翻译内容：4.7.1.2.2-4.7.1.5

### 4.7.1.2.2 Flexible SAM Engagement Coordination

4.7.1.2.2灵活的地对空导弹SAM交战协调

The Flexible SAM ruleset has the capability to capture the effect of distributed platforms that can engage, provide track support, provide illumination support and provide interceptor IFTU communication to any other platform within a defined group. The engagement coordination consists of the Flexible SAM ruleset's weapon selection capability, the Flexible SAM firing doctrine and the Flexible SAM performing peer engagement deconfliction with other platforms defined to be within a Coordinating Platform Group (CPG).

灵活的SAM规则集能够捕获分布式平台的影响，这些平台可以参与、提供跟踪支持、提供无线照射支持，并向已定义组内的任何其他平台提供截获的IFTU制导通信。交战协调包括灵活的SAM规则集的武器选择能力、灵活的SAM射击原则和灵活的SAM执行与定义在协同平台组（CPG）内的其他平台的对等交战解除冲突。

Engagement coordination can also be performed among members of different tiers through the definition of an Automated Engagement Coordination (AEC) Group. While the AEC group members do not deconflict among themselves to prevent dual engagements, the knowledge of other members’ engagement availability can be used to influence the firing doctrine chosen by the engaging SAMs. Detailed discussion of each coordination area follows.

通过定义自动交战协调（AEC）组，还可以在不同层级的成员之间执行交战协调。虽然AEC小组成员之间不会消除冲突以防止双重交战，但其他成员的战斗能力信息可以被用于调整交战SAM选择的射击原则。下面详细讨论每个协调领域。

#### 4.7.1.2.2.1 Flexible SAM Peer Deconfliction

4.7.1.2.2.1灵活SAM对等消除冲突

##### 4.7.1.2.2.1.1 Flexible SAM Engagement Support

4.7.1.2.2.1.1灵活的SAM交战支持

Flexible SAM engagements require one or more of the following support functions; track support, illumination support, and/or interceptor IFTU communication support. Candidate platforms for providing these engagement support functions are evaluated and determined independently as described below.

灵活的SAM交战需要以下一个或多个支持功能：跟踪支持、无线照射支持和/或拦截器IFTU通信支持。提供这些参与支持功能的候选平台将按照以下所述进行独立评估和确定。

If the launching platform that is planning/evaluating the engagement has local track on the target, priority is given to the launching platform for providing track, illumination and interceptor IFTU communication support. If all the required support functions cannot be provided by the launching platform, the platform's Engagement Supporter List is evaluated to locate platforms that can provide the required support functions. If after evaluating platforms on the launching platform's Engagement Supporter List, the required support functions are still not satisfied, other CPG platforms reporting track on the target will be evaluated to locate platforms that can provide the required support functions.

如果计划/评估交战的发射平台在目标上有本地轨道，则优先考虑发射平台提供轨道、无线照射和拦截IFTU通信支持。如果发射平台无法提供所有所需的支持功能，则评估平台的交战支持单位名单，以确定能够提供所需支持功能的平台。如果在评估了发射平台的交战支持单位名单上的平台后，所需的支持功能仍然不满足，则将评估其他CPG组内平台报告的目标跟踪轨迹，以确定能够提供所需支持功能的平台。

If after evaluating the launching platform, Engagement Supporters, and CPG track reporters, the required support functions are still not satisfied, the engagement is deferred.

如果在评估了发射平台、战斗支持组件和CPG跟踪平台后，仍然不满足所需的支持功能，则推迟交战。

For a detailed discussion of the engagement volume and intercept constraints applied during the determination of the track, illumination and interceptor IFTU communication support platforms, see Appendix B5.

关于确定轨道、无线照射和拦截IFTU通信支持平台期间应用的交战量和拦截限制的详细讨论，见附录B5。

CPG platforms will query both external engagement supporters and other CPG platforms for engagement support, illumination support, and communication support. Prior to EADSIM Version 7.00, the Flexible Commander ruleset had the capability to provide engagement support, which included illumination support. However, the engagement support and illumination support could not be tasked to separate platforms. The Flexible SAM now has a limited capability of engagement support and selection of external communication provider.

CPG平台将查询外部参与支持者和其他CPG平台的参与支持、无线照射支持和通信支持。在EADSIM版本7.00之前，灵活的指挥官规则集能够提供交战支持，包括无线照射支持。但是，交战支持和无线照射支持不能由不同的平台分别提供。灵活的SAM现在在交战支持和选择外部通信提供者方面的能力有限。

Both the Flexible SAM, for function as a CPG platform, and the Flexible Commander, for use as external engagement supporter have the ability to provide either engagement support, illumination support, or both. For the default case of engagement support for weapon selection by methods other than hierarchy, the illumination supporter is the same as the engagement supporter.

作为CPG平台使用的灵活SAM和作为外部交战支持者使用的灵活指挥官都有能力提供交战支持和/或无线照射支持。对于通过层次以外的方法选择武器的交战支持的默认情况，无线照射支持与交战支持相同。

The tasking and acknowledging of illumination support is handled identically to that of engagement support. At the time of weapon selection, an engagement supporter and illumination supporter platform will be chosen. Assignment commands for engage support and illumination support will be sent to the designated platforms, and the Flexible SAM initiating the engagement will wait for an acknowledgement.

无线照射支持的任务分配和确认与交战支持的处理方式相同。在武器选择时，将选择一个交战支持和无线照射支持平台。交战支持和无线照射支持的分配命令将发送到指定平台， SAM开启战斗将需要进一步的权限确认。

The assignment to external engagement supporters occurs at the time of lock in most other cases. Since CPG members will use a wait delay that will allow them early planning and peer deconfliction of engagements, the assignments to engagement and illumination supporters will not occur until the engagement has been deconflicted. This deconfliction occurs at the user-specified deconflict time. To assure that the timeline functions properly, the deconfliction time is added to the Launch Phase Start Time; thus, the minimum time from engagement decision to interceptor away is the Launch Phase Start Time plus the deconfliction time. This prevents the SAM from entering launch before other platforms in the Coordinating Platform Group have the opportunity to provide engagement information. The coast cycles can be used to allow the launch phase to coast if timing differences occur and the SAM reaches launch phase without tasking the supporters.

在大多数其他情况下，给外部交战支持者的任务分配发生在锁定时。由于CPG成员将使用一个等待延迟，这将允许他们提前规划和同级解除交战冲突，因此在解除交战冲突之前，不会向交战和无线照射支持者分配任务。“冲突解除”事件发生在用户指定的时间。为确保时间轴功能正常，将冲突解除时间添加到发射阶段开始时间；因此，从交战决策到拦截离开的最短时间是发射阶段开始时间加上冲突解除的时间。这可以防止SAM在协调平台组中的其他平台在提供交战信息之前进入发射状态。如果出现时间差，并且SAM到达发射阶段而无需向支持者下达任务，则可以使用滑行循环进入发射滑行阶段。

At the receipt of the assignment command, the Flexible Commander or Flexible SAM evaluates its resources to determine if the engagement can be supported. For clarity and easy maintenance of the code, both rulesets access the same routines for checking constraints and acknowledging the support request. If the supporting platform cannot block the required resources, a CANTCO will be sent back to the assigning SAM. If resources are available, a WILCO will be sent.

在收到分配命令时，灵活指挥官或灵活SAM评估其资源，以确定是否可以支持交战。为了代码的清晰性和易于维护，两个规则集访问相同的例程来检查约束和确认支持请求。如果支持平台无法满足所需的资源，将向分配SAM发送CANTCO(Can't Comply)。如果资源可用，将发送WILCO(Will comply)。

At the time of the receipt of acknowledgement by the assigning SAM, the lock actions of the supporting platform will occur. The C2\_LOCK\_IFTU command is the existing command graphically showing engagement support. An additional command for the illuminator platform, C2\_LOCK\_ILLUM will show the illuminating platform for the engagement. The SAM will be able to proceed with the launch at this time.

在接受了任务的SAM接收到确认指令时，将发生支持平台的锁定动作。C2\_LOCK\_IFTU命令是以图形方式显示交战支持的现有命令。无线照射平台的附加命令C2\_LOCK\_ILLUM将显示用于交战的无线照射平台。SAM此时将能够继续发射。

The standard engagement supporter capability utilizes an Engagement Supporter Response Time. After the SAM sends its commands to its supporting platforms, it will wait this long for response before aborting the engagement. This prevents the SAM from becoming stuck in an engagement when it queries a supporter that has since been killed. The CPG capability also utilizes this timeout to prevent the same condition; however, an immediate response from active supporter platforms is assumed due to the high bandwidth on the CPG network.

标准的交战支持功能利用了交战支持的响应时间。在SAM将其命令发送到其支持平台之后，它将等待响应这么长时间，然后可能中止战斗。这可以防止SAM因为提供支持的平台后来被击毁而在交战中卡住。CPG能力也利用这个超时来防止相同的情况；但是，由于CPG网络上的高带宽，可以假设来自活动支持平台的响应是即时的。

Whenever an engagement is completed or aborted, both the engagement supporter and illumination supporter will be sent an Engagement Complete message indicating that the engagement has been terminated and resources are no longer required. The supporting platforms will adjust their resources accordingly

无论何时完成或中止交战，都会向交战支持者和无线照射支持者发送一条交战完成消息，指示交战已终止，不再需要资源。支撑平台将相应调整资源。

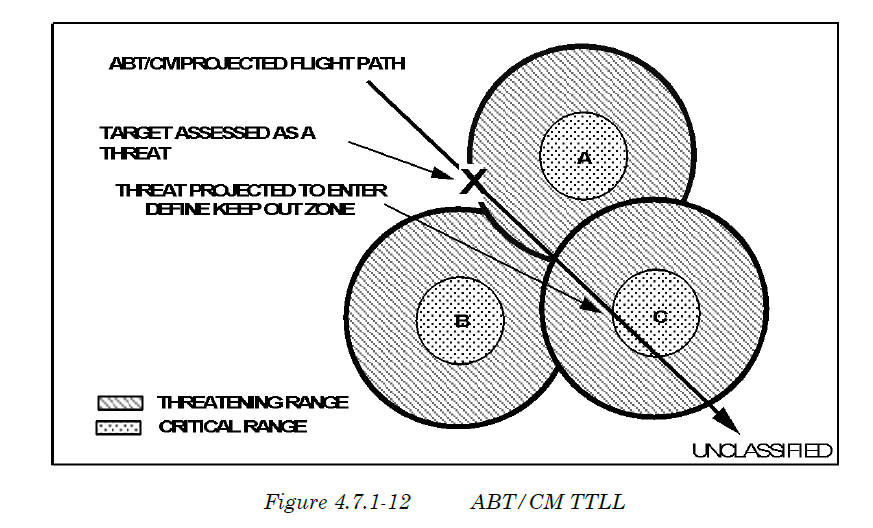
The communication provider for the engagement can be a separate platform from the launching platform, engagement supporter, and the illumination provider. While terrain checks will be performed to verify that the communication provider has line-of-sight during the specified time period of missile flyout, no explicit tasking will be issued to the communication provider. Upon completion of the engagement, the active status of the communication provider will be required in order for the engagement to be successful. At this time, there is no graphical indication of the communication provider for the engagement.

交战的通信提供者可以是独立于发射平台、交战支持者和无线照射提供者的平台。虽然SAM将执行地形检查，以验证通信提供者在导弹飞出的指定时间段内是否有视线，但不会向通信提供者发出明确的任务。接洽完成后，需要通信提供者的活动状态，以便接洽成功。此时，通信提供者没有给出用于交战的图形指示。

##### 4.7.1.2.2.1.2 Methodology For Computing Time To Last Launch Opportunity

4.7.1.2.2.1.2计算最后一次发射机会时间的方法

During the weapon selection processing, the Time to Last Launch (TTLL) across all weapons on the launching platform is computed. Each weapon on the launching platform is evaluated individually to determine the earliest valid intercept against the incoming threat. Once this earliest valid intercept is determined, a TTLL is computed for that particular weapon. This same process is applied to each weapon on the launching platform. The computed Time to First Launch (TTFL) and TTLL is stored for each weapon. If operating with the FIRE console, the data on the individual weapon solutions may be used by the operator to perform manual selection of which weapon to utilize in the engagement. After computing the individual weapon TTLLs, the latest individual weapon TTLL is considered the TTLL across all weapons on the platform. This overall TTLL value will be included in the engagement report for the selected weapon and will be used for engagement deconfliction.

在武器选择过程中，计算发射平台上所有武器的最后发射时间（TTLL）。发射平台上的每种武器都要单独评估，以确定针对来袭威胁的最早有效拦截。当最早的有效截获被确定后，该武器对象和其TTLL被视为用于拦截的武器。同样的过程也适用于发射平台上的每种武器。为每种武器存储计算的首次发射时间（TTFL）和TTLL。如果使用火力控制台操作，操作员可以使用单个武器解决方案上的数据手动选择交战中使用的武器。在计算单个武器TTLL后，最新的单个武器TTLL被认为是平台上所有武器的TTLL。该总TTLL值将包含在所选武器的交战报告中，并用于解除交战冲突。

The individual weapon TTLL is computed based on the perceived threat type. For TBMs, TTLL is based on final shot opportunity given the ballistic trajectory of the missile. The individual weapon TTLL is computed if the threat's projected flight path enters the user defined critical down range for weapon selection by hierarchy. The threat's projected flight path is evaluated to determine the defended asset whose critical down range is intersected earliest. For ABT/CM engagements, a point of closest approach method is applied using the ABT/CM projected flight path to determine intersection with the defended asset critical down range. The defended asset which produces the earliest point of closest approach intersecting critical down range is used for the weapon TTLL calculation.

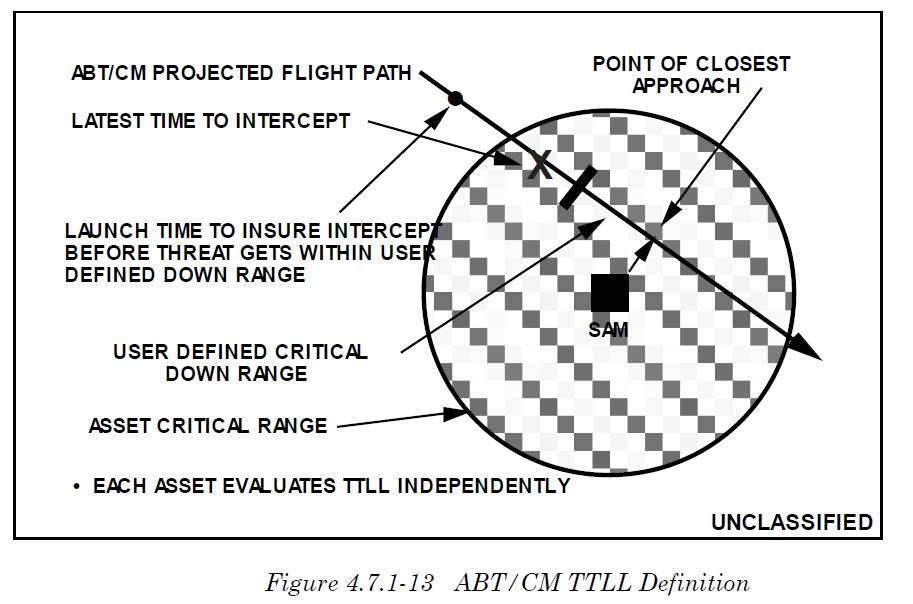
根据感知到的威胁类型计算单个武器的TTLL。对于战术弹道导弹tbm，TTLL基于给定导弹弹道的最终射击机会。如果威胁的预计轨迹进入用户定义的核心保护范围，则计算单个武器的TTLL，以便按层次选择武器。对威胁的预计飞行轨迹进行评估，以确定最早相交于其临界打击距离的防御资产。对于空中目标或巡航导弹ABT/CM拦截战斗，则解析ABT/CM飞行轨迹的投影，采用最近点进近方法，以确定与防御资产核心保护范围的交叉点。生成与临界打击射程相交的最早，最近点的防御资产用于武器TTLL计算。

Once this threatened asset is found, an intercept point is computed where the threat intersects the critical down range of the defended asset. If the computed intercept point at critical down range is valid, then the weapon TTLL is computed by subtracting the weapon flyout time and posture time from the time of intercept at critical down range. If the computed intercept point at critical down range is not valid, additional intercept points are computed by back propagating the threat's projected position at one second intervals starting at critical down range.

一旦发现该受威胁资产，将在威胁与被防御资产的临界打击范围相交的位置计算拦截点。如果计算的临界射程截获点有效，则通过从临界射程算出的截获时间中减去武器弹出时间和姿态调整时间来计算武器TTLL。如果计算的临界下射程截获点无效，则从临界射程开始，以1秒的间隔反向推导威胁的投影位置，计算新的截获点。

If a valid intercept point is computed during the back propagation that is later than the current earliest intercept solution for the weapon, the TTLL for this weapon is computed by subtracting the weapon flyout time and posture time from the latest valid intercept time. During the back propagation, if no valid intercept is found that is later than the current earliest intercept time, then the weapon TTLL is computed by subtracting the weapon flyout time and posture time from the current earliest intercept time for the individual weapon.

如果在反向传播过程中计算的有效截获点晚于武器的当前最早截获解，则通过从最新有效截获时间中减去武器弹出时间和姿态时间来计算该武器的TTLL。在反向传播过程中，如果没有发现晚于当前最早截获时间的有效截获，则通过从单个武器的当前最早截获时间中减去武器弹出时间和姿态调整时间来计算武器的TTLL。



##### 4.7.1.2.2.1.3 Flexible SAM Engagement Report

4.7.1.2.2.1.3灵活SAM参与报告

For each planned engagement by a platform operating under a Flexible SAM ruleset, an engagement report is created. This is a command message and will be transmitted to all platforms that have a command or composite network connection. The engagement report contains all pertinent information about the planned engagement. This report is the mechanism by which peer deconfliction within a Coordinating Platform Group (CPG) is performed.

对于在灵活SAM规则集下运行的平台的每个计划参与，将创建一个参与报告。这是一条命令消息，将传输到所有具有命令或复合网络连接的平台。审计业务报告包含有关计划审计业务的所有相关信息。此报告是协调平台组（CPG）内执行对等消除冲突的机制。

Engagement reports and engagement status messages have a status action associated with them and are sent when the engagement progresses to each new action. Engagement reports can have actions of Weapon Assigned, Tracking/Locked On/Ready to Fire, or Firing/Missile in Flight. Engagement complete messages can have actions of Effective/Target Destroyed, Not Effective, or Engagement Broken. An early engagement announcement of Weapon Assigned can be reported on a threat as soon as an intercept solution is found, even though the planned launch time is in the future, if the Transmit Early Assigned option is selected. If the SAM is in semi-automatic mode and the Transmit Assigned Once Authorized option is selected, the early announcement will be delayed until the operator authorizes the track for engagement. For a Flexible SAM with onboard weapons, Tracking/Locked On/Ready to Fire is reported when the SAM locks on the target and schedules the launch. Firing/Missile in Flight is reported when the launch occurs. If shooting a salvo then Firing/Missile in Flight is reported for each interceptor. If the SAM has remote launchers and the options to perform early engagement announcement have not been selected, Weapon Assigned is reported when a launcher is selected and the SAM’s launch phase is scheduled. For either case, if the SAM is in semi-automatic mode, Weapon Assigned is reported when an intercept solution is found. Further status reports will be deferred until the engagement is authorized and progresses further. Tracking/Locked On/Ready to Fire is reported when the assignment is sent to the launcher and Firing/Missile in Flight is reported when the remote launcher reaches its launch phase, with a separate Firing/Missile in Flight report for each interceptor in the salvo. An engagement complete message on a successful engagement is reported as Effective/Target Destroyed while an unsuccessful engagement is reported as Not Effective. If an engagement is broken off for any reason after an initial engagement report has been sent, an engagement complete message is sent with a status of Engagement Broken. The status is set to Engagement Broken when upon intercept evaluation the SAM finds the target killed by another platform. An engagement complete message with a status of Engagement Broken will also be sent when battlespace is lost on a track for which a Weapon Assigned engagement status was sent but the track was never engaged.

