Figure 3-1: RTR-4 Wireless Option Items

Figure 3-2: Power/Transceiver Unit

The Power/Transceiver unit (Figure 3-2) has three functions:

- Provides power to the imager previously supplied by the controller (in the CU-4 case) or the external power supply (in the notebook case).
- Facilitates wireless communication between the controller and the imager.
- Sends the wireless signal from the imager to the x-ray source for firing x-rays.

The Power/Transceiver unit has five assemblies:

- The black chassis
- Antenna 1 (tall, transceiving antenna)
- Antenna 2 (short, transmitting antenna)
- The blue Power/Transceiver-to-Imager cable for controller-and-imager communications
- The gray Power/Transceiver-to-Imager cable for imager-to-x-ray-source communications

The chassis houses all the active components, the battery, the imager-to-controller transceiver, and the x-ray transmitter. Antenna 1 provides signals for communication with the controller; Antenna 2 provides signals to the X-ray Receiver. The blue cable provides communication to the imager, and the gray cable (with one red strain relief and one yellow) provides communication from the imager for x-ray firing purposes.

The Power/Transceiver has a convenient briefcase-style handle and contains a 10.8-Volt smart battery that is the same type as provided with the CU-4 controllers. This battery can be recharged using either the single-slot or the dual-slot charger sometimes rovided with the RTR-4 controllers, or in the RTR-4 CU-4 controller's battery compartment. The Power/Transceiver also has a power switch and a power-indication LED as shown in Figure 3-2. The battery is in use whenever the power switch is on and the LED is illuminated. (Early versions have a red LED; later versions have a green LED.)

Radio-frequency communications between the Imager and the Controller combined with the radio-frequency communications with the X-ray Receiver are very low intensity. When the Power/Transceiver is more than 50 cm (1.5 feet) away from a target device, then the RTR-4 Wireless Option complies with the HERO specifications. (If the RTR-4 is not being used with potentially-explosive devices, then this specification is irrelevant.)

The transmission frequency of the Power/Transceiver when communicating with the imager is near 2.4 GHz. This communication is done between 2.4000 and 2.4835 GHz, is spread-spectrum and frequency-hopping, according to the IEEE-802.11b-1999 standard, and is further encrypted to minimize snooping or spoofing. The frequency used when transmitting to the X-ray Receiver is about 418 MHz, is very low power and is coded with a sequencing 64-bit security code to minimize the possibility of unintended source firing. Battery replacement procedures are described in Chapter 6.

X-ray Receiver Unit

The X-ray Receiver unit (Figure 3-3) receives a signal from the Power/Transceiver and fires the x-ray source. It has two components, the body and the cable. The detachable cable can accommodate any of the four x-ray sources manufactured by Golden Engineering. They are listed below in order of their appearance from top to bottom in Figure 3-4:

- Inspector Model 200 (special cable)
- XR-150 (special cable)
- XRS-3 (standard cable)
- XR-200 (standard cable)

The Inspector Model 200 was discontinued by Golden Engineering in 1998, but the RTR-4 Wireless Option still supports it.

The X-ray Receiver unit is powered by a standard 9-volt alkaline battery and has a power switch with an indicating LED. Battery replacement procedures are described in Chapter 6.

Figure 3-3: X-Ray Receiver Unit

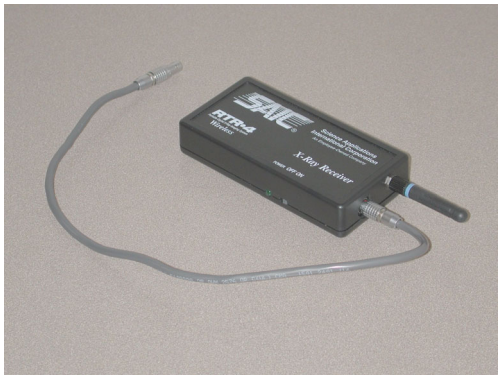

Figure 3-4: Four Golden Engineering X-ray Source Units

4 Wireless Option Setup

Introduction

This chapter describes the tasks uniquely required to prepare the RTR-4 Wireless Option for operation to be described in Chapter 5. Routine RTR-4 physical setup procedures are described in Chapter 2 of the RTR-4 Operator's Manual except for the Wireless Option Setup tasks described here.

The wireless option setup tasks in their proper sequence are:

- **Power Transceiver Setup**
- **X-ray Receiver Setup**
- **WiFi NIC Setup**
- **Optional Medium-Range Antenna Setup**
- **System Initialization**
- **Wireless Connection Test**

Power/Transceiver Setup

Connecting the Power/Transceiver

Connecting the Power/Transceiver Description

The Power Transceiver must be connected to the XR200 X-Ray source and Imager order for the XR200 and Imager to transceive commands with the controller.

Prerequisites

None.

Connecting the Power/Transceiver

The Power Transceiver is connected to the XR200 and Imager as follows

STEP	ACTION
1	Remove the Power Transceiver (Figure 3-2) from its packing case and place it on a flat, solid surface as close as possible to the XR200 and Imager.

STEP	ACTION
2	Screw on the two antennas (one shorter, one taller) to the Power/Transceiver as shown below: 
3	Insert one end of the Power/Transceiver's "X-Ray" coaxial cable into the red-labeled "X-Ray" jack on the right-hand end of the Power Transceiver as shown below.