Communication

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Instruction Sheet 1042-520

Introduction

Qualified Persons

<table>
<tr><td colspan="1">⚠ WARNING</td></tr>
</table>

⚠ **WARNING**

The equipment covered by this publication must be installed, operated, and maintained by qualified persons who are knowledgeable in the installation, operation, and maintenance of overhead electric power distribution equipment along with the associated hazards. A qualified person is one who is trained and competent in:

- The skills and techniques necessary to distinguish exposed live parts from nonlive parts of electrical equipment
- The skills and techniques necessary to determine the proper approach distances corresponding to the voltages to which the qualified person will be exposed
- The proper use of the special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools for working on or near exposed energized parts of electrical equipment

These instructions are intended only for such qualified persons. They are not intended to be a substitute for adequate training and experience in safety procedures for this type of equipment.

Read this Instruction Sheet

NOTICE

Read this instruction sheet thoroughly and carefully before installing or operating S&C 5800 Series Automatic Switch Controls. Familiarize yourself with the Safety Information page 3. The latest version of this publication is available online in PDF format at **sandc.com/en/support/product-literature/**.

Retain this Instruction Sheet

This instruction sheet is a permanent part of your 5800 Series Automatic Switch Control. Designate a location where you can easily retrieve and refer to this publication.

Proper Application

⚠ **WARNING**

The equipment in this publication must be selected for a specific application. The application must be within the ratings furnished for the selected equipment.

**Understanding
Safety-Alert Messages**

Several types of safety-alert messages may appear throughout this instruction sheet and on labels attached to the 5800 Series Automatic Switch Control. Familiarize yourself with these types of messages and the importance of these various signal words:

⚠ DANGER

"DANGER" identifies the most serious and immediate hazards that *will likely* result in serious personal injury or death if instructions, including recommended precautions, are not followed.

⚠ WARNING

"WARNING" identifies hazards or unsafe practices that *can* result in serious personal injury or death if instructions, including recommended precautions, are not followed.

⚠ CAUTION

"CAUTION" identifies hazards or unsafe practices that *can* result in minor personal injury if instructions, including recommended precautions, are not followed.

NOTICE

"NOTICE" identifies important procedures or requirements that *can* result in product or property damage if instructions are not followed.

**Following
Safety Instructions**

If you do not understand any portion of this instruction sheet and need assistance, contact your nearest S&C Sales Office or S&C Authorized Distributor. Their telephone numbers are listed on S&C's website **sandc.com**, or call S&C Headquarters at (773) 338-1000; in Canada, call S&C Electric Canada Ltd. at (416) 249-9171.

NOTICE

Read this instruction sheet thoroughly and carefully before installing or operating your S&C 5800 Series Automatic Switch Control.

**Replacement
Instructions and
Labels**

If you need additional copies of this instruction sheet, contact your nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

It is important that any missing, damaged, or faded labels on the equipment be replaced immediately. Replacement labels are available by contacting your nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

RadioShop Software

Installing RadioShop Software

RadioShop software is used to configure UtiliNet radios for use with the IntelliTeam Automatic Restoration System.

Follow these steps to install RadioShop software on the computer:

STEP 1. If necessary, install IntelliLink® Setup Software. It must be installed before RadioShop software is installed.

STEP 2. Insert the RadioShop Setup disc into the computer.

STEP 3. Click on the **Start** button, Then, click on the **Run** button.

STEP 4. Type A:\TRANSFER and the name of the directory (folder) where the IntelliLink software was installed (for example, A:\TRANSFER C:\ELine\). Then, click on the **OK** button.

The software creates a directory structure and installs all the files.

RadioShop Menu Tree

To make a selection from a menu, type the letter shown in angle-brackets below or use the arrow keys to move the cursor to highlight the desired choice. Then, press the <Enter> key. To return to a previous menu, press the <Esc> key.

RadioShop Main Menu

<S>elect Radio

Select <V>ia Radio

<C>onfigure Radio

- Configure <R>adio
- Configure <T>ransparent Port
- Configure <D>omain Routing
- Reconfigure Radio <W>AN Address

<D>CW Controls

- <S>end DCW
- <C>lear DCWs from Radio
- Set DCW <L>AN Source

<Q>uery Radio

- <C>onnectivity & Routing Reports

  WAN Nodes

  LAN Nodes

  Domain Routing

  Scan List

- <C>onfiguration Reports

  <R>adio Configuration

  <T>ransparent Configuration

  <L>AN Configuration

  <F>lash Configuration

- <A>ctivity Reports

  Active DCWs

  Radio Status

  Packet Accounting

  Transparent Activity

  Status & Control States

  Bootup Time

<U>tilities

- <N>odes Table Management

    <A>dd New Radio

    <D>elete Present Radio

    <M>odify Present Radio

    <L>oad...

    <S>ave As...

    <V>iew Current Nodes File

- Modify <C>onnection Parameters

- Toggle <L>og File On/Off (Presently Off)

- <T>oggle Tracing On/Off (Presently Off)

- View <S>ession Variables

- <A>bout RadioShop

<E>xit RadioShop

Nodes Table

The Nodes table is a list of UtiliNet radios and their WAN addresses. This list includes all radios used by the utility, the radios used in a specific area, or only the radios needed for a team. Some of the information in this list is used when configuring team members. After a Nodes table is created, it can be viewed and edited at any time.

NOTICE
A Nodes table must be adjusted when a control and radio is later added to the team or the physical location of a radio is changed. The team information must be reloaded and the team re-initialized. See Instruction Sheet 1042-530, "S&C 5800 Series Automatic Switch Controls With IntelliTeam® Automatic Restoration System: *Setup*."

The Nodes table also can be automatically created for the team as each radio is programmed. Information about automatically creating a Nodes table is shown at the "Configuring UtiliNet Radios" section - Step 5 on page 14.

Follow these steps to create, view, or edit a Nodes table:

STEP 1. Gather the address information for the team members and the radios.

Two kinds of information are required:

- The LAN address for each radio (This is the radio serial number, shown on a an exterior label.)

- The latitude and longitude for the site where the radio will be installed (The latitude and longitude information can be obtained later, when the radio is installed.)

STEP 2. If necessary, install RadioShop software on the computer. For details, see the "Installing RadioShop Software" section on page 4.

STEP 3. Start the Setup Manager software on the computer.

Setup Manager software provides a convenient way to move between programs to configure the radios and controls. To start the software, open the Windows **Start** menu. Then, open the *Programs>EnergyLine>Setup Manager* program.

STEP 4. Create the Nodes table.

