TAPCO
Safe travels.

BLINKERBEAM™ RADIO OPERATION GUIDE

FOR SYSTEMS EMPLOYING:
STANDARD AND LOW POWER RADIOS

UG_18054391

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

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

NOTICE

Standard and Low Power radios cannot be used in the same network

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This device complies with Industry Canada license-exempt RSS standard(s).

Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation of the device.

Le present appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisee aux deux conditions suivantes:

l'appareil ne doit pas produire de brouillage, et

l'utilisateur de l'appareil doit accepter tout brouillage radioelectrique subi, meme si le brouillage est susceptible d'en compromettre le fonctionnement

To satisfy ISED Canada RF exposure requirements, Radio must be used at a distance of greater than 20cm from the user, with the following exceptions:

Radio requires a minimum separation distance of 24cm when used with the Yagi antenna

Radio requires a minimum separation distance of 22cm when used with the Whip dipole antenna

Table Of Contents

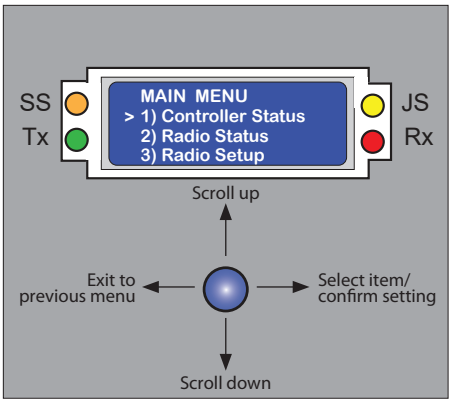


Figure 1

Note: Figures are for representation purposes only. Some details may vary among systems.

USER INTERFACE

The **LCD screen** displays menus, tables, and settings. Three icons have different meanings while navigating menus and selecting values. If a menu has a different meaning for an icon, the difference is explained in the section about that menu.

Icon	Meaning
>	Selected setting/value
->	Selected and saved setting/value
*	Saved setting/value

Use the **joystick** to navigate the menus and adjust menu settings.

- Scroll up (↑)
- Scroll down (↓)
- Exit to Previous Menu (←)
- Select Item/Confirm Setting (→)

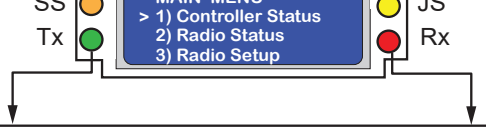
LEDs provide status and diagnostic information for both the radio and the network.

- During system startup, the orange, green, and red LEDs flash in an alternating sequence.
- LED indications may be different if the radio is in Transmitter (TX) or Receiver (RX) mode.

Transmitter (TX) and Receiver (RX) Mode

Orange LED
Rapid Flash: Active Network Survey
Single Flash: Passive Network Survey

Yellow LED
Single Flash: Joystick Active
OFF: Joystick Not Active



Transmitter (TX) Mode

Green LED
Single Flash: Transmitter Active, Normal Operation
Rapid Flash: Network Active

Red LED
Rapid Flash: Network Active
Flash: One (or More) Receiver(s) in Network
OFF: No Receiver in Network

Receiver (RX) Mode

Green LED
Rapid Flash: Network Active
Slow Flash: Communicates through another Network Receiver
OFF: Receiver not in Network

Red LED
Rapid Flash: Network Active
Single Flash: Receiver in Network
Double Flash: Receiver not in Network

Figure 2

Figure 3

Figure 4

MAIN MENU

The **MAIN MENU** screen is the home screen – it appears when power is applied to the unit and is the top-level menu. See Figures 3-4. There are several options available from the **MAIN MENU**:

- Quick Setup
- Controller Status
- Radio Status
- Radio Setup
- Legacy Control
- Site Survey
- Chevron
- Sensor Control

Notes:

- The Chevron submenu is only available on select radios. Refer to the Chevron Installation Guides for more information.
- The Sensor Control submenu is only available on select low power radios. Refer to the IR Bollard Guide for more information.

NOTICE

Always return to the **MAIN MENU** screen before you leave the site.

Note: Only one radio can be set as the Transmitter. The cabinet located in the most central point within a group of cabinets is typically the best system to set as the Transmitter.

