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RITRON®

WIRELESS SOLUTIONS

Quick Talk™

Wireless Voice Monitor & Alarm Owner's Manual

- CONSTRUCTION
- FACTORIES
- WAREHOUSES
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Ritron Publication 145000081 Rev. C 05-17

Call 800-USA-1-USA for the right Wireless Solutions to your communication needs.

P.O. Box 1998 • Carmel, Indiana 46082-1998 • USA
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For Your FREE copy of the Basic PC Programmer
go to**:** ***www.ritron.com/basicprogrammer***

Note: Before you begin using the above PC programmer, you will also need the following:

- A USB to Mini B 5-pin cable. You can purchase this cable from Ritron (pn #60201119) or, since this is a commonly used cable, you may want to check to see if you already own a compatible cable.
- Also, your PC will need:
  - Windows XP or newer version and
  - Your PC will need to have a USB port.

What this Manual Covers

This manual covers basic operation of the Quick Talk™ Wireless Voice Monitor and Alarm. For most applications, this is all the information you will need. Complex features of Quick Talk™ are explained in specific application notices available at www.ritron.com.

General Information

The Quick Talk™ is a wireless radio transmitter that reports changes in the status of switches by transmitting user-recorded voice messages to two-way mobile, portable or base station radios. The Quick Talk™ transmits your voice message when the switch change occurs, and at intervals you select.

Because you provide and connect the switches, your Quick Talk™ units can report on the status of intrusion, tampering, equipment malfunction, liquid levels, machinery, pressure, temperature, power, smoke or leakage.

The Quick Talk™ is easily programmed to transmit on either an existing or a new radio frequency, with the most popular sub-audible coded squelch formats, such as Quiet Call® or Digital Quiet Call™. This enables all your personnel with JOBCOM® or equivalent two-way radios to hear the voice messages instantly, and to be advised of the current condition of each monitored location or device.

Quick Talk™ is housed in a weather-resistant enclosure, so it can be installed in a wide variety of indoor and outdoor locations. Because six internal AA Alkaline batteries will power the unit for about a year, Quick Talk™ does not require AC line power.

Quick Talk™ Models and Frequencies

There are Quick Talk™ radios available for each of the three most popular professional radio communications bands. The model number appears on a label on the bottom of the case.

MODELS	BAND	FREQUENCY RANGE
RQT-151 RQT-152 RQT-151-CANADA RQT-152-CANADA	VHF-FM	150 to 165 MHz
RQT-151M RQT-152M	MURS	151.820, 151.880, 151.940, 154.570, 154.600 MHz
RQT-451 RQT-452 RQT-451-CANADA RQT-452-CANADA	UHF-FM	450 to 470 MHz

Ritron manufactures mobile, portable and base station two-way radios and repeaters for use with Talk™. Ritron pioneered the use of Color Dots on radios to identify frequencies.

Factory-programmed, default Quick Talk™ frequencies are:

MODELS	FREQUENCY	BANDWIDTH
RQT-151, RQT-152	151.625 MHz (Red Dot)	narrowband
RQT-151M, RQT-152M	154.570 MHz (Blue Dot)	wideband
RQT-151-CANADA RQT-152-CANADA	151.055 MHz	wideband
RQT-451, RQT-452	467.850 MHz (Silver Star)	narrowband
RQT-451-CANADA	458.6625 MHz	wideband
RQT-452-CANADA		

See page 5 for instructions on changing the Quick Talk™ transmit frequency to match an existing radio system.

Accessories for Quick Talk™

These replacement and optional items are available from Ritron and its authorized dealers.

Item	Description
AFB-1545	Standard 16 in. Flexible Whip Antenna
RAM-1545	Magnetic-Mount Antenna *wl* 20 ft. of Cable and a BNC Connector
RPG-1AG	Stainless steel push button assembly
RPS-EXPO	+12 VDC external supply for indoor use only

Quick Talk™ Features

- Internal radio transmitter (separate VHF and UHF models).
- User-recorded voice messages; total recording time of 30 seconds.
- Connection to user-supplied switches.
- Included external antenna.
- Typical range of 1/2 mile. Longer range is possible using an optional antenna.
- Weather-resistant (not waterproof nor immersible) enclosure.
- Internal battery holder for six (6) AA Alkaline cells. (Batteries not included)
- Optional External +12 VDC power supply with battery back-up.
- Typical operating battery life of 1 year.
- Automatic Low Battery and Power Fail messages, enabled or disabled via programming.
- Limited One-year Factory Warranty.
- The following are programmable features:
  - Transmit Frequency;
  - Tone Coded Squelch Encoder (Quiet Call® Interference Eliminator);
  - Digital Coded Squelch Encoder (Digital Quiet CalI™ Interference Eliminator);
  - DTMF and Selcall ANI
  - Message transmission schedules and limits.
- Use of multiple (4) switch inputs for messages
- Analog voltage (or 4-20 mA loop) inputs
- Location identification message
- Terminated alarm loop inputs
- Slow scan battery saver option

PLEASE NOTE THE FOLLOWING WITH REGARD TO RF EXPOSURE FOR THIS PRODUCT.....

EXPOSURE TO RADIO FREQUENCY ENERGY:

RQT-151, RQT-151M, RQT-151-CANADA,
RQT-152, RQT-152M, RQT-152-CANADA,
RQT-451, RQT-451-CANADA, RQT-452, RQT-452-CANADA
This product generates radio frequency (RF) energy when the state of any of the four inputs has been changed. This product has been evaluated for compliance with the maximum permissible exposure limits for RF energy at the maximum power rating of the unit when using antennas available from RITRON.

For both the AFB-1545 and the standard internal antennas, at the 20 cm (7.9 inches) minimum expected separation distance and greater, the maximum RF exposure is well below the General Population/Uncontrolled limits. Antennas other than those available from RITRON have not been tested for compliance and may or may not meet the exposure limits at the distances given. Higher gain antennas are capable of generating higher fields in the strongest part of their field and would, therefore, require a greater separation from the antenna. This product is not to be used by the general public in an uncontrolled environment unless compliance with the Uncontrolled/General Population limits for RF exposure can be assured.

To limit exposure to RF energy to levels below the limit, please observe the following:

- Use only the antenna(s) available from RITRON for these models. **DO NOT** operate the radio without an antenna.
- **DO NOT** activate the transmitter when not actually wishing to transmit. These radios transmit recorded messages of a pre-determined length to prevent continuous transmit times.
- When transmitting, make certain that the distance limits for the particular model in use are observed.
- **DO NOT** allow children to operate the radio.

When used as directed, this series of radios is designed to comply with the FCC's RF exposure limits for "Uncontrolled/General Population". In addition, they are designed to comply with the following Standards and Guidelines:

- United States Federal Communications Commission, Code of Federal Regulations; 47 CFR §§ 2 sub-part J.
- American National Standards Institute (ANSI) / Institute of Electrical and Electronic Engineers (IEEE) C95. 1-1992.
- Institute of Electrical and Electronic Engineers (IEEE) C95.1-1999 Edition.

LISEZ S'IL VOUS PLAÎT LA DÉCLARATION SUIVANTE DE L'EXPOSITION RF POUR CE PRODUIT. .....

RQT-151, RQT-151M, RQT-151-CANADA,
RQT-152, RQT-152M, RQT-152-CANADA,
RQT-451, RQT-451-CANADA, RQT-452, RQT-452-CANADA

Ce produit génère énergie radiofréquence (RF) lorsque le statut de l'un des quatre éléments a été modifié. Ce produit a été évalué pour le respect des limites de l'exposition maximale admissible pour l'énergie RF à la cote de puissance maximale de l'émetteur lorsque vous utilisez des antennes RITRON.

Lorsque vous utilisez l'AFB-1545 ou les antennes internes standards, à la 20 cm (7,9 pouces) minimum prévu à distance de séparation et au-delà, l'exposition RF maximale est inférieure à la Population générale / Uncontrolled limite. Antennes non-RITRON n'ont pas été testés pour la conformité et peuvent ou peuvent ne pas satisfaire les limites d'exposition à des distances donnés. Antennes de gains plus élevés sont capables de générer des champs plus élevés dans la partie plus forte de leur domaine et nécessiteraient donc une plus grande séparation de l'antenne. Ce produit ne doit ne pas être utilisé par le public en général dans un environnement non contrôlé, à moins que la conformité avec la Uncontrolled / les limites de l'ensemble de la Population pour l'exposition RF peuvent être assurés.

