

# RTS Intercom Series

Innovating the Future of Communications

*KP 612 and KP 412*

*Desktop, Rack Mount, and Handset  
Keypanels*

*User Manual*



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 THE LIGHTNING FLASH AND ARROWHEAD WITHIN THE TRIANGLE IS A WARNING SIGN ALERTING YOU OF "DANGEROUS VOLTAGE" INSIDE THE PRODUCT.	<b>CAUTION</b> RISK OF ELECTRIC SHOCK DO NOT OPEN CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER. NO USER-SERVICABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.	 THE EXCLAMATION POINT WITHIN THE TRIANGLE IS A WARNING SIGN ALERTING YOU OF IMPORTANT INSTRUCTIONS ACCOMPANYING THE PRODUCT.
SEE MARKING ON BOTTOM/BACK OF PRODUCT.		


**WARNING:** APPARATUS SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING AND NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHALL BE PLACED ON THE APPARATUS.

**WARNING:** THE MAIN POWER PLUG MUST REMAIN READILY OPERABLE.

**CAUTION:** TO REDUCE THE RISK OF ELECTRIC SHOCK, GROUNDING OF THE CENTER PIN OF THIS PLUG MUST BE MAINTAINED.

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**WARNING:** TO PREVENT INJURY, THIS APPARATUS MUST BE SECURELY ATTACHED TO THE FLOOR/WALL/RACK IN ACCORDANCE WITH THE INSTALLATION INSTRUCTIONS.

	This product is AC only.
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## *Important Safety Instructions*

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.





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# *Introduction*

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## *General Description*

The RTS KP 612/KP 412 keypanel fits in a standard 19" rack and is one (1) rack-unit high. It has 12 keys, each key consisting of one (1) listen button and one (1) talk button. Ten keys are used for intercom talk and listen and two (2) keys are for call-waiting response.

In addition, there are two (2) encoders. One (1) encoder is used for Headset, Microphone, Auxiliary Input, and Matrix In volume adjustment. The other encoder knob is used for menu selection. The KP 612/KP 412 keypanel has a standard numerical keypad with four (4) extra keys: Mic Mute, User Assignable, Page Up, and Page Down.

The KP 612 has a 6-character display panel and the KP 412 has a 4-character display panel. The KP 612/KP 412 keypanels have added significant new features such as digital signal processing (DSP). The KP 612/KP 412 keypanels also offer a custom design LCD display with support for 16 x 16 Kanji, Katakana, Hiragana, and English characters.

The KP 612/KP 412 keypanels are made of pressed aluminum/metal and feature state of the art audio processors and drivers. There are three (3) different keypanel models to choose between: Desktop, Rack Mount, and Rack Mount-Lever Key.

## Features

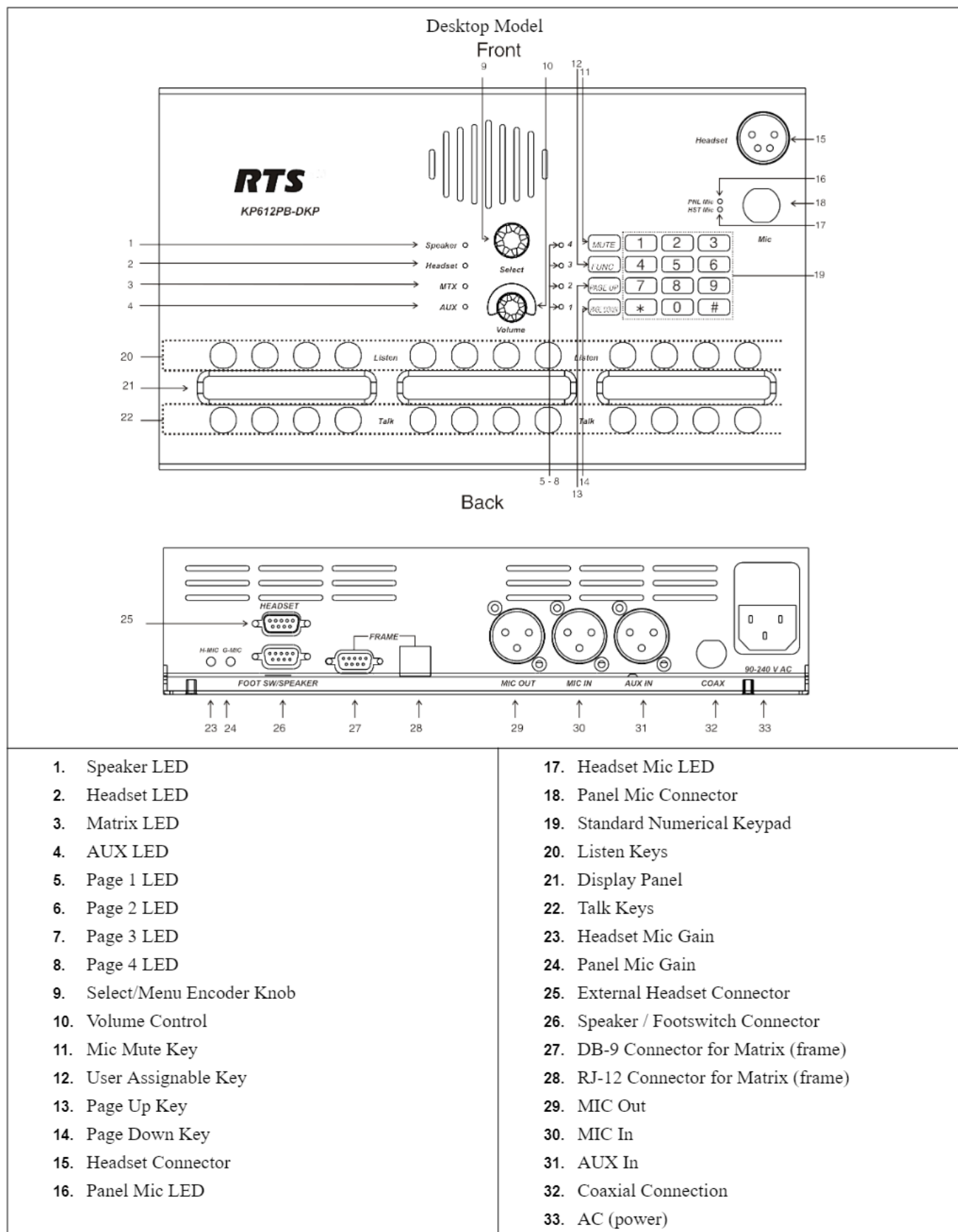
Talk/Listen Configuration:	Contains 12 keys, with 10 keys available for full talk/listen configuration. Keys support both latching (hands-free) and momentary (push-to-talk) operation. Plus an extensive scrollable menu system (accessed using an encoder). Menus include helpful prompts to walk the user through the setup. The 11th and 12th keys are used for the <b>CWW</b> (Call Waiting Window).
Call Waiting Window:	<p>The 11th and 12th display position are used as a CWW, while the 12th key can be used for menu displays. The CWW is configured through the menu. The user has three (3) assignable options from the menu, as follows:</p> <ul style="list-style-type: none"> <li>• No CWW</li> <li>• One CWW (12th key only)</li> <li>• Two CWW (11th and 12th key)</li> </ul>
Character Display:	<p>The LCD display is custom designed to show 16x16 display size, Japanese or Kanji characters. Each LCD shows two (2) rows of 16-characters for a total of 32-characters. Each display area shows 8-character alphas per key (Talk/Listen).</p> <p><b>NOTE:</b> The KP 612/KP 412 Keypanels have four (4) keys per display.</p>
Connections:	<p>The back of each keypanel has one (1) DB-9 connector, one (1) RJ-45 connector, and one (1) <b>BNC</b> (Bayonet Neil-Concelman) for the matrix connection. On the rack mount model only, there is one (1) RJ-45 connector for Expansion Panels and one (1) RJ-45 connector for an LCP. There are two (2) mechanical pots for Mic Level Control: one (1) for Headset Mic and one (1) for Panel Mic Gain.</p> <p><b>NOTE:</b> Only one (1) Matrix connection can be used at a time.</p>
Firmware:	Every keypanel has an in-system downloadable firmware feature, where firmware is downloaded through the AZedit application to the keypanels.
Configuration:	With the appropriate configuration, the KP 612/KP 412 keypanel can be used as a digital keypanel (sending and receiving digital audio from the matrix) or as an analog keypanel. Digital operation is used when coaxial cables are used.
Remote Applications:	The KP 612/KP 412 keypanel can be used in remote applications. The front panel can be mounted separately and connected to the keypanel using a maximum of 50 feet of cable.
<b>DSP</b> (Digital Signal Processing):	Improves microphone voice activation and limiting. Adds new mixing, metering, and filtering capabilities.

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*Options*

EKP-816:	Provides additional 12 or 16 intercom keys.
LCP-12 or 16:	Provides easy adjustment of point-to-point and party line listen levels for individual intercom keys. One LCP-12 or LCP-16 controls volumes for one row of keys.

## Keypanel References



**FIGURE 1.** Keypanel Reference Views



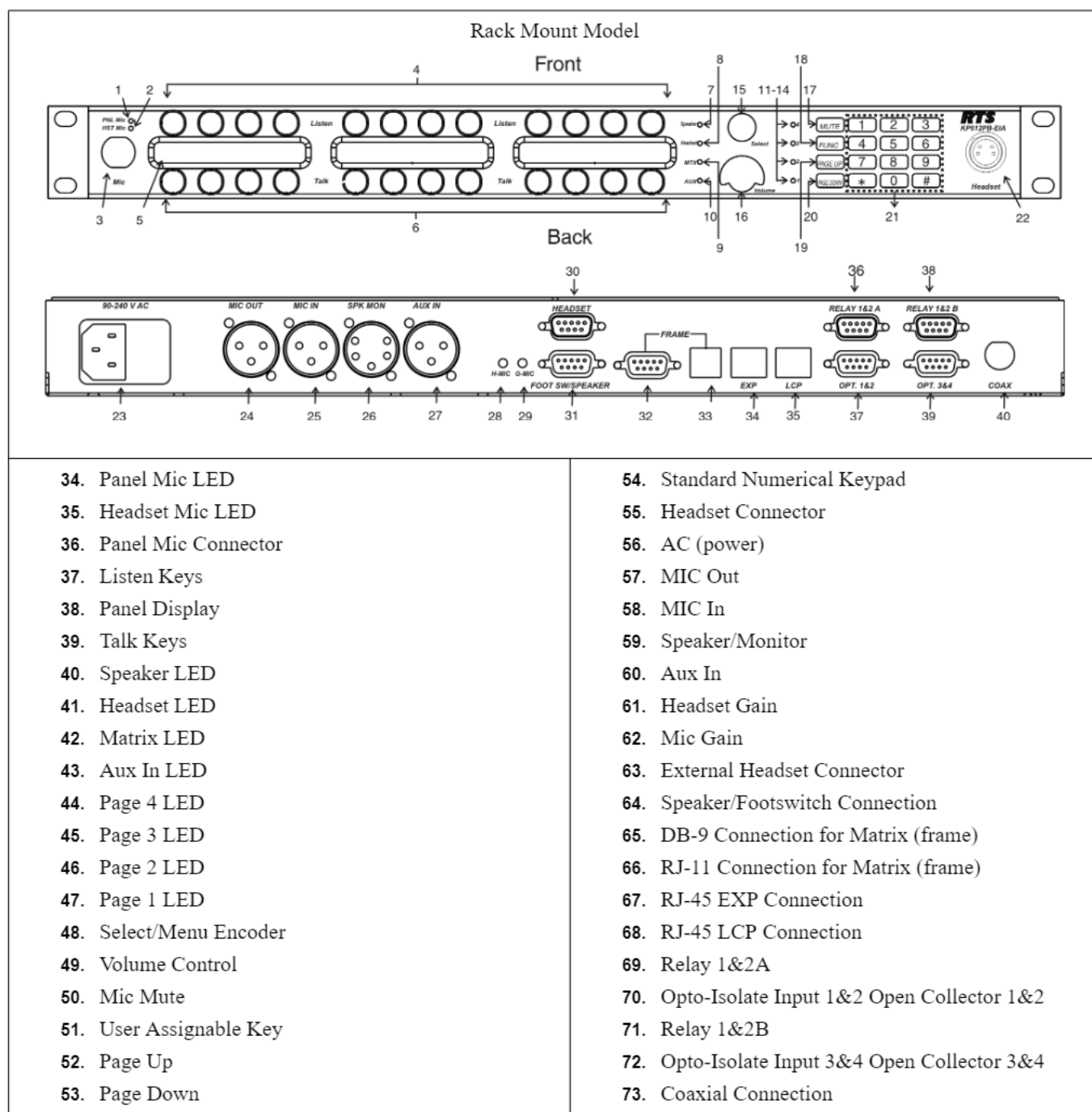


FIGURE 1. Keypanel Reference Views

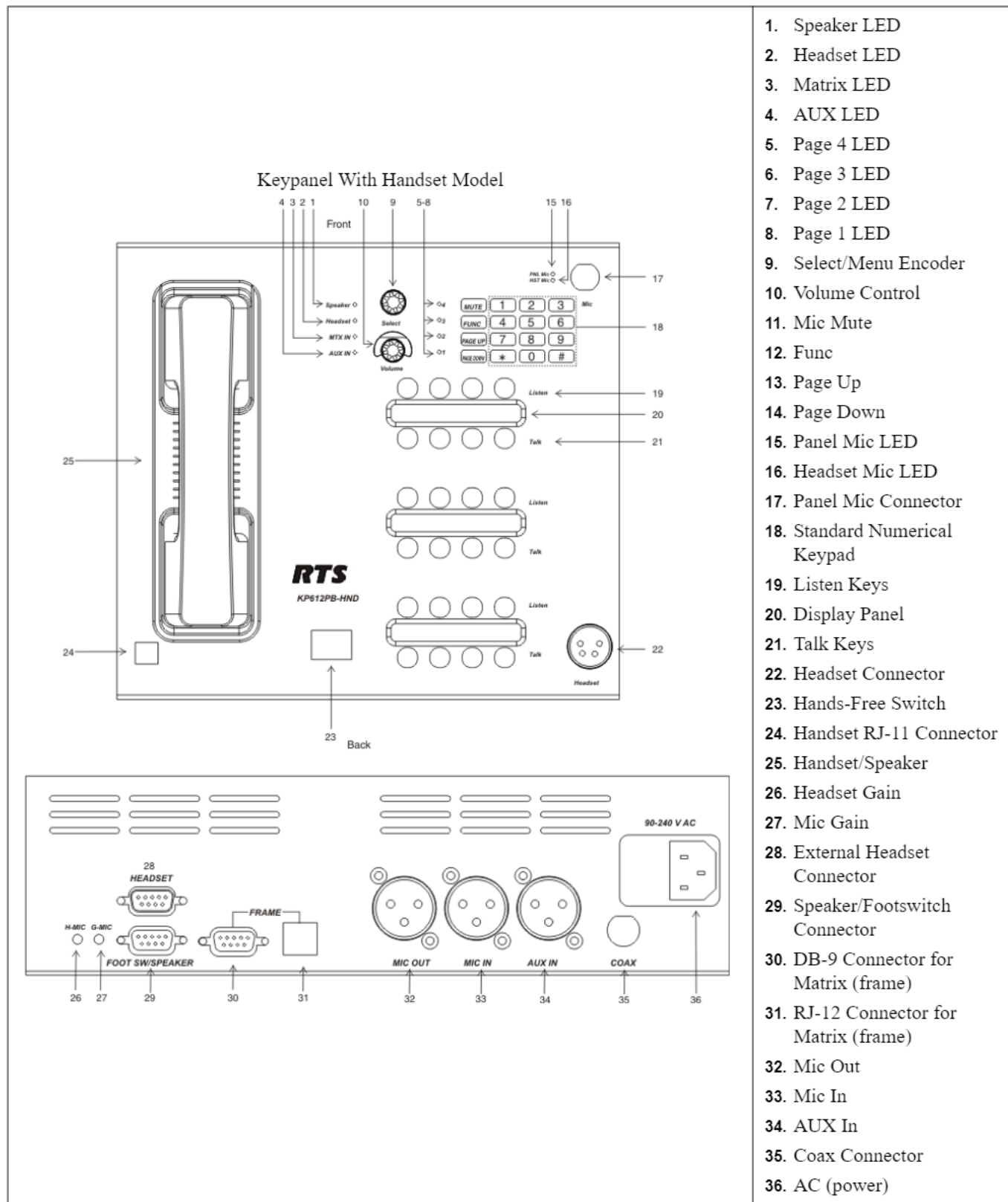


FIGURE 1. Keypanel Reference Views

## Controls Description

Speaker LED	Indicates the user can adjust the speaker levels.
Headset LED	Indicates the user can adjust the headset levels.
Matrix IN LED	Indicates the user can adjust the audio levels from the Matrix IN to the keypanel.
Aux IN LED	Indicates the user can adjust the audio levels from the Aux IN to the keypanel.
Page 4 LED	Indicates setup page four (4) is assigned to the main panel.
Page 3 LED	Indicates setup page three (3) is assigned to the main panel.
Page 2 LED	Indicates setup page two (2) is assigned to the main panel.
Page 1 LED	Indicates setup page one (1) is assigned to the main panel.
Menu Encoder	The menu encoder knob turns clockwise and counter-clockwise to scroll through menu options.
Volume Control	The volume control knob controls the volume of the selected source or destination, as indicated by the lit LED.
Mic Mute	The Mic Mute button mutes whichever microphone is active so no audio can be transmitted through the microphone.
Func Key	The Func Key is a user assignable softkey that can be programmed to perform an action frequently used or is difficult to access, such as a lower level menu item. It can also be programmed to operate a local GPI output.
Page Up and Down	The Page Up button or Page Down button changes the active page assigned to the main panel.
Panel Mic Connector	Accepts an electret gooseneck microphone, such as the Telex model MCP-90-XX. The model MCP-90 series panel mic connector is a 1/4" stereo plug, with a threaded shaft for easy installation.
Panel Mic LED (default mic)	When the Panel Mic LED is lit green, the Panel Mic is active. This is the default setting for the KP 612/KP 412 Keypanel.
Headset Mic LED	When the Headset Mic LED is lit green, the Headset Mic is active. This automatically becomes active when a headset is plugged in.
Standard Numerical Keypad	Used to enter autodial numbers as well as dial an outside number for TIF operation.
Listen Buttons	The listen buttons allow the user to listen to audio coming into the keypanel.
Display Panel	<p>The 11th and 12th display positions are used as a CWW and menu display. The CWW is configured through the menu. The user has three (3) assignable options from the menu, as follows:</p> <ul style="list-style-type: none"> <li>• No CWW</li> <li>• One CWW (12th key only)</li> <li>• Two CWW (11th and 12th key)</li> </ul>
Talk Keys	The talk buttons allow the user to talk to other keypanels.
Headset Connector	The headset connector is a 4-pin XLR connector, which when plugged into the KP 612/KP 412 keypanel, turns the panel mic off and audio is sent to the headset and the headset mic is activated.
Handset	The handset is used in place of the headset. If a user wants to use the handset, pin 3 of the 9-pin D-sub Headset connector must be set to Ground. For more pin out information, see "Headset (External headset connector)" on page 21.

## Specifications

### Microphone Preamplifier

Electret Mic Input Level @ 1kHz  
-42dBu, 150 Ohms  
Dynamic Mic Input Level @ 1kHz  
-50dBu, 150 Ohms  
Output Level (to Matrix)  
+8dBu,  $\pm 0.2$ dBu  
Max Voltage Gain, Mic to Line  
70dB,  $\pm 2$ dB  
Frequency Response  
100Hz to 10kHz,  $\pm 2$ dB  
Limiter  
10dB above nominal

### Tone Generator

Output Level (to Matrix)  
+8dBu,  $\pm 2$ dBu  
Output Frequency  
500Hz

### Headphone Amplifier

Maximum Voltage Gain  
46dB  
Frequency Response  
100Hz to 10kHz,  $\pm 2$ dB  
Headphone Impedance  
8 to 600 Ohms  
Output Power  
1W to 50 Ohms  
Output Voltage Level  
8V peak-to-peak (max.)

### Speaker Amplifier and Speaker

Frequency Response  
100Hz to 10kHz,  $\pm 2$ dB  
Output Power (per amplifier)  
5 watt into 8 Ohms  
Output Voltage Level  
12V peak-to-peak  
Volume Control Range  
30dB  
Speaker Rating  
8 watts max.

### Intercom Input/Output

Input  
Nominal: +8dBu, Peak +20dBu max.  
Output  
+8dBu,  $\pm 2$ dBu maximum

### External Line Input (Program Input)

Input Level  
+8dBu nominal

### General

AC Supply  
Internal switching type, 100–240VAC, 50/60Hz with universal  
IEC connector for connection to various AC main cords.  
Storage  
-40°C (-40°F) to 70°C (158°F)

Operating  
-20°C (-4°F) to 60°C (140°F)

### Dimensions

Desktop  
11.3(W) x 7.623(D) x 3.1(H)  
Rack Mount  
19(W) x 7.5(D) x 1.75(H)

### Approvals

UL, CSA, VDE, CE

### Connectors

#### Panel Mic Connector

Type: 3 circuit, 1/4" phone jack with threaded metal bushing,  
compatible with RTS MCP-90

#### Pin Out

Tip:	Hot
Ring:	Common
Sleeve	Chassis Ground

#### Headset Connector

Type: XLR-4 Female

Pin 1	Mic low
Pin 2	Mic high
Pin 3	Headphone low
Pin 4	Headphone high

#### Intercom Connectors: Parallel-wired DB-9 and RJ-12 Connectors

Type: DB-9 Female

Pin 1	Data +
Pin 2	Data -
Pin 3	Data Shield
Pin 4	Audio Out (to matrix) +
Pin 5	Audio Out (to matrix) -
Pin 6	Audio In (from matrix) Shield
Pin 7	Audio In (from matrix) -
Pin 8	Audio In (from matrix) +
Pin 9	Audio Out (to matrix) Shield

Type: RJ-12

Pin 1	Data -
Pin 2	Audio In (from matrix) +
Pin 3	Audio Out (to matrix) +
Pin 4	Audio Out (to matrix) -
Pin 5	Audio In (from matrix) -
Pin 6	Data +

#### Expansion Connector

Type: RJ-45

#### LCP Connector

Type: RJ-45

#### GPI Module Connectors (Optional)

#### Speaker/Monitor Output

Type: 5-pin XLR Male

Pin 1	Line Out (GND)
Pin 2	Line Out (+)
Pin 3	Line Out (-)
Pin 4	SPK Out (+)
Pin 5	SPK Out (-)

## Aux 1 In (Auxiliary Program Input)

## 3-pin XLR Female

Pin 1	Ground
Pin 2	Input +
Pin 3	Input -

Balance Input, +8dBu nominal

## Relay 1 &amp; 2 Output

## Type: 9-pin male, D-sub

Pin 1	NC contact 1
Pin 2	COM contact 1
Pin 3	NO contact 1
Pin 4	NC contact 2
Pin 5	COM contact 2
Pin 6	NO contact 2
Pin 7	+3.3VDC
Pin 8	Ground
Pin 9	+3.3VDC

## Relay 3 &amp; 4 Output

## Type: 9-pin male, D-sub

Pin 1	NC contact 3
Pin 2	COM contact 3
Pin 3	NO contact 3
Pin 4	NC contact 4
Pin 5	COM contact 4
Pin 6	NO contact 4
Pin 7	+3.3VDC
Pin 8	Ground
Pin 9	+3.3VDC

**NOTE:** The relay 1 and 3 contacts are electrically separate, but operate in unison. The relay 2 and 4 contacts are electrically separate, but operate in unison. The +3.3VDC pins are connected internally through 1K resistors to +3.3VDC and can source up to 3mA. This voltage can be used with the relay contacts to create an active high output for some devices that require a +3.3VDC signal to activate. For example, connecting pin 7 to pin 3 of the Relay 1&2 connector will result in +3.3VDC on pin 2 when the relay is activated.