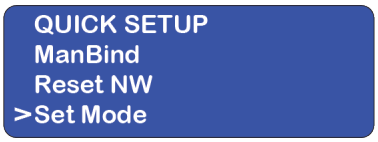


Figure 5

Figure 6

QUICK SETUP

1. To access Quick Setup, push the joystick in any direction to access the radio's MAIN MENU on the display, and use the joystick to scroll to and select **0) Quick Setup**.
2. Set mode. See Figure 5.
   - Select transmitter or receiver. See Figure 6.
   - For more information, see "Set The Operation Mode".

NOTICE

- Close proximity of some antennas can cause interference.
- If another TAPCO system is located within a 1 mile radius (or 40 miles if it has an Omni or a Yagi antenna) of this system, ensure **each system** uses its own Hop Channel and binding code by selecting a different QBind# or by manually binding with a different number code.
- A radio must have the same binding code and hop channel as every other radio in the network.
- Only one radio can be set as the Transmitter.

Figure 7

3. Set QBind1 or another QBind number in the QUICK SETUP menu. See Figure 7.
   - QBind uses preset binding codes (i.e., QBind1=01111111 or Qbind2=02222222). The QBind also changes the hop channel to the associated number (QBind1 sets the hop channel to 1, and QBind2 sets the hop channel to 2.).
   - After the BINDING SAVING indication displays, The QBind option on the QUICK SETUP menu should now have an arrow on the right side of it.
   - For more information, see "Set Bind Codes" and "Set Hop Channel Menu".

Figure 8

4. If one needs to manually set a bind code, use the joystick to scroll down to and select **ManBind** in the QUICK SETUP menu. See Figure 8.
   - Select the coding digits.

Notes:

- The digits on the display begin at the seventh digit and decrease to the right.

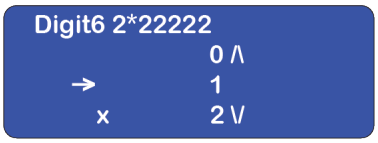


Figure 9

Figure 10

Notes (continued):

- The digit currently selected to be altered will have an X to the left of it, and the highlighted number will have an arrow.
  - Use the joystick's right and left controls to navigate to the digit to be altered.
  - Use the joystick's up and down controls to scroll to the digit's replacement. See Figure 9.
  - Push the joystick to the right to select the replacement.
    - The asterisk should have advanced to the next digit.
  - If additional digits need to be replaced, repeat the previous three substeps.
  - If the new numbered code is ready to be saved, press the joystick repeatedly to the right until the asterisk goes beyond the first digit and the BINDING SAVING indication displays.
    - The display will then return to the QUICK SETUP menu.

- Ensure the hop channel is set to match the network.
- **MAIN MENU > RADIO SETUP > Set Hop Channel**.

5. Set **ResetNW**. See Figure 10.
   - After LEDs and a blank display flash, the MAIN MENU should return.
     - Wait up to ten minutes for the radio network to activate.
   - For more information, see "Reboot All Radios in the Network".

Figure 11

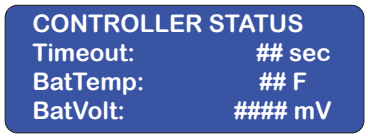


Figure 12

Figure 13

Figure 14

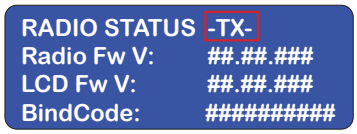


Figure 15

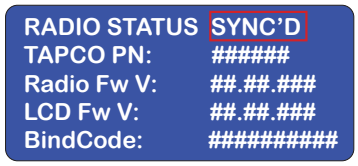


Figure 16

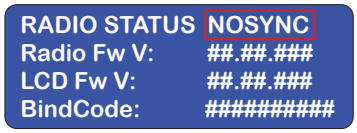


Figure 17

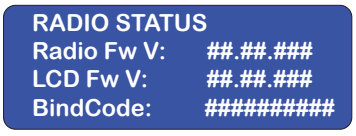


Figure 18

Figure 19

CONTROLLER STATUS MENU

To access the **CONTROLLER STATUS** menu, select **MAIN MENU>Controller Status**. See Figure 11.

