

Joey 1R

J1R

Version 1.0.1
Users Guide

Synthesized VHF Surveillance
Voice Transmitter
and
Mono Solid State Recorder
All-In-One Package

by
Tactical Technologies Inc.
&
Geonautics International Pty Ltd

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- Precautions will be undertaken to keep details restricted to members of their organization requiring such information.

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Version	By	Description	Date
1.0.0	SDE	Initial Draft	August 07
1.0.1	SDE	Touch Ups	September 07

CERTIFICATION STANDARDS

FCC Notice



This device complies with Part 90 and Part 15 of the FCC Rules.
FCCID: IP9751RV

This device meets FCC requirements as a controlled/occupational environmental device closer than 2.5 cm.

Operations is subject to the following two conditions:

1. this device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation

Australia / New Zealand

Pending

Industry Canada

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European Union



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1. INTRODUCTION

Tactical Technologies Inc. Joey 1R or J1R (Model numbers CTR-751R, CTR-752R, CTR-753R, CTR-754R, CTR-754X2R) is a 1 channel, ½ watt VHF-FM synthesized voice transmitter combined with a state of the art solid-state digital recorder and internal rechargeable LithiumPolymer battery, specifically designed for law enforcement use. The concise product description of the J1R would be **TRANSCORDER**.

The unit utilizes an external antenna for the transmitter and a single microphone for both the transmitter and recorder operations. The J1R can be equipped with an optional scrambler for added transmitter security.

The Joey1R, whilst utilizing an onboard hardware compander, derives unprecedented audio quality from its ability to capture sounds at user definable settings. The J1R uses flash memory as onboard storage, is fully configurable and allows the user to trade off between quality and recording time to suit their application.



Figure 1, The Joey1R Transcorder

The transmitter operating frequencies can be programmed through HyperTerminal (see **Error! Reference source not found.**) or may be programmed using any of TTI's Citation series receivers or the PTX-100 programming module. The recorder parameters are programmed through a PC running the supplied proprietary Joey software.

This document explains how to operate the Joey1R, it's accessories, and the associated Joey software suite.

1.1 Features

Features of the Joey1R include;

- High quality audio recovery for both transmitter and recorder
- Externally cabled microphone
- Single channel, ½ watt VHF-FM synthesized transmitter
- Transmitter has own hardware ON/OFF switch
- Program the transmitter directly from a TTI Citation Receiver or TTI PTX-100 Programmer
- Companded recorded audio for increased intelligibility
- Self powered, onboard real-time clock for increased integrity
- Outstanding concealing abilities to enhance operational usability
- Multiple recordings allowing stop / start operation
- User programmable timer record modes
- Recorder available in 64, 128, 256, 512, or 1024 MB storage capacity
- Extended record time capabilities
- High speed USB interface for faster data transfers
- Raw data download with audit trail identifiers for integrity
- Industry standard WAV compatibility for easy distribution
- Internal Lithium Polymer rechargeable battery
- Can add addition power externally, from 6 VDC to 24 VDC

1.2 Packing List

At the time of printing, a J1R standard kit contains the following items,


J1R Kit	Description
	Joey1R "J1R" Transcorder
	Microphone (3ft cable)
	Antenna
	USB program & download cable (4½ft cable)
	Citation / PTX-100 Programming Cable
	Charger for internal battery
	Joey Software CD
	TTI TX Programming Software
	Authenticate CD
	Plastic Accessory Box
	Black Storage Box

Table 1, Joey1R Standard Packing List

1.3 Using the J1R Transcorder

The J1R is designed to be used,

- operationally in a stand alone configuration, or
- in conjunction with its USB cable and a personal computer for configuration, downloading and replay of stored audio, or
- connected to a personal computer, TTI Citation Receiver, or TTI PTX-100 for Transmitter Only Frequency Programming.

Before using the J1R in an operational environment, it should first be run in *PC Mode* and the recorder configured using the accompanying Joey software. The Transmitter operating frequency must be programmed separately. See Appendix B for frequency programming instructions.

NOTE: Transmitter **must** be switched **OFF** while operating in *PC Mode*.

1.4 PC Mode – Recorder Operation

Install the Joey software and USB device drivers as described in, [Joey Software Installation Guide](#)

Using the USB cable supplied, connect the J1R to the computer and configure the unit to the desired operational parameters by running the Joey software (See Section 2 [Joey Software](#)). Make sure the Transmitter ON/OFF switch is in the OFF position.

To connect the USB cable to the Joey1R, align the *arrow and yellow dot* on the USB Cable 6 pin connector with the *yellow dot* 6 pin connector of the J1R unit, as seen in Figure 2. If you attempt to install the cable upside down, you will damage the Joey1R.



Figure 2, Aligning the USB Cable

Make sure that the connector makes contact head on with the J1R, ensuring no twist in the connection which may result in connector damage. Removal of cables also requires the connectors to come off without much twist, so that damage does not occur to the unit.

When using the USB cable, the Joey1R's recorder draws power directly from the computer through the cable.

After you are finished configuring the Joey1R, disconnect the recorder from the USB cable. The recorder will remember it's configuration parameters and will operate according to those parameters the next time power is applied.

1.5 Stand Alone Mode

Once the recorder is configured using the Joey program and transmitter frequency has been programmed using a Citation Receiver, Personal Computer, or PTX-100 programmer (see **Error! Reference source not found.**), the transmitter and recorder will remember and use the current configuration each and every time power is applied to the unit.

1.5.1 Making the Connections

For an operation, you must decide how you want to configure your J1R.

1. No matter what, you **must** connect the antenna.
2. External tethered or internal microphone?
3. Internal battery or other external power source?
(optional equipment needed)

4. Is there a need for the optional, tethered remote ON/OFF switch?

See the diagram below for connector placement on the J1R.

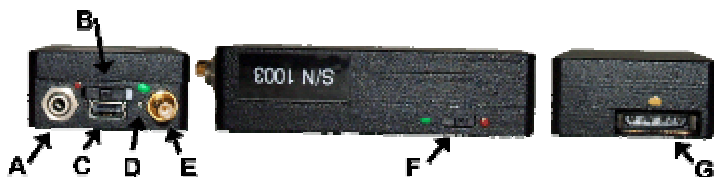


Figure 3, J1R Connections

A: External Microphone Connector

B: Transmitter ON/OFF Switch

C: Mini B connector for TX Programming and Battery Charging

D: Internal Microphone Port

E: Antenna Connector

F: MASTER On/Off Switch

G: 6 Pin connector for recorder programming, external power, or external remote on/off switch.

Antenna

Connect the external antenna to the J1R by inserting the male end of the SMC type antenna connector on the device to the female connector end on the wire antenna. Twist the connector clockwise to tighten, **HAND TIGHT ONLY!**

Microphone

Determine which of the two microphone configurations are best for your application: the long tethered remote microphone or the internal microphone.

If you choose the internal microphone, you do not need to do anything. If you choose the external microphone, connect the external microphone by inserting the plug male end of the mini connector on the microphone cable into the female jack found on the J1R. Push the connectors firmly together. Twist the plug clockwise slightly to lock the connector in place. **HAND TIGHT ONLY!** Switching between

the internal and external microphones is automatic and accomplished when the external microphone plug is inserted into (or removed from) the microphone jack on the *J1R*.

Power

IMPORTANT: *Before applying power to the J1R ensure that:*

- a) The Transmitter On/Off Switch is OFF, or*
- b) An antenna is connected to the J1R.*

Never apply power to the J1R without an antenna connected.

The *J1R* is equipped with an internal rechargeable Lithium Polymer battery which will operate both the transmitter and the recorder for up to 3 hours.

You can also apply external power to the J1R by applying 9 VDC to the optional external power cable. See the instructions supplied with this cable for it's proper use with a J1R.

1.5.2 Charging the J1R's Internal Battery

Your J1R Charger comes in two pieces: Wall plug and cable. The wall plug can be inserted into a 110 VAC outlet, or a 12 VDC cigarette lighter type outlet. Either supply can be used to charge the J1R.

Connect the cable to the Wall Plug. Connect there other end of the cable to the Mini-B connector on the J1R. Make sure Master Power Switch on J1R is in the OFF position. Now insert the wall plug into the appropriate power source.



Figure 4, J1R Charge – wall plug and cable nodule

The Red or Green LED on the wall plug does not indicate anything about the J1R's charge state, but merely that the wall plug is under power and sees a battery attached to it. The RED and GREEN LEDs on the cable nodule indicate the charge status of the J1R.

The RED LED will be illuminated at all times when the wall plug is inserted into an active power source (110 VAC or 12 VAC). When the GREEN LED comes ON – the J1R is fully charged and ready to go for an operation.

The J1R will completely charge from a full discharge state within 2 hours.

NOTE: You can not harm the J1R by leaving the charger connected to the unit for an extended period of time, and the battery does not have a 'memory' and thus will not be harmed by only partially charging it. However, it is best to fully cycle the battery as often as possible to achieve maximum battery life.

1.5.3 Using External Power with the J1R

The J1R can be powered by an external power source from 6 VDC to 24 VDC using the optional J1R-PWR external power/regulator cable.

Connect the external power cable to the J1R by inserting the female end of the friction-locking 6 pin connector on the power cable into the male connector found on the J1R . This connector is keyed for proper installation, and marked with yellow dots for proper alignment. Push the connectors firmly together.

Attach a power source to the terminal ends of the cable.

The J1R auto senses that external power is being applied, and will utilize external power as it's primary power source. The J1R's internal battery becomes a back-up or secondary supply during external power operations – and will not be utilized until the external power supply is drained or turned off.

Note: DO NOT apply external power directly to the J1R unit without using the Optional J1R-PWR cable. You will damage the J1R.

Note: The J1R is reverse polarity protected, however please be sure to connect the + and – leads to your power supply correctly for proper operation of the J1R. Pay particular attention to the markings on small batteries. When using a flying lead connector, the black lead is negative and the red or white lead is positive.

1.5.4 Microphone and Antenna Placement

As a general rule the external microphone should be as close as possible to mouth level. Sound waves travel in straight lines and the placement should reduce obvious obstructions. If a microphone is to be placed behind a surface, which is not porous, a small pin hole should be placed in the surface opposite the microphones diaphragm. Ensure that clothing or other material will not rub against the surface of the microphone.

For maximum efficiency, the J1R antenna should be kept vertical whenever possible. Placing the antenna on a metal object may result in quite poor performance of the J1R's transmitter. The antenna should not be wrapped around the J1R, nor should it be coiled or bunched in a ball.

1.5.5 Operational Mode

When power is applied to the J1R via the master power switch, the unit will wait for approximately three seconds, and then start to record using its current configuration.

Note: *The exception to this is if the unit has been previously configured for timer mode. (See [1.6 Timer Mode](#))*

Once the unit is recording, the transmitter will come on instantly when the Transmitter Power Switch is turned ON (towards the red dot).

Removing power stops the recording and the RF transmissions. Subsequent recordings and resumption of transmissions may be made by re-applying power to the recorder. This is repeatable up until the unit becomes full and cannot record any more audio. The transmitter will still operate, even if the recorder is full..

When the operation is completed or the recorder becomes full, it should be downloaded using the Joey program. The recorder does not require power to retain its recordings and downloading can happen at any time subsequent to a recording being made.

Noteworthy Operational Considerations

Before ANY use of the Joey1R:

1. Verify the TRANSMITTER is functioning correctly by checking its transmission with a good quality receiver programmed to the correct frequency.
2. Verify the RECORDER portion by operating the J1R in PC Mode and making a test recording.
3. ALWAYS use a fully charged internal battery at the start of any operation.
4. PRACTICE with this piece of equipment prior to official use.

1.6 Timer Mode

When configured to timer mode, the J1R's recorder will sleep until the next preset start time has been reached. After all timers have expired, the J1R's recorder remains in sleep mode until a power reset returns it to normal operation (see [1.5.5 Operational Mode](#)). If all start times have expired prior to power being applied, the J1R's recorder operates as if no timers had been set (see [1.5.5 Operational Mode](#)).

1.7 Recording Quality

The Joey1R's audio front end and data storage algorithms are designed to provide the user with a range of quality options ranging from direct storage of the 8 bit samples (Linear Pulse Code Modulation, LPCM) to Adaptive Differential Pulse Code Modulation (ADPCM) for the 4 bit modes.

Sampling Speed (kHz)	Typical Bandwidth (Hz)
8	3200
11	4700

Table 2, Typical Joey1R Recorder Audio Bandwidths

1.8 Recording Times

The Joey1R will yield the following recording times based on its recording profile,

Quality	Bits	64 MB	128 MB	256 MB	512 MB
11 kHz Mono	8 bit – LPCM	1.7 hrs	3.3 hrs	6.6 hrs	13.2 hrs
	4 bit – ADPCM	3.3 hrs	6.6 hrs	13.2 hrs	26.4 hrs
8 kHz Mono	8 bit – LPCM	2.3 hrs	4.6 hrs	9.1 hrs	18.2 hrs
	4 bit – ADPCM	4.6 hrs	9.1 hrs	18.2 hrs	36.4 hrs

Table 3, Recording Times

The new 1024 MB J1R will double the times found in the chart for the 512 MB unit.

