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LASER CLEARINGHOUSE REPORTS HANDBOOK

Change 10
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Summary of Changes

Version	Summary of Changes
Initial approval	Initial release, October 14, 2004; signed by Captain Patrick M. Mills, U.S. Navy, Director of Operations for Cheyenne Mountain Operations Center, U.S. Strategic Command.
Revision A	Revision A1, dated March 15, 2005 was signed by Captain Patrick M. Mills, U.S. Navy, Director of Operations for Cheyenne Mountain Operations Center, U.S. Strategic Command. Contains editorial and administrative updates.
Change 1	Change 1 dated August 26, 2006 was signed by MAJ Patrick Suggs, U.S. Army. The primary change was to delete the electronic message formats covered in the recently published LCH Spiral 3 Deconfliction System Interface Control Document. In addition, administrative updates were made to reflect the evolving organizational titles in USSTRATCOM and the Cheyenne Mountain Directorate plus a new unclassified email address for the Space Control Center.
Change 2	Updated the Inadvertent Illumination Notification and Report to add clarification. In addition, administrative updates were made to reflect the organizational title of the Joint Space Operations Center (replacing the Space Control Center).
Change 3	Revised the title of the Notification of Laser Firing Outside Authorized P/A Parameters and Report of Laser Firing Outside Authorized P/A Parameters. Added in Laser Activity Summary Report information.
Change 4	Revised J95 to USV and replaced JSpOC SSA Ops to Combat Operations Division (COD) Space Battle Duty Technician (SBDT). Updated LCH and COD contact information. Updated ICD to LP 14-1.
Change 5	Revised JSpOC USV to J3 and replaced JSpOC Space Battle Duty Technician with Senior Awareness Duty Technician (SADT). Updated LCH and SADT contact information. Updated Space Deconfliction System Interface Control Document (ICD) to LP 14-2. Also changed "predictive avoidance" terminology to "deconfliction." Renamed "Laser Test Master Schedule" to "Master Test and Operations Schedule." Incorporated "30-Day Outlook" into "Master Test and Operations Schedule."
Change 6	Various wording and formatting changes, as well as simplification of report templates.
Change 7	Document re-format with individual IER pages and additional details.
Change 8	Major process revisions to account for the removal of the ADO position and the impact on LCH operations. Added Appendixes A, B, and C.
Change 9	Various formatting changes and updates to email addresses.
Change 10	Updates to email addresses/Updates to Decentralized verbiage and formatting/Added the Satellite Owner/Operator Permissions Letter section (IER 3D-9). Fixed formatting issues within templates.

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SECTION 1: Introduction

1.1 Purpose

The Laser Clearinghouse (LCH) Reports Handbook contains verbal and electronic report and message templates required for information and data exchange between laser owners/operators (LO/O) and LCH. Additional data exchange formats are defined in the Space Deconfliction System (DECON) Interface Control Document (ICD)¹. This handbook applies to any laser program receiving deconfliction support from LCH.

LCH and LO/Os must work together to provide safe and responsible laser activities, as required by Department of Defense Instruction (DoDI) 3100.11² and Chairman of the Joint Chiefs of Staff Instruction 3225.01B³. LO/Os with Category II and III lasers require Space Forces Space (S4S) authorization to conduct laser activities per U.S. Strategic Command (USSTRATCOM) Instruction 534-12⁴. Authorization is granted upon approval of the laser program's Deconfliction and Capability Validation plan. LO/Os must obtain deconfliction from LCH prior to conducting laser activities in accordance with individual laser deconfliction plans.

Laser owners/operators currently conducting activities under previous agreements may continue to do so, with the understanding that further implementation of the DoDI or other changes to the deconfliction process may prompt mandatory revision to applicable agreements.

A Glossary of References and Supporting Information is included at Attachment 1.

1.2 Handbook Maintenance

LCH is the author and distribution authority for this Handbook. The LCH Chief can approve and implement revisions and updates as required. At a minimum, the Handbook will be reviewed every two years.

1.3 Points of Contact

Table 1 on the next page lists phone numbers and e-mail addresses for LCH.

¹ *Interface Control Document for the USSTRATCOM JFCC SPACE [LP 22-1] Space Deconfliction System*, DM-06914-A001, 04 August 2023.

² DoDI 3100.11, *Management of Laser Illumination of Objects in Space*, 24 October 2016

³ CJCSI 3225.01B, *Procedures for Management of Illumination of Objects in Space*, 29 March 2023.

⁴ SI 534-12, *Laser Deconfliction Processes*, 25 July 2007.

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Table 1 - Points of Contact

	LCH
Address	S4S S3/5 LCH 816 13th Street, Building 7000, Room A217A Vandenberg SFB, CA 93437
Office Hours	0730 - 1630 PT, Monday thru Friday, excluding Federal holidays and designated down days
E-mail NIPR	laserclearinghouse@us.af.mil
SIPRNet	ussf.vandenberg.s4s.mbx.cs poc-lch@mail.smil.mil
JWICS	~USAF-WCVAND_s4s.laserclearinghouse@af.ic.gov
Unclassified LCH Phone	(805) 605-4763, DSN 275-4763 (805) 606-7410, DSN 276-7410 (805) 605-4736, DSN 275-4736 (805) 606-7961, DSN 276-4961
Secure LCH Phone	829-1001 829-1008 829-1013
CSpOC CCO Phone	805-605-3514 NOTE: The CSpOC does not generate deconfliction products. Only contact for emergency LCH notifications.

1.4 Information Exchange Requirements (IERs)

Table 2 summarizes the IERs necessary to support deconfliction. In the IER # column, a “C” designation identifies IERs unique to centralized deconfliction and a “D” those unique to decentralized deconfliction. Note: ‘C’ and ‘D’. The Table lists whether the format is verbal or digital. See section 2.1 for detailed information on verbal and digital reports.

Reports may be Classified or Unclassified. Classification will be based on the laser system’s Security Classification Guide (SCG), the LCH Classification Guideline memorandum, and other SCGs as required. Space-Track.org is the preferred method of digital reporting of UNCLASSIFIED information. The Secure Internet Protocol Router Network (SIPRNet) is the preferred method of digital reporting of SECRET information. The Joint Worldwide Intelligence Communications System (JWICS) will be used for information at higher classifications. For additional higher classification digital reporting options please contact the LCH.

During a standard work week (see Table 1), LCH generates deconfliction products Mondays, Wednesdays, and Fridays for subsequent days. Adhering to the submission timelines outlined in Table 2 is critical to the information exchange process. **Late requests may not be fulfilled due to processing requirements.** Unique requests require prior coordination with LCH.

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Table 2 - Information Exchange Requirements for Deconfliction

IER	Title	Reference	Format	From → To	Submission / Delivery
1	Master Test and Operations Schedule (MTOS)	Handbook Section 2.2.1	DIGITAL MTOS Input Form (.xlsx) ¹	LO/O - to - LCH	Submit via e-mail NLT the 15 th of each month for the following month to: laserclearinghouse@us.af.mil
2-C	Program Request Message (PRM)	Handbook Section 2.2.2 ICD Section 4.2.1.1.	DIGITAL PRM Strict Text (.txt) ¹	LO/O - to - LCH	<u>Execution Requests</u> : Submit via space-track.org NLT 3 days prior to the laser activity. <u>Planning Requests</u> : Submit up to 30 days in advance of the laser activity.
2-D	Decentralized Request Message (DRM)	Handbook Section 2.2.2	DIGITAL DRM Strict Text (.txt) ¹	LO/O - to - LCH	Submit IAW signed Appendix A of the Standard Plan NLT 3 days prior to the laser activity IAW the CSpOC SOP for Data Transfer of Laser Deconfliction Products.
3-C	Program Approval Message (PAM)	Handbook Section 2.2.4 ICD Section 4.2.2.2.	DIGITAL PAM Strict Text (.txt) ¹	LCH - to - LO/O	Delivered via space-track.org NLT 1 day prior to the laser activity.
3-D1	Unique Protect List (UPL)	Handbook Section 2.2.5 ICD Section 4.2.2.3.	DIGITAL Strict Text (.txt) ⁴	LCH - to - LO/O	Delivered via SIPR SharePoint NLT 1 day prior to the laser activity IAW the CSpOC Standard Operating Procedure (SOP) for Data Transfer of Laser Deconfliction Products.
3-D2	Two-Line Element (TLE) Set	Handbook Section 2.2.6 ICD Section 4.2.1.4.	DIGITAL TLE Strict Text (.txt) ³	LCH - to - LO/O	Delivered via SIPR SharePoint NLT 1 day prior to the laser activity IAW the CSpOC SOP for Data Transfer of Laser Deconfliction Products.
3-D3	Vector Covariance Message (VCM)	Handbook Section 2.2.7 ICD Section 4.2.1.9.	DIGITAL VCM Strict Text (.txt)	LCH - to - LO/O	Delivered via SIPR SharePoint NLT 1 day prior to the laser activity IAW the CSpOC SOP for Data Transfer of Laser Deconfliction Products.
3-D4	Sigma Multiplier (SMP) File	Handbook Section 2.2.8 ICD Section 4.2.2.6.	DIGITAL SMP Strict Text (.txt)	LCH - to - LO/O	Delivered via SIPR SharePoint NLT 1 day prior to the laser activity IAW the CSpOC SOP for Data Transfer of Laser Deconfliction Products.
3-D5	Time Constants (TCON)	Handbook Section 2.2.9 ICD Section 4.2.1.6.	DIGITAL Time Strict Text (.txt) ⁵	LCH - to - LO/O	Delivered via SIPR SharePoint NLT 1 day prior to the laser activity IAW the CSpOC SOP for Data Transfer of Laser Deconfliction Products.
3-D6	Unique Laser Susceptibility (ULS) File	Handbook Section 2.2.10 ICD Section 4.2.2.5.	DIGITAL ULS Strict Text (.txt) ²	LCH - to - LO/O	Delivered via SIPR SharePoint NLT 1 day prior to the laser activity IAW the CSpOC SOP for Data Transfer of Laser Deconfliction Products.
3-D7	Lasing Approval List (LAL) Memorandum	Handbook Section 2.2.11	DIGITAL Memo Text Format (.pdf)	LCH - to - LO/O	Delivered via the space-track.org LCH Help page when it is updated by LCH IAW the CSpOC SOP for Data Transfer of Laser Deconfliction Products. <u>NOTE</u> : Used by the LO/O for deconfliction and awareness.