Pour limiter l'exposition à l'énergie RF à des concentrations inférieures à la limite, veuillez observer ce qui suit :

- Utilisez uniquement des antennes RITRON pour ces modèles. NE fonctionnent pas sans une antenne de la radio.
- N'utilisez pas l'émetteur lorsque vous ne souhaitez pas transmettre. Ces radios transmettent enregistré des messages d'une durée prédéterminée pour empêcher continu transmettent times.
- Lors de la transmission, s'assurer que les limites de distance pour le modèle particulier en usage sont observées.
- NE laissez pas les enfants pour l'exploitation de la radio.

Lorsqu'il est utilisé conformément aux directives, cette série de radios est conçue pour respecter les limites d'exposition RF pour « Incontrôlée / Population générale ». En outre, ils sont conçus pour respecter les normes et lignes directrices suivantes :

- United States Federal Communications Commission, Code of Federal Regulations; 47 CFR §§ 2 sub-part J.
- American National Standards Institute (ANSI) / Institute of Electrical and Electronic Engineers (IEEE) C95. 1-1992.
- Institute of Electrical and Electronic Engineers (IEEE) C95.1-1999 Edition.

IMPORTANT SAFETY INFORMATION

NOTICE The Quick Talk™ should not be used to report conditions relating to the safety of life or property.

To reduce the risk of fire, electric shock or personal injury, follow these basic safety instructions when using this unit.

1. Read and follow all instructions.
2. Remove power from the unit before cleaning. Do not use liquid or aerosol cleaners.
3. Use only Ritron approved power sources for the unit.
4. During thunderstorms, avoid contact with this unit and any external antenna system or wiring.
5. The Quick Talk™ switch and external power inputs are connected internally to the antenna connector. If the Quick Talk™ switch or power supply terminals contact high voltage, a hazardous condition may exist in that contacting the antenna could prove injurious or even fatal.
6. In general, the switches you connect to the Quick Talk™ are to be independent dry contact switches, and not part of any other "live" electrical circuit
7. If you are unsure whether your installation will be safe, contact an experienced electrician or electronics technician.

CARE AND MAINTENANCE

Moisture: When the antenna sealant and power cable recommendations are followed, the Quick Talk™ is highly weather-resistant in outdoor environments. Do not immerse the unit in water.

Temperature: The Quick Talk™ is designed to operate between -22 and +140 degrees Fahrenheit. Like all electronic equipment, Quick Talk™ should not be subjected to extreme heat. A shaded area is an ideal outdoor location.

Vibrations/Shocks: Though the Quick Talk™ is designed to be rugged, it cannot be expected to survive extreme abuse.

Chemicals: Do not use harsh, corrosive or abrasive chemicals to clean the Quick Talk™ case; use only a cloth moistened with water. Do not attempt to clean the printed circuit board inside the housing.

Batteries: Use only fresh, new alkaline batteries when programming Quick Talk™. Acceptable brands and types are: Duracell MX1500B, Eveready E91, Rayovac 815 or equivalent.

Estimated Battery Life: Starting with a fresh set of AA alkaline batteries, Quick Talk ™ can transmit about 7,000 voice messages over a period of one year before the batteries will need to be replaced.

FREQUENTLY ASKED QUESTIONS ABOUT QUICK TALK™ PROGRAMMING

Do I have to program my Quick Talk™?

You may not need to program your Quick Talk™ at all. If you purchased a Quick Talk™ that is factory-programmed to your radio system frequency (check the Color Dots on your radios and the Quick Talk™), and you do not use a form of Quiet Call coded squelch, you can connect your switch to the color-coded "Input #1" wires on the hook-up cable, install the batteries, and start using Quick Talk™. The factory default voice messages are "Switch 1 Open" and "Switch 1 Closed". Otherwise, read this manual, and then program your Quick Talk™.

Do I need to program every feature?

In many cases, no. The factory pre-programmed settings, explained in the instructions, may meet many of your needs.

How do I program my Quick Talk™?

Quick Talk™ is programmed using RITRON programming software and a PC computer.

What if I don't find what I need in this manual?

Call Ritron (800-872-1872): we will be glad to help you. For most applications, this manual should cover everything you will need to know.

Will it harm the Quick Talk™ if I program it improperly?

No; however, you may need to erase all programming and start over. Feel free to experiment with the various features and possible configurations.

Can my settings or messages get lost or erased if the battery runs down, or if my Quick Talk™ is disconnected?

No. The settings and voice messages you enter are stored in special electronic memory devices in the Quick Talk™ that do not require power to hold the information. This means that if the batteries run down or if you remove them, you will not need to reprogram the unit. All your settings and messages will be there for you when you install fresh batteries.

What if I need more range?

To increase the range of your Quick Talk™ transmissions, we suggest you first relocate the unit. Depending on the type of switch and wiring, you may use several hundred feet of wiring to connect the switch — this allows installation of the Quick Talk™ and it's attached antenna at an unobstructed and elevated position for the best range.

Also, Ritron offers several optional "high gain" antennas. Ritron also offers a radio repeater to increase the range not only for your Quick Talk™, but also for your entire radio system.

QUICK TALK™ PROGRAMMABLE FEATURES

The Quick Talk™ features four (4) separate inputs that can each be programmed with unique voice messages and attributes. All programming is accomplished with the RITRON RQA/RQT PC Programmer software available at www.ritron.com, and a standard USB Type A to Mini-B cable for interconnection of the PC computer to the Quick Talk™.

The programmer software requires Window® XP or newer, and a PC computer with a USB port.

Summary Screen

After reading the radio programming, a summary screen will appear with a tabulated display of the input programming. Double-click on any input column to program that input's attributes. Radio-wide features are programmed from the Summary Screen.

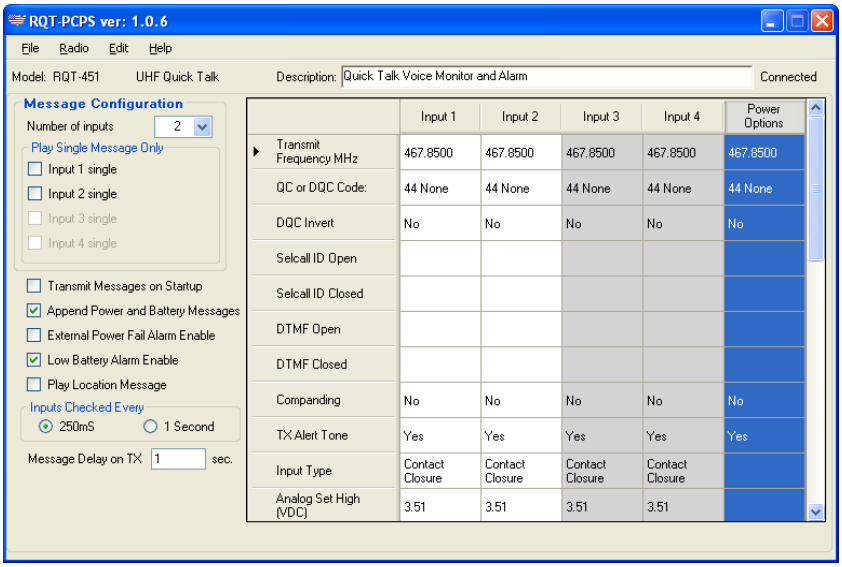


FIG-1: Programmer Summary Screen

Message Configuration

Programming the Message Configuration must be done before recording any of the voice messages. This allocates the available time for each message. Changing the Message Configuration will erase existing messages, requiring you to re-record all input messages.

Number of Inputs – This sets the number of inputs you will be using. Inputs used will always start with number 1 and progress sequentially as you add inputs.

Example: If you program the RQT for 2 inputs, Input 1 and Input 2 will be available, it cannot be Input 1 and Input 3.