The **CONTROLLER STATUS** menu displays the device settings but does not allow adjustments to the settings (See Figures 12-13):

- **Timeout:** Length of time an activated device stays ON until it turns itself OFF, ending a signal operation cycle
- **BatTemp:** Battery Temperature (°F)
- **BatVolt:** Battery Voltage (mV)
- **SolVolt:** Solar Voltage (mV)
- **SolCurr:** Solar Current (mA)
- **Serial:** 10-digits representing the serial number of the built-in Intelligent Warning System (IWS) controller

Radio Status Menu

To access the **RADIO STATUS** menu, select **MAIN MENU**>**Radio Status**. See Figure 14.

RADIO STATUS: To the right of the title is an indicator of the radio's network status.

- **-TX-:** This radio is a transmitter. See Figure 15.
- **SYNC'D:** This radio is a receiver, and the binding code and hop frequency have been recognized in the network. See Figure 16.
- **NOSYNC:** This radio is a receiver, but it has no network connection. See Figure 17.

TAPCO PN: Identifies the TAPCO radio part number

Radio Fw V identifies the Firmware Version. See Figure 18.

LCD Fw Ver identifies the LCD display board Firmware. See Figure 18.

Bind Code identifies the 8-digit code that matches all other radios in the network. See Figure 18.

NOTICE

A radio must have the same **BindCode** (Binding Code) and **Hop Seq.** (Hop Channel) as every other radio in the network.

Note: If this radio's **BindCode** does not match the **BindCode** of the other radios in the network, see **Set Binding Code** in the **Radio Setup** menu or **Quick Setup** menu.

NetCnt/Size: NetCnt (Network Count) shows all radios in the network. **Size** is the maximum number of radios in a network, which is 16. See Figure 19.

Radio Fw PN identifies the Firmware Part Number. See Figure 19.

Hop Seq. (Frequency Hopping Channel) selects which frequency hopping pattern is used by the network. See Figure 19.

Figure 20

Figure 21

Figure 22

Figure 23

Figure 24

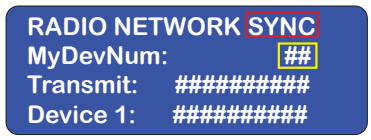


Figure 25

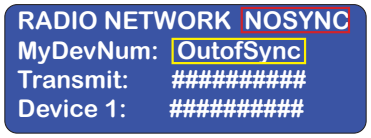


Figure 26

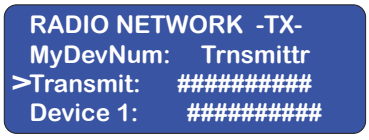


Figure 27

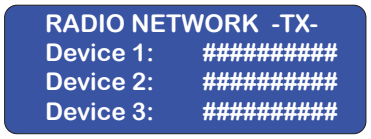


Figure 28

Figure 29

Note: If this radio's **Hop Seq. (Hop Channel)** does not match the **Hop Seq. (Hop Channel)** of the other radios in the network, see Set Hop Channel in the **Radio Setup Menu**.

Model identifies the TAPCO radio model. See Figure 20.

FCC ID is the regulatory number assigned to BlinkerBeam® radios by the FCC.

IC is the regulatory number assigned to BlinkerBeam® radios by the IC.

See Network Table provides additional information on the radio network. See Figure 21.

Network Table / Radio Network Menu

To access the **RADIO NETWORK** menu, select **MAIN MENU** > **Radio Status > See Network Table**. See Figures 22 and 23.

RADIO NETWORK: To the right of the title is an indicator of the radio's network status.

- **-TX-:** This radio is a transmitter. See Figure 24

NOTICE

A second transmitter makes the network non-functional. There can only be one transmitter in a network.

- **SYNC:** This radio is a receiver, and the binding code and hop frequency have been recognized in the network. See Figure 25.
- **NOSYNC:** This radio is a receiver, but it has no network connection. See Figure 26.

MyDevNum: This field indicates the radio's network role and status:

- **Trnsmittr:** This radio is a transmitter. See Figure 27.
- **##:** This radio is a receiver that is part of the network with a transmitter. The number may be any number in the range 1-15. Scroll through the entire list to view all networked radios. See Figure 26.
- **OutofSync:** This radio is a receiver, but it is not part of a network. See Figure 26.

