary to catch and deactivate an ELT that may accidentally be left on.

The ELT being programmed must properly perform all operations described in this set of instructions. An ELT that fails any portion must be rejected and repaired.

1. Set the Baud rate to 9600 to program long message ELTs and 2400 to program older, short message ELTs.
2. For an ELT 1000/345, programming will remain the same as other ELTs except for there are two baud rates to choose from:
  - 9600 for default or A/B protocol
  - 4800 for NEMA Protocol
  - Reference figures 9-13 for programming.
3. For an ELT 3000/4000, programming will remain the same as other ELTs except for there are two baud rates to choose from:
  - ARINC 429 (high or low speed)
  - 9600 or A/B protocol (ELT 3000 only)
  - Reference figures 9-13 for programming
4. Plug the programming cable into the ELT
5. Connect the cable to the Handheld Programmer.

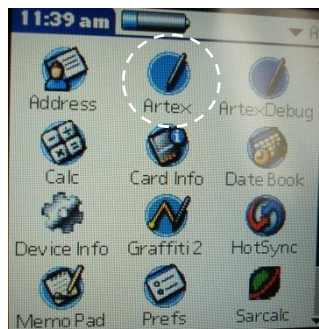
Table 1 provides data for programming ELTs with certain protocol types. This

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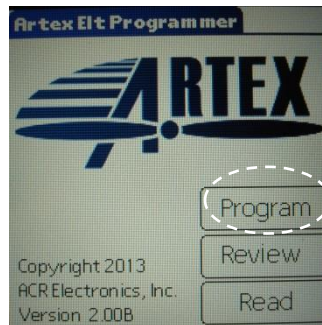
information is not used in all protocol types; hence, programming software may not ask for this information.

The Artex Programming Software divides the Models based on baud rates into the following families:

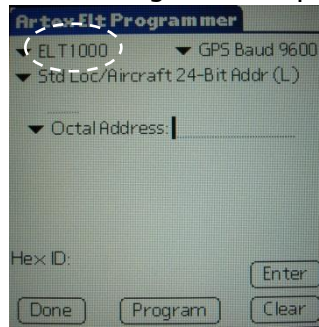
- 9600 Baud ELT
- 2400 Baud ELT (Legacy ELTs)
- 9600 Baud PA
- ELT 345/1000
- ELT 3000/4000
- ELT 3000PA



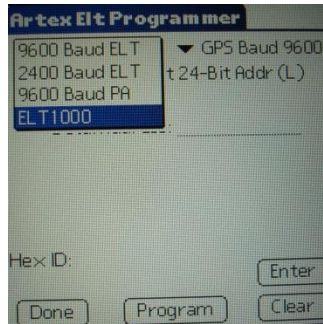
**Figure 9: Artex Main Screen**



**Figure 10: Artex Software Main Screen**



**Figure 11: ELT 1000 Will Display Baud Rates**



**Figure 12: Baud Rate Screen Drop-Down Menu**



**Figure 13: ELT 1000 Baud Rate Screen Drop-Down Menu**

Refer to Table 1 as instructed to complete programming sequences. For Table 1, protocols are defined as follows:

**Std Location** = Aircraft 24 Bit Address (Long) and ELT Serial (Long)

**Aviation User** = Tail Number (Short)

**Serial User** = Aircraft 24 Bit Addr (Short), Aircraft 24 Bit / National (Short), ELT / COSPAS (Short) and Aircraft Operator (Short)

**National Location** = ELT Serial (Long)

**User Location** = Aviation User / Tail Number / Location (Long)

**Serial User Location (ELT 345, ELT 1000, ELT 3000, and ELT 4000 Series Only)** = Serial User/Aircraft 24-Bit Loc (Long), Serial User/ELT/Cospas Loc (Long), and Serial User/Aircraft Operator Loc (Long).

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**Table 1: ELT Data**

ELT Part Number	Description	Baud Rate	COSPAS-SARSAT #	Programmed Serial #	Supported Protocols	Model #	Sequence # Range	Production # Range
<b>C406 Series</b>								
453-5060	C406-N	9600	135	Same as unit label (5 digit)	Std Location Aviation User Serial User User Location National Location	7	0-16383	0-9
453-5061	C406-N HM	9600	135	Same as unit label (5 digit)	Std Location Aviation User Serial User User Location National Location	7	0-16383	0-9
453-5000	C406-2	9600	See Note 2	See Note 2	Std Location Aviation User Serial User	6	0-16383	0-9
453-5001	C406-2HM	9600	See Note 2	See Note 2	Std Location Aviation User Serial User	6	0-16383	0-9
453-5002	C406-1	9600	See Note 2	See Note 2	Std Location Aviation User Serial User	6	0-16383	0-9
453-5003	C406-1HM	9600	See Note 2	See Note 2	Std Location Aviation User Serial User	6	0-16383	0-9
453-5006	C406-3	9600	See Note 2	See Note 2	Std Location Aviation User Serial User	6	0-16383	0-9
453-5056	RB 406-1HM	9600	See Note 2	See Note 2	Std Location Aviation User Serial User	6	0-16383	0-9
<b>PA SERIES</b>								
453-5068	PA (Blank)	9600	135	Same as unit label (5 digit)	Std Location Aviation User Serial User User Location National Location	7	0-16383	0-9
453-5078	PA (Pre-Programmed)	9600	135	Same as unit label (5 digit)	Std Location Aviation User Serial User User Location National Location	7	0-16383	0-9
<b>G406 SERIES</b>								
453-5100	G406-1	9600	126	Same as unit label (5 digit)	Std Location Aviation User Serial User	6	0-16383	0-9
453-5102	G406-2	9600	126	Same as unit label (5 digit)	Std Location Aviation User Serial User	6	0-16383	0-9

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ELT Part Number	Description	Baud Rate	COSPAS-SARSAT #	Programmed Serial #	Supported Protocols	Model #	Sequence # Range	Production # Range
453-5012	G406-4	9600	See Note 2	See Note 2	Std Location Aviation User Serial User	5	0-16383	0-9
<b>B406 SERIES</b>								
453-0004	B406-1	2400	67	Same as unit label (7 digit)	Aviation User Serial User (Short Only)	3	0-1047	0-255
453-0005	B406-A	2400	67	Same as unit label (7 digit)	Aviation User Serial User (Short Only)	3	0-1047	0-255
453-0003	B406-2	9600	104	Same as unit label (5 digit)	Std Location Aviation User Serial User	5	0-16383	0-9
453-5004	B406-4	9600	See Note 2	See Note 2	Std Location Aviation User Serial User	6	0-16383	0-9
<b>110-406 SERIES</b>								
453-0406	ELT 110-406	2400	67	Same as unit label (7 digit)	Aviation User Serial User (Short Only)	1	0-1047	0-255
453-0407	ELT 110-406HM	2400	67	Same as unit label (7 digit)	Aviation User Serial User (Short Only)	2	0-1047	0-255
453-0421	ELT 110-406 NAV	9600	104	Same as unit label (5 digit)	Std Location Aviation User Serial User	5	0-16383	0-9
453-0423	ELT 110-406HM NAV	9600	104	Same as unit label (5 digit)	Std Location Aviation User Serial User	5	0-16383	0-9
453-0006	ELT 110-406ED	2400	67	Same as unit label (7 digit)	Aviation User Serial User (Short Only)	4	0-1047	0-255
453-0424	ELT 110-406ED NAV	9600	104	Same as unit label (5 digit)	Std Location Aviation User Serial User	5	0-16383	0-9
<b>ME406 SERIES</b>								
453-6603	ME406	9600	See Note 2	See Note 2	Aviation User Serial User	8	0-16383	0-9
453-6604	ME406HM	9600	See Note 2	See Note 2	Aviation User Serial User	8	0-16383	0-9
453-6611	ME406P	9600	See Note 2	See Note 2	Aviation User Serial User	8	0-16383	0-9