Play Single Message Only – Setting an input for a single message doubles the available message time. The single message can be either the Open or Closed message.

Table 1: Maximum Message Length (sec.)

Number of Inputs	Single Message	Both Messages
1 input	24 sec.	12 sec.
2 inputs	12 sec.	6 sec.
3 inputs	8 sec.	4 sec.
4 inputs	6 sec.	3 sec.

Transmit Messages on Startup

If selected, Input status messages are transmitted when the RQT is powered on. This may be helpful in the event of a power outage.

Append Power and Battery Messages

If selected, Power Fail and Low Battery messages will play at the conclusion of any Input status message, as well as on the programmed schedule.

External Power Fail Alarm Enable

If selected, a Power Fail message is transmitted any time External Power supply drops below +12 VDC.

Low Battery Alarm Enable

If selected, a Low Battery message is transmitted when the internal batteries are in need of replacement.

Play Location Message

If selected, the RQT will transmit a recorded Location message immediately prior to any Input status message, Low Battery message, or Power Fail message.

Inputs Checked Every:

RQT checks Input status every 250mS by default, but can be set to check every one second to extend battery life.

Message Delay on TX

This sets a time delay between turning on the RQT transmitter and playing any messages, or ANI strings.

Description

Enter a brief description (35 characters or less) of the RQT use, location, customer, etc. This can be useful when reading out the Quick Talk™ programming at a later date, or when saving a programming profile for use with other radios.

Input Screen

The Input Screen is used to uniquely program the behavior of each input.

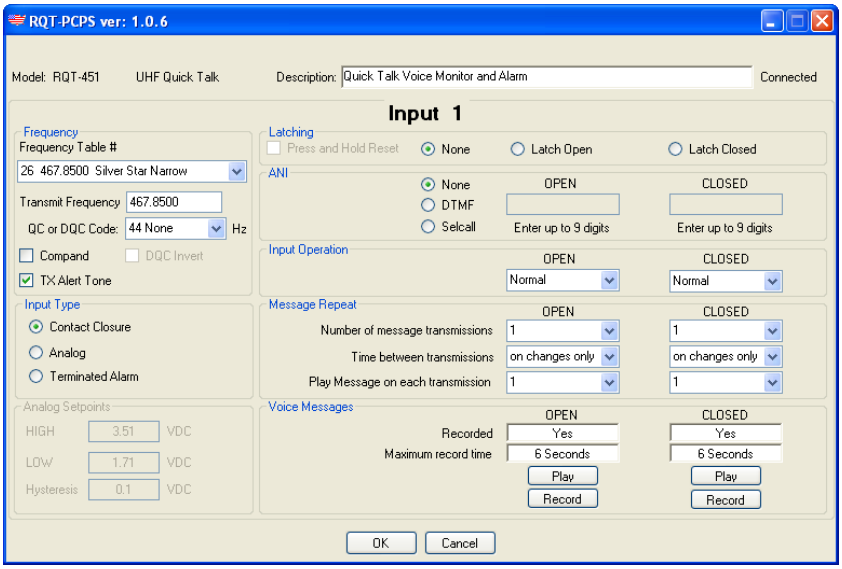


FIG-2: Programmer Input Screen

Frequency Table

To match other RITRON radios, the owner can select from a table of transmit frequencies. Simply "read-out" the Frequency Code of your RITRON portable, mobile or base radio and enter the same code when programming the Quick Talk™. Note that all RQT-151 and RQT-451 table frequencies operate in narrow band mode (12.5 kHz).

Transmit Frequency

Once you have selected a code from the Frequency Table the actual transmit frequency will appear here. If your operating frequency does not appear on the Frequency Table list, a licensed radio service technician will be able to enter other frequencies within the radio's operating band.

To identify your assigned frequency:

- Read-out the Frequency Code of the RITRON radio you intend to use with the Quick Talk™.
- Check for a corresponding color dot on the radio you intend to use with the Quick Talk™.
- Locate a label identifying the receiver frequency in megahertz (MHz).
- Your assigned frequency is shown on your FCC Station License.
- Call your radio dealer or Ritron for help if you cannot determine your radio's receiver frequency.
- The original factory-programmed transmitter frequency of your Quick Talk™ is marked on the outside of the shipping box.

QC or DQC Code

Select from a list of QC and DQC Codes to transmit subaudible squelch tones for interference elimination.

The Quick Talk™ radio transmitter is compatible with two standard communications industry sub-audible signaling formats: QC (Quiet Call® Interference Eliminator), and DQC (Digital Quiet Call™ Interference Eliminator). Both Quiet Call formats unlock receivers programmed to require these codes -- they screen out interference from other radio systems operating on your transmit frequency.

QC Quiet Call® is Ritron's trade name for what the communications industry calls sub-audible (below the range of human hearing) tone squelch, or CTCSS (Continuous Tone Coded Subaudible Squelch).

DQC Digital Quiet Call™ is Ritron's digital coded squelch, and works the same as QC, except it is a digital code that is transmitted with the voice messages.

<u>To identify your QC or DQC tone:</u>

- Read-out the Tone Code of the RITRON radio you intend to use with the Quick Talk™.
- Refer to your radio manual.
- Contact your radio dealer or Ritron if you are unsure about this issue.

DQC Invert

The DQC Digital Quiet Call™ code can be inverted for systems that require inversion.

TX Alert Tone

By default, the RQT will transmit an alert tone before each voice message transmission. This feature can be disabled via the PC programmer.

Input Type

Each input can be programmed for one of the three (3) basic types of Input operation.

Contact Closure – Is used when a switch closure is connected to the input.

Analog Input – Voltages above the High Analog Setpoint cause the Input OPEN message to transmit. The hysteresis voltage determines how much below the High Analog Setpoint the voltage must drop before it is no longer considered in the OPEN condition. Voltages below the Low Analog Setpoint cause the Input CLOSED message to transmit, with the hysteresis voltage determining how much above the Low Analog Setpoint the voltage must rise before it is no longer considered in the CLOSED condition. If the input is within the middle "dead zone" no message will be sent.

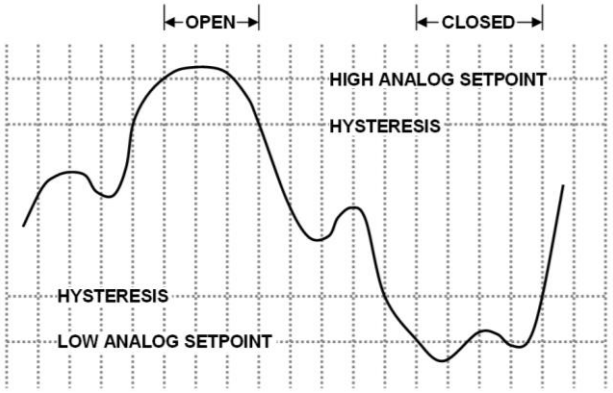


FIG-3: Example of Analog Input Type

Terminated Alarm Input - This mode is useful in security alarm applications, where the "Secure" (Good) condition is a range of voltages. Any voltage above or below this range represents an "Alarm" (Bad) condition.

The "Secure" condition is the range of voltage between the High and Low Analog Setpoints. The input OPEN message is activated in this range. Voltage above High Analog Setpoint, or below Low Analog Setpoint activates the input CLOSED message. Once the input is in the "Alarm" condition, the hysteresis voltage determines how much below the High Analog Setpoint or above the Low Analog Setpoint the voltage must go before it is no longer considered in the CLOSED condition.

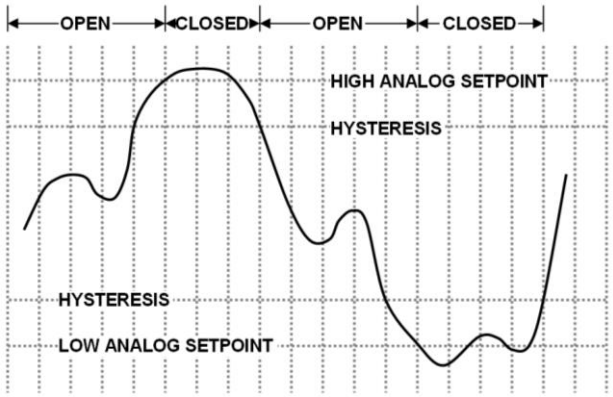


FIG-4: Example of Terminated Alarm Input Type

Analog Setpoints - The HIGH and LOW analog setpoints are used with Analog Input mode or Terminated Alarm Input mode, and can be programmed to any DC voltage between 0-5 VDC. The Hysteresis voltage is an offset applied to the HIGH and LOW Analog Setpoints once they have been exceeded. Analog Setpoints have no effect when the Input is set to Contact Closure mode.