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IER	Title	Reference	Format	From → To	Submission / Delivery
3-D8	Lasing Approval List (LAL) for Decentralized Lasers	Handbook Section 2.2.11 ICD Section 4.2.2.3.	DIGITAL LAL Strict Text (.txt) ⁵	LCH - to - LO/O	Distributed when LALs updated by LCH IAW the CSpOC SOP for Data Transfer of Laser Deconfliction Products. <u>NOTE:</u> Used by the LO/O for decentralized deconfliction only.
3-D9	Satellite Owner/Operator (SO/O) Permission Letter	Handbook Section 2.2.12	DIGITAL Memo Text Format (.pdf) ⁶	LO/O - to - LCH	Submit via e-mail when a new permission letter is signed. <u>NOTE:</u> LCH will update the LAL and post via space-track.org.
4	Laser Status Report	Handbook Section 2.2.13	DIGITAL Text ¹	LO/O - to - LCH	Submit via e-mail one hour prior to mission start. <u>NOTE:</u> No response from LCH is required to proceed.
5	Space Event Notification	Handbook Section 2.2.14	VERBAL ³	LCH or CCO - to - LO/O	Delivered as required via telephone.
6	Quick Look Report	Handbook Section 2.2.15	DIGITAL Text ¹	LO/O - to - LCH	Submit via e-mail within 15 minutes following mission completion. <u>NOTE:</u> No response from LCH is required.
7	Laser Firing Outside Authorized Parameters (LOAP) Notification	Handbook Section 2.2.16	VERBAL ¹	LO/O - to - LCH	Submit via telephone within 15 minutes of suspecting or determining a LOAP occurred.
8	LOAP Report	Handbook Section 2.2.17	DIGITAL Memo Text Format (.doc, .docx, .pdf) ¹	LO/O - to - LCH	Submit via email within 12 hours following LOAP notification.
9	Laser Activity Summary Report (LASR)	Handbook Section 2.2.18 ICD Section 4.2.1.3.	DIGITAL LASR Strict Text (.txt) ¹	LO/O - to - LCH	<u>If linked to a LOAP:</u> Submit via e-mail within 24 hours following LOAP notification. <u>If responding to LCH data request:</u> Submit via e-mail within 3 business days. <u>NOTE:</u> Firing data must be archived for one year to comply with LCH data requests.

Note 1. Classified in accordance with Laser Program SCG per Appendix A of the Standard Plan.

Note 2. Classified in accordance with the SCG for Laser Lethality, Countermeasures, and Counter-Countermeasures, AFRL/DE, November 15, 2004.

Note 3. Classified in accordance with SCG for Space Surveillance Operations, USSTRATCOM, 28 July 2017.

Note 4. Protect list will be a list of numbers generated via the DECON UPL report.

Note 5. Unclassified files may be exchanged along with the classified file transfer.

Note 6. Classified in accordance with Laser Program SCG per Appendix A of the Standard Plan and the and Satellite Owner/Operator SCG.

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SECTION 2: IER Reporting Guidelines and Templates

2.1 Reporting Guidelines

2.1.1 Verbal Reports

Verbal reports are used to announce space events that may impact activities, inform of a laser firing outside authorized parameters, and provide other information necessary to effectively conduct laser activities. The LO/O will initiate a LOAP Notification (IER 7) in accordance with this Handbook. LCH will contact the LO/O with Space Event Notifications (IER 5) if necessary.

Verbal reports will be submitted to LCH during normal duty hours. LCH will make verbal reports to LO/O when necessary. Normal duty hours for LCH are specified in Table 1. LCH should only be contacted during normal duty hours unless other arrangements have been made. During non-duty hours, the CSpOC Chief of Current Operations (CCO) can be contacted for emergency requests (e.g., a LOAP notification). The CCO is directly responsible to the CSpOC Combat Operations Division Chief for day-to-day space mission execution. They command an 11-member crew monitoring the status of forces and ensuring theater support and overall space situational awareness. The CCO will contact on-call LCH personnel if necessary. Phone numbers are provided in Table 1. The purpose, time requirements, and other pertinent details are indicated in each template.

For fully automated laser deconfliction and fire control systems, verbal reports normally provided by telephone may be replaced by system-generated electronic messages. The protocols for generating, sending, and receiving these reports will be defined in the laser system's appendix to the appropriate standard plan.

2.1.2 Digital Messages/Reports

Digital messages/reports are digitally transmitted documents or messages used to formally document laser activity, schedules, submit deconfliction requests, receive deconfliction products, and submit reports. The LO/O will submit MTOS Input Forms (IER 1), PRMs (IER #2-C), DRMs (IER #2-D), SO/O Permission Letters (IER #3-D9), Laser Status Reports (IER #4), Quick Look Reports (IER #6), LOAP Reports (IER #8), and LASRs (IER #9) in accordance with this Handbook, unless otherwise indicated in the laser system's appendix to the appropriate standard plan.

Digital reports will generally be submitted to LCH by means of www.space-track.org, e-mail, or by means otherwise agreed upon with LCH and detailed in the LO/O Appendix A to the appropriate Standard Deconfliction Plan. The preferred means of transmission for classified reports up to collateral SECRET is SIPRNet e-mail. E-mail addresses can be found in Section 1.3 of this handbook.

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2.1.3 File Naming Conventions

There are two types of digital reports: Text and Strict Text. Text reports may contain specific required information but otherwise do not need to fit an exact structure or format. Examples of Text reports include: the Master Test and Operations Schedule (MTOS) Input Form (IER 1) and LOAP report (IER 8). Strict Text reports, however, must adhere to very strict formatting and syntax requirements so that they can be properly parsed and imported by corresponding computer systems. Examples of Strict Text reports include: PRMs, PAMs, and LASRs. Strict Text reports will be constructed and exchanged in configuration-controlled formats consistent with the DECON ICD file naming conventions.

File naming conventions for each IER are found on the subsequent pages of this Handbook. Adherence to naming convention formats for each IER (particularly Strict Text reports), is essential to ensure consistent readability and to maintain uniformity over time.

In such cases that two distinct files are submitted on the same day but have the same filename, mark the end of the file name (before the file extension) with “a”, “b”, etc. Only add a letter at the end if both files are distinct and valid. In cases where one file is replacing another, inform LCH that the file is being replaced and do not add a letter to the end of the replacement file.

Example: PRM_BestCompany_BestProgram_BestLaser_01JAN2016_
For_JDAY005_SATa.txt

PRM_BestCompany_BestProgram_BestLaser_01JAN2016_ For_JDAY005_SATb.txt

2.2 IER Descriptions and Templates

Descriptions and templates for each IER begin on the next page.

[Continued on Next Page]

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2.2.1 IER 1 - Master Test and Operations Schedule (MTOS)

Report Type: DIGITAL - Spreadsheet file

Other References: None

Summary: The MTOS Input Form is a spreadsheet submitted by the LO/O to LCH that provides a forecast of planned and tentative laser activities for at least the next 30 days, and up to the next 12 months. LO/Os will complete the form by using the codes listed at the top of the form. Make use of the comments column to provide any additional details or stipulations.

Frequency / Deadline: Submit monthly, no later than the 15th of the month.

Method of Submission:

Unclassified: e-mail to laserclearinghouse@us.af.mil.

Classified: e-mail to ussf.vandenberg.s4s.mbx.cspoc-lch@mail.smil.mil or contact LCH to determine best means and document in the Deconfliction Plan.

Naming Convention:

Format: MTOS_[Program/Laser Name]_[Date Submitted (YYYYMMDD)].xlsx

Example: MTOS_BestLaser_20170914.xlsx

Template Location: A blank LCH MTOS Input Form can be found on www.space-track.org at: <https://www.space-track.org/documentation#/lch>.

Template / Example:

UP TO UNCLASSIFIED//FOUO ONLY	Month	JAN										
Submit this form by the 15th day of each month. Providing activity forecast for the next 30 days (15th of the current month to the 15th of next month) is essential. Provide additional activity forecast for the next 12 months when available. Tentatively scheduled operations are still appreciated, so please make use of the appropriate code below. Thank you!	Day	01	02	03	04	05	06	07	08	09	10	
	J-Day	001	002	003	004	005	006	007	008	009	010	
	Non-Sat Target											
Annotate Days of Activity via the Code Below: X - Day of Planned or Tentative Firing *Leave All Other Days Blank, Or Provide Comments as Required* Email Form To: laserclearinghouse@us.af.mil with Subject Line: "MTOS - MMMYY - Program Name" Example Email Subject: "MTOS - NOV17 - Laser Program Name Goes Here"	Sat Target											
	Comments											

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2.2.2 IER 2-C - Program Request Message (PRM)

Report Type: DIGITAL - Strict Text file

Other References: DECON ICD Section 4.2.1.1

Summary: The PRM is a Strict Text file used to request centralized deconfliction. PRMs are submitted by the LO/O to LCH and may be “For Execution” (live fire), or “For Planning”, which can assist mission planners in developing execution PRMs.

In response to the PRM, the LCH will generate a PAM. The PAMs are usually generated with “Authorized Shoot (Open) Windows” but “Restricted No-Shoot (Closed) Windows” can also be produced. If closed windows are desired this should be coordinated with LCH prior to execution and noted in the PRM Remarks section. The DECON system can also report only open windows that are of a certain size or larger (e.g., windows 3 minutes or greater). This should also be noted in the Remarks section and prearranged with the LCH.

Frequency / Deadline:

Execution Requests: Submit no later than 3 days prior to the laser activity.

Planning Requests: May be submitted up to 30 days in advance of the listed mission start time.

Method of Submission:

Unclassified: Post to applicable PRM folder on www.space-track.org.

Classified: Contact LCH to determine best means and document in the laser program Appendix A to the Standard Centralized Deconfliction Plan.

Mandatory Naming Convention:

Format: PRM_[Owner/Company Name]_[Program/System Name]_[Laser Name]_[Date of Submission (DDMMYYYY)]_For_JDAY[DDD (Julian Date of Mission Start)]_[Target Type (FFOV, SAT, etc.)].txt

Example:

PRM_BestCompany_BestProgram_BestLaser_01JAN2016_ For_JDAY005_SAT.txt

OR

PRM_Best-Company_Best-Program_Best-Laser_01JAN2016_ For_JDAY005_SAT.txt

NOTE: There must be exactly 7 underscores in the file name

Template Location: See the DECON ICD. Note there are numerous source and target methods and certain allowable source and target method combinations. For additional examples see the laser program Appendix A to the Standard Centralized Deconfliction Plan.

Template / Example: See Next Page. Additional examples can be found on www.space-track.org at: <https://www.space-track.org/documentation#/lch> (login required). For additional examples see Appendix A.

