

# Receiver VT-RC-74DE User Manual



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# Chapter 1: Introducing the VT-RC-74DE Receiver

## About This User Manual

You are reading the VT-RC-74DE Receiver User's Manual, This User's manual provides information regarding the various components in the receiver and how to use them. The following are major sections of this user manual.

### 1. Introducing the VT-RC-74DE

Introduces you to the VT-RC-74DE and this User's Manual

### 2. Knowing the Parts

Gives you information on the VT-RC-74DE's components

### 3. Getting Started

Gives you information on getting started with the VT-RC-74DE.

### 4. Using the VT-RC-74DE

Gives you information on using the VT-RC-74DE's components

### 5. Appendix

Introduces you to the optional components and gives additional information.

#### NOTE

The actual software and operating systems installed on your VT-RC-74DE may differ from those shown in this manual. Please accept your VT-RC-74DE installation as being correct.

## Notes for this Manual

A few notes and warnings are used throughout this guide, allowing you to complete certain tasks safely and effectively. These notes have different degrees of importance as follows:



**WARNING!** Important information that must be followed for safe operation.



**IMPORTANT!** Vital information that must be followed to prevent damage to data, components, or persons.



**TIP:** Tips for completing tasks.



NOTE: Information for special situations.

## Safety Precautions

The following safety precautions will increase the life of the VT-RC-74DE. Follow all precautions and instructions. Except as described in this manual, refer all servicing to qualified personnel.



Disconnect the AC power before cleaning the VT-RC-74DE. Wipe the VT-RC-74DE using a clean lint free cloth dampened with a solution of nonabrasive detergent and a few drops of warm water and remove any extra moisture with a similar dry cloth

Do not clean on uneven or unstable work surfaces. Seek servicing if the case or external connectors have been damaged.

Do not place or drop objects on top of the VT-RC-74DE and do not force any foreign objects into the VT-RC-74DE.

Do not operate the VT-RC-74DE near explosives or during a gas leak.

Do not expose the VT-RC-74DE to strong magnetic or electrical fields.

Do not press with excessive pressure on the display panel or close the display covers with object laying on them that may damage the screen.

Do not expose the VT-RC-74DE to standing water or operate the VT-RC-74DE for extensive periods of rain or spray.

Do not use the Ethernet connection when exposed to an electrical storm.

Do not leave the VT-RC-74DE on your lap or any part of the body to prevent discomfort or injury.

SAFE TEMP: This VT-RC-74DE should only be used for extended periods of time in environments with ambient temperatures between -20C and +60C.

INPUT RATING: Make sure that your power supply provides voltages between 96-260 VAC and 50Hz to 60Hz.

Do not carry or cover the VT-RC-74DE when it is powered on with any materials that may reduce air circulation such as a carrying case.

Do not use strong solvents such as thinners, benzene or other chemicals on any surface of the VT-RC-74DE.

Do not use damaged power cords, accessories cables or peripherals.



Do not throw the VT-RC-74DE in municipal waste. This product has been carefully designed to enable proper reuse of parts and recycling. Check local regulations for disposal of electronic products.

## Transportation Precautions

To prepare the VT-RC-74DE for transport, you should turn it off and disconnect all external peripherals to prevent damage to the connectors.



CAUTION! The VT-RC-74DE's surface may become scratched if not properly cared for. Be careful not to rub or scratch the VT-RC-74DE surfaces.

## Cover Your VT-RC-74DE

A specially designed transport container is optionally available for the VT-RC-74DE. This box when properly closed will protect the VT-RC-74DE from dirt, water, shock and scratches.

## Airplane Precautions

Contact the person responsible for the aircraft safety if you want to use the VT-RC-74DE on an aircraft.



CAUTION: There are three main types of aircraft security devices: X-Ray machines (used on items placed on conveyor belts), magnetic detectors (used on people walking through security checks), and magnetic wands (hand-held devices used on people or individual items). You can send the VT-RC-74DE through airport X-ray machines. However, it is recommended that you do not send the VT-RC-74DE through airport magnetic detectors or expose them to magnetic wands.