## Opto 1 - 2 In (Opto-isolated control inputs) / OC 1-2(J11)

## Type: 9-pin male, D-sub

Pin 1	3.3 VDC
Pin 2	Emitter OC 2
Pin 3	Emitter OC 1
Pin 4	Ground
Pin 5	Ground
Pin 6	Collector OC 1
Pin 7	Collector OC 2
Pin 8	Opto-Out 2
Pin 9	Opto-Out 1

**NOTE:** A contact closure between any switch and ground activates that input. The switch contact inputs are also connected internally through 1K resistors to internal +3.3VDC and can source 3mA for use with an external transistor switch circuit.

## Opto 3 - 4 In (Opto-isolated control inputs) / OC 1-2(J12)

## Type: 9-pin male, D-sub

Pin 1	3.3VDC
Pin 2	Emitter OC 4
Pin 3	Emitter OC 3
Pin 4	Ground
Pin 5	Ground
Pin 6	Collector OC 3
Pin 7	Collector OC 4
Pin 8	Opto-Out 4
Pin 9	Opto-Out 3

**NOTE:** A contact closure between any switch and ground activates that input. The switch contact inputs are also connected internally through 1K resistors to internal +3.3 VDC and can source 3mA for use with an external transistor switch circuit.

Headset (External headset connector)<sup>a</sup>

## Type: 9-pin male, D-sub

Pin 1	Ground
Pin 2	External headset PTT
Pin 3	External headset PTT enable
Pin 4	External headset enable
Pin 5	Balanced dynamic mic input -
Pin 6	Ground
Pin 7	Balanced dynamic mic input +
Pin 8	Left Speaker
Pin 9	Right Speaker

**NOTE:** Mic Input -50dBu nominal. Headset out 0.325 watts into 8 Ohms

## Foot Switch / Speaker

## Type: 9-pin male, D-sub

Pin 1	Ground
Pin 2	Speaker Plus (+)
Pin 3	Ground
Pin 4	No Connection
Pin 5	Foot Switch
Pin 6	Speaker Minus (-)
Pin 7	No Connection
Pin 8	No Connection
Pin 9	Ground

**NOTE:** A switch contact closure from the foot switch input to ground activates the foot switch input.

## MIC In (J7) Unbalanced Panel Microphone Input

## Type: 3-pin XLR Female

Pin 1	Ground
Pin 2	DC bias and Audio Plus (+)
Pin 3	Shield (circuit common)

**NOTE:** Input level -42.5dBu nominal

## MIC Out (J8) Balanced Microphone Output

## Type: 3-pin XLR Male

Pin 1	Shield (circuit common)
Pin 2	Audio output +
Pin 3	Audio output -

**NOTE:** Output level +8dBu nominal (balanced)

- a. If a user wants to use the handset pin 3 of the 9-pin D-sub Headset connector must be set to ground.





---

**NOTE:** For Dip switch location, see Figure 2 on page 24.

---

### *Dip Switch Settings*

- |                 |   |
|-----------------|---|
| <b>Switch 1</b> | <p><b>Latch Enable/Disable</b><br/> <b>Default Setting:</b> Open (Enabled)<br/> <b>Description:</b> An intercom key can always be turned on for momentary conversation by pressing and holding the key during the conversation. There is also an electronic latching feature that lets you tap intercom keys to turn them on or off. This permits convenient hands-free conversation. However, it can also result in a talk circuit being left on unintentionally. For example, a key that talks to a public address system could be accidentally left on. Or, an IFB key (a type of key assignment often used by a director or producer to give instructions to a listener, such as a news anchor during a television broadcast) could accidentally be left on, causing confusion for the IFB listener. To prevent such accidents, the latching feature can be turned off.</p> <p><b>NOTE:</b> Dip Switch 1 disables latching for the entire keypanel. If you need to disable latching for selected keys, leave Dip Switch 1 in the open position, and then, disable latching for the desired keys using the D check box in the Keypanel/Ports setup window in AZedit.</p> |
| <b>Switch 2</b> | <p><b>Enable/Disable the adjustment of listen volumes</b><br/> <b>Default Setting:</b> Open (Enabled)<br/> <b>Description:</b> Enables or disables the volume adjust on the keypanel.</p>   |
| <b>Switch 3</b> | <p><b>Unused</b><br/> <b>Default Setting:</b> Open (Enable)</p>   |
| <b>Switch 4</b> | <p><b>Call Flash Time-out</b><br/> <b>Default Setting:</b> Closed (Infinite Tally)<br/> <b>Description:</b> Whenever there is an incoming call and there is a talk key assigned to the caller, the talk LED next to that key flashes. If this Dip switch is closed, the flashing light goes off as the caller's talk key is closed. Otherwise, flash time can be set for a 15 second time-out, or until the caller's talk key is released. Call Flash Time-out can be set to 5 sec, 10 sec, or 15 sec.</p>  |

**Switch 5****Footswitch Enable/Disable****Default Setting:** Open (Disabled)

**Description:** The optional Connector Module has a footswitch (GRP CALL) input. If the footswitch is enabled (Dip 5 set to the Closed position), then keys latched on do not activate until the footswitch is closed. Latched keys are indicated by blinking amber talk LEDs (on time less than off time), and when the footswitch is activated, the LEDs provide normal talk on indication.

**NOTE:**

- If the talk key is held down in Footswitch mode, the channel is activated until the user releases the key. This function does not require the footswitch to be used.
- If Dip Switch 1 is set to the Closed position, nothing latches.
- Individual keys can be set to non-latching via AZedit. If this is done, the footswitch has no effect on the keys set to non-latching.

**Switch 6**

Reserved

**Switch 7**

Reserved. Must be left in the Open position.

**Switch 8**

Reserved. Must be left in the Open position.

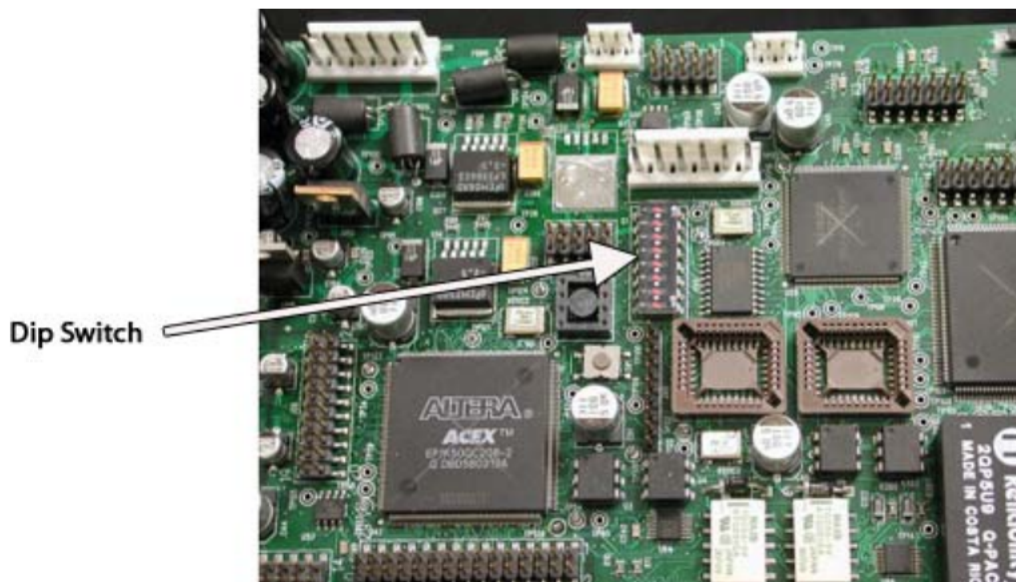


FIGURE 2. KP 612/KP 412 Keypanel Board, Dip Switch Location

## Connections

### EXP and LCP Connectors

Connect from the EXP connector on the back of the KP 612 / KP 412 keypanel to the Expansion 1 connector of an optional EKP 812 Expansion Panel. Use the interconnect cable supplied with the Expansion Panel.

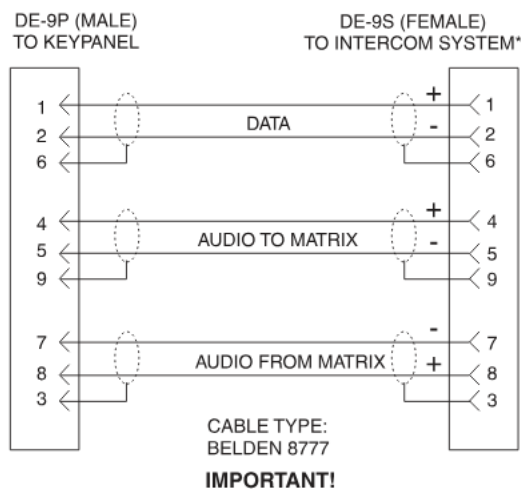
**NOTE:** JP1 must have pins 1 and 2 shorted to use the LCP connection.

Each LCP adjusts the listen levels for up to 16 keypanel keys, and you can connect as many LCP panels as required to adjust all keys on the KP 612/KP 412 keypanel and on an EKP 812 Expansion panel. An interconnect cable is supplied with each LCP. Connect the first LCP to the LCP connector on the KP 612/KP 412. Connect the second LCP to the first LCP, and so forth.

### Frame Connector

Use either, not both of the Frame connectors to connect to an intercom port on the intercom system. The intercom port you connect to should agree with the address set previously.

**NOTE:** For more information, see “Addressing” on page 35. Use the following cable diagrams to help you connect your system.



\* When connecting to an ADAM CS back panel, use only low-profile cable connectors such as AMP Part No. 747516-3 (Telex Part No. 59926-678)

**FIGURE 3.** DE9S Intercom Cable Wiring

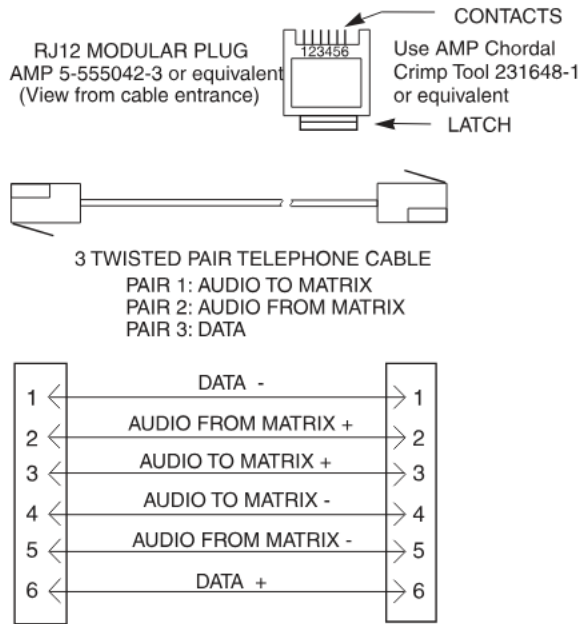


FIGURE 4. RJ-12 Intercom Cable Wiring

## Headset Connector

A dual-sided, mono headset may be connected for use along with or in place of the front panel speaker and a separate microphone. Headphones may be connected for use with a separate microphone.

### Headset Microphone Gain Adjustment

The gain of the headset microphone preamp can be adjusted via the recessed trim pot located on the back panel. See Figure 1 on page 16. Turn the pot clockwise to increase gain and counter-clockwise to decrease gain.

The range for the headset gain is  $\pm 20\text{dB}$  from nominal.

## Panel Microphone Connector

A panel microphone may be connected for talking with either the front panel speaker or headphones used for listening. The connector accepts MCP5, MCP6 or MCP90 panel microphones. Insert the microphone and rotate the entire microphone body clockwise several turns to lock in place.

### Panel Microphone Gain Adjustment

The gain of the panel microphone preamp can be adjusted via the recessed trim pot located on the back panel. Turn the pot clockwise to increase gain and counter-clockwise to decrease gain.

The range for the panel mic gain is  $\pm 20\text{dB}$  from nominal.

## Aux In

Provides a connector for a line-level audio input (program1).

## Microphone Preamplifier

Provides an unswitched, balanced, microphone preamplifier output.

## External Headset, Speaker Output, and Footswitch Input

Provides one (1) DB-9 headset connection, one (1) DB-9 Speaker Output/Footswitch Connection.

## GPIO

Opto-Isolate Input 1–4: four (4) general purpose inputs.

Open Collector 1–4: four (4) general purpose outputs.

## Relay 1 & 2 (A &B)

Includes two (2) SPGT relay outputs.

## Coaxial Connection (CSI-200 Coaxial System Interface)

Provides the ability to link the unit to the matrix using a single 75 Ohm coaxial cable. The interface converts all audio and data streams to a single transmission path. Perfect for systems where there are existing, but unused 75 Ohm video cables. Requires CSI-200 interface unit at the intercom matrix end.

### *Requirements*

You must upgrade the following boards to Rev J or above:

- KP612 (Rack) F.01U.191.343
- KP612 (DKP/HND) F.01U.191.344
- KP412 (Rack) F.01U.191.341
- KP412 (DKP/HND) F.01U.191.342

### *Flash Cards to Upgrade the Firmware Version to 1.0.0 or later*

Flash Chip	New KP612 Part Number	New KP412 Part Number
U21	F.01U.265.989	F.01U.265.991
U22	F.01U.265.988	F.01U.265.990

To convert an existing KP 612/KP 412 keypad to use the coaxial connection, do the following:

1. On the KP 612/KP 412 board, locate **U21** and **U22** flash chips.
2. Using IC pullers, remove **both flash chips**.
3. Replace the existing flash chips with the **new flash chips** (see above for part numbers). Carefully snap the flash chips in place.

To cable the CSI-200, KP 612/412 and the frame, do the following:

1. Connect a **DB-9 connection** to Frame A or Frame B (depending upon the channel being used) on the CSI-200.
2. Connect the **opposite end of the DB-9 cable** to the Frame you want to use (ADAM, ADAM CS, Zeus, or Cronus).
3. Depending upon the channel being used, connect the **coaxial cable** (up to 1000ft) to Coax A or Coax B on the CSI-200.
4. Connect the **opposite end of the coaxial cable** to the KP 612/KP 412 COAX connect on the back of the unit.
5. Using AZedit, add **5ms** to the Panel Poll Delay (Keypanels|Edit button|Advanced).
6. Click **Apply**.
7. Send **changes** to the frame.

**NOTE:** Panel Poll Delay must be set for each CSI-200 connected to the frame.

8. Power **on** the CSI-200.
9. Power **on** the KP 612/KP 412.

**NOTE:** On the CSI-200, the frame LED is solid green for the channel that is connected and active. The **TX** (Transmit) and **RX** (Receive) LEDs for the specified channel flash rapidly to signify the connection is active. On the KP 612/KP 412, dashes or panel assignments on the port are displayed in the panel window.



## *Basic Operation*

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### *Selecting Headset or Speaker*

By default, the panel mic is active. When a headset is used via the 4-pin XLR connector on the keypanel, the Headset Mic LED indicator lights and the headset mic is active.

---

### *Listen Volume Adjustments*

By default, the Vol control adjusts the listen volume for the speaker, headset, intercom input, or AUX In, as indicated by the lit LED. The level of auxiliary program input 1 (if AUX inputs are enabled) and the level of incoming audio from the intercom matrix can be adjusted. Use the Volume control to adjust the listen volume. The Vol control defaults back to the speaker or headset after approximately one (1) minute of inactivity. The minimum volume level for either the keypanel speaker or headset may be adjusted. See “Menus, Service, Min Volume” on page 59.

**NOTE:** You can save the volume adjustments to be the power up defaults by using “Menus, Service, Save Cfg” on page 62.

### *Listen Source Selection LED*

There are four (4) LED indicators for Listen Source selection. Default is Internal Speaker LED on, the rest set to off.

- ☒ **Internal Speaker**
- ☐ **Headset**
- ☐ **Matrix Audio IN**
- ☐ **Auxiliary 1 IN**

FIGURE 5. LED Indicators

On power up Matrix IN audio is routed to the speaker. This is indicated by the following:

<u><b>Speaker Selected</b></u>		<u><b>Headset/Handset Selected</b></u>
<input checked="" type="radio"/> <b>Speaker</b>	<b>Table 1</b>	<input type="radio"/> <b>Speaker</b>
<input type="radio"/> <b>Headset/Handset</b>		<input checked="" type="radio"/> <b>Headset/Handset</b>
<input type="radio"/> <b>Matrix IN</b>		<input type="radio"/> <b>Matrix IN</b>
<input type="radio"/> <b>Aux IN</b>		<input type="radio"/> <b>Aux IN</b>

FIGURE 6. Speaker and Headset/Handset Selected

The audio being heard on the speaker is changed through the volume encoder. The audio being heard on the headset is from Matrix IN. Audio level adjustments on the headset are changed through the volume encoder.

If the encoder is pushed once, it selects between Headset and Speaker Volume. If it is pushed twice, from either headset or speaker, it jumps to Matrix IN. See Figure 7.

<u><b>Matrix IN Selected</b></u>
<input type="radio"/> <b>Speaker</b>
<input type="radio"/> <b>Headset/Handset</b>
<input checked="" type="radio"/> <b>Matrix IN</b>
<input type="radio"/> <b>Aux IN</b>

FIGURE 7. Matrix IN Selected

The above LEDs indicate the level of audio being adjusted goes to Matrix IN.

In order to move between Matrix IN and Aux IN, tap the encoder knob once.

<u><b>AUX IN Selected</b></u>
<input type="radio"/> <b>Speaker</b>
<input type="radio"/> <b>Headset/Handset</b>
<input type="radio"/> <b>Matrix IN</b>
<input checked="" type="radio"/> <b>Aux IN</b>

FIGURE 8. Aux IN Selected

The above LEDs indicate the level of audio goes to Aux IN. If the encoder is pushed twice, it goes back to the previous selection item. See Figure 6.

## *Intercom Keys and Displays*

### **Alphanumeric Display Indications for Intercom Keys**

*Upper Case Letters* - Upper case letters indicate keys with any kind of talk assignment, with or without a corresponding listen assignment. For example; *DIR1*.

*Lower Case Letters* - Lower case letters indicate keys with only a listen assignment. For example, *dir1*.

*Dashes ----* - Dashes indicate a key has no talk or listen assignment.

**NOTE:** The flashing alphanumeric display for the TIF keys, remote IFB keys, and remote ISO keys can be disabled by placing a check mark in Don't generate tallies for TIF and trunk use check box, found in AZedit (*Options Menu|Intercom Configuration|Options Tab*).

### **LED Indications for Intercom Keys**

**NOTE:** For the Japanese model KP 612/KP 412 keypanel, the Talk On LED is red, while the Listen on LED is green.

*Talk LED Indications* - Each button is backlit with a bi-colored LED as an indicator. The talk LED is the button below the display panel. The talk LED indications are as follows:

**Continuous Red** - Talk is on and the keypanel operator can be heard at the destination.

**Continuous Green Talk LED & Flashing Display Alpha (in use)** - The key is off, but someone is talking to the destination. This indication is provided for any local PL, IFB, ISO, or TIF key. It does not apply to remote IFB or ISO keys. This indication is provided so keypanel operators know when critical director communications are occurring. If you activate the key, either of two (2) things occur:

- If you activate the key and the talk LED turns continuous red, it indicates you and the other keypanel operator are both talking to the destination.
- IFB keys only: If the talk LED flashes green when an IFB key is activated, it indicates the other keypanel has a higher IFB priority and you cannot talk at this time.

**NOTE:** The green in use indication for TIF keys can be disabled in AZedit (**Options|Intercom Configuration|Options tab**). Select the Don't generate tallies for TIF and trunk use check box. Send the change to the intercom system.

**Flashing Green Talk LED** - You cannot talk at this time. This indication occurs when you activate a local IFB key that is already in use by a keypanel with a higher IFB priority. It also occurs when you activate any key assigned to a remote destination, but there are currently no trunks available.

**Flashing Red Talk LED** - There is an incoming call from the destination assigned to the key. Activate the key to talk back.

**NOTE:** The duration of an incoming call flash is controlled by DIP Switch 4 on the KP 612/KP 412 keypanel. See "Dip Switch Settings" on page 23.

**Amber Talk LED (on time less than off time)** - This indicates a key is ready to talk (key is on), but requires external footswitch activation to talk.

*Listen LED Indications* - Each button is backlit with a bi-color LED as an indicator. The listen LED is the button above the display panel.

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## Intercom Key Operation

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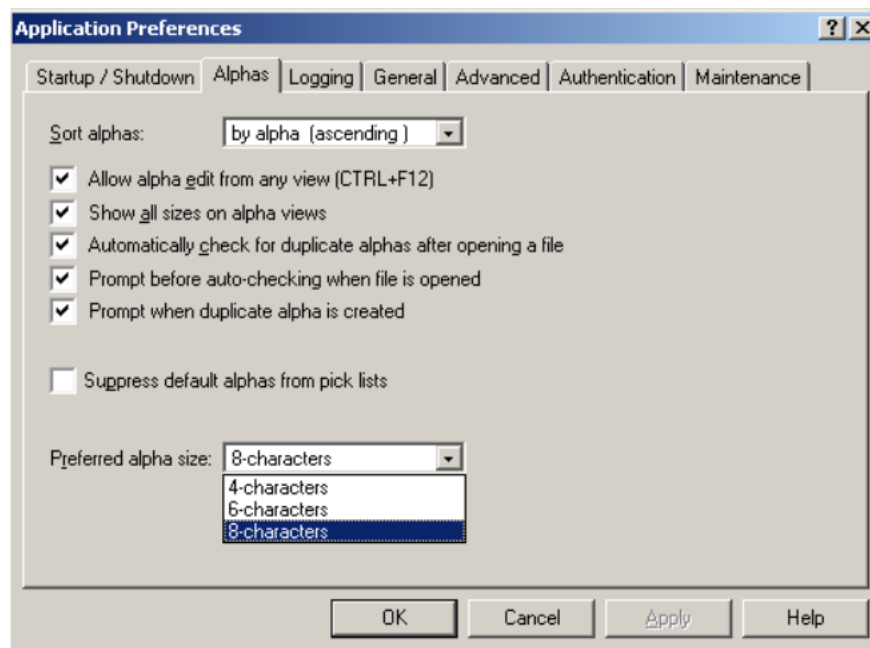
**IMPORTANT:** When using an AIO-8 or AIO-16 with a SCSI connector, or a Zeus Intercom System, only keypanels with the same alpha size can be used.