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ELT Part Number	Description	Baud Rate	COSPAS-SARSAT #	Programmed Serial #	Supported Protocols	Model #	Sequence # Range	Production # Range
453-6650	ME406 BLACK	9600	See Note 2	See Note 2	Aviation User Serial User	8	0-16383	0-9
<b>ELT 1000 and ELT 345</b>								
A3-06-2749-1	ELT 1000	9600 4800	251	Same as label (8-digit)	Std Location Aviation User Serial User User Location National Location	9	0-16383	0-9
A3-06-2880	ELT 345	4800 9600	267	Same as label (8-digit)	Std Location Aviation User Serial User User Location National Location	10	0-1638	0-9
<b>ELT 3000 and ELT 3000HM</b>								
A3-06-2796-8	ELT 3000	ARINC 429 (high or low speed) 9600	272	Same as label (8-digit)	Std Location Aviation User Serial User User Location National Location	11	0-1638	0-9
A3-06-2796-9	ELT 3000HM	ARINC 429 (high or low speed) 9600	272	Same as label (8-digit)	Std Location Aviation User Serial User User Location National Location	11	0-1638	0-9
<b>ELT 4000 and ELT 4000HM</b>								
A3-06-3005	ELT 4000	ARINC 429 (high or low speed)	298	Same as label (8-digit)	Std Location Aviation User Serial User User Location National Location	12	0-1638	0-9
A3-06-3005-1	ELT 4000HM	ARINC 429 (high or low speed)	298	Same as label (8-digit)	Std Location Aviation User Serial User User Location National Location	12	0-1638	0-9

**NOTE 1:** When entering data into the programming software, most fields not filled with the maximum allowable number of characters will fill the unused portion with zeros to the left of the data entered. Exceptions to this are noted in the appropriate subsections below.

**NOTE 2:** The COSPAS-SARSAT 15-digit ELT Identifier allows manufacturers 16,383 possible serial numbers. Artex has reached that limit with the C, B, G, and ME Series. For ELTs that pass serial number 16,383 and move on to a 3-digit prefix, different COSPAS-SARSAT numbers will be assigned to that ELT. See Table 2.

**Table 2: ELT Serial Number Continuations**

ELT Series	COSPAS-SARSAT #	Manufacturing Serial #	ELT Programmed Serial #
C, B, G	112	00001 to 16383	00001 to 16383
	170	170-00001 to 170-16383	00001 to 16383
	210	210-00001 to 210-16383	00001 to 16383
ME	152	00001 to 16383	00001 to 16383
	188	188-00001 to 188-16383	00001 to 16383
	197	197-00001 to 197-16383	00001 to 16383
	242	242-00001 to 242-16383	00001 to 16383
C406-N	135	00001 to 16383	00001 to 16383
	252	252-00001 to 252-16383	00001 to 16383
ELT 1000	251	251-00001 to 251-16383	00001 to 16383
	TBD	TBD-00001 to TBD-16383	00001 to 16383
ELT 345	267	267-00001 to 267-16383	00001 to 16383
	TBD	TBD-00001 to TBD-16383	00001 to 16383
ELT 3000	272	272-00001 to 272-16383	00001 to 16383
ELT 3000HM	TBD	TBD-00001 to TBD-16383	00001 to 16383
ELT 4000	298	298-00001 to 298-16383	00001 to 16383
ELT 4000HM	TBD	TBD-00001 to TBD 16383	00001 to 16383

Because a different COSPAS-SARSAT # is used when the serial numbers reset after 16,383, the 15-digit ELT Identifier remains unique.

**NOTE:** There were a small number of ELTs in the C, B, G series that used the letter "A" as a prefix before the numerical prefix was adopted for use. (i.e., A00001 instead of 170-00001)

#### 4.6 Country Code Database

The Handheld Programmer is loaded at Artex with a Country Code Database to be used with the Artex software. This database contains all listed countries assigned a three-digit Maritime Identification Digit (MID) by the International Telecommunications Union (ITU) and ICAO.

The database may be sorted either in alphabetical order (by country name) or in numerical order (by country code). The complete list can be seen by scrolling, using your stylus and the scroll bar to the right of the screen. See examples in Figure 14.





**Figure 14: Alphabetical and Numerical Sorting Examples**

For country codes not listed, "manual entry" may be used.

**NOTES:** Many countries have multiple country codes assigned by the ITU. Artex has verified the required or preferred country code for as many countries as possible.

The list contained in the Handheld Programmer represents our best efforts and lists only one option for each country listed. If a conflict arises with your national authority, please contact Artex so that we may update our information.

## 4.7 Protocols

The desired programming protocol must be selected. Consult with local aviation authorities for possible programming protocol exceptions/additional rules that may apply for particular countries.

In the protocol field, select the type of programming desired by tapping on the drop-down menu to show the protocol options. Refer to Table 1 to determine which ELTs are "Short Message" ELTs and which are "Long Message" ELTs. Short message ELTs accept short message protocol programming only. Long message ELTs may use either long message or short message protocol programming. The protocols are:

- Aviation User / Tail Number (Short)
- Serial User / ELT / COSPAS (Short)
- Serial User/ Aircraft 24-Bit Addr (Short)
- Serial User/Aircraft 24-Bit/Ntl (Short)
- Serial User/ Aircraft Operator Designator (Short)
- Serial User/Aircraft 24-Bit Loc (Long)\*ELT 345/ELT 1000/ELT 3000/ELT 4000 only\*
- Serial User/ELT/Cospas Loc (Long)\*ELT 345/ELT 1000/ELT 3000/ELT 4000 only\*
- Serial User/Aircraft Operator Loc (Long)\*ELT 345/ELT 1000/ELT 3000/ELT 4000 only\*
- Aviation User / Tail Number / Location (Long)
- Std Location / Aircraft 24-Bit Address (Long)
- Std Location / ELT Serial (Long)
- Ntl Location/ELT Serial (Long)

**NOTE 1:** For the ELT 345 and ELT 1000, the baud rate must be set manually.

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- In the top right corner, select "Options" once. It will change to "Get Options".
- Select "Get Options"; quickly place ELT switch in test mode and release. (\*Quickly is <1 second)
- If successful, the programmer will read the currently programmed baud rate and show "GPS Baud 4800" or "GPS Baud 9600". If the baud rate is correct, select return. If not, change the baud rate. Momentarily hold ELT in test mode; quickly tap on "Set", and release. Programmer should state "Successfully programmed speed". Select "Return".
- If failed, programmer will state "Failed to read GPS speed". If failed, select "Return" and start NOTE 1 over.

**NOTE 2: For the ELT 3000 and ELT 4000, there are options that must be set manually.**

- In the top right corner, select "Options" once. It will change to "Get Options".
- For the ELT 3000, "121.5 MHz" and "243 MHz" will be selected.
- For the ELT 4000, only "121.5 MHz" will be selected.
- Select either "Serial", "A429 High" or "A429 Low".
- Set "Prog. Adapter" to "Enabled" if using programming adapter A3-06-2868. "Disabled" is not using a programming adapter.
- Set "ARINC Speed" to "High" or "Low" depending on the speed the GPS will be communicating with the ELT 3000 or ELT 4000.
- After the above items are selected, tap on "Set". The programmer will state "Successfully programmed options". If failed, the programmer will state "Failed to program options".