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PRM Example:

```
Classification:          Unclassified
File Name:              PRM_Owner_Program_LaserName_01JAN2019_For
_JDAY003_TargetType.txt (1-128 char)
Message Purpose:       Request for Predictive Avoidance Support
Message Date/Time (UTC): 2019 JAN 01 (001) 12:00:00
Point of Contact:      First, Last (1-128 char)
                      (Office) (###) ###-#### (1-128 char)
                      (E-mail) example@example.com (1-128 char)
Emergency Phone # at Operations Site: ###-###-#### (0-128 char)
Remarks:              Special Instructions/Comments Go Here (0-2048
char)
```

MISSION INFORMATION

```
-----
Owner/Operator:        Organization Name (1-48 char)
Mission Name/Number:   Owner_Program_LaserName_1.064um_1W_50urad_1kHz (1-48
char)
Target Type:          Fixed Field of View
Location:             Test Site, Test Facility, State (1-128 char)
Start Date/Time (UTC): 2019 JAN 03 (003) 22:00:00
End Date/Time (UTC):  2019 JAN 04 (004) 12:00:00
Duration (HH:MM:SS):  14:00:00
```

LASER INFORMATION

```
-----
Laser:                Owner_Program_LaserName_1.064um_1W_50urad_1kHz (1-144
char)
```

SOURCE INFORMATION

```
-----
Method:               Fixed Point
Latitude:             XX.XXXX degrees N
Longitude:            YYY.YYYY degrees W
Altitude:             ZZ.ZZZ km
```

TARGET INFORMATION

```
-----
Method:               Fixed Field of View
Azimuth Range:        175.50 to 180.00 degrees
Elevation Range:      51.00 to 54.70 degrees
```

```
Method:               Fixed Field of View
Azimuth Range:        180.00 to 184.50 degrees
Elevation Range:      51.00 to 54.70 degrees
```

END OF FILE

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2.2.3 IER 2-D - Decentralized Request Message (DRM)

Report Type: DIGITAL - Strict Text file

Other References: None

Summary: The Decentralized Request Message is a Strict Text file used to request decentralized deconfliction files. DRMs are submitted by the LO/O to LCH. LO/Os will use the DRM to identify the laser point of contact (POC), contact information, start, and stop times, locations of the lasers, and the lasers to be used.

Frequency / Deadline: Submit no later than 3 days prior to the laser activity.

Method of Submission:

Unclassified: Post to applicable /DRM/ folder on www.space-track.org.

Classified: Contact LCH to determine best means and document in the laser program Appendix A to the Standard Decentralized Deconfliction Plan.

Naming Convention:

Format: DRM_[Owner/Company Name]_[Program/System Name]_[Laser Name]_[Date of Submission (DDMMYYYY)]_For_JDAY[DDD (Julian Date of Mission Start)].txt

Example:

DRM_BestCompany_BestProgram_BestLaser_01JAN2016_ For_JDAY005_SAT.txt

OR

DRM_Best-Company_Best-Program_Best-Laser_01JAN2016_ For_JDAY005_SAT.txt

Template Location: A template DRM file may be requested from LCH.

Template / Example: (See Next Page)

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DRM Example:

Classification:	Unclassified
File Name:	DRM_Alert_LaserNameOwner_LaserName_01Jan2019_For_JDAY003
Message Purpose:	Request for DDP Data
Message Date/Time (UTC):	2019 Jan 01 (001) 17:11:40
Point of Contact:	First, Last, ###-###-####, example@example.com
Remarks:	Special Instructions/Comments Go Here
MISSION INFORMATION	

Owner/Operator:	Organization Name
Start Date/Time (UTC):	2019 Jan 03 (003) 22:00:00
End Date/Time (UTC):	2019 Jan 04 (004) 12:00:00
Duration (HH:MM:SS):	14:00:00
LASER INFORMATION	

Laser:	Owner_Laser Name_355nm_10W_3.7urad_10kHz
SOURCE INFORMATION	

Method:	Four Surface Points
Surface Point #1	
Latitude:	XX.XXXX degrees N
Longitude:	YYY.YYYY degrees W
Surface Point #2	
Latitude:	XX.XXXX degrees N
Longitude:	YYY.YYYY degrees W
Surface Point #3	
Latitude:	XX.XXXX degrees N
Longitude:	YYY.YYYY degrees W
Surface Point #4	
Latitude:	XX.XXXX degrees N
Longitude:	YYY.YYYY degrees W
Minimum Altitude:	ZZ.ZZZ km
Maximum Altitude:	ZZ.ZZZ km
TARGET INFORMATION	

Method:	Satellite
Satellite:	XXXXX
Optional Name:	
Method:	Satellite
Satellite:	XXXXX
Optional Name:	
END OF FILE	

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2.2.4 IER 3-C - Program Approval Message (PAM)

Report Type: DIGITAL - Strict Text file

Other References: DECON ICD Section 4.2.2.2

Summary: The PAM is a Strict Text file used to provide files for centralized deconfliction. The PAM is a response from LCH to a laser owner/operator's request for deconfliction support (PRM message). The PAM provides approval for the laser activity and a listing of open or closed laser firing directions and time windows.

Frequency / Deadline: Submit between 1 to 3 days prior to actual laser activity. See Deconfliction Plan for more detailed schedule constraints.

Method of Submission:

Unclassified Requests: Post to applicable /PAM/ folder on www.space-track.org

Classified Requests: Contact LCH to determine best means. Document in the Deconfliction Plan.

Naming Convention:

Format:

PAM_[Owner/Company Name]_[Program/System Name if req.]_[Laser Name]_T-[Days Prior to Start]_[Date of PAM Generation]_For_JDAY[Julian Date of Mission Start]_[Target Type]_[Optional PAM Sequence Number].txt

Example:

PAM_BestCompany_BestProgram_BestLaser_T-001_04JAN2016_For_JDAY005_SAT-1.txt

Template Location: N/A (report is machine-generated by DECON).

Template / Example: See Next Page. Additional examples can be found on www.space-track.org at: <https://www.space-track.org/documentation#/lch> (login required). For additional examples see Appendix B.

UNCLASSIFIED

PAM Example:

Classification: UNCLASSIFIED	
UNITED STATES SPACE COMMAND LASER CLEARINGHOUSE (LCH) TIME WINDOWS REPORT	
Date:	2019 JAN 02
From:	LCH
To:	Laser Program
Subject:	LCH Authorized Shoot (Open) Windows
1. The attached information contains the coordinated and approved spatial parameters	
(a) Authorized Shoot (Open) Windows	
During Authorized Shoot Windows, the laser owner-operator (O/O) is authorized to operate the approved system laser(s) in accordance with the Source/Target geometry definitions contained in this report.	
2. The laser O/O may perform Hybrid Predictive Avoidance (HPA) during Authorized Shoot Windows, if previously certified in writing by USSTRATCOM to do so.	
3. Any deviation from this authorization must be immediately reported to the Laser Clearinghouse at: Commercial 805-605-4763, 805-606 7410 (7:30 to 4:30 M-F, PST) DSN is 275/276 or contact the CSpOC CCO at Commercial 805-605-3514 (which is manned 24/7), DSN is 275.	
4. See below for comments specific to this mission.	
5. If you have any questions, please don't hesitate to contact LCH at the above listed phone numbers.	
LCH BUILDING 7000, 13TH STREET, RM A217A VSFB, CA 93437	
Mission ID: LaserNameOwner_LaserName_1.064um_1W_50urad_1kHz_06090120000_P Laser Owner/Operator: Organization Name Report Date/Time (GMT): 2019 JAN 02 10:24:36 Mission Name: LaserNameOwner_LaserName_1.064um_1W_50urad_1kHz Mission Start Date/Time (GMT): 2019 Jan 03 22:00:00 Mission Stop Date/Time (GMT): 2019 Jan 04 12:00:00 Mission Duration (HHH:MM:SS): 14:00:00 Type of Windows in this report: Authorized Shoot (Open) Windows Comment: For Execution	

UNCLASSIFIED

Number of Targets:

123

YYYY	MM	dd	(DDD)	HHMM	SS	YYYY	MM	dd	(DDD)	HHMM	SS	MMMM:SS
2019	Jan	04	(004)	0755	49	2019	Jan	04	(004)	0815	49	0020:00
2019	Jan	04	(004)	0816	33	2019	Jan	04	(004)	0906	26	0049:53
2019	Jan	04	(004)	0907	14	2019	Jan	04	(004)	1002	41	0055:27
2019	Jan	04	(004)	1003	08	2019	Jan	04	(004)	1018	33	0015:25
2019	Jan	04	(004)	1018	52	2019	Jan	04	(004)	1024	51	0005:59
2019	Jan	04	(004)	1025	05	2019	Jan	04	(004)	1026	14	0001:09
2019	Jan	04	(004)	1026	43	2019	Jan	04	(004)	1042	06	0015:23
2019	Jan	04	(004)	1047	14	2019	Jan	04	(004)	1051	01	0003:47
2019	Jan	04	(004)	1051	44	2019	Jan	04	(004)	1052	15	0000:31
2019	Jan	04	(004)	1052	33	2019	Jan	04	(004)	1115	00	0022:27

Percent = 66.67%

Source Geometry: (WGS-84)

Method: Fixed Point

Latitude: XX.XXXX degrees N

Longitude: YYY.YYYY degrees W

Altitude: ZZ.ZZZZ km

Target Geometry: (WGS-84) 1

Method: Fixed Field of View

Azimuth Range: 175.50 to 180.00 degrees

Elevation Range: 51.00 to 54.70 degrees

END OF FILE

UNCLASSIFIED

2.2.5 IER 3-D1 - Unique Protect List (UPL)

Report Type: DIGITAL - Strict Text file

Other References: DECON ICD Section 4.2.1.10

Summary: The UPL is a Strict Text file of satellite Space Control Center (SCC) numbers and is most often utilized to support decentralized deconfliction. The message is used to pass the latest list of satellites to be protected during deconfliction from LCH to the laser owner/operator. The message comprises an identifying header followed by a list of satellite numbers. The UPL is a classified file.

Frequency / Deadline: The UPL is provided in response to a DRM. It is submitted between 1 to 3 days prior actual laser activity. See laser program Appendix A to the Standard Decentralized Deconfliction Plan for more detailed schedule constraints.

Method of Submission:

Unclassified: N/A.

Classified: Contact LCH to determine best means and document in the laser program Appendix A to the Standard Decentralized Deconfliction Plan.

Naming Convention:

Format:

[Owner/Company Name]_[Division or Sub-Organization if req.]_[Laser Name]_[Laser Mode if req.]_UPL_[Date Generated as DDMmmYY].txt

Example 1:

BestCompany_BestLaser_UPL_01Aug24.txt

Example 2:

BestCompany_BestDivision_BestLaser_Mode2_UPL_01Aug24.txt

Template Location: N/A (report is machine generated by DECON).

Template / Example: See Next Page.