---

To set the alpha size in **AZedit**, do the following:

- > On the Alphas page in the Application Preferences notebook in AZedit (*Options|Preferences|Alphas*), select the **alpha size** you desire.

**REFERENCE:** For more information, see the AZedit User Manual (P/N F.01U.239.453), which can be found at [www.rtsintercoms.com](http://www.rtsintercoms.com).



## Basic Intercom Key Operation

The upper button of an intercom key is on continuously (if assigned). The lower button activates the talk (if assigned). If there is no talk assignment for an intercom key, the talk button does not activate. If there is no listen assignment, the listen button is not active.

For **momentary activation of a key**, do the following:

- > Press and hold the **key**, and then release it when finished talking.

For **latching operation** (if enabled), do the following:

1. Tap the **button**; it turns on and remains on.
2. Tap the **button** again to release the latch.

**NOTE:** Latching may be turned off for the entire keypanel by setting DIP Switch 1 on the keypanel to the Closed position. Latching may be disabled for individual keys on a keypanel using AZedit or the latching menu (**Menu|Key Option|Latching**).

To **configure latching on a keypanel**, do the following:

1. Click the **KP button** in the AZedit toolbar to open the Keypanels/Ports setup window.
2. Select the **intercom port** where the keypanel is connected.
3. Select the **D check box** for any keys where you want to disable Latching.
4. Send the **changes** to the intercom system.

## Operation of Intercom Keys with Auto Functions

**NOTE:** Key assignments with auto functions are described in the programming sections that follow. Descriptions of the auto functions are contained in the “Glossary” on page 73.

Operation of keys with auto functions is as follows:

<b>Talk + auto follow</b>	Talk and listen can be activated separately. The listen assignment listens to whatever is assigned to the talk key.
<b>Talk + auto listen</b>	Both talk and listen activate when talk is activated.
<b>Talk + auto mute</b>	Listen turns off when talk is activated.
<b>Talk + auto reciprocal</b>	Listen is always on, and talk may be turned on or off.
<b>Talk + auto table</b>	If an IFB talk key has an auto table listen assignment, talk and listen can be independently activated. The listen key listens to whatever is defined as the IFB Listen Source for the IFB assigned to the talk key. For an assignment other than IFB, auto-table acts like auto-follow.

**REFERENCE:** A full explanation of the auto table feature is beyond the scope of this manual. For further information, search for IFB in the AZedit help file or user manual. Read the topics IFB Auto-Table Description and IFB Setup Procedures.

<b>All Call Key</b>	Activating the key activates all keys to the left of the original key (up to, but not including, another All Call key).
<b>Talk + DIM</b>	If a Point-to-Point key has the DIM function as a level 2 talk assignment, activating the key causes the crosspoint levels to diminish for any other intercom ports currently listening to the same destination and that are in the same DIM table.

**REFERENCE:** A full explanation of DIM tables is beyond the scope of this manual.

## Operation of Intercom Keys with Options

### *Group Option Keys*

Activating the master key in a key group activates all keys in the group according to each key's individual key assignment. Activating a slave key does not affect any other keys in the group.

### *Solo Key*

Activating a key with the solo option causes all other keys to turn off until the Solo key is turned off.

### *Exclusive Key*

Activating a key with the exclusive option causes all other keys to turn off and stay off even after the Exclusive key is turned off.

## Operation of Intercom Talk Keys with Speaker DIM Setting

Activating any talk key causes the speaker or headphone volume at the keypanel to diminish by the amount specified in the Dim menu item in the Service menu.

**NOTE:** Do not confuse this with the Talk+DIM auto function previously described. Talk+DIM affects the speaker or headphones on the other keypanels when a particular talk key is activated on this keypanel. Speaker DIM affects the speaker or headphone level on this keypanel when any talk key on the keypanel is activated.

## Operation of Intercom Keys Assigned to TIF Ports

If an intercom key is assigned to talk to an intercom port designated as a TIF port in AZedit, tapping the talk button activates the KP 612/KP 412's dialing menu. See "Telephone Operation" on page 39.

To **designate an intercom port as a TIF**, do the following:

1. In AZedit, click the **KP icon** on the toolbar to access the Keypanels/Ports setup window.
2. Select the **intercom port** where the TIF is connected.
3. Click **Edit**.
4. Select the **Advanced tab**.
5. Select the **Port is TIF** check box.

**NOTE:** Remember to send the changes to the intercom system.

---

## *Muting the Microphone*

The **Mic Mute** key turns microphone muting on or off. The mic mute LED indicator is activate when blinking green.

**NOTE:** While muting is on, you cannot be heard on the intercom by anyone on the telephone or by any device connected to the mic preamp output of the optional connector module.

---

## Call Waiting Operation

Occasionally, a keypanel may call and there is no key assigned to talk back to the caller. In this case, the caller's name appears in the CWW. Press the appropriate key to talk back.

To **clear a name from a call waiting window**, do the following:

- > Tap the **listen key** above the assignment.

If two (2) call waiting windows are configured on the keypanel, the first call appears in the left window. If a second call comes into the keypanel, it appears in the right call waiting window. Once the first call is complete, the call in the right call waiting window moves to the left window. However, if the first call waiting window key is latched on and a call is waiting in the second call waiting window, and a third call comes in, the second call is dropped and the third call appears in the right call waiting window.

**NOTE:** By default, only the names of callers who are not currently assigned to intercom keys appear in the call waiting window. This is a configuration option in the Master Controller.

---

## Addressing

**NOTE:** SET ADDR must be used during installation or whenever the keypanel is reset or moved to a new port.

### *Determining the Keypanel Address for ADAM and ADAM CS Intercoms*

See Table 1 on page 37.

### *Determining the Keypanel Address for Zeus Intercom Systems*

The address is the number (1–8) printed next to the connector on the back panel of the Zeus frame. This number repeats for each group of eight (8) connectors. The intercom system is able to distinguish between two (2) keypanels set to the same address by the group where each is connected.

## Setting the Keypanel Address

To **set the keypanel address**, do the following:

1. Using the encoder knob, scroll to **Menu**.
2. Tap the **encoder knob** once.  
*The menu options appear.*
3. Using the encoder knob, scroll to **Service**.
4. Tap the **encoder knob** once.  
*The Service menu options appears.*
5. Using the **encoder knob**, scroll to **Set Address**.
6. Tap the **encoder knob** once.  
*A scrollable list of addresses appear.*
7. Using the encoder knob, scroll to the **port address** you want to use.
8. Tap the **encoder knob**.  
*The CWW displays Save Config?*
9. Tap the **encoder knob** to save.  
*The display shows "\*\*\*\*\*" and change to "XXXXX", where XXXXX is the address.*

---

## *Handset Operation*

For information on configuring the handset operation, see “Menus, Service, Handset (Handset model only)” on page 55.

To **use the handset in normal mode**, do the following:

1. When a call comes into the keypanel, lift the **handset**.
2. Press the **talk key** and begin talking.

To **use the handset in PTT mode**, do the following:

1. When a call comes into the keypanel, lift the **handset**.
2. Press the **talk key**.
3. Press the **PTT key** to talk.
4. Release the **PTT key** to listen.



TABLE 1. Correspondence between ADDR numbers and Intercom port numbers for ADAM and ADAM CS Intercom Systems

ADDR SETTINGS	INTERCOM PORT NUMBERS																			
1	1	9	17	25	33	41	49	57	65	73	81	89	97	105	113	121	129	137	145	153
2	2	10	18	26	34	42	50	58	66	74	82	90	98	106	114	122	130	138	146	154
3	3	11	19	27	35	43	51	59	67	75	83	91	99	107	115	123	131	139	147	155
4	4	12	20	28	36	44	52	60	68	76	84	92	100	108	116	124	132	140	148	156
5	5	13	21	29	37	45	53	61	69	77	85	93	101	109	117	125	133	141	149	157
6	6	14	22	30	38	46	54	62	70	78	86	94	102	110	118	126	134	142	150	158
7	7	15	23	31	39	47	55	63	71	79	87	95	103	111	119	127	135	143	151	159
8	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160
1	201	209	217	225	233	241	249	257	265	273	281	289	297	305	313	321	329	337	345	353
2	202	210	218	226	234	242	250	258	266	274	282	290	298	306	314	322	330	338	346	354
3	203	211	219	227	235	243	251	259	267	275	283	291	299	307	315	323	331	339	347	355
4	204	212	220	228	236	244	252	260	268	276	284	292	300	308	316	324	332	340	348	356
5	205	213	221	229	237	245	253	261	269	277	285	293	301	309	317	325	333	341	349	357
6	206	214	222	230	238	246	254	262	270	278	286	294	302	310	318	326	334	342	350	358
7	207	215	223	231	239	247	255	263	271	279	287	295	303	311	319	327	335	343	351	359
8	208	216	224	232	240	248	256	264	272	280	288	296	304	312	320	328	336	344	352	360
1	401	409	417	425	433	441	449	457	465	473	481	489	497	505	513	521	529	537	545	553
2	402	410	418	426	434	442	450	458	466	474	482	490	498	506	514	522	530	538	546	554
3	403	411	419	427	435	443	451	459	467	475	483	491	499	507	515	523	531	539	547	555
4	404	412	420	428	436	444	452	460	468	476	484	492	500	508	516	524	532	540	548	556
5	405	413	421	429	437	445	453	461	469	477	485	493	501	509	517	525	533	541	549	557
6	406	414	422	430	438	446	454	462	470	478	486	494	502	510	518	526	534	542	550	558
7	407	415	423	431	439	447	455	463	471	479	487	495	503	511	519	527	535	543	551	559
8	408	416	424	432	440	448	456	464	472	480	488	496	504	512	520	528	536	544	552	560
1	601	609	617	625	633	641	649	657	665	673	681	689	697	705	713	721	729	737	745	753
2	602	610	618	626	634	642	650	658	666	674	682	690	698	706	714	722	730	738	746	754
3	603	611	619	627	635	643	651	659	667	675	683	691	699	707	715	723	731	739	747	755
4	604	612	620	628	636	644	652	660	668	676	684	692	700	708	716	724	732	740	748	756
5	605	613	621	629	637	645	653	661	669	677	685	693	701	709	717	725	733	741	749	757
6	606	614	622	630	638	646	654	662	670	678	686	694	702	710	718	726	734	742	750	758
7	607	615	623	631	639	647	655	663	671	679	687	695	703	711	719	727	735	743	751	759
8	608	616	624	632	640	648	656	664	672	680	688	696	704	712	720	728	736	744	752	760
1	801	809	817	825	833	841	849	857	865	873	881	889	897	905	913	921	929	937	945	953
2	802	810	818	826	834	842	850	858	866	874	882	890	898	906	914	922	930	938	946	954
3	803	811	819	827	835	843	851	859	867	875	883	891	899	907	915	923	931	939	947	955
4	804	812	820	828	836	844	852	860	868	876	884	892	900	908	916	924	932	940	948	956
5	805	813	821	829	837	845	853	861	869	877	885	893	901	909	917	925	933	941	949	957
6	806	814	822	830	838	846	854	862	870	878	886	894	902	910	918	926	934	942	950	958
7	807	815	823	831	839	847	855	863	871	879	887	895	903	911	919	927	935	943	951	959
8	808	816	824	832	840	848	856	864	872	880	888	896	904	912	920	928	936	944	952	960



# Telephone Operation

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**NOTE:** Telephone operations require an optional TIF Telephone Interface. Also, you must first assign an intercom key to talk/listen to the TIF. We recommend a talk+auto listen assignment.

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## Receiving a Phone Call

When there is an incoming telephone call, the talk LED flashes green on the selected key.

**NOTE:** The green flash for incoming TIF calls is the default operation. Alternatively, a continuous green talk LED indication can be provided. This is accomplished by selecting Don't generate tallies for TIF or trunk use in AZedit (**Options|Intercom Configuration|Options Tab**). This check box also affects other tally indications.

**REFERENCE:** For further information, see the AZedit User Manual (P/N F.01U.239.453).

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## Dialing and Hanging Up Using the KP 612/KP 412 Keypanel Dialing Menu

The dialing menu activates when talking to an intercom port that has the Port is TIF check box selected in AZedit.

### Manual Dialing

To **dial manually**, do the following:

1. Turn on the **TIF talk key**.  
*Manual Dial appears in the call waiting window.*
2. Tap the **menu encoder**.  
*Dial#? appears and a dial tone should be audible in your speaker or headset.*
  - a. To hang up at any time after this point, tap the **encoder knob**.  
*Hang Up appears.*
  - b. Tap the **encoder knob** again.
3. Dial the **phone number**.  
*Digits appear in the call waiting window as you dial. Dialing tones are audible in the speaker or headset.*
4. If the far end answers, begin your **conversation**.

**NOTE:** After the far end answers, you may dial additional digits to retrieve voice mail, or log on to automated answering systems, etc. Or, refer to the hang up instructions below.

To **hang up the phone**, do the following:

1. Verify that the **CWW window is clear**.
2. Hold the **encoder** for one (1) second.  
*Hang Up TIF appears.*
3. Continue holding the encoder knob, and tap the **talk key** assigned to the TIF.  
*When the encoder is released the CWW window will be cleared.*

**NOTE:** Occasionally, you may receive intercom caller names in the call waiting window while you are talking on the phone. In this case, the dialing menu options are cleared from the call waiting window, and the Hang Up option is not available.

## Redial

To **redial a number**, do the following:

1. Rotate the **encoder knob** until Manual Dial appears in the call waiting window.
2. Tap the **encoder knob**.
3. Rotate the **encoder knob** until Redial appears.
4. Tap the **encoder knob**.
5. If the far end answers, begin your **conversation**.

After the far end answers, you may dial additional digits to retrieve voice mail, or log on to automated answering systems, etc. Or, refer to the hang up instructions above.

**NOTE:** Occasionally you may receive intercom caller names in the call waiting window while you are talking on the phone. In this case, the dialing menu options are cleared from the call waiting window, and the Hang Up option is not available.

## Autodial

**NOTE:** Autodial is only available after you have saved autodial numbers.

To **autodial on the TIF**, do the following:

1. Turn on the **TIF talk key**.  
*Manual Dial appears in the call waiting window.*
2. Rotate the **encoder knob** until Autodial appears.
3. Tap the **encoder knob**.
4. Rotate the **encoder knob** until the desired number to autodial appears.
5. Tap the **encoder knob**.
6. If the far end answers, begin your **conversation**.

After the far end answers, you may dial additional digits to retrieve voice mail, or log on to automated answering systems, etc. Or, refer to the hang up instructions above.

**NOTE:** Occasionally, you may receive intercom caller names in the call waiting window while you are talking on the phone. In this case, the dialing menu options are cleared from the call waiting window, and the Hang Up option is not available.

## *KP 612/KP 412 Keypanel Menu System*

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### *Menu System, Menu Access*

To **access the menu**, do the following:

1. On the front panel of the KP 612/KP 412 keypanel, turn the **encoder knob** to scroll to the menu.
2. Tap the **encoder knob** to select the menu.
3. Turn the **encoder knob** clockwise to scroll forward and counter-clockwise to scroll backward through a list of menus.
4. Tap the **encoder knob**.

**NOTE:** A menu system quick reference is located at the back of this manual on page 67.

To **navigate within a menu**, do the following:

1. Turn the **encoder knob** clockwise to scroll forward and counter-clockwise to scroll backward through a list of menu options.
2. Tap the **encoder knob** to enter a menu.
3. Tap the **encoder knob** twice to exit a menu or press the encoder knob for one (1) second to exit the menu system.

## Menu System, Display Menu

Use this menu to display information about the keypanel configuration.

### Display Menu, Assign Type

**Assign Type** displays the talk level 1 assignment types for all keys. Abbreviations for the key assignment types appear in the alphanumeric displays as follows:

<i>P-P</i>	Point-to-Point talk key
<i>PL</i>	Party Line talk key
<i>IFB</i>	Interruptible Foldback talk key
<i>IFB SL</i>	Interruptible Foldback Special List talk key
<i>SPCL</i>	Special List talk key
<i>RLY</i>	Relay activates a GPI output at the intercom frame, or a relay output at a UIO-265, GPIO-16, or FR9528 frame.
<i>ISO</i>	Camera Isolate talk key
<i>UPL</i>	User Programmable Language resource key
<i>AC</i>	All Call key

### Display Menu, Chan On

**Chan On** displays an alpha list in the call waiting window of all intercom ports that currently have talk crosspoints closed to this keypanel. Chan On is typically used to locate an open mic or other open audio source that needs to be shut off. The most likely cause is typically a talk key that has been left on at a keypanel. In this case, turn the encoder knob to scroll through the list of names. Then use the call waiting button to ask the user at the other end to turn off the talk button.

### Display Menu, Exclusive

**Exclusive** displays the key with the exclusive assignment assigned to it. You can only have one exclusive key assigned at a time.

To **configure exclusive on a keypanel**, do the following:

1. Using the encoder knob, scroll to **Display**.
2. Tap the **encoder knob**.  
*The Display menu options appear.*
3. Using the encoder knob, scroll to display **Exclusive**.
4. Tap the **encoder knob**.  
*The key with the exclusive assignment lights up.*

### Display Menu, Key Groups

**Key Groups** displays the members in a key group. You can configure up to four (4) key groups.

To **display key groups**, do the following:

1. Using the encoder knob, scroll to **Group 1, Group 2, Group 3, or Group 4**.
2. Tap the **encoder button** to display the group.  
*The talk and listen LEDs of the master key light red and talk and listen LEDs for the slave keys light green.*

## Display Menu, Key List

**Key List** displays and allows access to all the other assignments on the other keypanel pages not currently showing in the keypanel display.

## Display Menu, Level 2

**Level 2** displays the talk level 2 assignments for all keys.

## Display Menu, Matrix

**Matrix** displays the intercom system name for all talk level 1 key assignments. In non-trunked intercom systems, the intercom system name is always LOCL (local). In trunked intercom systems, intercom system names are created in TrunkEdit (Intercoms|Names).

## Display Menu, Panel ID

**Panel ID** displays the calculated port number the keypanel connects to. The calculation is based on the data group the keypanel is connected to, along with the address switch setting on the keypanel. If the address switch is incorrectly set, the wrong Panel ID displays. If available, the entire alpha is seen by rotating the encoder knob.

## Display Menu, Solo

**Solo** displays the key with the solo assignment assigned to it. You can only have one (1) solo key assigned at a time.

To **display the solo key**, do the following:

1. Using the encoder knob, scroll to **Display**.
2. Tap the **encoder knob**.  
*The Display menu options appear.*
3. Using the encoder knob, scroll to **Solo**.
4. Tap the **encoder knob**.  
*The key with the solo assignment lights up.*

## Display Menu, Version

**Version** displays the firmware version of the keypanel.

**NOTE:** For firmware upgrades, contact your intercom system dealer. The KP 612/KP 412 firmware can be upgraded through AZedit. See “KP 612/KP 412 Keypanel Firmware Download” on page 65.

## Menu System, Key Assign Menu

**Key Assign** is used to assign intercom keys, adjust listen levels for point-to-point keys and party line keys, assign setup pages, configure quick assign and reset all volumes.

### General Procedure to Use the Key Assign Menu

To access the key assign menu, do the following:

1. Using the encoder knob, scroll to **Key Assign**.
2. Tap the **encoder knob** to enter the menu.
3. Using the encoder knob, select a **different list** as follows:
 

Pt-to-Pt	Assign a key to talk/listen to another intercom port.
Party Line	Assign a key to talk/listen to a party line.
IFB	Assign a key to talk/listen to an IFB.
Spcl List	Assign a key to talk/listen to a special list.
Sys Relay	Assign a key to activate a relay or GP Output.
Camera ISO	Assign a key to talk/listen to an ISO.
UPL Resrc	Assign a key to activate a UPL resource.
IFB SL	Assign a key to talk/listen to an IFB Special List
Quick Assign	Configure the Quick Assign key with talk/listen options.
Reset Vols	Restore the default listen level for keys that have a point-to-point or party line assignment.
4. Tap the **encoder**.  
*Wait may display while the requested list is uploaded from the intercom system.*
5. Using the encoder knob, scroll to the **desired assignment**.
6. Tap the **encoder knob**.  
*Talk Lvl 1 appears in the call waiting window.*
7. Using the encoder knob, select a **different option**.
 

Talk Level 1	Assigns only talk level 1. Leaves the listen assignment as is.
Listen	Assigns only listen. Leaves the talk assignment as is.
Talk + AF	Assigns talk level 1, with auto-follow listen.
Talk + AL	Assigns talk level 1, with auto-listen.
Talk Lvl 2	Assigns talk level 2.
Talk + AM	Assigns talk level 1, with auto-mute listen.
Talk + AR	Assigns talk level 1, with auto-reciprocal listen.
Talk + AT	Assigns talk + auto-table.

  - If you attempt to assign talk level 2 to a key and there is no talk level 1 assignment, the assignment goes on talk level 1.
  - If you change the talk level 1 assignment for a key that also has a talk level 2 assignment, the talk level 2 assignment is erased.
8. Tap the **encoder knob**.  
*Tap Key appears.*
9. Tap an **available keypanel key**.

If you assign any type of talk key, the assignment name appears in the alphanumeric display above the key.

- If you add a listen assignment to an existing talk assignment, the listen assignment appears briefly in the alphanumeric display to confirm the assignment. Then, the talk assignment reappears.
- If you assign a key that is listen only, the assignment name appears briefly in uppercase letters, then changes to lowercase letters.

**NOTE:** When reassigning keys, remember to remove any Chime, Solo, or Key Group options if they are not needed for the new key assignments.



**NOTE: Remote key assignment only** (trunk systems only)

If your intercom is trunked, Matrix displays in the call waiting window. You must select a remote intercom matrix before assigning intercom keys to destinations in that matrix. You do not need to select an intercom matrix if you are assigning keys in your own intercom system. Also, do not select an intercom matrix if you are assigning alt-functions or setup pages, or if you are changing listen gains for remote point-to-point keys or remote party line keys.

To **select a matrix**, do the following:

- a. Tap the **encoder key** once to access the Matrix list.
- b. Turn the **encoder knob** clockwise to scroll forward to locate the desired Matrix.
- c. Tap the **encoder knob** once.

*Wait may display while the scroll lists for that matrix are loading. Pt-to-Pt appears in the call waiting window (both for local and remote key assignments).*

**Key Assign Menu, Pt-to-Pt**

**Pt-to-Pt** assigns a key that talks or listens to another intercom port.

**NOTE:** Some pt-to-pt destinations may be non-keypanel devices that cannot activate talk and listen paths. Therefore, if you want full communications, you may need to assign both talk and listen on the key.

