Certification Exhibit

FCC ID: YKD-25STW4100-019

FCC Rule Part: CFR 47 Part 90, DA 09-2482

ACS Project: 13-2037

Manufacturer: L-3 Communications CyTerra Corporation
Model: Range-R 2D

User Manual

FCC COMPLIANCE

WARNING

Do not open the unit. There are no user serviceable parts contained within the unit, and opening or tampering with it will void the FCC certification and the manufacturer's warranty.

This device is approved for use by the FCC under FCC Order DA 09-2482, FCC ID YKD-25STW4100-019.

Warning: Changes or modifications to this device not expressly approved by **L-3 CyTerra** could void the user's authority to operate the equipment.

"This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment may operate in direct contact with the body of the user under normal operating conditions. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter."

 "NOTE: 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:"
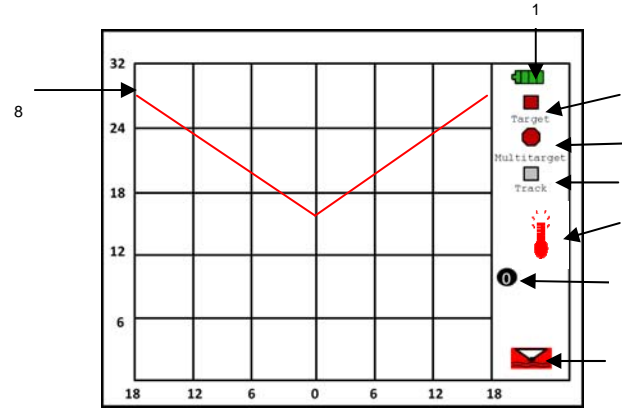
• Reorient or relocate the receiving antenna.

• 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.

For any questions related to FCC compliance contact L-3 CyTerra Technical Support.

This RANGE-R 2D Handheld Through Wall Radar is controlled under the U.S. International Traffic in Arms Regulations (ITAR) and may not be exported without proper authorization by the U.S. Department of State.
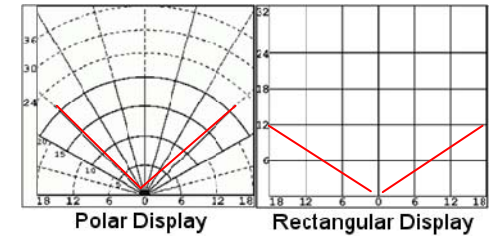
**RADAR SET,
RANGE-R 2D**

INDICATORS AND SYMBOLS

1	Battery Life indicator
2	Target Symbol
3	Multi-Target Symbol
4	Track Symbol
5	Brightness Level/Over Temp indicator (Replaces Brightness)
6	Number of Targets Displayed
7	Operator Movement Indicator/Backside Motion Indicator (only one displayed at a time, neither are displayed in normal operation)
8	Readout Map

PREPARATION FOR USE

SENSOR SET UP
1. Remove the RANGE-R 2D and soft case from the storage container.
2. Remove the RANGE-R 2D from the soft case.
3. Make a visual inspection to ensure there is no external damage to the housing or LCD screen

BATTERY INSTALLATION
1. Turn both thumbscrews that secure the battery cover counterclockwise to loosen them and remove the battery cover.
2. Place batteries into the compartment. Place them in the orientation shown in the internal plastic molding of the compartment.
3. Replace the battery cover. Line the thumbscrews up with their corresponding holes.
4. Turn the thumbscrews clockwise to tighten and secure the battery cover.
5. **DO NOT MIX BATTERIES.**

BRIGHTNESS ADJUSTMENT
1. Power on the RANGE-R 2D sensor by depressing and releasing both Scan Buttons.
2. Hold the RANGE-R 2D sensor horizontally.
3. Press the top Scan Button to increase the brightness and the bottom Scan Button to decrease the brightness. The brightness level will be represented by a number between 0 and 255 displayed on the LCD screen.
4. Continue until the desired brightness level is displayed.

MAIN MENU
1. Hold the RANGE-R 2D sensor horizontally and press and release both Scan Buttons to power the sensor on. The sensor will boot to Scan Mode.
2. While the sensor is in Scan Mode, press both Scan Buttons and release to enter Menu Mode. The sensor will display the MAIN MENU.

SHUTDOWN TIMEOUT SELECTION (FROM THE MAIN MENU)
1. Use the bottom Scan Button to cycle through the menu options until SHUTDOWN TIMEOUT is highlighted.
2. Use the top Scan Button to select the highlighted option.
3. On the SHUTDOWN TIMEOUT Menu, use the bottom Scan Button to cycle through the menu options until the desired option is highlighted.
4. Use the top Scan Button to select the highlighted option.
5. Select BACK to return to the MAIN MENU or both Scan Buttons to resume operation.

INDICATORS AND SYMBOLS

Polar Display   Rectangular Display

GRID SELECTION (FROM THE MAIN MENU)
1. Use the bottom Scan Button to cycle through the menu options until GRID SELECT is highlighted.
2. Use the top Scan Button to select the highlighted option.
3. On the GRID SELECT Menu, use the bottom Scan Button to cycle through the menu options until the desired option is highlighted.
4. Using the top Scan Button, highlight either the Rectangular or Polar Grid option.
5. Select BACK to return to the MAIN MENU or both Scan Buttons to resume operation

VARIABLE FIELD OF VIEW (FOV) SELECTION (FROM THE MAIN MENU)
1. Use the bottom Scan Button to cycle through the menu options until VARIABLE FOV is highlighted.
2. Use the top scan button to select VARIABLE FOV (the current setting will be displayed).