UNCLASSIFIED

UPL Example:

Note: Classification marking in the text box below is for example purposes only.

```
Classification:          SECRET
File Name:              PROGRAM_UPL_1Aug24
Message Purpose:       Unique Protect List
Report Date/Time (UTC): 2024 Aug 01 00:00:00
Owner/Operator:       Laser Program
MPL Date:              2024 Aug 01
Lasers:                LASER PROGRAM_HEL_1.00um_10kW_1.0urad
Constraints:           NONE
Point of Contact:     LCH
                      (Voice) (805) 605-4763
                      (Email) laserclearinghouse@us.af.mil

Total UPL Objects: XXXX
-----
XXXXXX
XXXXXX
XXXXXX
END OF FILE
```

UNCLASSIFIED

2.2.6 IER 3-D2 - Two-Line Element (TLE) Set

Report Type: DIGITAL - Strict Text file

Other References:

DECON ICD Section 4.2.1.4

The space-track.org documentation page at <https://www.space-track.org/documentation/#tle> provides a detailed description of the TLE format.

Summary: The TLE is a Strict Text file used to provide data for decentralized deconfliction. The message is used to pass the latest satellite states from LCH to the laser owner/operator. Each TLE is comprised of two 69-character lines of data that may be used with the SGP4/SDP4 orbital model to propagate the position and velocity of the associated satellite. The data set for decentralized deconfliction will comprise of TLE's for the satellites on the UPL and, if needed, targeted satellites on the LO/O's Lasing Authorized List. The classification of the TLE's associated with the UPL are classified. The classification of TLE's that are associated with the LAL depend on the classification of authorized targets.

Frequency / Deadline: A TLE file is provided in response to a DRM and in conjunction with a UPL. Typically submitted between 1 to 3 days prior actual laser activity. See Deconfliction Plan for more detailed schedule constraints.

Method of Submission:

Classified: Contact LCH to determine best means and document in the laser program Appendix A to the Standard Decentralized Deconfliction Plan.

Naming Convention:

Format: TLE_[Owner/Company Name]_[Division or Sub-Organization if req.]_
[Location if req.]_[Program/System Name if req.]_[Laser Name]_
[Laser Mode if req.]_[Date Generated as YYYYJDAYXXX]_
[Time Generated as HHMMZ].txt

Example 1: TLE_BestCompany_BestLaser_2017JDAY005_1430Z.txt

Example 2: TLE_BestCompany_AerospaceDivision_San Diego_BestProgram_
BestLaser_Mode2_2017JDAY005_1430Z.txt

Template Location: See the Space-track.org documentation page at <https://www.space-track.org/documentation/#tle>

Template / Example: The following is an example of a single TLE for satellite 25544.

TLE Example:

```
1 25544U 98067A 20331.01187177 .00003392 00000-0 69526-4 0 9990
2 25544 51.6456 267.7478 0001965 82.1336 12.7330 15.49066632257107
```

UNCLASSIFIED

2.2.7 IER 3-D3 - Vector Covariance Message (VCM) for Decentralized Lasers

Report Type: DIGITAL - Strict Text file

Other References:

DECON ICD Section 4.2.1.9. and 4.2.2.4

The AFSPC Standardized Astrodynamics Algorithm Library (SAAL) documentation provides a description of the VCM. See the Astrodynamics Standard Shared Library, Vector Covariance Message (VCM DLL), Appendix: Vector Covariance Message (VCM) Data Description, 28 September 2012. Contact

<https://www.astrodynamicstandards.org/software-request/> or
<https://halfway.peterson.af.mil/SARP>.

Summary: The VCM is a Strict Text file used to provide data for decentralized deconfliction. The message is used to pass the latest satellite states from LCH to the laser owner/operator. A VCM comprises 28 or more lines of data that may be used with the SP orbital model to propagate the position and velocity of the associated satellite. The data set will comprise VCMs for the satellites on the PL and targeted satellites on the Lasing Authorized List. VCMs may be classified and will be distributed by classified means.

Frequency / Deadline: Submit between 1 to 3 days prior actual laser activity. See laser program Appendix A to the Standard Decentralized Deconfliction Plan for more detailed schedule constraints.

Method of Submission:

Unclassified: N/A.

Classified: Contact LCH to determine best means and document in the laser program Appendix A to the Standard Decentralized Deconfliction Plan.

Naming Convention:

Format: VCM_[Owner/Company Name]_[Division or Sub-Organization if req.]_
[Location if req.]_[Program/System Name if req.]_[Laser Name]_
[Laser Mode if req.]_[Date Generated as YYYYJDAYXXX].txt

Example: VCM_BestCompany_AerospaceDivision_San Diego_BestProgram_
BestLaser_Mode2_2017JDAY005.txt

Template Location: N/A (report is machine-generated by DECON).

Template / Example: See Other References above for template description and example.

UNCLASSIFIED

2.2.8 IER 3-D4 - Sigma Multiplier File (SMP) for Decentralized Lasers

Report Type: DIGITAL - Strict Text file

Other References: DECON ICD Section 4.2.2.6

Summary: The SMP is a Strict Text file used to provide data for decentralized deconfliction when VCMs and SP propagation is used. The SMP expands the positional error of certain satellites to account for astrodynamics errors not fully modeled in the VCM. The message is used to pass the latest satellite sigma multiplier values from LCH to the laser owner/operator. The data set will comprise SMPs for the satellites on the PL and targeted satellites on the Lasing Authorized List. SMPs may be classified and will be distributed by classified means.

Frequency / Deadline: Submit between 1 to 3 days prior actual laser activity. See laser program Appendix A to the Standard Decentralized Deconfliction Plan for more detailed schedule constraints.

Method of Submission:

Unclassified: N/A (Not provided over unclassified networks).

Classified: Contact LCH to determine best means and document in the Deconfliction Plan.

Naming Convention:

Format: SMP_[Laser Owner/Operator]_[Date prepared as YYYYMMDD].txt

Example: SMP_BestCompany_2017005.txt

Template Location: N/A (report is machine generated by DECON).

Template / Example: See Other References above for template description and example.

UNCLASSIFIED

2.2.9 IER 3-D5 - Time Constants (TCON) File

Report Type: DIGITAL - Strict Text file

Other References:

DECON ICD Section 4.2.1.6

International Earth Rotation and Reference Systems Service (IERS),
<https://www.iers.org>

The United States Naval Observatory (USNO), <http://www.usno.navy.mil/USNO>

Summary: The TCON file is a Strict Text file used to provide time synchronization data in support of deconfliction. The TCON file provides data describing Coordinated Universal Time (UTC), UT1 and International Atomic Time (TAI) constants and offsets, which are necessary to properly time events, propagate satellite locations, and orient coordinate systems. The message is used to pass the latest TCON values from LCH to the laser owner/operator.

Time constants and offsets may be retrieved by the laser owner/operator from the IERS or USNO. If obtained from LCH the TCON file will be in the format and units described below. The data set comprises a time tag (YY DOY DD-MMM-YY), TAI offset (seconds), UT1-UTC offset (seconds), UT1-UTC rate (milliseconds/day), polar X and polar Y motion (arcseconds).

Frequency / Deadline: Submit between 1 to 3 days prior actual laser activity. See laser program Appendix A to the appropriate Standard Deconfliction Plan for more detailed schedule constraints.

Method of Submission:

Unclassified: Post to applicable folder on www.space-track.org.

Classified: File is unclassified but may be included in a classified data transfer. Contact LCH to determine best means and document in the laser program Appendix A to the appropriate Standard Deconfliction Plan.

Naming Convention:

Format: time_constants_[Date of creation as YYYYMMDD].txt

Example: time_constants_20170310.txt

Template Location: N/A.

Template / Example: See below.

TCON Example (notional):

19	191	10-Jul-19	37	0.38818	-0.297	0.1458	0.2264
19	201	20-Jul-19	37	0.41552	-0.534	0.1729	0.2537
19	213	01-Aug-19	37	0.55629	-0.516	0.1962	0.2908
19	222	10-Aug-19	37	0.53890	-0.710	0.2090	0.3175
19	232	20-Aug-19	37	0.52190	-0.900	0.2253	0.3481

UNCLASSIFIED

2.2.10 IER 3-D6 - Unique Laser Susceptibility (ULS) File

Report Type: DIGITAL - Strict Text file

Other References:

DECON ICD Section 4.2.2.5

UPL, DSS, and RTS Process and Methodology, AFRL Report, April 2006

Summary: The ULS file is a Strict Text file used to provide data for decentralized deconfliction. The ULS file provides data describing current laser parameters and the susceptibility data for some or all the satellites on the UPL. The message is used to pass the latest ULS values from LCH to the laser owner/operator. The data set for each satellite identifies the protection type for that satellite and includes susceptibility values for each applicable payload and satellite component for each wavelength. Different payloads on a satellite may have different susceptibilities to lasers at different wavelengths. The file is classified.

Frequency / Deadline: Updated on an infrequent basis. A single initial submission may be adequate for a laser test series. Document the notification and update approach in the laser program Appendix A to the Standard Decentralized Deconfliction Plan.

Method of Submission:

Unclassified: N/A (Not provided over unclassified networks).

Classified: Contact LCH to determine best means and document in the Deconfliction Plan.

Naming Convention:

Format: ULS_[Owner/Company Name]_[Location if req.]_[Program/System Name if req.]_[Laser Name]_[Laser Mode if req.]_ [Date Generated as YYYYJDAYXXX].txt

Example: ULS_BestCompany_San Diego_BestProgram_
BestLaser_Mode2_2017JDAY005.txt

Template Location: N/A (report is machine-generated by DECON).

Template / Example: The ULS format is complex; an example is not provided here. Systems using decentralized deconfliction with susceptibility should consult the Other References above for specific content and formatting requirements.

UNCLASSIFIED

2.2.11 IER 3-D7 - Lasing Approval List (LAL) Memorandum

Report Type: DIGITAL - Text file

Other References: Current version of the LAL Memo is on www.space-track.org, at this address: <https://www.space-track.org/documentation#/lch> (must be logged in and associated with a laser program to see the file).

Summary: The LAL Memo is an unclassified memo Text file used to provide data for deconfliction when satellite targets are being used. The memorandum is used to pass the latest list of satellites approved as targets for intentional illumination from LCH to the laser owner/operator. The LAL encompasses all LO/Os that have authorized satellite targets, and it includes the Department of Defense (DoD) payload list, which is a comprehensive record of approved satellite targets that any DoD program can intentionally illuminate. Classified LALs can also be requested but must be coordinated with LCH.

Frequency / Deadline: Updated as required.

Method of Submission:

Unclassified: Posted to the LCH Help page on www.space-track.org

Classified: Contact LCH to determine best means.

Naming Convention:

Format: Lasing Authorization List Memo DD MMM YYYY - Signed

Template Location: See the Space-track.org LCH Help page at

<https://www.space-track.org/documentation#/lch> (must be logged in and associated with a laser program to see the file).