敬业度报告和敬业度状态消息具有与之关联的状态操作，并在敬业度进展到每个新操作时发送。交战报告可以包含武器分配、跟踪/锁定/准备发射或发射/飞行中的导弹等动作。参与完成消息可以使有效/目标操作被销毁、无效或参与中断。一旦找到拦截解决方案，即使计划的发射时间是在未来，如果选择了传输早期分配选项，也可以在威胁上报告武器分配的早期交战通告。如果SAM处于半自动模式，并且选择了Transmit Assigned Once Authorized（传输分配一次授权）选项，则提前通知将被延迟，直到操作员授权轨道接合。对于带有机载武器的灵活SAM，当SAM锁定目标并计划发射时，会报告跟踪/锁定/准备发射。发射时报告发射/导弹在飞。如果发射齐射，则为每个拦截器报告发射/飞行中的导弹。如果SAM有远程发射器，但尚未选择执行早期交战通告的选项，则在选择发射器并计划SAM的发射阶段时，将报告分配的武器。对于这两种情况，如果SAM处于半自动模式，则在找到拦截解决方案时报告分配的武器。进一步的状态报告将推迟到约定获得授权和进一步进展。当任务发送到发射器时，报告跟踪/锁定/准备发射；当远程发射器到达发射阶段时，报告发射/飞行中的导弹，并为齐射中的每个拦截器提供单独的发射/飞行中的导弹报告。成功交战的交战完成消息报告为有效/目标已销毁，而未成功交战的消息报告为无效。如果在发送初始预订报告后，预订因任何原因中断，则会发送一条预订完成消息，其状态为“预订中断”。在拦截评估时，当SAM发现目标被另一个平台杀死时，状态设置为“交战中断”。当一条轨道上的作战空间丢失时，也会发送一条状态为“交战中断”的交战完成信息，该轨道上已发送武器指定的交战状态，但该轨道从未交战。

Engagement status reports may be sent once when a new action occurs, or periodically. An option is available to send periodic engagement status messages at a user-specified update rate. If this option is selected, the Flexible SAM sends the engagement report and complete messages on all nets, rather than just to the commander. The periodicity of the messages is specifiable as a table of number of updates vs. update rate. This allows the user to send, for instance, two initial transmissions of the engagement status at a 6-second rate and then continue with additional transmissions at a 30-second rate. The last entry in the table is used for the remainder of the updates, regardless of the number of updates specified. The status messages begin when the platform selects a target for engagement and continue until the engagement is broken off or track is lost on the target, with the exception of a message with an engagement status of Engagement Broken. The Engagement Broken message is only sent for the number of updates specified in the first row of the table. For reports of engagements with a status of Not Effective, the user can choose to send the Not Effective message immediately followed by a report with a status of Engagement Broken if the reporter is unable to re-engage.

参与状态报告可以在新操作发生时发送一次，也可以定期发送。有一个选项可用于以用户指定的更新速率发送定期参与状态消息。如果选择此选项，灵活的SAM将在所有网络上发送交战报告和完整消息，而不仅仅是发送给指挥官。消息的周期性可以指定为更新次数与更新率的表。这允许用户例如以6秒的速率发送接合状态的两个初始传输，然后以30秒的速率继续附加传输。表中的最后一个条目用于其余的更新，而不管指定的更新数是多少。状态消息从平台选择交战目标时开始，并一直持续到目标上的交战中断或航迹丢失，但交战状态为“交战中断”的消息除外。只有在表的第一行中指定的更新次数下，才会发送预订中断消息。对于状态为“未生效”的预订报告，如果报告者无法重新预订，用户可以选择立即发送“未生效”消息，然后发送状态为“预订中断”的报告。

Upon receipt of a report by any other platform within a defined CPG, the receiving platform will compare the engagement data to any ownship engagement that has been planned against the threat. Peer deconfliction rules will use the same criteria as the weapon selection rules, allowing the user to select the criteria, define the order in which the criteria are applied, and specify any applicable thresholds to evaluate the next criteria. The engagement report contains all data necessary to apply the criteria.

在收到定义的CPG内任何其他平台的报告后，接收平台将把交战数据与针对威胁计划的任何己方交战进行比较。对等反冲突规则将使用与武器选择规则相同的标准，允许用户选择标准，定义标准应用的顺序，并指定任何适用的阈值来评估下一个标准。审计业务报告包含应用标准所需的所有数据。

If the information contained in the engagement report is determined to be better than the ownship engagement, the ownship track is marked as engaged; and further assessment of the track is precluded until notification that the engagement has been completed or otherwise suspended. Upon receipt of the complete report, the track will be subject to future target selection processing by the local platform.

如果审计业务报告中包含的信息被确定为优于自有审计业务，则自有审计业务将被标记为已审计业务；在审计业务已完成或以其他方式暂停之前，禁止对审计业务进行进一步评估。收到完整报告后，轨道将由本地平台进行未来目标选择处理。

The engagement report will also contain the TTLL across all weapons for the reporting platform. This best TTLL across the CPG is stored by each platform for each threat. This TTLL information is used by each platform to evaluate last launch situations.

交战报告还将包含报告平台所有武器的TTLL。跨CPG的最佳TTLL由每个平台为每个威胁存储。每个平台都使用TTLL信息来评估上次的发射情况。

##### 4.7.1.2.2.1.4 Flexible SAM Engagement Deconfliction

4.7.1.2.2.1.4灵活SAM交战解冲突

The Flexible SAM ruleset deconfliction capability allows the user to define groups of platforms for which engagement deconfliction is to occur. This capability deconflicts engagements across all platforms that the user has defined to be of the same group. Additionally, the user can define a TTLL threshold that allows the group deconfliction to be suspended if the planned engagement launch time is determined to be within this time. This deconfliction capability yields deconfliction to the first engager with a TTLL override. Deconfliction has several additional options which are available for engagement selection through varying deconfliction criteria.

灵活的SAM规则集消除冲突功能允许用户定义发生交战消除冲突的平台组。此功能可消除用户定义为属于同一组的所有平台之间的冲突。此外，用户可以定义TTLL阈值，如果确定计划的交战启动时间在该时间内，则该阈值允许暂停组解冲突。这种消除冲突的能力产生了对带有TTLL超控的第一个接合器的消除冲突。“反冲突”有几个附加选项，可用于通过不同的“反冲突”标准选择交战。

The mechanism that is used by the Flexible SAM to perform engagement deconfliction is the engagement report. Upon receipt of an engagement report from any Flexible SAM platform, the engagement information contained in the report is stored; thus, each Flexible SAM obtains a complete list of information on all platforms that can engage the specific threat. The time of planning for the earliest information is also stored. For a Flexible SAM that has not already planned an engagement against the specific threat, the receipt of the engagement report is also a trigger to plan and report the engagement on the next execution of the Target Select phase even if the planned launch time does not fall within the early announcement criteria defined by the user input Wait Delay.

灵活SAM用于执行交战解除冲突的机制是交战报告。在收到来自任何灵活SAM平台的交战报告后，将存储报告中包含的交战信息；因此，每个灵活SAM将获得所有平台上可与特定威胁交战的完整信息列表。最早信息的计划时间也被存储。对于尚未计划对抗特定威胁的灵活SAM，即使计划的发射时间不在用户输入等待延迟定义的提前通知标准内，接收到交战报告也是在下一次执行目标选择阶段计划和报告交战的触发因素。

The user may tailor the doctrine by which this comparison is made by defining user-selectable criteria. The user may define a hierarchy of criteria, much the same as described for weapon selection, where each criteria is evaluated and compared against defined thresholds to determine which platform has the best shot opportunity based on those selected criteria. Each platform that is participating in engagement coordination will make an independent evaluation of whether some other platform is best suited to take the shot or if the ownship engagement is best. The determination of who has the best shot is performed on the first execution of the Target Select phase of each platform after the Deconflict Time has passed relative to the stored earliest planning time. Given this approach, the Wait Delay does not have to be set to guarantee time for deconfliction to occur. The Deconflict Time will need to be set to a value that insures that the next execution of the Target Select phase of all member of the CPG will execute prior to the Deconflict Time expiring. For example, if the Target Select repeat time is two seconds, then the Deconflict Time will need to be at least two seconds.

用户可以通过定义用户可选择的标准来定制进行比较的原则。用户可以定义一个标准层次结构，与武器选择所描述的基本相同，其中每个标准被评估，并与定义的阈值进行比较，以确定哪个平台具有基于那些选择的标准的最佳射击机会。参与交战协调的每个平台将独立评估其他平台是否最适合拍摄，或者自己的交战是否最佳。在相对于所存储的最早计划时间经过解冲突时间之后，在每个平台的目标选择阶段的第一次执行时执行对谁具有最佳拍摄的确定。考虑到这种方法，不必设置等待延迟来保证解冲突发生的时间。需要将解冲突时间设置为一个值，以确保CPG的所有成员的目标选择阶段的下一次执行将在解冲突时间到期之前执行。例如，如果目标选择重复时间为2秒，则消除冲突时间至少需要2秒。

If the selected shot is taken, the selected platform determines whether another shot opportunity exists within the CPG. This is done by comparing the computed intercept time plus kill assessment delays against the TTLL included in each engagement report. If the TTLL of any coordinating platform is greater than the selected engagement intercept time plus kill assessment time, it is assumed at least one additional shot opportunity exists. If it is determined that this will be the last shot opportunity, the deconfliction process is repeated using the hierarchy of criteria that was used to perform weapon selection on each platform. This allows the user to employ a differing deconfliction doctrine on the shot opportunity to conserve timeline and potentially yield an additional shot.

如果选择了放炮，则所选平台确定CPG中是否存在另一个放炮机会。这是通过将计算的拦截时间加上杀伤评估延迟与每个交战报告中包含的TTLL进行比较来实现的。如果任何协同平台的TTLL大于选定的交战拦截时间加上杀伤评估时间，则假定至少存在一个额外的射击机会。如果确定这将是最后一次射击机会，则使用用于在每个平台上执行武器选择的标准层次结构重复解冲突过程。这允许用户在放炮机会上采用不同的消除冲突原则，以节省时间线并可能产生额外的放炮。

If the determination is made that another platform is best suited, based on the ownship deconfliction evaluation, the ownship engagement is aborted; and the threat is flagged as engaged. All coordinating platforms that do not accept the engagement will suspend engagement processing on the track until receiving notification from the engager that the engagement is complete. Upon receipt of such notification, the track will be available for engagement processing and the deconfliction process will be repeated by all coordinating platforms that have a shot opportunity.

如果确定另一个平台最适合，则基于“己方对抗评估”，中止己方交战；并将威胁标记为已交战。所有不接受接洽的协调平台将暂停轨道上的接洽处理，直到收到接洽人关于接洽完成的通知。收到此类通知后，轨道将可用于交战处理，所有有机会的协调平台将重复消除冲突过程。

It is important to note, that an engagement complete report will be generated by the engaging platform when any of the following events occur: • Completion of kill assessment • Launch failure (reliability failure) • Inflight failure (reliability failure)

重要的是要注意，当发生以下任何事件时，交战平台将生成一份交战完成报告：•完成杀伤评估•发射失败（可靠性失败）•空中失败（可靠性失败）

Additionally, it is assumed that each coordinating platform will be operating under the same hierarchy of deconfliction criteria. In the event they are not operating under the same criteria, multiple simultaneous engagements against the same threat can occur.

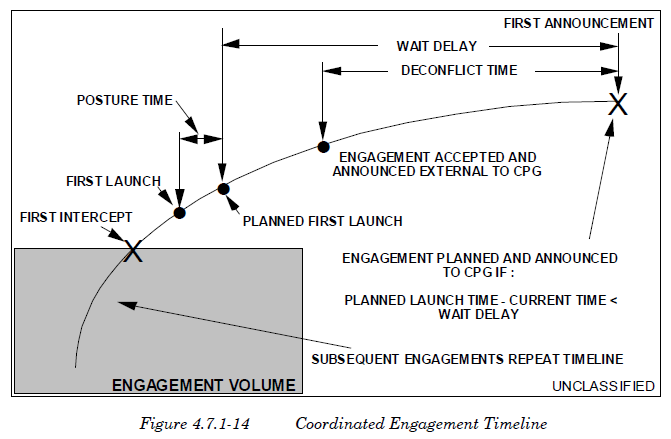
此外，假设每个协调平台将在同一层级的反冲突标准下运行。如果它们不是在同一标准下作战，那么针对同一威胁的多个同时交战就可能发生。

Given this implementation, a shorter Wait Delay input can be utilized. The Wait Delay input will force all SAMs to evaluate and report their shot plan on a specific target within the Wait Delay seconds prior to the first possible engagement decision being required. This methodology will allow the deconfliction to occur reliably, while keeping resources from being blocked for long periods of time. The current algorithm will block resources for a shot by all the SAMs against the threat, pushing shots against other threats into the future. A quicker decision on who takes the shots clears up the engagement channels to allow the SAMs to work on engaging other threats sooner.

给定这种实现，可以利用较短的等待延迟输入。等待延迟输入将强制所有SAM在等待延迟秒内评估并报告其对特定目标的射击计划，然后才需要第一个可能的交战决策。这种方法将允许可靠地消除冲突，同时防止资源长时间被阻塞。当前的算法将阻止所有SAM对威胁进行射击的资源，从而将对其他威胁的射击推向未来。对谁开枪的更快决定将清除交战通道，使SAM能够更快地对付其他威胁。

All platforms will monitor engaged tracks for the time to last launch. The user can optionally specify to switch to highest Pk doctrine for the last launch opportunity. Each platform will evaluate the platform currently engaging the threat to determine if this platform is the platform with the highest Pk. If a platform is engaging when the TTLL threshold is reached and this platform determines that it does not have the highest Pk weapon, it will abort its engagement of the threat. The platform who has the highest Pk weapon will also be performing the last launch evaluation and will initiate its engagement against the threat. If the platform already engaging the target has the highest Pk weapon, it will revert to the fire doctrine rules to determine how many shots it should fire.

所有平台都将在最后一次发射前监控交战轨道。用户可以选择指定为最后一次启动机会切换到最高主键原则。每个平台将评估当前攻击威胁的平台，以确定该平台是否是Pk最高的平台。如果一个平台在达到TTLL阈值时正在交战，并且该平台确定它没有最高Pk武器，它将中止其对威胁的交战。拥有最高Pk武器的平台也将执行最后一次发射评估，并将开始对抗威胁。如果已经与目标交战的平台拥有最高Pk武器，它将恢复到射击原则规则，以确定它应该发射多少枪。



#### 4.7.1.2.2.2 SAM Command Chain Automated Engagement Coordination

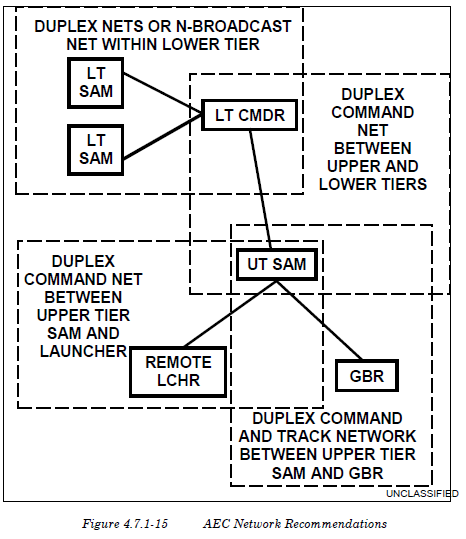
4.7.1.2.2.2 SAM指挥链自动交战协调

For the purpose of weapons conservation, members of a SAM command chain may wish to coordinate with members of a different command chain. Upper-tier SAMs may coordinate with other upper-tier SAMs and/or with lower-tier SAMs when making engagement decisions against TM threats. The individual command chains do not necessarily deconflict their joint engagements, but they may adjust their fire doctrine if it is known that another system is also engaging. This coordination may be established through association with an Automated Engagement Coordination (AEC) Group. An AEC group should contain the upper-tier Flexible SAM platforms and the commanders of the lower-tier Flexible SAMs. Figure 4.7.1-15 illustrates the recommended network configurations when employing automated engagement coordination.

为了保护武器，SAM指挥链的成员可能希望与不同指挥链的成员进行协调。在针对TM威胁做出交战决策时，上层SAM可与其他上层SAM和/或下层SAM协调。单个指挥链不一定能消除它们的联合交战冲突，但如果知道另一个系统也在交战，它们可以调整自己的火力原则。这种协调可以通过与自动交战协调（AEC）小组的联系来建立。AEC组应包含上层柔性SAM平台和下层柔性SAM的指挥官。图4.7.1-15说明了采用自动交战协调时的推荐网络配置。

Flexible SAMs report all engagement information to their commanders. The commander will forward information on its command nets. The Flexible Commander also has an option to forward the engagement information from one SAM to the commander's other subordinate SAMs. This option is used when the SAMs are networked on an NBroadcast net to the commander. The other SAMs will not automatically receive the engaging SAM's reports. Figure 4.7.1-15 illustrates the recommended network configurations when employing enclave coordination

灵活的SAM向其指挥官报告所有交战信息。指挥官将在其指挥网上转发信息。灵活指挥官还可以选择将交战信息从一个SAM转发到指挥官的其他下属SAM。当SAM在NBroadcast网络上与指挥官联网时，使用此选项。其他SAM不会自动接收SAM的报告。图4.7.1-15说明了采用飞地协调时的推荐网络配置



The tier coordination features within the Flexible SAM yield additional functionality to allow the user to coordinate engagements and engagement information between multiple defense tiers. The level of coordination and the doctrine by which the coordination will occur is user selected and differs depending on the type of SAM system that is being deployed (Upper Tier, Lower Tier, Upper/Lower Tier, Default). Given this, the following discussion detailing the coordination and coordination parameters is broken into three parts: the transmission of the coordination information, the use of that information by the upper-tier, and the use of the information by the lower-tier.

灵活的SAM中的层协调功能产生额外的功能，允许用户在多个防御层之间协调交战和交战信息。协调级别和进行协调的条令由用户选择，并根据正在部署的SAM系统类型（上层、下层、上层/下层、默认）而有所不同。鉴于此，以下详述协调和协调参数的讨论分为三个部分：协调信息的传输、上层对该信息的使用以及下层对该信息的使用。

The specific tier report message and the handling of that message forms part of the basis of shot selection between systems on the battlefield. The tier report message does not influence whether or not an engagement will be conducted, nor the timing of that engagement. Rather, the tier report message provides details of the ability of other systems to engage upon the threat. This information of other systems’ engagement capability against a specific threat is used to alter the number of shots taking on any given engagement opportunity.

特定层报告消息和对该消息的处理构成战场上系统之间选择射击的基础的一部分。层级报告消息不影响是否执行约定，也不影响该约定的时间。相反，tier report消息提供了其他系统攻击威胁能力的详细信息。其他系统对抗特定威胁的交战能力信息用于改变任何给定交战机会的射击次数。

##### 4.7.1.2.2.2.1 Tier Report Message Transmission

4.7.1.2.2.2.1层报表报文传输

The tier report message is used by the members of the AEC group to report their support status on a specific target track. A coordination action is sent in the message to indicate whether this message announces an intention to engage, an expectation of support, or the availability of support. An upper-tier SAM that is a member of an AEC group first reports whether or not it intends to engage a track. If the track is not a threat, no battlespace exists, or for the semi-automatic case, if the track has not been authorized, the SAM sends a tier report with an action of Do Not Intend to Engage on all nets. If the track is threatening, has battlespace, and is authorized, the SAM sends a report of Intend to Engage on all nets. Non-threatening tracks which have been manually authorized will also be reported as Intend to Engage.

层报告消息由AEC组的成员用于报告其在特定目标轨迹上的支持状态。在消息中发送一个协调操作，以指示此消息是否宣布参与的意图、支持的期望或支持的可用性。作为AEC组成员的上层SAM首先报告其是否打算参与轨道。如果轨道不是威胁，不存在作战空间，或者对于半自动情况，如果轨道未被授权，SAM发送一个带有“不打算与所有网络交战”操作的层报告。如果跑道有威胁，有作战空间，并且获得授权，SAM将发送一份报告，表明打算在所有网络上交战。手动授权的非威胁性轨道也将被报告为准备交战。

For coordination with other upper-tier SAMs, once the determination is made that the upper-tier SAM does intend to engage, it then evaluates its firing doctrine to determine if the UT1 vs. UT2 PK Specification criterion is selected. If using the UT1 vs. UT2 criterion and it is the first upper-tier member of the AEC group to engage the target, the upper-tier SAM sends a tier report with an action of Support Expected to the other upper-tier members of the AEC group. When an upper-tier SAM receives the Support Expected report and has the Process Upper Tier Reports option selected, the SAM checks its battlespace regardless of tracking restrictions and responds with support available if capable of engaging after the reported SAM. If the SAM is not capable of engagement after the reported SAM, no message is sent. If the upper-tier SAM has not received a support available from an upper-tier SAM before launching, then the current SAM is UT1 with no UT2 support. If not using the UT1 vs. UT2 criterion, then the Intend to Engage report may be used by other upper-tier systems to adjust their fire doctrine.