Latching

Use the Quick Talk™ Latching Input mode if repeated transmissions are desired with a momentary switch (i.e. a push-button). The latching effect maintains message repeats after the momentary switch change has ended. Latching can only apply to one input condition, open or closed.

Example: To use a Quick Talk™ in a paint department, you want it to re-transmit an "Assistance Needed" message several times after a "Press for Help" push-button is pressed. With the Quick Talk™ set to Latching Input mode, release of the push-button is ignored and the message is re-transmitted as scheduled.

Press and Hold Reset - With the Quick Talk™ programmed for latching mode operation it's often desirable to repeat the "Assistance message" without limitation until the call has been answered. With Press and Hold Reset enabled the push button can be held down for 5 seconds to reset the Quick Talk™ to the standby condition.

Example: To use a Quick Talk™ in a paint department, you want it to re-transmit a message several times after a "Press for Help" push-button is pressed. With the Quick Talk™ set for Press and Hold Reset an employee can terminate the message transmissions, and in the process send a "Call answered" message.

ANI

The Input Open and Input Closed conditions can each be programmed with a unique 1-9 digit DTMF or 3-7 digit Selcall ANI string. The ANI will be transmitted immediately prior to the Alert Tone and Input message. To program an ANI string, select Selcall or DTMF and enter the string in the value field.

Input Operation

Normal – operation transmits a message each time a changed condition is detected.

Dwell Mode - is an option specifying that the switch must remain in it's changed condition for the programmed dwell time before generating a message for the changed condition.

Example: A sensor is used to detect a car in a "No Parking" zone. Since it is undesirable for a message to be generated by normal traffic through the "No Parking" zone, a five-minute Dwell is used. Only if the sensor is activated for a full five minutes will the "car illegally parked" message be transmitted.

Holdoff Mode - option transmits messages immediately upon a change of switch condition, and will hold off a message indicating further change for the programmed holdoff time.

Example: A Quick Talk™ is used as a gate doorbell. It is practical for the message to be transmitted immediately, and also desirable to have a one-minute holdoff before the same message is re-sent, even if the button is pushed repeatedly.

Dwell / Holdoff Time – specifies the dwell time or holdoff time described above. This time is programmed independently for the OPEN and CLOSED conditions.

Message Repeat

Number of Message Transmissions

You can set a limit to the number of times the message will be transmitted at a scheduled interval.

Time Between Transmissions

This sets the amount of time the Quick Talk™ will wait between repeated transmissions. You can program a different Wait Time for the open condition, and for the closed condition of your switch.

The Quick Talk™ is set at the factory to transmit switch status messages only when they change.

Example: The switch status message for switch open is "Pump motor temperature OK". You may schedule the Quick Talk™ to transmit this message once every two hours; this way, you know the Quick Talk™ is operating properly.

If the corresponding switch status message for switch closed is "Pump Motor Over Temperature", you may schedule the Quick Talk™ to broadcast this message every two minutes, so the situation would receive prompt attention.

Example: Suppose you have a vehicle detection switch that closes when it detects a vehicle at the delivery door of your building. Your recorded message might then be "Vehicle at Delivery Door". You may want this message to be transmitted every two minutes for approximately a quarter hour after a vehicle is detected, then to stop transmitting until the vehicle is moved. In this case, you would program the Time Between Transmissions for two minutes, and set the Number of Message Transmissions to 8.

When a vehicle arrives, the switch closes and the message is transmitted every 2 minutes until it has been sent 8 times over a span of 16 minutes, unless the vehicle leaves before 16 minutes has lapsed. In this case, the switch opens and the message ceases when the vehicle is moved.

When another vehicle arrives, the Quick Talk™ again transmits the message every two minutes for about a quarter of an hour, or until the vehicle leaves.

Repeat Message on each transmission

Your recorded voice message can be programmed to repeat from one time to nine times on each Quick Talk™ radio transmission. Urgent messages may require more phrase repeats.

Example: You recorded the message "Pump Motor Hot", and then programmed the Quick Talk™ to repeat the phrase two (2) times in each transmission. In this case, activating the switch results in the Quick Talk™ transmitting: "...beep. Pump motor hot. Pump motor hot...." The beginning beep can be added to attract attention to Quick Talk™ transmissions.

Voice Messages

The Input Open and Input Closed messages are recorded via the Input Screen. Refer to the Recording Your Quick Voice Talk™ Messages section of this manual for instructions on recording voice messages. The Recorded box indicates whether or not a message has been recorded. The Maximum Record Time for each message is also indicated. This time is determined by the number of inputs programmed on the Summary Screen.

Power Options Screen

Power Fail and Low Battery Alert messages can be programmed for unique frequencies, tones, and Voice messages.

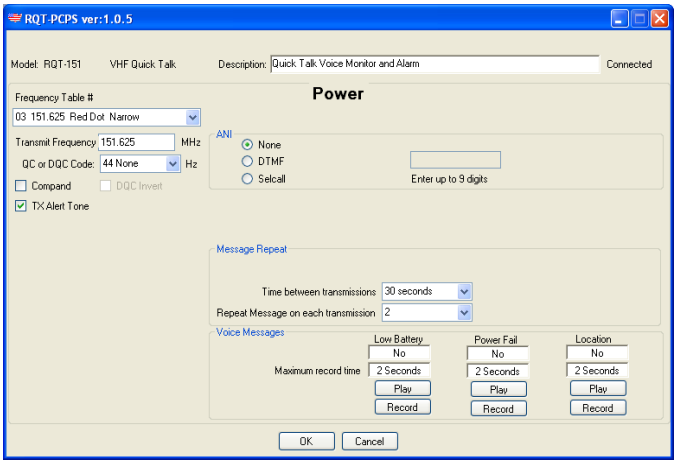


FIG-5: Programmer Power Options Screen

Frequency Table #

To match other RITRON radios, the owner can select from a table of transmit frequencies. Simply "read-out" the Frequency Code of your RITRON portable, mobile or base radio and enter the same code when programming the Quick Talk™.

Transmit Frequency

Once you have selected a Frequency Code the actual transmit frequency will appear here. If your operating frequency does not appear on the Frequency Code list, a licensed radio service technician will be able to enter other frequencies within the radio's operating band.

QUICK TALK™ PROGRAMMABLE FEATURES

QC or DQC Code

Select from a list of QC and DQC Codes to transmit subaudible squelch tones for interference elimination.

DQC Invert

The DQC Digital Quiet Call™ code can be inverted for systems that require inversion.

TX Alert Tone

The RQT can transmit an alert tone before each voice message transmission.

ANI

Power Alerts messages can be programmed with a unique 9 digit DTMF or 3-7 digit Selcall ANI string. The ANI will be transmitted immediately prior to the Alert Tone and Power Alert message. To program an ANI string, select Selcall or DTMF and enter the string in the value field.

Message Repeat

Time between transmissions

This sets the amount of time the Quick Talk™ will wait before re-transmitting a Power Alert message. For battery powered operation this time will likely be 1 hour or more.

Repeat Message on each transmission

Your recorded voice message can be programmed to repeat from one time to nine times on each Quick Talk™ radio transmission, depending on how you program this feature. Urgent messages may require more phrase repeats.

Voice Messages

Refer to the Recording Your Quick Talk™ Voice Messages section of this manual for instructions on recording voice messages.