(a) At the *UtiliNet Setup* screen, click on the **RadioShop** button at the bottom right of the screen.

The RadioShop software opens and briefly displays a *Title* screen. Then, it opens the *Main Menu* screen. See Figure 1 on page 6. Make sure the utility name is displayed on the screen. If it isn't displayed, contact S&C Electric Company to obtain the latest revision of RadioShop software.

> **NOTICE**
>
> When RadioShop software does not find a Nodes table, it displays the message "Cannot open file 'nodes.' Create it? (y/n)." Press the <Y> key to close the dialog box, create an empty Nodes table and display the *Main Menu* screen. See Figure 1.
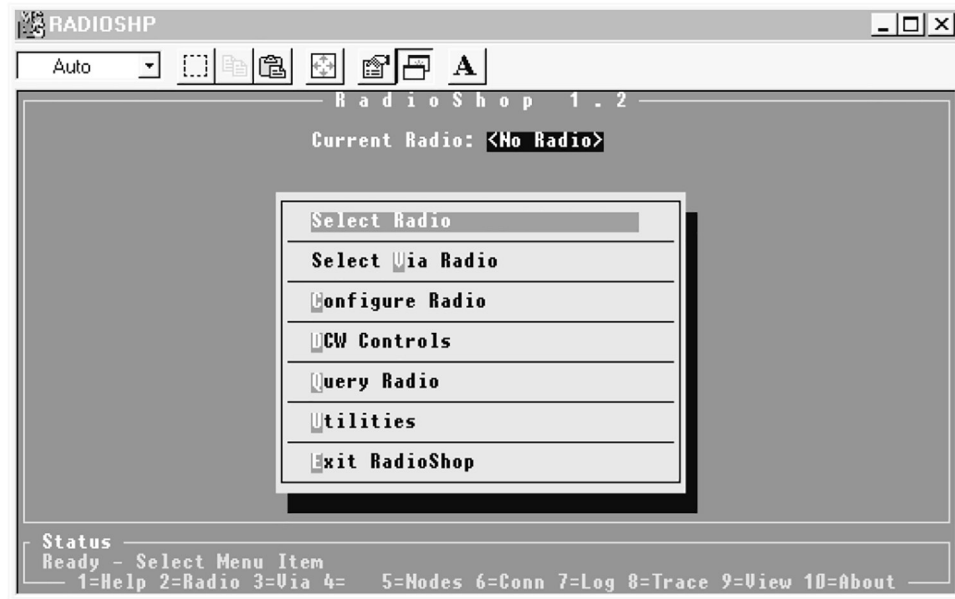

Figure 1. The RadioShop *Main Menu* screen.

(b) At the *Main Menu* screen, press the <U> key to select the **Utilities** option. Then, press the <Enter> key to open the *Utilities Menu* screen. See Figure 2.

Figure 2. The RadioShop *Utilities Menu* screen.

(c) Press the <N> key to select the **Nodes table Management** option. Then, press the <Enter> key to open the *Nodes table Management* screen. See Figure 3 on page 7.

Figure 3. The RadioShop *Nodes table Management* screen.

(d) Do one of the following:

- To view the present Nodes table content, press the <V> key at the *Nodes table Management* screen to select the **View Current Nodes File** option. Then, press the <Enter> key to view the file.

- To edit the values for a radio in the Nodes table, go directly to Step 4(l) on page 9.

- To add a radio to the table, press the <A> key to select the **Add New Radio** option, and press the <Enter> key to open the *Add New Node* screen. See Figure 4. Then, go to Step 4(e) on page 8.

Figure 4. The RadioShop *Add New Node* screen.

(e) In the **Name** field, type the name used to identify this radio in the table. Then, press the <Enter> key to move to the next field.

   Note: Any naming system can be used for the radios. Names that show where a radio is located are recommended, for example "1234" (for the radio connected to Switch #1234) or "RELAY_1" (for the first relay radio used by the team). Radios can be added to the Nodes table in any order.

(f) Verify (or enter) the LAN address of this radio. The LAN address is the radio serial number, usually found on a label on the outside of the radio. Then, press the <Enter> key to move to the next field.

(g) Type the WAN address and the latitude and longitude of the location where this radio will be installed. After the WAN address is entered, press the <Enter> key to move to the **Color** field.

   The WAN address includes 10 separate sub-fields—five for latitude and five for longitude. Type the information into each sub-field separately. When finished with one sub-field, press the <Enter> key to move to the next sub-field.

   Set the latitude and longitude to full- or half-second increments. UtiliNet radios have 1/3-second resolution; using a half-second entry as standard practice helps prevent creation of a duplicate WAN address.

(h) If necessary, select a color for the radio. Under most conditions, leave the **Color** field set to "0." A color entry is only required when two or more radios are so close together that a color designation is needed, in addition to a WAN address, to identify them.

(i) Press the <Ctrl> and <Enter> keys at the same time to add this information to the Nodes table.

   Note: If an incorrect value is entered, press the <Shift> and <Tab> keys at the same time to move back through the fields. Enter the correct information. Then, press the <Ctrl> and <Enter> keys at the same time to accept the new entry.

(j) Repeat Steps (d) through (i) for each radio to be added to the Nodes table.

(k) To verify the Nodes table information is correct, press the <V> key at the *Nodes table Management* screen to select the **View Current Nodes File** option. Then, press the <Enter> key to view the contents of the Nodes table file. See Figure 5.
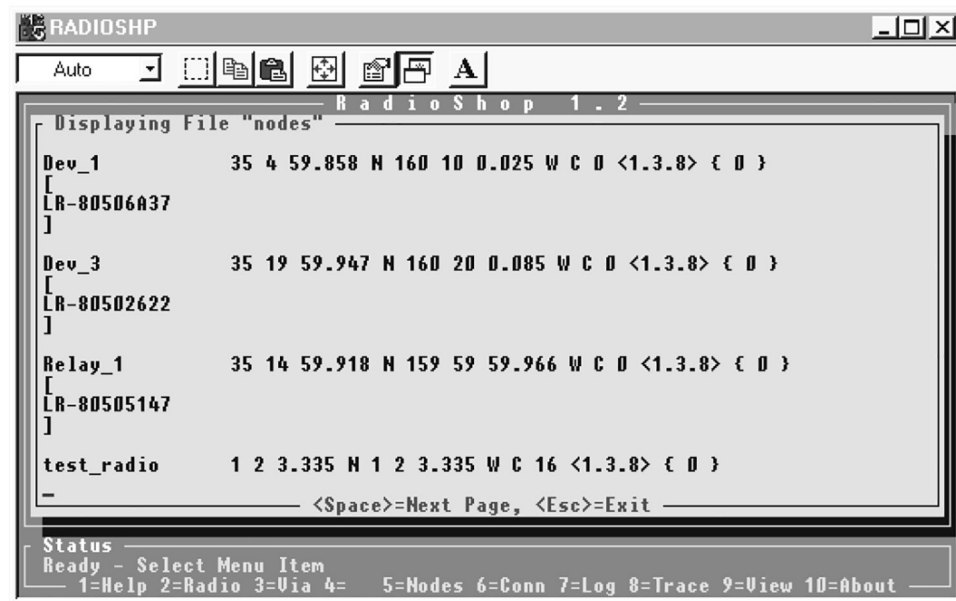

Figure 5. An example of contents in the nodes file.