Transmit shows the 10-digit serial number of the transmitter. See Figure 27.

Device Numbers are 10-digit serial numbers of each receiver in the network. See Figures 28 and 29.

Notes:

- To find the 10-digit serial number for a particular radio, see the **Controller Status** menu.
- If each digit of a device number is 0, then no device is in that network slot.

Figure 30

Figure 31

Figure 32

Figure 33

Figure 34

RADIO SETUP MENU

NOTICE

A radio must have the same **BindCode** (Binding Code) and **Hop Seq.** (Hop Channel) as every other radio in the network.

To access the **RADIO SETUP** menu, select **MAIN MENU** > **Radio Setup**. See Figure 30.

Binding Codes

NOTICE

Always verify binding code in the transmitter radio, no matter what is recorded elsewhere. Check the Radio Status menu for the radio's **BindCode** (binding code) setting.

To access the binding codes, select **MAIN MENU > RADIO SETUP > Set Binding Code**. See Figures 30 and 31.

Binding codes are read from left to right, but they are numbered from right to left. In the example shown in the table, Digit 1 is at far right. See Figure 32 through Figure 34.

Digit	Digit 7	Digit 6	Digit 5	Digit 4	Digit 3	Digit 2	Digit 1
Value	0	2	0	4	4	6	2

Note: The complete binding code is always eight digits, but only seven digits can be assigned. Digit 8 is locked with a value of 0.

Note: If this radio's **BindCode** does not match the **BindCode** of the other radios in the network, *see Set Binding Code Values for a Replacement Radio* in the **Radio Setup** Menu.

Note: On the **BINDING CONFIG** screens, the selection item is indicated by ***** instead of **>**.

Set Binding Code Values for a Replacement Radio

The user must configure the new radio to use the same binding code. In this example, the existing network uses binding code **00204462**.

Digit	Digit 7	Digit 6	Digit 5	Digit 4	Digit 3	Digit 2	Digit 1
Value	0	2	0	4	4	6	2

NOTICE

If another TAPCO system is located within a 1 mile radius (or 40 miles if it has an Omni or a Yagi antenna) of this system, ensure each system uses its own unique binding code.

Figure 35

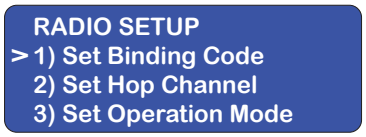


Figure 36

Figure 37

Figure 38

Figure 39

Figure 40

Figure 42

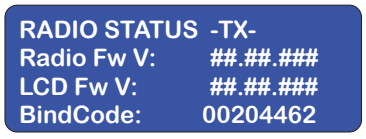


Figure 43

Figure 44

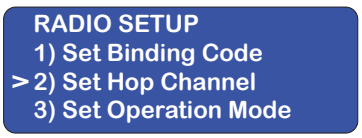


Figure 45

Setting the Binding Code:

1. Select **MAIN MENU > RADIO SETUP > Set Binding Code**. See Figures 35 and 36.
2. From **BINDING CONFIG** select **Digit 7**. See Figure 37.
3. Scroll to the correct **BINDING DIGIT 7** value (0) and select it. See Figure 38.

Icon	Meaning
X	Current saved value
- ->	Selected value

4. Confirm the digit value (0) by selecting the value again.
5. Exit to the **BINDING CONFIG** menu.
6. Scroll to **Digit 6** and select. See Figure 39.
7. Scroll to the correct **BINDING DIGIT 6** value (2) and select it. See Figure 40.
8. Confirm the digit value by selecting it twice.
9. Repeat Steps 3-7 for digits 5-1.
10. When all values are correctly set, select and apply ***SendCode**. See Figure 41.

    The **BINDING CODE** is saved. See Figure 42.

NOTICE

If ***SendCode** is not selected and applied, work could be lost. Select and apply ***SendCode** to save changes.

Note: The complete binding code is always eight digits but only seven digits can be assigned. Digit 8 is locked with a value of 0.

11. Verify that the **BindCode** is correct in the **RADIO STATUS** menu. See Figure 43.

Set Hop Channel Menu

NOTICE

A radio must have the same **BindCode** (Binding Code) and **Hop Seq.** (Hop Channel) as every other radio in the network.