## Preparing your VT-RC-74DE

These are only quick instructions for using your VT-RC-74DE.

### Local Operation

1. Connect the VT-RC-74DE to your local Ethernet on which the controlling computer is connected.
2. Connect the main power to the VT-RC-74DE.
3. The VT-RC-74DE is fitted with a power switch and power up when this is depressed.
4. Wait for two minutes for the controlling software to start.
5. If needed use the fields provided to enter the VT-RC-74DE controlling software login password (the default password is **jdajda** ).
6. You may now fully control the VT-RC-74DE from the front panel.

### Remote Operation

1. Connect the VT-RC-74DE to your local Ethernet on ensuring that the controlling computer is on the same network.
2. Connect the main power to the VT-RC-74DE.
3. The VT-RC-74DE is fitted with a power switch and power up when this is depressed.
4. Wait for two minutes.
5. Start the Windows preinstalled Remote Desktop Connection program on the controlling computer.
6. If needed use the fields provided to enter the VT-RC-74DE controlling software login password (the default password is **jdajda** ).
7. You may now fully control the VT-RC-74DE from the controlling computer.

## Chapter 2: Knowing the parts

### Front Side



#### 1. Main Touch Screen Display

The front panel touch screen display allows the user to setup and monitor all aspects for the VT-RC-74DE all band receiver's operation.

#### 2. Rack Mounting Hardware

The VT-RC-74DE is designed to fit into a 4U slot of a 19-inch equipment rack. The removable rack mounting hardware allows the receiver to be fixed firmly into place in that rack.

#### 3. Front Panel Power Switch

The front panel power switch will start the receiver when depressed, or turn off the receiver once on.

#### 4. Off/On Main Power Switch

In the Off position, all main components become depowered, in the On Position the indicator light in the Front Panel Power Switch will illuminate and the two right hand touch screens will start and provide instruction on how to power the unit on.

#### 5. Upper Right Touch Screen

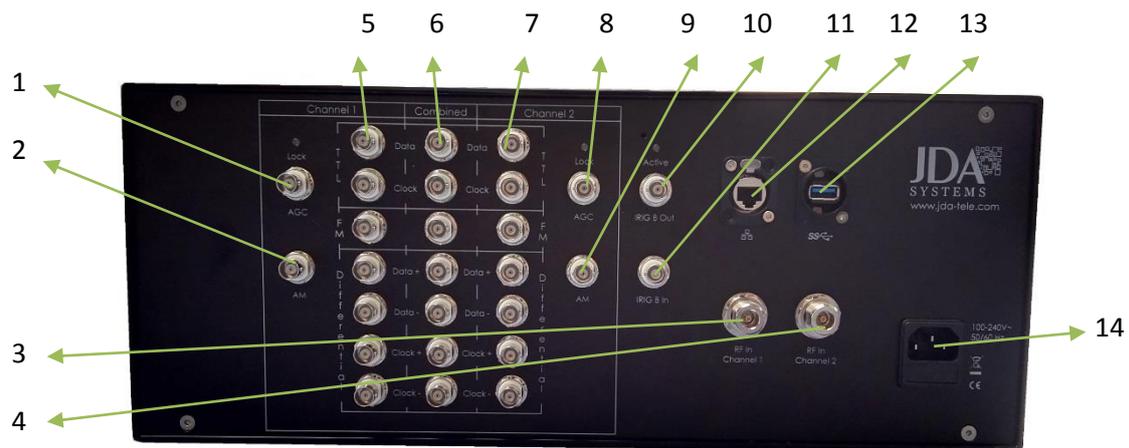
Upon power on this screen will display the JDA Systems logo until the unit is ready to be started by depressing the Front Panel Power Switch. Instructions on when to do this will appear directly on the display.