#### **4.7.1 Aviation User / Tail Number (Short)**

1. Select ELT Baud rate.
2. For the ELT 345 and ELT 1000, refer to Note 1 on page 23 before continuing.
3. For the ELT 3000 and ELT 4000, refer to Note 2 on page 23 before continuing.
4. Select Protocol.
5. Select Country Code.
6. Go to Graffiti screen and tap on letter/numbers.
7. Enter the tail number of the aircraft, which is up to seven alphanumeric characters.
  - Acceptable characters are letters (A-Z), numbers (0-9), a hyphen (-), a space ( ), and a slash (/).
  - If fewer characters are entered, that will be reflected in the final hex code.
  - Spaces are automatically filled in on the left of the data.
8. Tap "Done" when finished.
9. Tap "ENTER" button on Program screen. The 24-digit hex code is shown at the bottom of the screen, with the abbreviated 15-digit hex code below it.
10. **For ELT 345s or ELT 1000s only:** tap "Program"; quickly place ELT switch in the test mode and release. (Quickly is <1 second).
11. Tap the "Program" button to program the ELT.
12. Ensure that screen shows "Programming Successful".
13. Verify ELT using "Sarcalc", as described in Subsection 6.2.

#### **4.7.2 Serial User / ELT / COSPAS (Short)**

1. Select ELT Baud rate.
2. For the ELT 345 and ELT 1000, refer to Note 1 on page 23 before continuing.
3. For the ELT 3000 and ELT 4000, refer to Note 2 on page 23 before continuing.
4. Select Protocol.
5. Select Country Code.
6. Go to Graffiti Screen and tap on letter/numbers.
7. Enter the serial number, which matches the serial number seen on the product label, or a number that was designated for use by the competent national authority.
8. Enter the COSPAS-SARSAT TAC number.
9. Tap "Done" when finished.

10. Tap "ENTER" button on Program screen. The 24-digit hex code is shown at the bottom of the screen, with the abbreviated 15-digit hex code below it.
11. **For ELT 345s or ELT 1000s only:** tap "Program"; quickly place ELT switch in the test mode and release. (Quickly is <1 second).
12. Tap the "Program" button to program the ELT.
13. Ensure that screen shows "Programming Successful".
14. Verify ELT using "Sarcalc", as described in Subsection 6.2.

#### 4.7.3 Serial User / Aircraft 24-Bit Addr (Short)

1. Select ELT Baud rate.
2. For the ELT 345 and ELT 1000, refer to Note 1 on page 23 before continuing.
3. For the ELT 3000 and ELT 4000, refer to Note 2 on page 23 before continuing.
4. Select Protocol.

**NOTE:** Country Code will be blank. It will automatically be selected by entry of a valid 24-Bit Aircraft Address.

5. Select the desired number system (Octal: 8 digits from 0-7 or Hex: 6 digits from 0-9 or A-F) to match the format of the 24-bit address provided.
6. Go to Graffiti screen and tap on letter/numbers.
7. Enter the 24-bit address.

**NOTE:** The 3-digit country code is automatically determined from the country data encoded in the 24-bit address.

8. Enter the COSPAS-SARSAT TAC number.
9. Enter number of additional ELTs.
  - This particular number field represents the number of additional ELTs on board an aircraft, beyond the primary ELT.
  - Enter "0" if there is only one ELT on-board, and "1", "2", etc., corresponding to the number of additional ELTs installed on the aircraft.
10. Tap "Done" when finished.
11. Tap "ENTER" button on Program screen. The 24-digit hex code is shown at the bottom of the screen, with the abbreviated 15-digit hex code below it.
12. **For ELT 345s or ELT 1000s only:** tap "Program"; quickly place ELT switch in the test mode and release. (Quickly is <1 second).
13. Tap the "Program" button to program the ELT.
14. Ensure that screen shows "Programming Successful".
15. Verify ELT using "Sarcalc", as described in Subsection 6.2.

#### 4.7.4 Serial User / Aircraft 24-Bit Addr/Ntl (Short)

1. Select ELT Baud rate.
2. For the ELT 345 and ELT 1000, refer to Note 1 on page 23 before continuing.
3. For the ELT 3000 and ELT 4000, refer to Note 2 on page 23 before continuing.
4. Select Protocol.  
**NOTE:** Country Code will be blank. It will automatically be selected by entry of a valid 24-Bit Aircraft Address.
5. Select the desired number system (Octal: 8 digits from 0-7 or Hex: 6 digits from 0-9 or A-F) to match the format of the 24-bit address provided.
6. Go to Graffiti Screen and tap on letter/numbers.
7. Enter the 24-bit address.  
**NOTE:** The 3-digit country code is automatically determined from the country data encoded in the 24-bit address.
8. Enter the National Use designated number.
9. Enter number of additional ELTs.
  - This particular number field represents the number of additional ELTs on board an aircraft, beyond the primary ELT.
  - Enter "0" if there is only one ELT on-board, and "1", "2", etc., corresponding to the number of additional ELTs installed on the aircraft.
10. Tap "Done" when finished.
11. Tap "ENTER" button on Program screen. The 24-digit hex code is shown at the bottom of the screen, with the abbreviated 15-digit hex code below it.
12. **For ELT 345s or ELT 1000s only:** tap "Program"; quickly place ELT switch in the test mode and release. (Quickly is <1 second).
13. Tap the "Program" button to program the ELT.
14. Ensure that screen shows "Programming Successful".
15. Verify ELT using "Sarcalc", as described in Subsection 6.2.

#### 4.7.5 Serial User / Aircraft Operator Designator (Short)

1. Select ELT Baud rate.
2. For the ELT 345 and ELT 1000, refer to Note 1 on page 23 before continuing.
3. For the ELT 3000 and ELT 4000, refer to Note 2 on page 23 before continuing.
4. Select Protocol.
5. Select Country Code.
6. Go to Graffiti screen and tap on letter/numbers.
7. Enter Aircraft Operator Designator - (three digit assigned code)
8. Enter the COSPAS-SARSAT TAC number.

9. Enter designated serial number (between 0 and 4095).
10. Tap "Done" when finished.
11. Tap "ENTER" button on Program screen. The 24-digit hex code is shown at the bottom of the screen, with the abbreviated 15-digit hex code below it.
12. **For ELT 345s or ELT 1000s only:** tap "Program"; quickly place ELT switch in the test mode and release. (Quickly is <1 second).
13. Tap the "Program" button to program the ELT.
14. Ensure that screen shows "Programming Successful".
15. Verify ELT using "Sarcalc", as described in Subsection 6.2.

#### 4.7.6 Serial User / Aircraft 24-Bit Loc (Long)

1. Select ELT Baud rate.
2. For the ELT 345 and ELT 1000, refer to Note 1 on page 23 before continuing.
3. For the ELT 3000 and ELT 4000, refer to Note 2 on page 23 before continuing.
4. Select Protocol.

**NOTE:** Country Code will be blank. It will automatically be selected by entry of a valid 24-Bit Aircraft Address.

5. Select a desired number system (Octal: 8 digits for 0-7 or Hex 6 digits from 0-9 or A-F) to match the format of the 24-bit address provided.
6. Go to the Graffiti Screen and tap on letter/numbers.
7. Enter the 24-bit address.

**NOTE:** The 3-digit country code is automatically determined from the country data encoded in the 24-bit address.

8. Enter the COSPAS-SARSAT TAC number.
9. Enter number of additional ELTs.
  - This particular number field represents the number of additional ELTs on board an aircraft, beyond the primary ELT.
  - Enter "0" if there is only one ELT on-board, and "1", "2", etc., corresponding to the number of additional ELTs installed on the aircraft.
10. Tap "Done" when finished.
11. Tap "ENTER" button on Program screen. The 24-digit hex code is shown at the bottom of the screen, with the abbreviated 15-digit hex code below it.
12. **For ELT 345s or ELT 1000s only:** tap "Program"; quickly place ELT switch in the test mode and release. (Quickly is <1 second).
13. Tap the "Program" button to program the ELT.