To access the Set Hop Channel Menu, select **MAIN MENU > RADIO SETUP > Set Hop Channel**. See Figures 44 and 45.

Frequency-hopping spread-spectrum transmission is a continuous switching of radio frequencies that reduces interference and avoids signal interception. The firmware settings controlling this type of transmission are **Hop Channels**.

NOTICE

If two radio networks are less than a mile apart, ensure that each network uses a different **HOP CHANNEL** to avoid unwanted signal interference.

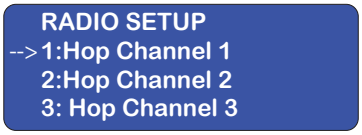


Figure 46

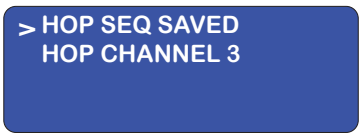


Figure 48

Figure 49

Figure 50

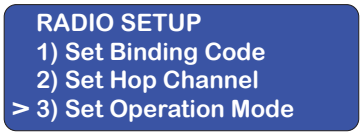


Figure 51

Figure 52

Figure 53

Figure 54

Figure 55

Figure 56

Check or Reset the Hop Channel

To check or reset the **Hop Channel** setting, follow these steps.

1. Select **MAIN MENU > RADIO SETUP > Set Hop Channel**. See Figures 44 and 45.

   Figure 46 shows that the current selection is **Hop Channel 1**.
2. To change to a different hop channel, scroll to another channel. See Figure 47.

   Figure 47 shows that the currently saved value is **Hop Channel 1**, and the user has selected **Hop Channel 3**.

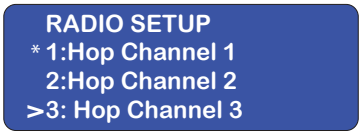


Figure 47

3. Select to save the selection. See Figure 48.
4. Confirm the selection. See Figure 49.

Set the Operation Mode

Every BlinkerBeam® radio can be set to operate as a Transmitter or Receiver.

Change the Radio's Operation Mode

1. Select **MAIN MENU > RADIO SETUP > Set Operation Mode**. See Figures 50 and 51.

   The **TRANSMITTER SELECT** menu appears.
   - Figure 52 shows the operation mode selected and saved as **Receiver**.
   - Figure 53 shows the operation mode selected and saved as **Transmitter**.
2. Scroll up or down to the desired operation mode.
   - Figure 54 shows the operation mode saved as **Transmitter** and selected as **Receiver**.
   - Figure 55 shows the operation mode saved as **Receiver** and selected as **Transmitter.**
3. Select the desired operation mode again to save the selection.
   - Figure 53 shows the operation mode selected and saved as **Transmitter**.
   - Figure 56 shows the operation mode selected and saved as **Receiver**.

NOTICE

If radio operating mode is changed from **Transmitter** to **Receiver**, reboot the network before changing or setting binding values. See *Reboot All the Radios in the Network*.

If the operating mode is changed from **Receiver** to **Transmitter** without rebooting (and more programming changes are required), reset power before using the radio in the new operation mode. See *Reboot All the Radios in the Network*.

Note: Only one radio can be set as the Transmitter. The cabinet located in the most central point within a group of cabinets is typically the best system to set as the Transmitter.

Reception (Rx) Sensitivity

If a radio is not being found in the network, first adjust the Transmission Power (see below). If needed, increase the radio's reception sensitivity.

Notes:

- Your radio may only have low RX Sensitivity level available.
- Wait up to ten minutes for the radio network to activate.
- Before changing Reception Sensitivity or Transmission Power, refer to the Troubleshooting section.

Figure 57

Figure 58

Figure 59

Figure 60

Figure 61

Adjust the Reception Sensitivity

1. Select **MAIN MENU** > **RADIO SETUP** > **RX Sensitivity**. See Figures 57 and 58.

   The **RX SENSITIVITY LEVEL** screen appears. See Figure 59.
   - If Low is selected and saved, go to Step 3.
   - If High is selected and saved, see Transmission Power.
2. Scroll down to **High**. See Figure 60.
3. Select and confirm the new value. See Figure 61.