QUICK TALK™ FACTORY DEFAULT PROGRAMMING

TX Frequency (all inputs)			
RQT-151, -152	03	151.625 MHz	NB
RQT-151M, -152M	02	154.570 MHz	WB
RQT-151-CANADA, RQT-152-CANADA	01	151.055 MHz	WB
RQT-451, -452	26	467.850 MHz	NB
RQT-451-CANADA RQT-452-CANADA	01	458.6625 MHz	WB
QC/DQC Code (all inputs)	44	No Tone	
DQC Invert	No		
Input Type	Contact Closure		
Analog Setpoints	High	3.6 VDC	
	Low	1.7 VDC	
Input Operation	Normal		
Latching Input Mode	No		
Dwell/Holdoff Time	Open/High	none	
	Closed/Low	none	
Number of Inputs	Inputs 1 and 2		
TX Alert Tone	Yes		
Power Strobe Time	250 mS		
Append Power Messages	Yes		

Low Battery Message	Yes
Power Fail Message	No
Play Location Message	No
Message Delay on TX	1 sec.
Recorded Messages	
Input 1 Open/High	“Switch 1 open”
Input 1 Closed/Low	“Switch 1 closed”
Input 2 Open/High	“Switch 2 open”
Input 2 Closed/Low	“Switch 2 closed”
Power Fail	“Quick Talk power fail”
Low Battery	“Quick Talk battery”
Number of Times Recorded Message is repeated on each Transmission	
Inputs 1-4 Open/High	One time
Inputs 1-4 Closed/Low	One time
Power Alert	One time
Number of Times the Transmission is sent	
Inputs 1-4 Open/High	No repeat
Inputs 1-4 Closed/Low	No repeat
Power Fail	Forever
Wait Time between Transmissions	
Inputs 1-4 Open/High	On change only
Inputs 1-4 Closed/Low	On change only
Power Alert	1 Hour

QUICK TALK™ TRANSMITTER TABLE FREQUENCIES AND TONES

The Quick Talk™ transmitter operates exclusively on a 12.5 kHz narrow band channel bandwidth. Many of the Frequency Table Codes programmed in your compatible Ritron radios are for 25 kHz wide band channels. If these codes are selected when programming your Quick Talk™ radio, the radio will operate at a 12.5 kHz narrow band channel bandwidth. This allows you to use your Quick Talk™ with all of your existing radios.

The RQT-151M and RQT-152M MURS model radios can only be programmed to the codes listed on Table 2 below. VHF Business band models can be programmed to the codes listed on Table 3 below, or can be programmed to any valid licensed frequency between 150-165 MHz EXCEPT the frequencies listed on MURS Table 2 below.

TABLE 2: MURS model radios only (US)

Code	Frequency (MHz)	Color Dot	Channel Bandwidth
01	154.600	Green Dot	25 kHz
02	154.570	Blue Dot	25 kHz
19	151.820	MURS	12.5 kHz
20	151.880	MURS	12.5 kHz
21	151.940	MURS	12.5 kHz
22	154.600	MURS	12.5 kHz
23	154.570	MURS	12.5 kHz

TABLE 3: VHF Business band models (US)

Code	Frequency (MHz)	Color Dot	Channel Bandwidth
03	151.625	Red Dot	12.5 kHz
04	151.955	Purple Dot	12.5 kHz
05	151.925		12.5 kHz
06	154.540		12.5 kHz
07	154.515		12.5 kHz
08	154.655		12.5 kHz
09	151.685		12.5 kHz
10	151.715		12.5 kHz
11	151.775		12.5 kHz
12	151.805		12.5 kHz
13	151.835		12.5 kHz
14	151.895		12.5 kHz
15	154.490		12.5 kHz
16	151.655		12.5 kHz
17	151.745		12.5 kHz
18	151.865		12.5 kHz
24	151.700		12.5 kHz
25	151.760		12.5 kHz
26	152.700		12.5 kHz

TABLE 4: UHF Business band models (US)

Code	Frequency (MHz)	Color Dot	Channel Bandwidth
01	467.7625	J	12.5 kHz
02	467.8125	K	12.5 kHz
03	464.5500	Yellow Dot	12.5 kHz
04	464.5000	Brown Dot	12.5 kHz
05	467.8500	Silver Star	12.5 kHz
06	467.8750	Gold Star	12.5 kHz
07	467.9000	Red Star	12.5 kHz
08	467.9250	Blue Star	12.5 kHz
09	469.2625		12.5 kHz
10	462.5750	White Dot	12.5 kHz
11	462.6250	Black Dot	12.5 kHz
12	462.6750	Orange Dot	12.5 kHz
13	464.3250		12.5 kHz
14	464.8250		12.5 kHz
15	469.5000		12.5 kHz
16	469.5500		12.5 kHz
17	463.2625		12.5 kHz
18	464.9125		12.5 kHz
19	464.6000		12.5 kHz
20	464.7000		12.5 kHz

TABLE 4: UHF Business band models (US) cont.

Code	Frequency (MHz)	Color Dot	Channel Bandwidth
21	462.7250		12.5 kHz
22	464.5000	Brown Dot	12.5 kHz
23	464.5500	Yellow Dot	12.5 kHz
24	467.7625	J	12.5 kHz
25	467.8125	K	12.5 kHz
26	467.8500	Silver Star	12.5 kHz
27	467.8750	Gold Star	12.5 kHz
28	467.9000	Red Star	12.5 kHz
29	467.9250	Blue Star	12.5 kHz
30	461.0375		12.5 kHz
31	461.0625		12.5 kHz
32	461.0875		12.5 kHz
33	461.1125		12.5 kHz
34	461.1375		12.5 kHz
35	461.1625		12.5 kHz
36	461.1875		12.5 kHz
37	461.2125		12.5 kHz
38	461.2375		12.5 kHz
39	461.2625		12.5 kHz
40	461.2875		12.5 kHz
41	461.3125		12.5 kHz
42	461.3375		12.5 kHz
43	461.3625		12.5 kHz
44	462.7625		12.5 kHz
45	462.7875		12.5 kHz
46	462.8125		12.5 kHz
47	462.8375		12.5 kHz
48	462.8625		12.5 kHz
49	462.8875		12.5 kHz
50	462.9125		12.5 kHz
51	464.4875		12.5 kHz
52	464.5125		12.5 kHz
53	464.5375		12.5 kHz
54	464.5625		12.5 kHz
55	466.0375		12.5 kHz
56	466.0625		12.5 kHz
57	466.0875		12.5 kHz
58	466.1125		12.5 kHz
59	466.1375		12.5 kHz
60	466.1625		12.5 kHz
61	466.1875		12.5 kHz
62	466.2125		12.5 kHz
63	466.2375		12.5 kHz
64	466.2625		12.5 kHz
65	466.2875		12.5 kHz
66	466.3125		12.5 kHz
67	466.3375		12.5 kHz
68	466.3625		12.5 kHz
69	467.7875		12.5 kHz
70	467.8375		12.5 kHz
71	467.8625		12.5 kHz
72	467.8875		12.5 kHz
73	467.9125		12.5 kHz
74	469.4875		12.5 kHz
75	469.5125		12.5 kHz
76	469.5375		12.5 kHz
77	469.5625		12.5 kHz

TABLE 5: Canadian UHF model radios only

Code	Frequency (MHz)	Color Dot	Channel Bandwidth
01	458.6625		25 kHz
02	469.2625		25 kHz

TABLE 6: Quiet Call Tone Codes

Code	Frequency	Code	Frequency	Code	Frequency	Code	Frequency	Code	Frequency
00	None	11	97.4	22	141.3	33	210.7	44	No Tone
01	67.0	12	100.0	23	146.2	34	218.1	45	183.5
02	71.9	13	103.5	24	151.4	35	225.7	46	189.9
03	74.4	14	107.2	25	156.7	36	233.6	47	196.6
04	77.0	15	110.9	26	162.2	37	241.8	48	199.5
05	79.7	16	114.8	27	167.9	38	250.3	49	206.5
06	82.5	17	118.8	28	173.8	39	69.4	50	229.1
07	85.4	18	123.0	29	179.9	40	159.8	51	254.1
08	88.5	19	127.3	30	186.2	41	165.5		
09	91.5	20	131.8	31	192.8	42	171.3		
10	94.8	21	136.5	32	203.5	43	177.3		

Use Code “44” to program No Tone for systems without a Coded Squelch Interference Eliminator feature.