**Key Assign Menu, Party Line**

**Party Line** assigns a key that talks and/or listens to a party line.

**NOTE:** Party line members are usually non-keypanel devices that cannot activate talk and listen paths. Therefore, if you want full communication with the party line, you may need to assign both talk and listen on the key. If all communications is normally 2-way, you may want to assign Talk+Auto Listen to the key.

**Key Assign Menu, IFB**

By default, all IFBs are restricted and Not Avail appears when you attempt to select this item. To see IFBs, you must select the appropriate scroll enable check boxes in AZedit.

**Key Assign Menu, Spcl List**

**Spcl List** assigns a key that talks and/or listens to a special list. This has no effect until members have been assigned to the special list in AZedit.

**NOTE:** Some or all special list members may be non-keypanel devices that cannot activate talk and listen paths. Therefore, if you want full communication with all members of the special list, you may need to assign both talk and listen on the key.

**Key Assign Menu, Sys Relay**

**Sys Relay** refers to any of several types of control devices that can exist in the intercom system, including:

- the eight (8) GP outputs from an ADAM frame (J11 on the XCP-ADAM-MC breakout panel).
- the eight (8) GP outputs of an ADAM CS frame (J903 on the ADAM CS backpanel).
- the relay outputs of an FR9528 Relay Frame (RELAY OUTPUTS connector on the FR9528 backpanel).
- the 16 GP outputs of a UIO-256 Universal Input/Output Frame (J5 on the UIO-256 backpanel) or GPIO-16.

## Key Assign Menu, Camera ISO

By default, all ISOs are restricted and you see Not Avail when you attempt to select this item. To see ISOs, you must select the appropriate scroll enable check boxes in AZedit.

## Key Assign Menu, UPL

By default, all UPLs are restricted and you see Not Avail when you attempt to select this item. To see UPLs, you must select the appropriate scroll enable check box in AZedit.

## Key Assign Menu, IFB SL

By default, all IFB SLs are restricted and you see Not Avail when you attempt to select this item. To see IFB SLs, you must select the appropriate scroll enable check box in AZedit.

## Key Assign Menu, Quick Assign

**Quick Assign** menu is used to configure what talk/listen function is assigned when a Quick Assignment is made.

Available options are:

*Party Line*

*Point-to-Point*

*Group*

*Special List*

Also, from this menu, special functions can be individually assigned to a talk/listen assignment. For the different special assignments, see “Display Menu, Assign Type” on page 42.

## Key Assign Menu, Reset Vols

**Reset Vols** is used to simultaneously reset gains for all point-to-point or party line keys.

To **reset volume levels**, do the following:

1. Using the **encoder knob**, scroll to Reset Vols.
2. Tap the **encoder knob**.  
*Done appears. All key gains are now reset to the default level.*
3. Press the **encoder knob** for 1 second to exit.

**NOTE:** You do not need to run Save Cfg after resetting key gains. These settings are stored in the intercom system.

## Menu System, Menus

### Menus, Autodial

**Autodial** is used to store autodial numbers. Up to 10 autodial numbers can be stored.

To **use autodial**, do the following:

1. Using the encoder knob, scroll to **Autodial**.
2. Tap the **encoder knob**.  
*Phone # appears.*
3. Using the keypad, enter the **phone number**.  
*The numbers scroll in the call waiting window.*

**NOTE:** To insert a pause or space at any time, tap \* 9 9. For example, you may have to insert a pause after dialing a 9 to get an outside line.

4. Tap the **encoder knob**.  
*A-Dial #1 appears (store autodial number 1).*
5. Turn and tap the **encoder knob** to display and select the desired autodial number for storing a different autodial number  
*#XX saved appears (where XX is the autodial number you select).*
6. Run **Service Menu, Save Cfg** to store autodial numbers.

### Menus, Key Option

#### Menus, Key Option, Btn Lock (Button Lock)

**Button Lock** is used to independently lock a key on or off. The default setting for all keys is no locking.

To **enable Btn Lock on a key**, do the following:

1. From the Menus list, select **Key Option**.
2. Tap the **encoder knob**.  
*Button Lock appears in the display.*
3. Tap the **encoder knob**.  
*Tap Key appears in the display.*
4. Press the **key** you want to enable button lock on.  
*The keys you select light solid red.*  
*The key appears the following for the associated action:*

*Solid Red -* Locked on

*Flashing Green -* Locked off

*No Indication -* Not Locked

5. Double-tap the **encoder knob** to return to the previous menu level.  
OR  
Press and hold the **encoder knob** to exit the menu structure.
6. Run **Save Cfg**. See “Menus, Service, Save Cfg” on page 62.

**NOTE:** You cannot assign button lock to any key programmed for solo operation or group operation. If you attempt to assign button lock to these keys, the call waiting window appears SOLO ERR (Solo Error), or GRP ERR (Group Error).

### *Menus, Key Option, Chime*

**Chime** is used to add a chime tone to any key for incoming call announcement. The chime tone activates for approximately five (5) seconds after a call is received.

To **set chime on a key**, do the following:

1. Using the encoder knob, select **Chime**.
2. Tap the **encoder knob**.  
*Tap Key appears.*
3. Tap **any keys** on the keypad where you want to add a chime tone.
4. Press and hold the **encoder knob** for one (1) second to exit.
5. Run **Service Menu, Save Cfg** to store chime settings.

**NOTE:** The chime option stays with a key even if you change the key assignment.

To **remove a chime from a key**, do the following:

1. Using the encoder knob, select **Chime**.
2. Tap the **encoder knob**.  
*Tap Key appears.*
3. Tap **any keys** on the keypad where you want to remove a chime tone.
4. Press and hold the **encoder knob** for one (1) second to exit.
5. Run **Service Menu, Save Cfg** to store chime settings.

### *Menus, Key Option, Clear Options*

**Clear Options** allows you to erase any options enabled on the key.

To **clear options from a key**, do the following:

1. Using the encoder knob, select **Key Option**.
2. Tap the **encoder knob**.  
*Button Lock appears in the display.*
3. Using the encoder knob, select **Clear Options**.
4. Tap the **encoder knob once**.  
*Tap Key appears in the display and any key with options enabled lights red.*
5. Press the **key** you want to clear options from.  
*The red LED turns off.*
6. Double-tap the **encoder knob** to return to the previous menu level.  
OR  
Press and hold the **encoder knob** to exit the menu structure.
1. Run **Save Cfg**. See “Menus, Service, Save Cfg” on page 62.

### Menus, Key Option, Exclusive

**Exclusive** is used to cause all other keys to turn off when activated; but unlike the solo key, when the exclusive key is released, the other keys do not turn on again. You can assign one (1) exclusive key.

1. Using the encoder knob, select **Exclusive**.
2. Tap the **encoder knob**.  
*Tap Key appears.*
3. Tap a **key**.  
*Both LEDs for the key light red to confirm the assignment. Tap the key again if you want to remove the assignment.*

**NOTE:** Activating the exclusive key causes all other active keys to turn off. The keys do not turn back on when you turn off the exclusive key.

4. Run **Service Menu, Save Cfg** to store the exclusive setting.

**NOTE:** The exclusive option continues on a key even if you change key assignments.

To **remove exclusive from a key**, do the following:

1. Using the encoder knob, select **Exclusive**.
2. Tap the **encoder knob**.  
*Tap Key appears.*
3. Tap the **exclusive key** to turn off the LEDs.
4. Press and hold the **encoder knob** for 1 second to exit.  
*The exclusive key is now cleared.*
5. Run **Service Menu, Save Cfg** to store the exclusive setting.

### Menus, Key Option, Key Groups

**Key Group** is used to set up a key group so you can activate one (1) key (the master key) and all keys in the group become active. Up to four (4) key groups can be set. The master LED is indicated by red, while the slave LED is indicated by green.

To **add a key group**, do the following:

1. Using the encoder knob, select **Key Groups**.
2. Tap the **encoder knob**.  
*Tap Master appears. The master key is the key you pressed to activate the group.*

**NOTE:** Tap the encoder knob once to bypass the master. You can define the slaves without the master. For example, using a GP Input to trigger a group.

3. Tap the **keypanel key** you want to use as the master.
4. Once you have assigned the master, turn the **encoder knob** to display Slaves.
5. Tap the **encoder knob**.  
*Tap Slaves appears. Slave keys are the keys that activate along with the master key.*
6. Tap **one (1) or more keypanel keys** to select them as slave keys.  
*Tap the key again to remove it from the key group.*
7. Once you are finished, press the **encoder knob** for one (1) second to exit.

**NOTE:** Activating the master key causes it and all the slave keys to activate. The LEDs for each key activates according to the current key assignment for that call.

8. Run **Service Menu, Save Cfg** to store Key Group Settings.

**NOTE:** Key group settings stay with keys even if you change the key assignments.

To **clear a key group**, do the following:

1. Using the encoder knob, select **Key Groups**.
2. Tap the **encoder knob**.  
*Group 1 appears.*
3. Tap the **encoder knob**.  
*Tap Master appears.*
4. Tap the **encoder knob** to clear the master key assignment.  
*The LED turns off.*
5. Tap the **encoder knob**.  
*Tap Slaves appears.*
6. Tap **all the keys where the LEDs are lit green**.  
*This turns the LEDs off.*
7. Press and hold the **encoder knob** for 1 second to exit.  
*The key group is now cleared.*
8. Run **Service Menu, Save Cfg** to store the cleared key group setting.

### **Menus, Key Option, Latching**

**Latching** is used to allow keys to stay on once the key has been tapped. The default setting for latching intercom keys is latching on for hands-free talk. This feature may be deactivated for selected keys. For more information, see “Basic Operation” on page 29.

To **enable or disable latching**, do the following:

1. Using the encoder knob, select **Key Option**.
2. Tap the **encoder knob**.  
*Btn Lock appears in the display.*
3. Using the encoder knob, select **Latching**.
4. Tap the **encoder knob**.  
*Tap Key appears in the display.*
5. Tap **all keys** as desired to enable or disable latching.  
*The talk indicators turn green for all keys that have latching enabled and does not display for keys that without latching enabled.*
6. Press and hold the **encoder knob** for 1 second to exit.  
*The key group is now cleared.*
7. Run **Service Menu, Save Cfg** to store the Latching settings. See “Menus, Service, Save Cfg” on page 62

### **Menus, Key Option, Solo**

**Solo** is used to cause all other keys to turn off when activated. You can assign one (1) solo key.

To **assign a solo key**, do the following:

1. Using the encoder knob, select **Solo**.
2. Tap the **encoder knob**.  
*Tap Key appears.*
3. Tap a **keypanel key**.  
*Both LEDs for the key light red to confirm the assignment. Tap the key again if you want to remove the assignment.*
4. Press and hold the **encoder knob** for one (1) second to exit.

**NOTE:** Activating the solo key causes all other active keys to turn off. The keys turn back on when you turn off the solo key.

5. Run **Service Menu, Save Cfg** to store the Solo setting.

**NOTE:** The solo option stays on a key even if the key assignment changes.

To **remove a solo key assignment**, do the following:

1. Using the encoder knob, select **Solo**.
2. Tap the **encoder knob**.  
*Tap Key appears.*
3. Tap the **solo key** to turn off the LED.
4. Press and hold the **encoder knob** for one (1) second to exit.  
*The solo key is now cleared.*
5. Run **Service Menu, Save Cfg** to store the Solo setting.

## Menus, RVON Conn.

**RVON Conn.** menu is used to select an RVON connection to use with the keypanel.

**NOTE:** This menu item only appears when an RVON-1 card is installed in the keypanel.

To **select an RVON connection**, do the following:

1. Using the encoder knob, select **Menus**.
2. Tap the **encoder knob**.  
*Autodial appears in the display window.*
3. Using the encoder knob, select **RVON Conn.**
4. Tap the **encoder knob**.  
*A list of available RVON connections appears in a scrollable list.*
5. Using the encoder knob, select the **RVON connection** you want to use.
6. Tap the **encoder knob**.  
*The RVON connection is set.*
7. Press and hold the **encoder knob** for one (1) second to exit.

## Menus, Service Menu

### *Menus, Service, Aux Inputs*

**Aux Inputs** control what input levels can be adjusted by the volume knob.

To **configure the Aux Inputs**, do the following:

1. Using the encoder knob, select **Aux Inputs**.
2. Tap the **encoder knob**.  
*Intercom appears.*
3. Tap the **encoder knob**.
4. Using the **encoder knob**, select either **Aux In**, **Intercom**, or **Timeout**.
5. Tap the **encoder knob**.  
*The arrow indicates the input is enabled allowing the source's volume to be adjusted.*
6. Press and hold the **encoder knob** for one (1) second to exit.  
*The new Aux In assignment is now set.*
7. Run **Service Menu, Save Cfg** to store the Aux Inputs setting.

**NOTE:** To assign the destination of the Aux Inputs, see the Mixing entry for Service Menu, DSP Func.

### *Menus, Service, Baud Rate*

**Baud Rate** is used to set the baud rate the keypanel uses to transmit audio.

To **set the baud rate**, do the following:

1. Using the encoder knob, select **Baud Rate**.
2. Tap the **encoder knob**.  
*Auto Baud appears.*
3. Using the encoder knob, select **Auto Baud**, **9600 Baud**, or **76.8 Baud**.
4. Tap the **encoder knob** once to select the baud rate.
5. Press and hold the **encoder knob** for one (1) second to exit.  
*The new baud rate is now set.*
6. Run **Service Menu, Save Cfg** to store the Baud setting

### *Menus, Service, Caller Vol*

**Caller Vol.** is used to adjust the volume of an incoming call. Normally, to adjust the volume on a key, you hold up the listen key, then turn the volume knob. With caller volume adjust enabled, if you receive an incoming call (a key starts tallying), rotate the volume knob, and it adjusts the volume for the incoming call key automatically.

You have approximately five (5) seconds in which to make the first adjustment before it times out.

To **enable caller volume adjust on the keypanel**, do the following:

1. Using the encoder knob, select **Caller Vol**.
2. Tap the **encoder knob**.  
*Adj Disab appears.*
3. Using the encoder knob, select **Adj Enab**.
4. Tap the **encoder knob**.  
*Caller Vol is enabled.*
5. Press and hold the **encoder knob** for one (1) second to exit.  
*The caller volume adjust is enabled.*
6. Run **Service Menu, Save Cfg** to store the Caller Vol. setting

### *Menus, Service, Dim*

**Dim** is used to diminish, by a specific amount, the speaker or headphone level when a talk key is activated.

To **activate dim**, do the following:

1. Using the encoder knob, select **Dim**.
2. Tap the **encoder knob**.  
*Speaker appears.*
3. Using the encoder knob, select either **Speaker** or **Headset**.
4. Tap the **encoder knob**.

**NOTE:** By default, -8dB appears for speaker and 0 dB appears for headset.

5. Turn the **encoder knob** clockwise to increase the dim, or counter-clockwise to reduce the dim.
6. Press and hold the **encoder knob** for 1 second to exit.  
*The new dimming level is now set.*
7. Run **Service Menu, Save Cfg** to store the Dim setting.



---

### *Menus, Service, DSP Func*

**DSP Func** is used to access the digital signal processing feature.

To **access the DSP Func menu**, do the following:

1. Using the encoder knob, select **DSP Func**.
2. Tap the **encoder knob**.  
*Filters appears. Turn the encoder knob to see the other DSP function options: Filtering, Gating, Metering, Mixing.*

Refer to one (1) of the following paragraphs for further information on each of these options.

#### *Filters*

**Filtering** allows you to add a 9.6kHz notch filter to one (1) or more audio sources. This can be useful in a few cases when the keypanel data port signal is being heard in the audio line due to cable routing problems.

To **configure filters**, do the following:

1. Using the encoder knob, select **Filtering**.
2. Tap the **encoder knob**.  
*Mic appears.*
3. Using the encoder knob, select a **filter option**.
4. Once you have the source to filter, tap the **encoder knob**.  
*→None appears to indicate that no filtering is selected.*
5. Using the encoder knob, select **Notch**.
6. Tap the **encoder knob**.  
*→Notch appears. The arrow indicates the notch filter is now selected.*
7. Press and hold the **encoder knob** for one (1) second to exit.
8. Run **Service Menu, Save Cfg** to save the change.

#### *Gating*

**Gating** minimizes or eliminates background noise problems by shutting off an audio source when the sound level drops below a certain threshold.

To **configure gating**, do the following:

1. Using the encoder knob, select **Gating**.
2. Tap the **encoder knob**.  
*Mic appears.*
3. Using the encoder knob, select **Microphone, Matrix, or Aux In**.
4. Once you have chosen the source to gate, tap the **encoder knob**.  
*Gating appears to indicate that no filtering is selected.*
5. Tap the **encoder knob**.  
*→Gating appears. The arrow indicates that gating is now selected.*
6. Press and hold the **encoder knob** for one (1) second to exit.
7. Run **Service Menu, Save Cfg** to save the change.

### ***Metering***

**Metering** lets you use the Vol. display as an LED bar graph meter to monitor an audio signal for about one (1) minute.

To **configure metering**, do the following:

1. Using the encoder knob, select **Metering**.
2. Tap the **encoder knob**.  
*Microphone appears.*
3. Using the encoder knob, select **Microphone**, **Matrix**, or **Aux 1**.
4. Once you have chosen the source to meter, tap the **encoder knob**.  
*Meter: Mic appears to indicate that no filtering is selected.*
5. Using the encoder knob, select **Meter: Mic**, **Meter: Mtx**, or **Meter: Aux In**.
6. Tap the **encoder knob**.  
*The Vol bar graph is now monitoring the selected audio source.*
7. Press and hold the **encoder knob** for one (1) second to exit metering or allow the metering function to time-out after approximately one (1) minute.
8. Run **Service Menu**, **Save Cfg** to save the change.

### ***Mixing***

**Mixing** lets you route selected audio signals to the intercom system, to the speaker, or to the left headphone when using the headset. By default, the microphone signal is routed to the matrix, and the matrix signal is routed to the speaker and the left headphone.

To **configure metering**, do the following:

1. Using the encoder knob, select **Mixing**.
2. Tap the *encoder knob*.  
*Aux In appears.*
3. Tap the **encoder knob** again.  
*To Matrix appears.*
4. Using the encoder knob, select either **To Matrix** or **To Speaker**.
5. Tap the **encoder** to select if the audio should be activated to the destination.  
*An arrow appears to indicate if Aux In audio is being fed to that destination.*
6. Press and hold the **encoder knob** for one (1) second to exit the mixing selections.
7. Run **Service Menu**, **Save Cfg** to save the change.

***Menus, Service, Handset (Handset model only)***

**Handset** is used to configure the operation of the handset in the different modes. From this menu you can configure the handset hold operation (what happens when the handset is onhook), the mode the handset operates (what type of handset is installed), and the speaker mute operation (what the speaker does when the handset is offhook).

Handset Hold configures if the handset is onhook, when hung up or the handsfree button is turned off, keys which were latched on, go into selected state and turn amber. If handset hold is off, those keys turn off.

Handset Mode has three (3) different modes:

<i>None-</i>	The panel does not have a handset.
<i>Normal-</i>	The panel has a handset and is in normal mode. <b>PTT</b> (Push to Talk) is not enabled. A normal handset does not have a PTT button. When the handset is offhook, talk is enabled.
<i>PTT-</i>	The panel has a handset in PTT mode. A PTT handset has a button that must be pressed when the handset is offhook.

Speaker Mute has two (2) different settings available:

*Normal:*When the handset is offhook, the speaker is muted.

*No Mute:*When the handset is onhook, the speaker remains active.

To **configure handset hold**, do the following:

1. Using the encoder knob, select **Handset**.
2. Tap the **encoder knob**.  
*Hold appears in the display window.*
3. Tap the **encoder knob**.  
*Off appears in the display window.*
4. Using the encoder knob, select either **Off** or **On**.
5. Tap the **encoder knob** to confirm the selection.
6. Run **Service Menu, Save Cfg** to store the setting.

To **configure the handset mode**, do the following:

1. Using the encoder knob, select **Handset**.
2. Tap the **encoder knob**.  
*Hold appears in the display window.*
3. Using the encoder knob, select **Mode**.  
*None appears in the display window.*
4. Using the encoder knob, select either **None**, **Normal**, or **PTT**.
5. Tap the **encoder knob** to confirm the selection.
6. Run **Service Menu, Save Cfg** to store the setting.

To **configure speaker mute**, do the following:

1. Using the encoder knob, select **Handest**.
2. Tap the **encoder knob**.  
*Hold appears in the display window.*
3. Using the encoder knob, select **Speaker Mute**.  
*Normal appears in the display window.*
4. Using the encoder knob, select either **Normal** or **No Mute**.
5. Tap the **encoder knob** to confirm the selection.
6. Run **Service Menu, Save Cfg** to save the settings.

### ***Menus, Service, LCD Bright***

**LCD Bright** adjusts the alphanumeric display settings.

To **adjust the display brightness**, do the following:

1. Using the encoder knob, select **LCD Bright**.
2. Tap the **encoder knob**.  
*An option for mods 1 through 16 or All appears.*
3. Turn the **encoder knob** clockwise to increase the brightness and counter-clockwise to reduce the brightness.

**NOTE:** The brightness scale ranges from 5 to 100, with 100 being the brightest.

4. Run **Service Menu, Save Cfg** to store the LCD Bright setting.

### *Menus, Service, LCP-16*

**LCP-16** is used to configure the LCP-16 to the KP 612/412. By default, each LCP-16 you connect to the KP 612/KP 412 keypanel takes control of level adjustments for the first available group of 16 physical keys it finds. The LCP-16 adjusts keys 1-16, which corresponds to the bottom row of keys on the KP 612/KP 412 keypanel; the second LCP-16 adjusts keys 17-32, and so forth.

If you do not want to use an LCP-16 with certain keys, you must program the KP 612/KP 412 keypanel to skip those keys. For example, you may not want to use the LCP-16 with the KP 612/KP 412 keypanel, but do want to use it with an EKP 812.

To **turn off LCP usage for keys 1–16**, do the following:

1. Using the encoder knob, select **LCP-16**.
2. Tap the **encoder knob**.  
*1-16: Yes appears. This indicates the first connected LCP-16 attaches to keys 1-16. If you select this option, skip to step 3.*
3. Turn the **encoder knob** to see other options.  
*1-16: Skip appears. This indicates the first connected LCP-16 skips keys 1-16 and attaches to the next available row of keys.*
4. Tap the **encoder knob**.  
*17-32: Yes appears.*
5. Turn the **encoder knob** to see other options.  
*17-32: Skip appears. This indicates the first connected LCP-16 skips keys 17-32 and attaches to the next available row of keys.*
6. Press and hold the **encoder knob** for one (1) second to exit.
7. Run **Service Menu, Save Cfg** to store the new LCP-16 settings.

### *Menus, Service, Local GPIO*

**Local GPIO** is used to assign the GP inputs and outputs. Inputs can be assigned to activate intercom keys (including group master keys and a solo key). Outputs can be activated by intercom keys.