14. Ensure the screen shows "Programming Successful".
15. Verify ELT using "Sarcalc", as described in Subsection 6.2.

#### **4.7.7 Serial User / ELT /Cospas Loc (Long)**

1. Select ELT Baud rate.
2. For the ELT 345 and ELT 1000, refer to Note 1 on page 23 before continuing.
3. For the ELT 3000 and ELT 4000, refer to Note 2 on page 23 before continuing.
4. Select Protocol.
5. Select Country Code.
6. Go to the Graffiti Screen and tap on letter/numbers.
7. Enter the serial number, which matches the serial number seen on the product label, or a number that was designated for use by the competent national authority.
8. Enter the COSPAS-SARSAT TAC number.
9. Tap "Done" when finished.
10. Tap "ENTER" button on Program screen. The 32-digit hex code is shown at the bottom of the screen, with the abbreviated 15-digit hex code below it.
11. **For ELT 345s or ELT 1000s only:** tap "Program"; quickly place ELT switch in the test mode and release. (Quickly is <1 second).
12. Tap the "Program" button to program the ELT.
13. Ensure the screen shows "Programming Successful".
14. Verify ELT using "Sarcalc", as described in Subsection 6.2.

#### **4.7.8 Serial User / Aircraft Operator Loc (Long)**

1. Select ELT Baud rate.
2. For the ELT 345 and ELT 1000, refer to Note 1 on page 23 before continuing.
3. For the ELT 3000 and ELT 4000, refer to Note 2 on page 23 before continuing.
4. Select Protocol.
5. Select Country Code.
6. Go to the Graffiti Screen and tap on letter/numbers.
7. Enter Aircraft Operator Designator – (three digit assigned code).
8. Enter the COSPAS-SARSAT TAC number.
9. Enter designated serial number (between 0 and 4095).
10. Tap "Done" when finished.
11. Tap "ENTER" button on Program screen. The 24-digit hex code is shown at the bottom of the screen, with the abbreviated 15-digit hex code below it.

12. **For ELT 345s or ELT 1000s only:** tap "Program"; quickly place ELT switch in the test mode and release. (Quickly is <1 second).
13. Tap the "Program" button to program the ELT.
14. Ensure that screen shows "Programming Successful".
15. Verify ELT using "Sarcalc", as described in Subsection 6.2.

#### **4.7.9 Aviation User / Tail Number / Location (Long)**

1. Select ELT Baud rate.
2. For the ELT 345 and ELT 1000, refer to Note 1 on page 23 before continuing.
3. For the ELT 3000 and ELT 4000, refer to Note 2 on page 23 before continuing.
4. Select Protocol.
5. Select Country Code.
6. Go to Graffiti Screen and tap on letter/numbers
7. Enter the tail number of the aircraft, which is up to seven alphanumeric characters.
  - Acceptable characters are letters (A-Z), numbers (0-9), a hyphen (-), a space ( ), and a slash (/).
  - If fewer characters are entered, that will be reflected in the final hex code.
  - Spaces are filled in on the left of the data.
8. Tap "Done" when finished.
9. Tap "ENTER" button on Program screen. The 32-digit hex code is shown at the bottom of the screen, with the abbreviated 15-digit hex code below it.
10. **For ELT 345s or ELT 1000s only:** tap "Program"; quickly place ELT switch in the test mode and release. (Quickly is <1 second).
11. Tap the "Program" button to program the ELT.
12. Ensure that screen shows "Programming Successful".
13. Verify ELT using "Sarcalc", as described in Subsection 6.2.

#### **4.7.10 Std Location / Aircraft 24-Bit Address (Long)**

1. Select ELT Baud rate.
2. For the ELT 345 and ELT 1000, refer to Note 1 on page 23 before continuing.
3. For the ELT 3000 and ELT 4000, refer to Note 2 on page 23 before continuing.
4. Select Protocol.
5. Select the desired number system (Octal: 8 digits from 0-7 or Hex: 6 digits from 0-9 or A-F) to match the format of the 24-bit address provided.
6. Enter the 24-bit address.



7. You may then click on the other number system selection to see the converted value (Octal or Hex).

**NOTE:** The 3-digit country code is automatically determined from the country data encoded in the 24-bit address.

8. Go to Graffiti screen and tap on letter/numbers.
9. Enter aircraft 24-bit address.
10. Tap "Done" when finished.
11. Tap "ENTER" button on Program screen. The 32-digit hex code is shown at the bottom of the screen, with the abbreviated 15-digit hex code below it.
12. **For ELT 345s or ELT 1000s only:** tap "Program"; quickly place ELT switch in the test mode and release. (Quickly is <1 second).
13. Tap the "Program" button to program the ELT.
14. Ensure that screen shows "Programming Successful".
15. Verify ELT using "Sarcalc", as described in Subsection 6.2.

#### **4.7.11 Std Location / ELT Serial (Long)**

1. Select ELT Baud rate.
2. For the ELT 345 and ELT 1000, refer to Note 1 on page 23 before continuing.
3. For the ELT 3000 and ELT 4000, refer to Note 2 on page 23 before continuing.
4. Select Protocol.
5. Select Country Code.
6. Go to Graffiti screen and tap on letter/numbers.
7. Enter the serial number, which matches the serial number seen on the product label, or a number that was designated for use by the competent national authority.
8. Enter the COSPAS-SARSAT TAC number.
9. Tap "Done" when finished.
10. Tap "ENTER" button on Program screen. The 32-digit hex code is shown at the bottom of the screen, with the abbreviated 15-digit hex code below it.
11. **For ELT 345s or ELT 1000s only:** tap "Program"; quickly place ELT switch in the test mode and release. (Quickly is <1 second).
12. Tap the "Program" button to program the ELT.
13. Ensure that screen shows "Programming Successful".
14. Verify ELT using "Sarcalc, as described in Subsection 6.2.

#### **4.7.12 National Location / ELT Serial (Long)**

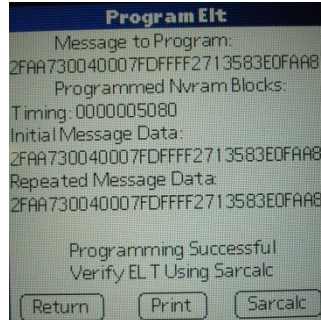
1. Select ELT Baud rate.
2. For the ELT 345 and ELT 1000, refer to Note 1 on page 23 before continuing.
3. For the ELT 3000 and ELT 4000, refer to Note 2 on page 23 before continuing.
4. Select Protocol.
5. Select Country Code.
6. Go to Graffiti screen and tap on letter/numbers.
7. Enter the serial number, which matches the serial number seen on the product label, or a number that was designated for use by the competent national authority.
8. Tap "Done" when finished.
9. Tap "ENTER" button on Program screen. The 32-digit hex code is shown at the bottom of the screen, with the abbreviated 15-digit hex code below it.
- 10. For the ELT 345s or ELT 1000s only:** tap "Program"; quickly place ELT switch in the test mode and release. (Quickly is <1 second).
11. Tap the "Program" button to program the ELT.
12. Ensure that screen shows "Programming Successful".
13. Verify ELT using "Sarcalc, as described in Subsection 6.2.

#### **4.8 Programming a Different Country Code for use with a Specific 24-Bit Address**

1. Follow the instructions for the 24-bit address method being used (short or long). Refer to Subsection 4.7.3, 4.7.4, or 4.7.10, as appropriate.
2. After "Enter" button function is used, go to the top of the screen and tap on "Artex ELT Programmer bar".
3. Tap on "Options".
4. Select: "Defaults".
5. Tap in "Country" entry space and go to numbers selection on Graffiti screen.
6. Enter required country code.
7. Tap "Done" when finished.
8. Tap "Return" on the Override default screen.
9. Tap "Program" on the Programmer screen.
10. After programming successful, launch Sarcalc and verify programmed information, as described in Subsection 6.2.