The total recording time is not diminished if more than one recording is made on the Joey1R to make up the total.

1.9 Power Considerations

The J1R will operate continuously with a fully charged internal battery and both the recorder operating and the transmitter operating for up to 3 hours.

The J1R will accept any external power source (in conjunction with the optional J1R-PWR cable) capable of supplying continuous current of 13mA for just the J1R's recorder section, or 150 mA for both the recorder and the transmitter, is acceptable.

The following table is indicative of the typical recording times available using some standard battery configurations.

Battery	Cell Type	Operation	MAHrs	Timer Correction	Hrs
1 x 9v	9 VDC Alkaline	Recorder only	565	4 hrs per day	60
1 x 9v	9 VDC Alkaline	Transmit and Record	565	0.5 hrs per day	3
1 x 9v	Lithium	Recorder only	1200	4 hrs per day	120
1 x 9v	Lithium	Transmit and Record	1200	0.5 hrs per day	6

Table 4, Battery Life

When the J1R recorder is used in timer mode (see [1.6 Timer Mode](#)), the expected operating hours must be reduced.

This correction is calculated from the length of time the unit will sleep prior to the recording starting.

The following formula is used to adjust battery life in timer mode,

True Hours = Expected Hours – (Sleep Days * Timer Mode Correction)

e.g. If a unit has been set to operate in 48 hours time (see [1.6 Timer Mode](#)), the True Hours from a Lithium battery would be,

$$\begin{aligned}\text{True Operating Hours} &= 6 - (2 * 0.5) \\ &= 5 \text{ Hours}\end{aligned}$$

1.10 Concealment and Tactical Issues

Concealment and tactical issues surrounding the use of the Joey1R are beyond the scope of this guide.

1.10.1 Range of the J1R Transmitter

It is impossible to state absolutes about how far an RF transmitter like the J1R will transmit. Many variables affect the range of a device including buildings, trees, weather, construction materials, installation, etc.

All things being perfect (meaning transmissions are outdoors over flat terrain with no obstructions), a ½ watt Joey1R should be able to easily transmit over a mile. You should expect less distance than that however, in a real world operation.

One of the most important variables, and one that the operator can actually control, is the placement of the receiver and the receiving antenna. A good rule to follow is the higher the antenna placement, the better chance you have of quality reception. This alone will increase your operating range. Just having the J1R in an ideal location is not enough.

2. JOEY SOFTWARE

The Joey software package is used to configure and download audio recordings from the recorder, and erase the recorder's memory. The program also offers limited recorded audio enhancement, file conversion and playback facilities.

2.1 Computer Hardware Requirements

The recommended minimum requirements for Joey2 are,

- Pentium III 500MHz CPU
- 128MB of RAM
- Windows™ 98 operating system or better
- One USB port
- Sound card
- 50MB of hard disk space available
- CD writer + DirectCD™ or similar real-time writing software

Note: Up to 6GB free hard disk space is recommended for storage and conversion of recordings.

2.2 Installing Joey Software

To install the Joey software onto Windows™ NT, 2000 or XP Operating Systems, you must log on to the computer with **Administrator** privileges.

Insert the supplied Joey CD media into your computer. The installation should auto-start.

Note: *If the setup program does not start automatically it can be manually executed by,*

- *Open Windows Explorer and navigate to your CDROM. Double click on **JoeySetup_verx.x.x.exe**.*

Note: *verx.x.x will be dependent on the version of the software.*

- Follow the prompts until installation is complete. A step-by-step guide is provided in [Joey Software Installation Guide](#)
- .

2.3 Running Joey Software

Use the Windows™ **Start** menu or the desktop icon to run Joey. The first time you run Joey the configuration window will be displayed, see [2.4 Configuring Joey](#).

2.3.1 Joey Main Window

Joey will display the following screen on start-up assuming the PIN (see, [2.14.1 Setting and Clearing the PIN](#)) and or timer record mode (see, [2.15.2 Disabling Timer Record Mode](#)) are not set on the recorder.

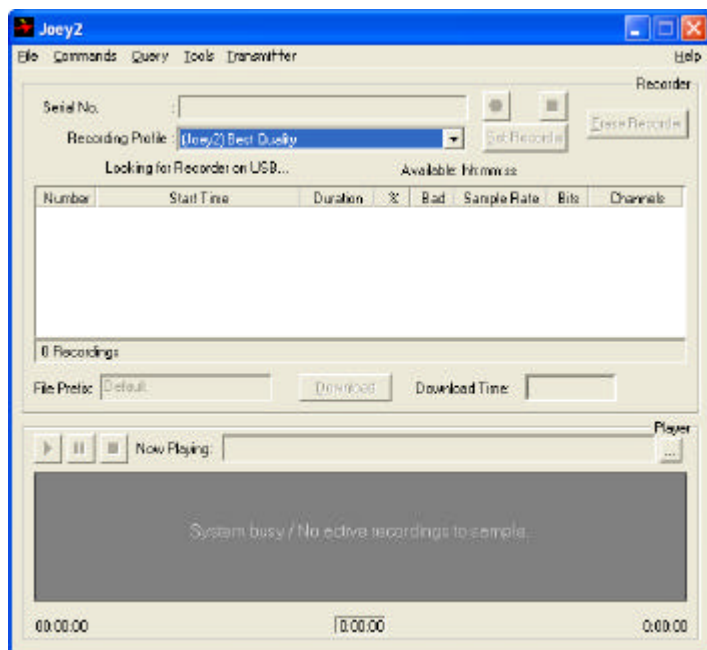


Figure 5, Joey2 Main Window

Buttons and menu items not currently available, are greyed out until such time that they can be used.

2.4 Configuring Joey

The configuration window is accessed from the tools menu and is displayed automatically the first time the Joey program is run.

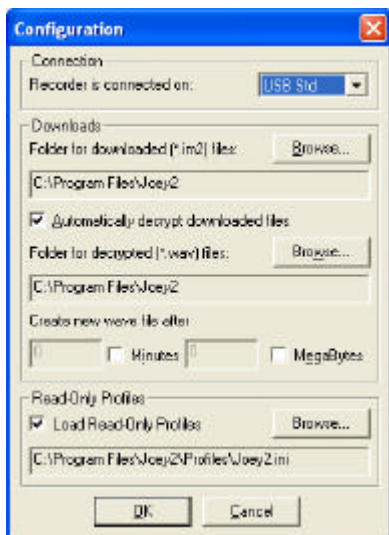
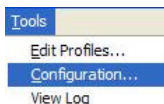



Figure 6, Configuration Window

Modify the options as detailed in [Table 5, Configuration Items](#), until they reflect the computers configuration and individual preferences, and press the  button to save these settings.

Item		Description
Connection	Download Port	USB or serial communications port used
Downloads	Browse	Select *.IM2 folder
	*.IM2 Folder	Folder to store downloaded *.IM2 files
	Automatically decrypt	Automatically decrypt to *.WAV after downloading the *.IM2 file.
	Browse	Select *.WAV folder
	*.WAV Folder	Folder to store converted *.WAV files
	Create new wave files after	Allows download to be split into size or time based files
Read-Only Profiles	Load Read-Only Profiles	Allow Read Only profile to be loaded to profile list of Joey2
	Browse	Select Read-Only Profile file
	File and Folder	Read-Only Profile File currently loaded
OK		Accept configuration changes
Cancel		Cancel the modification

Table 5, Configuration Items

The text below the **Recording Profile** in the main Joey window, details the current state of the software with regard to its connection with a unit. The messages change depending on whether the computer is using a USB or serial download cable.

Event (USB Port Selected)	Message
No download cable connected	USB cable not found
Recorder not connected	Looking for Joey on USB
Recorder connected	Connected to Joey

Table 6, USB Port Connection Messages

Event (Com x Port Selected)	Message
No download cable connected	Looking for Joey on Com x
Recorder not connected	Looking for Joey on Com x
Recorder connected	Connected to Joey

Table 7, Serial Port Connection Messages

Once a Joey is located the software will automatically try to interrogate the unit for its current profile and will provide a listing of audio recordings currently residing in the recorder's memory.

2.4.1 Update Display

When a J1R is first connected to the Joey program, it is interrogated and the program's main window is updated to display the latest information regarding the unit's recorder and transmitter.

This will result in the recording list being updated and the profile changing to show the Joey's current settings. If a profile is not available for the J1R's current settings, the parameters of the No Match profile (see [2.6.3 No Match Profiles](#)) will be changed to reflect the settings retrieved from the unit.

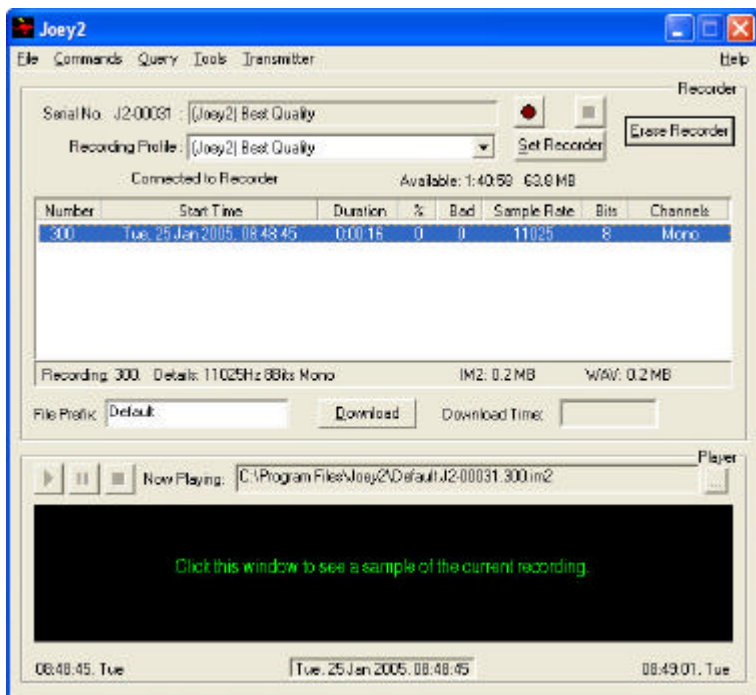
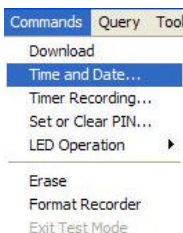


Figure 7, Updated Joey2 Window

2.5 Date and Time

Prior to using the Joey1R, ensure it has the correct date and time stored in its internal real time clock.


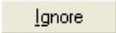
Access the following screen via the Commands menu.



The operator can then choose to synchronise the time to the computer, or set an alternative time. It is expected that the time will drift at a maximum rate of up to five seconds per day.



Figure 8, Date and Time

When a device is connected to the Joey software and the onboard real time clock is out by more than 60 seconds against the clock of the PC, a window will open allowing the user to immediately  or  the clock.

If the user chooses Set, then the Date & Time window will open.

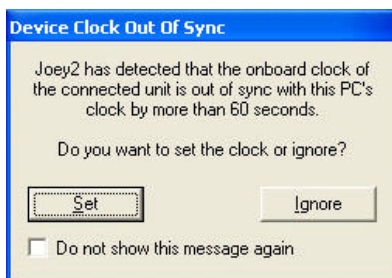


Figure 9, Clock out of Sync window

2.6 Profiles

A profile is basically the setup of the audio parameters of the Joey1R's recorder. It tells the recorder at what sampling rate and storage method to record the audio files with. Once a profile is loaded into a Joey1R, it is used every time it needs to make a recording until a new profile is loaded into the device.

There are three types of profiles that the Joey program can handle,

- Read-Only
- User Saved
- No Match

Read-Only profiles are profiles that can be loaded into Joey from files. This allows system administrators to load the same profile list for every installation of the program they run so that user errors can be minimized. These profiles can not be *deleted* from the list, unless the entire file is deselected. See [2.6.1 Loading Read-Only Profiles](#) on how to load and unload a profile file.

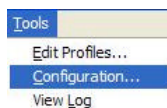
User saved profiles, are profiles created and saved within the program itself. A user may take a Read-Only profile, adjust a parameter or two and then save as a new profile. If no profiles are loaded to select from, a user may create a new profile, and save for future use. See [2.6.2 Edit Profile](#) on how to modify and save profiles.

No Match profiles are profiles contained on the recording device that do not correlate to any in the current profile list. This may occur if a device is setup on one PC and then taken and used on another PC. See [2.6.3 No Match Profiles](#)

2.6.1 Loading Read-Only Profiles

An existing read-only profile file may be loaded into Joey from the configuration window.