OPERATING PROCEDURES

SCAN MODE
1. Hold the sensor horizontally and steadily against a wall. Ensure the operator and any personnel behind or near the sensor remain as still as possible. The level of operator movement is displayed in the lower right corner of the display. Too much movement may cause false alarms or degradation in detection capabilities.
2. Press and release both Scan Buttons to power on the sensor and begin scanning. Watch the display for a detection indication. It takes approximately three seconds to detect a moving target and up to six seconds to detect a near stationary target. The best detection performance occurs directly in front of the unit, and extends out ±60 degrees in a conical pattern. Outside this region, detection performance rapidly falls off to a minimum at ±90 degrees, creating blind spots in close proximity and at sharp angles from the unit.
3. Whenever possible, repeat the procedure at multiple locations along the wall surface to ensure accuracy of results and maximize coverage area.
4. Be sure that the first wall in scanning range is visible and is shown at the correct range on the display
5. The RANGE-R 2D will go into standby mode after 1 minute of scanning.

INTERPRETING RESULTS

Targets are indicated by red squares on the display. Tracking of a target's movement is indicated by white squares. Multiple targets too close to interpret as individual targets, are displayed as a red octagon. The first two walls detected are indicated with bold red horizontal lines. The current field of view (if FOV display is set to ON), are two diagonal lines extending from the 0 point on the readout display. The graphical display uses a grid overlay to show the approximate distance in meters that a detection is located from the sensor with the number zero (0) representing the actual location of the sensor. This can be either on a rectangular grid, which allows for the easy determination of range and cross range to a plotted target, or a polar grid which allows for easy determination of distance and direction to a plotted target.

SCAN TIMES

- The minimum amount of time to detect a stationary target (standing person) is six seconds.
- There is a 2.5 second delay between the real movement and the displayed results. The object is displayed where it was 2.5 seconds ago.
- Object must be separated by at least 2 meters to be displayed as separate targets.

A 15 second scan time is recommended before moving.

CONTROLS AND COMPONENTS
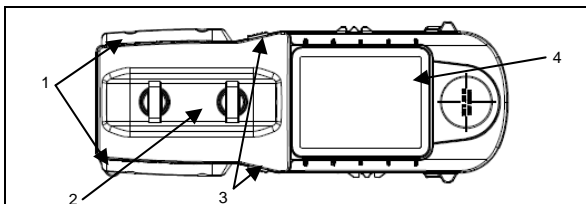
1	Hand Grips
2	Battery Cover
3	Scan Buttons
4	Liquid Crystal Display (LCD)

CONTROL SEQUENCE

Function	Sequence
Power-On	Press and release both Scan Buttons. Sensor will boot to Scan Mode.
Power-Off	Press and hold both Scan Buttons for three (3) seconds.
Increase Brightness	In Scan Mode, press the top Scan button.
Decrease Brightness	In Scan Mode, press the bottom Scan button.
Main Menu	Press and release both Scan Buttons while in Scan Mode.
Cycle Menu Options	Press the bottom Scan Button while in Menu Mode.
Select Menu Option	Press the top Scan Button while the selection is highlighted.
Scan Mode	Press and release both Scan Buttons from any other mode or menu.

THINGS TO KEEP IN MIND WHILE OPERATING THE SYSTEM.

This is a motion detector. It will pick up the movement of any object. This includes but is not limited to:

- The movement of trees and foliage caused by the wind
- Ceiling fans
- Standing fans
- Motors (vehicle or otherwise)
- Vibrating equipment (duct work, compressor, etc)
- Animals
- Friendly personnel (in front or behind the operator)

Any of these moving objects, and others, will appear as targets on the display. There is no way for the operator to determine this "clutter" from an actual target.

METALLIC SURFACES AND OBJECTS

- Sensor cannot penetrate metal surfaces
- Move sensor and attempt to rescan
- Metallic surfaces behind non-metallic surfaces could also block the system (refrigerator, file cabinet).
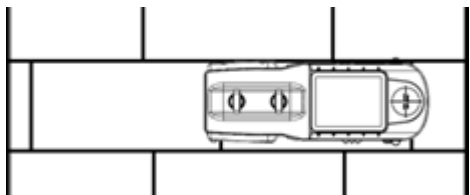
MOISTURE

Moisture content of the structure being scanned will affect the system's ability to "see" through the walls. If the surface is saturated, the system may not be able to detect targets at all.

REARWARD LOOKING ANTENNA
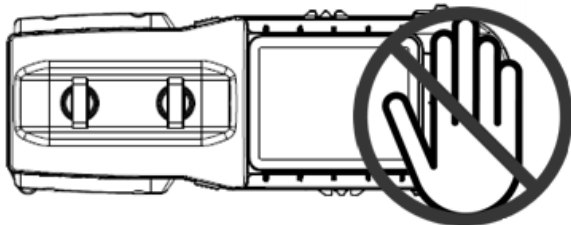
DO NOT BLOCK THE REARWARD LOOKING ANTENNA WHEN SCANNING.

System placement on Block walls

Place the system over one block not between two blocks.

Radar Field of View (FOV)