## 4.9 Programming Conclusion

After programming an ELT with any of the protocols listed in Subsection 4.7, the "Programming Successful" screen will be displayed (Figure 15).



**Figure 15: Programming Successful Screen**

Proceed to Section 6, Programming Verification. The programming may be printed now, but it is recommended the ELT be verified first. See Section 7, Label and Report Printing for printing instructions.

## 4.10 Battery Data Reader

The Artex programming software provides the means to determine battery usage and total battery activations.

**NOTE:** The software routine logs battery life in 30-second increments. A minimum of 30 seconds is added to the battery usage total each time the ELT is activated and de-activated. If the ELT is left activated beyond the first 30 seconds, additional time is added in 30-second increments. The ELT 345, ELT 1000, ELT 3000 and ELT 4000 series units count time to the exact second and not 30-second increments. The ELT 345 and the ELT 1000 no longer read number of activations.

Battery usage is given in hours and minutes, plus total number of activations (count) is also provided. To read the battery data:

1. Tap the Artex icon on the Home screen.
2. Tap the upper left-hand corner of the Artex main screen (Artex ELT Programmer header) to get the Screens drop-down menu.
3. Select "Read" in the drop-down menu.
4. Tap the "Down" arrow and select "Read Bat".
5. Select the Baud Rate.
6. For the ELT 345 and ELT 1000, momentarily place the ELT in test position and release. Immediately follow Step 7. Timing is key.
7. Tap "Read".

## 5. C406-N Series PA (Programming Adapter)

The C406-N series ELTs offer an accessory programming adapter (PA) designed to reprogram the attached ELT to match the programming contained within the programming adapter. This feature is used by fleet operators to facilitate ELT exchange for maintenance purposes. The C406-N series PA is programmed in exactly the same manner as an ELT, as described in Section 4.

A C406-N series ELT intended for use with the PA is typically shipped with generic Serial User – Aviation/ELT COSPAS (Short) programming, as described in Subsection 4.7.2 and will be overwritten by the PA. The PA may also be ordered blank.

### 5.1 PA Hardware Operation

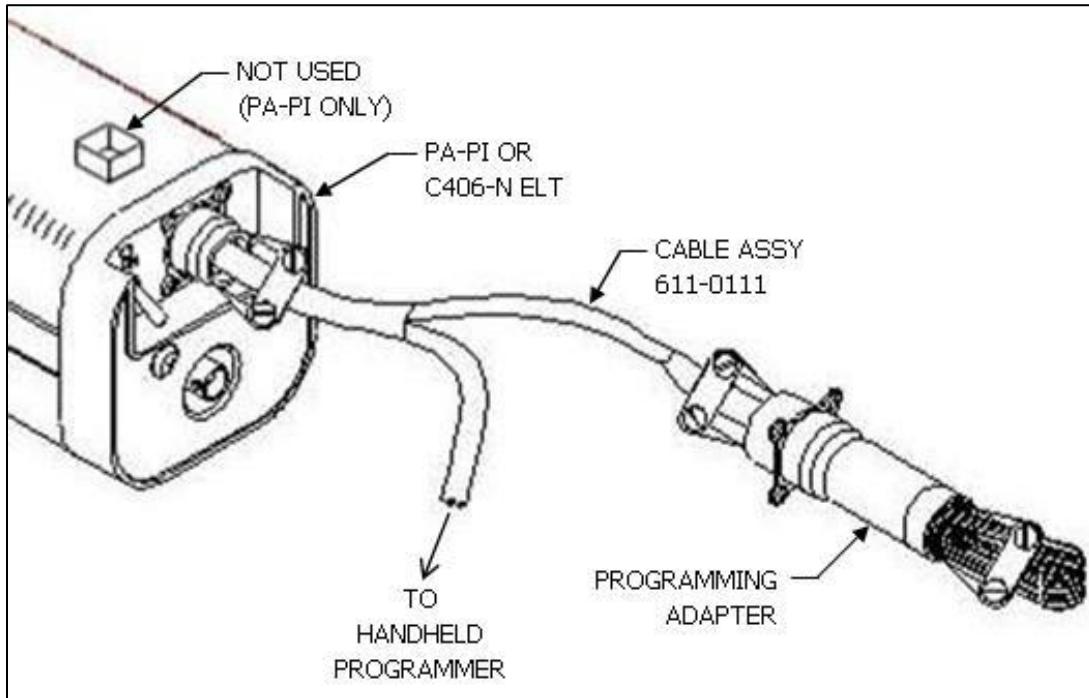
The following subsections describe operation of the PA with and without cannon plugs attached to the PA.

#### 5.1.1 With Cannon Plug Attached To PA

Communication between the PA and the Handheld Programmer requires translation by a C406-N series ELT or a Programmable Adapter – Programmer Interface (PAPI), P/N 500-8000.

Program a PA by attaching it to the Handheld Programmer using the cable P/N 611-0111. The male 22-pin circular connector attaches to the PA and the cable 22-pin female circular connector attaches to a C406-N series ELT or PA-PI. See Figure 16.

**NOTE:** The wiring of the 611-0111 harness only connects the six PA wires to the Handheld Programmer and ELT or PA-PI. Any other wiring installed on the PA connector will not be attached. It is therefore irrelevant if the additional lines are active or powered off at the time of programming.



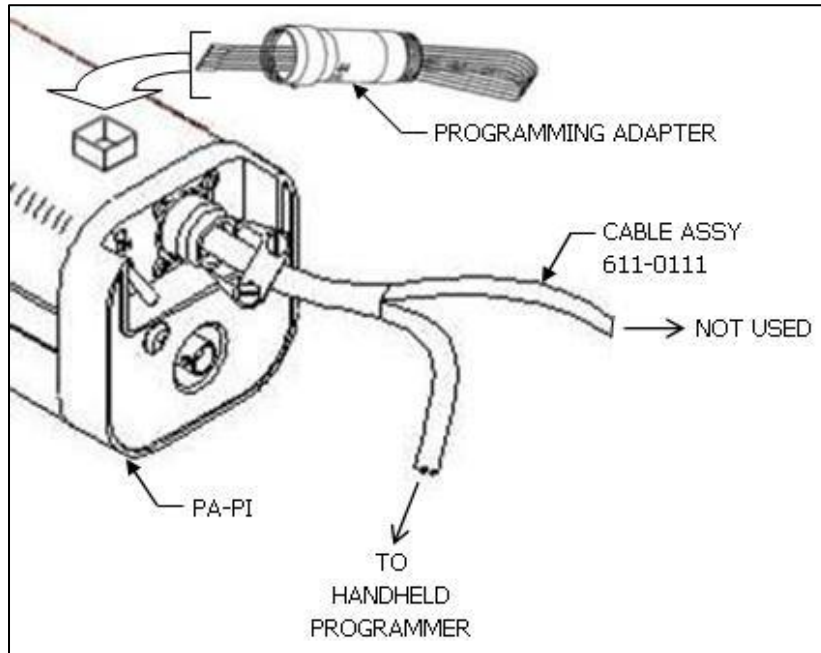
**Figure 16: Programming (PA with Cannon Plug)**

### **5.1.2 Without Cannon Plug Attached To PA**

Communication between the PA and the Handheld Programmer requires translation by the Programmable Adapter - Programmer Interface (PA-PI), P/N 500-8000.

To program a PA, attach it to the PA-PI, using the six wires coming from the PA. Attach them to the connector on top of the PA-PI matching the wire color codes to the designated pins on the connector.

Connect the PA-PI to the Handheld Programmer using cable P/N 611-0111 and mating the cable female 22-pin circular connector to the male connector on the PA-PI, as shown in Figure 17.