#### 6. Lower Right Touch Screen

Upon power on this display will show the JDA Systems Logo. The screen display will change mode when the main receiver control software is started to indicate first that the receiver is starting and then to change to the main receiver monitor state screen. When the main receiver control software

requires a user input suitable to be entered through this touch screen its display will change to a numeric and cursor screen allowing for user entry through its touch screen features.

## Rear Side



N.B. The 2-channel receiver is shown here. If the 4-channel option is selected this adds more connections to the rear panel.

### 1. Channel 1 AGC

The analog representation of the AGC (RSSI) signal. Support the optional time synchronization for the VT-RC-74DE.

### 2. Channel 1 AM Channel 1, Video Outputs 1 & 2

The analog representation of the AM signal. The separately buffered analog representations of the receiver signal, also known as the Video output

### 3. Channel 1 RF IN

The RF input to the receiver channel 1 on an N Type female connector. The input internally goes to an optional RF amplifier with an input gain of approximately 15dB. N.B. This LNA may be manually bypassed if required to ensure that the input to the receiver never exceeds 0dBm.

### 4. Channel 2 RF IN

The RF input to the receiver channel 2 on an N Type female connector. The input internally goes to an optional RF amplifier with an input gain of approximately 15dB. N.B. This LNA may be manually bypassed if required to ensure that the input to the receiver never exceeds 0dBm.

### 5. Channel 1 Bit Sync Outputs (TTL and RS422), FM Video Output and lock indicator

The TTL & RS422 differential output for the recovered bit sync data and clock, the analog representation of the received video signal (FM) and the link good lock indicator for Channel 1.

### 6. Combined Bit Sync Outputs (TTL and RS422), FM Video Output and lock indicator

The TTL & RS422 differential output for the recovered bit sync data and clock, the analog representation of the received video signal (FM) and the link good lock indicator for the Combined output provided by the post detect combiner.

### **7. Channel 2 Bit Sync Outputs (TTL and RS422), FM Video Output and lock indicator**

The TTL & RS422 differential output for the recovered bit sync data and clock, the analog representation of the received video signal (FM) and the link good lock indicator for Channel 1

### **8. Channel 2 AGC**

The analog representation of the AGC (RSSI) signal.

### **9. Channel 2 AM**

The analog representation of the AM signal.

### **10. Optional IRIG B Time Out**

Provide the optional IRIG B Input Signal, (not available in the basic configuration).

### **11. Optional IRIG B Time In**

Support the optional time synchronization input for the VT-RC-74DE, (not available in the basic configuration).

### **12. Ethernet Jack**

10/100 Mbit Ethernet interface allows full remote control and monitoring.

### **13. USB 3.0 Sockets**

High speed 3.0 USB sockets for data exchange and upgrade.

### **14. Power Input**

IEC Type power socket 100-240VAC, 50/60Hz with 1.6A fuse holder.

## Chapter 3: Getting Started

### Power System

The VT-RC-74DE is supplied with an IEC type power cable suitable for use in your region. This internal power supply is a universal voltage unit. That means that you may connect the power cord to any 100-250 VAC and 50Hz to 60Hz outlet without setting switches or using power converters. Different countries may require that an adapter be used to connect the provided AC power cord to a different standard when using the receiver out of your territory. It is always best to check what is required before bringing power adapters to another country.



**IMPORTANT!** Damage may occur if you use a different and incompatible power cable to the type which is delivered with the VT-RC-74DE. If there is smoke, a burning smell or extreme heat coming from the VT-RC-74DE then urgently seek servicing.



This VT-RC-74DE may come with either a two or three-prong plug depending on territory. If a three-prong plug is provided then you must use a grounded AC outlet or use a properly grounded adapter to ensure safe operation of the VT-RC-74DE.



**WARNING:** The internal power supply may become warm or hot when in use. Be sure not to cover the air inlet or outlet on the base of the VT-RC-74DE and keep the VT-RC-74DE away from your body.



Unplug the power cable or switch off the AC outlet to minimize power consumption when the VT-RC-74DE is not in use.