This will allow users to have default profiles, to use on their J1R recorders, displayed.



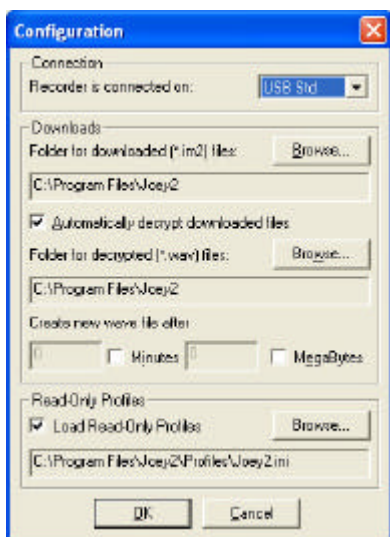



Figure 10, Configuration Window

To load a profile file, select the Load Read-Only Profiles tick box and then click on the  button to choose a file. This will show the following window,

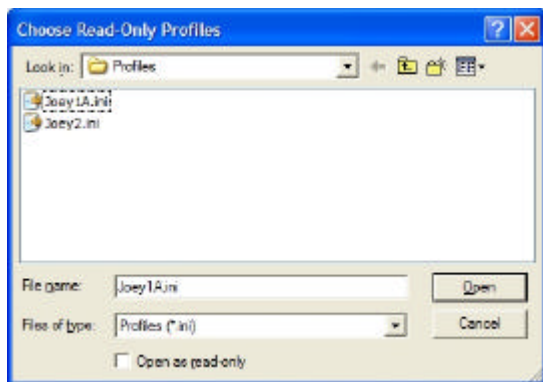
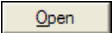


Figure 11, Load Profiles Window

Choose the appropriate profile file for your situation and click the  button. By default the program is installed with the above profile file in the Profiles directory.

Once loaded the profile list in the main window,

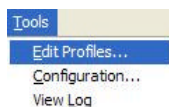


Figure 12, Profile List

will be updated with the new Read-Only profiles and any User Saved profiles already in the system.

2.6.2 Edit Profile

An existing profile may be edited or a new profile created through the tools menu in the main window.



This will result in the following window being displayed.

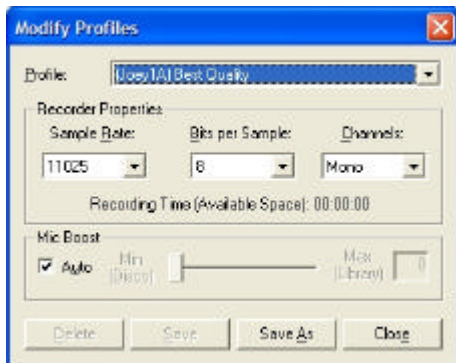


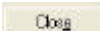


Figure 13, Modify Profiles Window

To modify a profile change the items as desired.

Item		Description
Profile		Name of the Profile
Recorder Properties	Sample Rate	Higher the number, better the quality
	Bits / Sample	Higher the number, better the quality
	Channels	Mono or stereo microphones Although Joey is mono only, this selection is useful if user has other Geonautics recorders, such as the stereo Bilby. If Stereo is selected here for J1R, Mono setup is defaulted.
Microphone Boost	Auto	Variable microphone gain based on input
	Min (Disco)	Fixed gain for loud environments
	Max (Library)	Fixed gain for quiet environments
Delete		Delete the current profile
Save As		Save the current profile to a new name
Discard		Discards the current changes made to profile and closes profile window
Close		Closes modify profile window

Table 8, Modify Profile Items

The modified profile can be saved using  to a new profile name or all changes can be discarded by using the  button, which replaces the  button once changes are made to the profile. The available recording time is updated whenever the profile is changed.

2.6.3 No Match Profiles

These occur when a profile contained on the recording device does not compare to any profiles currently loaded in the **Joey** program.

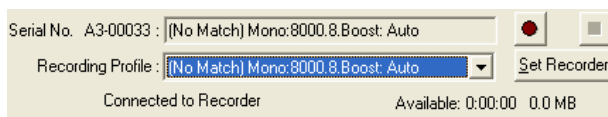


Figure 14, No Match Profile

If the profile on the device is one that could be used in future then saving it to the PC for later use is recommended. This then allows the profile to be chosen from the profile list and used to setup other recording devices . See [2.6.2 Edit Profile](#) on how to modify and save profiles.

2.6.4 Changing the Profile

The recorder's profile may be changed by selecting a preset or previously stored profile from the drop down list and pressing [Set Recorder](#) from the main window.



Figure 15, Profile Selection



Alternatively, users can create their own profile (see [2.6.2 Edit Profile](#)).

2.6.5 Programming Options for Transmitter

Any PC, any of Tactical Technologies Inc. Citation Receiver/Recorder kits, or the PTX-100 Programming Module are able to program frequency, power, and scrambling settings into the Joey1R. A special Citation/Serial Interface Cable, [Figure 39](#), is supplied with the Joey1R for transmitter programming. See [Appendix B](#) for more information.

2.7 Making a Recording

After configuring the J1R device, ensure there is adequate record time available to make a recording Available: 01:09:32 254.7 MB.

To make a recording use the  as a start and the  as the stop button. Alternatively, disconnect the recorder from the computer and use it in stand alone mode. (see [1.5 Stand Alone Mode](#))

Note: *Recordings made whilst attached to the computer will be of a quality slightly lower than similar recordings made with a battery in stand alone mode. Quality acceptance testing should only be performed using stand alone mode with a battery.*

2.8 Recording List

The recording list is automatically updated to display the recordings currently stored within the recorder's internal memory.

Number	Start Time	Duration	%	Bad	Sample Rate	Bits	Channels
300	Tue, 25 Jan 2005, 08:48:45	0:00:16	0	0	11025	8	Mono
302	Tue, 25 Jan 2005, 13:37:42	0:00:26	0	0	11025	8	Mono
303	Tue, 25 Jan 2005, 13:38:12	0:00:15	0	0	11025	8	Mono
304	Tue, 25 Jan 2005, 13:38:30	0:00:11	0	0	11025	8	Mono
305	Tue, 25 Jan 2005, 13:39:15	0:00:09	0	0	11025	4	Mono
306	Tue, 25 Jan 2005, 13:39:33	0:00:07	0	0	8000	4	Mono
0 Recordings Selected			IM2: 0.0 MB			WAV: 0.0 MB	

Figure 16, Device Recording List

The fields within the list are described as,

Field	Description
Number	Unique Recording number
Start Time	Start date and time for recording
Duration	Length of recording hh:mm:ss
%	Percentage already downloaded
Bad	Number of bad blocks found
Sample Rate	Sample rate of the recording in Hz
Bits	Number of bits used for each sample
Channels	Number of audio channels (mono or stereo)

Table 9, Description of Device Recording List

A sample of the currently selected recording can be displayed by clicking on the text [Click this window to see a sample of the current recording.](#) in the audio player window.

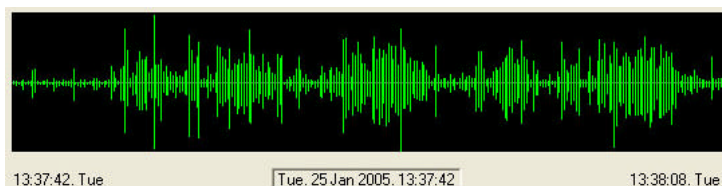


Figure 17, View the Recording Sample

2.9 Downloading the J1R Recordings

Enter a file prefix if desired, in the box provided. The file name to be used to store the recording is derived from the **file_prefix.unit_id.recording_number.IM2**. If the Joey2 software is configured to convert the *.IM2 file to *.WAV automatically, then the audio will also be stored in wave format in a second file **file_prefix.unit_id.recording_number.00.WAV**.

The configuration window is used to change the location where downloaded recordings are stored and enables the WAV file to be split to multiple files starting at ***.00.WAV**. (See [2.4 Configuring Joey](#))

Use the mouse to select the recordings within the recording list that are to be downloaded.

Number	Start Time	Duration	%	Bad	Sample Rate	Bits	Channels
300	Tue, 25 Jan 2005, 08:48:45	0:00:16	0	0	11025	8	Mono
302	Tue, 25 Jan 2005, 13:37:42	0:00:26	0	0	11025	8	Mono
303	Tue, 25 Jan 2005, 13:38:12	0:00:15	0	0	11025	8	Mono
304	Tue, 25 Jan 2005, 13:38:30	0:00:11	0	0	11025	8	Mono
305	Tue, 25 Jan 2005, 13:39:15	0:00:09	0	0	11025	4	Mono
306	Tue, 25 Jan 2005, 13:39:33	0:00:07	0	0	8000	4	Mono

Recording: 302. Details: 11025Hz 8Bits Mono IM2: 0.3 MB WAV: 0.3 MB


Figure 18, Selecting a Recording to Download

As recordings are selected and deselected, the disk space required by the ***.IM2** and ***.WAV** (optional) files will be automatically updated.


3 Recordings Selected	IM2: 0.6 MB	WAV: 0.6 MB
-----------------------	-------------	-------------

Figure 19, Storage Space Required for Download

Use the **<Ctrl>** or **<Shift>** keys to select multiple recordings.

Commence the download by pressing the  button. The download timer indicates the estimated time remaining to download all the selected recordings. The recording list will update the percentage of each download completed.

2.10 Erase J1R Recorder

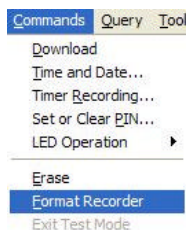
When the recordings stored on the J1R are no longer needed, use the  button to erase them. The Joey software checks to see if the recordings have been previously downloaded prior to erasing, and reconfirms the intention.

Once erased, all recordings on the J1R's recorder are **completely** removed and **cannot** be recovered.

Alternatively, the format command can be used to clear the recorder (See [2.11 Format J1R Recorder](#)).

***Note:** Erase can only be performed on the whole device; there is no way to erase individual recordings.*

2.11 Format J1R Recorder



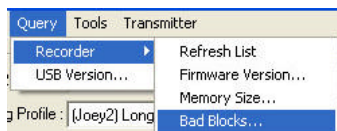
The format command is only available from the main menu and is used to verify that the J1R recorder's memory storage is error free.

Formatting can take several hours and is only required infrequently or when the device displays data errors (see [2.12](#)) during downloads.

***Note:** Format deletes all data from the recorder.*

2.12 Bad Blocks




Formatting (see [2.11 Format J1R Recorder](#)) the J1R recorder locates and accounts for bad memory blocks. After a format has been performed the list of bad blocks is updated.



Use the Query menu to view the number of bad blocks discovered (and the percentage of the total blocks available that are bad) during the format. It is not unusual for up to 2% bad blocks to be present. If you experience more than this please contact your local Geonautics representative. The recorder can handle any number of bad blocks, however too many bad blocks would impact on recording times.

For a more detailed look at how file integrity works on the Joey1R recorder see [APPENDIX B - Audio File Integrity](#).

2.13 Playback

After downloading, the last J1R recording is automatically selected in the audio player and can be played back using the play , pause  and stop  buttons.

Alternatively, position the current position of the playback cursor by clicking into the audio sample window and hit the play button to play from that point.

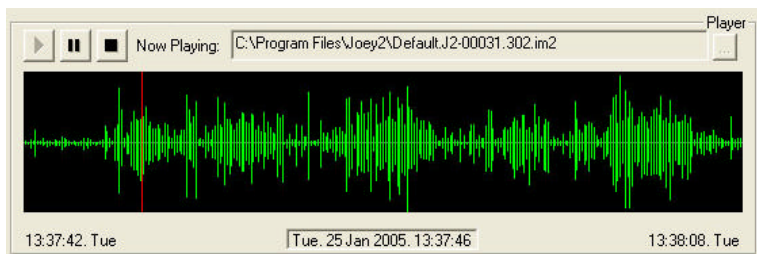



Figure 20, Recording Playback

To select a previously downloaded file click on the corresponding recording in the list or use the  button to browse the computer's disk for *.IM2 and *.WAV files.

When playing a J1R *.IM2 file, the date and time of the current cursor position is updated continuously. This feature is unavailable when replaying WAV files.

2.14 PIN Functions

The PIN number secures the J1R recorder so that it cannot be used with the Joey program until the correct number is entered. The PIN does not affect stand alone operation of the recorder.

Note: Once a PIN has been set within a Joey1R, it can only be RESET by the factory.

Please ensure you keep a record of your PIN in a safe place.

2.14.1 Setting and Clearing the PIN

The Set PIN widow is displayed via the Commands menu within the main window.

If a PIN is not currently set, then the following window will be displayed.