To **assign and input to activate a key**, do the following:

1. Using the encoder knob, select **Local GPIO**.
2. Tap the **encoder knob**.  
*Input appears.*
3. Tap the **encoder knob**.  
*GPI Opto 1 appears.*
4. Using the encoder knob, select a **different GP Input**.
5. Using the encoder knob, select a **GP Input**.
6. Tap the **encoder knob**.
7. Using the encoder knob, select **Talk Key**.
8. Tap the **encoder knob**.  
*Tap Key appears.*
9. Tap the **keypanel key** you want to assign.  
*This is the key that activates when the GP Input activates.*
10. Press and hold the **encoder knob** for one (1) second to exit, or tap the encoder knob twice to back up and make more assignments.
11. Run **Service Menu, Save Cfg** to store local GPIO settings.

To **assign an input to activate a key group**, do the following:

1. Using the encoder knob, select **Local GPIO**.
2. Tap the **encoder knob**.  
*Input appears.*
3. Tap the **encoder knob**.  
*GPI Inp #1 appears.*
4. Using the encoder knob, select a **different GP Input**.
5. Using the encoder knob, select a **GP Input**.
6. Tap the **encoder knob**.
7. Using the encoder knob, select **Group**.
8. Tap the **encoder knob**.  
*By default, Group 1 appears.*
9. Using the encoder knob, select a **different group**.
10. Tap the **intercom key** you want to assign.  
*This is the key that activates when the GPI Input activates.*
11. Press and hold the **encoder knob** for one (1) second to exit, or tap the encoder knob twice to backup and make more assignments.
12. Run **Service Menu, Save Cfg** to store local GPIO settings.

To **remove an input assignment**, do the following:

1. Using the encoder knob, select **GPIO**.
2. Tap the **encoder knob**.
3. Using the encoder knob, select **Input**.
4. Tap the **encoder knob**.
5. Using the encoder knob, select the **GP Input** you want to remove.
6. Tap the **encoder knob**.
7. Using the encoder knob, select **Not Asgnd**.
8. Tap the **encoder knob**.  
*→Not Asgnd appears. The arrow indicates that Not Assigned is the new selection.*
9. Press and hold the **encoder knob** for one (1) second to exit.
10. Run **Service Menu, Save Cfg** to store local GPIO settings.

To **add or remove a GP output key assignment**, do the following:

1. Using the encoder knob, select **Local GPIO**.
2. Tap the **encoder knob**.  
*Input appears.*
3. Using the encoder knob, select **Output**.
4. Tap the **encoder knob**.  
*Relay 1A, 1B appears.*
5. Using the encoder knob, select **Relay 2A, 2B, OC Output #1, 3, OC Output #2, or 4**.
6. Tap the **encoder knob**.  
*Tap Key appears.*

**NOTE:** If there is a key currently assigned to activate the selected GP Output, both LEDs for that key lights red. If there is no assignment, no LEDS light red.

7. Tap a **keypanel key** or **user assignable key** to add or remove the GP Output assignment.
8. Press and hold the **encoder knob** for one (1) second to exit or tap the encoder knob twice to back up and make more assignments.

9. Run **Service Menu, Save Cfg** to store local GPIO settings.

### *Menus, Service, Matrix Out*

**Matrix Out** is used to select between normal or hot mic. In the normal (default) setting, audio from the mic goes out to the matrix when the talk key is latched. In the hot mic setting, audio from the mic goes out to the Matrix without regard to the key's state.

To **configure matrix out**, do the following:

1. Using the encoder knob, select **Matrix Out**.
2. Tap the **encoder knob**.  
*Normal appears.*
3. Using the encoder knob, select either **Normal** or **Hot Mic**.
4. Tap the **encoder**.  
*The Matrix Out is configured.*
5. Press and hold the **encoder knob** for one (1) second to exit.
6. Run **Service Menu, Save Cfg** to store Matrix Out settings.

### *Menus, Service, Mic Select*

**Mic Select** is used to select between the panel mic or external mic input. In the panel mic (default) setting, audio from the panel mic is used. In the hdst only setting, audio from the headset mic is used. This is used to force the use of the headset microphone even when the keypanel's speaker is being used.

To **configure mic select**, do the following:

1. Using the encoder knob, select **Mic Select**.
2. Tap the **encoder knob**.  
*Normal appears.*
3. Using the encoder knob, select either **Normal** or **Extern**.
4. Tap the **encoder knob**.
5. Press and hold the **encoder knob** for one (1) second to exit.
6. Run **Service Menu, Save Cfg** to store Mic Select settings.

### *Menus, Service, Min Volume*

**Min Volume** is used to set the minimum volume for both the keypanel speaker and the headset speaker(s). This is the minimum volume level available on the volume control located on the front of the KP 612/KP 412.

To **set the minimum volume**, do the following:

1. Using the encoder knob, select **Min Volume**.
2. Tap the **encoder knob**.
3. Using the encoder knob, increase or decrease the **minimum volume level**.  
*The range is -1dB to -60dB or full Mute.*
4. Tap the **encoder knob**.
5. Press and hold the **encoder knob** for one (1) second to exit.
6. Run **Service Menu, Save Cfg** to store the Min Volume settings.

## Menus, Service, Mod Assign

Mod Assign is used to define the address of each keypanel key. The KP 612/KP 412 keypanel and EKP 812 use Module ID numbers (Mod ID Numbers) to define the address of each key and display module see Figure 9 on page 60.

**NOTE:** Normally, this is a service adjustment that is required only when replacing a key and display module. It may also be required if for some reason the key assignments, as displayed in AZedit, appear to be in the wrong position on the keypanel or expansion panel.

To **assign a mod**, do the following:

1. Using the encoder knob, select **Mod Assign**.  
*All modules go into Select Module ID.*

**NOTE:** To exit this procedure without making changes, tap the encoder once.

2. Assign the **Mod IDs** as shown in Figure 9 on page 60.
3. Repeat the **procedure** for each module.

**NOTE:** You do not need to run Service Menu, Save Cfg after changing mod assignments.

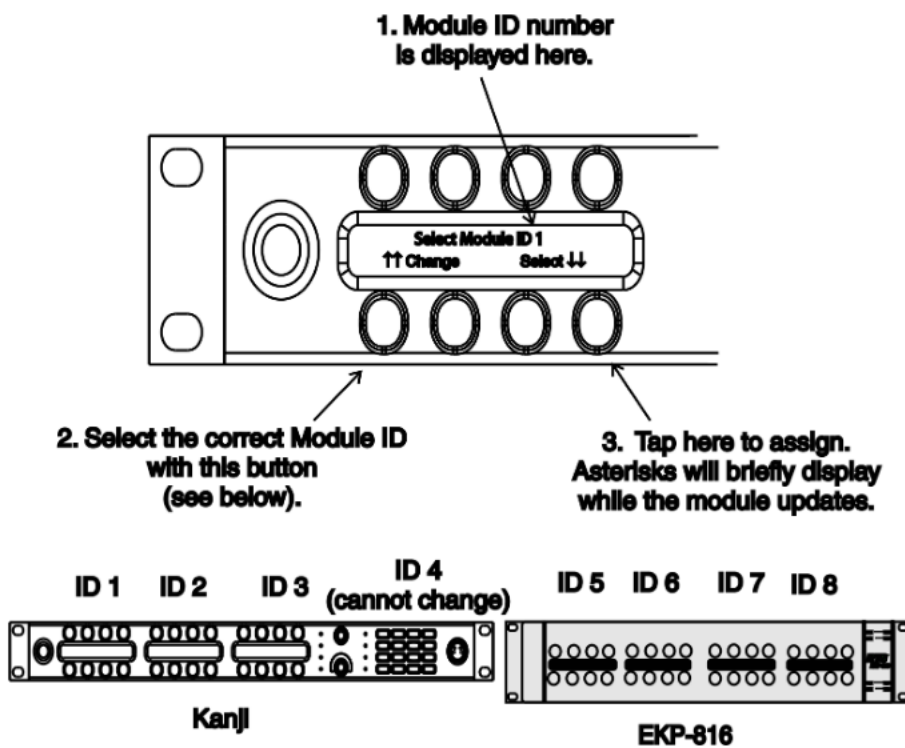


FIGURE 9. Module Assignment Example



### *Menus, Service, Output Level*

**Output Level** is used to adjustment of the nominal audio output level to the matrix from 0 dBu to +8dBu.

To **set the output level**, do the following:

1. Using the encoder knob, select **Outp Level**.
2. Tap the **encoder knob**.  
*0 dBu appears.*
3. Turn the **encoder knob** clockwise to increase the output level or turn the encoder knob counter-clockwise to decrease the output level.
4. Tap the **encoder knob**.
5. Press and hold the **encoder knob** for one (1) second to exit.
6. Run **Service Menu, Save Cfg** to store the Output Level settings.

### *Menus, Service, Page Skip*

**Page Skip** is used to tell the keypanel which assignment pages can be displayed when the Page Up or Page Down button is pushed. For example, you may allow users to see pages 1, 3 and 4, but don't want them to access page 2. Using Page Skip, you can tell the keypanel to skip displaying page 2.

To **set a page skip**, do the following:

1. Using the encoder knob, select **Page Skip**.
2. Tap the **encoder knob**.  
*Page 2: OK appears in the display window.*
3. Using the encoder knob, select the **page** you want to skip.  
*Page 2: Skip appears in the display window.*
4. Press and hold the **encoder knob** for one (1) second to exit.
5. Run **Service Menu, Save Cfg** to store the Page Skip settings.

### *Menus, Service, Preamp Out*

**Preamp Out** is used to choose how audio is routed to the Preamp Out connector.

Available options are:

- Switched* - keypanel audio is routed to the preamp out connected when a talk key is latched.
- Hot Mic* - audio is always available at the preamp out connector.
- Inverted* - keypanel audio is routed to the preamp out when no talk is active; conversely, keypanel audio is not routed to the preamp out when talk is active.
- Disable* - *keypanel audio is isolated from the USM connector.*

The default setting is *0 dBu*.

To **configure preamp out**, do the following:

1. Using the encoder knob, select **Preamp Out**.
2. Tap the **encoder knob**.  
→ *Switch appears.*
3. Using the encoder knob, select either **Switched**, **Hot Mic**, **Inverted**, or **Disabled**.
4. Tap the **encoder knob**.
5. Press and hold the **encoder knob** for one (1) second to exit.
6. Run **Service Menu, Save Cfg** to store the USM settings.

### *Menus, Service, Reset Cfg*

**Reset Cfg** restores all custom settings to the defaults and erases all stored auto dial numbers.

### *Menus, Service, RVON Setup (RVON Option Card Only)*

**RVON Setup** is used to configure the IP Address, Netmask Address, and Gateway Address for the RVON device you want to use.

To **configure the RVON device**, do the following:

1. Using the encoder knob, select **RVON Setup**.
2. Tap the **encoder knob**.  
*IP Address appears.*
3. Tap the **encoder knob**.
4. Using the keypad, enter the **IP Address**.
5. When finished entering the IP Address, tap the **encoder knob**.  
*Netmask appears in the display window.*
6. Tap the **encoder knob**.
7. Using the keypad, enter the **Netmask**.
8. When finished entering the Netmask, tap the **encoder knob**.  
*Gateway appears in the display window.*
9. Tap the **encoder knob**.
10. Using the keypad, enter the **Gateway Address**.
11. When finished enter the Gateway Address, tap the **encoder knob**.  
*RVON Setup appears in the display window.*
12. Press and hold the **encoder knob** for one (1) second to exit.
13. Run **Service Menu, Save Cfg** to store the RVON Setup options.

### *Menus, Service, Save Cfg*

**Save Cfg** saves custom settings you make in the Key Option or Service menus. After customizing settings, run Save Cfg to store your custom settings in non-volatile memory. This protects of your settings when the keypanel is powered down.

To **erase all custom settings**, do the following:

- > Using the encoder knob, select **Service Menu, Reset Cfg**.

### *Menus, Service, Set Addr*

**Set Addr** is used to set the address of the keypanel. The address can be set from 1 through 8.

To **set the address**, do the following:

1. Using the encoder knob, select **Set Addr**.
2. Tap the **encoder knob**.  
*Addr: 1 appears in the display window.*
3. Using the encoder knob, select the **address** you want to assign the keypanel (1 through 8).
4. Tap the **encoder knob**.
5. Press and hold the **encoder knob** for one (1) second to exit.
6. Run **Service Menu, Save Cfg** to store the Set Addr settings.

### *Menus, Service, Sidetone*

Currently not available; planned for future firmware release.

### **Menus, Service, Tally Duration**

**Tally Duration** is used to set the amount of time the incoming call indicator flashes. You can set the tally to 5, 10 or 15 seconds.

To **configure tally duration**, do the following:

1. Using the encoder knob, select **Tally Duration**.
2. Tap the **encoder knob**.
3. Using the encoder knob, select either **5 sec**, **10 sec**, or **15 sec**.
4. Tap the **encoder knob**.
5. Press and hold the **encoder knob** for one (1) second to exit.
6. Run **Service Menu, Save Cfg** to store the Tally Duration settings.

**NOTE:** If Dip Switch four (4) is closed, the tally lasts for as long as the caller's talk key is closed.

### *Menus, Service, Test Panel*

**Test Panel** allows you to check the operation of all keys and appears.

- All alphanumeric appears show a % (percent) symbol. Pressing down on any key causes *ok* to display. This verifies operation of the key. Tapping up or down on the headset vol sel. key causes the display to cycle through the available selections.
- Tapping either the listen or talk button, or the call waiting button causes the corresponding red LED to light. This verifies the latching operation and also that each red LED is ok.
- Holding any button causes the corresponding green LED to light. This verifies operation of the green LEDs.

### *Menus, Service, Tone Gen*

**Tone Gen** is used to turn the internal tone generator on or off. You can use the tone generator to check the audio path from the keypanel to the matrix and back.

**NOTE:** The microphone is muted when the tone generator is active.

---

## Special Functions

### Quick Assign

**Quick Assign** is used to assign key assignments to any key on the keypanel. This is only used for top level assignments.

To **perform a quick assign**, do the following:

1. Tap the **encoder knob** once to access the Quick Assign menu.
2. Using the encoder knob, select between **Assign** and **Clear Assign**.  
*When Assign is selected, the key assign list becomes available.*
3. Using the encoder knob, scroll through the **different assignments**.
4. Tap the **encoder knob**.  
*Tap Key appears.*
5. Tap the **talk button** of the key you want to assign.

**NOTE:** When a Quick Assign list and the FUNC key are tapped, the next Quick Assign list is displayed.

### User Assignable Key

The **User Assignable Key** is used to assign lower level menu items that are frequently used to operate a single key on the keypanel.

To **assign the user assignable key**, do the following:

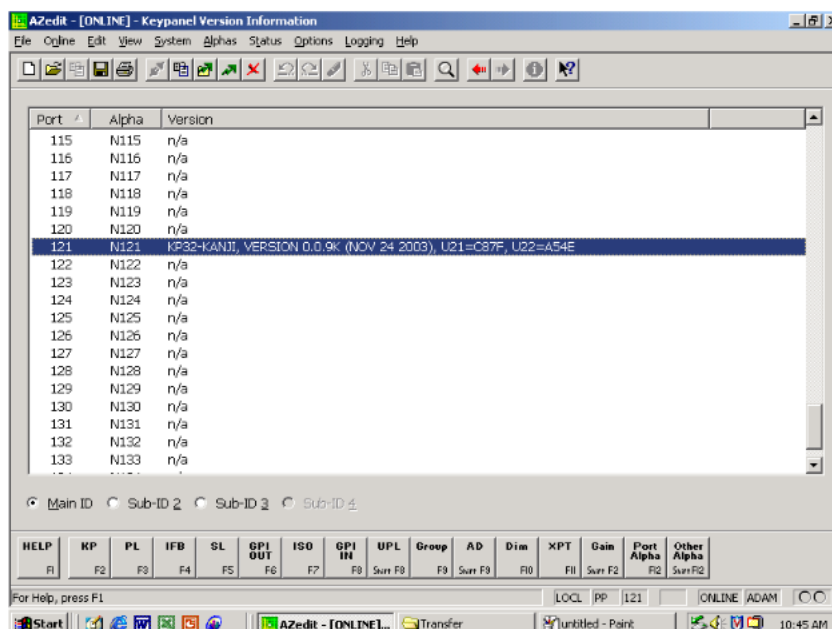
1. Turn the **encoder knob** to scroll to a menu item you wish to assign to the key.  
*The assignment should appear in the call waiting window.*
2. Press and hold the **user assignable key** until the LED behind the key is constant green for two (2) seconds.  
*This verifies the assignments have been made.*

# *KP 612/KP 412 Keypanel Firmware Download*

## *Download Keypanel Firmware through AZedit*

To download firmware to the keypanel, do the following:

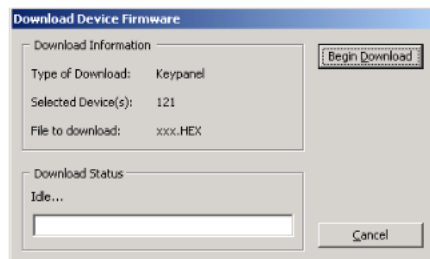
1. Open **AZedit**.
2. Select **Status|Software Versions|Keypanels** from the Status menu  
*The Keypanel Version Information window appears.*



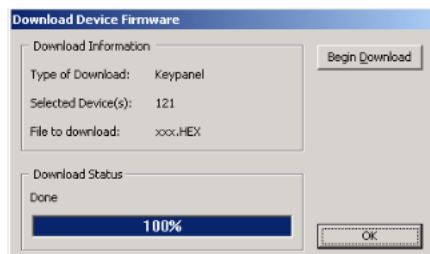
3. Highlight the **port** of the keypanel to be updated.  
  
**NOTE:** You may select more than one (1) port at a time by holding the CTRL key down while you select the ports.
4. Right-click the **highlighted selections** and select **Download Firmware**.  
*The Firmware Download window appears.*
5. Using the browse feature, browse to the **file** to be downloaded (XXX.hex)

6. Click **Open**.

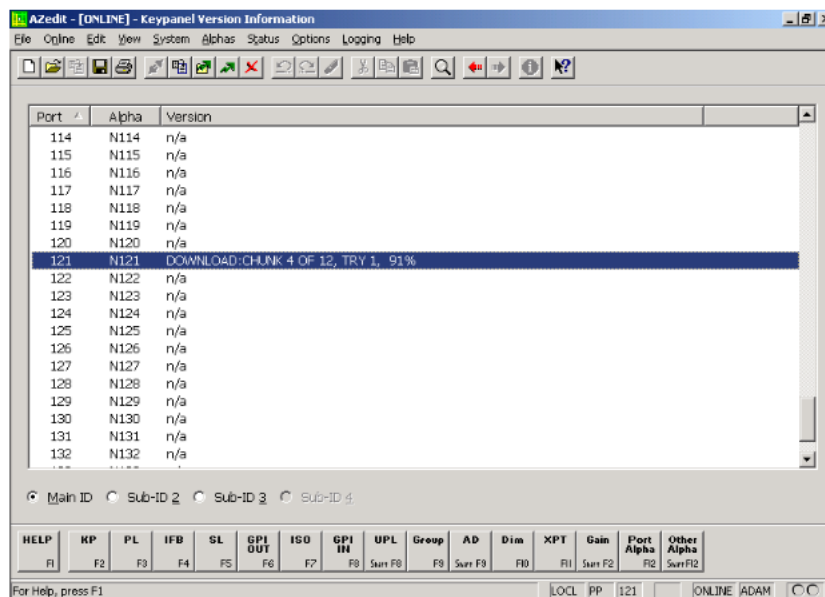
*The Download Device Firmware window appears.*

7. Click **Begin Download**.

*The download begins.*

8. Click **OK**.

*The firmware download to the keypanel is complete. This may take a few minutes to occur.*

9. Verify the **version upgrade is correct** in the Keypanel Version Information Window.

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## *KP 612/KP 412 Menu Structure Quick Reference*

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### *Menu Access*

To **access the menu structure**, do the following:

1. On the front panel of the KP 612/KP 412 keypanel, turn the **encoder knob** to scroll to the menu.
2. Tap the **encoder** to select the menu.
3. Turn the **encoder knob** clockwise to scroll forward, and counter-clockwise to scroll backward through a list of menus.

To navigate within a menu, do the following:

1. Turn the **encoder knob** clockwise to scroll forward, and counter-clockwise to scroll backward through a list of menus.
2. Tap the **encoder knob** to enter a menu.
3. Tap the **encoder knob** twice to exit a menu or press and hold the encoder knob for one (1) second to exit the menu system.

---

## Menu Structure

<b>Display</b>	
	<b>Asgn Type</b>
	<b>Chans On</b>
	<b>Exclusive</b>
	<b>Key Groups</b>
	<b>Group 1</b>
	<b>Group 2</b>
	<b>Group 3</b>
	<b>Group 4</b>
	<b>Key List</b>
	<b>Level 2</b>
	<b>Matrix</b>
	<b>Panel ID</b>
	<b>Solo</b>
	<b>Version</b>
<b>Key Assign</b>	
	<b>Point-to-Point</b>
	<b>Party Line</b>
	<b>IFB</b>
	<b>Spcl List</b>
	<b>Sys Relay</b>
	<b>Camera ISO</b>
	<b>UPL</b>
	<b>IFB SL</b>
	<b>Quick Assign</b>
	<b>Reset Vols</b>



Menus			
Autodial			
Phone #?			
	A-Dial 1-10		
Key Option			
Btn Lock			
	Tap Key		
Chime			
	Tap Key		
Clear Options			
	Tap Key		
Exclusiv			
	Tap Key		
Key Group			
	Groups 1-4		
		Tap Master	
		Tap Slave	
Latching			
	Tap Key		
Solo			
	Tap Key		
RVON Conn. (only appears with RVON device installed)			
Service			
Aux Inputs			
Intercom			
	Enabled		
	Disabled		
Aux IN			
	Enabled		
	Disabled		

			<b>Timeout</b>	
				30 seconds
				None
			<b>Baud Rate</b>	
				Auto Baud
				9600 Baud
				76.8K Baud
			<b>Caller Vol</b>	
				Adj Disabled
				Adj Enabled
			<b>DIM</b>	
			<b>Speaker</b>	
				0 dB--20dB (-8dB)
			<b>Headset</b>	
				0 dB--20dB (0dB)
			<b>DSP Function</b>	
			<b>Filters</b>	
			<b>Mic</b>	None
				Notch
			<b>Matrix</b>	None
				Notch
			<b>Aux IN</b>	None
				Notch
			<b>Gating</b>	
			<b>Mic</b>	Gating
			<b>Matrix</b>	Gating
			<b>Aux IN</b>	Gating
			<b>Metering</b>	
			<b>Mic</b>	Meter: Mic
			<b>Matrix</b>	Meter: MTX
			<b>Aux IN</b>	Meter: Aux 1

			<b>Mixing</b>	
			<b>Aux IN</b>	
			<b>To Matrix</b>	
			<b>To Speaker</b>	
			<b>Handset</b>	
			<b>Hold</b>	
			<b>Mode</b>	
			<b>None</b>	
			<b>Normal</b>	
			<b>PTT</b>	
			<b>Speaker Mute</b>	
			<b>Normal</b>	
			<b>No Mute</b>	
			<b>LCD Bright</b>	
			<b>All</b>	
			<b>Module 1-16</b>	
			<b>LCP 16</b>	
			<b>Main</b>	
			<b>Skip/Yes</b>	
			<b>EKP</b>	
			<b>Skip/Yes</b>	
			<b>Local GPIO</b>	
			<b>Input</b>	
			<b>GPI Opto 1-4</b>	
			<b>Output</b>	
			<b>Relays 1A. 1B</b>	
			<b>Relays 2A. 2B</b>	
			<b>OC Output 1, 3</b>	
			<b>OC Output 2, 4</b>	
			<b>Matrix Out</b>	
			<b>Normal</b>	
			<b>Hot Mic</b>	
			<b>Mic Select</b>	
			<b>Normal</b>	
			<b>External</b>	
			<b>Min Vol.</b>	
			<b>Speaker</b>	
			<b>-1dB to 60dB, Mute (-30dB)</b>	
			<b>Headset</b>	
			<b>-1dB to 60dB, Mute (-30dB)</b>	

		<b>Mod Assign</b>	
		Select Module 1	
		Select Module 2	
		Select Module 3	
		<b>Outp Level</b>	
		0 to 8dB (8dB)	
		<b>Page Skip</b>	
		Page 2	
		Skip/OK	
		Page 3	
		Skip/OK	
		Page 4	
		Skip/OK	
		<b>Preamp Out</b>	
		Switched	
		Hot Mic	
		Inverted	
		Disabled	
		<b>Reset Cfg</b>	
		Do Reset	
		Cancel	
		<b>RVON Setup</b>	
		IP Address	
		Netmask	
		Gateway	
		<b>Sidetone</b>	
		Currently not available; planned for future firmware release.	
		<b>Tally Duration</b>	
		5 Secs	
		10 Secs	
		15 Secs	
		<b>Test Panel</b>	
		<b>Tone Gen</b>	
		Tone On	
		Tone Off	

---

## *A*

### **All Call**

For talk key assignment only. Activating an All Call key also activates all talk keys to the left of the All Call key (up to, but not including another All Call key).