为了与其他上层SAM协调，一旦确定上层SAM确实打算交战，它将评估其射击条令，以确定是否选择了UT1与UT2 PK规范标准。如果使用UT1与UT2标准，并且它是AEC组中第一个与目标交战的上层成员，上层SAM将发送一个层报告，其中包含AEC组中其他上层成员预期的支持行动。当上层SAM接收到预期支持报告并选择了“处理上层报告”选项时，SAM检查其作战空间，无论跟踪限制如何，如果在报告的SAM后能够交战，则使用可用支持进行响应。如果在报告的SAM后SAM不能交战，则不发送消息。如果上层SAM在启动前未收到上层SAM提供的支持，则当前SAM为UT1，不支持UT2。如果不使用UT1与UT2标准，则其他上层系统可能会使用意向交战报告来调整其火力条令。

For coordination with lower-tier SAMs, once the determination is made that the upper-tier SAM does intend to engage it then evaluates whether or not the threat will impact within a TMDA associated with a lower-tier member of its AEC group. Scripted TMDAs may be created by the user and associated with the lower-tier commander and/or its subordinates. Dynamic TMDAs may be created through the reception of defended area messages from the lower-tier commanders. If the threat impacts within a lower-tier defended area, the upper-tier SAM sends a tier report with an action of either Support Expected or Support Not Expected to the commander of the lower-tier SAM whose TMDA contains the predicted impact point. If the target type is to be engaged by upper tier only, as specified in the Upper Tier Coordination parameters, the action is sent as Support Not Expected. If the SAM has previously received a coordination message from the lower-tier commander indicating that support is not available for this target, it sets the action to Support Not Expected. Otherwise, the SAM sends a message with an action of Support Expected. When a Support Expected message has been sent, the upper-tier SAM expects to receive a response from the recipient commander. The response may have an action of Support Available or Support Not Available, which the upper-tier SAM can then use to adjust its fire doctrine accordingly

为了与下级SAM进行协调，一旦确定上级SAM确实打算参与，则评估威胁是否会影响与其AEC组的下级成员相关的TMDA。脚本化的tmda可以由用户创建，并与下级指挥官和/或其下属相关联。动态TMDA可以通过接收来自下级指挥官的防御区信息来创建。如果威胁在较低层防御区域内产生影响，则较高层SAM向较低层SAM的指挥官发送一份含有预期支持或不预期支持行动的层报告，其TMDA包含预测的影响点。如果目标类型仅由上层参与，则按照上层协调参数中的指定，操作将作为不期望的支持发送。如果SAM先前收到来自下级指挥官的协调消息，指示此目标无法获得支持，则会将操作设置为“支持未预期”。否则，SAM将发送一条消息，其中包含预期的支持操作。当已发送预期支持消息时，上层SAM期望接收来自接收者指挥官的响应。响应可能有支持可用或支持不可用的动作，上层SAM可以使用该动作相应地调整其火力原则

The tier report message is retransmitted until a response is received up to a maximum number of retransmits. The user may specify the number of times a message is to be retransmitted and at what frequency. These values are defined based on whether this is a response or an original message, and whether or not a response is required. An original message sent on all nets is retransmitted based on the Response Not Required values. An original message that is addressed to a specific platform is retransmitted using the Response Required inputs. A response message is retransmitted using the values specified for a Response. The response message can only be received from externally controlled platforms. If none are present in the scenario, it is suggested that the Response Required Max Transmits be set to 0.

层报告消息将被重新传输，直到接收到最大重新传输次数的响应为止。用户可以指定消息被重传的次数和频率。这些值是根据这是响应还是原始消息以及是否需要响应来定义的。在所有网络上发送的原始消息将根据响应非必需值重新传输。使用响应所需的输入重新传输发往特定平台的原始消息。使用为响应指定的值重新传输响应消息。只能从外部控制的平台接收响应消息。如果场景中不存在响应，则建议将所需响应最大传输设置为0。

##### 4.7.1.2.2.2.2 Upper Tier Automated Engagement Coordination

4.7.1.2.2.2.2上层自动交战协调

For SAMs defined as Upper Tier, the availability of support from other tiers is required to determine the systems effectiveness that will be used to determine overall firing doctrine. Support availability can be evaluated on a track-by-track basis or the user can optionally select for the SAM to perform AEC across TBM track groups. The use of this option allows all tracks within a track group to be considered as having support when support is available on any one of the members of the track group. When the option to perform AEC across track groups is selected, both local and remote track groups are eligible for use in the engagement coordination. For coordination with lower-tier systems, the information needed is whether the lower tier can engage the threat and, if so, what is the lower-tier weapons inventory status.

对于定义为上层的SAM，需要来自其他层的支持的可用性来确定将用于确定总体射击条令的系统有效性。支持可用性可以逐个轨道进行评估，或者用户可以选择SAM跨TBM轨道组执行AEC。当轨道组的任何一个成员都有支撑时，使用此选项可以将轨道组中的所有轨道视为具有支撑。选择跨航迹组执行AEC的选项后，本地和远程航迹组都可以在交战协调中使用。为了与下级系统进行协调，所需的信息是下级是否能与威胁交战，如果能，下级武器库存状况如何。

The user has two options to obtain this information: the upper tier makes its own determination of whether the lower tier can provide support or it waits for the lower tier to report the information. If the user selects the option for the upper tier to evaluate independently, the user can optionally select the criteria by which the lower tier will be deemed available for support. The selectable options are: that the lower tier is alive, that the threat impacts in an associated TMDA, that the threat is in the lower tier sensor field of view, and that the lower tier has weapons. Depending on the selected criteria, evaluations are made and lower-tier engagement support is determined. The lower-tier weapons inventory status is determined by retrieving the unallocated weapons count for all lower-tier SAMs within the AEC group and comparing that number with the user-defined low-inventory threshold. For evaluation by track groups, all members of the evaluated track’s track group will be evaluated as having Support Available if it is deemed that the lower-tier can provide support on the track under evaluation. However, the lower-tier’s weapon inventory will be individually evaluated at the time of each track’s engagement evaluation.

用户有两个选项来获取此信息：上层自行确定下层是否可以提供支持，或者等待下层报告信息。如果用户选择上层独立评估的选项，则用户可以选择将下层视为可用于支持的标准。可选择的选项是：较低层是活动的，威胁影响相关TMDA，威胁在较低层传感器视野内，较低层有武器。根据选定的标准，进行评估并确定较低级别的参与支持。通过检索AEC组中所有较低层SAM的未分配武器计数并将该数字与用户定义的低库存阈值进行比较，确定较低层武器库存状态。对于轨道小组的评估，被评估轨道小组的所有成员将被评估为有可用的支持，如果认为较低层可以在被评估轨道上提供支持。但是，较低级别的武器库存将在每个轨道的交战评估时单独评估。

If the user selects the option for lower-tier weapons availability to be reported by the lower tier, the SAM uses the support availability status received in a tier report message to determine its fire doctrine. In the event that a tier report message has not been received from the lower tier when the upper-tier SAM is making its firing doctrine decisions, the user has the option to select whether the upper tier will assume that the lower tier has a high weapons inventory status, a low weapon inventory, or that the lower tier is unavailable. When evaluating by track groups, if a tier report is received on a member of a track group with the action Support Available, then all members of this track group will qualify as having Support Available. When using this evaluation method, the weapon inventory for the members of the track group will be set to low weapon inventory unless a tier report message is received by the upper-tier SAM for that specific track with a setting of weapon inventory high.

如果用户选择由较低层报告较低层武器可用性的选项，则SAM使用在层报告消息中接收的支持可用性状态来确定其火力条令。如果在上层SAM作出射击条令决策时，没有从下层收到层报告消息，则用户可以选择上层是否假定下层具有高武器库存状态、低武器库存或下层不可用。在按跟踪组进行评估时，如果收到一个跟踪组成员的层报告，并且有可用的操作支持，则此跟踪组的所有成员都将有资格获得可用的支持。使用此评估方法时，轨迹组成员的武器库存将设置为低武器库存，除非上层SAM接收到该特定轨迹的层报告消息，且武器库存设置为高。

For upper-tier coordination with other upper-tier systems, the systems effectiveness can be determined based on whether or not another upper-tier SAM has reported that it intends to engage the target and potentially the inventory status of that SAM. If a tier report with an action of Intend to Engage has been received from an upper-tier member of the AEC group, then upper tier support is considered available. The user has two options to obtain the supporting upper-tier SAM’s inventory status: the upper-tier SAM makes its own determination of the supporting SAM’s inventory status or it uses the status received in the tier report. If all upper-tier members have reported Do Not Intend to Engage, then the upper tier is considered as unavailable for support. When using the UT1 vs. UT2 PK Specification criteria, if a tier report with an action of Support Available has been received from an upper-tier member of the AEC group, then UT2 support is available. If a tier report with an action of Support Not Available has been received from an upper-tier member of the AEC group, then UT2 support is not available. If the coordination by track group option is selected and a report has been received from another upper-tier SAM with the intention to engage or with the support available, all other members of the track group will evaluate as having upper tier support available.

对于与其他上层系统的上层协调，系统有效性可根据另一上层SAM是否已报告其打算与目标交战以及该SAM的潜在库存状态来确定。如果已从该SAM的上层成员处收到带有“打算交战”动作的层报告AEC组，则认为上层支持可用。用户有两个选项来获取支持的上层SAM的库存状态：上层SAM自行确定支持SAM的库存状态或使用在层报告中收到的状态。如果所有上层成员都报告不打算参与，则上层成员将被视为无法获得支持。当使用UT1与UT2 PK规范标准时，如果已从AEC组的上层成员处收到具有可用支持操作的层报告，则UT2支持可用。如果已从AEC组的上层成员处收到包含支持操作不可用的层报告，则UT2支持不可用。如果选择了“按轨道组协调”选项，并且从另一个上级SAM收到了一份报告，打算参与或有可用的支持，则轨道组的所有其他成员将评估为有可用的上层支持。

##### 4.7.1.2.2.2.3 Lower Tier Automated Engagement Coordination

4.7.1.2.2.2.3下级自动交战协调

For SAMs defined as Lower Tier, the methodology for whether they can provide engagement support is much the same as that for upper-tier SAMs. The user may specify that a lower-tier system is available if the threat impacts in its TMDA and if the threat is within their sensors’ field of view. However, the determination of their support availability and the reporting of that availability status are performed by their commander, not by the lower-tier SAMs themselves. At the time of availability determination, the commander determines how many weapons are available on the SAM and compares that to the SAM’s Low Inventory Threshold to determine if the weapon inventory will be reported as high or low.

对于定义为较低层的SAM，其是否能够提供交战支持的方法与上层SAM的方法大致相同。如果威胁影响到TMDA，并且威胁在传感器的视野范围内，用户可以指定较低层系统可用。但是，确定其保障可用性和报告可用性状态由其指挥官执行，而不是由下级SAM自己执行。在确定可用性时，指挥官确定SAM上有多少武器可用，并将其与SAM的低库存阈值进行比较，以确定武器库存将报告为高还是低。

##### 4.7.1.2.2.2.4 Deconfliction Among Tiers

4.7.1.2.2.2.4层间消除冲突

Tiers can also be defined by group IDs. These IDs are used when making an engagement decision. If a SAM from one group (tier) reports an engagement of a threat, another SAM in that group (tier) will not take a shot against the threat unless it is within the user-specified TTLL threshold. SAMs from other groups can engage. This allows the lower tier to look at a target that the upper tier may already be engaging.

层也可以由组ID定义。这些ID在做出参与决策时使用。如果来自一个组（层）的SAM报告一个威胁的攻击，则该组（层）中的另一个SAM将不会对该威胁进行射击，除非该威胁在用户指定的TTLL阈值内。其他组的SAM可以参与。这使得较低的一级可以看到较高的一级可能已经参与的目标。

When using the Flexible SAM in a command chain, the commander performs deconfliction and coordination of reports with other command chains, or enclaves. The Flexible SAMs report all engagement information to their commanders. The commander will forward information on its command nets. Normally, a message will not be forwarded on the same network from which it was received. When all the subordinate SAMs are networked on a single NBroadcast net with the commander, this can prevent the SAMs from having knowledge of the other SAM’s engagements. To counteract this, the Flexible Commander has an option to forward the engagement information from one SAM to its other subordinate SAMs. This will allow engagement reports to be forwarded on all nets, including the one on which it was originally transmitted.

在指挥链中使用灵活SAM时，指挥官执行与其他指挥链或飞地的报告冲突消除和协调。灵活的SAM向其指挥官报告所有交战信息。指挥官将在其指挥网上转发信息。通常，消息不会在接收到它的同一网络上转发。当所有下级SAM与指挥官在一个NBroadcast网络上联网时，这可以防止SAM知道其他SAM的交战。为了抵消这一点，灵活指挥官可以选择将交战信息从一个SAM转发给其他下级SAM。这将允许在所有网络上转发交战报告，包括最初传输报告的网络。

When allowing the SAMs to function autonomously in a Coordinating Platform Group (CPG) using peer deconfliction, a different mechanism for enclave coordination is used. Engagements must first be deconflicted within the CPG, then the resulting engagement report must be sent to other enclaves.

当允许SAM在协调平台组（CPG）中使用对等解冲突自主运行时，使用不同的飞地协调机制。必须首先在中央人民政府内部解除交战冲突，然后将结果交战报告发送给其他飞地。

The mechanism for early deconfliction when using a commander with the Flexible SAM is the wait delay. The wait delay allows the SAM to make an early announcement of its intention to engage the target. The commander receives all the reports from its subordinate SAMs, selects one SAM to engage, sends stop commands to the other SAMs, and forwards the engagement report on all its command nets.

当使用具有灵活SAM的指挥官时，早期消除冲突的机制是等待延迟。等待延迟允许SAM提前宣布其与目标交战的意图。指挥官接收来自其下属SAM的所有报告，选择一个要交战的SAM，向其他SAM发送停止命令，并在其所有命令网上转发交战报告。

The wait delay is used to allow a deconfliction timeline for the CPG processing; however, the wait delay should be set large to allow CPG members to share planning information as soon as a platform knows it can engage a target.

等待延迟用于允许CPG处理的消除冲突时间线；但是，等待延迟应设置为较大，以允许CPG成员在平台知道可以与目标交战时共享计划信息。

When the early engagement report is sent, it will no longer be sent just to the commander; it will be reported out on all of the SAM's command networks. The engagement report will be flagged as not\_deconflicted.

当早期交战报告发送时，它将不再仅仅发送给指挥官；它将在SAM的所有指挥网络上报告。业务报告将被标记为未解除冲突。

When CPG members receive an engagement report that is not deconflicted and it is from a member of their CPG group, the CPG platform will apply its own deconfliction logic to the report. If the reporting platform is the best platform to engage the target, the deconflicting platform will stop its own engagement.

当CPG成员收到一份未消除冲突且来自其CPG组成员的参与报告时，CPG平台将对报告应用其自身的消除冲突逻辑。如果报告平台是与目标接洽的最佳平台，那么消除冲突的平台将停止自己的接洽。

The user-specified Deconflict Time allows a second report of the engagement, this time announcing that the report is peer deconflicted. This deconflicted report indicates that the reporting platform sent an early engagement report, coordinated with other CPG platforms' reports, and has been selected as the platform to engage the target.

用户指定的解除冲突时间允许第二次报告约定，这一次宣布报告是对等解除冲突的。这份消除冲突的报告表明，报告平台发送了一份早期交战报告，与其他CPG平台的报告相协调，并被选为与目标交战的平台。

When SAMs and commanders in other enclaves receive the deconflicted report, they can use the report to coordinate their own engagements. When SAMs and commanders in other enclaves receive non-deconflicted reports, the reports will not be processed. The Flexible Commander's deconfliction process flags its deconfliction results with a deconflicted flag, indicating that its forwarded engagement report can be used by other enclaves as well. This allows CPG's and command chains to coordinate engagements, using the deconfliction designation to determine which reports should be processed.

当SAM和其他飞地的指挥官收到解除冲突的报告时，他们可以使用该报告来协调自己的交战。当SAM和其他飞地的指挥官收到非冲突报告时，将不处理这些报告。灵活指挥官的解冲突过程使用解冲突标志来标记其解冲突结果，表明其转发的交战报告也可供其他飞地使用。这使得CPG和指挥链能够协调交战，使用反冲突指示来确定应该处理哪些报告。

When using the wait delay to announce early engagement, the Flexible SAMs will build launch records and flag their trackfiles to indicate their engagement against a target. If that engagement is subsequently aborted, the Flexible SAM will send out an engagement complete report to indicate that it has completed its engagement and the target can now be engaged by someone else.

当使用等待延迟来宣布提前交战时，灵活的SAM将建立发射记录并标记其跟踪文件，以指示其与目标的交战。如果该交战随后被中止，灵活SAM将发送一个交战完成报告，表明其已完成交战，并且目标现在可以被其他人交战。

At the time a Flexible SAM receives an engagement complete report from a platform the SAM recorded as engaging the target, the SAM will clear its track engagement record so that the target is now eligible for this SAM to engage.

当灵活SAM从平台接收到交战完成报告（SAM记录为与目标交战）时，SAM将清除其跟踪交战记录，以便目标现在有资格与该SAM交战。

If CPG platforms are still eligible to engage the target after receiving another platform's complete, the early engagement report and deconfliction process will begin again as the CPG platforms deconflict amongst themselves

如果CPG平台在收到另一个平台的完整信息后仍有资格与目标交战，则随着CPG平台之间的冲突消除，早期交战报告和冲突消除过程将再次开始

#### 4.7.1.2.2.3 The Launch Queue

4.7.1.2.2.3启动队列

For each weapon/target pair, a launch record is created for each shot taken against the target. The time at which the launch record is created is designated as the time the launch record entered the launch queue. The time at which the launch record entered the launch queue is compared with the start time of the launch phase when determining scheduling delays.

对于每个武器/目标对，针对目标的每次射击都会创建一个发射记录。创建启动记录的时间被指定为启动记录进入启动队列的时间。在确定调度延迟时，将启动记录进入启动队列的时间与启动阶段的开始时间进行比较。

If the posture time for a weapon allows time for a re-evaluation of the priorities during the next execution of the target-select phase, limited processing of the launch record is performed. The launch record is flagged not to be scheduled and placed in the queue temporarily. This record is used in the posture-timing calculation. No further processing of the record is performed until completion of all evaluations. Any launch records flagged to not be scheduled are removed at the end of the phase processing.

如果武器的姿态时间允许在目标选择阶段的下一次执行期间重新评估优先级，则对发射记录执行有限的处理。启动记录被标记为不计划并临时放置在队列中。此记录用于姿势计时计算。在完成所有评估之前，不会对记录进行进一步处理。在处理阶段结束时，将删除任何标记为不计划的启动记录。

After a launch record for the weapon/target pair is created, the Flexible SAM immediately goes into engage and lock modes on the target. If the engagement was the result of a commanded assignment, a WILCO acknowledgment is sent to the commander; otherwise, an engagement report is generated to send to the commander.

创建武器/目标对的发射记录后，柔性SAM立即进入对目标的接合和锁定模式。如果交战是由命令分配的结果，则会向指挥官发送WILCO确认；否则，会生成交战报告发送给指挥官。

The track is flagged as engaged, and the number of shots fired against this target is incremented in the track file. This number is then compared with the firing doctrine of the weapon selected to engage the target. If the necessary number of shots has been scheduled, the track is flagged as having the maximum number of shots scheduled. This track will not be evaluated again until the currently scheduled launches against the track have completed.

轨迹被标记为已接通，并且在轨迹文件中对该目标发射的炮弹数量将递增。然后将这个数字与选定的攻击目标的武器的射击原则进行比较。如果计划了必要的放炮次数，则轨迹将标记为计划了最大放炮次数。在当前计划的轨道发射完成之前，不会再次评估此轨道。

If the firing doctrine specifies that additional shots should be taken against the target, a new threat record is created. This record is then prioritized in the current threat list. The prioritization scheme is discussed in Appendix B4.

如果射击条令规定对目标进行额外射击，则会创建新的威胁记录。然后在当前威胁列表中对该记录进行优先级排序。优先级方案在附录B4中讨论。

For each launch record created, the launch scheduling routine evaluates when the launch will be scheduled. If no launches are scheduled, the delays for the current launch will be computed and the launch will be scheduled. If other launches exist, the expected launch time for the current launch will be computed and the launch will remain in the queue awaiting scheduling.

对于创建的每个启动记录，启动计划例程将评估何时计划启动。如果没有计划发射，将计算当前发射的延迟，并计划发射。如果存在其他启动，将计算当前启动的预期启动时间，并且启动将保留在队列中等待调度。

With the introduction of the early engagement announcement, the Flexible SAM was upgraded to monitor the status of pending launches. This monitoring of pending launches is designed to prevent launches against targets that drop in priority or become non-threatening during the time from early engagement announcement until actual interceptor launch. The prioritization of the tracks in the track file is maintained to cover the maximum number of simultaneous interceptors that can be supported in the air by this SAM system. If an engagement decision has been made, this process will stop the interceptor launch if the target falls off the prioritized list prior to the interceptor being in the air.

随着早期订婚公告的推出，灵活的SAM被升级，以监控待定发射的状态。这种对未决发射的监控旨在防止针对从早期交战通告到实际拦截发射期间优先级下降或变得无威胁的目标的发射。航迹文件中航迹的优先顺序被保持，以覆盖SAM系统在空中可支持的最大数量的同时拦截器。如果已经做出交战决定，如果目标在拦截器升空之前从优先列表中掉下来，这个过程将停止拦截器发射。

#### 4.7.1.2.2.4 Launch Preemption

4.7.1.2.2.4发射抢占

Generally, once intercepts have been planned (i.e., all engagement constraints have been met), they are fixed and will not be removed from the launch queue. The single exception to this is the presence of high-priority (special/critical) targets (described in Appendix B4.0). These target types have been included to capture the effect of high-priority threats that would take precedence over all other sensor tasking.

一般来说，一旦计划好拦截（即满足了所有交战约束），它们就被修复了，不会从启动队列中删除。唯一的例外是存在高优先级（特殊/关键）目标（见附录B4.0）。包括这些目标类型是为了捕获优先于所有其他传感器任务的高优先级威胁的影响。

Launch preemption will be performed in cases where high-priority targets are present and sensor resource availability (described in Appendix B5) does not permit additional intercepts to be planned. The launch preemption process determines which launches are consuming sensor resources in the scenario intervals where the high-priority targets require support, and then preempts one or more of those launches to free enough sensor resources to support the high-priority engagement.

在存在高优先级目标且传感器资源可用性（见附录B5）不允许计划额外拦截的情况下，将执行发射抢占。发射抢占过程确定在高优先级目标需要支持的场景间隔内，哪些发射正在消耗传感器资源，然后抢占其中一个或多个发射，以释放足够的传感器资源来支持高优先级交战。

Because launch preemption will only occur in conditions where sensor resource availability is not adequate to plan subsequent launches, the launch preemption functionality will only be invoked when used in conjunction with a system-limited compound sensor, described in Subsection 4.11, or when the average number of illuminators is set for the Flexible SAM. These two capabilities allow the user to constrain the available resources for sensors.