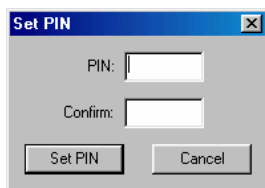
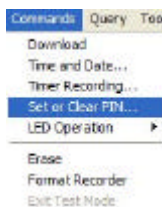



Figure 21, Setting the PIN

Enter and confirm the PIN and press the  button.

Note: You cannot set the PIN to 0000.

If a PIN is already set on the unit then the following window is displayed and may be used to change or clear the existing PIN.



Figure 22, Changing or Clearing the PIN

2.14.2 Entering the PIN

If a PIN is currently set on the Joey1R, the following window is displayed every time the recorder is connected with via the Joey software and no further action can be taken until a correct PIN has been entered.



Figure 23, PIN Entry

Once the PIN is entered the program continues as normal.

2.15 Timer Record Mode

The Joey1R recorder is capable of starting and stopping recording automatically via its timer record mode.

Note: *Timer record mode places addition current requirements on the recorder's batteries. See [1.8 Power Considerations](#).*

2.15.1 Setting Timer Record Mode

The Timer Recording window is displayed via the Commands menu within the main window.

The J1R recorder can have up to 5 timer events.

The user is able to pre-define times and dates for the recorder to record automatically.

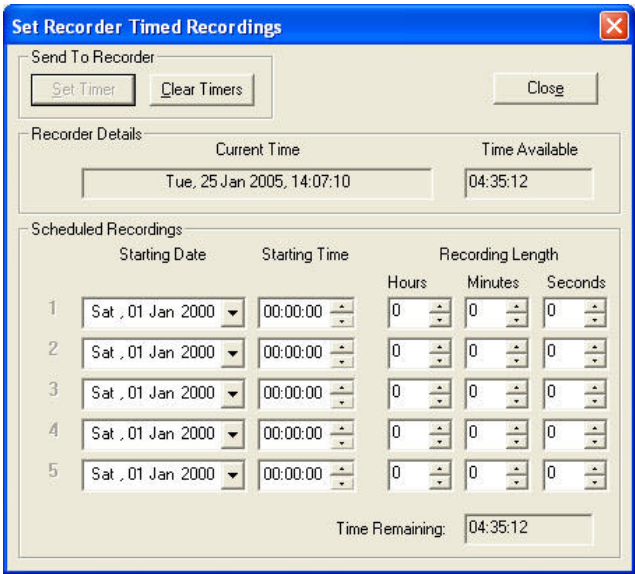
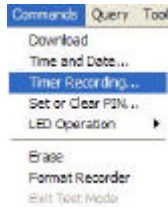


Figure 24, Set Recorder Timed Recordings

If times overlap or periods are longer than available memory on a device, a warning message will be displayed.

2.15.2 Disabling Timer Record Mode

If the J1R recorder has any valid start times which are yet to expire then the following window is displayed, when the recording device is connected to the Joey software.

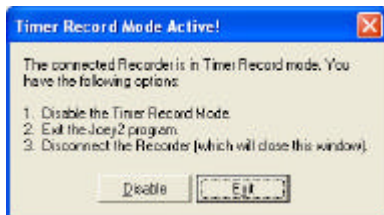


Figure 25, Active Timer Mode

Disable the timer record mode or wait for any start times to expire before attempting to proceed.

2.16 Post Process Filtering

The Joey program has some simple filters that can be applied to recorded WAV files to remove unwanted background sound and “enhance” the sounds of interest.

Select WAV Enhance from the File menu to utilize this feature. This will open a dialog box that allows the user to browse and select the file to convert and the type of filter to apply to the selected file.

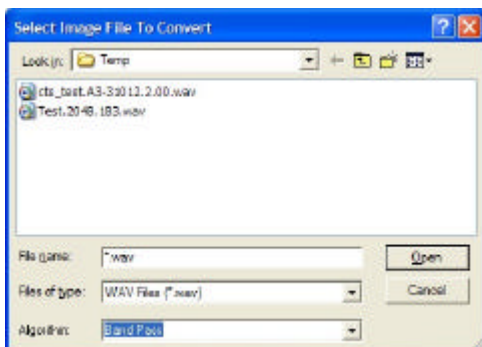
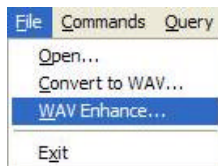
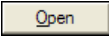
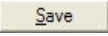


Figure 26, Open file dialog for Filtering

Type of Filter	Description
High Pass	Attenuates frequencies below 300Hz
Low Pass	Attenuates frequencies above 3300Hz
Band Pass	Attenuates frequencies below 300Hz and above 3300Hz
Normalized	Attempts to apply a companding effect to the recording
High Pass Normalized	Attenuates frequencies below 300Hz and attempts to apply a companding effect to the recording
Low Pass Normalized	Attenuates frequencies above 3300Hz and attempts to apply a companding effect to the recording
Band Pass Normalized	Attenuates frequencies below 300Hz and above 3300Hz and attempts to apply a companding effect to the recording

Table 10, Description of Available Filters

Once a file and type of filter have been selected, click the  button. Next you will be asked the location and name of the file to save, once entered, click the  button.

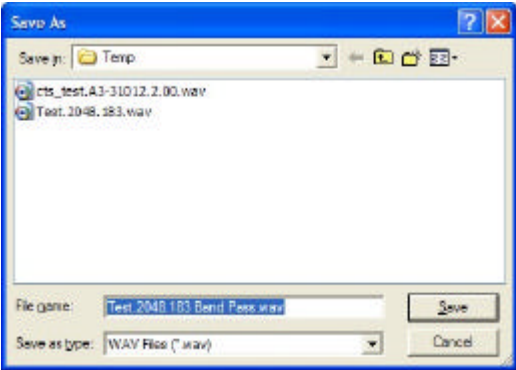


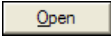
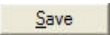
Figure 27, Save As dialog for Filtering

The size of WAV file and type of PC, will determine processing time, the faster your PC the shorter the time to process.

Once processed, the newly created file is ready for listening.

2.17 Converting *.IM2 files to *.WAV

The Joey program allows the user to convert previously downloaded *.im2 files into *.wav files.

Once an *.im2 file has been selected, click the  button. Next you will be asked the location and name of the file to save, once entered, click the  button.

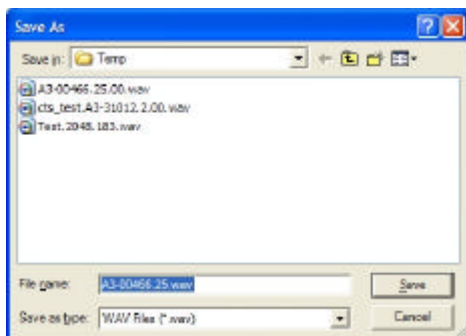


Figure 28, Save As dialog for File Conversion

The size of *.im2 file and type of PC, will determine processing time, the faster your PC the shorter the time to process. Once processed, the newly created file is ready for listening.

2.18 Joey Administration

The Joey program allows the user to mask certain parts of the program from operators. These items will then be grayed out, so an operator can not inadvertently select and alter.

Once selected, the following window is displayed,

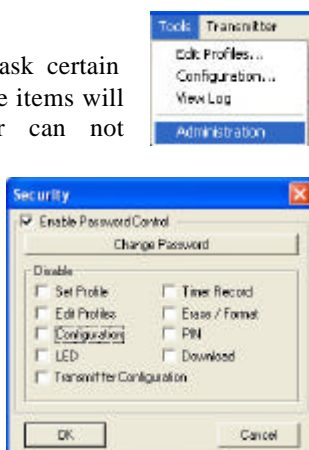


Figure 29, Initial security dialog

To implement security control over certain elements of the Joey program, tick the Enable Password Control option in the dialog, then select any items you would like to disable from the operator. An example is shown below,

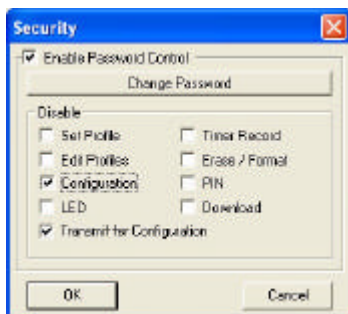


Figure 30, Selecting actions to mask out

Once your selections have been made, click the **Change Password** button, the dialog to the right will be displayed asking you to enter and confirm your password.

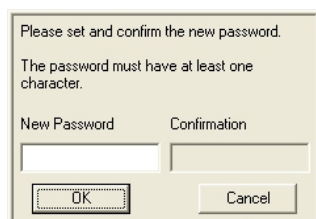


Figure 31, Setting a password

When a password has been set, you will be displayed the following dialog to re-enter the Security section of Joey,



Figure 32, Asking for password

If an incorrect password is entered the window shown to the right will be displayed.



Figure 33, Incorrect password supplied

3. JOEY1R HARDWARE

3.1 Joey1R Transcorder

The J1R is a ruggedly built unit with an external male SMC connector for the transmitter's antenna, a female mini connector for the external microphone, a 6 pin multi-port connector used for communications and external power, and two hardware switches. This switches are to control the master power, and the transmitter's on/off function.

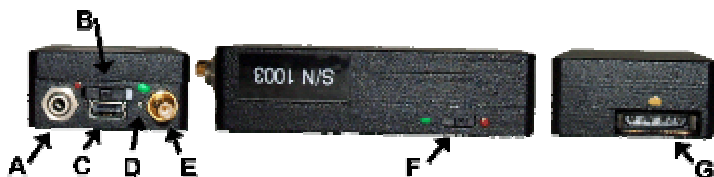


Figure 34, J1R Connections

A: External Microphone Connector

B: Transmitter ON/OFF Switch

C: Mini B connector for TX Programming and Battery Charging

D: Internal Microphone Port

E: Antenna Connector

F: MASTER On/Off Switch

G: 6 Pin connector for recorder programming, external power, or external remote on/off switch.

3.2 Cables and Connections

The Joey1R uses the following cables at various stages of operation.

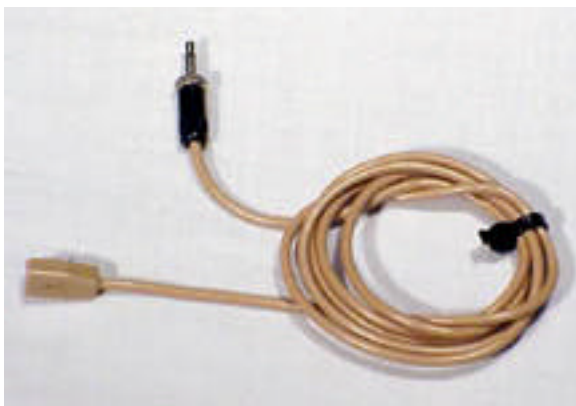


Figure 35, Cabled Microphone



Figure 36, USB Communications Cable



Figure 37, Antenna



Figure 38, J1R-PWR External Power Cable - OPTIONAL



Figure 39, Citation/PC TX Programming Cable

(PENDING PHOTO UPDATE)

Figure 40, Remote Switch



Figure 41, Internal Battery Charger Cable

3.3 Multi-port Connector Pin Configuration

The 6 pin connector located on the J1R is used to connect either the USB download cable, external power via the J1R-PWR optional cable, or the Remote Switch

Pin 1 of the connector is the pin on the inside edge of the J1R.

3.4 Optional Joey1R Scrambling Feature

The optional TX audio scrambling feature, allows your RF transmissions to be encoded so that an ordinary receiver will not be able to understand what is being transmitted. The operation of the scrambler is programmable via the program a unit section.

In order for the scrambler to be useful, you must also own a Tactical Technologies Inc. compatible RF receiver with scrambling decode capabilities. See your TTI or Geonautics representative for further details.

3.5 Specifications

Joey1R

Property		Specification
Size	metric	
	imperial	
Temperature	storage	-20°C to 70°C / -4°F to 158°F
	operating	-5°C to 65°C / 23°F to 149°F
Operating Voltage		7 to 10v DC
Operating Current (maximum)		13mA Recorder Only 150mA Transmitter and Recorder
TX Frequency Range		150 – 174 MHz – programmable
Channels		One – programmable frequency
RF Output		500 mW
Frequency Stability		2.5 pm @ 0°C to 55°C
Modulation Type		F3E
Harmonic/Spurious		<43 dBc
Deviation		2/5 kHz
Antenna		Remote 50 ohm
Serial Number		Electronically imbedded

Sleep Current		1mA (sleep on timer mode)
Quantisation	8 bit	LPCM linear
	4 bit	ADPCM non-linear
Dynamic Range (typical)	8 bit	>42dB
	4 bit	>38dB
Sample rates		8kHz, 11kHz
Audio Bandwidth	8 kHz	200 – 3200 Hz
	11 kHz	200 – 4700 Hz
Computer Interface		USB 1.1 or greater
Software Compatibility		Microsoft TM Windows 98 or later

Table 11, Joey1R Specification

APPENDIX A - JOEY SOFTWARE INSTALLATION GUIDE

Installing Joey Software onto a computer can be divided into installing the software and installing the associated USB driver.

