

1.0 PRODUCT DESCRIPTION

The RF Intercom Console (RI-C) is a five-channel intercom unit, which allows half-duplex conversation over either a 467.6875 MHz or a 467.5625 FM signal. Key features include:

- 1024 random house codes (programmable) to reduce interference from units in other systems (transparent to the user).
- 5 station codes (programmable).
- 5 push-button switches to select the receiving station.
- 5 Channel LED's to indicate called/calling location. A fast flashing LED indicates that the corresponding station is in use. A slow flashing LED indicates that call is in progress and the unit is receiving a call.
- A Press-to-Talk button.
- An All Call button to select all units in the system.
- A Call Lockout switch to inhibit All Call and DoorBell.
- Power on LED.
- Digital Calling to activate the unit only when the house and station codes match.
- Tone squelch.
- On/Off switch.
- Internal speaker & microphone.
- External antenna.
- Speaker volume control.
- AC wall mount transformer.

2.0 HARDWARE/SOFTWARE SPECIFICATIONS

2.1 MECHANICAL

All electronics shall be contained in a plastic enclosure with the dimensions 7.5 x 5.5 x 1.4 inches. The body and button colors shall be gray.

2.2 ELECTRICAL

2.2.1 DC CHARACTERISTICS

Input Power: 9VDC supplied by the AC Wall Mount Transformer

Input Current: 100 mA

2.2.2 AC CHARACTERISTICS

System Frequency:	467.6875 MHz or 467.5625 MHz
Modulation Type:	FM
Receiver Sensitivity:	-100 dBm minimum
Transmitter Power Output:	100 mW nominal

2.3 REGULATORY AGENCIES

The unit shall comply with FCC part 95 regulations.

2.4 ENVIRONMENTAL

Temperature:

0 to +50°C (Indoor Applications)

2.5 USER INTERFACE

2.5.1 SELECT CALL BUTTONS

Five Select Call buttons allow selection of individual remote units. Pressing the button again will de-select the remote unit. The remote unit is also de-selected if:

- The Press-to-Talk button is not pressed within 20 seconds of the call selection.
- The Press-to-Talk button is not pressed within 20 seconds of the loss of incoming RF.
- Correct incoming code is not detected within 20 seconds of the release of the Press-to-Talk button.

2.5.2 PRESS-TO-TALK BUTTON

After selecting the remote unit using the Select Call buttons, the user may press the Press-to-Talk button to initiate RF data and voice transmission. At the press of the button, with the microphone disabled, the unit first sends out the house code, the Transmitting Station's code, and the Receiving Station(s) code. Then the unit enables the microphone and allows the user to transmit voice over RF. When the button is released, the unit disables voice transmission and sends out an 83.3Hz tone to tell the receiving station to shut off its speaker. After a 0.25 second delay, the unit then goes into a receive mode and waits for a response.

The Press-to-Talk button is also used to program the house address (refer to the programming section 3.0).

2.5.3 ALL CALL BUTTON

An All Call button may be pressed to select all units with the same house address. When the Press-to-Talk button is pressed, all units will enable their speakers. If all stations have been selected, press of the All Call button will de-select all stations.

The All Call button is also used to program the house address (refer to the programming section 3.0).

2.5.4 ALL CALL LOCKOUT SWITCH

The All Call Lockout Switch is used to keep the speaker off during an All Call or when the doorbell is activated.

2.5.5 CHANNEL FREQUENCY SELECT SWITCH

To reduce interference from non-system RF transmitters, the channel frequency may be switched between 467.6875 MHz and 467.5625 MHz, via a slide switch.

2.5.6 LED INDICATORS

Five LED indicators are used to indicate called/calling locations. A blinking LED indicates that the corresponding location is in use.

2.5.7 POWER ON LED

A green LED is used to indicate that the power is on.

2.5.8 VOLUME CONTROL POTENTIOMETER

A potentiometer is used to control the speaker volume.

2.5.9 ON/OFF SWITCH

The on/off switch is integrated with the volume control potentiometer.

2.5.10 POWER INPUT

The power to the unit is supplied via a wall mount transformer.

2.6 MICROCONTROLLER

All programming and control functions are performed via a microcontroller on-board.

2.7 RF TRANSMITTER

The RF Transmitter Circuitry transmits FM data and audio over either a 467.6875 MHz or a 467.5625 MHz carrier signal. The Transmitter is disabled when its supply is shut off by the microcontroller.

2.8 RF RECEIVER

The RF Receiver Circuitry receives FM signals and converts them to audio and data that is usable by the microcontroller.

2.9 MICROPHONE

An internal microphone, which is enabled or disabled by the microcontroller, is used for audio input.

2.10 SPEAKER

An internal speaker, which is enabled or disabled by the microcontroller, is used for audio output.

2.11 SQUELCH

To reduce the noise that is generated on the speaker when the Press-to-Talk button is released on the transmitting unit, the transmitter sends out an 83.3Hz tone to the receiver before it shuts off RF. The receiver disables its speaker before RF goes away. If the tone is corrupted for some reason, a squelch signal that is generated by the RF Receiver is sent to the microcontroller.

2.12 CALLING STATION DATA FORMAT

The transmitting station sends out a coded signal to select the appropriate receiver when the Press-to-Talk is initially pressed. The total word length is approximately 96ms.

3.0 PROGRAMMING

At the factory, a 10 bit, sequentially selected, house code will be programmed into the units. This code will be transparent to the customer. Also, the unit number will be "1". Since each unit in a system may have a different house code, the house code must be re-programmed by the user. In order to do so, one unit must become the master unit and the rest of the units in the system will be slaves. The master unit must teach the house code to the units in the system. When the units are programmed, the factory code in the master will be programmed into the slaves.

The programming mode shall be invoked by pressing and holding the Press-to-Talk and All Call buttons upon power up. All LED's will flash to indicate that the unit is in this mode. The unit will then wait for the release of the buttons and subsequently turns off all LED's. The unit will then be in the learn mode (slave). The user must then select one of the units to be the master to teach the house code to the slaves. This is done by pressing the Press-to-Talk button on the selected master unit. Upon pressing the Press-to-Talk button on the master unit, the house code will be sent out to the slaves. Before turning the power off, a station number must be selected by pressing one of the Call Select switches. If none is selected before power down, the unit number will remain unchanged. To exit the programming mode, the unit must be turned off.

If the user decides to add another unit to the system, one of the programmed units must be used as the master and the new unit as the slave.

If the user is having interference from adjacent systems, he may change the house code by pressing the All Call button, once the programming mode is invoked. The house code will be incremented once. The house code may be changed on a master unit and then transmitted to the rest of the system. The house code may also be changed on individual units in slave mode.

To further reduce interference from adjacent systems, the user may change the Channel frequency by toggling the Channel Frequency Select switch.

4.0 TRANSMITTER ALIGNMENT / MICROPHONE TEST

To align the transmitter, a 500Hz signal shall be transmitted from the unit. The microphone may be turned on/off via the All-Call Lockout switch. The RF frequency may be selected via the Frequency Select Switch.

4.1 RECEIVER ALIGNMENT / SPEAKER / SQUELCH TEST

The unit shall be in the receive mode to align the receiver section. The speaker shall be turned off if RF is not detected. The transmitter may be activated by pressing the TALK pushbutton. This mode allows the unit to be used as a squelch operated receiver (No digital codes.).