### **Alpha**

Alphas are the user-changeable names that identify destinations (intercom ports, party lines, etc.). Change Alpha names by using the Port Alpha button in AZedit. When you assign a destination to a talk key, the alpha name appears in the alpha-numeric display for that key (on keypanels so equipped).

### **Auto Follow (AF)**

A key assignment for list keys only. Auto Follow causes a key's listen assignment to always be the same as the talk assigned. Thus, if you change the talk assignment, you do not also have to change the listen assignment. You can manually activate an auto-follow listen key independently of the talk key. If you want auto-activation or deactivation or listen during talk, use one (1) of the other auto key assignments, such as auto-listen, or auto-mute.

### **Auto Functions**

Auto functions are special key assignments that work with other key assignments. For further information, see the glossary description of individual auto functions: auto-follow, auto-listen, auto-reciprocal, auto-mute, auto-table, all-call, DIM.

### **Auto Listen (AL)**

A key assignment for listen keys only. This assignment works like auto-follow, except listen automatically activates during talk. Auto-listen is sometimes a good assignment for use with party lines or other non-keypanel devices that do not have talk-back control of matrix crosspoints.

### **Auto Mute (AM)**

A key assignment for listen keys only. This assignment works like auto-follow, except listen automatically mutes during talk. Auto-mute can help prevent feedback or echo when talking to certain destinations. In some cases, you may find it works better to disable talk latching for this type of key, because if you accidentally leave talk latched on, you can never hear the destination.

### Auto Reciprocal (AR)

A key assignment for listen keys only. This assignment forces you to continuously listen to whatever is assigned to the talk key. It is commonly used on keypanels that are not equipped with listen keys, to allow listening to party lines. It is also useful to force listening when it is desirable to have an operator continuously hear a party line or other source.

### Auto Table (AT)

A key assignment for listen keys only, when the corresponding talk is assigned to an IFB. Auto Table causes a listen key's assignment to always be the same as the listen source for whatever IFB is currently assigned to the talk key. (You define the Listen Source in AZedit during IFB setup.) Auto Table is convenient in a broadcast environment when a director needs 2-way communication with the IFB talent. And the IFB keys are frequently reassigned during the course of a program to talk to new talent locations. Using AZedit, several IFBs can be set up in advance, and their listen sources can also be defined during setup. Every time an IFB talk key is reassigned on a keypanel, the listen source for each new IFB automatically becomes the listen key assignment for that key.

---

## C

### Codec

A Codec is an algorithm used to compress audio. Codecs dictate the quality of audio you hear and the network bandwidth used. The packet size determines how much audio data is carried across the network in each transmitted packet. The Codec type and packet size chosen require different amounts of bandwidth from the network. As with the Codec type, the packet size you choose for the audio transfer will affect the audio you hear and the bandwidth you use over the network. The larger the audio packet you choose to use, the lower the bandwidth used. However, the larger packet size can result in a higher delay and longer gaps if the packet is lost. On the other hand, smaller packet sizes result in larger bandwidth use, but lower delays and smaller gaps if the packet is lost. The intercom system engineer and the network designer may want to work together in choosing the Codec type and packet size suitable for the size of the network, so degradation of network resources does not occur.

### Crosspoint

The term Crosspoint, like the term Matrix, is inherited from intercom systems, such as the RTS CS9500, CS9600, and CS9700, that use a switching matrix to route intercom audio. In those systems, the crosspoints are the actual switches that close or open to connect or disconnect talk and listen paths. RTS ADAM, ADAM CS, Zeus, and Cronus Intercom Systems do not actually use crosspoint switches, but use a technique called **TDM** (Time Division Multiplexing), in which communications are routed as digital packets. However, use of the term *crosspoint* persists since packet routing basically accomplishes the same thing as conventional crosspoints: namely, connecting distinct talkers and listeners. In this sense, a crosspoint can be thought of simply as a communication link between any two (2) points in the intercom system.

---

## D

### Destination

A destination is anything a talk key talks to or a listen key listens to. A destination can therefore be any port, party line, IFB, etc.

---

## Dim

Dim occurs in two (2) contexts in RTS Digital Matrix Intercom Systems. First, the dim table feature. Dim tables are used to correct a feedback problem that can occur between two (2) keypanels operating in close proximity that have keys assigned to talk/listen to a common destination. Dim tables are set up in AZedit. Once a dim table is setup, it can be assigned as a level 2 talk assignment for those keys causing the feedback problem

Second, the adjustable speaker dim available in the KP-32 keypanel. This causes the speaker or headphone volume to diminish by a preset amount whenever a talk key is activated. This can help to prevent occasional feedback between the speaker and microphone, due to volume settings, microphone placement, etc.

---

## G

### Gateway

A **Gateway** is a node (for example, a computer) on a network that serves as an entrance to another network.

### GPIO

General Purpose Input / Output. (You may also see this referred to simply as “GPI”.) GPIO is a means of controlling devices using switch contact closures, DC voltages, or similar methods. For example, you can control a lighting system from keypanel keys, or key a transmitter from a talk key during transmit. Or, simply operate a light or buzzer for cueing. In ADAM, ADAM CS, Zeus, or Cronus Intercom Systems, you can also control intercom events from external switches. For example, you can activate key assignments, close or open crosspoints, activate GPI outputs, etc. In CS9000 Series intercom systems, general purpose control outputs are provided by optional FR9528 Relay Frames (8 relays each). In those systems, a relay may be assigned to an intercom key on a keypanel using the Relay key assignment type. Pressing the intercom button activates the relay. ADAM, ADAM CS, Zeus, and Cronus intercom system all have a dedicated GPIO connector (J27 on Zeus, J903 on ADAM CS, J11 on the XCP-ADAM-MC Master Controller breakout panel and J9 on Cronus). This connector supports eight (8) control inputs and eight (8) control outputs. Additionally, one (1) or more UIO-256/GPIO-16 frames may be connected to the intercom system. Each UIO-256/GPIO-16 provides another 16 control inputs and no control outputs. Control outputs may be assigned to the intercom keys using the Relay key assignment type, and the intercom keys can then control external devices the same as the FR9528. Control inputs can be assigned to activate virtual key assignments. A virtual key assignment is a key assignment at an intercom port where there is no keypanel connected. Basically, an external switch acts like a talk or listen key. The control inputs and outputs can also be used as conditions for UPL statements in AZedit. Finally, there is a GPIO option available for the KP-12 keypanel, and a connector module option for the KP-32, which includes GPIO. These are referred to as Local GPIO, since they are assigned and used locally at the keypanel. Each local GPIO includes four (4) control inputs and four (4) control outputs.

---

## I

### IFB

IFB (Interrupt Foldback) is a special type of communication in which a listener at a particular intercom output port normally hears an audio program source connected to a particular intercom port. A keypanel operator can activate a key to interrupt the audio program source and then talk to the listener. Normal operation resumes when the keypanel operator releases the key. IFB is typically used to cue on-air talent. For example, the news anchor during a news broadcast typically listens to the broadcast audio mix in an earset (except the news anchor’s own voice audio is removed from the mix). A director at a keypanel can interrupt the broadcast audio to the new’s anchors earset and provide new information to the news anchor. IFB could also be used with a PA (Public Address) system that normally broadcasts background music. The background music can be interrupted while someone is talking over the PA. IFBs are set up by defining the IFB inputs and outputs, using the intercom system configuration software (AZedit). The intercom output port is called the IFB output and the program input port is called the IFB input. IFBs can also be given names which are meaningful to keypanel operators. Once an IFB has been set up and named, it can be assigned to any keypanel key, provided that IFB assignment has not been restricted or disabled in the intercom system configuration software.

---

## ISO (Camera ISO)

ISO is a means for a keypanel operator to isolate a particular intercom port for private communication. While the intercom port is isolated, it can only hear audio from the keypanel operator. ISO is frequently used in television broadcasting to temporarily isolate a member of a camera party line. The isolated camera operator can then receive directions without interference from other audio traffic on the party line. ISOs are setup using the intercom system configuration software (AZedit). Each ISO can also be given a name which is meaningful to keypanel operators. Once an ISO is set up and named, it can be assigned to any keypanel key, provided that ISO assignment has not been restricted or disabled in the intercom system configuration software.

---

## M

### Matrix

Matrix is a term inherited from earlier point-to-point intercom systems, where all point-to-point communication was accomplished by closing specific switches in a switching matrix. Examples include RTS CS9500, CS9600, and CS9700 Intercom Systems. In many instances, Matrix is used interchangeably with Intercom Systems. RTSADAM, ADAM CS, Zeus, and Cronus intercom systems, on the other hand, do not use a switching matrix, but use a method called **TDM** (Time Division Multiplexing), in which communications are routed as digital packets. However, use of the term *matrix* persists, since packet routing basically accomplishes the same thing as a conventional switching matrix: namely, connecting distinct talkers and listeners.

---

## N

### Netmask

The **Netmask** is a string of number similar to an IP Address, except it masks or windows out the network part of an IP Address so only the host computer part of the address remains (for example, 255.255.255.0).

---

## P

### Party Line (PL)

A party line, also called a conference line, is a group of intercom ports which can always talk and/or listen to each other. Party lines have default names, PL01, PL02, etc. These names can be changed to more meaningful names using the Alphas button in AZedit. Members are assigned to a party line using Party Line setup in AZedit. Once a party line has been set up, it can also be assigned to a keypanel key either from the configuration software or at a programmable keypanel. This allows the keypanel operator to talk and/or listen to the party line without being a member.

#### **IMPORTANT:**

Do not confuse special lists and party lines. A special list is used when a keypanel operator needs to occasionally talk or listen to a group of intercom ports that are otherwise unrelated. A party line is typically used when several users of non-keypanel devices (such as beltpacks or camera intercoms) are engaged in a specific common activity and they need to talk and/or listen to each other all the time. Keypanels are almost never members of party lines (although they can be). However, a keypanel key can be assigned to occasionally talk or listen to a party line, if desired. Remember, party lines are primarily set up for party line members, with occasional access by keypanel operators. While special lists are set up exclusively for keypanel operators to talk or listen to several unrelated intercom ports.



## Port

Ports are the individual channels devices are connected to. Devices include: 2-way communication devices, such as, keypanels, beltpacks, etc.; audio sources, such as broadcast feeds or background music; miscellaneous audio output devices, such as powered loudspeakers, PA systems, etc. The audio signal from any input port can be routed to any output port. For example, during keypanel setup, you assign keypanel keys so that keypanel operators can talk and listen to other intercom ports. Communication of this type is called *point-to-point communication*. You can also route signals between intercom ports without keypanels. One way to do this is to force crosspoints in the Crosspoint Status window of AZedit. Another way to do this is with GP Inputs. Intercom ports have identification numbers 001, 002, etc. These numbers cannot be changed. Each intercom port also has a default name, called an *alpha*. The default alpha names are N001, N002, etc. These default alpha names may be changed to names that are more meaningful to keypanel operators. Use the Alphas setup windows in AZedit.

For data routing purposes, port numbers are arranged in groups of eight (8) sequential intercom ports. In an ADAM or ADAM CS Intercom System, each audio I/O card comprises one (1) data group. In a Zeus Intercom System, each group of eight (8) port connectors comprises a data group. Within each data group, each keypanel is uniquely identified by its address setting. Whenever you display the Panel ID, the intercom system determines which data group the keypanel is connected to, and also the address setting. It then reports the calculated address. For example, suppose a keypanel is connected to data group 3 and the keypanel address is set to 5. Since each data group consists of eight (8) sequential intercom ports, the calculated port number for this keypanel is  $(2 \times 8) + 5$ , or 21. This is the total of all intercom port numbers on the first two (2) data groups, plus the offset of five (5) ports into the third data group.

Keypanels are calibrated to send and receive audio at the standard operating levels of the intercom system. No audio gain adjustment is normally required when connecting these. However, many other types of devices may not operate at the standard intercom system levels. To assure signal level compatibility between the various types of audio devices connected to the intercom system, there are separate analog input and output gain adjustments for each intercom port when listening to any other specific intercom port. This is called the point-to-point listen gain, or crosspoint gain. For example, a keypanel operator might want to monitor a music source connected at some intercom port, but at a reduced audio level so it does not interfere with normal intercom communications. The crosspoint gain can be reduced for the keypanel port listening to the port where the music source is connected. Analog gain adjustment is only available using AZedit. Crosspoint gains can be adjusted either within AZedit or from a programmable keypanel.

---

## R

### Relay

Relay is used interchangeably with GP Output. The relay feature works with the 16 GP outputs of an optional UIO-256/GPIO-16 and with the relay outputs of an FR9528 Relay Frame. The relay feature also works with the eight (8) GP outputs of an ADAM, ADAM CS, Zeus, and Cronus intercom system (J27 on a Zeus frame, J903 on an ADAM CS frame, J9 on a Cronus frame, and J11 on the XCP-ADAM-MC Master Controller Breakout Panel). You can assign a keypanel key to control a GP Output from any of these devices, and then use that key and output to control an external device. For example, you could use a keypanel key to control lighting. Or, you could assign a relay as a level 2 talk assignment in a stacked talk key arrangement to both send audio and key a device, such as a paging amplifier or a 2-way radio.

---

## S

### Special List

A special list is a means for a keypanel operator to talk and/or listen to several unrelated destinations using a single key. Special lists are useful for group call or zone paging. Special list members are defined in AZedit. Once a special list has been configured, it can be assigned to a keypanel key. Special lists have default names SL01, SL02, etc. These names can be changed using the Alpha edit window in AZedit. Define the members of the special lists using the Special List setup window. Once a special list has been setup, you typically assign it to a keypanel key, using the Keypanel Setup window. The keypanel operator can then activate the special list key to talk or listen to all members of the special list.

**IMPORTANT:** Do not confuse special lists and party lines. A special list is used when a keypanel operator needs to occasionally talk or listen to a group of intercom ports otherwise unrelated. A party line is typically used when several users of non-keypanel devices (such as beltpacks or camera intercoms) are engaged in a specific common activity and they need to talk and/or listen to each other all the time. Keypanels are almost never members of party lines (although they can be). However, a keypanel key can be assigned to occasionally talk or listen to a party line, if desired. Remember, party lines are primarily set up for party line members, with occasional access by keypanel operators. While special lists are set up exclusively for keypanel operators to talk or listen to several unrelated intercom ports.

### Stacked Key

See Talk Level 1 and Talk Level 2 descriptions on page 78.

---

## T

### Talk Level 1

Talk Level 1 is the normal talk key assignment. This is the assignment normally displayed in the alphanumeric display, on keypanels so equipped. You may add a talk level 2 assignment to activate a second device along with talk level 1.

### Talk Level 2

Talk Level 2 is used with stacked talk keys. A stacked talk key activates two (2) types of communication at once. For example, a stacked talk key could simultaneously activate audio output to a transmitter using a relay. The audio output is called the level 1 assignment and the relay is called the level 2 assignment.

### Trunking

Trunking is a method of interconnecting two (2) or more independent intercom systems. The connection is accomplished by reserving one (1) or more audio ports in each of the intercom systems for use as audio links between the systems. A special device, called a Trunk Master is required to control access and usage for the trunked intercom ports. A configuration application, called TrunkEdit, is used to set up the Trunk Master.

# RVON-1

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## *General Description of the RVON-1 Voice Over Network Card*

Installed directly into KP-32 or KP 612/KP 412 keypanels, the RVON-1 provides **VoIP** (Voice Over Internet Protocol) communications, for the RTS ADAM Intercom family. In general, VoIP means sending voice information in digital form using discrete packets rather than the traditional hard wire connection. The RVON-1 delivers an integrated solution for connecting keypanels to the Intercom Matrix over standard IP networks.

The RVON-1 is compatible with any RTS Matrix Intercom System equipped with a suitable RVON interface. In conjunction with any new or existing KP-32 or KP 612/KP 412 keypanel, the RVON-1 brings a new level of enterprise-wide and remote access functionality to your RTS Matrix Intercom.

The RVON-1 card is configurable through the keypanel service menu and the AZedit configuration software. It is also fully compatible with internationally recognized standards and supports the following protocols: G.711, G.729A, and G.723 (2 bit rates).

The RVON-1 reaffirms RTS' history of providing support for the latest technology in a fully supported backward compatible manner to all its RTS products.

---

## *Features*

Installation	The RVON-1 provides a single RJ-45 Ethernet connection for use with a 10 BASE-T or 100 BASE-TX network.
1 Channel of Audio In and Out	The RVON-1 card supports one (1) channel in and out and has configurable network and bandwidth parameters that can be tailored to individual network functions.
Ethernet Compatible	The RVON-1 card uses standard Ethernet protocols and is compatible with 10 BASE-T and 100 BASE-TX Ethernet compliant devices and networks.
AZedit Configurations	Users have the ability to adjust the audio parameters of the RVON-1 channel to optimize the available bandwidth.
Swappable Between Ethernet and AIO Connection	When connected to an Ethernet LAN, audio comes from the RVON-1 card; and, when an Ethernet link is not present, the audio comes from the AIO connection. Note, the user does not need to remove the RVON-1 card to switch to AIO mode.

Specifications

DIGITAL

Compression	Audio Bit Rate	Coding Delay	Playout Delay	IP Bandwidth
G.711	64k	125µs	20–60ms	160–224kbps
G.729A	8k	10ms	20–120ms	32–112kbps
G.723	5.3k/6.3k	30ms	60–120ms	29–45kbps

\*Data depends on CODEC selection.  
**NOTE:** The Playout Delay and Bandwidth depend on the configured amount of audio per packet.

CONNECTIONS

- RJ-45 Ethernet via backcard
- 14-pin KP Compatible Expansion Connector
  - Pin 1.....5 Volt Analog
  - Pin 2..... -12 Volt
  - Pin 3 ..... +12 Volt
  - Pin 4..... 5 Volt Digital
  - Pin 5..... Analog GND
  - Pin 6..... Digital GND
  - Pin 7..... To Matrix Audio L
  - Pin 8..... NC
  - Pin 9..... From Matrix Audio L
  - Pin 10..... RS485L
  - Pin 11 ..... From Matrix Audio H
  - Pin 12..... NC
  - Pin 13..... To Matrix Audio H
  - Pin 14..... RS485H

Power..... Powered internally from keypanel motherboard

Physical ..... 2.5” W x 5.75” L (63.5mm W x 146.05mm L)

## Default Addresses for the RVON Product Line

**TABLE 2.** Default Addresses for the RVON Product Line

Product	Default IP Address	Default Subnet Mask
RVON-I/O	192.168.0.1	255.255.0.0
RVON-8	192.168.0.2	255.255.0.0
RVON-1	192.168.0.3	255.255.0.0
RVON-C	192.168.0.4	255.255.0.0
RVON-16	192.168.0.5	255.255.0.0
GPIO-16	192.168.0.6	255.255.0.0
MCII-e	192.68.0.7	255.255.0.0
Cronus	192.68.0.8	255.255.0.0
Zeus III	192.68.0.9	255.255.0.0

## Dip Switches

### Switch 1    **Reserved**

### Switch 2    **Disable Telnet Shell**

Default            off (Telnet Enabled)  
Setting:

Description:    The Telnet shell allows you to access configuration options through the use of Telnet. When DIP switch 2 is off, you can use Telnet to access configuration options on the RVON-1 card. Turn DIP switch 2 on to disable the Telnet shell.

### Switch 3    **Enable Boot Downloader**

Default            off (boot downloader disabled)  
Setting:

Description      The purpose of the boot downloader is to allow you to recover from having your main application image corrupted (either by bad flash programming or by downloading an invalid image). Turn DIP switch 3 on to enable the boot downloader.

### Switch 4    **Debug Only!**

Default            off  
Setting:

Description      DIP switch 4 should always be left in the off position. It is reserved for debugging and can have unintended consequences.