A.1 Installation of the Joey software

Insert the Joey software CD into your computer. The setup process should start automatically.



Figure 42, Setup

If you have installed either the Geonautics *Whisper2 software* or the *Joey software* previously, the following window is displayed.

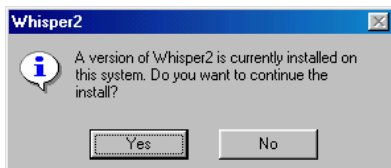
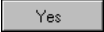


Figure 43, Previous Install Message

Press  to continue with the installation.

Note: *If the setup program does not start automatically it can be manually executed by,*

- *Open Windows Explorer and navigate to your CDROM. Double click on **JoeySetup_verx.x.x.exe**.*

Note: **verx.x.x** will be dependent on the version of the software.

Press



Figure 44, Licence

The software license and copyright notice are displayed. Please ensure you read the full license and understand your obligations.

Press

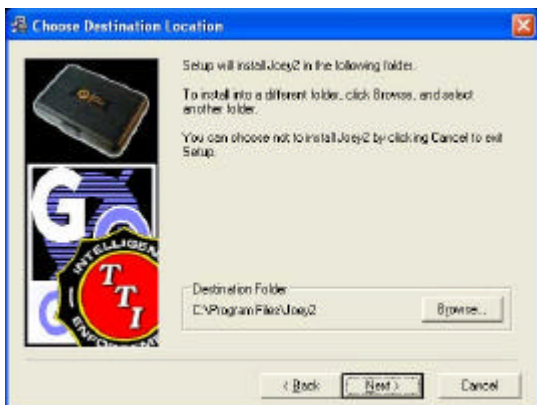


Figure 45, File Destination

Enter the destination folder where you want to install the software. If you are unsure it is recommended that you accept the default values.

Press



Figure 46, Adobe Install Screen

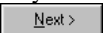

Documentation associated with Joey2 (including this help file) is distributed in Adobe Acrobat 5 format. Choose whether you would like to install or upgrade your Acrobat Reader and press .



Figure 47, Start Install

Press  again to perform the installation.

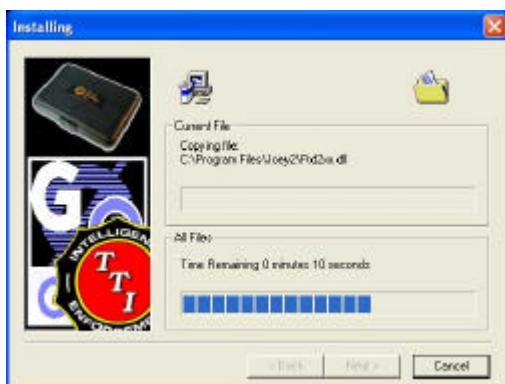



Figure 48, Installing...

On completion the following window is displayed:



Figure 49, Installation Complete

Press . You will be prompted to reboot the computer.

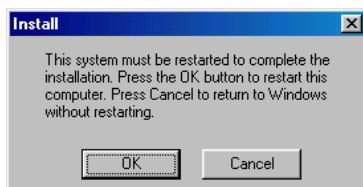
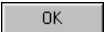


Figure 50, Reboot

Press  to reboot the system immediately. The computer must be rebooted before the Joey software is run.

A.2 Installation of the “Geonautics Dongle I” USB Device Driver

Please refer to section below that matches your computers operating system:

- Windows 98 – USB Driver Installation Procedure on page 56
- Windows 2000 – USB Driver Installation Procedure on page 59
- Windows XP – USB Driver Installation Procedure on page 62

A.2.1 Windows 98 – USB Driver Installation Procedure

Ensure the Joey installation CD is in the computer’s CDROM drive. (If you have previously installed Joey and the auto-install begins press

No

when you are warned it is already installed.)

Plug the USB cable into the computer. The “Add New Hardware Wizard” should activate and be searching for “Geonautics Dongle I”.



Figure 51, Dongle Driver 98 Install

Press . The "What do you want Windows to do?" window should appear.



Figure 52, Dongle Driver 98 Search

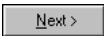

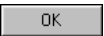
Select the Search for the best driver for your device. (Recommended) and press  to bring up the search window.



Figure 53, Driver Location 98 Screen

Tick the “Specify a location” option and press . Select the Drivers directory on the CDROM drive and press . The drop down box option should now display **CDROM:\Drivers**.


Press the  button. A confirmation window displaying the “Geonautics Dongle I Device” and location of the driver as **CDROM:\Drivers\Geonau~2.INF** should now be visible.



Figure 54, Driver Install 98 Ready



Press . The driver will now install. A final window is displayed with “Geonautics Dongle I Device” clearly written at the top of the window. The window should state “Windows has finished installing the software that your new hardware device requires”.



Figure 55, Dongle Driver Install 98 Complete

Press . The appropriate USB driver should now be installed.

A.2.2 Windows 2000 – USB Driver Installation Procedure

Ensure the Joey installation CD is in the computer's CDROM drive. (If you have previously installed Joey and the auto-install begins press  when you are warned it is already installed.)

Plug the USB cable into the computer. The "Found New Hardware Wizard" should activate.



Figure 56, 2K New Hardware Found


Press . The "What do you want the wizard to do?" window should appear.



Figure 57, 2K Find Driver


Select the “Search for the best driver for the device (Recommended)” option and press . A new window should appear asking you to select possible search locations for the device driver.



Figure 58, 2K Driver Location


Tick the “Specify a location” option and press . A new window appears asking for the location of the manufacturer’s drivers for the USB device.



Figure 59, 2K Specific Driver Location


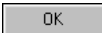
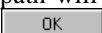
Click  and select the Drivers directory on the CDROM drive and press . The selected path will now be displayed in the window as shown above, click  to continue. The New Hardware Wizard window should now display **CDROM:\Drivers\GeonauticsDongle.inf** as confirmation that Windows found the driver for the device as below.



Figure 60, 2K Driver Install Ready

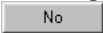
Press **Next >**. The driver should now be installing. A final window should be displayed with “Geonautics Dongle I Device” clearly written at the top of the window. The window should state that “Windows has finished installing the software for the device”.



Figure 61, 2K Install Finished

Press **Finish**. The appropriate USB driver should now be installed.

A.2.3 Windows XP – USB Driver Installation Procedure


Ensure the Joey installation CD is in the computer's CDROM drive. (If you have previously installed Joey and the auto-install begins press  when you are warned it is already installed.)

When the supplied USB cable is plugged into your computer's USB port Windows XP will popup the "Add New Hardware Wizard" to help install software for the "Geonautics Dongle I Device"



Figure 62, XP Found New Hardware

Select the "Install the software automatically (Recommended)" option.

Pressing  starts a search for the "Geonautics Dongle I Driver". Once the driver is found the following warning message may be displayed.

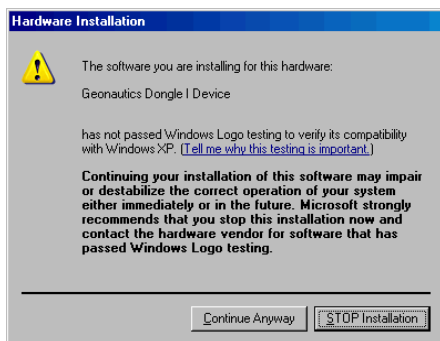


Figure 63, XP Windows Signature message

If so press **Continue Anyway** to start installing the files associated with the "Geonautics Dongle I Device".

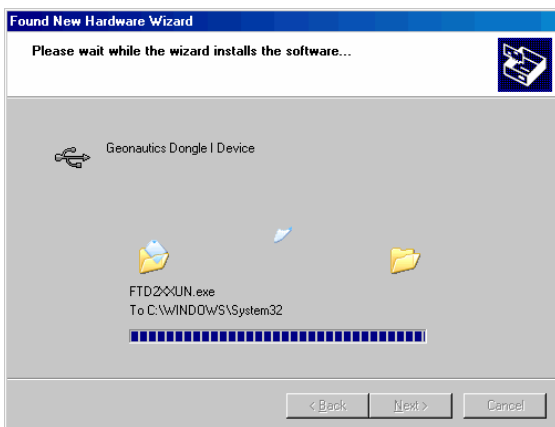


Figure 64, XP Driver Installing

As the installation completes a final dialog box is displayed to verify that "Windows has finished installing the software for: Geonautics Dongle I Device".

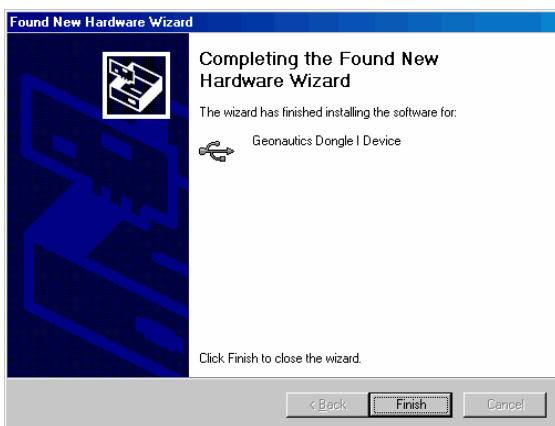


Figure 65, XP Driver Install Finished

Press **Finish**. The appropriate USB driver should now be installed.

A.2.4 Trouble Shooting the USB

If you are having trouble connecting your Joey1R to the Joey software please take the following steps.

- From the "Control Panel" on your computer select "System".
- Select the "Device Manager" option. This might be its own TAB or it could be under the "Hardware" tab.
- Select the "Universal Serial Bus Controllers" and ensure that there is a "Geonautics Dongle I Device" driver installed under this option. If there is not please try and reinstall the Geonautics Dongle I device driver. (see *Appendix A, Installation of the "Geonautics Dongle I" USB Device Driver*)
- When running the Joey software ensure that you have the correct port selected. If you are using the USB cable then ensure that the USB option is selected in the Joey2 software.
- Consult your manual for further information regarding connections.
- Contact your Tactical Technologies Inc. or Geonautics representative.

APPENDIX B - TRANSMITTER INFORMATION

B.1 Transmitter Software Installation Guide

The computer program supplied to install the frequencies into your J1R transmitter is a module written for Microsoft's HyperTerminal program. HyperTerminal is supplied with Windows operating systems. If HyperTerminal is installed, you can proceed.

If you have not installed this program onto your computer, please do so at this time if you intend to program your transmitter frequencies via a computer.

Installing HyperTerminal in Windows:

- a) Select "START" from the windows Task Bar
- b) Select "Settings" – "Control Panel" from the Start Menu
- c) Select "Add/Remove Programs" from the Control Panel
- d) Select the "Windows Setup" tab at the top of the window
- e) Double-click on "Communications" in the 'components' window
- f) Click the box next to "HyperTerminal". This puts an X in the box
- g) Click "OK" at the bottom of the window
- h) Click "OK" at the bottom of the new window
- i) Follow the on screen instructions to complete the process

Installing the TTI Transmitter Programming Module:

- a) Insert the supplied CD into your PC
- b) Select "START" from the Windows Task Bar
- c) Select "RUN" from the Start Menu
- d) Type "<drive letter>:\setup" in the space provided
- e) Select "OK"
- f) Follow the on screen instructions
- g) Remove CD when finished

B.2 Programming the Joey1R Audio Transmitter's Operating Frequency

Programming the frequency used by the Joey1R transmitter can be achieved in one of three ways.

- Connecting the Joey1R to a personal computer that has the TTI transmitter software installed (see [APPENDIX B - Transmitter Informaiton](#))or,
- Connecting the Joey1R to a Citation receiver (see your Citation User Guide for more information).
- Connecting the Joey1R to the TTI Model PTX-100 Portable Transmitter Programmer.

B.2.1 For programming from a personal computer:

- 1.) Connect the CTR-75xR TX programming cable to the top of the transmitter via the Mini-B connector. This connector is keyed for proper installation.
- 2.) Connect the D style 9 pin female connector to an open serial port on your IBM compatible computer
- 3.) Start the "TTI Transmitter Programming" software by clicking it's icon located on the Windows Desktop.
- 4.) By default the program is set to communicate via COM 1.

