



LIBERTY 2000

OPERATIONS GUIDE

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Declarations

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ? Reorient or relocate the receiving antenna.
- ? Increase the separation between the equipment and receiver.
- ? Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ? Consult the dealer or an experienced radio/TV technician for help.

The user is cautioned that changes and modifications made to the equipment without the approval of the manufacturer could void the user's authority to operate this equipment as well as invalidate the systems warranty.

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Preface

Welcome to the Premier Wireless LIBERTY 2000 *Operations Guide*.

What the Manual Covers

This manual contains most of the information you need to operate the LIBERTY 2000 and use it to place video conference calls with the remote wireless camera and full duplex audio link. It includes:

- ? Information about the hardware included in and options recommended for the LIBERTY 2000
- ? An overview on video conferencing with a wireless video/audio connection
- ? Instructions on operating the LIBERTY 2000
- ? Instructions on how to diagnose and resolve problems
- ? An overview on typical applications for the LIBERTY 2000

Included in the appendices are detailed instructions on how to contact Premier Wireless for technical support as well as the details of the specific wiring and switching network installed at your facility.

What the Manual Does Not Cover

The manual does not cover in depth the operation and configuration of the Video Conferencing equipment. That is covered in a separate manual included with the LIBERTY 2000. The manual assumes that the LIBERTY 2000 has been installed with all the wiring and switching network fully operational and tested.

Where to Find Information

If you want to . . .

Find out what equipment is and is not included with the LIBERTY 2000 system

Get an overview of video conferencing with wireless video and audio

Learn about operating the LIBERTY 2000

Diagnose and resolve problems with LIBERTY 2000

Learn different applications for the LIBERTY 2000

Find details on the cabling & switching network

See . . .

Chapter 1, "What is Included"

Chapter 2, "Overview of the LIBERTY 2000"

Chapter 3, "Operating your LIBERTY 2000"

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Chapter 1 What is Included

The LIBERTY 2000 includes:

- *A Portable Transmission Unit (2000T) consisting of a wireless video transmitter, a light weight portable tripod with fluid head, an antenna support bracket with flexible arm, a battery pack and cables.
- *A Fixed Receiver Unit (2000V) consisting of a wireless video diversity receiver, three high gain circular polarized Panel antennas, an antenna support bracket and cables.
- *A Duplex Communications Unit (2000A) consisting of a wireless intercom base station with one or more headset/belt-pack transceivers, a transmit antenna, a receive antenna, and cables.

What optional accessories are not included and may be required?

- *A small video camera or camcorder with a zoom lens
- *Several extra camera batteries and or a 12V adapter to tap power from 2000T battery pack
- *A 25 foot Video/Audio Extension Cable for handheld camera operation
- *Additional headset/belt-pack transceivers
- *A High Power Transmitter Substitution
- *An Analog Video Scrambling System or Digital Encryption System
- *A Ranger 400 Microwave Video Stabilizer
- *Additional 2000V systems for extended coverage in larger facilities
- *A Multi-Point Video/Audio Matrix Switcher for multiple 2000V location sites

Chapter 2 Overview of the LIBERTY 2000

What is the LIBERTY 2000?

Designed as an aid to teleconferencing, the LIBERTY 2000 is a fully integrated mobile video/audio communication system that allows the user to transmit high quality full motion color video and audio from virtually any location, while maintaining full duplex audio communications and without the need for long cable runs or A/C power sources.

How does it work:

In a typical scenario, a camera operator wearing a headset communicator is located in a coverage zone. The fixed receiver unit is mounted near the ceiling or against a wall with the panel antennas aimed at the coverage zone. This receiver is hard wired to a conference room codec or monitor via coaxial video cable or twisted pair. A video/audio signal is transmitted wireless via microwave radio frequency from a camera on the portable tripod assembly to the fixed receiver, which is then viewed in the conference room(s). Using the duplex audio communication system, the camera operator can receive instructions from either the local or remote conference rooms as to where to shoot, or when to adjust the transmit antenna for optimum picture clarity.

CHAPTER 3 Operating the LIBERTY 2000

Part One: Establishing a Duplex Audio Link

1. Using a large blade flathead screwdriver or a small coin, remove the back cover from the belt-pack transceiver and install a fully charged battery module, making sure contacts are aligned.
2. Re-close cover and plug headset into belt-pack.
3. Power up the Base Station by depressing the **Power** switch located on the left side of the front panel.
4. Depress the **Aux Audio** switch located in the middle of the front panel. Make sure the slide switch on the rear panel marked Transmit is either in the **Cont** or **Remote** position.
5. Power up the belt-pack transceiver by rotating the OFF/ON Volume Control thumb-wheel switch counterclockwise until it clicks, and adjust audio to a comfortable level. Observe the front panel of the base station and depress the **Carrier Status** switch that corresponds to the green LED which lit up when you turned on the belt pack. If more than one belt-pack transceiver is being used, repeat this process for each one.
6. To transmit audio from the microphone connected to the belt-pack transceiver, depress the **Talk** switch and hold for PTT function. This enables the talk function and the green light next to the **Talk** switch will be on as long as you are holding down this switch. You should be able to hear yourself in the earphone if everything is set correctly and you are within range of the base station. To lock the microphone into continuous talk mode, for hands-free audio transmission, double-click the **Talk** switch so that the green **Talk** indicator light remains on.
7. When finished using the system, remember to turn off the belt-pack transceivers by rotating the thumb-wheel switch clockwise until it clicks. If the red LED on belt-pack is on continuously, the batteries should be recharged or replaced.