### Powering On the VT-RC-74DE

The VT-RC-74DE will go into standby mode immediately when external power is applied.

To power on first rotate the main power key switch from the Off to the On position. The indicator light in the Front Panel Power Switch will illuminate and the two right hand touch screens will start showing the JDA Systems logo until the unit is ready to be started by depressing the Front Panel Power Switch. Instructions on when to do this will appear directly on the right upper touch screen display.

### Powering Off the VT-RC-74DE

Start with the VT-RC-74DE fully powered on (main display and dual right-hand touch displays).

To power off use one of the following two methods:

Press the power switch for about 1 second and wait up to two minutes for the main controller to fully power down, then rotate the keyed power switch to the Off position.

OR

Switch of the main controller in the normal way to shut down windows and wait up to two minutes for the main controller to fully power down, then rotate the keyed power switch to the Off position.



**WARNING:** Do not carry or cover the VT-RC-74DE when it is powered on with any materials that may reduce air circulation such as a carrying case.

### **The Power-On Self Test (POST)**

When you turn on the VT-RC-74DE, it will start to run through a series of software controlled diagnostic tests called the Power-On Self-Test (POST). The software that controls the POST is installed as a permanent part of the VT-RC-74DE's architecture. This process can take more than one minute to complete. Once completed the front panel touch screen display will show that the receiver is ready for operation.

### **Monitoring and Reporting Technology**

The VT-RC-74DE has an Ethernet control and monitoring interfaces on the rear panel, this is a 10/100 MBit Ethernet interface. The interface uses a command and monitoring protocol which is fully compatible with the front control software provided with the receiver.



**IMPORTANT!** If errors are still given during startup, you should check the settings for your interface to the receiver. If this does not resolve the issue then contact your local agent for servicing.

### **Shutdown**

To power down simply press the front panel power switch on the receiver while it is powered on. No special shutdown procedure is required except to wait to remove the external power cable until the receiver is completely powered down.

### **Status Indicators**

#### **The Front Panel Power Switch**

The receiver's front panel power switch will illuminate when the VT-RC-74DE is powered up, fully initialized and operating normally.

#### **The Touch Screen Display**

The receiver's front panel touch screen display will become active once the receiver is powered up and ready for use.

#### **Front Panel Activity Monitor**

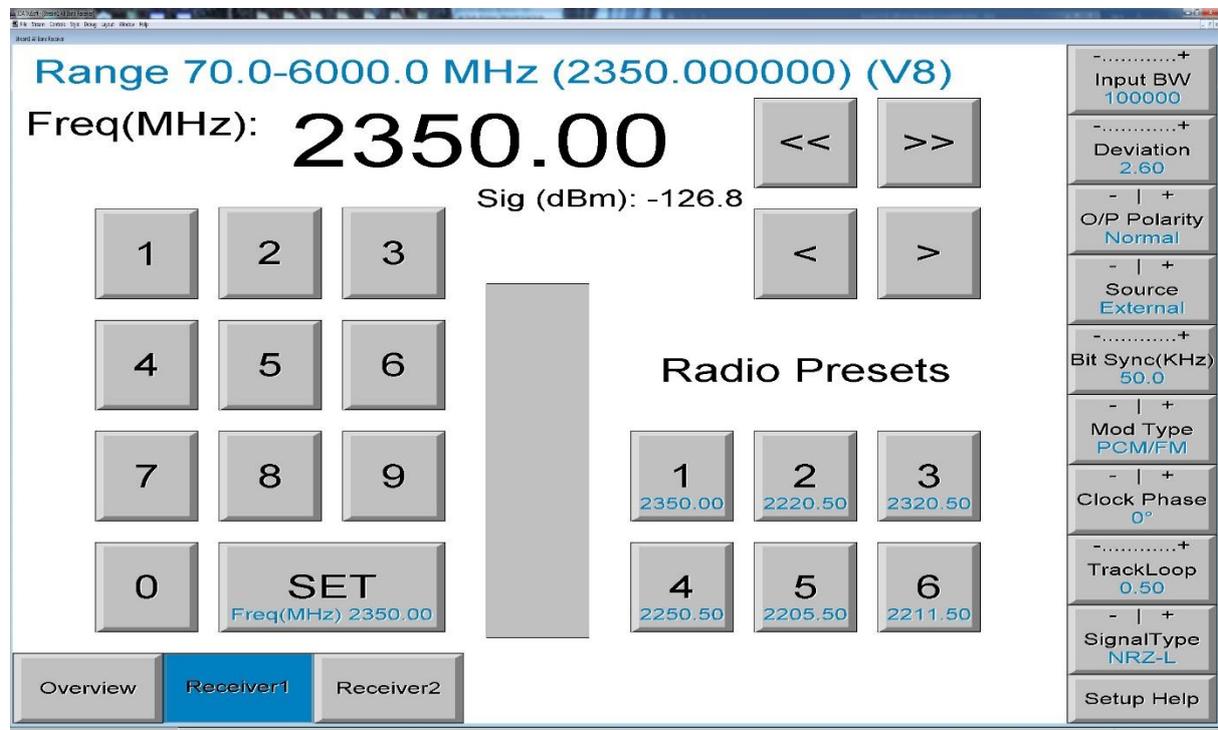
Flashes red when the receiver is accessed remotely, or when internal storage is being accessed.