- 5.) Turn ON both the MASTER switch and the TRANSMITTER switch. At this time, your computer screen should look similar to the following:

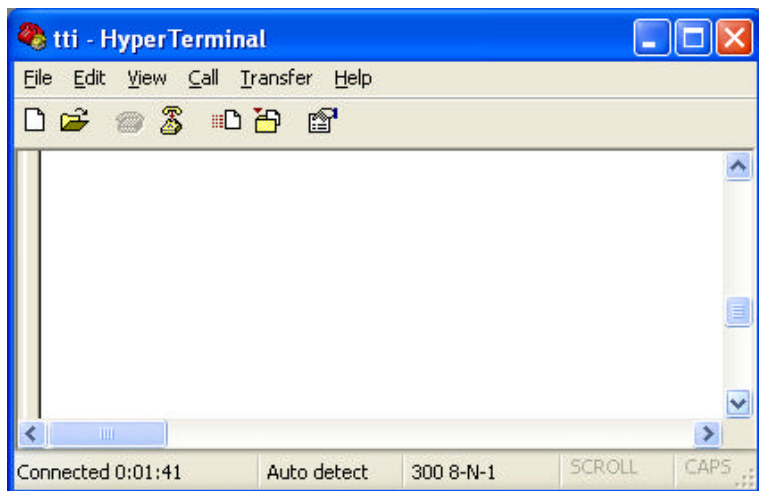


Figure 66, Start Screen

The following commands are accepted by the J1R:

Command	Description
F	Begins the new frequency programming sequence
V	Verifies the frequency that is currently programmed in the transmitter
C	Selects CLEAR transmission mode, for units shipped with the scrambling option
S	Selects SCRAMBLE transmission mode, for the units shipped with the scrambling option

Table 12, J1R TX Programming Commands

Note: All commands are lower case letters.

- 6.) Begin by verifying the information about your transmitter. Type a v. Immediately upon your entering a "v", the program will report the unit's ID (J1R X), an approximation of operating time in minutes (180m = 180 minutes) as well as a percentage of internal battery life available (ie: 95%), and finally the frequency that is

currently programmed into the unit (ie: $1621000 = 162.100$ MHz). The screen will look something like the following:

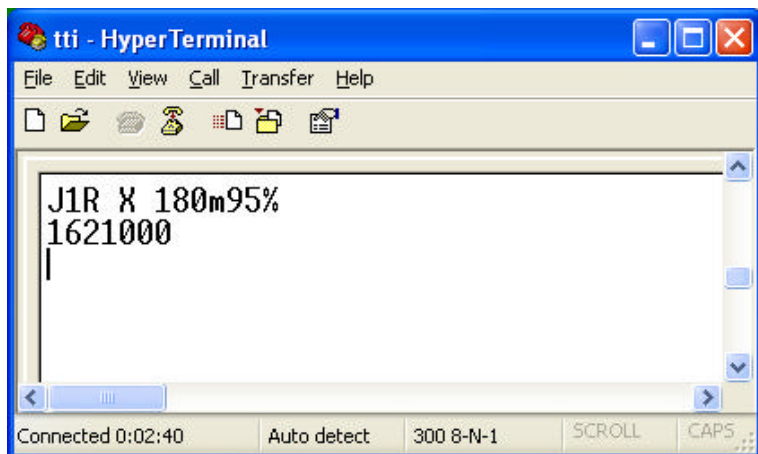


Figure 67, Verifying unit details

7.) Program your frequency. Type an f. The computer will respond with "f=1", as follows:

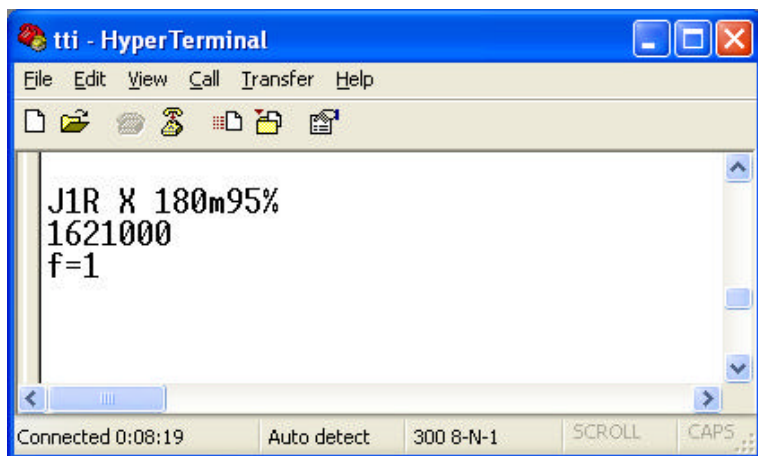


Figure 68, Frequency Programming

8.) Then type in the remainder of the frequency of operation for the J1R. EX: type 548000.

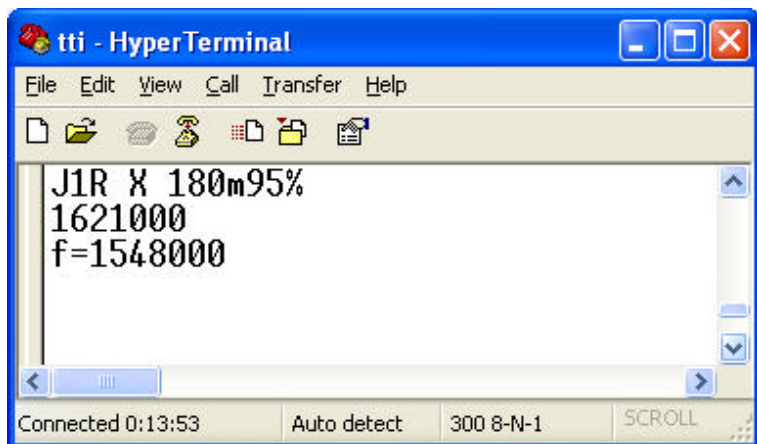


Figure 69, Frequency entered

At this point, the program is awaiting another instruction from you; either an f, v, c, or s. (Remember: c or s are only valid entries on scrambled units.)

- 9.) After you have finished validating your entries, turn off your transmitter, disconnect the cables, and close the computer program.

If you enter an invalid frequency, the software will respond on the screen as follows:

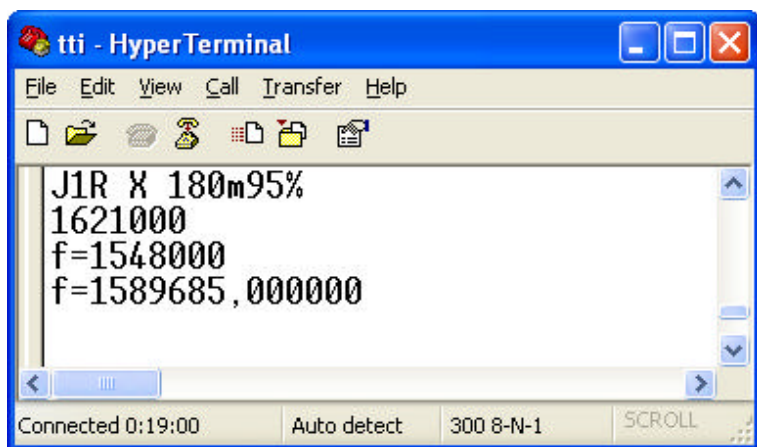


Figure 70, Invalid frequency entered

As you can see from the example, the frequency entered was 158.9685 MHz. This is invalid. The software responds with a comma, then 6 zeros, and a carriage return. At this point, the program has not updated your transmitter, and is awaiting an input instruction (f, v, c, or s) from you. Enter an f so that you may re-enter a correct, valid frequency. Read the section titled “Operating Frequencies” for more information on valid and invalid frequency selections.

FOR SCRAMBLED UNITS:

If your transmitter is equipped with scrambling capabilities, this will be noted with an "S" or a "C" after the model number instead of the "X". The S or C denotes whether the unit is in scrambled mode or clear mode.

At any point in the sequence where the program is awaiting an input instruction, you can set the 'scramble' or 'clear' mode by typing sv ("s" sets scramble mode, plus the "v" verifies the programming) or cv ("c" sets to clear mode, plus the "v" verifies the programming).

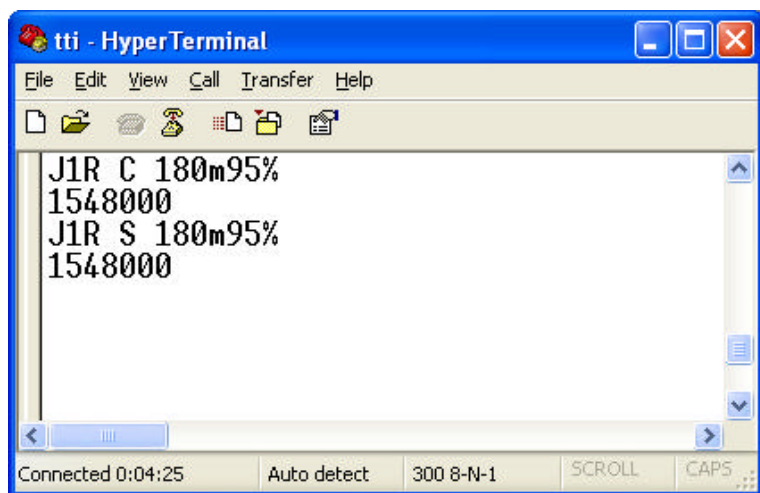


Figure 71, Scrambled entered

In order for the scrambler to be useful, you must also own a Tactical Technologies Inc. compatible RF receiver with scrambling decode capabilities.

VALID AND INVALID FREQUENCIES

Operating Frequencies

The frequencies available on the Joey1R are spaced in 12.5 kHz steps beginning with 150.0000 MHz and ending with 174.0000 MHz.

Simply put, “12.5 kHz steps” means your frequency must be in any of the following configurations:

1xx . x000
1xx . x125
1xx . x250
1xx . x375
1xx . x500
1xx . x625
1xx . x750
1xx . x875

This gives the Joey1R the ability to transmit on any one of 1680 available frequencies.

Certain special application Joey1R units may have the ability to also use frequencies that are in 5 kHz steps. These configurations look like this:

1xx . x000
1xx . x050
1xx . x100
1xx . x150
1xx . x200
etc...
1xx . x950

See your TTI or Geonautics representative for further details.

B.2.2 Programming from Citation

CITATION 20

Your Citation 20 has the ability to program your J1R directly from the panel - via the DB9 connector marked "**PROGRAM**". You can also program a channel in your Citation 20 with a frequency that is pre-programmed into your J1R.

PROGRAM YOUR J1R

- 1.) Make sure your Citation 20 is powered up - from any of the three possible power sources.
- 2.) Connect the J1R's Citation/Serialprogramming cable to the transmitter. See your transmitter's operator's manual for the correct connection procedures.
- 3.) Connect the D style 9 pin female connector to the male DB9 connector marked **PROGRAM** near the top left of the Citation 20 panel.
- 4.) Turn on your transmitter.
- 5.) Select an unused channel on your Citation 20. (NOTE: The frequency information entered here will also be programmed into the Citation 20 in the channel you use. Make sure you start with either a blank Citation 20 channel, or a channel you will want to use with this particular transmitter.)
- 6.) To VERIFY the information already programmed into the transmitter, press the **ENTER** key on the Citation 20, then press the **0** key on the keypad. The transmitter will write its information into the Citation 20's selected channel. The Citation 20 display will look something like this:



You can see in the example, the RX channel number (99), the frequency from the transmitter (154.6000), and the status of the J1R's internal battery (approx. 95% capacity, 180 minutes operating time remaining). Battery percentage numbers change in 5% step. At this point, you have also programmed channel 99 of the Citation 20 with the frequency 154.6000 MHz.

7.) To program a **NEW** frequency into the transmitter (and simultaneously into the Citation 20), press the **FREQ** key on the Citation 20. The display will show the cursor placed over the first programmable digit in your transmitter.

8.) Enter the desired frequency into the Citation 20 keypad.

9.) If you enter an invalid frequency, the Citation 20 will report a frequency on its display of 100.0000 MHz. This will **NOT** be written into your transmitter.

VERIFY the TX frequency by pressing the **ENTER** key, then the **0** key. Re-program the unit with a **VALID** frequency.

10.) After you have finished validating your entries, turn off your transmitter, and disconnect the programming cables.

FOR SCRAMBLED UNITS:

1.) Connect the transmitter, setup the Citation, and power up the units as previously described.

2.) **VERIFY** the TX info by pressing **ENTER** and then **0** on the keypad. Your display will look something like this:



Our example display is showing a J1R programmed to operate at 157.2050 Mhz, Scrambled (S), over 90% battery capacity (9), the unit ID of a J1R (R), and approx. 180 minutes of operating time remaining on the internal battery.

3.) In order to change from **SCRAMBLED** to **CLEAR** (or via versa), you must press **ENTER** and then **0**

4.) You must enter a **1** to set unit to **SCRAMBLE** mode, or a **0** to set unit to **CLEAR** mode. The display will automatically update.