Template / Example: N/A.

UNCLASSIFIED

2.2.12 IER 3-D8 - Lasing Approval List (LAL) for Decentralized Lasers

Report Type: DIGITAL - Text file

Other References: Current version of the LAL Memo is on www.space-track.org, at this address: <https://www.space-track.org/documentation#/lch> (must be logged in and associated with a laser program to see the file).

Summary: The LAL is a Strict Text file used to provide data for decentralized deconfliction when satellite targets are being used. The message is used to pass the latest list of satellites approved as targets for intentional illumination from LCH to the laser owner/operator. The message comprises an identifying header followed by a list of satellite numbers. A laser program may be approved for and receive multiple LALs based on number of lasers and/or laser modes within the program.

Frequency / Deadline: Updated as required. A single initial submission may be adequate for a laser test series. Document the notification and update approach in the laser program Appendix A to the Standard Decentralized Deconfliction Plan.

Method of Submission:

Unclassified: Transmitted in accordance with the laser program Appendix A to the Standard Decentralized Deconfliction Plan.

Classified: Contact LCH to determine best means and document in the laser program Appendix A to the Standard Decentralized Deconfliction Plan.

Naming Convention:

Format: LAL_[LAL identifier if req.]_
[Owner/Company Name]_[Location if req.]_[Program/System Name if req.]_[Laser Name]_[Laser Mode if req.]_[LCH authorization memo date (YYYYMMDD)].txt

Example: LAL_RB_BestCompany_San Diego_BestProgram_
BestLaser_Mode2_20190105.txt

Template Location: N/A (report is generated by DECON).

Template / Example: The following is a notional example of an LAL. The first line will correspond to the file naming convention, followed by a list of satellite numbers.

LAL Example:

```
LAL_LaserNameOwner_LaserName_20190105  
12  
125  
456  
3456
```

UNCLASSIFIED

2.2.13 IER 3-D9 - Satellite Owner/Operator Permission Letter

Report Type: DIGITAL - pdf file

Other References: Current version of the LAL Memo is on www.space-track.org, at this address: <https://www.space-track.org/documentation#/lch> (must be logged in and associated with a laser program to see the file).

Summary: A satellite owner/operator permission letter is an official memorandum signed by a satellite owner/operator (SO/O) that permits an LO/O to illuminate one or several objects belonging to that SO/O. The SO/O and LO/O coordinate to determine which LALs that the approved objects will go on. This letter provides technical specifications, including the maximum fluence, max peak irradiance, and max average irradiance at which the objects may be illuminated. An expiration date is also stipulated for these permissions. LCH is not involved in the coordination of asking for permission to illuminate.

Frequency / Deadline: Updated as required.

Method of Submission:

Unclassified: e-mail (see Table 1).

Classified: e-mail (see Table 1).

Naming Convention:

Format: [Owner/Company Name]_[Program/System Name if req.]_[Laser Name if applic.]_Permission to Illuminate_[Payload Name Or SO/O Org]_[Applicable LAL]_[Expiration date if applic.] (YYYYMMDD)].txt

Example: BestCompany_BestProgram_BestLaser_Permission to Illuminate_BestPayload_DoD_20800101.pdf

Template Location: See the space-track.org Laser Clearinghouse help page at <https://www.space-track.org/documentation#/lch> (must be logged in and associated with a laser program to see the file).

Template / Example: The following is a notional example of a satellite owner/operator permission letter.

UNCLASSIFIED

Satellite Owner/Operator Permission Letter Example:



**DEPARTMENT OF THE PROGRAM
BEST PROGRAM
BEST UNIT**

01 January 2024

MEMORANDUM FOR BEST LASER PROGRAM
ATTENTION: JOHN DOE

FROM: Best Satellite Owner/Operator Agency
123 ABC Rd
Candyland SFB, CA 12345

SUBJECT: Permission to Illuminate ABC123 Sat

1. The object listed in paragraph 4 is owned and are operated by Best Unit. This object is operational, and we affirm that laser illumination of this object by Best Laser Program will not disrupt, deny, degrade, or destroy the object.
2. The object listed in paragraph 4 may be added to the Laser Clearinghouse (LCH) Lasing Approval List/Department of Defense List (DoD). These objects may be illuminated with a maximum fluence on each object not to exceed $1 \text{ J/cm}^2/\text{pulse}$ with a maximum peak irradiance of 1 W/cm^2 and a maximum average irradiance of 1 W/cm^2 .
3. Permission to illuminate is granted with an effective date of 01 January 24, and an expiration date of 02 January 24. If the operation or ownership of the object listed in paragraph 4 transitions to another organization, this permission letter becomes null and void. If this occurs, the laser program is responsible for obtaining a new permission letter from the new satellite owner/operator.
4. Listed below are the objects authorized to be placed on the LAL/DoD.

SCC	Int'l Designator	Object Name	Operational Status
99999	99999A	ABC123 Sat	Operational

5. This authorization to illuminate the object listed in paragraph 4 applies to all laser facilities owned or operated by the Best Laser Program that will be considered for this series of tests.
6. The Best Satellite Owner/Operator Agency points of contact are Richard Roe/123-456-7890/richard.roe@agency.com.

Satellite Owner/Operator
Signature block

UNCLASSIFIED

2.2.13 IER 4 - Laser Status Report

Report Type: Digital - e-mail

Other References: None

Summary: The Laser Status Report is a digital report (e-mail) from the LO/O to LCH that includes the contents listed below in the Template/Checklist. The purpose is to verify that a scheduled laser activity is nearing its start and to provide LCH with a record of the laser activity. If the Laser Status Report will include classified information, be sure to mark correctly and use an appropriate secure communications system. Use the Quick Look Report (Section 2.2.15) to report completion of laser activities.

Frequency / Deadline: One hour prior to the start of daily laser activities.

Method of Submission: E-mail (see Table 1)

Naming Convention: N/A.

Template Location: This document.

Template / Example: See below.

Laser Status Report Template/Checklist:

#	Item/Information
1	Confirm Classification Ensure proper communication line is used
2	Name/Organization of Operator
3	Laser System Name
4	Expected Start Time (UTC)
5	Expected Stop Time (UTC)
6	Status of Laser System Note whether system is Green (on track), Yellow (mission at risk) or Red (likely cancel). Note reason, e.g., weather, equipment, etc.

UNCLASSIFIED

2.2.14 IER 5 - Space Event Notification

Report Type: Verbal

Other References: None

Summary: Space Event Notification is a verbal report from LCH or the CCO to the LO/O. The purpose is to inform the LO/O of a Space Event that impacts planned or currently operating laser activities.

A Space Event is an event that results in the invalidation/expiration of a previously generated deconfliction product (PAMs). For soon-to-be operating or currently operating laser activities which are impacted by the Space Event, the notification directs cessation of laser activity and advises the LO/O to wait for a replacement deconfliction product if possible. LO/Os using deconfliction products not impacted by the Space Event will not be contacted.

If the Space Event results in minimal (but non-zero) impact to a preexisting PAM, LCH may issue individual "Closure Windows" to be manually implemented by a LO/O in lieu of a full replacement PAM.

Frequency / Deadline: As soon as possible following the Space Event.

Method of Submission: Telephone call (see Table 1) or e-mail.

Naming Convention: N/A.

Template Location: This document.

Template / Example: See Below.

Space Event Template/Checklist:

#	Item/Information
1	Confirm Classification Ensure proper communication line is used
2	Name/Organization of Caller
3	Date/Time of Call (UTC)
4	Notification of Space Event LCH will state that a Space Event has occurred
5	Cease-Fire Notification LCH will state whether the LO/O must cease laser activities
6	Confirm Cease-Fire If required, LCH will confirm laser firing has ceased
7	Estimated Time to Generate Replacement PAMs 90 minutes or more, depending on nature of the Space Event and number of operating lasers
8	Discussion LCH will provide other information as required, and ask the LO/O if they have any questions at the time of the Space Event Notification

UNCLASSIFIED

2.2.15 IER 6 - Quick Look Report

Report Type: Digital - e-mail

Other References: None

Summary: The Quick Look Report is a digital report (e-mail) from the LO/O that includes the contents listed below in the Template/Checklist. The purpose is to confirm the completion of laser activities. If an event is cancelled, such as a target scrub, use this report to notify LCH. If the report will include classified information, be sure to mark correctly and use a secure communications system.

Frequency / Deadline: Within 15 minutes of completing all laser activities on a given day.

Method of Submission: e-mail (see Table 1).

Naming Convention: N/A.

Template Location: This document.

Template / Example: See below.

Quick Look Report Template/Checklist:

#	Item/Information
1	Confirm Classification Ensure proper communication line is used
2	Name/Organization of Sender
3	Date/Time of Call (UTC)
4	Laser System Name
5	Actual Start Time (UTC)
6	Actual Stop Time (UTC)
7	Assessment of Deconfliction Adherence State whether laser activities were nominal and executed in accordance with supplied deconfliction

UNCLASSIFIED

2.2.16 IER 7 - LOAP Notification

Report Type: Verbal

Other References: None

Summary: The LOAP Notification is a verbal report from the LO/O to LCH. The purpose is to provide initial notification that a laser has fired outside authorized deconfliction parameters. If the call will include classified information, be sure to use a secure communications system. This voice report must be followed up by the hardcopy LOAP Report (Section 2.2.17) within 12 hours.

For centralized deconfliction, firing outside authorized parameters means that either (1) the laser was outside the laser location listed in the PAM, (2) the laser fired outside an authorized pointing direction in the PAM, (3) the laser was fired outside an open window time specified in the PAM, or (4) different laser parameters were used resulting in higher on-orbit irradiance (e.g., higher power, smaller divergence, smaller pulse width).

For decentralized deconfliction, firing outside authorized parameters is defined as a laser firing that may have posed a hazard to a nearby satellite that exceeds the uncertainties of the Keep-Out Cone. A decentralized LOAP may be related to a procedural deviation, software issue or equipment malfunction.

Frequency / Deadline: Within 15 minutes following the determination of laser firing outside authorized parameters.

Method of Submission: Telephone call (see Table 1).

Naming Convention: N/A.

Template Location: This document.

Template / Example: (See Next Page).

UNCLASSIFIED

LOAP Notification Template/Checklist:

#	Item/Information
1	Confirm Classification Ensure proper communication line is used
2	Name/Organization of Caller
3	Date/Time of Call (UTC)
4	Laser System Name
5	Nature of Incident Confirm laser firing has ceased; describe the circumstances related to the firing outside authorized parameters
6	Time of Incident (UTC) Provide start and stop times
7	Laser System Location (latitude in decimal degrees North or South/ longitude in decimal degrees East or West/ altitude in kilometers)
8	Output Power (Watts) Provide average or equivalent-Continuous Wave (CW) power (and instantaneous peak power for pulsed lasers)
9	Laser Pointing Information (azimuth in degrees relative to true North/ elevation in degrees above local horizon; if PAM used other target definition, provide information as appropriate)
10	Laser Target Note satellite number, missile, point in space, star, etc.
11	Applicable Open Windows Note applicable window times from supplied deconfliction products (PAMs) that may have been violated
12	Pointing Limits Note applicable azimuth and elevation limits

UNCLASSIFIED

2.2.17 IER 8 - LOAP Report

Report Type: DIGITAL - e-mail or memorandum attached to e-mail

Other References: None.