## Chapter 4: Using the VT-RC-74DE

### Software

All aspects for the VT-RC-74DE are controlled and monitored using the preinstalled control software.



N.B. The 2-channel receiver is shown here. If the 4-channel option is selected this adds more receiver selection buttons to the display.

The overview selection shows only status of all fitted receiver channels (2 or 4).

The Receiver1, Receiver2 (optionally Receiver3 and Receiver4) buttons allow the individual settings to be made per channel.

The main settings per channel are:

Frequency: Set via the numeric keyboard and/or the 0.5MHz and 10MHz step forward and backwards buttons.

Input Bandwidth: Set between 10Hz and 56MHz in 10Hz resolution. N.B. This is equivalent to the IF filter setting on an old fashioned IF based receiver.

Deviation: Set between 0.1MHz and 20MHz in 0.1 MHz steps. N.B. This is roughly equivalent to the Video filter setting on an old fashioned IF based receiver.

O/P Polarity: Set the Normal or Inverted.

Source: External feeds the RF signal through the receiver channel. PDC Input feeds the data from the second receiver channel through the outputs of this channel. Combiner activates the Post Detect Combiner for automatic selection of best source signal through this RF channel.

Bit Sync (KHz): Set the bit sync rate between 10KHz and up to 10MHz (options and settings dependent). When selected the values for Input BW and Deviation are automatically optimized. These may be overridden by use input if required.

Mod Type: Select the Modulation Type as PCM/FM, SOQPSK BIT, SOQPSK DBIT, SOQPSK CPM, IRIG106 ARTM, with optional MSK CPM, MSK BIT, MSK DIBIT, DBPSK(PM), DQPSK Grey, DQPSK Binary, DOQPSK IQ\_BIT, DOQPSK IQ\_DIBIT, PCM/PM.

Clock Phase: Select the output clock phase from the internal bit sync to be 0, 90, 180 or 270 degrees. 0 degrees means that the clock is completely in phase with the data.

Track Loop: Sets the loop bandwidth of the internal bit sync between 0.01% and 10%.

Signal Type: Select the bit sync data type from the selection NRZ-L, NRZ-M, NRZ-S, BIO-L, BIO-M, BIO-S, RNRZ9, RNRZ11, RNRZ15, RNRZ17, RNRZ23.

Six preset buttons are provided per RF channel that store all settings for that channel for quick recovery.

To set a preset press and hold down the required Preset button until the Preset Stored indication text is displayed.

To recover a preset momentarily press the required Preset button.

