



DEPARTMENT OF THE NAVY

NAVAL SURFACE WARFARE CENTER

DAHLGREN DIVISION

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IN REPLY REFER TO

8020

Ser B52/4747

APR 28 2010

From: Commander, Naval Surface Warfare Center, Dahlgren Division
To: Lytx, Inc. (G. Sutton), San Diego, CA

Subj: HAZARDS OF ELECTROMAGNETIC RADIATION TO ORDNANCE,
PERSONNEL, AND FUEL ANALYSIS FOR THE LYTX ER-SV2W,
ER-SV2B, AND ER-SF1 VIDEO EVENT RECORDER SYSTEMS INSTALLED
IN ORDNANCE VEHICLES

Ref: (a) NAVSEA OP 3565/NAVAIR 16-1-529, Volume 2, Eighteenth
Revision of 1 Apr 11
(b) NAVSEA OP 3565/NAVAIR 16-1-529, Volume 1, Sixth
Revision of 1 Feb 03
(c) DoDINST 6055.11 of 19 Aug 09
(d) Lytx, Inc. e-mail memo Mr. G. Sutton of 9 Sep 15
(e) Work Request N0017816SD16001 of 27 Jan 16

Encl: (1) System Specifications and Hazards of Electromagnetic
Radiation to Ordnance Safe Separation Distances
(2) System Specifications and Hazards of Electromagnetic
Radiation to Personnel and Fuel Safe Separation
Distances
(3) Distribution List

1. In accordance with references (a) through (c) and as requested by reference (d) and funded by reference (e), a Hazards of Electromagnetic Radiation to Ordnance (HERO), Personnel (HERP), and Fuel (HERF) analysis was performed to assess the impact of using the Lytx ER-SV2W, ER-SV2B, and ER-SF1 video event recorder (VER) systems installed in ordnance vehicles.

2. The Lytx ER-SV2W, ER-SV2B, and ER-SF1 are vehicle-mounted VER systems that contain cameras, wireless modems, and internal meander line antennas. The Lytx VER systems usually are mounted on the windshield or dashboard of the vehicle. The systems automatically transmit audio and video recordings after being triggered by the occurrence of a critical event.

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3. Enclosure (1) provides the system specifications and HERO safe separation distances for the wireless communication transmitters installed in these VER systems. Since these transmitters are independently controlled by the VER system, a recommended HERO safe separation distance of 10 feet (3 meters) should be maintained between these VER systems and any ordnance operations involving HERO UNSAFE and HERO SUSCEPTIBLE ORDNANCE items.

4. Ensure that a HERO warning label is affixed in view of the vehicle operator. Complete the label with the appropriate safe separation distance specified in paragraph 3 for HERO UNSAFE ORDNANCE and HERO SUSCEPTIBLE ORDNANCE. HERO warning labels may be downloaded from the Naval Ordnance Safety and Security Activity (NOSSA) web-site at www.nossa.navsea.navy.mil.

5. Enclosure (2) provides the system specifications and HERP/HERF safe separation distances. Calculated electromagnetic environments show that the maximum permissible exposure limits for personnel were not exceeded at any distance. Therefore, no safe separation distances are required for personnel.

6. Ensure a minimum HERF separation distance of 10 feet (3 meters) is maintained between these VER systems and any fueling/defueling operations.

7. Based on this analysis, the Naval Surface Warfare Center, Dahlgren Division (NSWCDD), Electromagnetic Environmental Effects (E3) Assessment and Evaluation Branch (B52), recommends that all installations planning to use this system request radiation hazard (RADHAZ) (HERO, HERP, and HERF) certification from NOSSA (N8) for the equipment described in the preceding paragraphs. Upon receipt of certification from NOSSA (N8), NSWCDD (B52) recommends incorporating enclosure (1) into the installation's HERO Instruction/Bill and enclosure (2) into the installation's RADHAZ HERP/HERF control measures. All updates may be found on the Electromagnetic Environmental Effects (E3) Team Online Knowledge Management System (KMS).