**Figure 17: Programming (PA without Cannon Plug)**

## 5.2 PA Software Operation

The PA is programmed in the exact same manner as the C406-N ELT. The reason for this is that the PA holds programming identical to the programming in the attached ELT, and simply updates the ELT if there is a difference.

To program a C406-N series PA, follow the ELT programming instructions in Section 4, except select 9600 Baud PA. Select the protocol intended for the ELTs that will be attached to the PA in the aircraft.

1. Enter programming information for protocol being used.
2. Tap "ENTER" button on screen.
3. The 32-digit Hex code or 24-digit Hex code is shown at the bottom of the screen with the abbreviated 15-digit Hex code below it.
4. Tap the "PROGRAM" button to program the PA.
5. Ensure the screen shows "Programming Successful".
6. Verify the programming using Sarcalc, as described in Subsection 6.2.

## 5.3 ELT 3000/ELT 4000 Series Programming Adapter

The ELT 3000 series and ELT 4000 series offer an accessory programming adapter (PA) designed to reprogram the attached ELT to match the programming contained within the programming adapter. This feature is used by fleet operators to facilitate ELT exchange for maintenance purposes. The ELT 3000 series and ELT 4000 series PA is programmed in exactly the same manner as an ELT, as described in Section 4.

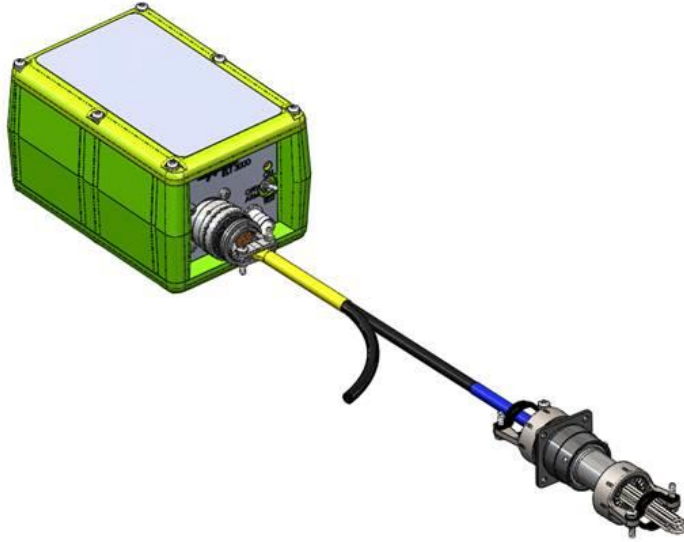
### 5.3.1 Programming the ELT 3000/ELT 4000 Programming Adapter

Communication between the PA and the Handheld Programmer requires translation

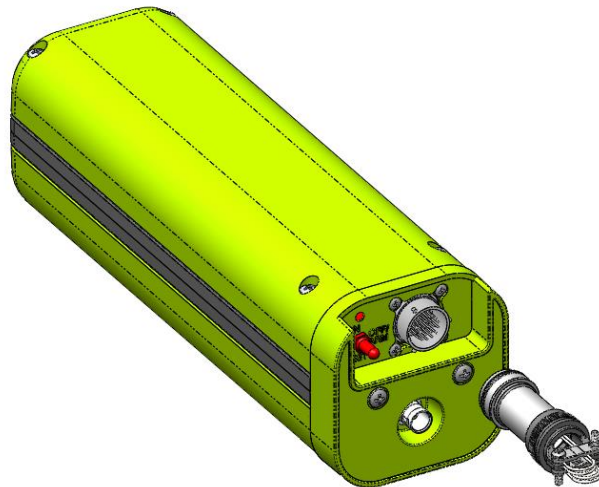
by an ELT 3000 series or ELT 4000 series ELT.

Program a PA by attaching it to the Handheld Programmer using the cable P/N A2-07-0270. The male 22-pin circular connector attaches to the PA and the cable 22-pin female circular connector attaches to an ELT series ELT. See Figure 2.

**NOTE:** The wiring of the A2-07-0270 harness only connects the six PA wires to the Handheld Programmer and ELT. Any other wiring installed on the PA connector will not be attached. It is therefore irrelevant if the additional lines are active or powered off at the time of programming.



**Figure 18: ELT 3000 Programming Adapter**



**Figure 19: ELT 4000 Programming Adapter**

#### **5.4 ELT 3000/ELT 4000 PA Software Operation**

The PA is programmed in the exact same manner as the ELT 3000 or ELT 4000 Series. The reason for this is that the PA holds programming identical to the programming in the attached ELT, and simply updates the ELT if there is a difference.

To program an ELT 3000 or ELT 4000 series PA, follow the ELT programming instructions in Section 4, except select ELT 3000 or ELT 4000 PA. Select the protocol intended for the ELTs that will be attached to the PA in the aircraft.

1. Enter programming information for protocol being used.
2. Refer to Note 2 on page 23 for selecting options.
3. Tap "ENTER" button on screen.
4. The 32-digit Hex code or 24-digit Hex code is shown at the bottom of the screen with the abbreviated 15-digit Hex code below it.
5. Tap the "PROGRAM" button to program the PA.
6. Ensure the screen shows "Programming Successful".
7. Verify the programming using Sarcalc, as described in Subsection 6.2.



## 6. Programming Verification

Artex requires that a verification test as described in the following subsections be performed. All testing should be done inside some type of metal enclosure that will attenuate any radio frequency emissions. It is possible for the 406 MHz transmission to reach an SAR satellite if the signal is not attenuated or shielded.

### 6.1 ELT Testing Precautions

**CAUTION:** PERFORM ALL ELT TESTING IN ACCORDANCE WITH LOCAL OR NATIONAL REGULATIONS. IF REQUIRED, TERMINATE ELT INTO A 50-OHM LOAD OR PERFORM TESTING IN AN RF SHIELDED ENVIRONMENT.

ELTS WITH 121.5/243 MHZ TRANSMITTERS MUST BE TESTED WITHIN 5 MINUTES AFTER THE HOUR (US/CANADA). LIVE TRANSMISSIONS OF THE 406 MHZ SIGNAL MUST BE LIMITED TO ELTS THAT TRANSMIT A "SELF-TEST" USING TEST FRAME SYNCHRONIZATION. EXTENDED TESTING OF THE 406 MHZ ELT SIGNAL MUST BE PERFORMED DIRECTLY CONNECTED TO THE PROGRAMMER WITH PROPER SIGNAL ATTENUATION AND/OR RF SHIELDING. SEE "OPTIONAL EQUIPMENT".

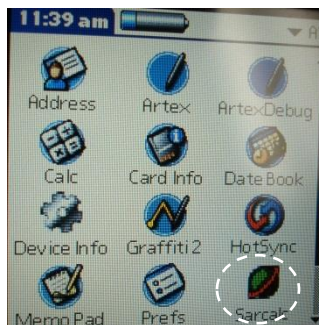
### 6.2 ELT Reader Function (Sarcalc)

The ELT Reader function of the Handheld Programmer uses a separate software program called "Sarcalc". This software must be opened and run separately from the Artex Programming software. The Sarcalc program (sarcalc.prc, version 3.01 or higher) is pre-installed on the Meazura™ unit in ROM memory. In the event the program is lost or needs to be re-installed, it may be installed using the Palm Desktop™ application and the Meazura™ serial or USB cable.

**NOTE:** The ELT read function does not detect or verify the presence of 121.5 MHz; this is a 406 MHz reader only.

1. Select the Sarcalc program by tapping the "Sarcalc" icon (Figure 19).

**NOTE:** The exact location of the Sarcalc icon may vary depending on what other programs or applications are loaded on the Handheld Programmer.