## Firmware Compatibility Requirements for the RVON-1 Card

**TABLE 3.** Compatibility Requirements for the RVON-1 card.

Description	Version
Master Controller	9.19.0 or later
Peripheral Controller	10.10.0 or later
DBX	1.10.1 or later
AZedit	2.06.06 or later
RVON-8	1.1.0 or later
KP-32	2.0.0 or later

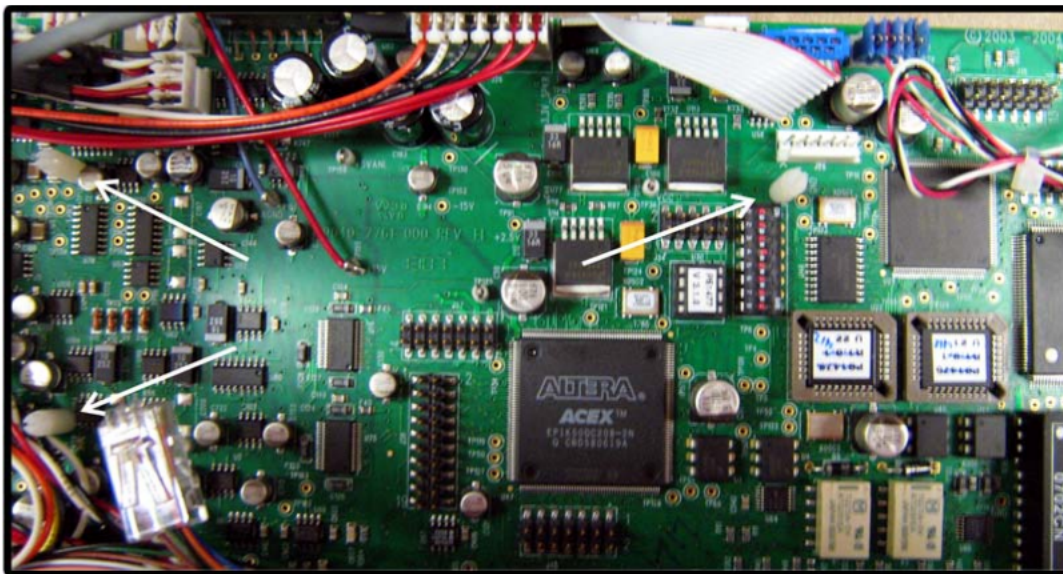
## Installation of the RVON-1 Card in a KP 612/KP 412

**NOTE:** These instructions are applicable for the KP 612, and the KP 412.

To **install the RVON-1 card**, do the following:

1. Remove the **cover** from the KP 612/KP 412 keypanel.

**NOTE:** It is recommended to seat the RVON-1 card on the J2 connector located on the KP 612/KP 412 motherboard before snapping the RVON-1 board onto the spacers. Be careful to attach J2 to J37 correctly.



**FIGURE 10.** Spacer placement on KP 612/KP 412 motherboard

2. Gently secure the **RVON-1 board** in place.

**NOTE:** Be sure the orientation of the board is correct, otherwise undesirable effects may occur. Make sure the RJ-45 connection is positioned so it connects correctly to the RJ-45 connector:

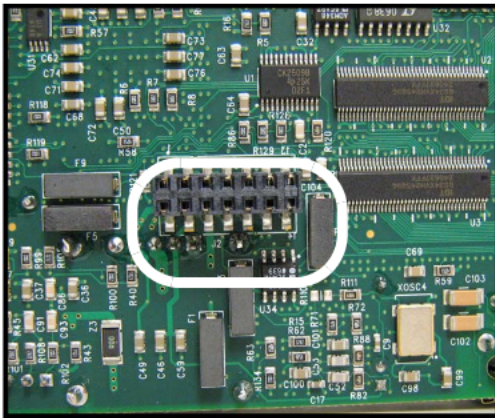


FIGURE 11. J2 Connector on the KP 612/KP 412 Board

In the KP 612/KP 412, the RVON-1 card connects to the KP 612/KP 412 by way of the J2 connector on the RVON, attached to J37 on the KP 612/KP 412 header.

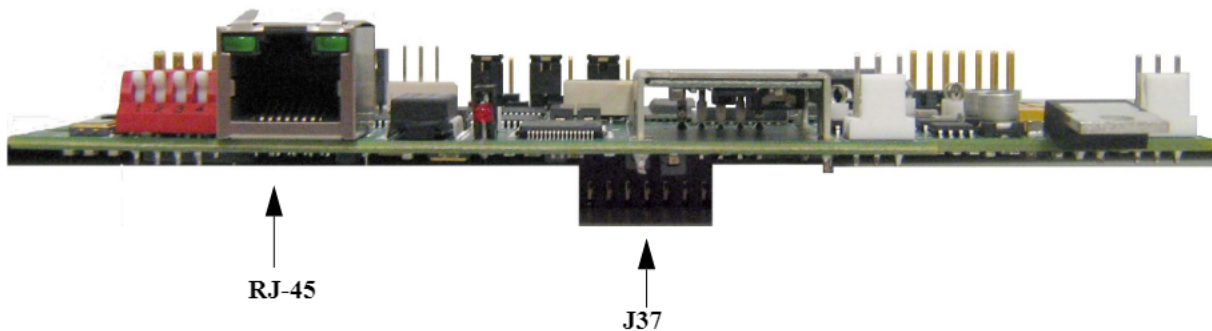


FIGURE 12. The J37 connector on the KP 612/KP 412 board.

3. Connect the **RJ-45 extension connector cable** to the RVON-1 board.

### *RVON-1 Relay*

When connected to an Ethernet LAN, audio comes from the RVON-1 card; and, when Ethernet is not plugged in, the audio comes from the AIO connection. Note, the user does not need to remove the RVON-1 to switch to AIO mode.

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**WARNING:** You cannot have both an Ethernet connection and an AIO connection simultaneously. If the Ethernet and AIO are connected simultaneously, no audio communication occurs.

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## Addresses and the RVON-1

Because the RVON-1 has an Ethernet interface, it is required to have a **MAC** (Media Access Control) ID. This is a low level address that contains 48 bits. Do not confuse this address with an IP Address. In order to be IP compliant, all cards must have a unique MAC ID when shipped from the manufacturer. Typically, the MAC ID of a piece of hardware, such as the RVON-1 card, has a fixed or static address. Where the RVON-1 card's IP Address can change over time.

The MAC ID uniquely identifies each node of a network and interfaces directly with the network media. The RVON-1 card has a small 8-pin serial device on the board that the processor can read the unique MAC ID from. For more information on MAC IDs, contact technical support.

**NOTE:** Each RVON-1 card needs to be programmed with its own IP Address.

---

## Configure the RVON-1 from the KP 612/KP 412

### TOP LEVEL MENU, SERVICE, RVON SETUP

The RVON-1 card, when shipped has a default IP Address already configured. This must be changed in order for the RVON-1 card to function properly because the pre-configured IP Address may not work with your network.

To set the IP Address from the Service Level menu, do the following:

1. On the KP 612/KP 412, scroll to **Menu**.  
*The top level menu appears.*
2. Using the encoder knob, scroll to **Service**.
3. Tap the **encoder knob** to select Service.  
*The Service menu appears.*
4. Using the encoder knob, scroll to **RVON Setup**.
5. Tap the **encoder knob** to select RVON Setup.  
*The IP Address menu item appears.*
6. Tap the **encoder knob** to select IP Address.  
*The IP Address appears.*
7. Enter the **first number** in the IP Address.  
*This activates the first octet of the IP Address and clears the rest of the IP Address.*
8. Tap the **encoder knob**.  
*This confirms the first octet in the IP Address and moves you to the second octet.*

**NOTE:** Tap the encoder knob to skip over any octet that does not need modifications.

9. Repeat steps 7 and 8 until the entire IP Address is entered.
10. Tap the **encoder knob**.  
*The Netmask menu item appears.*

**NOTE:** Once you have entered the IP Address, enter the Netmask.

11. Tap the **encoder knob**.  
*The actual Netmask appears.*
12. Enter the **first number** in the Netmask.  
*This activates the first octet of the Netmask and clears the rest of the Netmask.*



13. Tap the **encoder knob**.  
*This confirms the first octet in the Netmask and moves you to the second octet.*

**NOTE:** Tap the encoder knob to skip over any octet that does not need modification.

14. Repeat steps **13** and **14** until the entire Netmask is entered.
15. Tap the **encoder knob**.

*The Gateway IP Address menu item appears.*

**NOTE:** Once you have entered the Netmask, you may need to enter the Gateway IP Address.

16. Tap the **encoder knob**.  
*The actual Gateway IP Address appears.*
17. Enter the **first number** in the Gateway IP Address.  
*This activates the first octet of the Gateway IP Address and clears the rest of the address.*
18. Tap the **encoder knob**.  
*This confirms the first octet in the Gateway IP Address and moves you to the second octet.*

**NOTE:** Press PGM to skip over any octet that does not need modifications.

19. Repeat steps **19** and **20** until the entire Gateway is entered.
20. Tap the **encoder knob**.
21. Press and hold the **encoder knob** to exit the menu.  
*The changes are now enabled.*

**NOTE:** You can still set the IP Address without being connected to an Ethernet LAN. Once you have entered the IP information, you are prompted to perform a **Save Cfg**. The address is saved in the keypanel until the RVON-1 is connected to an Ethernet LAN.

## TOP LEVEL MENU, RVON CONN.

The RVON Conn. menu is a list of connection offers from other intercoms. This menu allows the keypanel to dynamically select an intercom and port to which it will connect.

To **select the connection offer from the top level menu**, do the following:

1. Using the encoder knob, scroll to **RVON Conn.**
2. Tap the encoder knob.  
*The currently selected connection offer appears in the CWW window. If you have not previously selected the connection, None appears.*
3. Using the encoder knob, scroll to the **connection offer** to which you want to connect.
4. Tap the **encoder knob**.  
*The connection offer begins to flash indicating it has been selected.*
5. Press and hold the **encoder knob** to exit the menu.  
*The keypanel now connects to the selected port.*

## Configure the RVON-8 using AZedit to contact the RVON-1

To configure the RVON-1 card in AZedit, do the following:

1. From the Status menu, select **I/O Cards**.  
*The I/O Card Status window appears showing the types of installed I/O Cards.*
2. Right-click an **RVON-8 card**, and then select **RVON-8 Configuration**.  
*The RVON-8 Configuration window appears.*

**NOTE:** The RVON-8 you use should be already configured. If it is not configured, refer to your RVON-8 Card User Manual.

**NOTE:** Remember, the RVON-1 has only one (1) channel that can be configured.

3. In the RVON-8 Channel drop down list, select the **channel** to communicate to the RVON-1 card across the network.
4. In the Device IP field, enter the **IP Address** for the RVON-1 card.
5. From the Device Type drop down list, select **RVON-1/Keypanel**.
6. From the Device Channel drop down list, select **Channel 1**.

**NOTE:** There may be two (2) channels listed, but the connection can only be made through channel 1.

7. From the CODEC Type drop down list, select the **CODEC type**.
8. From the Packet Size drop down list, select the **size** of each audio packet.
9. Select **Enable VAD** (Voice Activation Detection), if you want to conserve bandwidth when the audio level is below a given threshold.

**NOTE:** VAD saves network bandwidth by stopping the flow of audio packets when silence is detected. VAD is similar to VOX.

10. Once you are completely finished, click **Apply**.

## Download RVON-1 Firmware Through AZedit

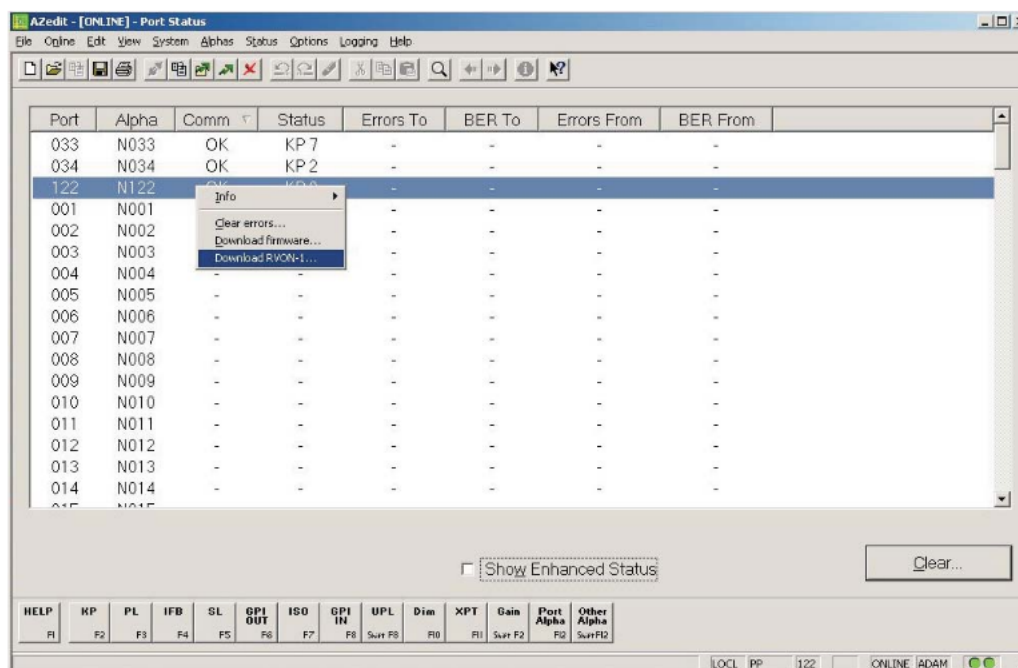
AZedit sends firmware directly to the RVON-1 card over Ethernet. This is different from other I/O cards (except the RVON-8) that receive the firmware from the Master Controller. For this reason, verify the PC running AZedit is able to contact the RVON-1 card via the network, or is configured with a Gateway IP Address that can contact the RVON card. If it is not, AZedit will not be able to find the RVON-8 card.

To **test the connection**, do the following:

- > Ping the **RVON card** from a command line window. For more information on how to test for a connection, see “Ping a Computer” on page 93.

To **download the RVON-1 firmware**, do the following:

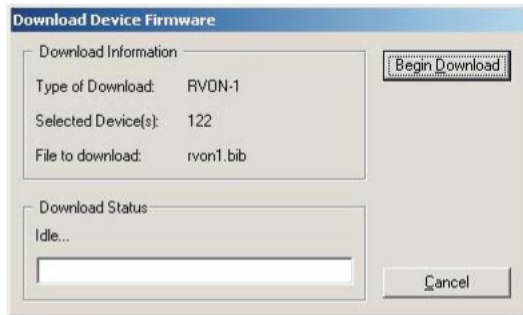
1. Open **AZedit**.
2. From the Status menu, select **Software Versions** and then **Keypanels**.  
*The Keypanel Version window appears.*



3. On the Keypanel Version window, select the **Show RVON-1 Versions** check box.
4. Right-click the **keypanel** which has the RVON-1 installed, and then select **Download RVON-1**.  
*The Download Device Firmware window appears.*
5. Using the Browse feature, browse to the **file to be downloaded**.

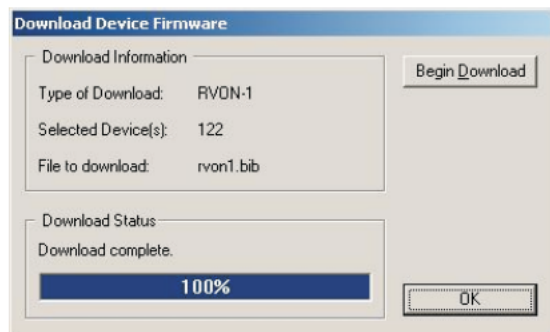
6. Click **Open**.

*The Download Device Firmware window appears.*



7. Click **Begin Download**.

*The download begins.*



8. Click **OK**.

*The RVON-1 firmware download is complete. This takes a minute or two to occur.*

---

**WARNING:** Do not power down the keypanel until you have verified the new version information from AZedit. If the card loses power while reprogramming the onboard flash memory, the card may become unbootable and may need to have its flash chips reprogrammed at the factory.

---

9. Verify the correct **version** is shown on the Keypanel Version window.

**NOTE:** You can also download the RVON-1 firmware through *Status|Ports*. You can not check the version once the download is completed from the Port Status window.

## Basic Network Configuration

This section covers basic network configuration setup and testing. Also covered, are basic concepts and operations, including the difference between LAN and WAN networks and how IP Addressing is used.

In a networked environment, such as a company, typically there are many computers connected together using a router or a switch. In larger companies, there may be several different routers distributed in buildings and plant locations. A router allows any LAN-side computer to communicate with other computers and devices outside the **LAN** (Local Area Network). Routers send data packets from one (1) place to another place on a network. Routers use network addresses to route packets to the correct destination. For example, in a TCP/IP network, the IP Address of the network interface is used to direct router destinations.

Because routers help computers inside the LAN talk with computers outside of the LAN, the security of a company's LAN may be compromised by gaps of open ports in the router. Security measures must be instituted to compensate for these vulnerabilities. Consult your network administrator to learn about the security measures taken to protect your network. **VPN** (Virtual Private Network) is one such security measure to protect the intelligence of the LAN. A computer outside the LAN must have an address or key known by the VPN to allow access to the LAN. Many companies use a VPN to connect two (2) different LANs, thus allowing the transfer of data between two (2) networks.

### LAN vs. WAN

#### Local Area Network

Simply put, a **LAN (Local Area Network)** is a computer network that connects a relatively small area (a single building or group of buildings). Most LANs connect workstations and computers to each other. Each computer (also known as a node), has its own processing unit and executes its own programs; however, it can also access data and devices anywhere on the LAN. This means many users can access and share the same information and devices. A good example of a LAN device is a network printer. Most companies cannot afford the budgetary or hardware expense of providing printers for each of its users; therefore, one (1) printer (or device) is placed on the LAN where every user can access the same printer.

The LAN uses IP Addresses to route data to different destinations on the network. An IP Address is a 32-bit numeric address consisting of four (4) numbers separated by periods (for example, 1.160.10.240).

**NOTE:** For more information on IP Addresses, see your local network administrator.

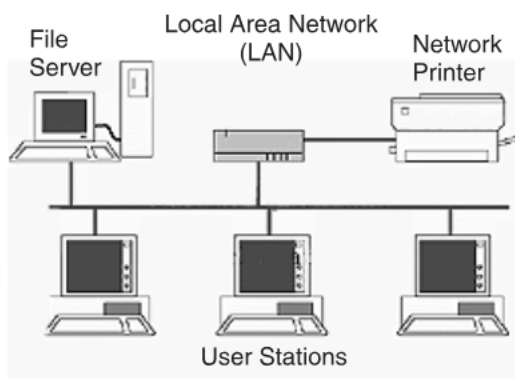


FIGURE 13. Local Area Network Diagram

## Wide Area Network

A **WAN (Wide Area Network)** connects two (2) or more LANs and can span a relatively large geographical area. For example, Bosch Headquarters in Burnsville, MN is connected to several branch offices in Nebraska and Arkansas over a WAN. The largest WAN in existence is the Internet.

### Wide Area Network (WAN)

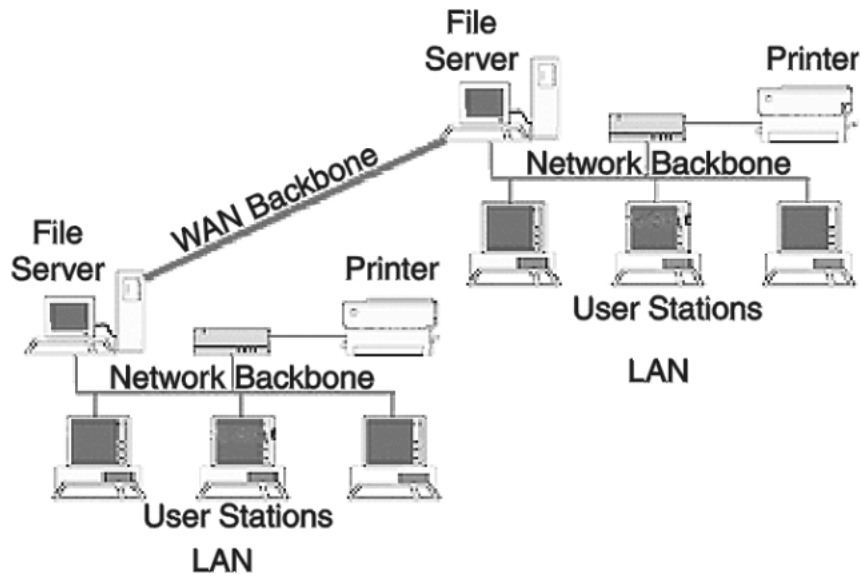
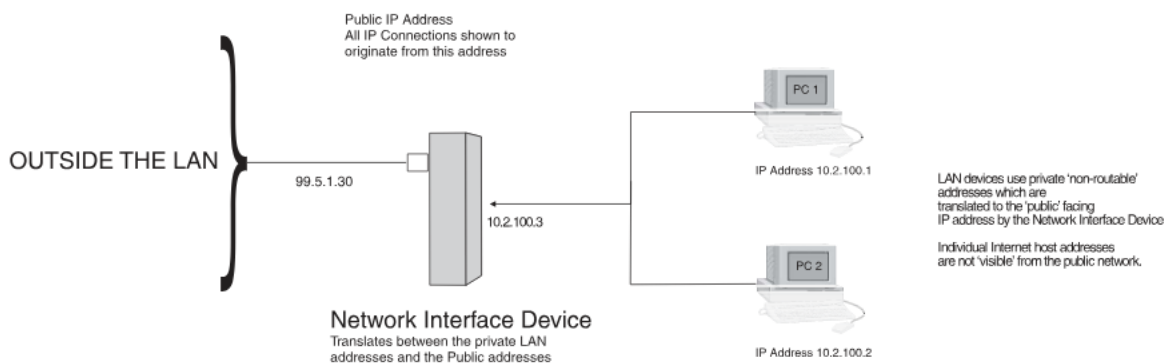


FIGURE 14. Wide Area Network Diagram

## ACCESSING THE WIDE AREA NETWORK (WAN)

Figure 15 shows LAN IP Addresses using a common IP Address, 10.2.100.X (192.168.X.X is another common address). Most devices are shipped with these addresses as their default. It is recommended to use these addresses for LANs.



Note: A Network Interface Device can be a router, switch, gateway or anything that acts as one of these devices, such as a PC.

FIGURE 15. Network Address Translation

## NETWORK ADDRESS TRANSLATION (NAT)

Using the initial IP Address, then converting it to a valid WAN IP Address is how the **Network Address Translation (NAT)** works, in theory. Once the IP Address is changed, it is up to the network interface device (such as a router, gateway, switch, etc.) to keep track of which computers are talking on which ports. For example, if two (2) local devices (PC1 and PC2 in Figure 15) both wanted to talk via port 1031, then the network interface device would have to change one (1) of the port requests to the next available port, 1032.

## PORTS

In general, a network **port** is an endpoint to a logical connection. The port number identifies what type of port it is. For example, port 80 is used for HTTP traffic. When you type an address into the address bar of a web browser, your computer goes to find an IP Address for the url you are requesting (<http://www.telex.com>). To obtain this address, the computer contacts a DNS server (Domain Name Server). Once the IP Address is found, it tries to connect to the http port of the network device (port 80). See Table 6 for a list of well-known port numbers.

Each network device can be set up to respond or not respond to the various ports. The function of responding or hosting a service is called serving.

**TABLE 4.** Packet Translation

Packet before Translation					Packet after Translation			
	Source		Destination		Source		Destination	
	IP Address	Port Number	IP Address	Port Number	IP Address	Port Number	IP Address	Port Number
To Internet	10.2.100.2	1031	192.156.136.22	80	99.5.1.30	1031	192.156.136.22	80
From Internet	192.156.136.22	80	99.5.1.30	1031	192.156.136.22	80	10.2.100.2	1031

If a second workstation on the LAN wants to communicate to the same server, and happens to use the same source port number, the LAN Modem translates the source port number as well as the source IP Address. In Table 5, a second LAN computer wants to access a web page. The NAT device now uses port 1032 for this connection where it used port 1031 in Table 4.