(l)   Do one of the following:

- When information for all radios has been entered correctly, press the <Esc> key and go to Step 4(m).

- If the information for any radio is incorrect, press the <Esc> key and follow this procedure:

     1.   Press the <M> key to select the **Modify Current Radio** option.

     2.   Use the arrow keys to select the radio. Then, press the <Enter> key.

     3.   Correct the table entries.

     4.   Press the <Ctrl> and <Enter> keys at the same time to save the revised table entries.

     5.   Press the <Esc> key. Then, go to Step 4(m).

(m) Press the <Esc> key as needed to return to the RadioShop *Main Menu* screen.

(n)   To exit the RadioShop program and return to the Setup Manager software, press the <E> key, press the <Enter> key, and press the <Y> key.

When correct information has been entered in the Nodes table, configure the UtiliNet radio(s) and transfer radio address information to the team members.

Configuring UtiliNet Radios

For proper team operation, configure each UtiliNet radio with the correct DCW, WAN address, and the radio configuration software version.

Radios can be configured in the shop or after they have been installed in the field.

NOTICE
WANGATE II relay radios require a special programming cable that provides access to the transparent and LAN packet ports. The 6-foot (1.8 m) cable includes a 15-pin mil-spec connector and two DB9 socket connectors. It is available from S&C (part number 110-000178-01). A radio power cable with the military connector on one end and a wall plug on the other end is available for use with a WANGATE radio when it is not installed in the field.

Follow these steps to configure a radio:

STEP 1.   If necessary, plug the radio into a power source. The radio, or the control that contains the radio, must be connected to a power source.

NOTICE
When a two-wire, ungrounded extension cord is used to power either the computer or the radio while they are connected, the serial port on the computer may be damaged.
Always use a grounded, three-wire extension cord or use battery power.

STEP 2.   Connect the computer to the radio.

(a)   If the radio is in a control, open the control door and the faceplate so the radio is accessible.

The exact location of the radio in a control depends on the control type. For overhead switches, the radio is on the back of the faceplate. See Figure 6 on page 10.

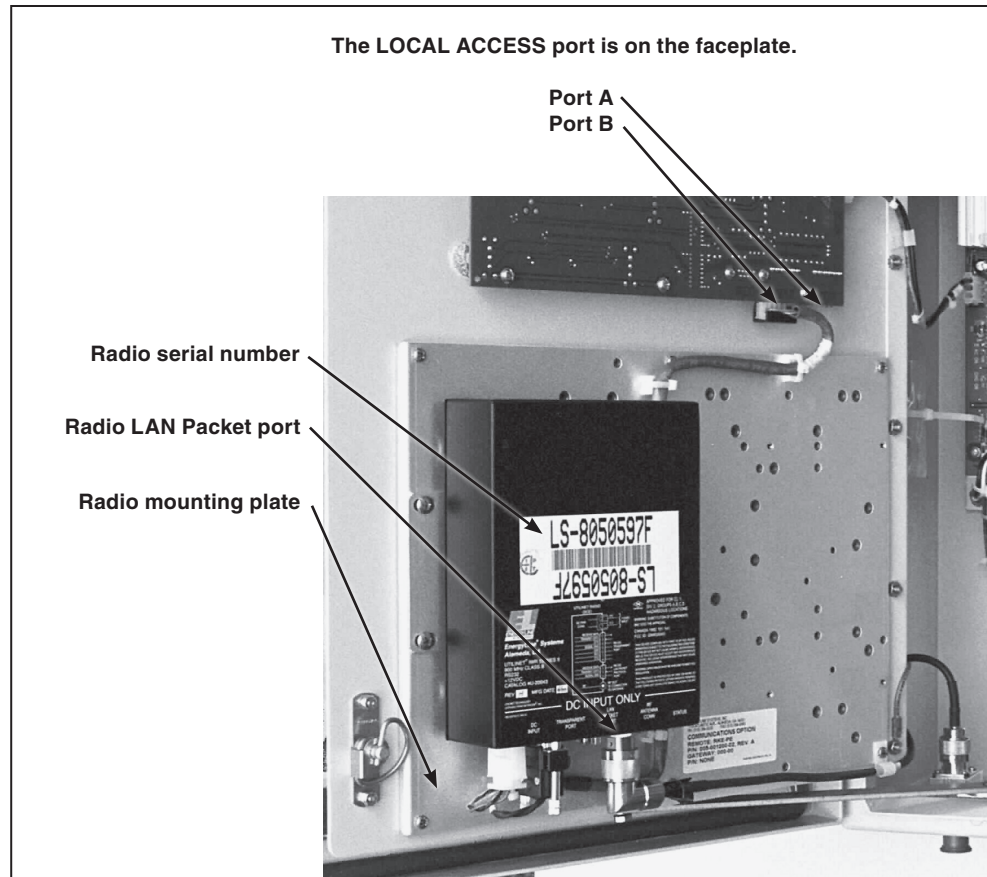(b)   Connect the RS232 serial cable to the computer and to the LAN PACKET port on the radio.

Figure 6. A UtiliNet radio with LAN Packet port installed in an S&C 5801 control.

STEP 3. Start RadioShop software on the computer.

    (a) On the Windows **Start** menu, click on the Programs>EnergyLine>Setup Manager program entry.

    (b) At the *UtiliNet Setup* screen, click on the **RadioShop** button. Then, do one of the following:

        • If RadioShop software finds a Nodes table, it displays the *Main Menu* screen. Go directly to Step 4.

        • If RadioShop software displays the message "Cannot open file 'nodes.' Create it? (y/n)," a new Nodes table must be created. Press the <Y> key. Then, see the "Nodes Table" section on page 5 for the procedure to create the Nodes table. After the Nodes table has been created, go to Step 4.

STEP 4. Check the radio configuration software version This step is optional.