N.B. Some settings such as receiver Frequency, Input BW, Deviation and Bit Sync settings are set to be the same for each pair of channels 1 & 2 and optionally 3 & 4 when fitted.

## Network Connection

The standard computer interfaces such as Ethernet and USB may be accessed from the VT-RC-74DE rear panel.

Connect a network cable with RJ-45 connectors, one end to the network port on the VT-RC-74DE and the other end to a switch or hub, or directly to a suitable remote control PC. For 100 BASE-TX speed your network cable must be category 5 or better with twisted pair wiring.

For 10Base-T you may use category 3, 4 or 5 twisted pair wiring. 10 / 100 Mbps Full-Duplex is also supported by the VT-RC-74DE but requires connection to a network switching hub with "duplex" enabled. The software default is to use the fastest setting available so normally no user intervention is required.



100BASE-T (or Gigabit) is not supported by the VT-RC-74DE with a direct wire connection, but it can be connected to such a network through a suitable switch

## Twisted-Pair Cable

The cable used to connect the Ethernet card to a host (generally a Hub or Switch) is called a straight through Twisted Pair Ethernet (TPE). The end connectors are called RJ-45 connectors, which are not compatible with RJ-11 telephone connectors. If connecting two computers together without a switch

in between a cross over LAN cable will be required only if one or both ends of the link does not support auto-crossover which is standard on GigaNet interfaces in most modern PC's.

## Specifications

Two Fully Digital Direct Conversion Receivers Per Chassis Both Tunable to the Same Frequency

All Band Operation of 70MHz to 6GHz with 1KHz tuning resolution

RF N Type female inputs @ 50Ohm, VSWR < 1.5

Post Detection Combiner

Receives AM, FM, SOQPSK (Optional PM, BPSK, MSK, QPSK, DQPSK, ARTM)

Optional PM demodulation loss 1.5dB(max) @ 1Mbps/1rad

Optional phase 0.4 to 1.5 rad @ PM 1Mbps BIØ-L

Optional BPSK/QPSK output unique digital root nyquist (square) relating to output bandwidth

Programmable tracking BW to +/-200kHz with 1KHz resolution

Fully Programmable input BW and Input Filter with 1Hz resolution

Low Total Noise of Less Than 4dB

High Absolute Sensitivity < -125 dBm

RF input maximum level -10dBm

AGC with automatic response setting 1 to 100mSec

Digital Trellis Based Dual Bit Syncs 8kbps up to >10 Mbps (option and settings dependent) with 1Hz resolution

Data types NRZ-L/M/S, BIØ-L/M/S, RNRZ-L9/11/15/17/23

BNC analog outputs 0-5V AGC1, AM1, FM1(Video), AGC2, AM2, FM2(Video)

Analog Outputs for AGC, AM and data suitable for legacy Video Reception and Auto Tracking

Antenna Control

TTL & RS422 differential level Data1, Clock1, Lock1, Data2, Clock2, Lock2

TCP/IP Direct Receiver Interface

BIT Self Test: 0 Operational, 1 Startup, 2 DSP Initialize, 3 RF Initialize, 4 Comm Error, 5 Message Error, 6 Time Lost.

Ethernet 10/100 Bit Control Interface

Easy to use Graphic User Interface

Dimensions w440 x d320 x h170 mm

Weight Approx 10kg

100 to 240 VAC, 50 or 60 Hz Operation

Less Than 80W Heat Dissipation

## **Appendix**

### **Optional Accessories**

The following optional items may compliment your VT-RC-74DE

#### **Cable Set**

A complete cable set for the VT-RC-74DE.

#### **Controlling PC**

A preinstalled laptop PC ready to run the remote control of the VT-RC-74DE out of the box.

## Operating System and Software

### Support Software

The VT-RC-74DE comes with full preinstalled control and monitoring software.



Some of the VT-RC-74DE components and features may not work until the control and monitoring software is installed.