If increasing reception sensitivity does not solve the problem, see *Transmission (TX) Power*.

Transmission (Tx) Power

Note: TX Power Level may only have low or low and medium options available.

See *Cover Page* for FCC information.

Refer to the *Omni and Yagi Antenna Installation Guide* for information on multiple-antenna combinations.

NOTICE

Using the radio at High power with a Yagi antenna violates FCC regulations. Only use **Low** or **Medium** settings.

Figure 62

Figure 63

Figure 64

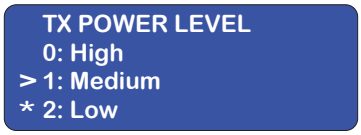


Figure 65

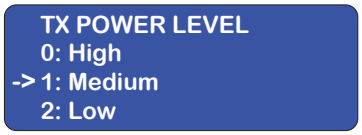


Figure 66

Figure 67

Figure 68

Figure 69

Figure 70

Figure 71

Adjust the Transmission (TX) Power

NOTICE

Only adjust the **Tx Power Level** if instructed to do so by TAPCO.

1. Select **MAIN MENU > RADIO SETUP > Tx Power**. See Figures 62 and 63.

Note: Asterisk indicates that the current saved value is Low. This is the default setting. See Figure 64.

2. Scroll down and select **Medium**. See Figure 65.
3. Confirm and save the selection. See Figure 66.

Transmission Power Output

Increasing the transmission power level also increases the power draw. For installations with solar or battery power, this additional power draw can reduce the autonomy of these systems.

Network Search Menu

To locate and add a missing receiver radio to the network, perform network search from a transmitter radio. Network searching may take several minutes to perform.

Note: Passive Search mode (default) takes more time than the Active Search mode, but Passive Search will reliably find all available radios.

To perform a network search:

1. Select **MAIN MENU > RADIO SETUP > Find Net Devices** to begin a Network Search in **Passive Search** mode. See Figures 67 and 68.

   The **NETWORK SEARCH** screen appears and the network search begins. The radio count starts with **1** to include the transmitter radio. See Figure 69.

   As radios join the network, the digits to the left of the slash increment up to the maximum (16). See Figure 70.

   LED lights to the left of the radio LCD screen light up on both passive and active search. The red Rx LED flashes when a receiver radio joins the network. See *LEDs* in the User Interface section.

2. To speed up a passive search, push the joystick right to enter active search mode.

The LCD screen indicates **STOP Net Search** as the bottom row text changes to flash **SEARCHING**. See Figure 71.

Figure 72

Figure 73

Figure 74

Figure 75

Figure 76

Figure 77

Figure 78

Figure 79

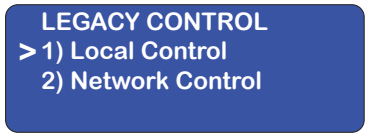


Figure 80

End of Search

If the final count shows that not all radios on the network are communicating, check the radio to verify the following:

- All radios are powered on.
- Only one radio is set to **Transmitter**.
- All radios have the same binding code.
- All radios are on the same Hop channel.

If a radio cannot be added to the network, see *Binding Codes*, *Set Hop Channel Menu*, and *Troubleshooting*.

When all radios have joined the network, exit the menu.

LEGACY CONTROL MENU

The **Legacy Control** menu allows several functions used for Intelligent Warning Systems (IWS) network management:

- Run an LED diagnostic routine,
- Reboot a single radio,
- Reboot all the radios in the network, or
- Change the length of time that an LED display flashes.

To access these various functions:

1. Select **MAIN MENU > Legacy Control**. See Figure 72.
2. From the **LEGACY CONTROL** Menu select either option:
   - **Local Control** (this unit). See Figure 73.
   - **Network Control** (all units). See Figure 74.

Run an LED Diagnostic Routine

The user can run an LED Diagnostic routine on either LED array from either the **LOCAL COMMANDS** or **NETWORK COMMANDS** menu.

1. Select **MAIN MENU > Legacy Control**. See Figure 72.
2. From the **LEGACY CONTROL** Menu select either option:
   - **Local Control** (this unit). See Figure 73.
   - **Network Control** (all units). See Figure 74.
3. Select either:
   - **LED1 10s ON** for Array 1. See Figures 75 and 76.
   - **LED2 10s ON** for Array 2. See Figures 77 and 78.