Summary: The LOAP Report is the LO/O's formal notification memorandum to LCH that a laser has fired outside authorized deconfliction parameters. This text report is a follow up to the LOAP Notification (IER #7, Section 2.2.16). If the report is classified mark appropriately and use appropriate secure communication means.

LCH will use this information to continue its assessment to determine whether a satellite hazard existed because of the firing. The Laser Activity Summary Report (Section 2.2.18) for the incident should be provided as an attachment, and attachments with additional detail may be included as appropriate. The document should be signed at the O-6, GS-15, or Director level and transmitted in a way that preserves the written signature.

Frequency / Deadline: Within 12 hours of the LOAP Notification (Section 2.2.16).

Method of Submission: Submit to LCH via e-mail per Table 1.

Naming Convention:

Format: LOAP-Report_[Owner/Company Name]_[Program/System Name if req.]_[Laser Name]_[Date of Submission as YYYYMMDD].txt

Example: LOAP-Report_BestCompany_BestProgram_BestLaser_20170105.txt

Template Location: This document.

Template / Example: (See Next Page).

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LOAP Report Template (Example):

FROM: (Laser Owner/Operator)

TO: S4S S3/5 LCH

SUBJECT: Laser Firing Outside Authorized Parameters (LOAP) Report

1. This is to notify the Laser Clearinghouse of a laser incident. To assist in further analysis, the following information describes the incident:

a. Laser system name and configuration (for pulsed lasers - pulse width, pulse repetition frequency, pulse energy, divergence half-angle, and wavelength; for continuous wave lasers - power, wavelength, divergence half-angle).

b. Laser location (latitude, longitude, and elevation).

c. Time of laser firings during incident (date, hh:mm:ss (UTC)).

d. Laser target (satellite number, missile, point in space, star, etc.).

e. Laser pointing direction (azimuth relative to true north and elevation above the local horizon; preferred units: degrees).

f. Assessment of incident, including how far outside authorized parameters were the firings.

g. Laser system or test conditions that may have contributed to the laser incident, including actions to mitigate future incidents.

h. Identify whether LOAP related to centralized or decentralized deconfliction.

2. Point of contact/phone/fax numbers.

3. If additional information and detailed data (e.g., system data logs, etc.) become available to clarify or provide more detail about the incident, we will forward it as separate correspondence or part of the corrective action report.

4. Contact information, e.g., phone numbers, other POCs, etc.)

<<Signature>>

Name, Rank / Grade, Office Symbol Title

Attachment:

Laser Activity Summary Report

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2.2.18 IER 9 - Laser Activity Summary Report (LASR)

Report Type: DIGITAL - Strict Text file

Other References: DECON ICD Section 4.2.1.3

Summary: The LASR is a Strict Text file from the LO/O to LCH used to provide post-mission data for centralized and decentralized deconfliction. The message enables LCH analysis of a laser firing event. It is required in the event of a LOAP and otherwise is only submitted upon request. If the report is classified, mark appropriately and use secure communication means. Firing data must be archived for one year in order to comply with LCH data requests.

The LASR is a summary of an emitter's firings for one event. The report contains laser and mission information, mission assessment, inadvertent illumination information, and a summary of the actual laser firing times and associated targets. Firing times and targets should be reported at 1-second intervals.

Frequency / Deadline: If associated with a LOAP Notification, submit via e-mail within 24 hours. If in response to a LCH data request, submit via e-mail within 3 business days.

Method of Submission: Submit to LCH via e-mail per Table 1.

Naming Convention:

Format: LASR_[Owner/Company Name]_[Location if req.]_[Program/System Name if req.]_[Laser Name]_[Laser Mode if req.]_For_JDAY[Julian Date of Mission Start]_File [#] of [#].txt

Example: LASR_BestCompany_San Diego_BestProgram_BestLaser_Mode2_For_JDAY005_File 2 of 4.txt

Template Location: See <https://www.space-track.org>, select the HELP Menu, then select the LASER CLEARINGHOUSE dropdown. LASR samples are in the Templates and Examples section.

Template / Example: LASR format will vary by source and target type. See the next page for one example. For additional examples see Appendix C.

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LASR Example (notional):

```
Classification:          Unclassified
Mission ID:              Owner_LaserName_01JAN2019_For_JDAY003
_TargetType.txt (1-128 char)
File Name:              LASR_Owner_LaserName_20190104.txt
Message Purpose:       Laser Activity Summary Report
Report Date/Time (UTC): 2024 Jan 01 00:00:00
Point of Contact:      First, Last (1-128 char)
                       (Office) (###) ###-#### (1-128 char)
                       (E-mail) example@example.com (1-128 char)

MISSION INFORMATION
-----
Owner/Operator:        Organization Name (1-48 char)
Mission Name/Number:   Owner_Laser Name_1.064um_1W_50urad_1kHz (1-48
char)
PAM Target Type:      Fixed Azimuth/Elevation
Location:             Test Site, Test Facility, State (1-128 char)
Start Date/Time (UTC): 2024 JAN 01 10:52:16
End Date/Time (UTC):  2024 JAN 01 10:52:25
Duration (HH:MM:SS):  00:00:09

LASER INFORMATION
-----
Laser Name:           Owner_LaserName_1.064um_1W_50urad_1kHz (1-
144 char)
CW Output Power:      1 Watts (Keep blank for pulsed)
Pulse Energy:         1.13E-5 J/pulse
Pulse Repetition Freq: 1000.0 Hz
Max half beam divergence: 0.00286479 degrees half angle

LASER FIRING INFORMATION
-----
Mission Assessment: Laser firing at target that did not have an open
fire window.
Lasing Outside of Authorized Parameters: YES

LASER SHOTS
-----
Shot Number: 1
PAM Target ID: 1
Actual Source Type:   Fixed Point
Actual Target Type:   Fixed Azimuth/Elevation

Time                Source      Source      Source      Laser      Laser
                   Latitude    Longitude    Height     Azimuth    Elevation
                   -----    -----    -----    -----    -----
YYYYJDDHHMMSS.SSS  XX.XXXX    YYY.YYYYY    Z.ZZZZ km   nnn.nn    nn.nn
2019004105216.000  XX.XXXX    YYY.YYYYY    Z.ZZZZ km   nnn.nn    nn.nn
2019004102517.000  XX.XXXX    YYY.YYYYY    Z.ZZZZ km   nnn.nn    nn.nn
2019004105218.000  XX.XXXX    YYY.YYYYY    Z.ZZZZ km   nnn.nn    nn.nn
END OF FILE
```

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APPENDIX A: PRM Samples

Note that the Header, Mission Information, and Laser Information sections of the PRM are unchanged across the different source and target combinations. Reference Section 2.2.2 for guidance on this information. Some source and target combinations are not allowed, per Table A.3. The Table shows commonly used types of sources and targets. Reference the DECON ICD for the full list of source and target types and allowable combinations.

Table A.3 - Allowable Combinations for Typical Sources and Targets

TARGET	SOURCE				
	FIXED POINT	4 SURFACE POINTS	TWO WAYPOINTS	CENTERPOINT/C ENTERLINE	SATELLITE
Fixed Azimuth/Elevation	Yes	No	No	No	Yes
Fixed Field of View (FFOV)	Yes	Yes	Yes	Yes	No
Satellite	Yes	Yes	Yes	Yes	Yes
Star	Yes	Yes	Yes	Yes	Yes
Right Ascension/Declination	Yes	Yes	Yes	Yes	Yes
Celestial Body	Yes	Yes	Yes	Yes	Yes
Sky (creates FFOV)	Yes	Yes	Yes	Yes	No

A.1 Laser Source Examples

Note that only one source designation is allowed in any given PRM.

Fixed Point source

SOURCE INFORMATION	

Method:	Fixed Point
Latitude:	XX.XXXX degrees N
Longitude:	YYY.YYYY degrees W
Altitude:	Z.ZZZ km

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Four Surface Points source

SOURCE INFORMATION

Method: Four Surface Points
Surface Point #1
Latitude: XX.XXXX degrees N
Longitude: YYY.YYYY degrees W
Surface Point #2
Latitude: XX.XXXX degrees N
Longitude: YYY.YYYY degrees W
Surface Point #3
Latitude: XX.XXXX degrees N
Longitude: YYY.YYYY degrees W
Surface Point #4
Latitude: XX.XXXX degrees N
Longitude: YYY.YYYY degrees W
Minimum Altitude: -0.100 km
Maximum Altitude: 0.100 km

Two Waypoints source

SOURCE INFORMATION

Method: Two Waypoints
Waypoint #1
Latitude: 23.0897 degrees N
Longitude: 160.2729 degrees W
Altitude: 0.100 km
Waypoint #2
Latitude: 23.0447 degrees N
Longitude: 160.2250 degrees W
Altitude: 0.100 km
Left/Right Dimension: 2.000 km
Up/Down Dimension: 2.000 km

Centerpoint, Centerline source

SOURCE INFORMATION

Method: Centerpoint, Centerline
Centerpoint
Latitude: 23.6000 degrees N
Longitude: 160.2400 degrees W
Altitude: 1.000 km
Centerline Azimuth: 10.0 degrees
Centerline Elevation: 10.0 degrees
Left/Right Dimension: 3.000 km
Up/Down Dimension: 0.500 km
Fore/Aft Dimension: 5.000 km

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Satellite source

```
SOURCE INFORMATION
-----
Method:                Fixed Point
Latitude:              34.964 degrees N
Longitude:             106.464 degrees W
Altitude:              1.8800 km
END OF FILE
```

A.2 Laser Target Examples

Multiple targets of the same type may be included in one PRM.