由于发射抢占仅在传感器资源可用性不足以计划后续发射的情况下发生，因此发射抢占功能仅在与系统有限的复合传感器一起使用时才会被调用，如第4.11小节所述，或者当为灵活的SAM设置平均无线照射器数量时。这两种功能允许用户限制传感器的可用资源。

Once a determination has been made that launch preemption must occur to support a high-priority engagement, decisions must be made on what launch(es) must be removed to make room for the new engagement. This process uses the threat assessment logic described above to determine the overall ranking (priority) of all of the candidate engagements for preemption. A candidate for preemption is a launch that is competing for resources with the high-priority engagement. The computed priority of the high-priority engagement is then compared with the preemption candidates and the lowest priority candidate is selected for preemption. This process is continued until enough sensor resources have been freed to accommodate the launch or until all of the preemption candidates have been removed from consideration. When the launch selected for preemption is part of a salvo, all shots for the salvo are removed. All available weapons are evaluated to determine if a weapon exists that will not require launch preemption.

一旦确定必须进行发射先发制人以支持高优先级交战，就必须决定必须移除哪些发射，以便为新的交战腾出空间。此过程使用上述威胁评估逻辑来确定抢占的所有候选交战的总体排名（优先级）。先发制人的候选方案是一种发射，它以高优先级参与竞争资源。然后将高优先级交战的计算优先级与抢占候选进行比较，并选择最低优先级候选进行抢占。这一过程将继续下去，直到释放出足够的传感器资源以适应发射，或者直到所有抢占候选设备都被排除在考虑范围之外。当选择先发制人的发射是齐射的一部分时，齐射的所有射击都被取消。对所有可用武器进行评估，以确定是否存在不需要发射先发制人的武器。

#### 4.7.1.2.2.5 SAM Weapon Performance in HOJ

4.7.1.2.2.5日本总部SAM武器性能

Surface-to-Air Missile systems have several options available to combat the introduction of noise jamming into their system. For certain systems, one of these options is to launch a missile designed to home onto the source of the jamming power, thus a Home on Jam (HOJ) missile capability. HOJ has the ability to decide to launch on a jamming target either from single-platform detection of the target or more commonly through triangulation on the signal from multiple sources to achieve additional information on the jamming source location. Another HOJ capability is to transition a missile in flight to a target into an HOJ mode if jamming is introduced during missile flyout.

地对空导弹系统有几种选择，可以用来对抗噪声干扰。对于某些系统，其中一种选择是发射一枚导弹，其设计目的是瞄准干扰电源，从而获得“瞄准干扰”（HOJ）导弹的能力。HOJ有能力决定对一个干扰目标进行发射，无论是从对目标的单平台检测，还是更常见的是通过对来自多个源的信号进行三角测量，以获得有关干扰源位置的附加信息。另一个HOJ能力是，如果在导弹飞出时引入干扰，则将飞行中的导弹转换为目标HOJ模式。

A number of factors lead to the decision to launch an HOJ missile at a jamming threat. These factors are a function of options selected on the specific weapons placed on the SAM system. The decision criteria are different for the significantly different cases of launching the HOJ missile with and without triangulated data.

许多因素导致了在干扰威胁下发射霍吉导弹的决定。这些因素是在SAM系统上放置的特定武器上选择的选项的函数。在有无三角数据的情况下，发射HOJ导弹的情况明显不同，决策标准也不同。

##### 4.7.1.2.2.5.1 Triangulated Data Not Required

4.7.1.2.2.5.1不需要三角测量数据

The specific SAM weapons have an option to be launched at a jamming target on the passive detection from a local sensor. A jamming strobe is recognized as a track for which no local data from other than a signal detector are held. This definition allows data to be recognized as available for up to the local track purge time to prevent unrealistic losses of track as a result of fluctuating target models.

特定的SAM武器可以选择从本地传感器被动探测干扰目标。干扰选通被认为是除信号检测器外没有其它本地数据的轨道。此定义允许在本地航迹清除时间内将数据识别为可用，以防止由于目标模型的波动而造成航迹的不现实损失。

A target that generates a jamming strobe can lead to the declaration of that target as a threat. To be declared a threat, the local DFD rating on data from the signal detector must be greater than or equal to the minimum required for launching the HOJ weapon without triangulated data. This method allows for a passive RF sensor to be set up as the passive detection source, thus allowing the specification of a jamming signal to background noise level at which the SAM system will decide to launch the weapon. This launch may result in an intercept point beyond the capability of the HOJ weapon. The constraints checking is bypassed when selecting a weapon against the jamming target. For the case of a flyout table, an off-the-table solution results in a maximum range flight of the interceptor resulting in an intercept failure once maximum kinematic range has been achieved by the interceptor.

产生干扰频闪的目标可能会导致宣布该目标为威胁。若要宣布为威胁，信号探测器数据的本地DFD等级必须大于或等于在没有三角数据的情况下发射HOJ武器所需的最小值。该方法允许将无源射频传感器设置为无源探测源，从而允许将干扰信号的规格设置为SAM系统决定发射武器的背景噪声水平。这次发射可能会导致一个拦截点超出了霍吉武器的能力。对干扰目标选择武器时，绕过约束检查。对于弹出式表格的情况，表外解决方案会导致拦截器的最大射程飞行，一旦拦截器达到最大运动射程，就会导致拦截失败。

##### 4.7.1.2.2.5.2 Triangulated Data Available

4.7.1.2.2.5.2可用三角测量数据

The specific SAM systems will have the option to be launched if triangulated data are available that produce a DFD rating greater than or equal to the minimum required for launch on triangulated data. If triangulated data are available, the target range is assumed to be known well enough to provide range and speed data sufficient for engagement planning. The threat assessment is determined based on the geometry of the jamming target's location. The weapon selection is computed accounting for all of the engagement constraints.

如果三角化数据产生的DFD等级大于或等于三角化数据发射所需的最低等级，则特定SAM系统将可以选择发射。如果三角测量数据可用，则假设目标射程已知，足以提供足以进行交战规划的射程和速度数据。威胁评估是根据干扰目标的几何位置确定的。武器选择是在考虑所有交战约束的情况下计算出来的。

Triangulation is allowed to occur from two different processing threads. Triangulation of strobes is an option within the track-processing thread of platforms with track files. This option is selectable on all track options windows. When tracks from two different sources are received, the angular separation between the tracks is evaluated. If the angular separation is greater than a minimum triangulation threshold, the track is flagged as having been triangulated and the highest DFD rating of the two tracks reported in the track.

允许从两个不同的处理线程进行三角剖分。闪光灯的三角测量是带有跟踪文件的平台的跟踪处理线程中的一个选项。此选项在所有轨迹选项窗口中都是可选的。当接收到来自两个不同来源的磁道时，将评估磁道之间的角度间隔。如果角度间隔大于最小三角测量阈值，则轨迹将被标记为已被三角测量，并且轨迹中报告的两个轨迹的最高DFD等级。

The second processing thread is through the Intelligence Collection and Analysis Center ruleset. The governing parameters on the angle threshold are the same as those used in the track-processing thread. The Intel CAC ruleset allows the further setting of a new DFD rating and Level of Intelligence Data for the triangulated message. This information can then be fed to a SAM system, either a commander or an FU, to allow prioritization of an engagement and to generate a launch on the triangulated data.

第二个处理线程是通过情报收集和分析中心规则集。角度阈值上的控制参数与轨迹处理线程中使用的参数相同。“英特尔CAC”规则集允许为三角化消息进一步设置新的DFD等级和智能级别数据。然后，这些信息可以反馈给SAM系统，无论是指挥官还是作战单位，以便确定交战的优先级，并根据三角化数据生成发射。

##### 4.7.1.2.2.5.3 HOJ Mode Transition in Flight

4.7.1.2.2.5.3飞行中的HOJ模式转换

An interceptor in flight has the option to transition to an HOJ mode if a determination is made that jamming is present. This capability supports both implicit and explicit missile flyout capabilities. The transition to the HOJ mode depends on the current mode of the interceptor. If the interceptor is operating in command guidance or semi-active modes, the transition to HOJ occurs after the FU has lost active track on the target and detected the presence of jamming. For an interceptor in active guidance modes, the transition to HOJ mode is dependent on whether an implicit or explicit flyout is being conducted. For the case of an implicit flyout, the HOJ mode is activated if the target has an emitting jammer within the HOJ spectrum of the interceptor. For the case of an explicit flyout, the HOJ mode is activated if a strobe track is achieved on the target.

如果确定存在干扰，飞行中的拦截器可以选择转换到HOJ模式。这种能力支持隐式和显式导弹弹出能力。向HOJ模式的转换取决于拦截器的当前模式。如果拦截器在指令制导或半主动模式下运行，则在FU失去对目标的主动跟踪并检测到存在干扰后，将过渡到HOJ。对于处于主动制导模式的拦截器，向HOJ模式的过渡取决于是否进行了隐式或显式飞出。对于隐式弹出的情况，如果目标在拦截器的HOJ频谱内有发射干扰机，则激活HOJ模式。对于显式弹出的情况，如果在目标上实现选通轨迹，则激活HOJ模式。

#### 4.7.1.2.2.6 Flexible SAM CANTCO Reason Trace

4.7.1.2.2.6灵活的SAM CANTCO原因跟踪

The Flexible SAM ruleset can generate CANTCO messages to its commander. These CANTCO messages will either be generated immediately upon hitting certain conditions or be generated once the maximum attempt time has expired for the commanded track assignment. Whenever a CANTCO message is generated, a reason is logged for why the SAM system cannot respond.

灵活的SAM规则集可以向其指挥官生成CANTCO消息。这些CANTCO信息要么在达到特定条件时立即生成，要么在指令航迹分配的最大尝试时间到期时生成。每当生成CANTCO消息时，都会记录SAM系统无法响应的原因。

Immediate CANTCOs can be issued from both the message-processing function and the threat-assessment logic. When a commanded assignment is received, a CANTCO will be generated if the SAM system is currently in its LASHE mode or if the SAM system's track file is already full of commanded assignments. A commanded assignment would replace a target that is not a commanded assignment that is already in the track file. An immediate CANTCO will also be generated within the threat assessment logic whenever a track is either determined to be a friendly or if the target is determined to be on an LLTR. The determination of being on an LLTR is described in Subsection 4.6.5.4.3. The LLTR determination is only performed if the ruleset is operating under Truth mode; otherwise, the LLTR determination feeds the overall ID determination through the Procedural Identification.

即时cantco可以从消息处理功能和威胁评估逻辑发出。当接收到命令分配时，如果SAM系统当前处于其捆绑模式，或者如果SAM系统的轨迹文件已经充满命令分配，则将生成CANTCO。指令分配将替换轨迹文件中已存在的非指令分配的目标。当一条轨道被确定为友军或目标被确定为LLTR时，威胁评估逻辑中也会立即生成CANTCO。第4.6.5.4.3小节描述了在LLTR上的确定。仅当规则集在真值模式下运行时，才执行LLTR确定；否则，LLTR确定通过过程标识反馈整个ID确定。

The rest of the CANTCO messages are generated within the threat assessment once the maximum attempt time has expired for the commanded track assignment. The expiration of the attempt time is one of the first checks for each track. The reason that is logged for the CANTCO is therefore the reason why the SAM was unable to engage the target on the previous execution of its target-select phase.

一旦指令航迹分配的最大尝试时间到期，剩余的CANTCO信息将在威胁评估中生成。尝试时间的过期是每个音轨的第一个检查。因此，为CANTCO记录的原因是SAM在上次执行目标选择阶段时无法与目标交战的原因。

These reasons will result from either being unable to call a target a threat during the threat-assessment processing or being unable to select a weapon to engage the target during the weapon-selection processing. Only the first condition that results in not declaring a target a threat is logged, although additional reasons could result in a failure. This approach provides the user with the most immediate reason for not being able to engage a target. The following are the threat assessment CANTCO messages, ordered from highest to lowest: 1. Track has been assessed as dead. 2. Commanded assignment delay has not expired. 3. Track is still a handover track. 4. Track is older than purge time-i.e., stale. 5. Local track required, but not established. 6. TBM track that is unengageable. 7. Impact point for the TBM track has not been predicted. 8. The track priority is too low. 9. Track priority indicated as do-not-shoot due to INTEL information. 10. Track is not in an associated MEZ. 11. Track is in an associated FEZ. 12. ABT Assessment Delay has not expired

这些原因要么是在威胁评估过程中无法将目标称为威胁，要么是在武器选择过程中无法选择武器与目标交战。只记录导致未将目标声明为威胁的第一个条件，尽管其他原因可能导致失败。这种方法为用户提供了无法与目标交战的最直接原因。以下是威胁评估CANTCO消息，按从高到低的顺序排列：1。轨道已被评估为死亡。2命令的分配延迟尚未过期。三。轨道仍然是移交轨道。4磁道早于清除时间，即过时。5需要本地轨道，但未建立。6无法测量的TBM轨道。7尚未预测TBM轨道的撞击点。8曲目优先级太低。9由于情报信息，跟踪优先级指示为“请勿射击”。10轨迹不在关联的MEZ中。11轨道位于相关FEZ中。12ABT评估延迟尚未过期

Once a commanded track makes it through the threat assessment processing, the engagement of the track can be delayed as a result of the inability to select a specific weapon to engage the target. The reason for failure to engage that results from the weapon that proceeds through the most weapon-selection logic will be logged. This weapon will be that which comes the closest to being able to engage the target. The following are the weapon-selection CANTCO messages, ordered from highest to lowest: 13. Intercept point found, but SAM is at its maximum number of engagements. 14. Intercept point found for other than NLOS weapon, but local track is not held on the target. 15. Intercept point found for a semi-active weapon, but local track is not held on the target by a radar 16. Intercept point found, but the track DFD rating is below the minimum engagement level of the weapon. 17. Intercept point found, but the planned intercept point is outside the maximum altitude or range. A future intercept would be possible. 18. Intercept point found, but the planned intercept point is below the minimum altitude or within the minimum range. 19. Intercept point found, but the planned intercept point is outside the field of view of the fire control sensor required for semi-active weapons. 20. An intercept point cannot be found for any weapon on this SAM. 21. All weapons are excluded from this track because the default Pk against the target type has been set to -1. 22. All weapons are excluded from this track because of the ABT/TM switches on the weapon. 23. The SAM is out of weapons with the capability against this target type.

一旦指令航迹通过威胁评估处理，由于无法选择特定武器与目标交战，航迹的交战可能会延迟。无法接通的原因是武器通过most武器选择逻辑导致的。这种武器将是最接近目标的武器。以下是武器选择CANTCO信息，从高到低排列：13。发现了拦截点，但山姆正处于最大交战次数。14为非直瞄武器以外的武器找到了拦截点，但目标上没有本地跟踪。15为半主动武器找到的拦截点，但雷达16无法在目标上保持本地跟踪。找到拦截点，但跟踪DFD等级低于武器的最低交战等级。17发现拦截点，但计划拦截点在最大高度或范围之外。未来的拦截是可能的。18发现拦截点，但计划拦截点低于最低高度或在最低范围内。19发现拦截点，但计划拦截点在半主动武器所需火控传感器的视野之外。20山姆21号上找不到任何武器的拦截点。所有武器都被排除在这条轨道之外，因为对目标类型的默认Pk被设置为-1。22由于武器上的ABT/TM开关，所有武器都被排除在这条轨道之外。23山姆没有武器可以对付这种类型的目标。

### 4.7.1.2.3 Flexible SAM Launch Phase

4.7.1.2.3灵活SAM启动阶段

#### 4.7.1.2.3.1 Launch Scheduling Delays

4.7.1.2.3.1发射计划延迟

The launch phase operates on the launch records placed in the queue. There are four timing delays that influence scheduling launches: the start time of the launch phase, the salvo delay, the minimum interval between launches, and the coast time (repeat time of the launch phase).

启动阶段对放置在队列中的启动记录进行操作。有四种时间延迟影响发射计划：发射阶段的开始时间、齐射延迟、发射之间的最小间隔和滑行时间（发射阶段的重复时间）。

All launch records in the queue that are coasting are evaluated first. For each of these records, the time of occurrence for the launch is computed using the mean and delta repeat times for the launch phase added to the time that the launch coasted. Each of these coasted records is further subjected to the minimum interval of launches to determine the time at which the launch should be scheduled. If a coasting launch record is found that is to execute in less than two times the minimum interval from the time of last launch by the platform, the launch phase will be scheduled for that launch record.

首先计算队列中所有正在惰行的启动记录。对于这些记录中的每一个，发射发生的时间是使用发射阶段的平均和增量重复时间加上发射滑行的时间来计算的。这些滑行记录中的每一个都会进一步受到最小发射间隔的影响，以确定应安排发射的时间。如果发现滑行发射记录的执行时间少于平台上次发射时间最小间隔的两倍，则将为该发射记录安排发射阶段。

All non-coasting launch records are evaluated if the launch phase was not scheduled for a coasting record. The first non-coasting record is subjected to the launch phase start time based on the mean and delta values. The scheduling time based on the minimum launch interval is evaluated next. If this shot is a second shot, the delay for salvo against a target is examined next. This delay is computed as the salvo delay added on to the time of launch of the previous shot at this target. The maximum of these three values determines when the launch phase is to be scheduled for this launch record. If there are no coasting records, the launch phase will be scheduled for this time. If there are coasting records, the record that should execute the earliest will be scheduled for launch.

如果没有为滑行记录安排发射阶段，则评估所有非滑行发射记录。第一个非滑行记录取决于基于平均值和增量值的发射阶段开始时间。接下来评估基于最小发射间隔的调度时间。如果这是第二次射击，下一次检查对目标的齐射延迟。这个延迟被计算为对这个目标的上一次射击的发射时间加上的齐射延迟。这三个值中的最大值决定何时为该发射记录安排发射阶段。如果没有滑行记录，这次将安排发射阶段。如果有滑行记录，则应执行最早的记录将被安排发射。

#### 4.7.1.2.3.2 Launch Phase Operation

4.7.1.2.3.2发射阶段操作

The launch phase represents the processing required to launch the interceptor at a threat. Several evaluations are made in the launch phase to determine if the launch will proceed. The launch will be aborted if the track on the target is older than the purge time specified for the platform or if the target has been determined to be a friend. Except for an NLOS weapon and when an engagement supporter is providing In-Flight Target Updates (IFTUs) support for the engagements, the platform must have local track on the target to launch the weapon. If local track is not held for these weapons, the launch will be coasted for the user-specified number of launch cycles. The frequency of these cycles is the repeat time of the launch phase. If local track is not obtained, the launch attempt is aborted. While the current launch coasts, the next launch in the queue is evaluated for possible scheduling, as described above.

发射阶段表示在威胁情况下发射拦截器所需的处理过程。在发射阶段进行了几次评估，以确定发射是否会继续进行。如果目标上的轨迹早于为平台指定的清除时间，或者目标已被确定为好友，则启动将中止。除非直瞄武器外，当交战支持人员为交战提供飞行中目标更新（IFTUs）支持时，平台必须在目标上有本地跟踪才能发射武器。如果这些武器没有保持本地轨道，发射将在用户指定的发射周期内滑行。这些周期的频率是发射阶段的重复时间。如果没有获得本地磁道，发射尝试将中止。当当前发射滑行时，队列中的下一次发射将被评估为可能的调度，如上所述。

If IFF at launch is selected for the Flexible SAM, interrogation of the target will be performed. If the result determines the target to be friendly, the launch is aborted.

如果灵活SAM选择了IFF at launch（发射时敌我识别），将对目标进行询问。如果结果确定目标是友好的，发射中止。

The Flexible SAM may launch a weapon without local track if the weapon is capable of being launched on remote data. For this case, there must be a Flexible Commander or another Flexible SAM associated with the SAM as an engagement supporter. The engagement supporter, once the SAM launches the weapon, can take optional responsibility for providing the IFTUs to the missile interceptor. If the engagement supporter has this capability, then the SAM can transfer the IFTU responsibility to the engagement supporter by sending a request for IFTU support to that engagement supporter. Upon receiving a WILCO from the engagement supporter, the SAM can then launch the weapon using remoted data. If it does attempt to hand off the engagement to an engagement supporter, then the SAM sends the message and reschedules its launch phase for this engagement. The launch phase will continue to be rescheduled until the SAM receives an acknowledgment from the engagement supporter, or until the Supporter Response Time is exceeded. If the acknowledgment is a WILCO, the weapon is launched. If the acknowledgment is a CANTCO, or if the Supporter Response Time is exceeded, then the launch is aborted. Subsections 4.7.1.3.9 and 4.7.2.3.10 describe the processing of the IFTU support message by the Flexible SAM and Flexible Commander, respectively. If the engagement supporter has to hand-off the engagement at any time during the missile flight, the SAM can take back control of the engagement

如果武器能够在远程数据上发射，灵活的SAM可以在没有本地跟踪的情况下发射武器。在这种情况下，必须有一个灵活的指挥官或另一个灵活的SAM与SAM关联，作为交战支持者。一旦SAM发射武器，交战支持方可以选择向导弹拦截提供IFTU。如果作战支持人员具有此能力，则SAM可以通过向该作战支持人员发送IFTU支持请求，将IFTU责任转移给该作战支持人员。一旦收到交战支持方的WILCO，SAM就可以使用远程数据发射武器。如果它确实试图将交战交给交战支持者，那么SAM将发送消息并重新安排其此交战的启动阶段。发射阶段将继续重新安排，直到SAM收到交战支持方的确认，或者直到超过支持方的响应时间。如果确认是WILCO，武器就发射了。如果确认是CANTCO，或者如果超过了支持者的响应时间，那么发射将中止。第4.7.1.3.9和4.7.2.3.10小节分别描述了灵活SAM和灵活指挥官对IFTU支持信息的处理。如果在导弹飞行过程中，交战支持方必须随时移交交战，SAM可以收回对交战的控制权

The Flexible SAM determines if the current launch is part of a LASHE engagement. For engagements against unidentified targets, the user can specify if the target should be interrogated before launch. If the target is identified as a friendly, a random draw will be compared with the LASHE probability of engaging a friendly. If the draw is less than or equal to the probability, the launch will proceed; otherwise, the launch will be terminated. With randomness eliminated, friendly tracks will never be engaged as part of the LASHE engagement.