When activated, the LEDs on the selected array stay ON for 10 seconds.

Reboot a Single Radio

To reboot the radio,

1. Select **MAIN MENU > Legacy Control**. See Figure 79.
2. Select **LEGACY CONTROL> Local Control**. See Figure 80.
3. Select **LOCAL COMMANDS > Reset Legacy**. See Figure 81.

Figure 81

Figure 82

Figure 83

Figure 85

Figure 86

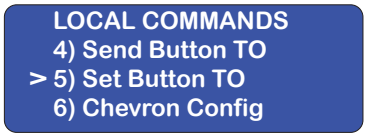


Figure 87

Figure 88

Note: Using the **Reset Legacy** command resets both the controller and the radio.

Note: This must be done after switching Operation Mode. See *Set the Operation Mode*.

Reboot All the Radios in the Network

If you need to restore communication across the entire network,

1. Select **MAIN MENU > Legacy Control**. See Figure 79.
2. Select **LEGACY CONTROL> Network Control**. See Figure 82.
3. Select **NETWORK COMMANDS > Reset Controllers**. See Figure 83.

Note: Using the **Reset Controllers** command resets all of the controllers and the radios in the network.

The LCD screen turns off for approximately eight seconds. The orange, green and red LEDs all flash brightly in an alternating sequence. See Figure 84.

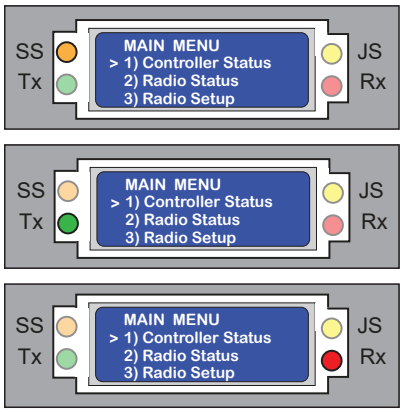


Figure 84

When the network reset is complete, the **MAIN MENU** reappears. See Figure 79.

Change the Length of Time the LEDs Flash

1. Select **MAIN MENU > Legacy Control**. See Figure 85.
2. From the **LEGACY CONTROL** menu**,** select either option.
   - Local Control (this unit) See Figure 86.
   - Network Control (all units)
3. From the **LOCAL COMMANDS** or **NETWORK COMMANDS** menu, select **Set Button TO**. See Figures 87 and 88.

   The **BUTTON TIMEOUT MENU** appears.

Figure 90

Figure 91

Figure 92

Figure 93

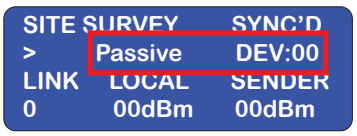


Figure 94

Figure 95

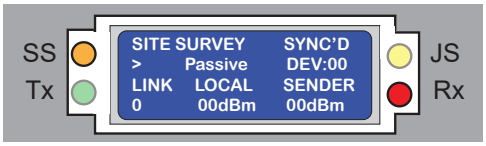


Figure 96

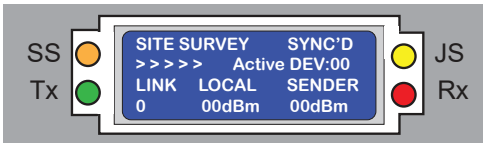


Figure 97

4. In the **BUTTON TIMEOUT MENU**, select a value in the range 5-600 seconds. See Figure 89.

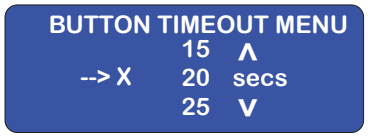


Figure 89

Icon	Meaning
X	Current saved value
-->	Selected value

5. Save the desired value and then exit the submenu.
6. From the **LOCAL COMMANDS** or **NETWORK COMMANDS** menu, scroll to and select **Send Button TO**. See Figures 90 and 91.

   The **Button T/O Saving** screen appears briefly to confirm save. See Figure 92.

   The LCD screen reverts to the **LOCAL COMMANDS** or **NETWORK COMMANDS** menu.