Part Two: Establishing a Wireless Camera Link

1. Set up 2000T remote tripod assembly at desired location, and adjust patch antenna at top of gooseneck so that the front side of antenna is aimed in direct line of sight with 2000V Receive Antenna Array (located near ceiling or against wall).
2. Power up system by turning on main battery pack and switching wireless video transmitter to ON position.
3. Power up video camera and set up shot utilizing methods covered in section entitled **Basic Videographic Techniques for Industrial Applications**.
4. Determine if picture is clear by communicating with viewer on receive end using duplex audio link.
5. If picture at receive end is not clear or is experiencing multipath interference, re-align patch antenna by adjusting it's direction. Try bouncing signal off the roof or an adjacent wall. If picture is still breaking up, move entire tripod a foot or so in any direction until the shot stabilizes.
6. Proceed to shoot target subject matter per instructions at receive end and maintain communications on quality of video picture as you need to establish a clear link every time you move to a new location.

Part Three: Basic Videographic Techniques For Industrial Applications

When shooting video for a live audience, it is important to remember that the camera is the only set of eyes and ears the viewers have. Everyone viewing the picture has to process the information at their own pace. Unless you are instructed otherwise, **zoom** in and out **slowly**. Try to zoom as **smoothly** as possible. Above all, the most important thing to remember is to try to **keep the camera as steady as possible at all times**. Also, try to keep in focus at all times. If you get out of focus, try to focus back again as smoothly as you can. One tip that can help you regain focus easily (especially when using auto focus) is to simply zoom out to a wide angle shot, then slowly zoom back in on the target subject. Maintaining slow, graceful movements are the key to shooting good video.

When moving the camera to a different location or going hand-held, or even panning onto a new subject, always zoom out to a fairly wide angle shot before proceeding. Otherwise, if you are zoomed in and have a narrow-angle lens position, the wobbles of your camera will be so highly exaggerated that the viewers can become dizzy or seasick. This is a prime example of bad videography. Remember to always zoom out before changing the shot.

Communication between cameraperson and conference room camera director is extremely important, especially when a live wireless video transmission is in progress. Not only should the remote camera operator be listening for instructions on what to shoot, but also if the image is being received clearly. When transmitting video via microwave radio frequency in a noisy factory environment with many reflective surfaces and constantly moving objects, proper antenna positioning is critical. The only thing worse than bad video camera work is an unstable picture.

The remote camera operator must make sure that the transmit antenna is correctly aimed at the receive antenna array and a stable picture is achieved before proceeding with camera adjustment. The only way the remote camera operator knows if the picture is clear is to communicate with the end viewer in the conference room. It may mean moving the entire tripod a foot or so in any direction, or even bouncing the signal off a wall or ceiling in order to get a picture that is free of multipath interference. In some cases, it may never be possible to get a 100% perfect picture, but as long as it's mostly stable, the shot can be conveyed satisfactorily. Always remember, when dealing with microwave radio transmission, there are three words to keep in mind which are the key to a stable signal: **Location...Location...Location**.

There may be some situations when the target object to shoot is just out of range of the receive antenna, and a stable picture from the tripod is impossible. In this case, a hand-held shot would be required. To do this, simply position the tripod/transmitter unit as close to the target as possible while remaining in range of receiver and maintaining a clear picture. If the camera is being powered by the same powerpack as the transmitter, replace the 12V adapter on the camera with a separate battery pack, and release the camera from the tripod. The video/audio cable between the camera and the transmitter may need to be exchanged with a longer one if it is too short to reach the target area.

When going hand-held, keeping the camera steady will be even more difficult than when it's mounted on a tripod. In order to minimize jerky or choppy movements, aim the camera with your whole upper body, and have your legs absorb all the wiggles and bumps. Always remember the key to successful videography is slow, smooth fluid movement.

Chapter 4 Troubleshooting

Problems Establishing a Wireless Camera Link

<i>Symptom</i>	<i>Probable Cause</i>	<i>Look For</i>
Monitor Screen Black	No video signal being sent to monitor.	Broken transmission line between video receiver and monitor or no power to video receiver.
Noise only, no video image on monitor.	Video receiver transmitting to monitor but receiving no signal from transmitter.	No power to transmitter or antennas broken off or removed from transmitter or receiver.
Diagonal lines on monitor but no video image.	Video transmitter on with no video signal input to transmitter.	No power to camera or cable disconnected between transmitter and camera.
Noisy video image on monitor. Noise is “snow” or “sparkle” in image.	Weak signal from transmitter.	<ul style="list-style-type: none"> a. Transmission range in excess of 500 feet line of sight. b. Damaged or removed transmit or receive antenna’s. c. Failure in receiver or transmitter. To check this measure RSSI signal at receiver (see manual for instructions) when transmitting from 50 - 100 feet. RSSI should be 2.1 - 2.5 volts.
Video image on monitor “breaks up” or “tears”.	Multipath from reflected signals.	Move transmitter antenna 0.5 to 3.0 feet until stable image is present on monitor.

Problems Establishing a Wireless Audio Link

<i>Symptom</i>	<i>Probable Cause</i>	<i>Look For</i>
No Audio Signal	No audio signal being sent to or received from codec.	Broken transmission line between audio base station and codec or power off at base station or low battery in belt pack. (Make sure push to talk button on belt pack is operated correctly).
Audio transmission “breaks up” in use.	Weak audio transmission between base station and belt pack.	<ul style="list-style-type: none"> a. Transmission range in excess of 1000 feet line of sight. b. Damaged or removed transmit or receive antenna’s in base station or belt pack. c. Low battery level in belt pack.

Chapter 5 Applications for the LIBERTY 2000

Training with the LIBERTY 2000

Trouble Shooting & Servicing Equipment with the LIBERTY 2000

Project Management with the LIBERTY 2000