    (a) At the RadioShop *Main Menu* screen, press the <S> key to open the *Select Radio* screen that shows the list of radios in the Nodes table. See Figure 7.
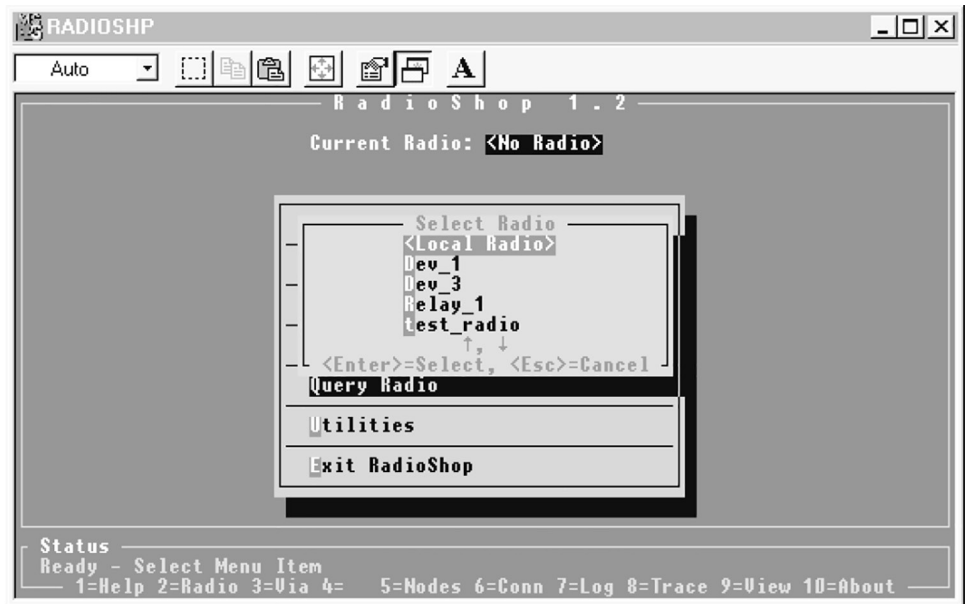

Figure 7. The *Select Radio* screen shows the radio list.

    (b) Use the arrow keys to select the **Local Radio** option. Then, press the <Enter> key.

        The name of the connected radio (for example, "Dev_3") appears at the top of the RadioShop *Main Menu* screen. See Figure 8.
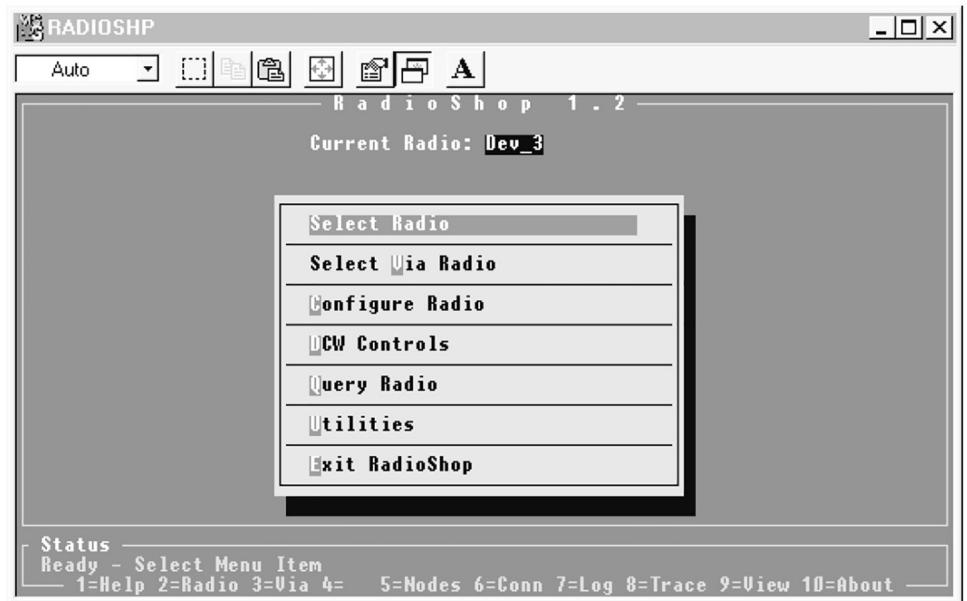

Figure 8. The RadioShop *Main Menu* screen with the selected radio.

NOTICE

RadioShop software compares the name in the radio to the names listed in the Nodes table. When it doesn't find a match, it displays the message "Local Radio did not match Nodes List." The information for this radio must be added to the Nodes table. See the "Nodes Table" section on page 5. Then, start the radio configuration process again.

(c) Press the <Q> key to select the **Query Radio** option. Then, press the <Enter> key to open the *Query Radio* screen. See Figure 9.
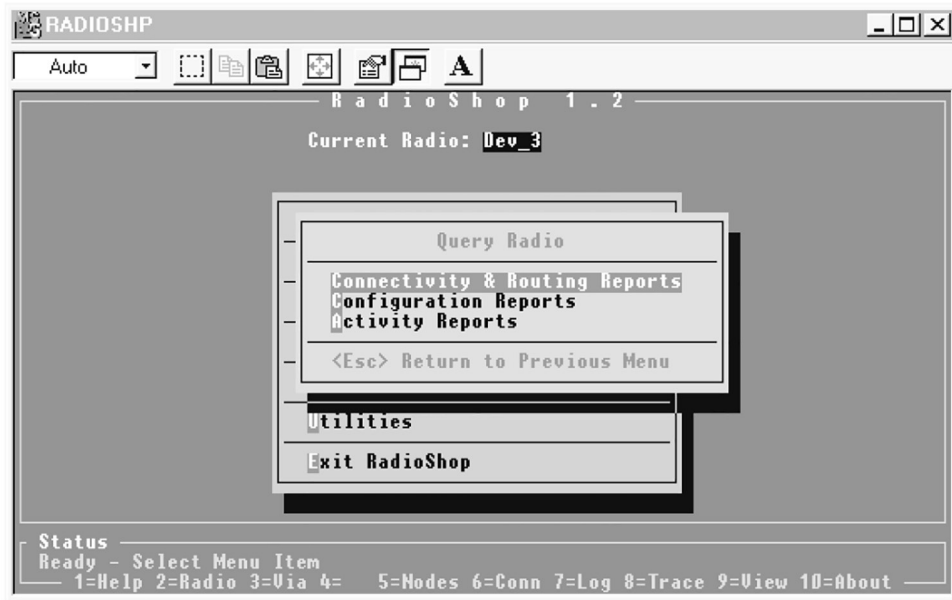

Figure 9. The *Query Radio* screen.