Site Survey

Site Survey can only be done from receiver radios. Site Survey analyzes signal strength between the receiver radio and the radio to which it is communicating. Receiver radios join the network automatically.

To perform a site survey:

1. Select **MAIN MENU > Site Survey**. See Figure 93.

   The initial **SITE SURVEY** menu opens in **Passive Mode**. See Figure 94.

   In **Passive Mode**:

   - The orange Site Survey (**SS**) LED flashes every two seconds, indicating transmission of a data packet.
   - The red Receiver (**Rx**) LED flashes once every three seconds, indicating the radio has received a communications packet.

2. Toggle the joystick once to the right to enter **Active Mode**.

   In **Active Mode**:

   - Angled brackets (>) appear on the second LCD row. See Figure 95.
   - The orange Site Survey (SS) LED flashes four times per second, indicating transmission of data packets See Figure 96.
   - The red Receiver (Rx) LED flashes once every four seconds, indicating the radio has received a communications packet. See Figure 97.

3. Toggle the joystick again to the right to return to **Passive Mode**.

Figure 98

Local and Sender RSSI (Received Signal Strength Indicator) Values

In Active Mode, allow a few minutes for Local and Sender dBm (decibel milliwatt) values to settle. See Figure 98.

- Local (Tx) value ranges between -100 dBm and -10 dBm.
- Sender (Rx) value ranges between -100 dBm and -10 dBm.

> **Note:** Sender (Rx) values closer to -10 dBm are preferred.

If either value settles between -80 dBm and -100 dBm, this indicates weak, unreliable signal.

Refer to following sections for options to resolve this problem:

- *Transmission (Tx) Power*
- *Reception (Rx) Sensitivity*

NOTICE

LCD backlight does not shut off in Site Survey Mode. To prevent draining the battery, exit this menu when finished.

Troubleshooting

A network requires just one radio configured as a Transmitter, with all others configured as Receivers.

To function, each radio within a network must be configured with the same 8-digit Binding Code and the same Frequency Hopping Channel.

These values can be quickly viewed in the **MAIN MENU > Radio Status** menu.

Binding Code and Frequency Hopping Channel values are typically pre-set at factory: verification of these values is explained in the section **Radio Status >Radio Network Table**.

Avoid Co-locating Radios

Do not install or test radios within six feet of each other. If the Transmitter radio is located too closely to any Receiver radio, communication between all radios may be interrupted.

Automatically Joining the Network

Assuming the Binding Code and Frequency Hopping Channel values match on all radios in the network, Receiver radios automatically join the network within ten minutes of applying power to all radios.

TROUBLESHOOTING		
Symptom	**Issue**	**Action**
No Power to Radio	▪ Battery low/dead ▪ Inadequate solar input	▪ Recharge or replace battery and reconnect. ▪ Test solar panel and replace if needed.
	▪ Power Connection	▪ Verify circuit continuity and fuses/circuit breaker. ▪ Tighten terminal connections or replace fuse as needed.
Radios Don't Communicate **Note:** Radios that function independently DO NOT communicate	▪ Proximity (collocation)	▪ Make sure all radios are at least six feet apart. ▪ Reboot power to all radios and retest.
	▪ Network reset needed	▪ In Legacy Control Menu apply Reset Legacy to restart radio network connections.
	▪ Binding code	▪ Make sure all radios have same binding code, NOT all zeros. ▪ Modify as needed.
	▪ Frequency hopping channel	▪ Make sure all radios have same value. ▪ Modify as needed.
	▪ Insufficient signal strength	▪ If signal strength is too low, increase Rx Sensitivity to medium if possible. ▪ If device still shows up as all zeros in Radio Status table, increase Tx power if possible. ▪ If this is a receiver radio and you have already performed Legacy Control Network Reset, go to MAIN MENU option 5 and run receiver radio Site Survey.
	▪ Site based signal interference	▪ Change Operation Mode of Transmitter to Receiver and a more centrally located Receiver's Operation Mode to Transmitter.
	▪ Antenna/cable is loose or defective	▪ Check antenna cable connections.
Can't Program Active Timeout	▪ Needs TAPCO firmware update	▪ Contact TAPCO customer service for a firmware update.

For technical support, call TAPCO® at 800-236-0112 or email customerservice@tapconet.com.

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