5.) Press **ENTER** then **0** to **VERIFY** the change. The display will look similar to this:



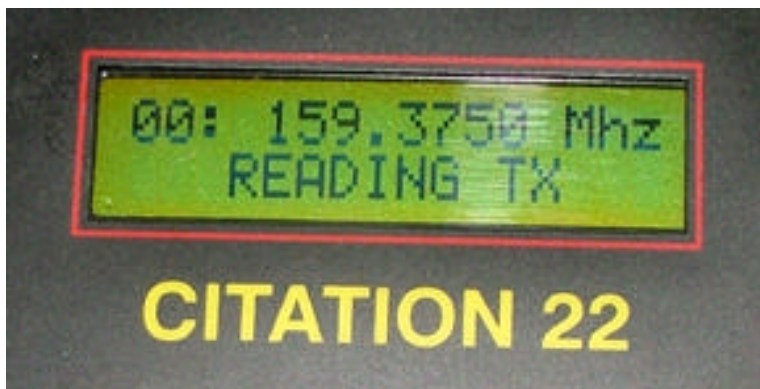
In this example, the frequency remains the same, however the transmitter is now in CLEAR mode, as indicated by the "C".

7.) You can toggle between CLEAR and SCRAMBLE mode after pressing ENTER and 0.

CITATION 22 or 24

To program your J1R with a Citation Model 22 or 24 Receiver:

- 1.) Make sure your Citation is powered up.
- 2.) Connect the J1R's Citation/Serial programming cable to the transmitter. See your transmitter's operator's manual for the correct connection procedures.
- 3.) Connect the D style 9 pin female connector to the male DB9 connector on the Citation panel.
- 4.) Turn on your transmitter.
- 5.) Press and hold the UP and Down buttons on the Citation panel simultaneously. The second line of the LCD will display READING TX.



At this point, release the two buttons. After about one second the frequency of the transmitter will be displayed on the second line of the

LCD.



The first numbers on the second line of the LCD reports the status of the J1R's internal battery – in percentage of operating capacity remaining. The above example shows the battery to be at 95% capacity. This is followed by the transmitter's current frequency. If the transmitter has a scramble option installed, the second line of the LCD will display an "S" or a "C" , combined with a single digit depicting battery capacity. Example:



This example shows a J1R in "S"cramble mode, over 90% battery capacity, "R" tells us it is a J1R, operating at 157.2050 MHz.

6.) To change from one audio mode to another, press the UP button to go from clear to SCRAMBLE or the DOWN button to go from

scrambled to CLEAR. After pressing one of the arrow buttons the second line of the LCD will display “^^^”, then briefly “CHECK TX”.



7.) Press the CHANNEL button, and the Cit-22/24 will exit program mode, and the display will revert to only one line, with channel location and frequency showing.

8.) To verify the transmitters new configuration, place the Citation 22/24 into programming mode by pressing and holding the UP and Down buttons and the display will now report the transmitter's frequency as well as it's reprogrammed audio mode.

9.) To program a frequency into the transmitter from the Citation 22/24 Receiver, connect TX Programming cable to the TX and the Citation 24., power up the Citation.

10.) If a pre-programmed channel on the receiver is your frequency of interest, press the CHAN button and scroll to that channel.

11.) Turn on the J1R. Then press and hold the UP and DOWN buttons on the Citaion at the same time, then release them after the Citation has read the TX frequency.

12.) Press the FREQ button to program the receiver's frequency into the transmitter. The second line of the LCD will display PROGRAMMING TX and then READING TX.



13.) If the frequency that is to be programmed into the transmitter is invalid, the second line of the LCD will display CHECK TX and the transmitter will not be re-programmed

14.) To change the transmitter's frequency to another frequency other than any of your receiver channels, scroll through your receiver channel and find an empty channel. Program the frequency of interest into the Citation 24, then follow the above steps to program the transmitter.

15.) To exit the programming mode of the Citation 24, press the CHANNEL button.

B.2.3 Programming from PTX-100

Connect the J1R to the PTX-100 using the Citation/Serial programming cable. Turn ON your J1R via the Master Power Switch.

Turn ON the PTX-100 via it's PWR switch.

Momentarily tapping this key switches the PTX-100 on. The display flashes the firmware version as follows:



In a couple of seconds the screen changes and the status of the PTXZ-100's internal 9v battery is displayed as either Good, Weak or Replace.

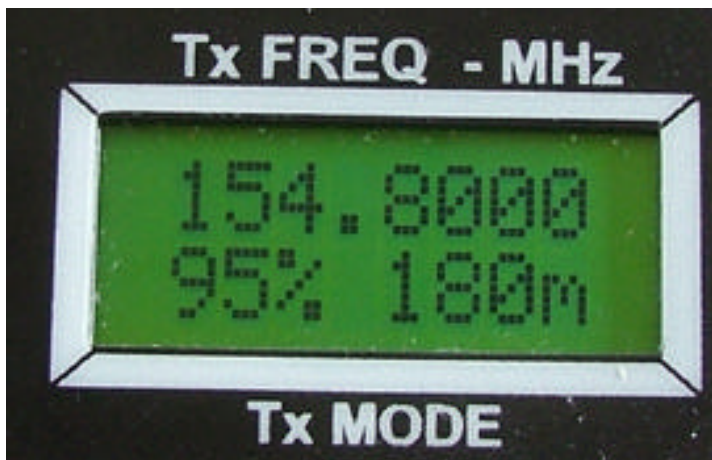




The PTX-100 will then look for a connected transmitter.



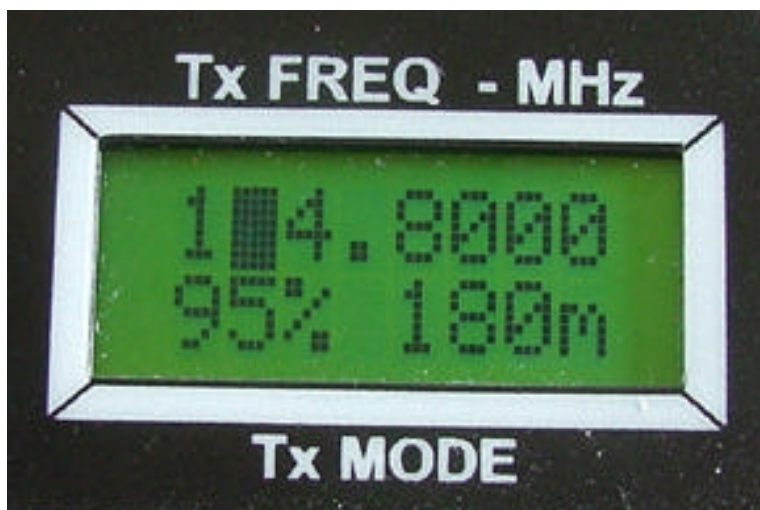
Once the J1R is communicating with the PTX-100, the display will look like this:



Display shows an operating frequency of 154.8000 MHz, and the J1R's internal battery capacity at approx. 95% and 180 minutes of run time. Battery numbers change in 5% steps.

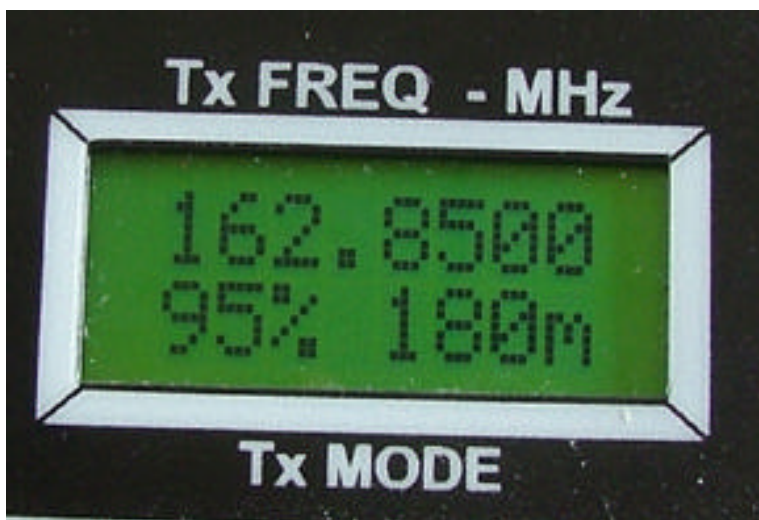
To change the operating frequency of your J1R, use the FRQ switch.

FRQ switch: The **F**requency key is used to initiate the process to change a transmitter's frequency. This key is only active when the LCD display is at the top level menu (Frequency and Mode displayed). The first tap of the **FRQ** key places a flashing cursor at the second digit from the left. The left most digit (most significant digit) is always a "1" and cannot be changed. Tapping the FRQ key moves the cursor from left to right in the frequency display. At every decade the number displayed may be changed by tapping the appropriate digit (0-9) on the keypad.

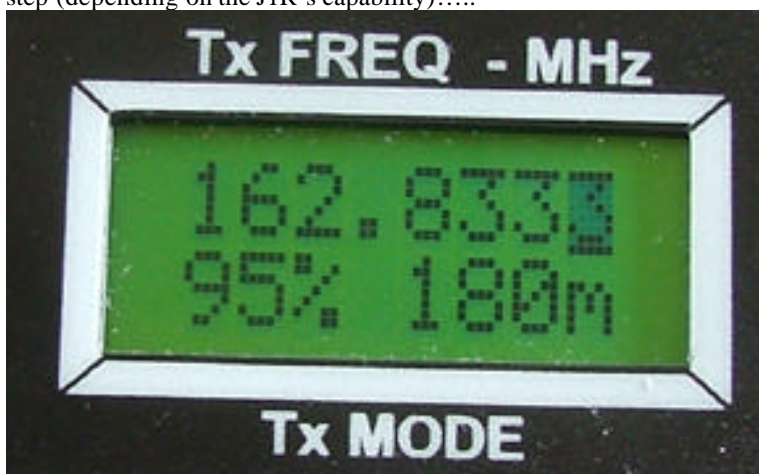


When the desired frequency is displayed, the **ENT** key can be tapped to program the transmitter. At any time during the frequency programming selection the **BKS** key can be used to move the aursor one step to the left in order to make corrections.

If the entered frequency is within the specifications of the transmitter, the display flashes several times to indicate that the data has been accepted.



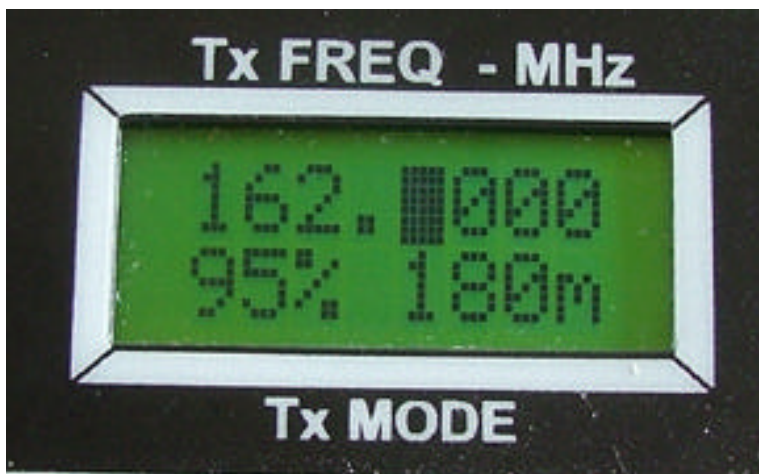
In the event that the frequency data that was entered was either outside of the specified range for the transmitter or that the last two digits of the frequency did not correspond to a 5 KHz or 12.5 KHz step (depending on the J1R's capability).....



....the display will show “Invalid Frequency”



....and a flashing cursor will appear on the display.



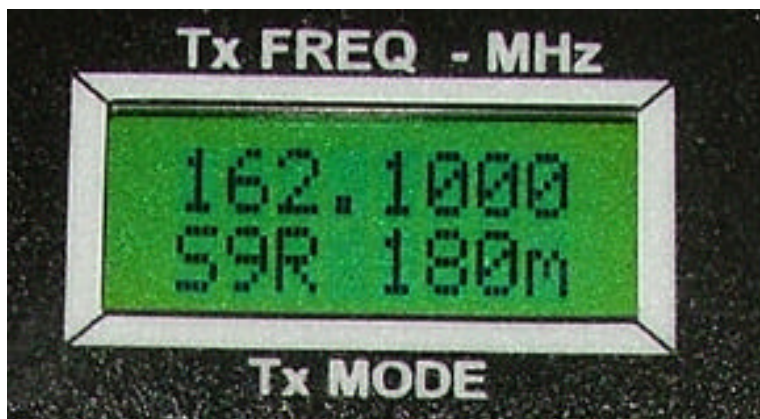
The frequency data can be corrected and the “ENT” key pressed to re-enter the new frequency.

OPT switch: The **Options** key steps through a number of options advancing with each tap of the key. Repeated pressing of the **OPT** key cycles you through the available options.