(d) Press the <A> key to select the **Activity Reports** option. Then, press the <Enter> key to open the *Activity Reports* screen. See Figure 10.
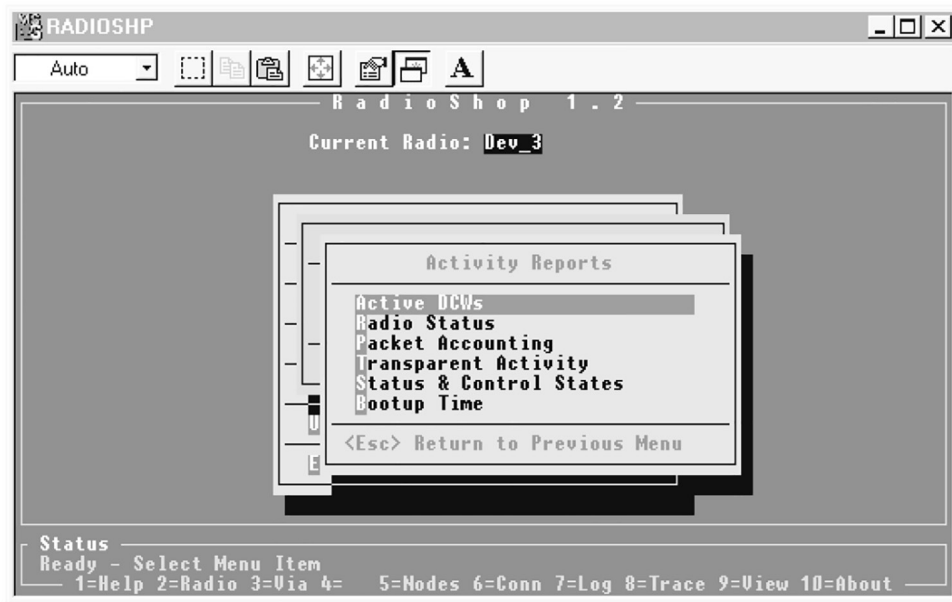

Figure 10. The Acitivity Reports menu.

(e)   Press the <R> key to select the **Radio Status** option and press the <Enter> key to retrieve the information from the radio.

The TLL message at the bottom right corner of the screen shows the progress of the query. When complete, the *Message Window* screen displays the results. See Figure 11.

Figure 11. The *Message Window* screen displays the query results.

(f)   At the *Message Window* screen, press the <PgDn> key to scroll down to the **Running Part Number** field.

(g)   Check whether the last section of the number shows "414-D" (software version 4.14d) or later. Then, press the <Esc> key three times to return to the RadioShop *Main Menu* screen.

(h)   Do one of the following:

- If the software version is correct, go directly to Step 6.
- If the software is not version 4.14d or later, press the <Esc> key one time. Then, press the <Y> key to exit the RadioShop software. Continue to Step 4(i).

(i)   Click on the **Close** button to exit the Setup Manager software.

(j)   Using Windows Explorer, open the RadioShop subdirectory (for example, C:\ELine\ rshop).

(k)   Double-click on the SDT_414D.EXE program entry.

(l)   At the prompt, enter the number for the communications port (usually COM1) used on the computer. Then press the <Enter> key.

The RadioShop software sends the correct information to the radio. The TLL message at the bottom right of the screen shows the time remaining for this action.

(m) Follow the on-screen instructions to close the SDT_414D.EXE program.

(n)   Restart RadioShop software, and then go to Step 5 on page 14.

For information about starting RadioShop software, see Step 3 on page 10.

STEP 5. Add the radio being programmed to the Nodes table.

    (a) At the RadioShop *Main Menu* screen, press the <S> key to open the *Select Radio* screen that shows the list of radios in the Nodes table. See Figure 7 on page 11.

    (b) Use the arrow keys to select the **Local Radio** option, and then press the <Enter> key.

        The name of the connected radio (for example, "Dev_3") appears at the top of the RadioShop *Main Menu* screen. See Figure 8 on page 11.

    (c) If the radio is not listed in the Nodes table, a message that the radio needs to be added to the Nodes table will be displayed. Press the <Esc> key to go back to the *Main Menu* screen.

    (d) Repeat Step 4(b) on page 11 through Step 4(k) on page 13. Then, continue to press the <Esc> key to return to the *Main Menu* screen.

    (e) At the RadioShop *Main Menu* screen, press the <S> key to select the **Select Radio** option. Then, press the <Enter> key. Use the arrow keys to select the **Local Radio** option. Then, press the <Enter> key.

STEP 6. Load the radio configuration file into the radio.

    (a) At the RadioShop *Main Menu* screen, press the <C> key to select the **Configure Radio** option. Then, press the <Enter> key.

    (b) At the *Configure Radio* screen, press the <Enter> key to select the **Configure Radio** option to open the list of radio configuration options. See Figure 12.
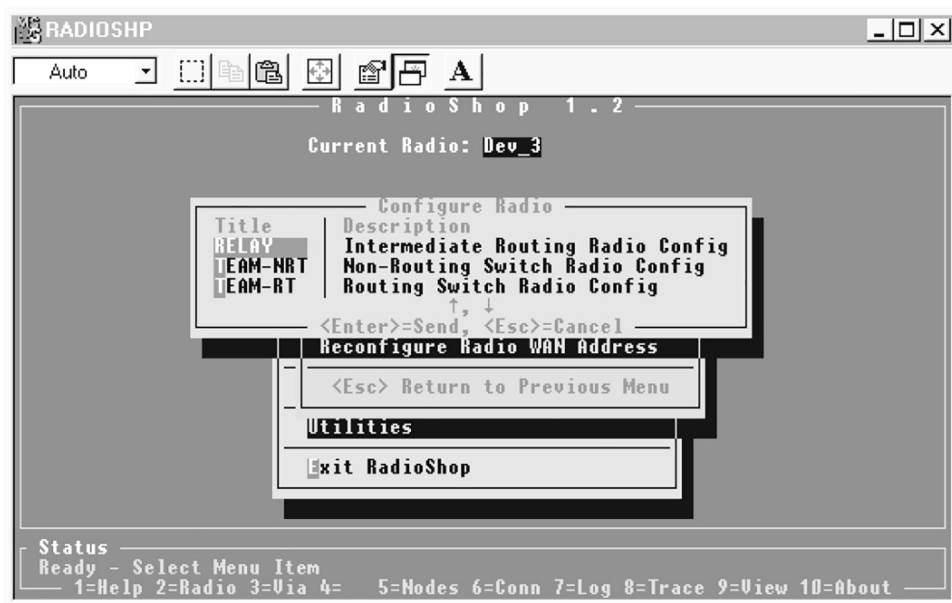

Figure 12. The *Configure Radio* screen.