**TABLE 5.** Packet Translation

Packet before Translation					Packet After Translation			
	Source		Destination		Source		Destination	
	IP Address	Port Number	IP Address	Port Number	IP Address	Port Number	IP Address	Port Number
To Internet	10.2.100.1	1031	192.156.136.22	80	99.5.1.30	1032	192.156.136.22	80
From Internet	192.156.136.22	80	99.5.1.30	1032	192.156.136.22	80	10.2.100.1	1031

Amazingly, all the address translation that occurs takes place automatically in order to make web browsing and other functions easier. This is also a way for large web hosting services to speed up the network by having different devices perform different functions



TABLE 6. Well-Known TCP Port Numbers

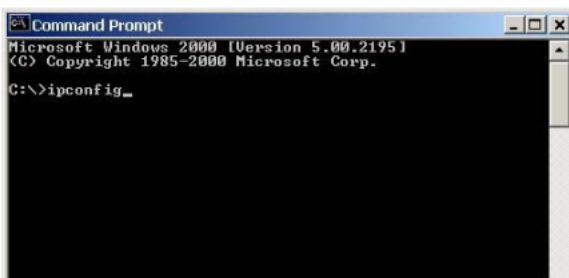
Port Number	Description	Port Number	Description
1	TCP Port Service Multiplexer (TCPMUX)	118	SQL Services
5	Remote Job Entry (RJE)	119	Newsgroup (NNTP)
7	ECHO	137	NetBIOS Name Service
18	Message Send Protocol (MSP)	139	NetBIOS Datagram Service
20	FTP-Data	143	Interim Mail Access Protocol (IMAP)
21	FTP- Control	150	NetBIOS Session Service
23	Telnet	156	SQL Server
25	Simple Mail Transfer Protocol (SMTP)	161	SNMP
29	MSG ICP	179	Border Gateway Protocol (BGP)
37	Time	190	Gateway Access Control Protocol (GACP)
42	Host Name Server (Nameserv)	194	Internet Relay Chat (IRC)
43	Whols	197	Directory Location Services (DLS)
49	Login Host Protocol (Login)	389	Lightweight Directory Access Protocol (LDAP)
53	Domain Name Server (DNS)	396	Novell Netware over IP
69	Trivial File Transfer Protocol (TFTP)	443	HTTPS
70	Gopher Service	444	Simple Network Paging Protocol (SNPP)
79	Finger	445	Microsoft-DS
80	HTTP	458	Apple Quick Time
103	X.400 Standard	546	DHCP Client
108	SNA Gateway Access Server	547	DHCP Server
109	POP2	563	SNEWS
110	POP3	569	MSN
115	Simple File Transfer Protocol	1080	Socks

## IP ADDRESSES

If you do not know your IP Address, you can open a DOS window in a Windows-based environment and enter the ipconfig command.

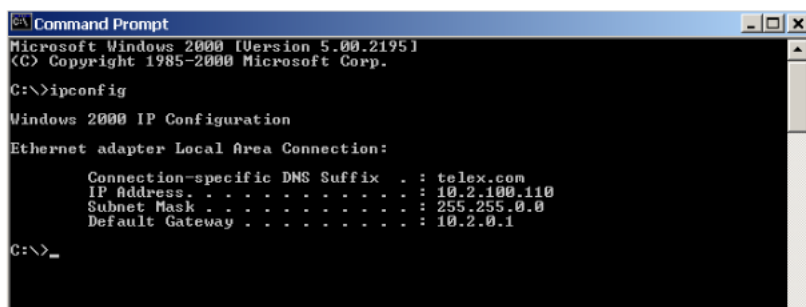
To **find your IP Address using ipconfig**, do the following:

1. From the Start Menu, open a **Command Prompt** window.





- At the prompt, type **ipconfig**, then press **Enter**.  
*The IP configurations for your machine, such as the DNS suffix, IP Address, Subnet Mask, and Default Gateway appears.*



```
Command Prompt
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.

C:\>ipconfig

Windows 2000 IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : telex.com
    IP Address. . . . . : 10.2.100.110
    Subnet Mask . . . . . : 255.255.0.0
    Default Gateway . . . . . : 10.2.0.1

C:\>_
```

- At the prompt, type **Exit** to close the window.

**NOTE:** If you want more detailed parameters for your machine, type **ipconfig/All**. This window displays the computers network configuration settings.

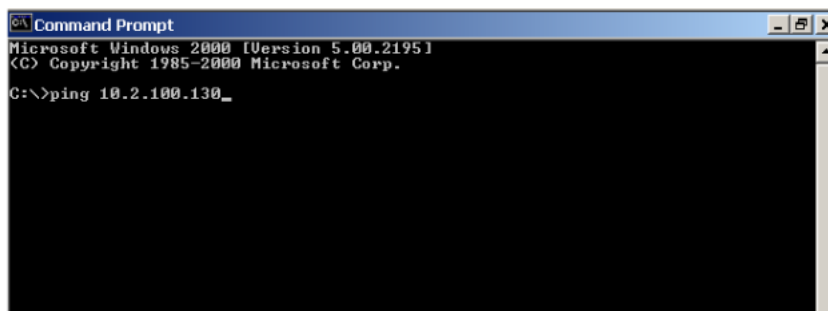
## Ping a Computer

Pinging a computer on the network makes sure it is connected and able to receive messages from the network.

**NOTE:** You can also ping your RVON-8 card to verify it is responding over the network by putting the cards IP Address in place of the computer IP Address.

To **ping a computer on the network**, do the following:

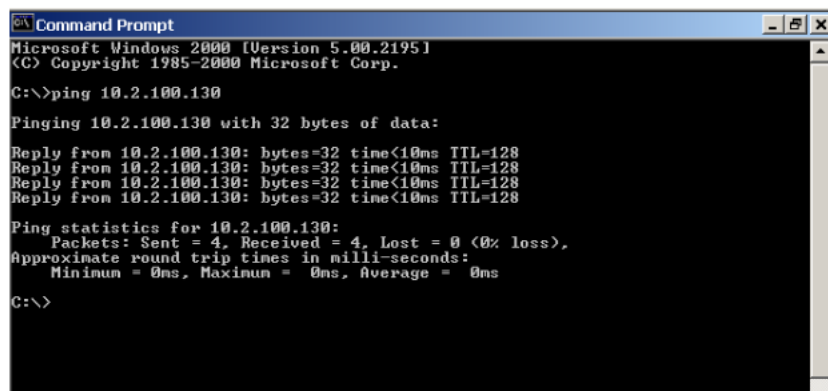
- From the Start menu, select **Run....**
- At the Run command, type **CMD** to open a **Command Prompt** window.



```
Command Prompt
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.

C:\>ping 10.2.100.130_
```

- At the prompt, type the **IP Address** of the computer you want to ping (for example, 10.2.100.130).
- Press **Enter**.



```
Command Prompt
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.

C:\>ping 10.2.100.130

Pinging 10.2.100.130 with 32 bytes of data:

Reply from 10.2.100.130: bytes=32 time<10ms TTL=128
Reply from 10.2.100.130: bytes=32 time<10ms TTL=128
Reply from 10.2.100.130: bytes=32 time<10ms TTL=128
Reply from 10.2.100.130: bytes=32 time<10ms TTL=128

Ping statistics for 10.2.100.130:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

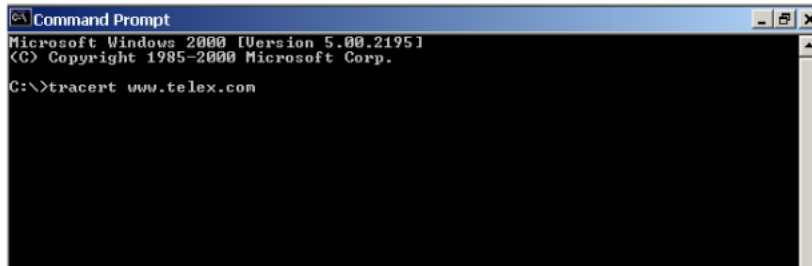
C:\>
```

## POSSIBLE PITFALL WITH ROUTERS, GATEWAYS, AND SWITCHES

Anytime computers communicate through routers, gateways, and switches, they may be allowed or denied the connection. Network interface devices can be configured to block specific outgoing requests, as well as incoming requests, based on the IP Address and/or port. This is one (1) of the security mechanisms of a router. This also happens when broadcast messages are sent and received.

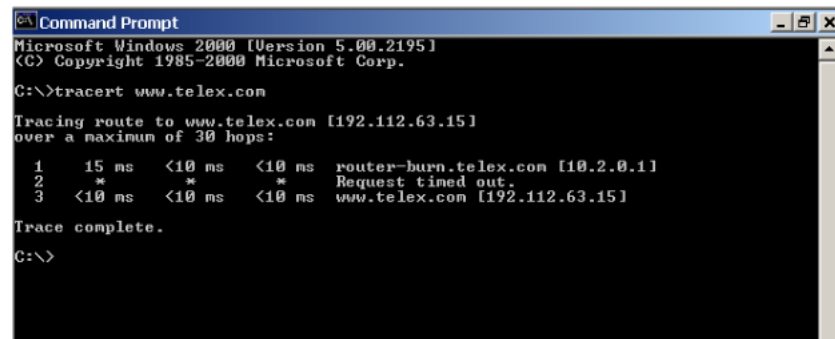
To view the path an IP Address takes to retrieve information, do the following:

1. From the Start Menu, open a **Command Prompt** window.
2. At the prompt, type **tracert** and type the **URL or IP Address** you want to trace.



```
Command Prompt
Microsoft Windows [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.
C:\>tracert www.telex.com
```

3. Press **Enter**.  
*The details of the tracer route are displayed.*



```
Command Prompt
Microsoft Windows [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.
C:\>tracert www.telex.com

Tracing route to www.telex.com [192.112.63.15]
over a maximum of 30 hops:
  0  15 ms  <10 ms  <10 ms  router-burn.telex.com [10.2.0.1]
  1  *      *      *      Request timed out.
  2  <10 ms  <10 ms  <10 ms  www.telex.com [192.112.63.15]

Trace complete.
C:\>
```

**NOTE:** The message request timed out appears if the IP Address/port in or out is denied to the incoming or outgoing message.

4. When you are finished, type **exit** to close the Command Prompt window.

## RVON Configuration

RVON cards use ports for communication of audio and control packets. Because routers can be configured to block certain incoming and outgoing requests, you need to open the following ports in your network to allow WAN connections to and from a Network Interface Device. See Table 7 for the ports that need to be opened for the RVON cards to operate properly.

**TABLE 7.** Ports necessary for RVON card functionality.

Port	Port Description
2076	UDP Call Control Signalling
2077	UDP Audio Packets
2079	UDP Telex Proprietary Signalling
2080	TCP Telex Keypanel Protocol
2081	UDP Pass Through Serial
2082	TCP Firmware Download
2100	Remote Administration
2102	Authentication Server

Below, is an example of a router configuration window. Not all routers are configured the same way and may not look exactly like this window.

**LINKSYS®**

Filters **Forwarding** Dynamic Routing Static Routing DMZ Host MAC Addr. Clone Setup

**PORT RANGE FORWARDING**

Port forwarding can be used to set up public services on your network. When users from the Internet make certain requests on your router, they will be redirected to the specified IP.

Customized Applications	Ext.Port	Protocol TCP	Protocol UDP	IP Address	Enable
RVON VOIP	2077 To 2077	<input type="checkbox"/>	<input checked="" type="checkbox"/>	10.2.210.0	<input checked="" type="checkbox"/>
	0 To 0	<input type="checkbox"/>	<input type="checkbox"/>	10.2.210.0	<input type="checkbox"/>
	0 To 0	<input type="checkbox"/>	<input type="checkbox"/>	10.2.210.0	<input type="checkbox"/>
	0 To 0	<input type="checkbox"/>	<input type="checkbox"/>	10.2.210.0	<input type="checkbox"/>
	0 To 0	<input type="checkbox"/>	<input type="checkbox"/>	10.2.210.0	<input type="checkbox"/>
	0 To 0	<input type="checkbox"/>	<input type="checkbox"/>	10.2.210.0	<input type="checkbox"/>
	0 To 0	<input type="checkbox"/>	<input type="checkbox"/>	10.2.210.0	<input type="checkbox"/>
	0 To 0	<input type="checkbox"/>	<input type="checkbox"/>	10.2.210.0	<input type="checkbox"/>
	0 To 0	<input type="checkbox"/>	<input type="checkbox"/>	10.2.210.0	<input type="checkbox"/>
	0 To 0	<input type="checkbox"/>	<input type="checkbox"/>	10.2.210.0	<input type="checkbox"/>
	0 To 0	<input type="checkbox"/>	<input type="checkbox"/>	10.2.210.0	<input type="checkbox"/>

UPnP Forwarding Port Triggering

Apply Cancel

**Figure 8.** Router Configuration Window

**NOTE:** Linksys supports up to 253 nodes on a router. This is why it is called a Router/Switch because there are WAN functions like a router as well as having a 4-port LAN switch. It also does not support simultaneous forward and DHCP.

---

## *RVON Serial and Telnet Commands*

RVON card programming can be done via direct serial or Telnet connection. There are several physical connections to an RVON board:

- Direct serial through custom debug cable (J20 6-pin bottom front)  
The customer debug cable always functions as the general purpose debug tool.
- DB-9 Backcard J2  
The backcard DB-9 must be disabled/enabled via a DIP Switch because it can also be used for serial port pass-through. The DB-9 backcard can be used for a debug terminal when DIP switch 6 is switched to the on position.
- RJ-45 Backcard J1 (Telnet Only)

### Setup

Serial Port	38,4000 baud, No-flow control
Telnet	IP Address, port 23

---

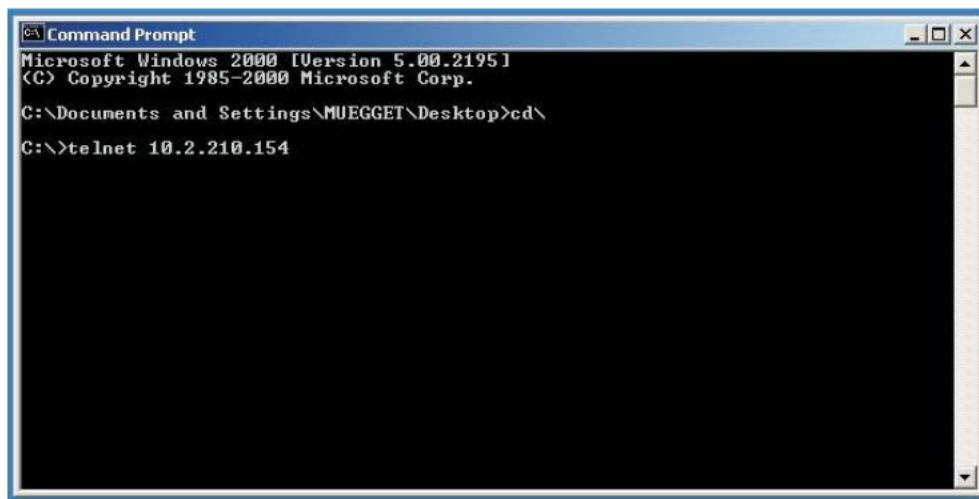
## *How to Configure the RVON-1 Using Telnet*

Regardless whether or not you have access to the physical KP 612/412 with RVON-1 installed on it, you can still configure the card through the use of Telnet. The following instructions describe how to access the Telnet window and show you some of the information you can see and edit.

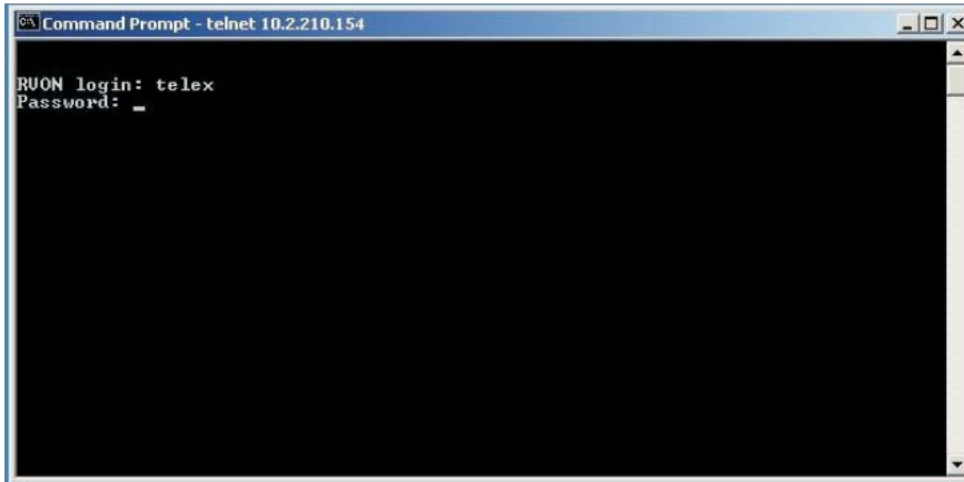
**NOTE:** These instructions are to help you get to the Telnet windows and give you an overview of what can be done. This is not an all inclusive document. Not every action that can be performed are contained within this document.

To display the settings for the RVON-1 Card, do the following:

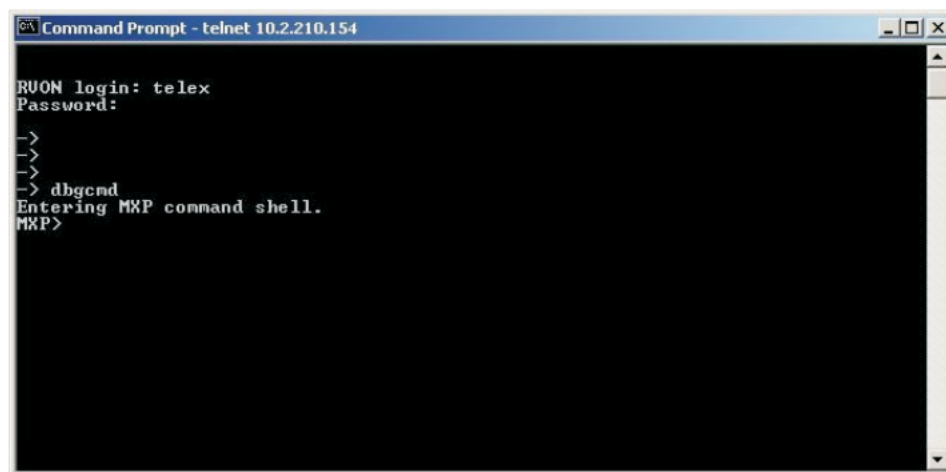
1. From the Start menu, open a **command prompt** (Start|Programs|Accessories).
2. At the prompt, type **Telnet <IP Address>** (where IP Address is the IP Address assigned to the RVON-1 card).



3. Press **Enter**.  
*The RVON logon option appears.*



4. In the logon field, type the **RVON logon** (default = telex).
5. Press **Enter**.
6. In the password field, type the **RVON password** (default = password).
7. Press **Enter**.  
*A prompt appears.*
8. Type **dbgcmd** to access the debug command windows.



9. Press **Enter**.  
*An MXP prompt appears.*
10. At the prompt, type **Show**.

11. Press **Enter**.

*The show commands options and MXP prompt appears.*

```

Command Prompt - telnet 10.2.210.154
Password:
>
>
> dbgcmd
Entering MXP command shell.
MXP>show
Show Commands:
show rvon
show channel
show emac
show version
show coding      [prof_id]
show tcid        [tcid]
show tstat       [tcid] [clear]
show upstat      [tcid] [clear]
show rxtxstat    [tcid] [clear]
show errstat     [tcid] [clear]
show call_record [tcid]
show tlevels     [tcid]
show gains       [tcid]
show dsp_version [dsp]
OK
MXP>

```

12. At the MXP prompt, type the **show command** from the list you want to see (for example, “show rvon”).

13. Press **Enter**.

*The values for the RVON-1 card appear.*

To edit the RVON-1 configuration, do the following:

1. Repeat **steps 1 through 9** from “How to Configure the RVON-1 Using Telnet” on page 96.
2. At the MXP prompt, type either **set RVON** or **set EMAC**.
3. Press **Enter**.

```

MXP>set rvon
RVON CARD RELATED:
set rvon ip_addr <ip address <x.x.x.x>>
set rvon netmask <netmask <x.x.x.x>>
set rvon gateway <default gateway <x.x.x.x>>

set rvon serial_ip <ip address <x.x.x.x>>
set rvon serial_baud <baud rate <50-38400>>

set rvon user <username>
set rvon password <password <8-40 characters>>

set rvon vad_threshold <adaptive!value -- In dBm <-20 to 10>>

```

set rvon ip_addr	Allows you to edit the IP Address
set rvon netmask	Allows you to edit the Netmask
set rvon gateway	Allows you to edit the Gateway
set rvon serial_ip	Allows you to edit the serial IP Address
set rvon serial_baud	Allows you to set the baud rate (50–38400)
set rvon user	Allows you to set the username for the RVON-1 card. By default the user name is “telex”
set rvon password	Allows you to set the password for the RVON-1 card. By default, the password is “password”
set rvon vad_threshold	Allows you set the vad threshold.

**NOTE:** In AZedit, you can enable and disable VAD, however, through Telnet you are able to set the amount. You are able to set the VAD threshold in later versions of AZedit.

```

MKP>set channel
RUON CHANNEL RELATED:
set channel [chan] dest_ip <ip address <x.x.x.x>>
set channel [chan] dest_type <type <0-2>, 0=RVON-8, 1=RVON-1, 2=RVON-10>
set channel [chan] dest_chan <chan <0-7>>
set channel [chan] chan_codec <prof_id <0 to <max_prof - 1>>>

set channel [chan] input_gain <gain <-14 to +14 dB>>
set channel [chan] output_gain <gain <-14 to +14 dB>>

set channel [chan] onhook
set channel [chan] offhook

```

set channel dest_ip	Allows you edit the destination IP Address the RVON-1 card communicates with
set channel dest_type	Allows you to edit the destination type for the device the RVON-1 card talks with
set channel dest_channel	Allows you to edit the destination channel of the device the RVON-1 talks with
set channel channel_codec	Allows you to edit the Codec to be used for transferring the data between the two (2) devices
set channel input_gain	Allows you to edit the input gain for the RVON-1 card
set channel output_gain	Allows you to edit the output gain for the RVON-1 card
set the channel onhook	onhook = hang up If the channel was already connected, going offhook has no effect (it is already offhook if connected). Going onhook hangs up the call, and it should then try to reconnect. If the channel was not already connected, going offhook causes it to try and establish a connection. Going onhook in this stat has no effect (it is already onhook if idle).
set channel offhook	offhook = connected If the channel was already connected, going offhook has no effect (it is already offhook if connected). Going onhook hangs up the call, and it should then try to reconnect. If the channel was not already connected, going offhook causes it to try and establish a connection. Going onhook in this state has no effect (it is already onhook).

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