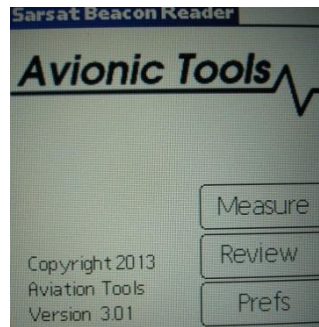


**Figure 19: Sarcalc Icon**

2. Connect the reader to the ELT directly with a coax cable (no attenuator required for test set) or connect the whip antenna.

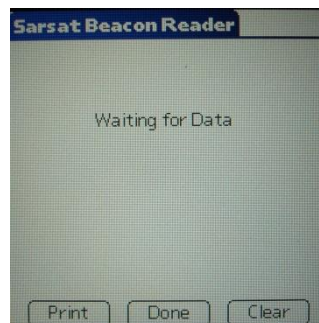
The reader is now ready to receive and decode the message.

3. Select "Measure" from "Avionic Tools" screen, as shown in Figure 20.



**Figure 20: Avionic Tools Screen**

4. The screen will display "Waiting for Data", as shown in Figure 21, until a valid ELT transmission is received.



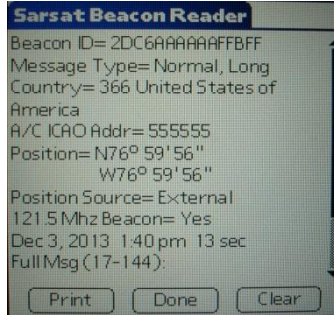
**Figure 21: Waiting for Data Screen**

5. Perform a "Self-Test" of the ELT by turning the ELT local or remote switch from "OFF/ARMED" to "ON" for no more than 3 sweeps of the 121.5/243 MHz signal and then switch back to "OFF/ARMED".
  - For the ELT 345 and ELT 1000, simply place the ELT in the test position and release.
  - For the ELT 3000 and ELT 4000, hold the ELT in the test position until you see the LED flash and then release.
6. If the received data is invalid, then "Message Error!" will be displayed. This may indicate excessive distance from the ELT antenna if testing externally.
  - 0-30 feet distance from the ELT antenna is recommended, although distances up to 50 feet are possible (as allowed).
  - The ELT internal 406 MHz oscillator may need to warm up.
7. Repeat the ELT test if necessary.
8. Select "Done" to save the message and proceed. A new message will not over-write the old message. The message will be automatically saved to a database for later review.
9. Press "Clear" or the right arrow key to clear screen for next message.

### 6.3 Message Display

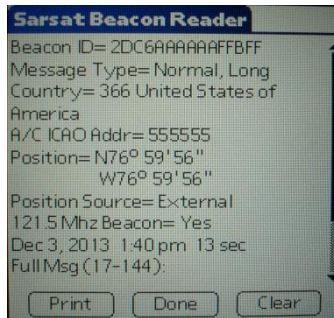
Once a valid message is received, all encoded data is displayed on the screen as shown in Figure 22.

**NOTE:** The message will remain on-screen until the "Clear" button is selected.



**Figure 22: Valid Standard Location Message**

If the ELT is encoded with the 24-bit ICAO address and country of registry is USA, then the ICAO address will also be decoded to an 'N' number registration, as shown in Figure 23.



**Figure 23: Valid 24-Bit Address Message**

Referring to Figure 22 and Figure 23:

- The first line contains the 15-digit Hex ELT ID. This ID is used to register the ELT with the national authorities (NOAA in USA).
- The second line indicates the message type: Test or Normal, and Short or Long.
- The third line displays the country of registry code and the country.
- The fourth line contains the ELT identifying data. The ELT identifying data will consist of one of the following: serial number, aircraft 24-bit ICAO address, aircraft registration number.
- ELT type will be displayed (ELT) and also any auxiliary locating device (121.5 MHz ELT).
- If the ELT includes a navigation function, position data will be displayed in latitude/longitude.
- The received 406 MHz frequency is not displayed.
- The message is time stamped.

## 6.4 Reader Database

All recorded messages are automatically saved to a database (up to 1000 records).

Select "Review" from the initial Sarcalc screen. The latest message will be displayed with the date and time the message was recorded.

Navigate between older and newer saved messages by selecting "Prev" or "Next". Any displayed message can also be printed (if optional printer software is installed).

The number of records kept can be changed by selecting "Prefs" from the initial Sarcalc screen (Subsection 6.5). The database can be erased by deleting the database "SarcalcDB" from the main Meazura™ screen, as shown in Figure 24.

1. Tap the upper left-hand corner of the main screen to show the "App" drop-down screen.
2. Select "Delete".
3. Select "SarcalcDB" to delete. Individual records cannot be erased.



Figure 24: Database Delete Screen Sequence

## 6.5 ELT Reader Preferences

If "Prefs" is selected from the initial Sarcalc screen (Figure 20), the following items may be selected (Figure 25):

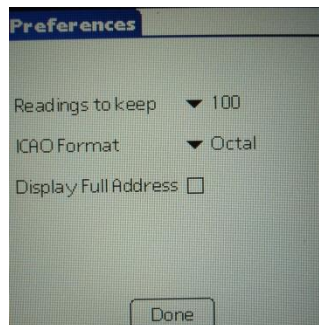


Figure 25: Sarcalc Preferences

- Readings to keep – 10, 20, 100, 1000 (Maximum number of readings to store in the database)

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- ICAO Format – Octal, Hex, Decimal (Format of ICAO Address display)
- Display Full Address – checked, unchecked (Check for display of full ELT message, bits 9 –144 (30 Hex digits) or leave unchecked to display only bits 26-85 (15 Hex digits))

## 6.6 Printing Messages (No longer supported, for reference only)

The message may be printed (via serial connection) by selecting "Print" from the Measure or Review screens. The report will print all the displayed data.

**NOTE:** Artex does not provide or support the optional printer software, contact the recommended source below.

The print function relies on the Stevens Creek Software application PalmPrint™ or SCSPrint™. Either PalmPrint.prc or SCSPrint.prc must be installed on the base Meazura™ unit for printing to function. PalmPrint™ or SCSPrint™ are available from:

**Stevens Creek Software, LLC**

P.O. Box 2126

Cupertino, CA 95015


Email: <http://www.stevenscreek.com/contact.html>

[www.stevenscreek.com](http://www.stevenscreek.com)

Printing preferences are selected from the main Meazura™ screen by selecting PalmPrint™ or SCSPrint™ and then choosing serial connections, and choosing an appropriate printer type. Poorly formatted or illegible text may be caused by incorrect serial port speed or printer type selection. For more information contact the printer software vendor.




## 6.7 Sarcalc Desktop

The Sarcalc Desktop application SarCalc Desktop V 3.01 (or higher) may also be installed on a PC (available as a free download at [www.acrartex.com](http://www.acrartex.com)). Once installed, the entire Sarcalc or Artex database can be reviewed.

1. Open desktop browser and go to [www.acrartex.com](http://www.acrartex.com)
2. Select options in the following order:
  - **SUPPORT**
  - **ARTEX SUPPORT**
  - Under **DOWNLOADS**, select **SARCALC DESKTOP Software**
3. Open File Folder **SARCALC DESKTOP Software**
4. Select **SarCalcInstall.exe. Setup Wizard** will open.
5. Perform steps below:
  - **Next**
  - Read **License Agreement** and Select **I Agree**
  - Select **Destination Folder** and **Install**
  - **Finish**
6. Open program **SarCalc Desktop** 
7. There are two methods to obtain the SarcarcDB.prc

**NOTE:** The Meazura™ unit must be Hot Sync'd with the Palm Desktop™ software to load the database from the Meazura™ MEZ1500 to the PC.