Fixed Azimuth/Elevation targets

```
TARGET INFORMATION
-----
Method:                Fixed Azimuth/Elevation
Azimuth:               0.0 degrees
Elevation:             31.0 degrees

Method:                Fixed Azimuth/Elevation
Azimuth:               0.0 degrees
Elevation:             45.0 degrees
END OF FILE
```

Fixed Field of View targets

```
TARGET INFORMATION
-----
Method:                Fixed Field of View
Azimuth Range:         175.50 to 180.00 degrees
Elevation Range:       51.00 to 54.70 degrees

Method:                Fixed Field of View
Azimuth Range:         180.00 to 184.50 degrees
Elevation Range:       51.00 to 54.70 degrees
END OF FILE
```

Satellite targets

```
TARGET INFORMATION
-----
Method:                Satellite
Satellite:             43210
Optional Name:         myNiceSat

Method:                Satellite
Satellite:             43210
Optional Name:         myNiceSat
END OF FILE
```

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Star targets

```
TARGET INFORMATION
-----
Method:                      Star
Name:
Hipparcos ID:                25544

Method:                      Star
Name:
Hipparcos ID:                25544
END OF FILE
```

Right Ascension and Declination targets

```
TARGET INFORMATION
-----
Method:                      Right Ascension and Declination
Catalog Date:               J2000
Right Ascension:            300.065
Declination:                 29.921

Method:                      Right Ascension and Declination
Catalog Date:               J2000
Right Ascension:            300.065
Declination:                 29.921
END OF FILE
```

Celestial Body targets

```
TARGET INFORMATION
-----
Method:                      Celestial Body
Celestial Body:             JUPITER

Method:                      Celestial Body
Celestial Body:             MOON
END OF FILE
```

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Sky targets

The Sky method is a shorthand way to create same-sized Fixed Field of View (FFOV) target boxes. It instructs the DECON to craft boxes in intervals across an azimuth and elevation range. The Sky method can be stacked to create different sized boxes in different parts of the sky, but exercise care so none of the boxes overlap.

```
TARGET INFORMATION
-----
Method:                Sky
Azimuth Range:         296 to 20 degrees
Azimuth Interval:     2 degrees
Elevation Range:      5 to 51 degrees
Elevation Interval:   2 degrees

Method:                Sky
Azimuth Range:         296 to 20 degrees
Azimuth Interval:     4 degrees
Elevation Range:      51 to 90 degrees
Elevation Interval:   3 degrees
END OF FILE
```

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APPENDIX B: PAM Samples

Note that the Header, Mission Information, and Laser Information sections of the PAM are unchanged across the different source and target combinations. Reference Section 2.2.4 for guidance on this information. DECON will only process allowable source and target combinations as noted in Table A.3 above. The Table shows commonly-used types of sources and targets. Reference the DECON ICD for the full list of source and target types and allowable combinations.

B.1 PAM Examples - Fixed Point Source

As with the PRM, only one source designation is allowed in any given PAM. The PAM will report the start and stop time for each open window, or closed window if the LCH has been so directed. This is followed by the duration of the window and at the end by the percentage of time the windows represent vs. the mission start/stop time called out in the header. Then the Source Geometry is identified, followed by the Target Geometry and target number. Then follows the start and stop times for the next target(s), if any. There is no "END OF FILE" designation, the data simply stops. The following examples all use the Fixed Point Source Geometry, but the PAM source will follow the Source Information format in the PRM per Appendix A.

PAMs may be checked for correctness in several ways: The mission start/stop times should be as requested in the PRM. The windows should fall within the start/stop times. The duration should be correct for the windows specified. The source and target geometries should be as requested in the PRM. For firing, the laser location should fall within the source geometry, laser pointing should fall within a target geometry on the PAM, and time should fall within an open firing window.

[Continued on Next Page]

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Fixed Point source to FFOV target

YYYY MMM dd (DDD) HHMM SS	YYYY MMM dd (DDD) HHMM SS	MM:SS
-----	-----	-----
2017 Jun 03 (154) 0016 58	2017 Jun 03 (154) 0017 46	0000:48
2017 Jun 03 (154) 0023 58	2017 Jun 03 (154) 0024 34	0000:36
...		
...		
2017 Jun 03 (154) 2325 04	2017 Jun 03 (154) 2326 02	0000:58
2017 Jun 03 (154) 2330 52	2017 Jun 03 (154) 2333 57	0003:05
Percent = 5.75%		
Source Geometry: (WGS-84)		

Method: Fixed Point		
Latitude: 30.00000000 degrees N		
Longitude: 115.00000000 degrees W		
Altitude: 1.23456 km		
Target Geometry: (WGS-84) 1		

Method: Fixed Field of View		
Azimuth Range: 0.0 to 7.2 degrees		
Elevation Range: 0.0 to 7.2 degrees		

Fixed Point source to Fixed Azimuth/Elevation target

YYYY MMM dd (DDD) HHMM SS	YYYY MMM dd (DDD) HHMM SS	MM:SS
-----	-----	-----
2017 Oct 13 (286) 1200 00	2017 Oct 13 (286) 1459 52	0179:52
2017 Oct 13 (286) 1459 56	2017 Oct 13 (286) 1601 46	0061:50
...		
...		
2017 Oct 14 (287) 0745 12	2017 Oct 14 (287) 1150 12	0245:00
2017 Oct 14 (287) 1151 36	2017 Oct 14 (287) 1200 00	0008:24
Percent = 99.79%		
Source Geometry: (WGS-84)		

Method: Fixed Point		
Latitude: 30.000000 degrees N		
Longitude: 115.000000 degrees W		
Altitude: 1.23456 km		
Target Geometry: (WGS-84) 1		

Method: Fixed Azimuth/Elevation		
Azimuth: 270.0 degrees		
Elevation: 90.0 degrees		

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Fixed Point source to Satellite target

YYYY	MMM	dd	(DDD)	HHMM	SS	YYYY	MMM	dd	(DDD)	HHMM	SS	MM:SS
2017	Oct	25	(298)	2152	27	2017	Oct	25	(298)	2210	28	0018:01
2017	Oct	25	(298)	2346	51	2017	Oct	25	(298)	2347	09	0000:18
...												
...												
2017	Oct	26	(299)	0335	07	2017	Oct	26	(299)	0346	17	0011:10
2017	Oct	26	(299)	0346	36	2017	Oct	26	(299)	0353	09	0006:33

Percent = 16.75%

Source Geometry: (WGS-84)

Method: Fixed Point
Latitude: 30.0000 degrees N
Longitude: 100.0000 degrees W
Altitude: 1.2345 km

Target Geometry: (WGS-84) 2

Method: Satellite
Satellite: 1328
Optional Name: BEACON-C

Fixed Point source to Celestial Body target

YYYY	MMM	dd	(DDD)	HHMM	SS	YYYY	MMM	dd	(DDD)	HHMM	SS	MM:SS
2017	Oct	13	(286)	1133	00	2017	Oct	13	(286)	1313	00	0100:00

Percent = 100.00%

Source Geometry: (WGS-84)

Method: Fixed Point
Latitude: 32.7803 degrees N
Longitude: 105.8203 degrees W
Altitude: 2.788 km

Target Geometry: (WGS-84) 1

Method: Celestial Body
Celestial Body: MOON

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Fixed Point source to Right Ascension and Declination target

YYYY MMM dd (DDD) HHMM SS	YYYY MMM dd (DDD) HHMM SS	MM:SS
-----	-----	-----
2017 Oct 26 (299) 2301 02	2017 Oct 27 (300) 0036 11	0095:09
2017 Oct 27 (300) 0036 19	2017 Oct 27 (300) 0102 17	0025:58
...		
...		
2017 Oct 27 (300) 0323 04	2017 Oct 27 (300) 0336 02	0012:58
2017 Oct 27 (300) 0336 06	2017 Oct 27 (300) 0447 08	0071:02
Percent = 53.02%		
Source Geometry: (WGS-84)		

Method: Fixed Point		
Latitude: 30.2408 degrees S		
Longitude: 70.7367 degrees W		
Altitude: 2.722 km		
Target Geometry: (WGS-84) 69		

Method: Right Ascension And Declination		
Catalog Date: J2000		
Right Ascension: 291.812 degrees		
Declination: -23.573 degrees		

[Continued on Next Page]

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B.2 PAM Example - Four Surface Point Source

Four Surface Point source to FFOV target

YYYY MMM dd (DDD) HHMM SS	YYYY MMM dd (DDD) HHMM SS	MM:SS
-----	-----	-----
2022 Jan 07 (007) 0415 05	2022 Jan 07 (007) 0424 23	0009:18
2022 Jan 07 (007) 0550 33	2022 Jan 07 (007) 0601 47	0011:14
...		
...		
2022 Jan 07 (007) 1716 40	2022 Jan 07 (007) 1727 07	0010:27
2022 Jan 07 (007) 1855 29	2022 Jan 07 (007) 1900 29	0005:00
Percent = 7.32%		
Source Geometry: (WGS-84)		

Method: Four Surface Points		
Surface Point #1		
Latitude:	32.886 degrees N	
Longitude:	106.445 degrees W	
Surface Point #2		
Latitude:	32.974 degrees N	
Longitude:	106.457 degrees W	
Surface Point #3		
Latitude:	33.032 degrees N	
Longitude:	106.35 degrees W	
Surface Point #4		
Latitude:	32.918 degrees N	
Longitude:	106.353 degrees W	
Minimum Altitude:	1.188 km	
Maximum Altitude:	1.204 km	
Target Geometry: (WGS-84) 1		

Method: Fixed Field of View		
Azimuth Range:	0.0 to 360.0 degrees	
Elevation Range:	0.0 to 90.0 degrees	

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APPENDIX C: LASR Samples

The Header, Mission Information, Laser Information, and Laser Firing Information sections of the LASR are unchanged across the different source and target combinations. Reference Section 2.2.18 for guidance on this information. Under Mission Information, the “PAM Target Type” should reflect what is being reported in the Laser Shots vs. the actual PAM that may have been in use at the time. E.g., systems may report out time tagged azimuth and elevation even if it’s a Celestial Body that was being tracked at the time. In this case the LASR should indicate Fixed Point or Fixed Azimuth/Elevation for the PAM Target Type.

C.1 Laser Information Examples

Divergence is always reported in degrees, vs. the usual microradians in other LCH reports.

CW Laser

```
LASER INFORMATION
-----
Laser Name:                Owner_LaserName_1.064um_23.1W_50urad
CW Output Power:           23.1 Watts
Pulse Energy:
Pulse Repetition Freq:
Max half beam divergence:  0.00286 degrees half angle
```

Pulsed Laser

```
LASER INFORMATION
-----
Laser Name:                Owner_LaserName_532nm_7W_24.4urad_100Hz
CW Output Power:
Pulse Energy:              0.070 J/pulse
Pulse Repetition Freq:    100 Hz
Max half beam divergence:  0.0014 degrees half-angle
```

C.2 Laser Shot Examples

Up to three shots may be included in one LASR, and for each shot there is a maximum of three hundred records allowed. The PAM Target ID field is required but reporting a value for this field is optional. Usual entries for Actual Source Types will be Fixed Point or Satellite, with DECON interpolating between different sequential time tagged fixed points. Usual entries for Actual Target Types will be Fixed Point, Star, Right Ascension and Declination, Celestial Body, Fixed Azimuth/Elevation, or Satellite. Fixed Point targeting references engaging some latitude, longitude, and altitude (LLA) location vs. pointing in some azimuth/elevation direction. DECON will interpolate between different sequential time tagged fixed LLAs or fixed azimuth/elevations. For a truly fixed source location or target pointing, repeat the same LLA or azimuth/elevation values for each time tag.

