



.: www.totalrecallvr.com :.

Analog Two Way Radios

Step by Step Guide

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Related Documents:

- [1] Prolancer Pty Ltd, Total Recall VR Overview User Guide, 13.0, March 2016
- [2] Prolancer Pty Ltd, Total Recall VR Manager User Guide, 5.0, March 2016

Table of Contents

1. Preface	4
1.1. <i>Conventions</i>	4
1.1.1. Notes & Warnings	4
1.1.2. Typographic Conventions.....	4
1.1.3. Procedures	5
1.2. <i>We Need Feedback</i>	5
2. Introduction	6
2.1. <i>About This Guide</i>	6
2.2. <i>What are Radio Scanner</i>	6
2.3. <i>What is Total Recall VR</i>	6
3. Solution Example	7
3.1. <i>Scenario</i>	7
3.2. <i>Radio Scanner</i>	7
3.3. <i>Total Recall VR Interface Requirements</i>	8
3.4. <i>Total Recall VR Deployment</i>	9
3.5. <i>Total Recall VR Configuration</i>	10
3.5.1. <i>Analogue Channel Configuration</i>	11

1. Preface

1.1. Conventions

Our guides use several conventions to highlight certain words and phrases and draw attention to specific pieces of information.

1.1.1. Notes & Warnings

We use the following visual styles to draw attention to information that might otherwise be overlooked:



Notes are tips, shortcuts or alternative approaches to the task at hand. Ignoring a note should have no negative consequences, but you might miss out on a trick that makes your life easier.



Important boxes detail things that are easily missed: configuration changes that only apply to the current session, or services that need restarting before an update will apply. Ignoring the information will not cause data loss, but may cause irritation and frustration.



Warnings should not be ignored. Ignoring warnings will most likely cause data loss.

1.1.2. Typographic Conventions

We use typographic conventions to call attention to specific words and phrases. These conventions, and the circumstances they apply to, are as follows.

Example	Meaning
Select <u>Guide</u> to display ...	Locate the link named "Guide" on the screen, position the cursor over the link and then depress the appropriate mouse button to follow the link.
Select Add to create a new ...	Locate the button or menu item named "Add" on the screen, position the cursor over the button or menu item and then depress the appropriate mouse button to initiate an action.

Enter <i>Commission</i> ...	Locate the field named "Commission" on the screen, position the cursor over the field and then depress the appropriate mouse button to select the field. Once the cursor appears in the field, enter a value.
Choose <i>Country</i> ...	Locate the field named "Country" on the screen, position the cursor over the field and then depress the appropriate mouse button to display the available options. Then position the cursor over the desired option and depress the appropriate mouse button to select it.
Tick <i>Active User</i> ...	Locate the check box named "Active User" on the screen, position the cursor over the check box and depress the appropriate mouse button to place a visual tick in the box.
Un-tick <i>Active User</i> ...	Locate the check box named "Active User" on the screen, position the cursor over the check box and depress the appropriate mouse button to remove the visual tick in the box.
Enter \$30.95 ...	Enter "\$30.95" using the keys on your keyboard.

1.1.3. Procedures

We use numbered sequence of steps to define procedures for performing certain tasks. For example:

Procedure Title

1. This is the first step of the procedure.
2. This is the second step of the procedure.
 - a. This is the first sub-step of step 2.
 - b. This is the second sub-step of step 2.
3. This is step three.

1.2. We Need Feedback

If you find a typographical error in this guide, or if you have thought of a way to make this guide better, we would love to hear from you.

Please submit your feedback using the feedback form on our web site:

<http://www.prolancer.com.au/contact/feedback>.

If you have a suggestion for improving the guide, then try to be as specific as possible when describing your suggestion. Otherwise, if you have found an error, please include the section number and some of the surrounding text so we can find it easily.

2. Introduction

2.1. About This Guide

This guide explains, via examples, how to record conversations over analogue 2-way radios with Total Recall VR.

It is undeniable that digital 2-way radios are becoming more common every day. Total Recall VR offers a number of different mechanisms to record communications over digital radios.

However, analogue 2-way radios continue to offer a simple, reliable and affordable option in many recreational, emergency and business cases.

This guide explains how to record analogue radio communication with a Total Recall VR. We use 2-way radios in the examples, however the examples described here are applicable to recording any wireless analogue communication including wireless microphones and broadcast radio signals.

2.2. What are Radio Scanner



Radio scanner are devices that can automatically tune, or scan, to one, or multiple, radio frequencies for audio communication.