灵活的SAM确定当前的发射是否是捆绑战的一部分。对于针对不明目标的交战，用户可以指定是否应在发射前询问目标。如果目标被确定为友军，则随机抽签将与友军的攻击概率进行比较。如果抽签小于或等于概率，发射将继续；否则，发射将终止。随着随机性的消除，友好的轨道将永远不会参与睫毛交战的一部分。

If the failure conditions are passed, a launch will be performed. If the Flexible SAM is launching the weapon, it will launch on the target and schedule the intercept phase of the platform providing IFTU support. The last launch time of the Flexible SAM will be set as the current simulation time, for scheduling delay computations. The next launch in the queue is then evaluated for scheduling.

如果故障条件通过，将执行发射。如果柔性SAM正在发射武器，它将在目标上发射，并安排提供IFTU支持的平台的拦截阶段。灵活SAM的最后启动时间将设置为当前模拟时间，用于调度延迟计算。然后评估队列中的下一次启动以进行调度。

If IFTUs and track continuity checks are to be used in the guidance of the interceptor, then Guidance/IFTU phases must be defined for the weapon being launched. Each phase defines update rate and coast time as a function of time to intercept. IFTUs are supported by the Flexible SAM and Commander from their intercept phases. After the weapon is launched, if the SAM is to provide the IFTU support for the engagement, then the SAM's intercept phase is scheduled according to the update rate for the current IFTU phase. If an engagement supporter is to provide the IFTUs, then its intercept phase is scheduled at this update time. If Guidance/IFTU phases are not defined for the weapon, then IFTUs and track continuity are not to be used and the SAM's intercept phase is scheduled at the computed time of intercept.

如果在拦截导弹的制导中使用IFTUs和航迹连续性检查，则必须为发射的武器定义制导/IFTU阶段。每个阶段定义更新率和滑行时间作为截获时间的函数。IFTU由灵活的SAM和指挥官在拦截阶段提供支持。武器发射后，如果SAM要为交战提供IFTU支持，则根据当前IFTU阶段的更新率安排SAM的拦截阶段。如果交战支持方要提供IFTU，则其拦截阶段安排在此更新时间。如果没有为武器定义制导/IFTU阶段，则不使用IFTUs和航迹连续性，SAM的拦截阶段安排在计算的拦截时间。

Prior to scheduling the intercept event, the intercept point is recomputed. The intercept point is recomputed because of the ability to specify a random posturing time for the launch phase and the need for accurate information on the locations of the intercepts. Furthermore, if the engagement was coasted, the previously computed intercept time is no longer valid. If the weapon launch caused depletion of the particular weapon to a level that requires reloading, the reload phase is scheduled for its start time.

在安排截取事件之前，将重新计算截取点。由于能够指定发射阶段的随机姿态时间，并且需要有关拦截位置的准确信息，因此需要重新计算拦截点。此外，如果交战发生滑行，先前计算的拦截时间将不再有效。如果武器发射导致特定武器耗尽到需要重新装填的程度，则重新装填阶段安排在其开始时间。

If a SAM launcher is launching the weapon, the Flexible SAM sends an assignment command to the SAM launcher. The last launch time of the Flexible SAM is set to the current simulation time for computing scheduling delays, and the next launch in the queue is evaluated for scheduling.

如果SAM发射器正在发射武器，灵活的SAM会向SAM发射器发送分配命令。将柔性SAM的最后一次启动时间设置为当前模拟时间以计算调度延迟，并评估队列中的下一次启动以进行调度。

If the launched weapon is of the complex weapon type, then that defines this weapon as an explicitly flown missile platform. At the time of the launch, the missile interceptor is dynamically created by all four models and enters the scenario as a platform. The missile platform is given the sensors, communications devices, airframe, ruleset, and signatures defined in the weapons system parameters. The commander of the missile platform is the SAM. If explicit networks are to be used, then one is dynamically created at this time between the SAM and the missile platform. If an engagement supporter is to provide IFTUs, then a network is established with that platform once the supporter accepts responsibility for the IFTUs. The network is set up according to the missile platform's network specification on the flyout phase of the Missile ruleset it is using. Subsection 4.7.34 explains this ruleset. Subsection 4.13 describes how to set up and use explicitly flown missiles.

如果发射的武器是复杂的武器类型，那么这就把这种武器定义为一个明确的飞行导弹平台。发射时，导弹拦截器由所有四个模型动态创建，并作为平台进入场景。导弹平台拥有武器系统参数中定义的传感器、通信设备、机身、规则集和特征码。导弹平台的指挥官是SAM。如果要使用显式网络，则此时会在SAM和导弹平台之间动态创建一个网络。如果参与支持者要提供IFTU，那么一旦该支持者接受IFTU的责任，就会与该平台建立一个网络。该网络是根据导弹平台在其使用的导弹规则集的弹出阶段的网络规范建立的。第4.7.34小节解释了该规则集。第4.13小节描述了如何建立和使用显式飞行导弹。

Tests for launch and inflight failures are performed after all processing requisite to launching an interceptor has been completed and the intercept phase is to be scheduled. For a launch reliability failure, a random number is drawn and compared with the probability of a successful launch. If the number is greater than the probability threshold, a launch failure is assumed to have occurred. Given that the launch has failed, the delay required for the platform to recognize the failure and reschedule a launch is used to schedule the completion of the engagement. A launch failure event is scheduled to log the failure in the engagement log file and to notify the Flexible SAM of the failure. Launch phase processing of the track is then terminated. If randomness is eliminated, launch failures will not occur.

发射和机上故障测试是在完成发射拦截弹所需的所有处理后进行的，拦截阶段将被安排。对于发射可靠性故障，提取一个随机数，并与成功发射的概率进行比较。如果该数字大于概率阈值，则假定发生了发射失败。考虑到发射失败，平台识别失败和重新安排发射所需的延迟用于安排完成交战。计划发射失败事件，将失败记录在交战日志文件中，并将失败通知灵活SAM。然后终止轨道的启动阶段处理。如果消除了随机性，就不会发生发射失败。

The possible inflight failures that can occur during the intercept phase are contained in a user-specified list. This list is based on events timed to occur relative to either interceptor launch or the actual intercept event. If the launch is successful, each inflight probability of failure is tested to determine if one occurs. When a random draw indicates a failure will occur on a specific event, a failure event is scheduled for the time determined by the event delay to log the failure in the engagement log file and to notify the Flexible SAM of the failure. If a failure is to occur, the interceptor is still placed in the air, as knowledge of this failure is not available to the launching platform until some timing delay beyond the actual failure. If randomness is eliminated, inflight failures will never occur.

截获阶段可能发生的空中故障包含在用户指定的列表中。此列表基于相对于拦截器启动或实际截获事件而定时发生的事件。如果发射成功，将测试每一次飞行中的失败概率，以确定是否发生了一次。当随机抽取指示某个特定事件将发生故障时，将按事件延迟确定的时间安排故障事件，以将故障记录在交战日志文件中，并将故障通知灵活SAM。如果要发生故障，拦截器仍然被放置在空中，因为发射平台不知道这一故障，直到超过实际故障的某个时间延迟。如果消除了随机性，就永远不会发生空中故障。

### 4.7.1.2.4 Flexible SAM Intercept Phase

4.7.1.2.4灵活SAM截获阶段

The Flexible SAM intercept phase is used for two separate functions: 1) track continuity checks coupled with the sending of IFTUs and 2) intercept processing. This phase is actually used by the Flexible SAM, the Fighter, and the Flexible Commander.

灵活的SAM截获阶段用于两个独立的功能：1）与IFTU发送相结合的轨道连续性检查和2）截获处理。这个阶段实际上由灵活的SAM、战斗机和灵活的指挥官使用。

An option exists on the Flexible SAMs target-select phase window that gives the Flexible SAM the capability of providing IFTUs and illumination to an implicit or explicit missile interceptor launched by another Flexible SAM. When a Flexible SAM launches the weapon on remoted data, it requests an engagement supporter to provide IFTUs to the weapon to allow the weapon to guide to the target position. If that weapon has a semi-active capability, meaning it requires illumination, then the engagement supporter Flexible SAM must also have the capability for illuminating the target. This option says that the Flexible SAM can provide those functions to a missile interceptor.

灵活SAMs目标选择阶段窗口中存在一个选项，该选项使灵活SAM能够向另一个灵活SAM发射的隐式或显式导弹拦截器提供IFTUs和无线照射。当灵活SAM根据远程数据发射武器时，它请求交战支持者向武器提供IFTUs让武器引导到目标位置。如果该武器具有半主动能力，这意味着它需要无线照射，那么交战支持者柔性SAM也必须具有无线照射目标的能力。该选项表示，灵活的SAM可以为导弹拦截器提供这些功能。

The start and repeat timing that appears on the intercept phase window is not used in the scheduling of this phase. If Guidance/IFTU phases are not defined for the weapon used in the engagement being processed, then this phase is scheduled by either the Flexible SAM launch phase or the SAM launcher launch phase to occur at the computed intercept time. The intercept processing is then performed.

“截获阶段”窗口上显示的开始和重复计时不用于此阶段的调度。如果没有为正在处理的交战中使用的武器定义制导/IFTU阶段，则该阶段由灵活SAM发射阶段或SAM发射器发射阶段安排在计算的拦截时间进行。然后执行截获处理。

If Guidance/IFTU phases are defined, then this phase is scheduled by the Flexible SAM or SAM launcher launch phase to perform the track-continuity checks and to send IFTUs to the missile interceptor. If an engagement supporter is to provide the IFTUs, then this phase is scheduled for the Flexible SAM or Commander that is serving as the engagement supporter. If the IFTUs from offboard information are to be reported through the launching platform, the phase is scheduled for the launching platform, the Flexible SAM ordering the engagement for cases of remoted launchers. This latter case represents maintaining the communications at the controlling SAM system as opposed to direct communications from offboard sensor to the interceptor.

如果定义了制导/IFTU阶段，则该阶段由灵活SAM或SAM发射器发射阶段安排，以执行航迹连续性检查，并将IFTU发送至导弹拦截器。如果交战支持者要提供IFTU，则此阶段将安排给作为交战支持者的灵活SAM或指挥官。如果要通过发射平台报告来自非车载信息的IFTU，则该阶段将安排在发射平台上，灵活SAM命令远程发射器的情况下交战。后一种情况表示在控制SAM系统上保持通信，而不是从非车载传感器到拦截器的直接通信。

#### 4.7.1.2.4.1 Track Continuity Checks/In-Flight Target Updates

4.7.1.2.4.1航迹连续性检查/飞行中目标更新

If the weapon being used in the engagement has Guidance/IFTU phases defined, then this phase is used to perform track continuity checks and to send inflight target updates to the missile interceptor. The Guidance/IFTU phases define update rate, coast time, and the missile guidance mode as a function of time to intercept.

如果交战中使用的武器定义了制导/IFTU阶段，则该阶段用于执行跟踪连续性检查，并向导弹拦截器发送空中目标更新。制导/IFTU阶段将更新率、滑行时间和导弹制导模式定义为拦截时间的函数。

The track continuity checks allow for ensuring that the platform providing the guidance support for the missile interceptor (SAM or engagement supporter) maintains track on the target while it is supporting the missile guidance. If track is lost and the missile is command guided or semi-active, then the missile begins to coast to allow time for the support platform to regain track on the target. If the coast time of the current IFTU phase is exceeded, and if the missile interceptor has an active seeker capability, then the support platform will send a message to the missile, commanding it to go active. If the missile does not have an active seeker capability, then the engagement will be aborted and logged as a failure. An option also exists to allow for the failure of the engagement automatically if track is lost and the coast time is exceeded. These track continuity checks are performed regardless of whether the missile is implicitly or explicitly flown.

跟踪连续性检查允许确保为导弹拦截提供制导支持的平台（SAM或交战支持方）在支持导弹制导时保持对目标的跟踪。如果航迹丢失，导弹处于指令制导或半主动状态，则导弹开始滑行，以便支持平台有时间恢复对目标的航迹。如果超过当前IFTU阶段的滑行时间，并且导弹拦截器具有主动导引头能力，则支持平台将向导弹发送消息，命令其进入主动。如果导弹没有主动导引头能力，那么交战将中止并记录为失败。还存在一个选项，允许在航迹丢失且超过滑行时间时自动接合失败。无论导弹是隐式飞行还是显式飞行，都要执行这些轨迹连续性检查。

In all cases where communication to the interceptor is required, track must be actively supplied to the interceptor within the specified coast time. If the communications from engagement supporter option is selected and the track is lost by the engaging Flexible SAM, then it will attempt to hand off the engagement to one of its associated engagement supporters. The Flexible SAM searches through the engagement supporter list for an engagement supporter that is sending an active track and chooses one. Selection is prioritized for tracks from engagement supporters that also have the intercept within the FOV of the chosen supporter’s sensors. The SAM then sends a message to the chosen supporter. If it receives a WILCO, then it transfers the engagement control over to the chosen supporter. If it receives a CANTCO, then it attempts to choose another engagement supporter. If a new engagement supporter has not been chosen by the end of the current Guidance/IFTU phase coast time, then the SAM will optionally activate the missile seeker or abort the engagement and log it as a failure. If IFTUs are currently being provided by an engagement supporter, and the supporter loses track, the launching SAM is considered along with any other engagement supporters on its list as a potential candidate for the engagement hand off. In order to send the IFTU assignment to the selected handoff platform, the engagement supporters must be networked together. Subsections 4.7.1.3.9 and 4.7.2.3.10 describe the processing of the IFTU support message for the Flexible SAM and Flexible Commander, respectively.

在所有需要与拦截器通信的情况下，必须在规定的滑行时间内向拦截器主动提供轨道。如果选择了“来自参与支持者的通信”选项，并且参与灵活SAM丢失了轨迹，则它将尝试将参与移交给其关联的参与支持者之一。灵活的SAM在参与支持者列表中搜索发送活动轨迹的参与支持者并选择一个。选择优先考虑参与支持者的轨迹，这些轨迹在所选支持者传感器的视场内也有截获。然后，SAM向选定的支持者发送一条消息。如果它收到一个WILCO，那么它就把交战控制权转移给所选择的支持者。如果它收到一个CANTCO，那么它会尝试选择另一个参与支持者。如果在当前制导/IFTU阶段滑行时间结束时尚未选择新的交战支持方，则SAM将选择性地激活导弹导引头或中止交战并将其记录为失败。如果当前由参与支持者提供IFTU，且支持者失去跟踪，则启动SAM将与其列表中的任何其他参与支持者一起被视为参与移交的潜在候选人。为了将IFTU任务发送到所选的切换平台，交战支持者必须联网在一起。第4.7.1.3.9和4.7.2.3.10小节分别描述了灵活SAM和灵活指挥官的IFTU支持消息的处理。

If the communications from launcher option is selected, track is considered good as long as any of the offboard track suppliers listed as engagement supporters provide track updates within the specified coast time of the current guidance phase.

如果选择了“来自发射器的通信”选项，只要列为交战支持方的任何非车载航迹供应者在当前制导阶段的指定滑行时间内提供航迹更新，则认为航迹良好。

Coupled with the track continuity checks, the guidance support platform sends IFTUs to the missile interceptor. These messages are sent once the platform has determined that it still has track on the target. If the missile is implicit, then no real IFTU messages are generated. If the missile is explicit, and if explicit networks are being used, then IFTU messages are generated and transmitted to the explicit missile platform. Upon receipt of these messages, the missile platform then updates its guidance based on the IFTU message. If implicit networks are being used, then the missile platform's guidance is immediately updated based on this IFTU with no message delays being suffered.

再加上轨道连续性检查，制导支持平台将IFTUs发送给导弹拦截器。一旦平台确定目标上仍有跟踪信息，就会发送这些消息。如果导弹是隐式的，那么就不会生成真正的IFTU消息。如果导弹是显式的，并且正在使用显式网络，则生成IFTU消息并将其传输到显式导弹平台。收到这些信息后，导弹平台将根据IFTU信息更新其制导。如果正在使用隐式网络，则导弹平台的制导将立即根据该IFTU进行更新，不会出现任何消息延迟。

The missile guidance mode is also updated from within the intercept phase. Both implicit and explicit missiles can be flown using command, semi-active, or active guidance modes. Command and semi-active guidance both require the support platform to maintain track on the target. Active guidance has no support platform track requirements.

导弹制导模式也在拦截阶段更新。隐式和显式导弹都可以使用指令、半主动或主动制导方式飞行。指挥和半主动制导都需要支撑平台保持对目标的跟踪。主动制导没有支撑平台轨道要求。

For implicit missiles, processing for all three guidance modes entails the recomputation of the intercept point based on the target's current trajectory and the missile's kinematic capability. An intercept evaluation is also performed to see if the implicit missile has successfully reached its intercept of the target.

对于隐式导弹，所有三种制导方式的处理都需要根据目标的当前弹道和导弹的运动能力重新计算拦截点。拦截评估也被执行，以查看隐式导弹是否已经成功地达到其目标拦截。

For explicit missiles, commanded guidance processing entails recomputation of the intercept point and the sending of that point to flight processing so the missile can steer toward it. Semi-active guidance mode processing involves simply sending the track position of the target to flight processing, allowing the missile to home on that position. There is no active guidance processing within the Flexible SAM intercept phase since the missile ruleset handles it for the missile platform. Subsection 4.7.34 details the missile ruleset. Intercept evaluation for explicit missiles is performed by flight processing. Intercept occurs when the missile reaches closest approach. Subsection 4.13 describes how explicit missiles are set up and used.

对于显式导弹，指令制导处理需要重新计算拦截点，并将该点发送给飞行处理，以便导弹能够朝着它方向飞行。半主动制导模式处理只需将目标的轨迹位置发送给飞行处理，就可以让导弹回到该位置。灵活SAM拦截阶段没有主动制导处理，因为导弹规则集为导弹平台处理。第4.7.34小节详述了导弹规则集。显式导弹的拦截评估是通过飞行处理来完成的。拦截发生在导弹到达最近的接近点时。第4.13小节描述了如何建立和使用明确的导弹。

The guidance mode is updated based on the current time to intercept. If the missile is currently in its command-guidance mode, and if illumination is being performed, then the missile will transition to semi-active when its time to intercept falls below the illumination time threshold. This threshold is set by the constant average illumination time or from the dynamics of the illumination time table. If the missile is currently in either its command or semi-active guidance mode, and if a guidance/IFTU phase with active guidance is defined for the weapon, then the missile transitions to active when it enters that guidance/IFTU phase. Once a missile transitions to semi-active or active guidance, it cannot transition backward: i.e., an active missile cannot transition back to semi-active or command guidance.

制导模式根据当前截获时间进行更新。如果导弹当前处于指令制导模式，并且正在进行无线照射，则当其拦截时间低于无线照射时间阈值时，导弹将转换为半主动。此阈值由恒定的平均无线照射时间或无线照射时间表的动态设置。如果导弹当前处于命令或半主动制导模式，并且为武器定义了具有主动制导的制导/IFTU阶段，则导弹在进入该制导/IFTU阶段时将转换为主动制导。一旦导弹过渡到半主动或主动制导，它就不能向后过渡：即，主动导弹不能过渡回半主动或指挥制导。

Guidance mode transitions are message driven if used with an explicit missile and explicit networks. The missile will transition to the new mode once it receives the message from the support platform. If either the missile or the network is implicit, then the missile is automatically transitioned to the new guidance mode. All guidance mode transitions are logged.

如果与显式导弹和显式网络一起使用，则制导模式转换是消息驱动的。一旦收到支持平台的信息，导弹将转换到新模式。如果导弹或网络是隐式的，那么导弹将自动转换到新的制导模式。记录所有制导模式转换。

If the missile has intercepted the target, then the intercept processing is performed next.

如果导弹拦截了目标，那么接下来执行拦截处理。

#### 4.7.1.2.4.2 Intercept Processing

4.7.1.2.4.2截获处理

Intercept processing represents the actual intercept event and outcome determination of that event. Execution of the intercept phase includes several checks to determine the outcome of the engagement. If the platform has died, the engagement is logged as a failure. If the target has died, the engagement is also logged as a failure. If the target is still alive, the target will be checked to determine if the target is now marked as a friend. If it is, the engagement will be aborted under the assumption that the information would have changed in time to abort the engagement.