    (c) Use the arrow keys to choose the configuration file that matches the function of this radio. Select the correct option from Table 1. Then, press the <Enter> key.

Table 1. Radio Function Types

Select	If This Radio
RELAY	Will be used only as a communications relay or SCADA radio; it is not connected to a control or IntelliNode™ Interface Module.
TEAM-RT	Is connected to a control or IntelliNode™ Interface Module and can be used to relay information to other team members.
TEAM-NRT	Is connected to a control or IntelliNode™ Interface Module, but cannot be used to relay information to other team members. **Note:** Try the **TEAM-RT** setting first; there are few circumstances that use the **TEAM-NRT** setting.

(d) Press the <Y> key to confirm the selection and load the configuration file. The information transfer takes a few minutes. The TTL Countdown message at the bottom right of the screen shows the software is working.

(e) After the configuration file is loaded, press the <Esc> key twice to return to the RadioShop *Main Menu* screen.

STEP 7. Load the Device Control Word (DCW) into the radio.

Skip this step for relay radios not connected to team members.

Note: Before loading the DCW, set the **LAN Source** setpoint to 14. This will prevent accidently overwriting the DCW when using temporary DCWs for testing purposes.

(a) Press the <D> key to select the DCW Controls entry. Then, press the <Enter> key.

(b) Press the <Enter> key to select the Send DCW entry.

(c) Press the <Enter> key. Then, wait while the control DCW (the dat.hex file) is sent to the radio. The TLL Countdown message at the bottom right of the screen shows the transmission progress.

(d) Look for the words "Driver Version 1.80" (or later) in the message that appears when the DCW has finished loading.

Note: If the message does not appear, make sure the section "Installing RadioShop Software" on page 4 was completed correctly. When the driver version is not 1.80 or later, contact S&C to obtain the latest software version.

(e) Press the <Esc> key three times. Then, press the <Y> key to exit RadioShop software.

(f) Disconnect the serial cable from the radio.

(g) If appropriate, disconnect the radio from the power source.

(h) Repeat Step 7 for each radio that needs configuration.

Testing Basic Radio Communication

After all radios have been installed and configured, confirm they can communicate with each other. Check communication at the last team member, just before team configuration is initiated. Or, check communication before configuring the switch control software as part of a separate radio configuration and testing process.

Follow these steps to test communication with other radios:

STEP 1. Connect the computer to the radio. Then, start the computer and the RadioShop software. For more information, see Step 1 through Step 3 in the "Configuring UtiliNet Radios" section on page 9.

STEP 2. Perform a WAN Nodes query.

(a) At the RadioShop *Main Menu* screen, press the <S> key to select the **Select Radio** option.

(b) Press the <Enter> key to select the **Local Radio** option.

Note: If the message "Local Radio did not match Nodes List" appears, this radio is not included in the RadioShop Nodes table. Add this radio to the Nodes table. Then, restart this step. See the "Nodes Table" section on page 5 for information about adding a radio.

(c) Check the radio to see whether it has the name expected. If necessary, edit the radio information to correct any errors.

(d) Press the <Q> key to select Query Radio entry. Then, press the <Enter> key.

(e) Press the <Enter> key to select the Connectivity and Routing Reports entry.

(f) Press the <W> key to select the WAN Nodes entry. The RadioShop software queries the radio and displays the results. See Figure 13 on page 16.
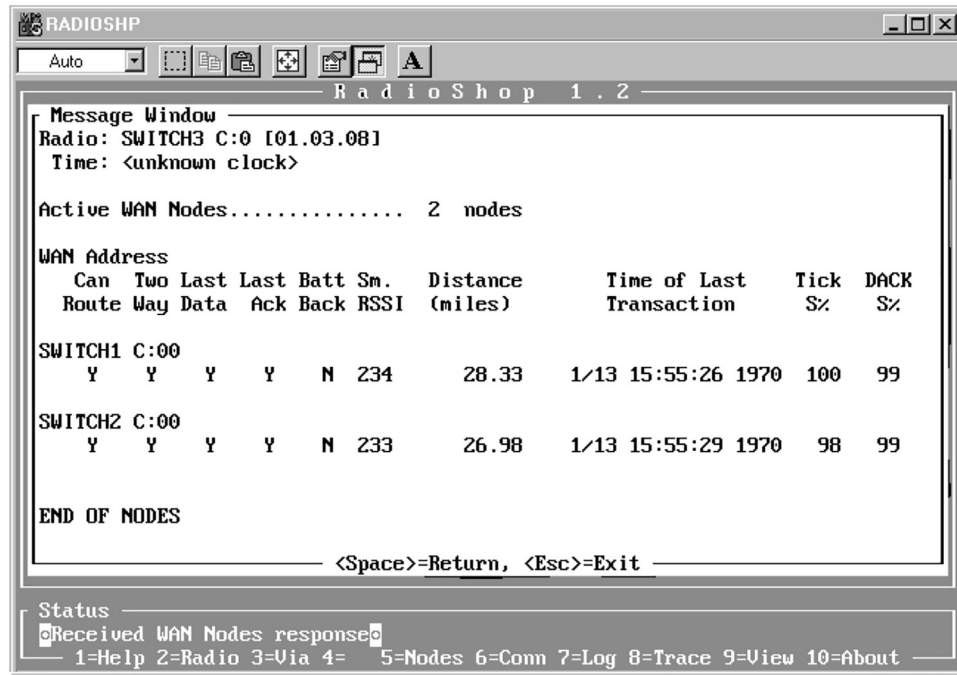
Figure 13. The *WAN Nodes Query* screen.

(g) Check the list of radio names.

The name of every radio with which this radio can communicate directly is displayed. To insure good connectivity, check that the RSSI is 150 (or greater), the TIC% is 50 (or greater), and the DACK% is 80 (or greater).

If a radio name is missing, see the "UtiliNet Radio Routing Problems" section in Instruction Sheet 1042-550, "S&C 5800 Series Automatic Switch Control with IntelliTeam® Automatic Restoration System: *Troubleshooting.*"

Loading Address Information

When the team uses radios, load the radio address information into all team members. Use the Setup Manager software to create a team configuration file. Load the file into the last team member, and then send the address information to the other team members when team configuration is initiated.