8. The E3 Team Online KMS is an official Department of the Navy web portal that provides access to HERO, HERP, and HERF E3 data; technical reports; and RADHAZ calculation tools. E3 Team Online

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can be accessed at <https://e3.nswc.navy.mil>. A valid Common Access Card is required for access to this web portal. To request an E3 Team Online account, visit <https://www.e3teamonline.org>. Upon receipt of account approval, visit <https://e3.nswc.navy.mil> for log-in. Questions regarding E3 Team Online content should be directed to Mr. Richard Magrogan, NSWCDD (B52), at commercial 540-653-3445 or DSN 249-3445, or via electronic mail at richard.magrogan@navy.mil. Questions regarding access to E3 Team Online should be directed to Ms. Rebecca Payne, AECOM, at commercial 540-663-9460 or via electronic mail at rebecca.payne@aecom.com.

9. This system is recommended for HERO/HERP/HERF approval provided the safe separation distances for ordnance contained in enclosure (1) and for fuel contained in enclosure (2) are observed.

10. Enclosure (3) is the distribution list for this letter.

11. If there are any questions or comments, please contact Steven Springer (B52) at commercial 540-653-2931 or DSN 249-2931, or via electronic mail at steven.p.springer@navy.mil.



RICHARD F. MAGROGAN
By direction

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NAVFAC PACIFIC PEARL HARBOR HI (BD1/M. Ishida, PW6/K. Fukuda)
NAS PATUXENT RIVER MD (GEMO/M. Agamaite)
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NAVY REGION HI (Explosive Safety Manager/B. Shaw)
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SYSTEM SPECIFICATIONS AND HAZARDS OF ELECTROMAGNETIC RADIATION TO
ORDNANCE SAFE SEPARATION DISTANCES

SYSTEM SPECIFICATIONS AND HERO SAFE SEPARATION DISTANCES

Separation Distances

Antenna Location	Antenna Nomenclature	Antenna Type	Antenna Gain (dBi)	Transmitter Frequency (MHz)	Transmitter Max. Avg. Power (watts)	Transmitter Type	HERO UNSAFE ORDNANCE (feet/meters)	HERO SUSCEPTIBLE ORDNANCE (feet/meters)
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	698-716	0.32	LYTX ER-SF1 (WP7504 CDMA 700)	10/3	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	704-787	0.32	LYTX ER-SF1 (HL7588 GSM 710)	10/3	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	777-787	0.32	LYTX ER-SF1 (HL7588 GSM 750)	10/3	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	815-849	0.32	LYTX ER-SF1 (WP7504 CDMA 850)	10/3	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	824-849	0.32	LYTX ER-SF1 (HL7588 GSM 850)	10/3	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	824-849	2.00	LYTX ER-SF1 (HL8548)	10/3	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	880-915	2.00	LYTX ER-SF1 (HL8548)	10/3	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	1710-1755	0.32	LYTX ER-SF1 (HL7588 DCS 1800)	10/3	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	1710-1755	0.32	LYTX ER-SF1 (WP7504 PCS 1800)	10/3	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	1710-1785	1.00	LYTX ER-SF1 (HL8548)	10/3	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	1850-1915	0.10	LYTX ER-SF1 (HL8548)	10/3	5/1.5
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	1850-1915	0.32	LYTX ER-SF1 (WP7504 PCS 1900)	10/3	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	1850-1915	0.32	LYTX ER-SF1 (HL7588 PCS 1900)	10/3	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	1922-1978	0.32	LYTX ER-SF1 (HL8548)	10/3	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	2400-2462	0.01	LYTX ER-SF1 (WP7504 BLUETOOTH)	0/0	0/0
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	2400-2462	0.01	LYTX ER-SF1 (HL7588 BLUETOOTH)	0/0	0/0
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	2400-2462	0.10	LYTX ER-SF1 (HL7588 802.11B/G/N)	10/3	5/1.5
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	2400-2462	0.10	LYTX ER-SF1 (WP7504 802.11B/G/N)	10/3	5/1.5
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	2412-2462	0.32	LYTX ER-SF1 (HL8548)	10/3	10/3

SYSTEM SPECIFICATIONS AND HERO SAFE SEPARATION DISTANCES (CONT.)