截获处理表示实际截获事件和该事件的结果确定。执行拦截阶段包括若干检查，以确定交战结果。如果平台失效，则该接合被记录为故障。如果目标已死亡，则交战也会记录为失败。如果目标仍处于活动状态，则将检查目标以确定该目标现在是否标记为朋友。如果是，则在假定信息会及时更改以中止接合的情况下中止接合。

If track is required, the status of track on the target is evaluated next. The engagement will be aborted if the target is still in the track file but the purge time has been exceeded for the track or the track is no longer in the track file. If the weapon has semi-active guidance, the Flexible SAM platform must locally track the target. All other cases do not require local track to be held—e.g., fire-and-forget missiles.

如果需要跟踪，则下一步评估目标上的跟踪状态。如果目标仍在轨迹文件中，但已超过轨迹的清除时间或轨迹不再在轨迹文件中，则接合将中止。如果武器具有半主动制导，柔性SAM平台必须在本地跟踪目标。所有其他情况都不需要保持本地轨道，例如发射导弹。

If the target has met all of the criteria, the target will be assessed against the weapon's capability. If the range to the target is greater than the lethal range of the weapon against the given target type, the engagement is logged as a failure. The Pk of the weapon against the target is evaluated next. This is either a single-valued Pk or it is based on geometric dependencies. For the single-value case, the Pk is the user-specified Pk out to a user-defined percentage of the weapon's lethal range. The Pk decreases linearly from the specified value at the user-defined percentage of the weapon's lethal range to a second user-defined percentage of the specified value at the lethal range of the weapon. The geometry-based Pk tables are discussed in Appendix B6.

如果目标符合所有标准，将根据武器能力评估目标。如果到目标的距离大于武器对给定目标类型的致命距离，则交战记录为失败。接下来评估武器对目标的Pk。这要么是单值Pk，要么是基于几何依赖关系的Pk。对于单值情况，Pk是用户指定的Pk，达到武器致命射程的用户定义百分比。Pk从用户定义的武器致命射程百分比的指定值线性减小到武器致命射程的第二个用户定义的指定值百分比。附录B6中讨论了基于几何的Pk表。

Defensive countermeasures, represented in EADSIM as towed decoy weapons and anti-weapons, are used to model chaff, flares, or any technique available to reduce the effectiveness of the Flexible SAM’s weapon against ABTs. The particular ABT weapon that will be used as a defensive countermeasure is the one that provides the greatest effectiveness against the Flexible SAM weapon type. The Pk of the Flexible SAM weapon is then reduced by the effectiveness, [R(eff)], of the selected ABT weapon. The reduction is computed as:

EADSIM中表示为拖曳诱饵武器和反武器的防御对抗，用于模拟箔条、无线照射弹或任何可用技术，以降低柔性SAM武器对ABT的有效性。将用作防御对抗的特定ABT武器是针对灵活SAM武器类型提供最大效能的武器。然后，柔性SAM武器的Pk被所选ABT武器的效能[R（eff）]降低。减少量计算如下：

The outcome of the engagement is evaluated by taking a random draw between zero and one. If the number is less than the effective probability of kill, the engagement is judged a success; otherwise, the engagement is a failure. Engagements will always be judged a success if randomness is eliminated.

通过在0和1之间随机抽取来评估参与的结果。如果该数字小于有效杀伤概率，则认为交战成功；否则，认为交战失败。如果消除了随机性，那么约会总是被认为是成功的。

For LASHE engagements, a fraction of the weapon's Pk is used to evaluate the outcome. The Pk is reduced by a factor equal to the user-specified LASHE fraction of normal Pk.

对于鞭笞攻击，武器Pk的一小部分用于评估结果。Pk减少的系数等于用户指定的正常Pk的睫毛分数。

In all cases, the truth of the intercept outcome is logged when the intercept processing executes, modeling the actual interceptor endgame. In the cases where the missile has been hit by the interceptor, a probability draw, Pdraw, from a uniform distribution is compared with the probability of a credible TM threat remaining, Pcredible. If Pdraw is less than Pcredible, the TM target is still a credible threat. If randomness is eliminated the TM will always be assessed as a credible threat, unless the Pcredible is input as 0. The credibility of the threat is a TM parameter and a function of the interceptor missile. If the threat is determined to be credible, the missile continues to be flown. The missile is flagged as dead to account for its state at impact, and the missile icon color in the Scenario Playback display changes to yellow. Sensors continue to track the missile, and the missile can be engaged again. If the threat is not credible, the missile is no longer flown. An action is logged indicating that the threat is no longer credible.

在所有情况下，截获结果的真实性都会在截获处理执行时被记录下来，从而模拟实际的截获者结局。在导弹被拦截弹击中的情况下，从均匀分布得出的概率值Pdraw与可信TM威胁剩余概率Pcredible进行比较。如果Pdraw小于Pcredible，TM目标仍然是可信的威胁。如果消除了随机性，则TM将始终被评估为可信威胁，除非Pcredible输入为0。威胁的可信度是TM参数和拦截导弹的函数。如果确定威胁可信，导弹将继续飞行。导弹被标记为死亡，以说明其撞击状态，场景回放显示中的导弹图标颜色变为黄色。传感器继续跟踪导弹，导弹可以再次交战。如果威胁不可信，导弹就不再飞行。一个动作被记录下来，表明威胁不再可信。

After the truth result of the engagement and the credibility of the threat have been determined, the error probabilities are used to determine how the platform performing the endgame analysis will assess the outcome of the engagement. The endgame analysis is performed by either the SAM or by the Flexible Commander that is serving as the engagement supporter to the SAM. The outcome of the engagement is logged by the platform performing the endgame analysis. If using an explicit interceptor, the outcome of the engagement is also logged by the interceptor. If using an implicit interceptor, the interceptor’s name will be available in the Geometric Action History report for the Weapon Platform Name column. If the SAM is doing the endgame, it sends a report up to its commander, who then forwards the outcome around to the platforms on its nets. If the engagement supporter is doing the endgame, then it sends an outcome message to the SAM, who then sends a report to its commander.

在确定交战的真实结果和威胁的可信性之后，将使用错误概率来确定执行最终博弈分析的平台将如何评估交战结果。由SAM或作为SAM交战支持方的灵活指挥官执行终局分析。交战结果由执行终局分析的平台记录。如果使用显式拦截器，则拦截器也会记录交战结果。如果使用隐式拦截器，拦截器的名称将出现在武器平台名称列的几何动作历史报告中。如果SAM正在进行最后的游戏，它会向其指挥官发送一份报告，然后指挥官将结果转发给其网络上的平台。如果作战支持人员正在进行最后阶段，那么它会向SAM发送一个结果消息，然后SAM会向其指挥官发送一个报告。

The probability of leakage, Pleak, is the probability of assessing a live missile as dead. This probability is a function of the platform's kill assessment logic and is specified in the ruleset. The leakage probabilities are dependent on both the intercepted and interceptor missiles.

泄漏的概率，Pleak，是评估一枚活导弹是否死亡的概率。该概率是平台杀伤评估逻辑的函数，并在规则集中指定。泄漏概率取决于拦截导弹和拦截导弹。

The probability of false alarm, Pfa, is the probability of assessing a dead missile as alive. This probability is a function of the platform's kill assessment logic specified in the ruleset. The probability is dependent on both the intercepted and interceptor missiles. The probability also depends on the credibility of the dead missile. One probability of false alarm is used when the missile has been assessed as a credible threat and is being flown after intercept. A second probability of false alarm is used when the missile is not a credible threat and is not being flown after intercept. If randomness is eliminated, alive missiles will be assessed as alive and dead as dead.

虚警概率，Pfa，是指将一枚死的导弹评估为活的概率。该概率是规则集中规定的平台杀伤评估逻辑的函数。概率取决于拦截导弹和拦截导弹。这种可能性还取决于死亡导弹的可信度。当导弹被评估为可信威胁并在拦截后飞行时，使用一种虚警概率。当导弹不是可靠的威胁并且拦截后没有飞行时，使用第二种虚警概率。如果随机性被消除，活着的导弹将被评估为活着，死的导弹将被评估为死的。

The probability is selected based on the truth outcome of the engagement. For missiles that are alive, the probability of leakage, Pleak, is used. A probability draw from a uniform distribution is compared with Pleak. If Pdraw is greater than or equal to Pleak, the target is assessed as alive. If Pdraw is less than Pleak, an alive missile is assessed as dead. An engagement action is logged for the assessment.

概率是根据交战的真实结果来选择的。对于活着的导弹，使用泄漏概率Pleak。将均匀分布的概率图与Pleak作了比较。如果Pdraw大于或等于Pleak，则目标被评估为活着。如果Pdraw小于Pleak，则一枚活着的导弹被评估为死亡。将为评估记录参与操作。

The probability of false alarm is used for the assessment of dead missiles. This probability is a function of whether the missile is being flown after intercept. If the missile is being flown, the probability of false alarm as a function of the missile being flown, Pfa(MF), is used. A probability draw from a uniform distribution is compared with Pfa(MF). If Pdraw is less than Pfa(MF), the dead missile is assessed as alive. If Pdraw is greater than or equal to Pfa(MF), the missile is assessed as dead. An engagement action is logged for the assessment.

虚警概率用于评估导弹的死区。这个概率是拦截后导弹是否飞行的函数。如果导弹正在飞行，则使用作为导弹飞行函数的虚警概率Pfa（MF）。将均匀分布的概率图与Pfa（MF）进行了比较。如果Pdraw小于Pfa（MF），死的导弹被评估为活的。如果Pdraw大于或等于Pfa（MF），导弹被评估为死亡。将为评估记录参与操作。

The same logic is applied for the case where the missile is not being flown, but the probability of false alarm as a function of the missile not being flown Pfa(NF) is used for comparison with the probability draw.

同样的逻辑也适用于导弹没有飞行的情况，但虚警概率作为导弹没有飞行的函数Pfa（NF）用于与概率图进行比较。

A probability draw is made for each salvo shot in an engagement. The results of successful shots are saved. After all salvo shots have intercepted, the kill assessment function is scheduled to execute after the TM delay. This delay represents the time from when intercept occurs to the time that a decision can be made as to the status of the target

交战中的每一次齐射都有概率抽签。保存成功拍摄的结果。拦截所有齐射射击后，计划在TM延迟后执行杀伤评估功能。这个延迟表示从截获发生到可以决定目标状态的时间

When kill assessment executes, the results of each shot of the engagement are evaluated to determine the outcome. If any of the salvo shots are assessed to be successful, the engagement outcome is assessed as successful; otherwise it is assessed as a failure. An action is logged for the engagement, showing the truth of the outcome as well as the assessment.

执行杀戮评估时，将评估交战每次射击的结果，以确定结果。如果有任何一次齐射被评估为成功，则交战结果被评估为成功；否则被评估为失败。为参与记录一个操作，显示结果的真实性以及评估。

If the weapon launched is a Surface-to-Air (SA) gun and the target is destroyed, the status is reported to the commander. If the target is not destroyed and the SA gun still has available weapons, another launch is scheduled for the target. A message is not sent to the commander until the target is destroyed or the SA gun runs out of weapons.

如果发射的武器是地对空（SA）炮，且目标被摧毁，则状态报告给指挥官。如果目标没有被摧毁，SA枪仍然有可用的武器，另一次发射计划的目标。在目标被摧毁或SA枪的武器用完之前，信息不会发送给指挥官。

After an engagement is completed and a message is sent, the target-select phase will be scheduled at its start time for Flexible SAMs operating in single engagement mode or in a LASHE response.

接通完成并发送消息后，目标选择阶段将安排在其开始时间，以便在单一接通模式或冲击响应中操作灵活的SAM。

### 4.7.1.2.5 Flexible SAM Reload Phase

4.7.1.2.5柔性SAM重新加载阶段

The reload phase is executed at the completion of the reload process. The reload phase handles the reload of a platform operating with either the Flexible SAM ruleset or a SAM Launcher ruleset in the case of remote launchers. The weapons are managed according to the weapon list on the System Element Definition. Each listed weapon is managed separately and is defined with a weapon load size, an initial weapon load, the number of weapons to be reloaded on each reload phase execution, and the total weapon inventory available to be reloaded. The load size defines the weapon count at which the system is considered 100% weapon inventory. The initial load determines how many weapons are on the system at activation. Reload operations will always be initiated when the current weapon count reaches 0, but the system can optionally be configured to perform partial reloads, based on the reload size. If the same weapon type is listed multiple times, when the first instance is depleted, the reload process will start for that item on the list, although another entry with the same weapon type may still have weapons. Listing the same weapon multiple times is a method by which a partial reload functionality may be achieved, but it does not take into consideration whether launch and reload activities can occur simultaneously and it results in redundant processing during weapon selection, as each weapon entry is evaluated individually. Use of the Allow Partial Reloads option instigates reload activities before the weapon count reaches 0, but will not allow reloading while the system has launches to perform and once scheduled, prevents new launches from being scheduled until the reload is complete.

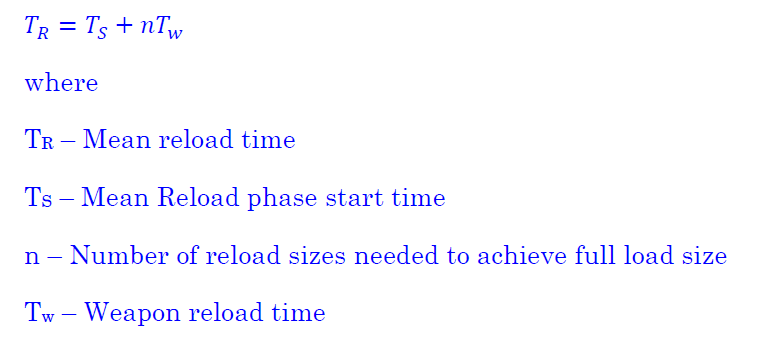
重新加载阶段在重新加载过程完成时执行。在远程发射器的情况下，重新加载阶段处理使用灵活SAM规则集或SAM启动器规则集操作的平台的重新加载。根据系统元素定义上的武器列表管理武器。每个列出的武器都是单独管理的，并且定义了武器装载量、初始武器装载量、每个重新装载阶段执行时要重新装载的武器数量以及可重新装载的武器库存总量。负载大小定义了武器计数，在该计数下，系统被视为100%武器库存。初始载荷决定了激活时系统上有多少武器。当当前武器计数达到0时，将始终启动重新加载操作，但系统可以根据重新加载大小选择性地配置为执行部分重新加载。如果同一武器类型被多次列出，当第一个实例耗尽时，将开始重新加载列表中该项目的过程，尽管另一个具有相同武器类型的条目可能仍然有武器。多次列出同一武器是一种可以实现部分重新加载功能的方法，但它没有考虑发射和重新加载活动是否可以同时发生，并且在武器选择过程中会导致冗余处理，因为每个武器条目都是单独评估的。使用“允许部分重新加载”选项会在武器计数达到0之前触发重新加载活动，但在系统有发射要执行时不允许重新加载，并且一旦计划，则会阻止在重新加载完成之前计划新的发射。

If partial reloads are not allowed, the reload phase is scheduled by the launch phase when a platform’s current weapon count reaches 0. Upon execution of the reload phase, the weapon count for the depleted weapon is incremented by the reload size if weapons remain from the available inventory for that specific line on the weapon list. When performing partial reloads, a reload is deemed necessary when the current weapon count is less than the full load size by at least a single reload size count. However, the reload phase cannot be scheduled if other launches have already been scheduled. Additionally, control over the partial reload capability may be managed via the user rules. The Partial Reload Authorization response allows partial reloading to be turned on or off based on trigger conditions, such as the presence of threatening tracks within a certain range of the platform. Once the reload phase has been scheduled, the platform will be prevented from scheduling any future launches until the reload has occurred. When the reload phase executes, the platform is reloaded by as many multiples of the reload size count as are needed to reach the full load size, without exceeding the load size or the remaining available inventory.

如果不允许部分重新加载，则当平台当前武器计数达到0时，由发射阶段安排重新加载阶段。在执行重新装填阶段时，如果武器清单上特定行的可用库存中仍有武器，则耗尽武器的武器计数将增加重新装填尺寸。当执行部分重新加载时，当当前武器计数小于满载尺寸至少一个重新加载尺寸计数时，认为有必要重新加载。但是，如果已经安排了其他发射，则无法安排重新加载阶段。此外，可以通过用户规则来管理对部分重新加载能力的控制。部分重新加载授权响应允许根据触发条件打开或关闭部分重新加载，例如在平台的特定范围内存在威胁轨道。一旦重新加载阶段被安排，平台将无法安排任何未来的发射，直到重新加载发生。当重新加载阶段执行时，平台将以达到满负载大小所需的重新加载大小计数的倍数重新加载，而不超过负载大小或剩余可用库存。

The reload phase start time represents the logistics time needed to prepare for a reload, such as to transport weapons to the launcher site. Each weapon specification then contains the time needed to load the number of weapons given as the reload size. The mean time needed to reload is then calculated as:

重新装填阶段开始时间表示准备重新装填所需的后勤时间，例如将武器运送到发射场。然后，每个武器规格都包含了装载武器所需的时间，这些武器的数量作为重新装载的尺寸给出。然后，重新加载所需的平均时间计算为：

  
 The reload phase is scheduled by taking a random draw, using the calculated mean reload time, TR, and the Reload phase start time sigma. If the Uniform distribution model is selected, the weapon reload time, 𝑛𝑇𝑤, is added to both the a and b values to determine the minimum and maximum reload phase times available. If randomness has been eliminated, the mean value is used. The reload phase repeat time is not used for reload scheduling. If no more weapons are available for reload for this specific list item, other weapons on the list will be evaluated to load onto the launcher. If a subsequent weapon in the list is listed with a 0 initial load count, that weapon will be available to load upon depletion of a prior weapon in the list. The order of reload is dependent upon the order in which the weapons are listed. In this case, the weapon count for this new weapon will be incremented by the reload size listed for it.

重新加载阶段通过使用计算的平均重新加载时间TR和重新加载阶段开始时间sigma进行随机抽取来安排。如果选择了均匀分布模型，则将武器重新加载时间𝑛𝑇𝑤添加到a和b值中，以确定可用的最小和最大重新加载阶段时间。如果消除了随机性，则使用平均值。重新加载阶段重复时间不用于重新加载计划。如果没有更多的武器可用于重新装载这个特定的清单项目，清单上的其他武器将被评估加载到发射器上。如果列表中的后续武器的初始装载计数为0，则该武器在耗尽列表中的先前武器后可以装载。重新装填的顺序取决于武器的排列顺序。在这种情况下，这个新武器的武器数量将增加为它列出的重新加载大小。

If the weapon is on a remoted launcher using the SAM Launcher ruleset and no more weapons are available for reload on the launcher, the list on its commanding Flexible SAM or SAM LCS will be evaluated. If a weapon with a 0 initial load count is found with the same weapon type as one listed on the launcher, that weapon on the launcher will be loaded/reloaded from the inventory found at its commanding platform. If partial reloads have been enabled, the platform will be reloaded up to the full load count specified for that weapon type on its system using the commander’s reload size and weapon reload timing to determine how many partial reloads are needed and how long the reload will take. Otherwise only the single reload size specified on the commander’s system is reloaded. This usage of the commander allows the inventory available to a battery to be managed across the battery. Similarly, a Flexible SAM can reload from a common weapon inventory located on its commanding Flexible Commander.

如果武器位于使用SAM发射器规则集的远程发射器上，并且没有更多的武器可用于在发射器上重新加载，则将评估其指挥灵活SAM或SAM LCS上的列表。如果发现初始装载计数为0的武器与发射器上列出的武器类型相同，则发射器上的武器将从其指挥平台上找到的库存中装载/重新装载。如果启用了部分重新加载，平台将重新加载到系统上为该武器类型指定的满载计数，使用指挥官的重新加载大小和武器重新加载时间来确定需要多少部分重新加载以及重新加载需要多长时间。否则，仅重新加载指挥官系统上指定的单个重新加载大小。指挥官的这种用法允许跨电池管理电池可用的库存。类似地，一个灵活的SAM可以从位于其指挥灵活指挥官的通用武器库存中重新加载。

In either case, the available reload inventory for the loaded weapon is decremented by the number of weapons reloaded. If the platform is flagged as having no more weapons, the platform is reset with the knowledge of available weapons.

在这两种情况下，可用的重新装填库存武器是减少了数量的武器重新装填。如果平台被标记为没有更多武器，平台将在已知可用武器的情况下重置。

At least one weapon on a platform that will launch weapons must have an initial weapon load count. Subsequent weapons on that platform may have a 0 initial load signifying that those weapons are available for reload upon depletion of the weapons initially placed on the platform. In addition, a Flexible Commander, Flexible SAM or SAM LCS may have a weapons list with the initial weapon count for all set to 0. This makes the weapons available for reload to the commander’s subordinates.

