1. Overview:

This document is intended to provide users with all of the necessary information to understand and take full advantage of all of the Pinger Dish’s useful features. The Pinger Dish IV is designed to work with ATS JSATS tags, model SS400. With ATS’ Pinger Dish, it is easy for the user to activate and deactivate ATS' JSATS tags as well as verify that each tag’s code and alternating code, pulse rate interval (PRI), temperature setting, and hibernation interval are all set to their proper values prior to deployment.

Your Pinger Dish shipment should include the following five items:

1. Pinger Dish IV
2. Power converter / cable
3. DB-9 (serial) interconnect cable
4. 5 inch ‘magnetic stick’
5. This Pinger Dish IV User’s Guide

2. Getting Ready to Use the Pinger Dish:

*Power:* The Pinger Dish requires an external 12 Volt DC power source to operate. This power is intended to be supplied by the included power converter (and cable) when it is connected to a standard household 120 Volt AC (2-prong) outlet. The 12 Volt DC input power jack, located at the back end of the dish, is where the supplied power cable should connect to the Pinger Dish.

*Water:* The Pinger Dish must be filled with water in order to detect JSATS tag pulses. It is recommended that the user pour room temperature water into the round black cup until it covers the transducer by at least ½ an inch (filling the Pinger Dish's cup close to the top of the cup ensures optimal detection of a JSATS tag's acoustic signal).

While the Pinger Dish is designed to be water resistant, it is recommended that you take care to keep excess water/moisture away from the device as much as possible. Water that may occasionally spill from the Pinger Dish’s cup to the surface near the switches should be wiped up immediately.

*Handling JSATS Tags:* JSATS tags, though encapsulated with an outer parylene layer, are still delicate and should be handled with care (never handle the tags with a sharp metal object since this may puncture the JSATS tag's outer protective seal). It is recommended that your tags be held gently using the supplied magnetic stick when placing them in the Pinger Dish (with the magnetic stick's magnet touching the transmitter). While lowering the tag into the jig with the magnet stick, you may also use your finger to carefully guide the tag into the proper position (although with practice, you will find that the magnetic stick, by itself, works the best).
**Basic Operation:** The Pinger Dish is designed to operate in one of two modes. In the default mode of operation, (not connected to a computer) the Pinger Dish operates in a stand-alone configuration. In this mode, you can choose only one of two possible commands to send to a JSATS tag: 1) Activate the transmitter and 2) Deactivate the transmitter. A transmitter’s parameters (code and alternating code value, pulse rate interval, temperature option, and hibernation interval) may not be modified in this mode. This ensures that the tag’s basic parameters can’t be inadvertently changes by an end user who’s task is only to activate tags and verify their proper operation just be prior to deployment.

The second mode of operation requires that the Pinger Dish be connected to a computer (via a serial cable or USB to serial converter). This allows a JSATS tag’s configuration values to be modified (described in section 4). Most users will never need to use this second mode.

3. **Using the Pinger Dish to Activate/Deactivate Tags**

To turn the Pinger Dish on, press the small *Restart* button on the right side of the top of the unit (just below the LCD display). When the *Restart* button is pushed, a short “Beep” can be heard from the speaker. The Pinger Dish’s title screen will be displayed along with the two firmware versions (one for the Pinger Dish processor and a separate one for the DSP decoding processor).

The Pinger Dish will look for a JSATS tag’s signal to decode after it displays the message “Waiting for JSATS Tag Pulses”. If approximately two minutes have elapsed without a tag being detected (or a computer command being sent), the system will turn off automatically. Pushing the *Restart* button again will turn the Pinger Dish back on. It is unlikely that the Pinger Dish will unintentionally turn off during normal operation since the time between transmitter pulses should usually be less than the automatic shut-off time of two minutes.

To activate or deactivate JSATS tag, begin by placing the magnet end of the ‘magnet stick’ on an encapsulated tag. The tag’s internal inductor (near the end with the gold colored transducer) will be drawn towards the magnet and ‘snap on’ when held close (figure 1). Once attached to the magnet stick, the user should place the tag in the Pinger Dish tag jig (on the left side of the Pinger Dish cup), with the battery (long silver component) on the left side and the transducer on the right side (figure 2). The tag can be locked in place in the Pinger Dish by pushing the tag to the left into the hole on the left side of the Pinger Dish (which holds the JSATS tag in the jig, figure 3). When the tag is fully in the hole (when the tag’s battery reaches the black line), continue to move magnet stick to the left to disengage the magnet stick (the tag should allow the magnetic stick to move away while the tag remains in the hole, figure 4). This task may seem difficult at first, but, with continued practice, should eventually become routine for most users.

To remove the tag from the Pinger Dish cup, reverse the steps described in the above paragraph.
After the tag is in the jig and has been released from the magnet stick, the user can use the three position toggle switch (directly below the cup with the tag) to activate or deactivate the tag. Moving the switch to the left activates the tag (the green LED will flash) and moving the switch to the right deactivates the tag (the red LED with flash). The switch is a monetary switch and does not need to be held in the activate position or deactivate position for a very long period of time. Additionally, holding the switch in either position for an extended period of time will not extend the time that the ‘activate’ or ‘deactivate’ commands are sent to the tag (this fixed amount of time should be all that is necessary, for a properly functioning ATS JSATS tag, to detect the activate/deactivate commands coming from the Pinger Dish).