## **Common Problems and Solutions**

### **No Power Indicator**

Check your power supply and its connection to your VT-RC-74DE, check that the Off/On switch is in the On position

### **No Front Panel Display**

If no front panel display is shown after more than 2 minutes after powering on the receiver then check your power supply and its connection to your VT-RC-74DE. If it is connected then cycle the power and wait up to three minutes for the indicators to illuminate.

### **No Communication over Ethernet**

Check IP address if communicating over the Ethernet. You may check communications using the ping utility under windows, or by typing the address of the receiver into the windows explorer address bar. You will see the internal website of the receiver if everything is setup properly. If you continue to experience difficulties check you firewall and network settings to ensure that the communications between the PC and the receiver are not being blocked.

## Declarations and Safety Statements

### Federal Communications Commission Statement

The device complies with FCC Rules Part 15. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the federal Communications Commission (FCC) rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions may cause harmful interference to radio communications. However there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



The use of a shielded type power cable is required in order to meet FCC emission limits and to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used. Use only shielded cables to connect I/O devices to this equipment. You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

(Reprinted from the Code of Federal Regulations #47, part 15.193, 1993. Washington DC: Office of the Federal Register, National Archives and Records Administration, U.S. Government Printing Office.)

### Declaration of Conformity (R&TTE directive 1999/5/EC)

The following items were completed and are considered relevant and sufficient:

- Essential requirements as in [Article 3]
- Protection requirement for health and safety as in [Article 3.1a]
- Testing for electric safety according to [EN 60950]
- Protection requirement for electromagnetic compatibility in [Article 3.1b]
- Testing for electromagnetic compatibility in [EN 301 489-1] & [EN 301 487-17]
- Effective use of the radio spectrum as in [Article 3.2]
- Radio test suites according to [EN 300 382-2]

## CE Marking



### CE Marking for devices without wireless LAN/Bluetooth

The shipped version of this device complies with the requirement of the EEC directives 2004/108/EC “Electromagnetic compatibility” and 2006/95/EC “Low voltage directive”.

### IC Radiation Exposure Statement for Canada

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. To maintain compliance with IC RF exposure compliance requirement, please avoid direct contact to the antenna connections during data transmission. End users must follow the specific operating instructions for satisfying RF exposure compliance.

Operation is subject to the following conditions:

- This device may not cause interference and
- This device must accept any interference, including interference that may cause undesirable operation of the device.

To prevent radio interference to the licensed service (i.e. co-channel Mobile Satellite systems) this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or its transmit antenna) that is installed outdoors is subject to licensing.

## Optical Drive Safety Information

### Laser Safety Information

External optical drives sold with this VT-RC-74DE contain a CLASS 1 LASER PRODUCT. Laser classifications can be found in the glossary at the end of that products user’s manual



**WARNING!** Making adjustments or performing procedures other than those specified in the user’s manual may result in hazardous laser exposure. Do not attempt to disassemble the optical drive. For your safety, have the optical drive serviced only by an authorized service provider.

### Service warning label



**CAUTION:** Invisible laser radiation when open. Do not stare into the beam or view directly with optical instruments.

## CDRH Regulations

The center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured from August 1, 1976. Compliance is mandatory for products marketed in the United States.



**WARNING!** Use of controls or adjustments or performance of procedures other than those specified herein or in the laser product installation guide may result in hazardous radiation exposure.

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JDA will only be responsible for or indemnify you for loss, damages or claims based in contract, tort or infringement under this Warranty Statement.

This limit also applies to JDA's agents. It is the maximum for which JDA and its agents are collectively responsible.

Under no circumstances is JDA liable for any of the following:

1. Third party claims against you for damages.
2. Loss of, or damage to, your records or data
3. Special, incidental, or indirect damages, or for any economic consequential damages (including lost profits or savings, even if JDA or its agents is informed of this possibility).

## **Service and Support**

Please contact the agent from who you purchased the VT-RC-74DE or JDA Systems directly. Contact details for JDA are available on their website <http://www.jda-tele.com>