发射武器的平台上至少有一件武器必须有初始武器装载计数。该平台上的后续武器的初始载荷可能为0，表示这些武器在耗尽最初放置在平台上的武器后可以重新加载。此外，灵活指挥官、灵活SAM或SAM LCS可能有一个武器列表，所有武器的初始武器计数设置为0。这使得武器可以重新装填给指挥官的下属。

### 4.7.1.2.6 Flexible SAM User Rules Phase

4.7.1.2.6灵活SAM用户规则阶段

The Flexible SAM ruleset is able to employ countermeasures when under ARM attack, when being jammed, or when a commander or subordinate is lost, killed, or regained. It can also repoint sensors based on platform events. User-specified trigger events, such as the recognition of an ARM, cause user-specified responses to occur. These responses include shutting down emitters, forwarding alerts for ARMs, activating decoys, choosing an alternate commander, and triggering another platform. The trigger conditions are composed of events—e.g., recognition that an ARM has been launched—combined with the state of the SAM. The state of the SAM includes whether the SAM is currently locked on a target or has interceptors requiring guidance in the air to targets. The User Rules phase is described in Subsection 4.12.

灵活的SAM规则集能够在遭受武装攻击、被干扰或指挥官或下属丢失、死亡或重新获得时使用对抗措施。它还可以根据平台事件重新定位传感器。用户指定的触发事件（如识别手臂）会导致发生用户指定的响应。这些反应包括关闭发射器、转发武器警报、激活诱饵、选择候补指挥官以及触发另一个平台。触发条件由事件组成，例如，识别ARM已发射以及SAM的状态。SAM的状态包括SAM当前是否锁定在目标上，或者是否有需要空中引导的拦截目标。第4.12小节描述了用户规则阶段。

## 4.7.1.3 Flexible SAM Received Message Processing

4.7.1.3灵活的SAM接收报文处理

Much of the coordination within the Flexible SAM ruleset with other participants comes through the messages that are received. These messages are key to the coordinated operation among the individual SAM units and with aircraft operating in the same area. Designating a Flexible SAM platform as External Control disables its ability to process command type messages. This subsection discusses the messages that this ruleset processes.

灵活SAM规则集中与其他参与者之间的大部分协调都是通过接收到的消息来实现的。这些信息是各个SAM单元之间以及飞机在同一区域运行时协调操作的关键。将灵活的SAM平台指定为外部控制将禁用其处理命令类型消息的能力。本小节讨论此规则集处理的消息。

### 4.7.1.3.1 Flexible SAM Track Data

4.7.1.3.1灵活的SAM跟踪数据

The Flexible SAM ruleset uses a track file; thus this ruleset is able to process track messages. Subsection 4.6 describes the track processing used for the Flexible SAM ruleset.

灵活的SAM规则集使用跟踪文件；因此该规则集能够处理跟踪消息。第4.6小节描述了用于灵活SAM规则集的跟踪处理。

### 4.7.1.3.2 Flexible SAM Commanded Assignment

4.7.1.3.2灵活分配

Commanded assignments represent the method used by the Flexible Commander ruleset to communicate an assignment order to his subordinate. The commanded assignment message is always generated in the Flexible Commander's target-select phase and routed directly to the subordinate.

命令分配表示灵活的指挥官规则集用于将分配命令传达给其下属的方法。命令分配消息总是在灵活指挥官的目标选择阶段生成，并直接路由到下级。

If the SAM system is acting in a LASHE response, the SAM issues a CANTCO to its commander. This action allows the commander to make an assignment to a different subordinate.

如果SAM系统正在执行冲击响应，则SAM向其指挥官发出CANTCO。此操作允许指挥官将任务分配给不同的下属。

Upon receipt of the message, a check is made to determine if this platform is already engaging the target in question. The assumption is made that the commanding platform had not received the engagement report by the time the assignment decision was sent. If the platform is engaging the target, the assignment message is ignored. The ruleset then determines if the platform currently has the target in track. If the threat is already in track, the platform accepts the assignment order and flags the track as being a commanded assignment.

收到信息后，进行检查，以确定该平台是否已与相关目标交战。假设在发送任务决定时，指挥平台尚未收到交战报告。如果平台与目标交战，则忽略分配消息。然后规则集确定平台当前是否有目标跟踪。如果威胁已经在轨道上，平台接受分配命令并将轨道标记为命令分配。

For the case where track is not currently held, an update request message is sent to the commander. Upon receipt of the commanded track update, the assignment will continue to be processed. If a track is still not found, the threat is added to the track file and flagged as unengageable. Adding it to the track file sends a message to detection to put the track on the search list of any dependent sensors that the platform might have. Once track data are received, the track becomes engageable either from a dependent sensor or from a remote track message.

对于当前未保留轨迹的情况，将向指挥官发送更新请求消息。在收到命令的轨迹更新后，将继续处理分配。如果仍然没有找到轨迹，则威胁将添加到轨迹文件并标记为不可探测。将其添加到轨迹文件会向detection发送一条消息，将轨迹放在平台可能拥有的任何从属传感器的搜索列表中。一旦接收到轨迹数据，轨迹就可以从从属传感器或远程轨迹信息中接合。

The DFD rating from the track of the commander issuing the command is included in the message. This information is used to either update the current DFD rating in the receiving platform's track file or to initiate a track entry. The DFD rating controls which sensors are cued through the commanded assignment.

消息中包含发布命令的指挥官轨迹的DFD等级。此信息用于更新接收平台跟踪文件中的当前DFD等级或启动跟踪条目。DFD等级控制通过指令分配提示哪些传感器。

If the target-select phase is unable to act upon the engagement within the specified assignment attempt time, a CANTCO message is sent to the commander to allow assignment to a different subordinate.

如果目标选择阶段无法在指定的分配尝试时间内对交战采取行动，则会向指挥官发送CANTCO消息，以允许分配给不同的下属。

### 4.7.1.3.3 Flexible SAM Commanded Launch

4.7.1.3.3灵活SAM指令发射

Commanded launches represent the method used by a Flexible Commander to command a weapon launch order to a Flexible SAM. This commanded launch can be sent to any Flexible SAM for which the Flexible Commander serves as an engagement supporter. The Flexible Commander does not need to be in the command chain of that Flexible SAM. The commanded launch message is always generated in the Flexible Commander's target-select phase and routed directly to the SAM chosen for launching the weapon.

指令发射是指灵活指挥官将武器发射命令发送给灵活SAM的方法。该指令发射可发送给灵活SAM，灵活指挥官为其提供交战支持。灵活指挥官不需要在该灵活SAM的命令链中。命令的发射消息总是在灵活指挥官的目标选择阶段生成，并直接路由到选择用于发射武器的SAM。

If the SAM system is acting in a LASHE response, the SAM issues a CANTCO to its commander. This action allows the commander to make an assignment to a different subordinate.

如果SAM系统正在执行冲击响应，则SAM向其指挥官发出CANTCO。此操作允许指挥官将任务分配给不同的下属。

Upon receipt of the message, the commanded launch is treated essentially as a commanded assignment. It is prioritized above self-assigned engagements. The main difference is that the platform issuing the commanded launch automatically serves as the engagement supporter. No IFTU support request message is generated for this case. The SAM accepts responsibility for launching the weapon and then proceeds to launch a weapon at the target. The platform issuing the commanded launch provides the IFTUs to the missile interceptor, implicit or explicit, and conducts the endgame analysis at the completion of the engagement.

收到信息后，指令发射基本上被视为指令分配。它的优先级高于自我分配的约定。主要区别在于，发出指令发射的平台自动充当交战支持者。没有为这种情况生成IFTU支持请求消息。SAM接受发射武器的责任，然后继续向目标发射武器。发出指令发射的平台向导弹拦截器提供IFTU（隐式或显式），并在交战结束时进行终局分析。

Upon receipt of a commanded launch message from a platform that is not the SAM's commander, the Flexible SAM issues a report to its commander, notifying its commander that it is launching a weapon at the commanded target. The commander then passes a report around to all platforms on its nets that the target is being engaged. This prevents other platforms from taking shots at a target already being engaged. At the completion of the engagement, the engagement supporter sends a message to the SAM, notifying it of the outcome of the engagement. The SAM then sends a report to its commander, again allowing the commander to report this information around so other platforms will know they should now engage on the target if the target survived.

在接收到来自非SAM指挥官平台的命令发射信息后，灵活SAM向其指挥官发出报告，通知其指挥官正在向命令目标发射武器。然后指挥官向其网络上的所有平台传递一份报告，说明目标正在交战。这样可以防止其他平台向已经交战的目标射击。在参与完成时，参与支持者向SAM发送一条消息，通知其参与的结果。然后，SAM向其指挥官发送报告，再次允许指挥官报告周围的信息，以便其他平台知道如果目标幸存，他们现在应该攻击目标。

If the target-select phase is unable to act upon the engagement within the specified assignment attempt time, a CANTCO message is sent to the commander to allow assignment to a different subordinate.

如果目标选择阶段无法在指定的分配尝试时间内对交战采取行动，则会向指挥官发送CANTCO消息，以允许分配给不同的下属。

### 4.7.1.3.4 Flexible SAM Engagement Reports

4.7.1.3.4灵活的SAM参与报告

Engagement reports are used to report engagements around the battlefield. While all engagement reports are sent with the same intent, two kinds of engagement reports exist. The difference between the two is the source of the report. The SAM rulesets generate a single engagement report for each engagement. The fighter rulesets create an engagement report that can contain multiple targets. The Flexible Sam ruleset processes these messages to log the engagement events to prevent dual engagements.

交战报告用于报告战场周围的交战情况。虽然发送所有交战报告的目的相同，但存在两种交战报告。两者的不同之处在于报告的来源。SAM规则集为每个约定生成一个约定报告。战斗机规则集创建一个可以包含多个目标的交战报告。灵活的Sam规则集处理这些消息以记录交战事件，以防止双重交战。

The processing for a received single engagement report is discussed first. If the engagement report has previously been received the message is ignored. If the platform cannot find the reported track number in its track file, the platform sends an update request message to the source of the engagement report. Upon receipt of the requested track update, if the platform still does not have track on the target, no further processing is performed. Information from the reports is stored to allow the display of external engagement data in FIRE. The engaging platform, current engagement status, interceptor track number, and intercept time of all engagement report and engagement complete messages received by a Flexible SAM is collected, regardless of whether that message will be used for any further deconfliction evaluations. Received engagement reports that do not originate from the Flexible SAM’s commander, its peer deconfliction group, or its fratricide avoidance group are processed no further once the external engagement data is stored.

首先讨论接收到的单个审计业务报告的处理。如果先前已收到预订报告，则忽略该消息。如果平台在其跟踪文件中找不到报告的跟踪编号，则平台将向交战报告源发送更新请求消息。在收到请求的跟踪更新后，如果平台在目标上仍然没有跟踪，则不执行进一步的处理。存储报告中的信息，以便在火灾中显示外部交战数据。收集灵活SAM接收到的所有交战报告和交战完成消息的交战平台、当前交战状态、拦截器航迹号和拦截时间，无论该消息是否将用于任何进一步的解冲突评估。存储外部交战数据后，将不再处理接收到的并非来自灵活SAM指挥官、其对等反冲突组或自相残杀避免组的交战报告。

If the track is not currently flagged as engaged, then this platform is not engaging the target and an engagement report from another platform has not been received on this track. At this point, the track is flagged as engaged to prevent the platform from engaging the track on its own. If the track is already flagged as assigned or engaged, the processing that is performed is identical to that of receiving a stop command message. The assumption is made within the SAM rulesets that an engagement will not be reported unless the commander has accepted that engagement. With this assumption, a reported engagement to this level is equivalent to receiving the stop command.

如果航迹当前未标记为已接通，则此平台未接通目标，且此航迹上未收到来自其他平台的接通报告。此时，轨道被标记为已接合，以防止平台自行接合轨道。如果轨道已标记为已分配或已接合，则执行的处理与接收停止命令消息的处理相同。在SAM规则集中假设，除非指挥官接受交战，否则不会报告交战。在此假设下，报告的此级别的交战相当于接收停止命令。

All of the multiple engagement report messages received by the Flexible Sam ruleset are assumed to be messages forwarded from the commander. The processing for these messages is a loop over all the targets within the report message. The processing performed for each individual target is identical to a single engagement report as described previously.

所有由灵活Sam规则集接收的多个交战报告消息都假定为从指挥官转发的消息。对这些消息的处理是对报表消息中所有目标的循环。对每个单独目标执行的处理与前面描述的单个交战报告相同。

### 4.7.1.3.5 Flexible SAM Acknowledgments

4.7.1.3.5灵活的SAM确认

The Flexible SAM does not receive acknowledgments from its SAM Launchers. The SAM processes two types of acknowledgment messages: IFTU acknowledgments and forwarded multiple acknowledgments. A forwarded multiple acknowledgment is treated as a multiple engagement report as described in Subsection 4.7.1.3.4. An IFTU acknowledgment is received in response to an engagement support request. If the response is a WILCO, the SAM updates its launch information with the ID of the IFTU provider. A lock action is scheduled for the new IFTU provider. If the WILCO is in response to a hand-off request, the new supporter's launch record is updated with the data from the current supporter's record, and the SAM performs a complete to clear itself as the engagement supporter. If a CANTCO is received, the ID of the IFTU provider is cleared. If this is a response to an initial engagement support request, the SAM's launch record is also cleared, and a stop due to the lack of support is performed. If the CANTCO is a response to a hand-off request, the SAM tries to find another platform to take over the engagement.

灵活的SAM不接收来自其SAM启动器的确认。SAM处理两种类型的确认消息：IFTU确认和转发的多个确认。转发的多次确认被视为第4.7.1.3.4小节所述的多次审计业务报告。接收到IFTU确认，以响应交战支持请求。如果响应是WILCO，SAM将用IFTU提供者的ID更新其启动信息。已为新的IFTU提供程序安排锁定操作。如果WILCO响应移交请求，则新支持者的发射记录将使用当前支持者记录中的数据进行更新，并且SAM将执行一个完整的命令，以清除自己作为参与支持者的身份。如果收到CANTCO，则清除IFTU提供程序的ID。如果这是对初始交战支持请求的响应，SAM的发射记录也将被清除，并执行因缺少支持而停止的操作。如果CANTCO是对移交请求的响应，SAM会尝试寻找另一个平台来接管约定。

### 4.7.1.3.6 Flexible SAM Engagement Status Reports

4.7.1.3.6灵活的SAM参与状态报告

Engagement status reports also come in the forms of a single engagement status report and a multiple target engagement report, where the originators of the reports are a SAM and a fighter, respectively. The message is ignored if the report is a failure but the reporting platform is not flagged as the engager. If the reported track number is not found in the platform’s track file, an update request is sent to the source of the report. Upon receipt of the requested track update, if the track is still not found in the track file the report is not processed further. For tactical missile engagements, the engagement status report contains the assessment of an engagement rather than the truth. An action is logged indicating the receipt of an assessment from another platform. The TM track in the SAM's track file is flagged as being assessed dead upon receipt of an engagement assessed as a success. ABT engagement reports contain the truth of an ABT engagement outcome. The ABT track in the SAM's track file is flagged as dead upon receipt of a success message. If the engagement was a success or assessed as a success, consideration is given to the fact that this platform may have a missile scheduled for or in the air to the target. If a missile is scheduled, then the engagement is stopped to prevent a wasted missile expenditure. If a missile is in flight, the missile is aborted and the engagement considered a failure. This action frees the platform to make another engagement.

交战状态报告也有单目标交战状态报告和多目标交战状态报告两种形式，其中报告的发起人分别是SAM和战斗机。如果报告失败，但报告平台未标记为接合器，则忽略该消息。如果在平台的跟踪文件中找不到报告的跟踪编号，则会向报告源发送更新请求。收到请求的跟踪更新后，如果在跟踪文件中仍然找不到该跟踪，则不进一步处理报告。对于战术导弹交战，交战状态报告包含对交战的评估，而不是事实。将记录一个操作，指示从另一个平台接收评估。SAM跟踪文件中的TM跟踪在收到评估为成功的约定时被标记为评估为已死亡。ABT参与报告包含ABT参与结果的真实性。在收到成功消息时，SAM的跟踪文件中的ABT跟踪被标记为已死亡。如果交战成功或被评估为成功，则考虑到该平台可能有一枚导弹预定或在空中射向目标。如果计划了导弹，那么就停止交战，以防止浪费导弹开支。如果一枚导弹在飞行中，导弹将被中止，交战将被视为失败。这一行动释放了平台进行另一项约定的自由。

In the case of a failure report, the engagement status is cleared to allow future engagements. However, if the platform still has a missile in flight, the engagement status is set to indicate that this platform is engaging.

如果出现故障报告，将清除接合状态以允许将来接合。但是，如果平台仍有一枚导弹在飞行，则交战状态设置为表明该平台正在交战。

Upon receiving an engagement status report, the upper-tier Flexible SAM deletes the record that indicates the reporting platform was engaging—except when a report is received about a target that was not killed. In this case, the upper-tier SAM flags the engagement as complete but preserves the planned Pk for that engagement to use in subsequent decisions for engaging the target.

当接收到交战状态报告时，上层灵活SAM删除指示报告平台正在交战的记录，除非接收到关于未击毙目标的报告。在这种情况下，上层SAM将交战标记为已完成，但保留该交战的计划Pk，以便在随后的与目标交战的决策中使用。

The forwarded multiple engagement status report is treated as multiple single status reports. The processing for each target is the same as the processing for a single engagement report.

转发的多重交战状态报告被视为多个单一状态报告。对每个目标的处理与对单个交战报告的处理相同。

### 4.7.1.3.7 Flexible SAM Stop Commands

4.7.1.3.7灵活的SAM停止命令

The stop command is used by the commander rulesets to carry out the actions of the deconfliction process. Reception of the stop command indicates that the platform is to perform a cease fire action on the given target. The cease fire action is accomplished by allowing interceptors in flight to continue to intercept.

指挥官规则集使用stop命令来执行解除冲突过程的操作。接收到停止命令表示平台将对给定目标执行停火行动。停火行动是通过允许飞行中的拦截器继续拦截来完成的。

If the stop message has been previously received, the message is ignored. If the commanded track number is not found in the platform’s track file, the platform sends an update request to the source of the stop command. Upon receipt of the requested track update, if the track still does not exist, the command is not processed further. If the platform is engaging the track, the status of the engagement is evaluated. If the missile has not been launched, the engagement is stopped. In case the missile is already in the air or the assignment message has already been sent to a SAM Launcher, the missile is allowed to continue to intercept. The correct engager is received in the stop command. Whether the current platform has a missile in the air or is even engaging the target, the correct engager will be logged into the track entry.

如果先前已收到停止消息，则忽略该消息。如果在平台的轨迹文件中找不到指令轨迹号，平台将向停止指令源发送更新请求。在收到请求的磁道更新后，如果磁道仍然不存在，则不进一步处理该命令。如果平台与轨道接合，则评估接合状态。如果导弹还没有发射，交战就停止了。如果导弹已经在空中，或者分配信息已经发送到SAM发射器，导弹可以继续拦截。在stop命令中接收到正确的接合器。无论当前平台是否有导弹在空中，或者甚至正在与目标交战，正确的接合器都将被记录到轨道入口。

### 4.7.1.3.8 Flexible SAM Communications Check

4.7.1.3.8灵活SAM通信检查

A platform operating with the Flexible SAM ruleset relies on communication of command messages with its commander. If this communication is disrupted, the platform responds by executing its User Rules phase to determine the appropriate action. The platform continues to monitor its commander to determine if communications are restored.

使用灵活的SAM规则集操作的平台依赖于与其指挥官之间的命令消息通信。如果此通信中断，平台将通过执行其用户规则阶段来做出响应，以确定适当的操作。该平台继续监测其指挥官，以确定通信是否恢复。

The Flexible SAM monitors the existence of the capability to communicate command messages with its commander through the receipt of command messages from its commander. The command message can be any of the standard messages generated to report and deconflict engagements. The commander of the platform, which will be operating with the Flexible Commander ruleset, periodically generates a communication check message to its subordinates. These periodic messages are to ensure that communications are operational during periods of time when engagements are not being conducted. The periodicity for generation of the message is defined by the Send To Subordinate input for the commanding platform. If any of these message types are received from the commander, the time of message receipt from the commander is stored for the platform.

灵活的SAM通过接收来自其指挥官的命令消息来监视是否存在与其指挥官通信命令消息的能力。命令消息可以是为报告和消除冲突而生成的任何标准消息。平台的指挥官将使用灵活的指挥官规则集进行操作，并定期向其下属生成通信检查消息。这些定期信息是为了确保在不进行交战期间通信是可操作的。生成消息的周期由指挥平台的发送到下级输入定义。如果从指挥官处收到这些消息类型中的任何一种，则会为平台存储从指挥官处收到消息的时间。

As a subordinate, the Flexible SAM will periodically verify the receipt of messages from its commander to insure that the communication link to its commander exists. The periodicity for checking is defined by the Verify From Commander input. The periodicity represents the length of time to recognize that communications has been disrupted and to respond to that recognition. The platform compares the time of the last received message from its commander to the time of last verification. If the time of last receipt was prior to the time of last verification, the commander will be considered lost. The Flexible SAM can optionally execute its User Rules phase upon loss of its commander. This would allow the Flexible SAM to select an alternate commander to go into autonomous operations, as well as execute other User Rules responses.

作为下属，灵活的SAM将定期验证从其指挥官收到的消息，以确保到其指挥官的通信链路存在。检查周期由“验证来自指挥官”输入定义。周期性表示识别通信中断并对该识别作出反应的时间长度。平台将最后一次从其指挥官处收到消息的时间与最后一次验证的时间进行比较。如果最后一次接收时间早于最后一次核实时间，则指挥官将被视为失踪。灵活的SAM可以选择在失去其指挥官时执行其用户规则阶段。这将允许灵活的SAM选择一个备用指挥官进入自主操作，以及执行其他用户规则响应。

The platform will continue to periodically verify the communications link from its commander. If a message is received from its commander after the subordinate has become autonomous, the original operational mode for all target types is restored. If the Update Commander option is selected, the platform reports all its current engagements to its commander at the time the operational mode is restored. This brings the commander up to date on the platform's ongoing engagements.