A tag in the Pinger Dish will be confirmed as being active by an audible “Beep” from the Pinger Dish whenever the activated tag transmits a JSATS code. The JSATS tag’s pulse specific values will then be displayed on the Pinger Dish’s LCD display:

1) Tag code value (4 digit hexadecimal number: $12DA for example)
2) CRC value (cyclic redundancy check; used for error detection)
3) PRI Measured (pulse rate interval, in seconds with 1000th of a second precision)
4) Estimated tag frequency (in kHz)

Note that for alternating codes (or when using the temperature option) the Pinger Dish will display the code of the most recent decode with the PRI time representing the time from the most recent decode to the previous decode.

Upon activation, the tag will first transmit both the alternating and normal codes (or the same code if a tag is not programmed for alternating codes) and then transmit the tag’s software version. Additionally, after about another 5 detections the Pinger Dish will display the number of days of hibernation the tag is programmed for. If the hibernation option is not used, the number of days of hibernation will read as ‘000’ days.

Note that temperature readings of 0C to 31C are output as the lowest five bits of the secondary code when the tag is programmed with temperature option enabled. The upper eleven bits of the secondary code will be unchanged from their programming in the secondary code when a temperature is transmitted.

If a tag does not appear to have been activated after moving the switch to the activate position, you may need to remove and reinsert the tag into the dish, and repeat the tag activation process (it is possible the tag was not properly positioned within the Pinger Dish).
4. Using the Pinger Dish in Programming Mode

To change the programmable parameters of your JSATS tags (such as the tag’s alternating code value or pulse rate interval (PRI), etc.), the Pinger Dish must be connected to a computer using the supplied DB-9 serial cable. If your computer does not have a DB-9 serial port available, but, instead, uses a USB port, you will need to purchase a USB to serial port adaptor (not provided but available from ‘Keyspan’). The Pinger Dish’s serial DB-9 connector is mounted on the back.

A terminal emulation program (also known as ‘dumb terminal’), such as ‘ProComm Plus’, must be used in order for your computer to communicate with the Pinger Dish. Various terminal emulation software packages are available on the internet. Some work quite well and are free of charge (such as ‘Tera Term’). Older computer operating systems incorporate built in terminal emulation software (such as ‘Hyper Terminal’ found in pre-‘Windows 7’ computers).

After starting one of the terminal emulation program described in the paragraph above, you must configure the computer’s communication settings. Please select the following:

1) 8 data bits
2) 1 stop bit
3) 19,200 baud
4) No parity
5) Flow control: Xon/Xoff (or None)

Also, be sure to configure your terminal emulations software to allow ASCII characters to be echoed back onto the terminal’s (computer) screen.

Once you have connected the Pinger Dish to your computer, press the Restart button. The characters shown on the LCD should be echoed back to the terminal screen on your computer. Additionally, on Restart, if the Pinger Dish detects the presence of an RS232 connection, the following character will be momentarily displayed on the Pinger Dish (and computer) screen, confirming that the Pinger Dish has detected the presence of an external computer:

RS232 Detected:
Use 19.2kb N-8-1

To place the Pinger Dish into the programming mode, type the command letter “r” (or “R”) on your computer. The following output should then be displayed up on your computer screen:
RS232 Mode:
Awaiting Command

ATS ‘Pinger Dish IV’ RS232 Mode
Available Options:
‘A’ => Activate JSATS Tag
‘D’ => Deactivate JSATS Tag
‘C’ => Code Programming
‘P’ => Pulse Rate Interval Programming
‘H’ => Hibernation Interval Programming
‘Q’ => Query Tag Battery Voltage
‘F’ => Flash Pinger Dish LED
‘X’ => Exit RS232 Mode
Select...

You must now type a character from the list displayed on the computer (‘A’, ‘D’, ‘C’, ‘P’, ‘H’, ‘Q’, ‘F’, or ‘X’) that corresponds to the function you are interested in using. For example, to change the Tag’s Pulse Rate Interval, type the letter “p” (or ‘P’). This will bring up the pulse rate interval selection menu and the user can then select the desired PRI by typing the appropriate character:

Enter New Pulse Rate Interval
(Format = XX.X seconds):

The other menu options (alternating code, temperature settings, and hibernation interval) should be self-explanatory but will probably not be useful for most customers since customer tags should come preprogrammed with the user’s desired options. These additional options were designed for internal use to assist in automating the programming/testing of ATS JSATS transmitters in the production process.

5. Additional Information:

We’ve tried to make this user’s guide as easy to understand as possible. However, if you have any questions, please contact ATS Sales at 763-444-9267 and we will be happy to assist you in getting you started.

Warranty: Your ATS Pinger Dish IV is warranted to be free from defects due to materials or workmanship for one year.