TABLE 7: Digital Quiet Call Codes

Code	Code	Code	Code	Code	Code	Code	Code	Code
023	071	143	225	266	356	452	546	703
025	072	145	226	271	364	454	565	712
026	073	152	243	274	365	455	606	723
031	074	155	244	306	371	462	612	731
032	114	156	245	311	411	464	624	732
036	115	162	246	315	412	465	627	734
043	116	165	251	325	413	466	631	743
047	122	172	252	331	423	503	632	754
051	125	174	255	332	431	506	645	
053	131	205	261	343	432	516	654	
054	132	212	263	346	445	523	662	
065	134	223	265	351	446	532	664	

Each of the four Quick Talk™ inputs can be programmed to play two unique voice messages, a "Switch Open" message that plays when the input changes to an OPEN or HIGH condition, and a "Switch Closed" message that plays when the input changes to a CLOSED or LOW condition.

Voice messages can be recorded into the Quick Talk™ using the RQA/RQT PC Programmer and the electret condenser microphone built onto the radio PCB assembly. Voice messages can also be recorded with an incoming audio signal from your computer. This allows you to record and store a message onto your computer and use it for multiple Quick Talk™ transmitters.

Input Messages

The length of each message is determined by two factors:

1. The number of inputs to be used.
2. If you will play both an OPEN and CLOSED message, or just one or the other.

A total of 24 seconds is allocated for all voice messages related to the four inputs. The 24 seconds is first divided equally by the number of inputs you have programmed into your Quick Talk™. Each input is then divided by the number of messages it will play, either two messages for both the OPEN and CLOSED condition or one message if only one condition is required.

Example: If you have programmed your Quick Talk™ for two inputs, 12 seconds will be allocated to each input. If Input 1 transmits both the "Switch Open" and "Switch Closed" messages they will each be limited to 6 seconds. If Input 2 requires only the "Switch Closed" message it can be up to 12 seconds.

Carefully consider your requirements before recording the Quick Talk™ voice messages. If you decide later to use additional inputs, all messages will have to be re-recorded.

Low Battery Message

The Low Battery message is limited to 2 seconds

When it senses the installed batteries are nearly run down, the Quick Talk™ will transmit the factory-programmed message: "Quick Talk Battery" at the scheduled time programmed on the Power Options screen.

If you use only one Quick Talk™ in any area, or if you regularly change Quick Talk™ batteries, the factory-programmed message may be sufficient for your application. You may also re-record the message to satisfy your specific needs.

Power Fail Message

The Power Fail message is limited to 2 seconds

When the Quick Talk™ is powered with an external +12 VDC supply and batteries are installed as a back-up, the RQT will transmit the Power Fail Message on a scheduled basis for as long as the +12 VDC external supply is not detected.

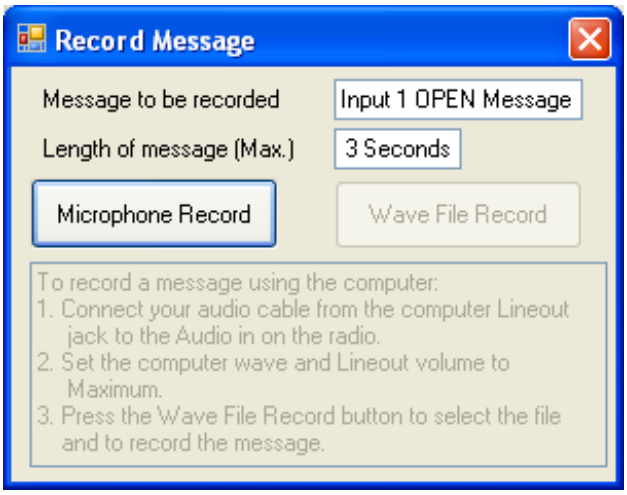
Location Message

The Location message is limited to 2 seconds

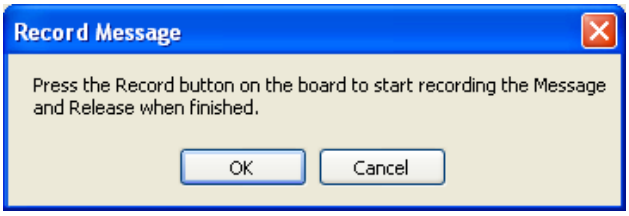
When installing more than one Quick Talk™ on a single frequency it may be desirable to record a unique Location Message to identify each individual Quick Talk™. When enabled, the Location Message will be played after the TX Alert Tone and before the Input Message.

To record your Quick Talk™ Voice Messages using the on-board microphone:

1. Read the existing radio programming.
2. Enter the Number of Inputs you will be using and program the RQT for this change.
3. Select the Input, or Power Option, for the message you will be recording.
4. Press the RECORD button for the message to be recorded. The Record Message dialog box will appear.



5. Select Microphone Record.
6. The following dialog box will appear. Record the message per the instructions, then press OK to exit record mode. Message recording will automatically terminate after the allotted Length of Message time if the record button has not been released.



7. The RECORDED textbox will now indicate that the message is recorded.
8. After you have recorded a message you can review it by pressing the associated PLAY button. The Quick Talk™ will transmit the message on the transmit frequency associated with the input selected.

RECORDING YOUR QUICK TALK™ VOICE MESSAGES

Custom Voice Messages

Recording customized Quick Talk™ voice messages gives them unmistakable meaning and significance. The standard factory prerecorded messages of "Switch Open" and "Switch Closed" require the listener to know how the switch works and what it does. However, when a user hears a custom message such as 'Water pump three running hot", the meaning is clear.

If the factory recorded messages "Switch Open" and "Switch Closed" suit your application, recording custom messages is not necessary.

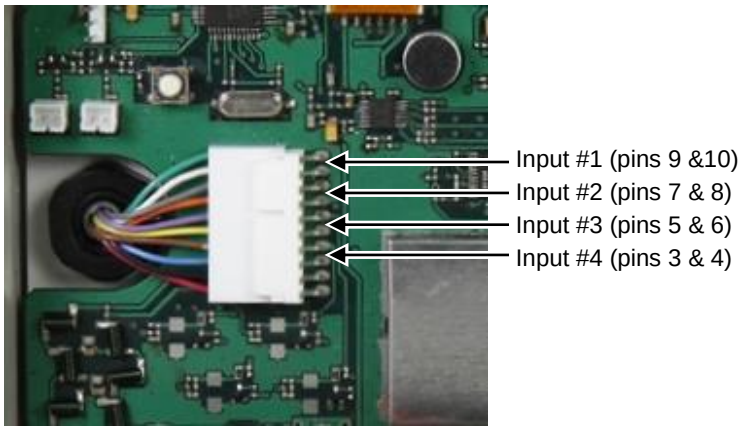
To record a custom message, follow the instructions in the Recording Your Quick Talk™ Voice Messages section of this manual. Once recorded, play back the message to be sure you are satisfied with the quality and content of the message.

TEST YOUR QUICK TALK™ PROGRAMMING

Once your Quick Talk™ has been programmed, it will transmit on the same frequency as your radio receivers, and will transmit any coded squelch signals required for your radio system. Before installing the Quick Talk™ you should test for communication with your radio receivers to verify your Quick Talk™ programming.

To test the Quick Talk™ radio transmitter:

1 Attach the Quick Talk™ flexible antenna.
2. Turn on your radio receiver.
3. Place a screwdriver, paper clip or other electrically conductive item across the Input #1 pins.
4. Quick Talk™ will transmit the Input 1 CLOSED message, which you should be able to hear on your radio receiver.
5. Remove the short across the Input #1 pins.
6. Quick Talk™ will transmit the Input 1 OPEN message, which you should be able to hear on your radio receiver.
7. Repeat Steps 3 through 6 for Inputs 2, 3 and 4 if they have been programmed to be used.
8. If you do not hear the messages, you have probably not properly programmed the Quick Talk™ transmitter frequency or the Quiet Call® Coded Squelch. In this case, repeat the programming and perform this test again.