Note: If a team member is added or removed later, or the location of any radio is changed, update the address information in the entire team. Load the new information into one team member. Then, initiate a team configuration to update all other team members.

Follow these steps to load address information into a switch control:

STEP 1. Connect the computer to the LOCAL COMMUNICATION port on the switch control. See Figure 6 on page 10 for the port location.

STEP 2. Start the Setup Manager software.

    (a) Start Windows on your computer.

    (b) On the Windows **Start** menu, and select the Programs>EnergyLine>Setup Manager program.

STEP 3. Display the team setup information.

    (a) Click on the **Select Team** tab to display the team information table. See Figure 14.

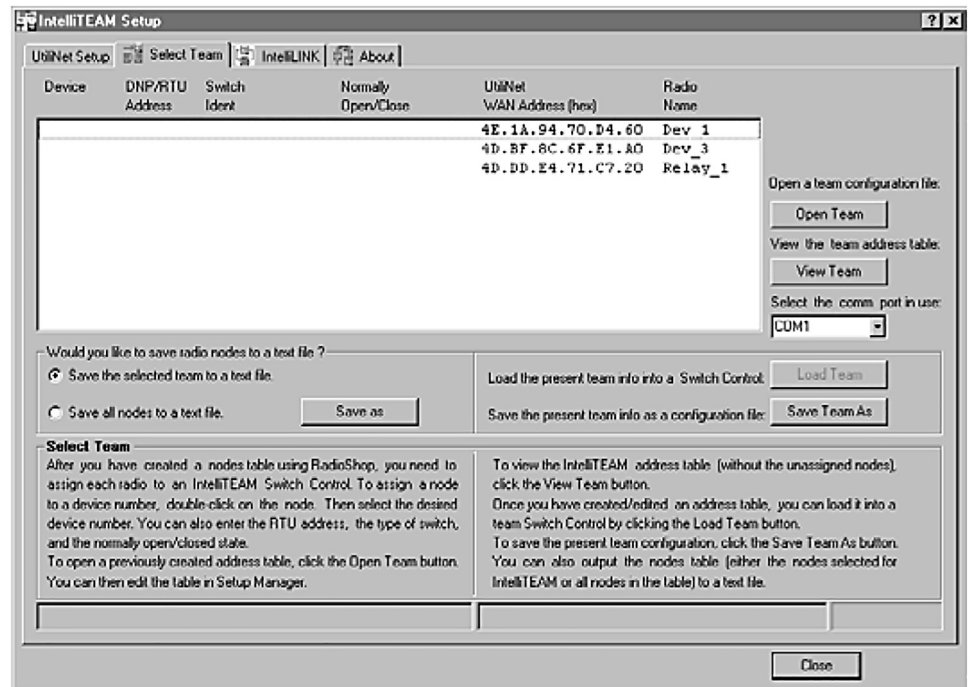

Figure 14. The *Select Team* screen in the Setup Manager software.

Initially, this shows only the information entered when the Nodes table was created. The radio names are the same as those entered, and the latitudes and longitudes are in Hex-encoded values.

Note: If the list is empty or incorrect, enter the correct information now. For details, see the "Nodes Table" section on page 5.

Note: To use a previously created team-configuration list instead of the default list, click on the **Open Team** button, select the name of the configuration list, and click on the **OK** button.

STEP 4. Enter the team-configuration information.

Specify which radio is physically connected to each team member and to the SCADA master station, if one is included. Then, enter additional information about each team member. Ignore any relay radios and unused radios that are in the list.

(a) Double-click on the name of the first radio directly connected to a team member.

The Edit Device dialog box opens and displays the name and WAN address for the selected radio. See Figure 15.

Figure 15. The Edit Device dialog box.

(b) Select the **Device** number for the team member connected to this radio.

In the **Device** drop-down list, the options are **Device 1-7** (for the team members) and **Master** (for the SCADA master station radio).

The IntelliTeam system uses a single-line representation of the circuit. Device 1 is furthest left in the diagram, and Device 7 is furthest right. For more information about assigning device numbers, see Instruction Sheet 1042-530, "S&C 5800 Series Automatic Switch Control with IntelliTeam® Automatic Restoration System: *Setup*."

(c) Enter the **DNP/RTU Address**, **Switch Ident**, and **Normally Open/Close** switch position values for this device.

You can enter this information in this window or later at Page 1 of the *Setup>Team Configuration* screen. For a more detailed explanation of all these parameters, see Instruction Sheet 1042-530, "S&C 5800 Series Automatic Switch Control with IntelliTeam® Automatic Restoration System: *Setup*."

DNP/RTU Address
This is the RTU address of each team member. It must be the same as the "Communications RTU Address" on the *Setup>Communications* screen for the team member; it cannot be changed here.

Switch Ident
This is the type of switch that is controlled by each team member (overhead or padmounted).

Normally Open/Close
This is the normal position of the switch(es) controlled by each team member. The selection can be modified later at Page 1 of the *Setup>Team Configuration* screen.

UtiliNet WAN Address
This is the hex-encoded latitude/longitude address of the radio in each team member. This comes from the Nodes table and cannot be changed here.

Radio Name
This is the name (identifier) for the radio in each team member. This is the name selected from the Address list; it cannot be changed here. Click on the **OK** button to select the value.

STEP 5. Repeat Step 4 for each radio that is directly connected to a team member or to the SCADA master station.

STEP 6. Review, save, and print the list. (This is an optional step.)

If needed, do any or all of the following:

- To show only the radios that are assigned to a member of this team, click on the **View Team** button.

- To save the present team radio configuration, click on the **Save Team As** button.

- To save the entire list in a text file, click on the **Save all nodes to a text file** button. Then, click on the **Save As** button. In the Save As dialog box, specify the name and location for this file.

- This optional step is recommended. If modifications are necessary, this configuration can be retrieved and edited. The alternative is to re-enter all information.

- To save only the information for the assigned radios, click on the **Save the selected team to a text file** button, and then click on the **Save As** button. In the Save As dialog box, specify the name and location for this file.

STEP 7. Click on the **Load Team** button to load the address information into the switch control. The software transfers all required information to the control.

The message "Task Completed" appears near the bottom right of the screen when the transfer is complete.

STEP 8. Do one of the following:

- To start the IntelliLink software from within Setup Manager software, click on the **IntelliLink** tab, and then click on the **IntelliLink** button.

Do this to keep Setup Manager open to easily move back and forth among the RadioShop, Setup Manager, and IntelliLink software options.

- To close the Setup Manager software, click on the **Close** button.