Separation Distances

Antenna Location	Antenna Nomenclature	Antenna Type	Antenna Gain (dBi)	Transmitter Frequency (MHz)	Transmitter Max. Avg. Power (watts)	Transmitter Type	Separation Distances	
							HERO UNSAFE ORDNANCE (feet/meters)	HERO SUSCEPTIBLE ORDNANCE (feet/meters)
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	2412-2462	0.32	LYTX ER-SF1 (HL7588 LTE)	10/3	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	2412-2462	0.32	LYTX ER-SF1 (WP7504 LTE)	10/3	10/3
MOBILE (LYTX VER)	ETHERTRONICS 1001013	MEANDER LINE	2.1	2412-2462	0.01	LYTX ER-SV2B (BLUETOOTH 2.1+EDR)	0/0	0/0
MOBILE (LYTX VER)	ETHERTRONICS 1001013	MEANDER LINE	2.1	2412-2462	0.10	LYTX ER-SV2B (802.11B/G/N)	10/3	5/1.5
MOBILE (LYTX VER)	LYTX ER-SV2W	MEANDER LINE	1.2	815-849	0.32	LYTX ER-SV2W (GEMALTO PVS8 CDMA 850)	10/3	5/1.5
MOBILE (LYTX VER)	LYTX ER-SV2W	MEANDER LINE	1.2	815-849	3.16	LYTX ER-SV2W (GEMALTO PHS8-US GSM 850)	10/3	10/3
MOBILE (LYTX VER)	LYTX ER-SV2W	MEANDER LINE	1.2	880-915	3.16	LYTX ER-SV2W (GEMALTO PHS8-E GSM 900)	10/3	10/3
MOBILE (LYTX VER)	LYTX ER-SV2W	MEANDER LINE	1.2	1710-1785	1.59	LYTX ER-SV2W (GEMALTO PHS8-E GSM 1800)	10/3	10/3
MOBILE (LYTX VER)	LYTX ER-SV2W	MEANDER LINE	1.2	1850-1910	0.32	LYTX ER-SV2W (GEMALTO PVS8 CDMA 1900)	10/3	5/1.5
MOBILE (LYTX VER)	LYTX ER-SV2W	MEANDER LINE	1.2	1850-1910	1.59	LYTX ER-SV2W (GEMALTO PHS8-US GSM 1900)	10/3	10/3
MOBILE (LYTX VER)	LYTX ER-SV2W	MEANDER LINE	1.2	1920-1980	0.32	LYTX ER-SV2W (GEMALTO PHS8-E GSM 2100)	10/3	5/1.5

VER = Video Event Recorder

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**SYSTEM SPECIFICATIONS AND HAZARDS OF ELECTROMAGNETIC RADIATION TO
PERSONNEL AND FUEL SAFE SEPARATION DISTANCES**

Enclosure (2)