Depending upon your programming, the following sequence describes what you should hear with your radio receiver:

1. The Quick Talk™ transmitter will broadcast on the Transmit Frequency and QC or DQC Code programmed for the input that has been activated.
2. The Quick Talk™ will broadcast silence during the programmed Message Delay on TX Time.
3. The Quick Talk™ will broadcast DTMF or Selcall ANI if it has been programmed.
4. The Quick Talk™ will broadcast the TX Alert Tone if it has been enabled.
5. The Quick Talk™ will broadcast the Location Message if it has been recorded and enabled.
6. The Quick Talk™ will broadcast the recorded Input OPEN Message if the input has gone high or the Input CLOSED Message if the input has gone low.
7. The Input Message will be played for the number of times programmed for Play Message on each Transmission.
8. The Quick Talk™ transmitter will turn OFF and the RQT will wait for the period of time programmed for Time between Transmissions.
9. If Number of Message Transmissions has been programmed for more than one transmission, the Quick Talk™ transmitter will again be activated and Steps 1 – 8 will be repeated for the programmed number of transmissions.

1 Battery Holder

The battery holder accommodates the six (6) standard "AA" alkaline cells required to power the Quick Talk™.

NOTE: Always install a fresh set of alkaline batteries before programming the unit.

2 BNC Antenna Connector

The antenna radiates radio signals. Before using Quick Talk™, make sure the antenna is fastened securely to this connector on the front of the radio.

3 SMB Antenna Connector

This connects the front-panel, BNC antenna connector to the radio's printed circuit board.

4 External Audio Input

Allows input to the Quick Talk™ voice recorder from an external audio source, such as the Line Out audio from your computer.

5 Microphone

Microphone for recording voice messages.

6 USB Programming Connector

Connects the Quick Talk™ to the USB port on your computer for programming.

7 Record Button

Press this button to initiate voice recording.

8 External Hookup Cable (not shown)

A 10-conductor cable for connection of external power supply and up to four (4) switch inputs.

9 Watertight Strain Relief Cable Fitting

The External Hookup cable to your external switches passes through this fitting. When the strain relief fitting is used with recommended cable sizes, it provides a water-resistant enclosure. Do not overtighten this fitting.

NOTES: Use Alpha Wire 1219C/10, 10-conductor #24 AWG cable with an outside diameter of 0.25" for a watertight fit.

If you cannot find suitable wire, call Ritron at 800-872-1872.

10 External Hookup Connector

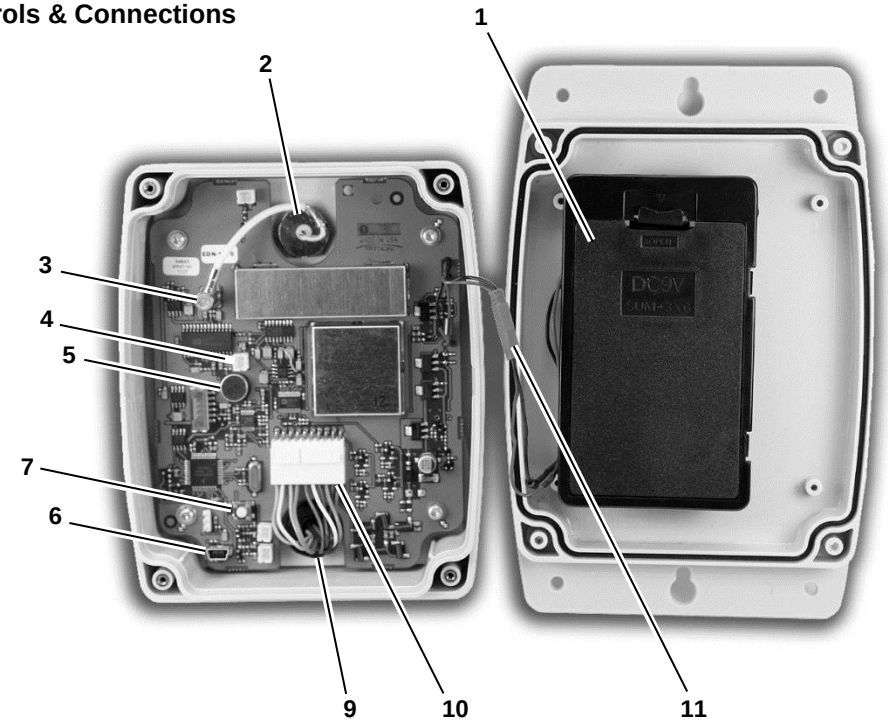
A 10-position connector for the external hookup cable.

11 Battery Connector

In-line connector between the printed circuit board and the battery holder.

IMPORTANT: Do not remove any other fasteners or further disassemble the Quick Talk™ unit; doing so risks damage to the unit and could void the manufacturer's warranty.

FIG-6: Controls & Connections



INSTALLING THE QUICK TALK™

Prior to installing the Quick Talk™ transmitter, it is important to verify all radio programming to be certain that you have achieved the operation you desire. Re-programming requires the removal of the Quick Talk™ from it's installed location, which can be time consuming and frustrating.

1. **Install 6 new AA Alkaline batteries into the internal battery holder** and screw the case halves together. Be sure the case halves are pulled tightly together for a good weather seal.

2. **Select a location that provides the best possible radio coverage.**
   - Avoid mounting to metal structures
   - Install as high as possible
   - Be sure the antenna is in a vertical position
   - Be aware that metal or wires near the antenna can block or absorb radio transmissions.

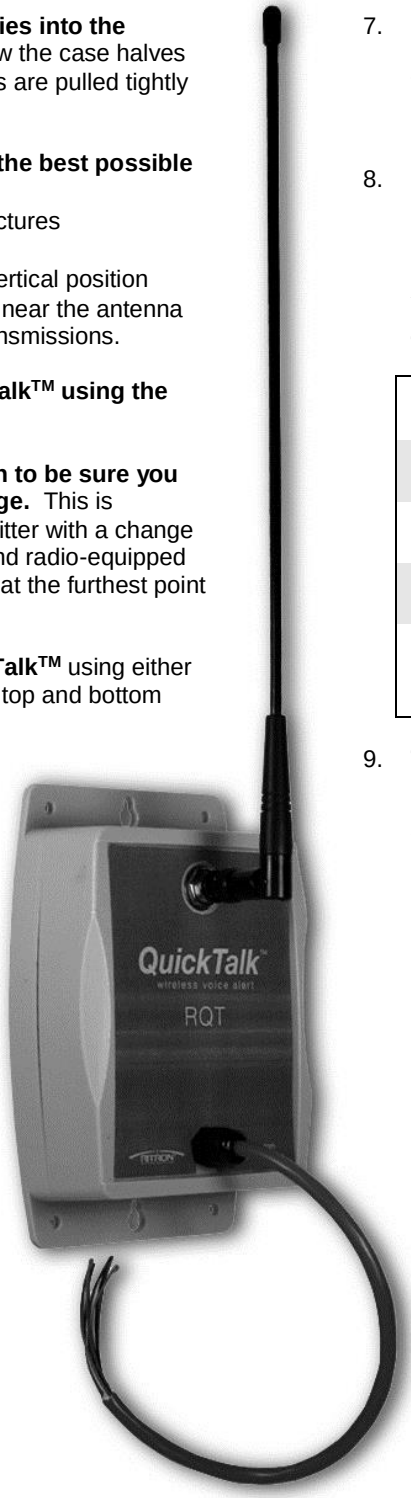
3. **Temporarily mount the Quick Talk™ using the top keyhole slot.**

4. **Test the radio from this location to be sure you get the necessary radio coverage.** This is achieved by activating the transmitter with a change on one of the inputs while a second radio-equipped person receives the transmission at the furthest point you will need to cover.

5. **Permanently mount the Quick Talk™** using either the four (4) corner mounts, or the top and bottom keyhole slots.

6. **Connect the antenna to the front panel BNC connector.**

   If the Quick Talk™ is installed in an outdoor location, the antenna connection must be sealed with weather-proof tape to prevent corrosion and leakage. Seal the antenna connection to hold the antenna in a vertical position, to protect antenna fittings, and to maintain water-resistance of the Quick Talk™ in wet or outdoor environments. Use Archer Connector Sealant, Radio Shack Catalog Number 278-1645 or an equivalent. Wrap the connection with the sealant tape and press it securely in place. See sealant instructions for the specific details.