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Fixed Point source, Fixed Azimuth/Elevation target

```
LASER SHOTS
-----
Shot Number: 1
PAM Target ID: 1
Actual Source Type: Fixed Point
Actual Target Type: Fixed Azimuth/Elevation

Laser          Source      Source      Source      Laser
Time          Latitude   Longitude   Height      Azimuth
Elevation
-----
-----
2020216170020.000 35.8727    253.6708    2.2870 km   190.00
0.000
2020216170021.000 35.8727    253.6708    2.2870 km   190.00
0.000
...
...
2020216170026.000 35.8727    253.6708    2.2870 km   190.00
0.000
2020216170026.785 35.8727    253.6708    2.2870 km   190.00
0.000
END OF FILE
```

Fixed Point source, Fixed Point target

```
LASER SHOTS
-----
Shot Number: 1
PAM Target ID: 1
Actual Source Type: Fixed Point
Actual Target Type: Fixed Point

Target        Target      Source      Source      Source      Target
Time          Longitude   Height      Latitude   Longitude   Height      Latitude
-----
-----
2020216170020.000 35.8727    253.6708    2.2870 km   35.3944
174.6570      2.3001 km
2020216170021.000 35.8727    253.6708    2.2870 km   35.3944
174.6570      2.3024 km
...
...
2020216170026.000 35.8727    253.6708    2.2870 km   35.3944
174.6570      2.4126 km
2020216170026.785 35.8727    253.6708    2.2870 km   35.3944
174.6570      2.4121 km
END OF FILE
```

UNCLASSIFIED

Fixed Point source, Satellite target

```
LASER SHOTS
-----
Shot Number: 1
PAM Target ID: 1
Actual Source Type: Fixed Point
Actual Target Type: Satellite

Time                Source      Source      Source      Target
                   Latitude    Longitude   Height      SCC
-----
2020216170020.000  35.8727    253.6708    2.2870 km   25897
2020216170021.000  35.8727    253.6708    2.2870 km   25897
...
...
2020216170026.000  35.8727    253.6708    2.2870 km   25897
2020216170026.785  35.8727    253.6708    2.2870 km   25897
END OF FILE
```

Fixed Point source, Celestial Body target

Valid Celestial Body targets include SUN, MOON, MERCURY, VENUS, MARS, JUPITER, SATURN, URANUS, NEPTUNE, and PLUTO.

```
LASER SHOTS
-----
Shot Number: 1
PAM Target ID: 1
Actual Source Type: Fixed Point
Actual Target Type: Celestial Body

Time                Source      Source      Source      Target
                   Latitude    Longitude   Height      Celestial Body
-----
2020216170020.000  35.8727    253.6708    2.2870 km   MOON
2020216170021.000  35.8727    253.6708    2.2870 km   MOON
...
...
2020216170026.000  35.8727    253.6708    2.2870 km   MOON
2020216170026.785  35.8727    253.6708    2.2870 km   MOON
END OF FILE
```

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Fixed Point source, Right Ascension and Declination target

Catalog Date may be B1950, J2000, or catalog date designated as YYYY.ffffffff fractional year format.

```
LASER SHOTS
-----
Shot Number: 1
PAM Target ID: 1
Actual Source Type: Fixed Point
Actual Target Type: Right Ascension and Declination
```

Time	Source Latitude	Source Longitude	Source Height	Target Catalog Date	Target Right Ascension	Target Declination
2020216170020.000	35.8727	253.6708	2.2870 km	B1950	145.0	-45.0
2020216170021.000	35.8727	253.6708	2.2870 km	B1950	145.0	-45.0
...						
2020216170026.000	35.8727	253.6708	2.2870 km	B1950	145.0	-45.0
2020216170026.785	35.8727	253.6708	2.2870 km	B1950	145.0	-45.0

```
END OF FILE
```

Fixed Point source, Star target using Hipparcos ID

Star targets will be designated by Hipparcos ID or common name, but not both.

```
LASER SHOTS
-----
Shot Number: 1
PAM Target ID: 1
Actual Source Type: Fixed Point
Actual Target Type: Star
```

Time	Source Latitude	Source Longitude	Source Height	Target Hipparcos ID	Target Name
2020216170020.000	35.8727	253.6708	2.2870 km	21421	N/A
2020216170021.000	35.8727	253.6708	2.2870 km	21421	N/A
...					
2020216170026.000	35.8727	253.6708	2.2870 km	21421	N/A
2020216170026.785	35.8727	253.6708	2.2870 km	21421	N/A

```
END OF FILE
```

UNCLASSIFIED

Fixed Point source, Star target using Name

Star targets will be designated by Hipparcos ID or common name, but not both.

```
LASER SHOTS
-----
Shot Number: 1
PAM Target ID: 1
Actual Source Type: Fixed Point
Actual Target Type: Star

Time                Source      Source      Source      Target      Target
                   Latitude    Longitude    Height      Hipparcos ID Name
-----
2020216170020.000  35.8727    253.6708    2.2870 km   N/A         Aldebaran
2020216170021.000  35.8727    253.6708    2.2870 km   N/A         Aldebaran
...
...
2020216170026.000  35.8727    253.6708    2.2870 km   N/A         Aldebaran
2020216170026.785  35.8727    253.6708    2.2870 km   N/A         Aldebaran
END OF FILE
```

Satellite source, Satellite target

Satellite targets will be designated by a valid SCC number.

```
LASER SHOTS
-----
Shot Number: 1
PAM Target ID: 1
Actual Source Type: Satellite
Actual Target Type: Satellite

Time                Source      Target
                   SCC         SCC
-----
2020216170020.000  12345      25897
2020216170021.000  12345      25897
...
...
2020216170026.000  12345      25897
2020216170026.785  12345      25897
END OF FILE
```

UNCLASSIFIED

Satellite source, Celestial Body target

Valid Celestial Body targets include SUN, MOON, MERCURY, VENUS, MARS, JUPITER, SATURN, URANUS, NEPTUNE, and PLUTO.

```
LASER SHOTS
-----
Shot Number: 1
PAM Target ID: 1
Actual Source Type:  Satellite
Actual Target Type:  Celestial Body

Time                Source      Target
                   SCC        Celestial Body
-----
2020216170020.000  25897      JUPITER
2020216170021.000  25897      JUPITER
...
...
2020216170026.000  25897      JUPITER
2020216170026.785  25897      JUPITER
END OF FILE
```

Satellite source, Right Ascension and Declination target

Catalog Date may be B1950, J2000, or catalog date designated as YYYY.ffffffff fractional year format.

```
LASER SHOTS
-----
Shot Number: 1
PAM Target ID: 1
Actual Source Type:  Satellite
Actual Target Type:  Right Ascension and Declination

Time                Source      Target      Target      Target
                   SCC        Catalog Date  Right Ascension  Declination
-----
-
2020216170020.000  12345      B1950        145.0         -45.0
2020216170021.000  12345      B1950        145.0         -45.0
...
...
2020216170026.000  12345      B1950        145.0         -45.0
2020216170026.785  12345      B1950        145.0         -45.0
END OF FILE
```

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Satellite source, Star target using Hipparcos ID

Star targets will be designated by Hipparcos ID or common name, but not both.

```
LASER SHOTS
-----
Shot Number: 1
PAM Target ID: 1
Actual Source Type:  Satellite
Actual Target Type:  Star

Time                Source      Target      Target
-----            -
                SCC          Hipparcos ID  Name
-----            -
2020216170020.000  25897      21421        N/A
2020216170021.000  25897      21421        N/A
...
...
2020216170026.000  25897      21421        N/A
2020216170026.785  25897      21421        N/A
END OF FILE
```

Satellite source, Star target using Name

Star targets will be designated by Hipparcos ID or common name, but not both.

```
LASER SHOTS
-----
Shot Number: 1
PAM Target ID: 1
Actual Source Type:  Satellite
Actual Target Type:  Star

Time                Source      Target      Target
-----            -
                SCC          Hipparcos ID  Name
-----            -
2020216170020.000  25897      N/A          Aldebaran
2020216170021.000  25897      N/A          Aldebaran
...
...
2020216170026.000  25897      N/A          Aldebaran
2020216170026.785  25897      N/A          Aldebaran
END OF FILE
```

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ATTACHMENT 1: Glossary of References and Supporting Information

References

CJCSI 3225.01B, *Procedures for Management of Illumination of Objects in Space*, 29 March 2023.

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SCG for *Laser Lethality, Countermeasures, and Counter-Countermeasures*, AFRL/DE, 15 November 2004.

SCG for Space Surveillance Operations, USSTRATCOM, 28 July 2017.

Abbreviations and Acronyms

ADO - Awareness Duty Operator

AFRL - Air Force Research Laboratory

CFSCC - Combined Force Space Component Command

CCO - Current Chief of Operations

COD - Combat Operations Division

CSpOC - Combined Space Operations Center

CW - Continuous Wave

DECON - Space Deconfliction System

DRM - Decentralized Request Message

FFOV - Fixed Field of View

IAW - In Accordance With

ICD - Interface Control Document

IER - Information Exchange Requirements

IERS - International Earth Rotation and Reference Systems Service

JDAY - Julian Day

JSpOC - Joint Space Operations Center

JWICS - Joint Worldwide Intelligence Communications System

LAL - Lasing Approval List

LASR - Laser Activity Summary Report

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LCH - Laser Clearinghouse
LLA - Latitude, Longitude, and Altitude
LO/O - Laser Owner/Operator
LOAP - Laser Firing Outside Authorized Parameters
MTOS - Master Test and Operations Schedule
NLT - No Later Than
PAM - Program Approval Message
PARM - Predictive Avoidance Request Message
POC - Point of Contact
PRM - Program Request Message
SAAL - Standardized Astrodynamics Algorithm Library
SADT - Senior Awareness Duty Technician
SAT - Satellite
SCG - Security Classification Guide
SIPRNet - Secure Internet Protocol Router Network
SMP - Sigma Multiplier
SO/O - Satellite Owner/Operator
S4S - Space Forces Space
UPL - Unique Protect List
SSA - Space Situational Awareness
TCON - Time Constants
TLE - Two-Line Element Set
ULS - Unique Laser Susceptibility
UPL - Unique Protect List
USSPACECOM - United States Space Command
USSTRATCOM - United States Strategic Command
UTC - Coordinated Universal Time
VCM - Vector Covariance Message