In general, every option is followed by a number that is used to select the option. Once the number has been pressed, the **ENT** key must be pressed to active the selection.

Options available depends on your specific J1R's capability.

- a. Scramble or Clear (if your J1R is equipped with SCRAMBLING).



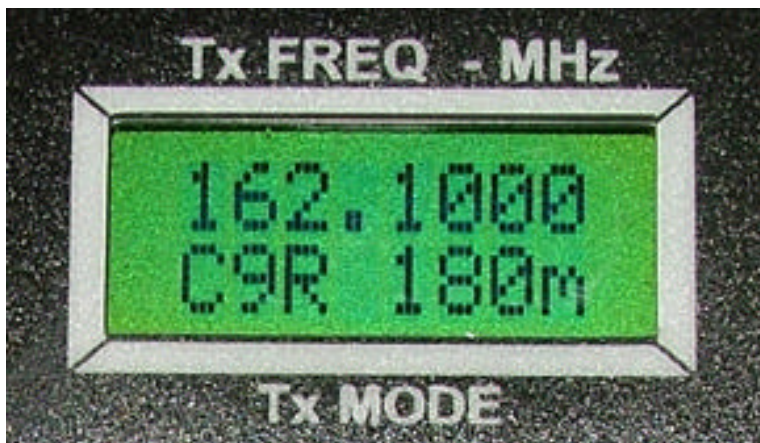
For a J1R equipped with SCRAMBLING, Pressing the **OPT** switch reveals the **SCR/CLR** option screen:



Pressing 1 – you can change the unit from SCR to CLR



Press the ENT key to complete the option change.



Press OPTION again, then press 2 to change back to Scramble mode:

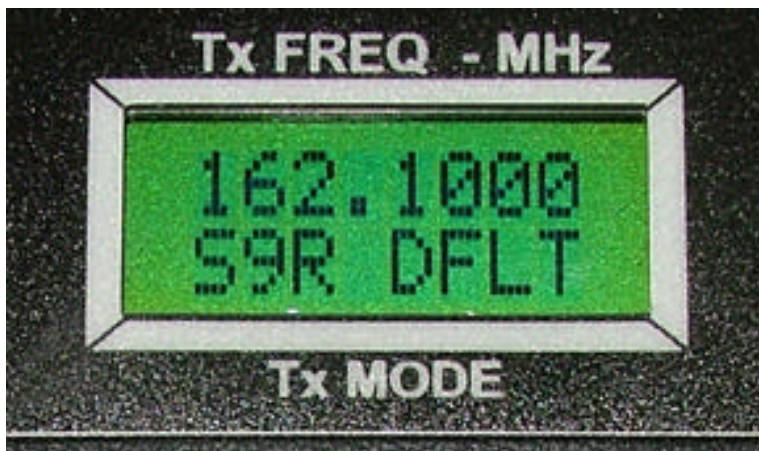


Now, press the ENT key to complete the change.



b.. **Default Data:** This data is the Frequency and Mode status of the J1R when it was first connected to the PTX-100. The frequency and mode of J1R can be changed as often as desired but the Default Data can always be referred to if needed. This data does not change until the transmitter is disconnected or the PTX-100 is powered down and re-powered.





c. **RF Level** (Field Strength Meter) is provided as a feature regardless of the particular TTI transmitter being used and is accessed through the **Options** menu. The display shows a series of ">" arrows that indicate the relative Field Strength of a transmitter. (Note that the transmitter can NOT be connected to the PTX-100 when this option is being used. TTI transmitters are inhibited from transmitting during the programming process.





Note: Use of the RF Field Strength function does not require a transmitter to be connected to the PTX-100.

The Auto-Off feature of the PTX-100 is set to 3 minutes when the RF level mode is activated.

It is important to note that the number of “>” arrows shown on the display is proportional to the transmit power of the transmitter being checked as well as the distance between the transmitter and the PTX-100. The feature is intended as a quick check and relative power indicator for field work. Selection of the RF Level option immediately after power on (following the self test splash screen) requires the options button to be held down for approximately ½ sec.

NOTES:

1. **BKS** switch: At any time during the option selection process, the **BKS** (Backspace) key can be used to return to the next higher level in the menu.
2. **DIM** switch: The (Dimmer) key controls the LCD Backlight intensity. When the unit is powered **On**, the backlight will be at its maximum intensity. Momentarily pressing the **DIM** key reduces the level in several steps until the Backlight is fully off. The next tap of the key returns the Backlight to maximum level.
3. The **PWR** key is also used to shut down the unit manually. The key must be held for >2 seconds and then **released**.

In the event that the **PWR** key is not used to manually power down the unit, the automatic power down timer will shut the PTX-100 down in approximately 60 seconds after the last keystroke.



APPENDIX C - AUDIO FILE INTEGRITY – J1R RECORDER

To ensure the validity of the recorded data sets and to safeguard continuity of evidence, the *.IMG and *.IM2 audio files use a packet data format that intertwines the recorded data with extra information so that data verification and integrity checking is possible. Packets are totally self-contained to prevent unauthorized changes of audio image file. The data is further protected by the proprietary nature of the format and by data encryption for some models of the recorders.

The size of each audio packet will generally represent between 0.005 and 0.15 seconds depending on the configuration and model of recorder.

The Authenticate program included with your Joey1A goes into more detail on how audio file integrity is implemented and can be verified. Please consult your Authenticate user guide for more information.

An explanation of some of the major integrity sources incorporated into each and every packet of the audio image file follows.

C.1 Unique UNIT ID

Each Joey1R is given a unique UNIT ID at the time of manufacture. The UNIT ID is coded into the internal memory of the unit and cannot be changed by the user.

The UNIT ID ensures audio image files from two or more different recorders have not been combined to create a new audio image file.

C.2 Unique Recording FILE NUMBER

Every recording made on a Joey1R is given a unique FILE NUMBER. The FILE NUMBER is generated by the recording device and cannot be nominated by the user.

The FILE NUMBER ensures audio image files from two or more different recordings have not been combined to create a new audio image file.

C.3 TIMING Sequence

Each packet of audio data knows its position within the audio image file. The TIMING sequence is internally generated by the device and cannot be changed.

The TIMING sequence ensures sections of audio are not moved from their original position within the audio image file. On some recorders the timing sequence can be related back to recorders internal real time clock, on others it represents the elapsed time.

***Note:** The current time if available is based on the recorders real-time clock as set by the user. Integrity is performed on the sequence of the timing not upon the absolute value. Failure to correctly set the devices real-time clock will not affect the integrity of the audio image file.*

C.4 CHECKSUM Errors

Each individual byte of audio data stored in the image file packet is manipulated to produce a CHECKSUM for the complete packet. At the time of verification a newly calculated CHECKSUM is compared to the CHECKSUM created at the time of recording to verify the complete data packet.

The CHECKSUM ensures each byte of audio data stored has not changed since the time of recording.

C.5 Irregularities

Irregularities within recordings are expected from time to time.

With analogue recordings we are a custom to hearing a small amount of static, hissing or the occasional click or pop in the replayed audio. These are all evidence of irregularities, the difference with a digital product is that any such irregularities can be exactly quantified and are therefore brought to our attention.

If irregularities do occur in a file being authenticated, they should be assessed with a view to determining how much data is in question, where in the file has the irregularity occurred, and what relevance does that section of data in question have to the audio file as a whole.

C.6 What are Irregularities

Most people have experienced a CD which skips during playback or a computer disk which contains errors, both of these are good examples of what might happen to an *.IMG or *.IM2 file from time to time.

Irregularities are pieces of data that are corrupt or otherwise damaged and cannot be validated by the authentication process. They are not necessarily wrong, they just cannot be verified as correct. Irregularities can be short, possibly less than a 10th of a second, or last for several minutes and will cause the audio to be unusable during that section of the file. Unusable audio will sound like loud static, or possibly silence.

Irregularities in one section of a file have no influence on the other parts of an audio file.

C.7 How Can Irregularities Occur

There are three main areas where irregularities can occur, during recording, during transfer and during storage.

Some reasons for the failure include,

- Interference from other electronic devices, such as cell phones or radio transmitters.
- Power fluctuations to the unit.
- Physical influences such as shock or pressure.
- Minor electronic failures.
- Computer glitches during transfer.
- Damage to the storage medium.

Note: This is not a complete list.

C.8 Tampering

Most people with a computer could, with a little help or training, cut and paste an audio file to change it from the original. There may be a perception held by people that the same be true for *.IMG & *.IM2 files. This is not the case.

*.IMG & *.IM2 files are specifically designed to stop such interventions. When authenticated, tampering would be evident by

large section of audio showing up as RED and containing irregularities in,

- **C.1 Unique UNIT ID**
- **C.2 Unique Recording FILE NUMBER**

or

- **C.3 TIMING Sequence**

Reverse engineering the packets and modifying the identifiers themselves is stifled by the chosen file format.

C.9 When Irregularities Occur

If irregularities do occur then their effect on the integrity of the audio product should be assessed by ascertaining the length of the unusable section. Its position in the file, and it's influence on the remainder of the audio.

Once again, the file format chosen is specifically designed so that irregularities in one section of a file have no influence on the other parts of an audio file.

C.10 Expert Witness

For more information regarding the legal ramifications of presenting digital audio data in a court of law please contact a recognized expert in that field.

Paul Ginsberg of Professional Audio Laboratories is one such expert and has written many papers on the subject including, "*The Legality of Digitally Recorded Tapes*" which has particular relevance to this equipment. Paul can be contacted via,

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APPENDIX D - MENU QUICK GUIDE – JOEY SOFTWARE

Menu Item		Description
File		
Open ...		Open IM2 or WAV file for playback
Convert to WAV ...		Converts an existing IM2 file to WAV
WAV Enhance ...		Several strategies to improve audio
Exit		Exit Joey
Commands		
Download		Downloads the selected recordings
Time and Date ...		Check / Set the recorders date or time
Timer Recording ...		Set the recorder to record automatically
Set or Clear PIN ...		Limit access via Joey2
LED Operation		Sets how and if the LED will flash
Disabled		The LED is never flashed
Status Only		Only flash to indicate status
Status and Vox		Flash with the presence of audio
Erase		Erase ALL recordings on the recorder
Format Recorder		Low level format (also erases the recorder)
Exit Test Mode		Returns to full operation mode
Query		
Recorder		
Refresh List		Manually update recordings list
Firmware Version ...		Version information about the recorder
Memory Size ...		Memory installed in the recorder
Bad Blocks ...		Information derived from last format
USB Version ...		Hardware of the USB dongle
Tools		
Edit Profiles ...		View or create recording profiles
Configuration ...		General program settings
View Log		Communications log used to debug
Transmitter		
Configuration...		Disabled when using a Joey1R
Help		
Help ...		Display a PDF of this guide
About ...		Version and copyright info

Table 13, Quick Manu Guide

APPENDIX E - TACTICAL TECHNOLOGIES INC. WARRANTY***LIMITED (3) THREE YEAR WARRANTY***

Tactical Technologies Inc. warrants its devices and equipment for a period of three (3) years from date of shipment to be free from defects in workmanship or materials unless otherwise stated. The liability of Tactical Technologies Inc., under this warranty is limited to replacing or repairing, at its option, for any devices which are returned by the Purchaser during such warranty period, provided:

- Tactical Technologies Inc. is notified in writing within five days, after discovery of such defects by the purchaser. Proof of purchase must accompany notification.
- The defective units are returned to Tactical Technologies Inc. nearest regional office with transportation charges prepaid by the Purchaser. NO C.O.D. shipments will be accepted.
- Equipment damaged in shipment must be reported to and claim forms filed with carrier by customer. In shipments to factory, notice and claim procedures will be initiated by Tactical Technologies Inc.
- Tactical Technologies Inc.'s examination of such units shall disclose to its satisfaction that such defects exist and have not been caused by misuse, mis-application, neglect, improper installation, improper storage, alteration, physical damage or accidents.
- The warranty shall not apply to microphones, batteries, antennae, crystals, or material ordinarily susceptible to field damage or any accessories of a disposable nature.
- This warranty does not apply to, and Tactical Technologies Inc. does not independently warrant, items or systems sold by Tactical Technologies Inc. which are produced by other manufacturers' and or which warranty cards or documents of the original manufacturers are included in shipment from Tactical Technologies Inc. With respect to such items, the purchaser must look to the warranty of the original manufacturer and Tactical Technologies Inc. disclaims all warranty, expressed or implied. This includes recorders manufactured by Marantz, Sony, Olympus, and others.

In no event shall Tactical Technologies Inc. be liable to the Purchaser for incidental, collateral, or consequential damages of any nature arising from the use, performance, sale, resale, or distribution of any of its products or from any cause or nature whatsoever.

This warranty is in lieu of all other warranties expressed or implied.