SYSTEM SPECIFICATIONS AND HERP/HERF SAFE SEPARATION DISTANCES

Antenna Location	Antenna Nomenclature	Antenna Type	Antenna Gain (dBi)	Transmitter Frequency (MHz)	Transmitter Max. Avg. Power (watts)	Transmitter Type	Separation Distances	
							Controlled HERP (feet/meters)	HERF (feet/meters)
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	698-716	0.32	LYTX ER-SF1 (WP7504 CDMA 700)	0/0	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	704-787	0.32	LYTX ER-SF1 (HL7588 GSM 710)	0/0	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	777-787	0.32	LYTX ER-SF1 (HL7588 GSM 750)	0/0	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	815-849	0.32	LYTX ER-SF1 (WP7504 CDMA 850)	0/0	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	824-849	0.32	LYTX ER-SF1 (HL7588 GSM 850)	0/0	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	824-849	2.00	LYTX ER-SF1 (HL8548)	0/0	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	880-915	2.00	LYTX ER-SF1 (HL8548)	0/0	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	1710-1755	0.32	LYTX ER-SF1 (HL7588 DCS 1800)	0/0	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	1710-1755	0.32	LYTX ER-SF1 (WP7504 PCS 1800)	0/0	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	1710-1785	1.00	LYTX ER-SF1 (HL8548)	0/0	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	1850-1915	0.10	LYTX ER-SF1 (HL8548)	0/0	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	1850-1915	0.32	LYTX ER-SF1 (WP7504 PCS 1900)	0/0	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	1850-1915	0.32	LYTX ER-SF1 (HL7588 PCS 1900)	0/0	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	1922-1978	0.32	LYTX ER-SF1 (HL8548)	0/0	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	2400-2462	0.01	LYTX ER-SF1 (WP7504 BLUETOOTH)	0/0	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	2400-2462	0.01	LYTX ER-SF1 (HL7588 BLUETOOTH)	0/0	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	2400-2462	0.10	LYTX ER-SF1 (HL7588 802.11B/G/N)	0/0	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	2400-2462	0.10	LYTX ER-SF1 (WP7504 802.11B/G/N)	0/0	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	2412-2462	0.32	LYTX ER-SF1 (HL8548)	0/0	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	2412-2462	0.32	LYTX ER-SF1 (HL7588 LTE)	0/0	10/3
MOBILE (LYTX VER)	ETHERTRONICS P822601	MEANDER LINE	3.9	2412-2462	0.32	LYTX ER-SF1 (WP7504 LTE)	0/0	10/3
MOBILE (LYTX VER))	ETHERTRONICS 1001013	MEANDER LINE	2.1	2412-2462	0.01	LYTX ER-SV2B (BLUETOOTH 2.1+EDR)	0/0	10/3
MOBILE (LYTX VER)	ETHERTRONICS 1001013	MEANDER LINE	2.1	2412-2462	0.10	LYTX ER-SV2B (802.11B/G/N)	0/0	10/3
MOBILE (LYTX VER)	LYTX ER-SV2W	MEANDER LINE	1.2	815-849	0.32	LYTX ER-SV2W (GEMALTO PVS8 CDMA 850)	0/0	10/3
MOBILE (LYTX VER)	LYTX ER-SV2W	MEANDER LINE	1.2	815-849	3.16	LYTX ER-SV2W (GEMALTO PHS8-US GSM 850)	0/0	10/3
MOBILE (LYTX VER)	LYTX ER-SV2W	MEANDER LINE	1.2	880-915	3.16	LYTX ER-SV2W (GEMALTO PHS8-E GSM 900)	0/0	10/3

**SYSTEM SPECIFICATIONS AND HERP/HERF SAFE SEPARATION DISTANCES
(CONT.)**

Antenna Location	Antenna Nomenclature	Antenna Type	Antenna Gain (dBi)	Transmitter Frequency (MHz)	Transmitter Max. Avg. Power (watts)	Transmitter Type	Separation Distances	
							Controlled HERP (feet/meters)	HERF (feet/meters)
MOBILE (LYTX VER)	LYTX ER-SV2W	MEANDER LINE	1.2	1710-1785	1.59	LYTX ER-SV2W (GEMALTO PHS8-E GSM 1800)	0/0	10/3
MOBILE (LYTX VER)	LYTX ER-SV2W	MEANDER LINE	1.2	1850-1910	0.32	LYTX ER-SV2W (GEMALTO PVS8 CDMA 1900)	0/0	10/3
MOBILE (LYTX VER)	LYTX ER-SV2W	MEANDER LINE	1.2	1850-1910	1.59	LYTX ER-SV2W (GEMALTO PHS8-US GSM 1900)	0/0	10/3
MOBILE (LYTX VER)	LYTX ER-SV2W	MEANDER LINE	1.2	1920-1980	0.32	LYTX ER-SV2W (GEMALTO PHS8-E GSM 2100)	0/0	10/3

VER = Video Event Recorder

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DISTRIBUTION LIST

DISTRIBUTION LIST FOR HERO, HERP, AND HERF ANALYSIS FOR THE LYTX ER-SV2W,
ER-SV2B, AND ER-SF1 VER SYSTEMS INSTALLED IN ORDNANCE VEHICLES

Primary Recipient:

PLA: LYTX, INC (G. Sutton)

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PLA: SPAWARSYSCEN PACIFIC SAN DIEGO CA (Code 5232JM/J. Munechika)

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PLA: CG MCI EAST (Spectrum Manager/P. Mullican)

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