Other Communication Systems

Under certain circumstances it may be possible to use modems with simple telephone wiring or fiber-optic transceivers to connect members of the team or to connect to the SCADA master station. For more information about these options, please contact S&C Electric Company.

Updating the Device Control Word (DCW)

Occasionally, it is necessary to update the DCW in the radio by using the following steps. Skip this section for relay radios not connected to team members.

STEP 1. Start the RadioShop software and select the radio.

(a) Connect the RS232 serial cable between the computer and the LAN PACKET port on the radio. See Figure 6 on page 10.

(b) Start the computer.

(c) On the **Start** menu, select the Programs>EnergyLine>Setup Manager program.

(d) On the *UtiliNet Setup* screen, click on the **RadioShop** button.

> **Note:** If the RadioShop software displays the message "Cannot open file 'nodes'. Create it? (y/n)", a Nodes table must be created before setup can be continued. Press the <Y> key, then see the "Nodes Table" section on page 5. Return to this step after creating the Nodes table.

(e) At the RadioShop *Main Menu* screen, press the <S> key to select the **Select Radio** option.

(f) Use the arrow keys to select the **Local Radio** option. Then, press the <Enter> key.

> The name of the radio appears near the top of the window in the **Current Radio** field.

> **Note:** RadioShop software compares the name in the radio to the names in the Nodes table. If it didn't find a match, it displays the message "Local Radio did not match Nodes List." Add the information for this radio to the Nodes table. For information, see the "Nodes Table" section on page 5. Then, start the update process again.

STEP 2. Load the Device Control Word (DCW) into the switch control.

(a) Press the <D> key to select the **DCW Controls** option. Then, press the <Enter> key.

(b) Press the <Enter> key to select the **Send DCW** option.

(c) Press the <Enter> key again. Then, wait while the control DCW is sent to the radio.

> The message at the bottom right of the screen shows the DCW is loading.

(d) Look for the words "Driver Version 1.80" (or later) in the message that appears when the DCW has finished loading.

> **Note:** If the message does not appear, make sure Step 1 was completed correctly. If the driver version is not 1.80 or later, contact S&C to obtain the latest software version.

> When the new DCW (dat.hex) is received, load it into the \ELine\rshop\DCW\ folder.

(e) Press the <Esc> key three times. Then, press the <Y> key to exit the RadioShop software.

(f) Disconnect the serial cable from the radio.

The battery-backed WANGate II radio can be used as a relay radio. A special cable is required to configure the relay radio. This cable is available from S&C (part number 904-000053-01). The 6-foot (1.8 m) long cable has a 15-pin MS connector and two DB9 socket connectors to provide access to the TRANSPARENT and LAN PACKET ports. A special 6-foot (1.8 m) long power cord is also required (part number 904-001137-01) that has an ac plug and a connector for the radio.

Note: It is easier to configure a radio before installing it.

Mount the radio on a street light arm 2 inches (51 mm) to 5 inches (127 mm) in diameter, as shown in Figure 16. Make sure the radio is mounted on a horizontal section of the street light arm, with the antenna pointing down. The mounting brackets, screws, washers, and nuts are included with the radio.

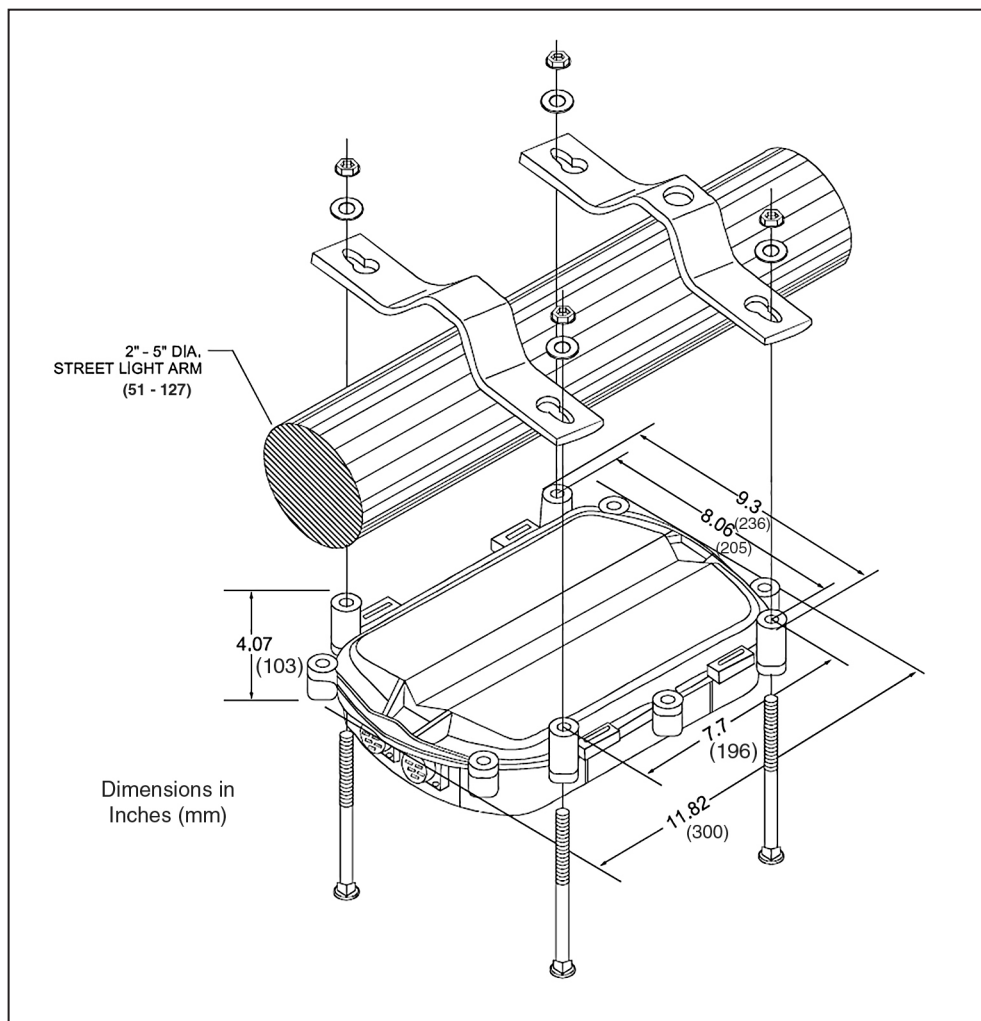The relay radio can be powered with a photocell adaptor (S&C part number 904-000063-01). The photocell plugs into the adapter.

Figure 16. Attaching the relay radio to a street light arm.