It is beyond the scope of this guide to explain radio scanners in detail. We recommend you visit radioreference.com and other Internet resources for detailed overview.

However, they are important here because they are an inexpensive way to pick up conversations over one, or multiple, designated radio channels and deliver the audio of the conversations in analogue form to a recording device like Total Recall VR.

Radio scanners come in many forms and shapes: hand-held, portable ..., have varied features and most importantly can cost as little as AU\$30 for a very basic device that covers a single band.



2.3. What is Total Recall VR

Total Recall VR is a professional audio logging and call recording system which is self-contained, fully featured and cost-effective. Enterprises and governments worldwide use it to create electronic records of many forms of audio communication including telephone, 2-way radio, broadcast radio, public address, room microphones and much more.

Total Recall VR is the ideal solution for:

- Recording business telephone conversations;
- Recording agent calls in contact centres;
- Logging emergency response communication;

- Logging business operations communication;
- Logging radio broadcasts;
- Logging public announcements;
- Creating audio records of meetings, legal proceedings, public enquiries and similar events; and
- Creating compliance records to meet duty of care and legal requirements.



For additional information on Total Recall VR see the Total Recall VR overview guide [1].

3. Solution Example

3.1. Scenario

This solution is designed for a small volunteer marine rescue outfit which monitors two emergency maritime radio channels (VHF channel 16 and UHF channel 88) and uses two additional maritime channels (VHF channel 73 and UHF channel 72) for base-to-ship communication.

However, the solution can easily scale to any number of radio channels at any band. For example an airport can cover all channels on the common aviation band, a construction business can cover the radio channels it uses on the common business (CB) band, and a music event can cover the radio channels it uses for wireless microphones.

In addition, and if it is legal to do so in your region, then the solution can be used to record conversations on radio bands used by the emergency and law enforcement services.

3.2. Radio Scanner

As stated earlier in this document, we will use radio scanners to tune in to the radio channels that we wish to record.

When deciding on which radio scanner to use it is important to choose the right radio scanner, and in particular:

1. Select a radio scanner that covers the correct radio frequency band. For example, if you wish to record conversations on the common aviation band, then pick a radio scanner with frequency range that covers 118.000 to 136.975MHz.

2. Select a radio scanner that offers the “Channel Hold” feature; that is, it allows you to set the frequency and lock the scanner to that frequency (disable scanning).
3. Select a radio scanner that can be powered by an AC/DC power pack. The radio scanner will have to work 24/7 so it is no good to you if it only uses a rechargeable battery pack.
4. To use a radio scanner with Total Recall VR you must select one that has a headphone output. This output will provide the audio signal that will be recorded by Total Recall VR. For best results with Total Recall VR select a scanner that provides 60mW power into a 500ohm load on the headphone output. However, and in general, any headphone output will work with Total Recall VR.

In our solution for the marine rescue outfit we will use 4 hand-held radio scanners, each locked to one of the radio channels which is used by the outfit. This will enable us to record conversations on all 4 channels independently.

However, in some cases you may wish to configure a radio scanner to scan multiple channels (frequencies) and record the conversations on all channels via one radio scanner. For example, radio systems with repeaters use two channels (one to the repeater and another from the repeater).

Note that officially we do not recommend any radio scanner. However we have successfully used different radio scanners from the Uniden range in recording solutions for the maritime, air traffic and construction industries.

3.3. Total Recall VR Interface Requirements

Radio scanners have an analogue interface (the headphone output) for the purpose of recording as explained in the previous section. As a result, we need to use a Total Recall VR recorder with analogue recording channels (1 analogue channels per radio scanner output that will be recorded).

Any of the following Total Recall VR models can be used when equipped with analogue recording channels:

- Total Recall VR LinX Altus (<http://totalrecallvr.com/products/total-recall-vr-linx-altus>)
- Total Recall VR LinX Neos (<http://totalrecallvr.com/products/total-recall-vr-linx-neos>)
- Total Recall VR LinX Omnia (<http://totalrecallvr.com/products/total-recall-vr-linx-omnia>)