8. Open **Palm Desktop** and perform **Hotsync** operation. (Refer to sections above).

9. Open **SarCalc Desktop**  and click on .
10. Open **Computer/OS (C:)/ProgramFiles(x86)/Palm/" Select Correct User"/Backup**
  - Example: Computer/OS (C:)/ProgramFiles(x86)/Palm/User/Backup
  - **NOTE:** You will not see the backup folder unless you use "**Salcalc Desktop**"
  - Select **Sarcalc.pdb** and **Open**
11. Tests are found on the left side and are listed by date, then time.
12. Select test and then print icon. 

## 7. Label and Report Printing (No longer supported, for reference only)

After successfully programming and verifying the ELT, tap the "Print" button for the following options (Figure 26):

- 15-Digit Hex ID label
- Country Code label
- Combined label (ME406 series)
- Report

Both the 15-Digit Hex ID and Country Code labels can be printed to a serial printer via the bottom connector on the Meazura™ MEZ1500.



Figure 26: Print Options

### 7.1 Printers

- For compatible printers, contact [support@aceeca.com](mailto:support@aceeca.com).  
**NOTE:** Artex does not provide or support the printers listed above.

### 7.2 Label Printing (No longer supported, for reference only)

Prior to printing, be sure to select the applicable printer from the "Prefs" (preferences) menu. See Subsection 4.3 for instructions on selecting preferences.

Connect the Handheld Programmer to the applicable printer using the specified cable and adapter, as applicable.

Labels for the ELT can be printed one of two ways:

- After the ELT has been successfully programmed select the "print" option, or
- From the Review screen, select the "print" option.

Once selected, the following print options will appear. Refer to Section 8 for labeling requirements.

- 15-Digit Hex ID label
- Country Label
- Combined Label (ME406 series)
- Report (Subsection 7.2)

**NOTE:** Most Artex 406 MHz ELTs have 2 separate labels for the 15-digit Hex ID and the Country name/code; whereas, the ME406 series uses a combined label.

1. Make sure the printer is connected, has the correct label stock, and is ready to print.



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2. Tap the desired label option, the label should print out.
3. If there is a connection problem, an error message will appear: "Serial Timeout. Is printer connected and powered on?" Verify connection and power.
4. Refer to the applicable printer manufacturer's instructions for additional printing details.

## **8. Labeling Requirements**

Reprogramming any ELT or C406-N series PA makes the existing 15-digit hex code label obsolete. A new 15-digit hex code label must replace the old one, as ELT labeling must reflect the programming inside.

If reprogramming the ELT also changes the country of origin and 3-digit country code, a new country and country code label must replace the old one before the ELT may be returned to service.

## **9. Civil Aviation Authority Registration Requirements**

After obtaining the proper 15-digit hex code as described in this manual, it is essential the ELT be registered. Registration forms for the US can be obtained from Artex, by contacting NOAA at 1-888-212-SAVE, or by visiting their web site [www.sarsat.noaa.gov](http://www.sarsat.noaa.gov) and clicking on "Beacon Registration Forms".

If the programming of the 406 MHz ELT in a given aircraft changes, the aircraft owner/operator must update all programming information with the appropriate local aviation authorities. Realize that if a given aircraft's ELT is replaced with one that has identical programming (or an auto-reprogramming function updates the programming to be the same), the registration does not need to change.

If the correct ELT programming is not registered, search and rescue operations may be inefficient or nonexistent. An incorrect false alarm conclusion may be made, or valuable time during a rescue effort may be lost. Proper ELT registration is extremely important. Many foreign ELT registration forms are available on the Artex web site [www.acrartex.com](http://www.acrartex.com).

## 10. Specifications and Calibration

The following subsections provide specifications and calibration information.

### 10.1 Meazura™ MEZ1500 Specifications

Operating System:	Palm/Garnet OS™5.4
Memory:	64MB SDRAM, 128MB Flash
Display:	240x320 Color, backlit LED
Communications:	USB (cable provided) Serial (921.6Kbs)
Battery:	7.4V Li-Ion 1700mAh
Sealing:	IP67 – submersible to 1 meter (30 min)
Current Consumption:	60-120mA (depending on screen brightness) unit ON (excluding module) 120mA typical (maximum brightness). 5 mA Sleep mode

Contact [support@aceeca.com](mailto:support@aceeca.com) for more information on the base Aceeca Meazura unit or for additional accessories.

### 10.2 Handheld Programmer Module Specifications:

406 receiver range:	-60 dBm to +36 dBm (5W)
Power source:	Meazura™ internal battery
Decoding:	Per COSPAS/SARSAT C/S T.001, Issue 3 Rev. 5
Current Consumption:	10 mA unit ON <100 nA Sleep mode

### 10.3 Calibration

The Handheld Programmer is factory calibrated and does not require periodic re-calibration.

## 11. Components and Optional Equipment

The following subsections provide information on system component part numbers and optional equipment.

### 11.1 System Component Part Numbers

The Artex Handheld Programmer is being offered as a complete kit (8700) with the following parts:

Quantity	Part Number	Description
1 ea.	A3-06-2824-1	Handheld Programmer
1 ea.	110-418	Antenna, ¼ Wave Flexible Whip 418 MHz
1 ea.	452-0100	Holster, Padded ELT Test Set
1 ea.	611-0110	Cable, C406/110 Series Programming
1 ea.	611-0111	Cable, C406-N/PA Series Programming
1 ea.	611-0112	Cable, ME406 Series Programming
1 ea.	A2-07-0270	Cable, ELT 3000 Series Programming
1 ea.	A1-04-0329	SD Card (2 GB)
1 ea.	Y1-06-0316-1	Quick Start Guide

Any of the above part numbers may be ordered as a replacement or as a separate line item. Contact the Artex Customer Service department at 1-800-432-0227 or (954) 981-3333 for details.

### 11.2 Optional Equipment

If national or local regulations require that the ELT be attenuated and/or directly connected to the Handheld Programmer, the following parts may be used:

- 500-3000 Attenuator, 30 dB
- 611-9010 Cable, Coax 6 ft. TPS to BNC (For Dual Output ELT)
- 611-6013 Cable, Coax BNC to BNC (For Single Output ELT)

Commercial equivalents of any of these parts may also be used.

## 12. Troubleshooting

The following subsections provide troubleshooting and technical assistance information.

### 12.1 Trouble Shooting Guide

The following table provides user troubleshooting guidelines. For problems beyond the scope of this guide, contact Artex for return instructions.

SYMPTOM	LIKELY CAUSE	ACTION
Meazura is "locked" up, programs will not respond	Various	Perform "soft reset" by holding down both the power and backlight keys simultaneously will perform a soft reset; the Meazura stops what it was doing and restarts.  All applications and data stored in the handheld are retained.
Meazura will not respond to "soft reset"	Various	Perform "hard reset" by doing a soft reset but keeping the power key held down until the Palm Powered™ logo appears.  A confirmation message is displayed asking the user to confirm the hard reset, whereby pressing the UP arrow key will proceed with the process.  A hard reset does everything a soft reset does, but also erases all programs, data, patches, and user information.
Meazura will not power on	Dead battery	Charge battery for at least 2 hours
Meazura will not reset (either "soft" or "hard")	Defective Meazura unit	Return unit to Artex
Meazura will not power on with known good battery	Defective Meazura unit	Return unit to Artex

### 12.2 Technical Assistance

Programming ELTs with the proper information and the proper protocol is not always a straightforward process. Please be sure to thoroughly read this manual. If assistance is required, contact Artex in the United States at (954) 981-3333 or send an e-mail to [info@acrartex.com](mailto:info@acrartex.com).

### **13. Warranty Information**

The Handheld Programmer is covered by the Artex Limited Avionics Warranty for 12 months. See "**Artex Warranty Statement**" on the Artex web site at [www.acrartex.com](http://www.acrartex.com) for more details.