7. **Connect the 4 Inputs and External +12 VDC power** provided by a 10-conductor, color -coded cable from the front of the Quick Talk™. This cable has been pre-installed with a sealed strain relief to provide weather resistance.

8. **Connect your switches or sensors to the desired Quick Talk™ inputs using wire nuts** to the color-coded cable described in Table 8. Be sure to use an appropriate sized, sealing wire nut. The color-coded wires are 24 AWG stranded.

Table 8: RQT Color-Coded Inputs

Input 1	+	GREEN
	-	WHITE (Ground)
Input 2	+	GRAY
	-	ORANGE (Ground)
Input 3	+	PURPLE
	-	YELLOW (Ground)
Input 4	+	BROWN
	-	BLUE (Ground)
External +12 VDC		
	+	RED
	-	BLACK

9. **Test each one of the input switches or sensors** for the desired operation.

   To test your input switches:

   a. Set your two-way radio to the channel programmed to receive the Quick Talk™ messages.

   b. Activate each switch one at a time, and listen to your two-way radio as each message is transmitted. Write down a description of how the condition of your switch corresponds to the transmitted message. Then de-activate the switch and listen to the other transmitted message; again, write down the results.

   c. By performing Step b, you should understand how your switch works, and the meaning of it's open and closed states — essential knowledge if you intend to record a descriptive voice message for each switch condition.

Example: if your switch is a magnetic reed switch on a door, and the switch closes when the door is opened, you can record the phrase "Door three open" for the switch closed condition, and then "Door three closed" for the switch open condition. Note that magnetic reed switches are available which work in the opposite way.

Connecting an External +12 VDC Power Supply

The Quick Talk™ may be used with an external +12 VDC power supply. With an external supply connected the internal batteries are automatically configured as a back-up power source. With the Quick Talk™ programmed for External Power and batteries installed as a back-up, it will broadcast the Power Fail message any time the external supply is removed and will repeat the Power Fail message once every hour (default) until external power is restored.

To use the Quick Talk™ with an external +I2 VDC power supply:

1. Use the PC Programmer to set the Quick Talk™ for External Power Fail alarm enabled.
2. If the factory recorded "Quick Talk Power Fail" message is not adequate, record a new Power Fail message.
3. Use Ritron RPS-EXPO Power Supply or equivalent, to power the Quick Talk™. Depending on the specific model, the Quick Talk™ requires up to 11-15 VDC, 1.5A minimum.
4. Connect the positive (+) terminal of the power supply cable to the RED wire on the Quick Talk™ color-coded cable.
5. Connect the negative (-) terminal of the power supply cable to the BLACK wire on the Quick Talk™ color-coded cable.
6. Be sure to use an appropriate sized, sealing wire nut to connect the wires. The color-coded wires are 24 AWG stranded.

Solar Panels for Operating & Charging Rechargeable Batteries

Quick Talk™ uses little power when it is not transmitting. The estimated time the unit transmits can help determine the solar panel size required to charge rechargeable batteries. The following formula can be used to determine the size the solar panel:

The formula to calculate the solar panel's required mAH:

(TX time per hour) x (TX current in mA) x (Number of hours per day) = Req'd. mAH per day

Example: Assume the Quick Talk™ transmits for one minute of every hour, on average (1/60 hour). Further assume the Quick Talk™ draws 150 mA of current while transmitting.

NOTE: 150 mA is a bit higher than real consumption; the panel will be slightly oversized.

Plug the Example into the Formula:

(1/60 hour) x (l50mA) x (24 hours/day) = 60 mAH per day

RESULTS: In this Example, the Quick Talk™ solar panel requires 60 mAH in a 24-hour period.

NOTE: Study solar panel manufacturers' information. Quick Talk™ input voltage cannot exceed 15 VDC.

Monitor 4-20 mA Sensor Current Loop with Quick Talk™ Analog Input

Quick Talk™ can act as a current sink when a resistor is connected between an Input's positive and negative connection. The resistance value is selected to scale the current to the permitted 0 - 5 Volt range for the Input to Quick Talk™. The following formula is used to calculate the Analog Threshold Setpoints necessary for your application.

Analog Threshold Setpoint = 4-20 ma current (Amps) times the resistor value (Ohms)

NOTE: A resistor value of 250Ω provides the maximum resolution, and is the recommended value. Using a lower resistance value with the 4-20 mA current loop produces less than 5 V at the Input and the measurement resolution is reduced. Using a higher resistance value at 20 mA can produce a voltage greater than 5V at the Input, which will not be recognized.

To configure an Input for 4-20 mA current loop:

1. Connect a resistor between the two wires on the Quick Talk™ color-coded cable that are associated with the desired Input (see Table 8).
2. Connect the output of the 4-20 mA current loop device to the positive (+) wire of the Input connection.
3. Program the desired Input for Analog Input operation and for the calculated Analog Setpoints.
4. Record an Input OPEN and Input CLOSED message for the associated Input.

RITRON, INC. LIMITED WARRANTY.....

WHAT THIS WARRANTY COVERS:

RITRON, INC. ("RITRON") provides the following warranty against defects in materials and/or workmanship in RITRON Radios and Accessories under normal use and service during the applicable warranty period (as stated below). "Accessories" means antennas, holsters, chargers, earphones, speaker/microphones and items contained in the programming and programming/service kits.

WHAT IS COVERED	FOR HOW LONG	WHAT RITRON WILL DO
Ritron RQT Quick Talk™	1 year*	During the first year after date of purchase, RITRON will repair or replace the defective product, at RITRON's option, parts and labor included at no charge.
Accessories	90 days*	*****_After date of purchase_

WHAT THIS WARRANTY DOES NOT COVER:

- Any technical information provided with the covered product or any other RITRON products;
- Installation, maintenance or service of the product, unless this is covered by a separate written agreement with RITRON;
- Any products not furnished by RITRON which are attached or used with the covered product, or defects or damage from the use of the covered product with equipment that is not covered (such as defects or damage from the charging or use of batteries other than with covered product);
- Defects or damage, including broken antennas, resulting from:
  - misuse, abuse, improper maintenance, alteration, modification, neglect, accident or act of God,
  - the use of covered products other than in normal and customary manner or,
  - improper testing or installation;
- Defects or damages from unauthorized disassembly, repair or modification, or where unauthorized disassembly, repair or modification prevents inspection and testing necessary to validate warranty claims;
- Defects or damages in which the serial number has been removed, altered or defaced.
- Batteries if any of the seals are not intact.

IMPORTANT: This warranty sets forth the full extent of RITRON's express responsibilities regarding the covered products, and is given in lieu of all other express warranties. What RITRON has agreed to do above is your sole and exclusive remedy. No person is authorized to make any other warranty to you on behalf of RITRON. Warranties implied by state law, such as implied warranties of merchantability and fitness for a particular purpose, are limited to the duration of this limited warranty as it applies to the covered product. Incidental and consequential damages are not recoverable under this warranty (this includes loss of use or time, inconvenience, business interruption, commercial loss, lost profits or savings). Some states do not allow the exclusion or limitation of incidental or consequential damages, or limitation on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you. Because each covered product system is unique, RITRON disclaims liability for range, coverage, or operation of the system as a whole under this warranty.

WHO IS COVERED BY THIS WARRANTY: This warranty is given only to the purchaser or lessee of covered products when acquired for use, not resale. This warranty is not assignable or transferable.

HOW TO GET WARRANTY SERVICE: To receive warranty service, you must deliver or send the defective product, delivery costs and insurance prepaid, within the applicable warranty period, to **RITRON, INC., 505 West Carmel Drive, Carmel, Indiana 46032, Attention: Warranty Department.** Please point out the nature of the defect in as much detail as you can. You must retain your sales or lease receipt (or other written evidence of the date of purchase) and deliver it along with the product. If RITRON chooses to repair or replace a defective product, RITRON may replace the product or any part or component with reconditioned product, parts or components. Replacements are covered for the balance of the original applicable warranty period. All replaced covered products, parts or components become RITRON's property.

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