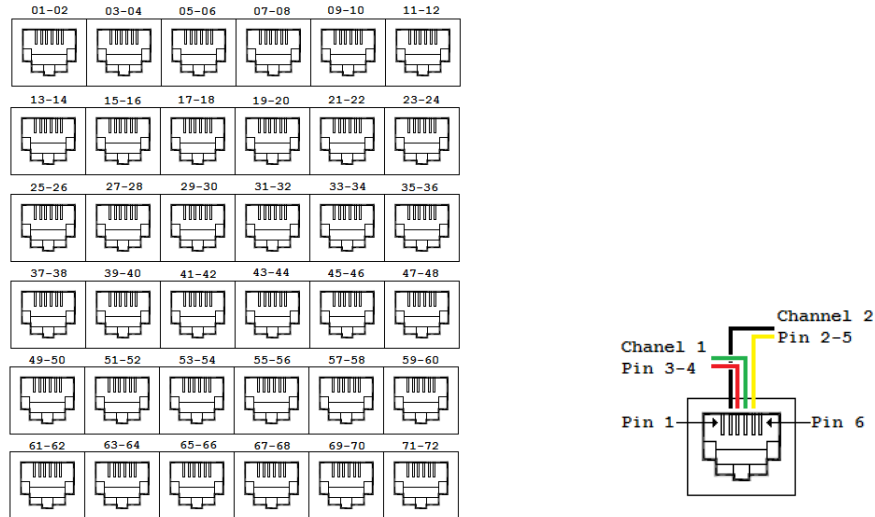
Total Recall VR uses a purpose built interface card to capture audio from different types of analogue sources including:

1. Analogue telephone lines.
2. Outputs of a digital-to-analogue converter (DAC).

3. Analogue signal sources with 2-wire output.

Total Recall VR does not interact with the analogue signal on the lines in any way, unless its configuration specifies to inject a recording 'beep' tone.

The interface cards use RJ11C/RJ12/RJ14 (6P6C) connectors. Your system can have up to 36 connectors, 6 in each row:



Note that recording channel numbering start from left on the top row and continues to right and down as shown on the previous image.

Further, each connector has two recording channel, one on pins 3 and 4 and another on pins 2 and 5 as shown on the previous diagram.

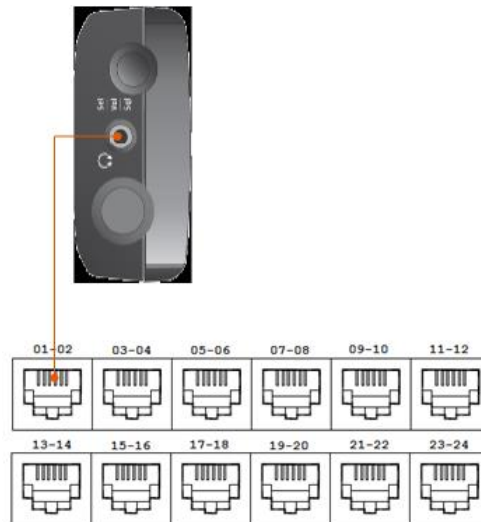
3.4. Total Recall VR Deployment

The following diagram shows how Total Recall VR fits in the solution.



In summary:

In our solution for the marine rescue outfit uses 4 hand-held radio scanners, each locked to one of the radio channels which is used by the outfit. Each of the radio scanners is connected to one analogue recording channel on the Total Recall VR as shown on the following diagram:



That is, the headphones output on each radio scanner is connected to one analogue recording channel on the Total Recall VR with a custom made cable (3.5mm TS connector on one side and RJ12 connector on the other side).

As a result Total Recall VR records conversations on all 4 channels independently.

3.5. Total Recall VR Configuration



This section does not show the full configuration of the Total Recall VR. For example you may have to assign IP address to the Total Recall VR to connect it to the network.



You can use the Total Recall VR Manager [2] PC application to complete the configuration described in this section.

3.5.1. Analogue Channel Configuration

The following table shows the configuration of each of the 4 analogue recording channels on the Total Recall VR:

Channel	Trigger	VoX Timeout	Beep Level	Detect Digits	Extension
1	VoX 4	5	Off	No	Ch. 16 VHF
2	VoX 4	5	Off	No	Ch. 73 VHF
3	VoX 4	5	Off	No	Ch. 88 UHF
4	VoX 4	5	Off	No	Ch. 72 UHF

Note:

1. You may have to experiment with different VoX trigger levels based on the level of the audio from the headphone outputs of the radio scanners. VoX 4 should work fine if the signal level is at around -10dBv.
2. VoX Timeout of 5 seconds is only a suggestion. You can set this value to a different value. Short value may result in a segmented recording of conversations if the duration of silence periods during conversations is longer than the set value. Long value may result in a single recording of multiple conversations if the duration of silence periods between conversations do not exceed the set value.
3. We are using “Ch. 16 VHF”, “Ch. 73 VHF”, “Ch. 88 UHF” and “Ch. 72 UHF” as values for extension for each channel. This will enable users to search for recordings using the text shown.

[End of Document]