平台将继续定期核查其指挥官的通信链路。如果在下属已自治后收到来自其指挥官的消息，则恢复所有目标类型的原始操作模式。如果选择“更新指挥官”选项，则平台将在恢复作战模式时向指挥官报告其所有当前交战。这将使指挥官了解平台正在进行的交战的最新情况。

Communications with SAM Launchers and SAM LCS's can also be verified. If a Flexible SAM loses communications with a SAM Launcher, the Flexible SAM will flag this subordinate as inactive. The Flexible SAM will then send a Command Info message to tis commander to indicate this launcher is no longer available. This prevents commanders operating in weapon capability mode from evaluating an inactive launcher. The Flexible SAM can also execute its User Rules phase upon losing a subordinate launcher.

还可以验证与SAM发射器和SAM LCS的通信。如果柔性SAM与SAM启动器失去通信，柔性SAM会将此下属标记为不活动。灵活的SAM随后将向tis指挥官发送一条命令信息消息，指示该发射器不再可用。这可防止在武器能力模式下作战的指挥官评估非活动发射器。灵活的SAM还可以在失去一个从属启动器时执行其用户规则阶段。

The Flexible SAM verifies communications to its SAM LCS's. If an LCS is lost, the Flexible SAM will flag that LCS as inactive. When SAM Launchers are evaluated during weapon selection, the status of the LCS commanding that launcher is evaluated. If the LCS is inactive, Launchers subordinate to the LCS cannot be assigned. The LCS is not a direct subordinate of the Flexible SAM therefore, it is handled differently than the SAM Launchers. When an LCS loses communications with all Flexible SAMs associated with it, the LCS can execute its User Rules phase to select an alternate SAM. The SAM then has access to the launchers commanded by that LCS.

灵活SAM验证与其SAM LCS的通信。如果LCS丢失，灵活SAM会将该LCS标记为不活动。在武器选择过程中评估SAM发射器时，将评估指挥该发射器的LCS的状态。如果LCS处于非活动状态，则无法分配从属于LCS的启动器。LCS不是灵活SAM的直接下属，因此其处理方式与SAM发射器不同。当LCS与所有与其相关的灵活SAM失去通信时，LCS可以执行其用户规则阶段以选择备用SAM。然后，SAM可以访问该LCS命令的发射器。

### 4.7.1.3.9 Flexible SAM Engagement Support Request

4.7.1.3.9灵活SAM参与支持请求

The Flexible SAM, if it serves as an engagement supporter for another Flexible SAM, can receive a request to provide IFTUs to an implicit or explicit missile interceptor launched by the SAM. If it receives this message, the SAM checks to see if it has track on the target. It also verifies that the intercept point is within its FOV and that it can, if necessary, provide the required illumination. The SAM can only act as an illumination supporter if the intercept point is within its FOV. The SAM will also check that its maximum interceptors in flight constraint will not be exceeded. If it can support the engagement, then it sends a WILCO to the Flexible Commander or Flexible SAM that requested the IFTU support. If it cannot, a CANTCO is sent.

灵活的SAM，如果它作为另一个灵活的SAM的交战支持者，可以接收一个请求，向SAM发射的隐式或显式导弹拦截器提供IFTUs。如果它接收到这个消息，SAM会检查它是否跟踪目标。它还验证了拦截点是否在视场范围内，并且如果需要，它可以提供所需的无线照射。如果截获点在视场范围内，SAM只能作为无线照射支架。SAM还将检查其最大拦截飞行限制不会超过。如果它能够支持交战，那么它将向请求IFTU支持的灵活指挥官或灵活SAM发送WILCO。如果不能，则发送CANTCO。

### 4.7.1.3.10 Flexible SAM Alert Message

4.7.1.3.10灵活的SAM警报消息

The Flexible SAM can generate and receive ARM and jamming alert messages through User Rules reactions. When the Flexible SAM receives an alert message, the Flexible SAM's User Rules triggers are evaluated. If the Flexible SAM has a trigger that matches the type of alert, the User Rules phase will be scheduled to evaluate the SAM's response.

灵活的SAM可以通过用户规则反应生成和接收ARM和干扰告警信息。当柔性SAM收到警报消息时，将评估柔性SAM的用户规则触发器。如果灵活SAM具有与警报类型匹配的触发器，则将安排用户规则阶段来评估SAM的响应。

### 4.7.1.3.11 Flexible SAM Sensor Status Messages

4.7.1.3.11柔性SAM传感器状态信息

The Flexible SAM ruleset can send and receive sensor status messages. These messages are used by the EMCON authority to determine which platforms have changed their sensor status.

灵活的SAM规则集可以发送和接收传感器状态消息。EMCON管理局使用这些消息来确定哪些平台已更改其传感器状态。

The Flexible SAM will only process a sensor status message if it is the EMCON authority. If it is the EMCON authority, the Flexible SAM will either drop or add the reporting sensor's coverage from its EMCON grid. It then initiates its User Rules phase to replace or drop coverage as specified in its responses. If the Flexible SAM's User Rules triggers do not include triggers for adding or dropping commanded sensors or external surveillance sensors, the User Rules phase will not be scheduled. Subsection 4.12 details the responses for sensor changes.

灵活的SAM仅在EMCON授权的情况下处理传感器状态消息。如果是EMCON当局，灵活的SAM将从其EMCON网格中删除或添加报告传感器的覆盖范围。然后，它启动其用户规则阶段，以替换或删除响应中指定的覆盖范围。如果灵活SAM的用户规则触发器不包括添加或删除命令传感器或外部监视传感器的触发器，则不会安排用户规则阶段。第4.12小节详细说明了传感器变化的响应。

### 4.7.1.3.12 Flexible SAM Sensor Assignment Message

4.7.1.3.12灵活SAM传感器分配消息

The Flexible SAM ruleset can process assignments from the EMCON authority to turn sensors on or off. Upon receiving this command message, the Flexible SAM will loop through the list of sensors contained in the command and check the commanded status of the sensor. The Flexible SAM will then turn the sensor on or off as commanded.

灵活的SAM规则集可以处理来自EMCON机构的分配，以打开或关闭传感器。收到此命令消息后，柔性SAM将循环浏览命令中包含的传感器列表，并检查传感器的命令状态。然后，柔性SAM将按照命令打开或关闭传感器。

### 4.7.1.3.13Flexible SAM Tier Availability Report

4.7.1.3.13灵活SAM层可用性报告

An upper-tier Flexible SAM can process tier availability reports from members of its automated engagement coordination (AEC) group. These reports indicate other members’ engagement intentions and their availability to provide backup support. The SAM processes reports from upper-tier members with the following coordination actions: Intend to Engage, Do Not Intend to Engage, Support Expected, Available for Support and Not Available for Support. The Intend to Engage and Available for Support messages include the upper tier weapon inventory status which is stored for each AEC member. Upon receipt of an Intend to Engage or a Do Not Intend to Engage, the SAM flags the track to indicate whether or not upper tier support is available for the engagement. When a Support Expected action is received and the Process Upper Tier Reports option is selected, the SAM evaluates its current battlespace regardless of tracking restrictions and responds with an Available for Support message if capable of engaging after the intercept time in the received message. If not capable of engaging after the intercept time, then a Not Available for Support message is sent. Upon receipt of an Available for Support message, the SAM flags the track to indicate UT2 support is available for this engagement. If the coordination by track group option is selected and a report has been received from another upper-tier SAM with the intention to engage or with the support available, all other members of the track group will evaluate as having upper tier support available.

上层灵活SAM可以处理来自其自动参与协调（AEC）组成员的层可用性报告。这些报告表明了其他成员的参与意图及其提供备份支持的可用性。SAM通过以下协调行动处理来自上层成员的报告：打算参与、不打算参与、预期支持、可支持和不可支持。“准备交战”和“可用于支持”信息包括为每个AEC成员存储的上层武器库存状态。在收到“打算交战”或“不打算交战”时，SAM会标记轨迹，以指示上层支持是否可用于交战。当收到预期支持行动并选择“处理上层报告”选项时，无论跟踪限制如何，SAM都会评估其当前作战空间，如果能够在收到的消息中的截获时间后接通，则使用可用支持消息进行响应。如果在截获时间后无法接通，则发送不可用于支持的信息。在收到“可用于支持”消息后，SAM将标记轨迹，以指示UT2支持可用于此接合。如果选择了“按轨道组协调”选项，并且从另一个上级SAM收到了一份报告，打算参与或有可用的支持，则轨道组的所有其他成员将评估为有可用的上层支持。

From lower-tier members of the group, the tier report may have an action of Available for Support or Not Available for Support. An Available for Support message also indicates the lower tier weapon inventory. Upon receipt of the tier message, the Flexible SAM indicates in the track record for the target if the lower tier can engage the target in the future and logs the weapon inventory of the lower tier. This information is used during the fire-doctrine determination of how many shots should be taken by the upper tier against the target.

从组的较低级别成员处，级别报告可能有“可供支持”或“不可供支持”的操作。“可供支持”信息还指示较低级别的武器库存。在收到tier消息后，灵活SAM在目标的跟踪记录中指出较低一级是否可以在未来与目标交战，并记录较低一级的武器库存。在火力条令确定上层应向目标射击多少次时，使用此信息。

### 4.7.1.3.14Flexible SAM Command Information Message

4.7.1.3.14灵活SAM命令信息报文

The Flexible SAM ruleset can process command information messages sent by the SAM LCS. This message will contain information about a subordinate launcher that has either been activated or deactivated based on communications messages. The Flexible SAM will record this information for its subordinate and forward the information to its commander.

灵活的SAM规则集可以处理SAM LCS发送的命令信息消息。此消息将包含有关已根据通信消息激活或停用的从属启动器的信息。灵活的SAM将为其下属记录此信息，并将此信息转发给其指挥官。

### 4.7.1.3.15Flexible SAM Update Request Message

4.7.1.3.15灵活SAM更新请求消息

When the Flexible SAM sends a command message such as an engagement report or an engagement status report, it contains the number of the track entry on the target. The receiving platform then attempts to find the commanded track number in its track file. If the track number is not found, the receiving platform sends an update request message back to the SAM for that track number. Upon receipt of the request message, the Flexible SAM generates a commanded track update message that contains the track data for the target. The commanded track update also contains all the information of the previous command message, which will then be processed by the receiving platform after the track information has been processed.

当灵活SAM发送命令消息（如交战报告或交战状态报告）时，它包含目标航迹条目的编号。然后，接收平台尝试在其轨迹文件中查找指令轨迹号。如果找不到磁道号，接收平台将向SAM发回该磁道号的更新请求消息。在接收到请求消息后，灵活SAM生成一个命令航迹更新消息，其中包含目标的航迹数据。指令航迹更新还包含先前指令报文的所有信息，在航迹信息处理完毕后，接收平台将对其进行处理。

### 4.7.1.3.16Flexible SAM Commanded Track Update

4.7.1.3.16灵活SAM命令航迹更新

The commanded track update message contains the track data for the requested track number as well as the data contained in the previous command on the track. When the platform receives the update message, it first processes the track information into its track file. The track data is processed in the same way as a track update or a new track, as detailed in Section 4.6. Once the track data has been processed, the platform then processes the original command message for which this track was requested.

指令航迹更新信息包含请求航迹号的航迹数据以及航迹上的上一个指令中包含的数据。当平台接收到更新消息时，它首先将跟踪信息处理到其跟踪文件中。轨道数据的处理方式与轨道更新或新轨道相同，详见第4.6节。处理完轨迹数据后，平台将处理请求此轨迹的原始命令消息。

## 4.7.1.4 Flexible SAM System Configuration

4.7.1.4灵活的SAM系统配置

The Flexible SAM ruleset is useful in modeling several current and projected systems. From the standpoint of the system definition, the actions taken by the ruleset and the need for a sensor on the system is driven by the weapons placed on the system. Several of the thrusted weapon types are supported. If the guidance is semi-active, the platform is required to track a target through intercept; thus, a sensor is required. If the guidance for the thrusted missile is anything other than NLOS or semi-active—e.g., a fire-and-forget missile—track by the platform is only required through launch, also requiring a sensor. The surface-to-air gun is treated in a similar manner to the fire-and-forget missiles: track is required through launch. A sensor is therefore required to use the surface-to-air gun or any of the weapons thus far discussed. This sensor requirement can be substituted with a network to an engagement supporter.

灵活的SAM规则集可用于建模多个当前和预测系统。从系统定义的角度来看，规则集所采取的行动以及系统上传感器的需求是由系统上放置的武器驱动的。支持几种推力武器类型。如果制导是半主动的，则需要平台通过拦截跟踪目标；因此，需要一个传感器。如果推力导弹的制导不是非直瞄或半主动的，例如，只有在发射过程中才需要平台提供的火控导弹跟踪，还需要一个传感器。地对空炮的处理方式与“射而忘”导弹类似：发射时需要跟踪。因此，使用地对空火炮或迄今讨论的任何武器都需要一个传感器。这种传感器的要求可以用一个网络来代替。

The expected configuration of the NLOS weapon requires target information before the missile is launched. This target information could be from a sensor on the NLOS system; however, a remoted sensor or network of sensors may feed the NLOS track/target data. The NLOS capability does not require a sensor on the NLOS platform; thus a sensor is not required if only an NLOS-capable weapon is used on the system definition with a Flexible SAM ruleset.

非直瞄武器的预期配置需要在导弹发射前获得目标信息。这些目标信息可以来自非直瞄系统上的传感器；但是，远程传感器或传感器网络可以提供非直瞄航迹/目标数据。非直瞄能力不需要非直瞄平台上的传感器；因此，如果系统定义中仅使用了具有非直瞄能力的武器，且具有灵活的SAM规则集，则不需要传感器。

If the weapon is of type complex weapon, meaning it is an explicit missile platform once it is launched, then another requirement exists for the SAM. If explicit networks are being used, and if propagation is to be used to check connectivity, there must be one communications device for each missile platform that the SAM is capable of launching. The dynamic network established between the SAM and the missile platform uses an undedicated communications device to establish the communications link. At the time of the network setup, the pointing mode of the SAM's communications device is automatically set to the "To Platform" pointing mode, with the missile platform as the target platform.

如果武器类型为复杂武器，意味着一旦发射，它就是一个明确的导弹平台，那么对SAM存在另一个要求。如果使用明确的网络，并且如果要使用传播来检查连接性，则SAM能够发射的每个导弹平台必须有一个通信设备。SAM和导弹平台之间建立的动态网络使用非指定通信设备建立通信链路。在建立网络时，SAM通信设备的指向模式自动设置为“对平台”指向模式，导弹平台作为目标平台。

If weapons are to be launched that require target illumination for successful intercept of the target, the Flexible SAM must be set up to allow for this illumination. The SAM must be defined with an average number of illuminators greater than zero to allow a weapon requiring illumination to be launched. This automatically sets up the scheduling of the SAM's ability to illuminate the target based on the weapon's average illumination time, or the illumination time table. If using the guidance/IFTU phases, this illumination capability drives when an implicit or explicit missile goes semi-active.

如果要发射需要目标无线照射才能成功拦截目标的武器，必须设置灵活的SAM以允许这种无线照射。必须用大于零的平均无线照射器数量来定义SAM，以允许发射需要无线照射的武器。这将根据武器的平均无线照射时间或无线照射时间表自动设置SAM照亮目标的能力调度。如果使用制导/IFTU阶段，当隐式或显式导弹进入半主动状态时，这种无线照射能力就会驱动。

Other weapon types should not be used with this ruleset; however, the ruleset will ignore most other types. SAM Launchers can be used with the Flexible SAM to perform actual weapon launch. The Flexible SAM must be specified as the commander of the SAM Launcher. The SAM Launcher uses the same weapon types as the Flexible SAM. A communications link with command only is required between each Flexible SAM and SAM Launcher.

其他武器类型不应与此规则集一起使用；但是，此规则集将忽略大多数其他类型。SAM发射器可与灵活的SAM一起使用，以执行实际的武器发射。柔性SAM必须指定为SAM发射器的指挥官。SAM发射器使用与柔性SAM相同的武器类型。每个柔性SAM和SAM发射器之间只需要一个带命令的通信链路。

Any of the sensor types that detect threats of interest, ABTs and TMs, can be used with the weapons on a system using the Flexible SAM ruleset. An independent search sensor can be placed on the system and used for both detection of threats and tracking through intercept. A dependent search sensor can only be used to represent a system requiring an acquisition sensor to cue the fire control or tracking radar. Finally, a combination of independent and dependent search sensors can be used to represent various search volumes and tracking volumes, respectively. This capability allows representation of multi-functional radar capabilities, such as found in the Patriot radar. The sensors on the SAM system will be required to provide a DFD rating greater than the minimum engagement DFD of the weapons on the platform.

任何探测感兴趣威胁的传感器类型，ABT和TMs，都可以与使用灵活SAM规则集的系统上的武器一起使用。系统上可以放置一个独立的搜索传感器，用于检测威胁和通过拦截进行跟踪。从属搜索传感器只能用于表示需要采集传感器提示火控或跟踪雷达的系统。最后，可以使用独立和依赖搜索传感器的组合来分别表示各种搜索量和跟踪量。这种能力可以表示多功能雷达的能力，例如爱国者雷达。SAM系统上的传感器需要提供大于平台上武器最小交战DFD的DFD等级。

The Flexible SAM has a designed feature for a case where no weapons are specified. The ruleset will continue to operate in the target-select phase through the threat-assessment logic. With the track-reporting capabilities available with this ruleset, this feature allows the modeling of a sensor-processing node with missile prediction capability; however, the sensor must be on the platform to be able to predict the impact and launch points. An alternative to specifying no weapons is to give the ruleset zero maximum simultaneous engagements and an NLOS weapon. This allows the sensor to be remoted and the prediction process to be used on other than locally tracked objects.

灵活的SAM有一个专为没有指定武器的情况设计的功能。规则集将通过威胁评估逻辑在目标选择阶段继续运行。利用此规则集提供的跟踪报告功能，此功能允许对具有导弹预测功能的传感器处理节点进行建模；但是，传感器必须位于平台上，才能预测撞击点和发射点。不指定武器的另一种选择是，给规则集零最大同时交战和非直瞄武器。这使得传感器可以被远程控制，并且预测过程可以用于本地跟踪对象以外的对象。

This ruleset is capable of generating and receiving messages. A communications device is necessary if imperfect connectivity is to be evaluated.

此规则集能够生成和接收消息。如果要评估不完美的连接性，通信设备是必要的。

## 4.7.1.5 Flexible SAM Network Recommendations

4.7.1.5灵活SAM网络建议

The ability of the Flexible SAM ruleset to operate in various configurations is limited by the platforms with which the ruleset can communicate. Unless it is in an autonomous mode, communications with the platform's commander should be set up across a command-capable net. This commander should have a Flexible Commander ruleset. This net can be any of the network types. If an N-to-N net or N\_Broadcast net is chosen, the commander should have the option to report engagements to subordinates selected. Without this option selected, the coordination will be diminished between fire units if all of the commander's subordinates are placed on the net. Without this option selected, the commander will not forward engagement reports and status reports to the other FUs if they are generated by one of his subordinates. He will be required to deconflict a potential multitude of dual engagements. Links carrying track data can be utilized as desired to provide the air picture.

灵活的SAM规则集在各种配置中运行的能力受到规则集可以与之通信的平台的限制。除非处于自主模式，否则应通过具有指挥能力的网络建立与平台指挥官的通信。这个指挥官应该有一个灵活的指挥官规则集。此网络可以是任何网络类型。如果选择了N对N网络或N广播网络，指挥官应该可以选择向选择的下属报告交战情况。如果不选择此选项，则如果指挥官的所有下属都在网络上，则火力单位之间的协调将减少。如果未选择此选项，则指挥官不会将交战报告和状态报告转发给其他FUs（如果这些报告是由其下属之一生成的）。他将被要求消除潜在的多重双重交战冲突。承载轨道数据的链路可以根据需要被利用来提供空中图像。

If the Flexible SAM is commanding SAM Launchers, a command-capable link is required from the Flexible SAM to the SAM Launcher.

如果柔性SAM正在指挥SAM发射器，则需要从柔性SAM到SAM发射器的具有命令功能的链接。

If the Flexible SAM is to be supported by an engagement supporter, then a two-way network link needs to be established between the SAM and each Flexible SAM or Commander on its Engagement Supporter list. The network needs to pass both command and track information. The network link can be a single multi-participant network between the SAM and its supporters, or individual duplex links could be used. If the engagement supporters are able to command launches from Flexible SAMs that are not their subordinates, then separate networks need to be established between the Flexible SAMs and their commanders. These should be duplex links to ensure that the engagement reporting is correctly passed around.

如果灵活SAM由交战支持者支持，则需要在SAM与其交战支持者列表上的每个灵活SAM或指挥官之间建立双向网络链接。网络需要传递指挥和跟踪信息。网络链路可以是SAM及其支持者之间的单个多参与者网络，也可以使用单个双工链路。如果交战支持方能够指挥非其下属的灵活防空导弹发射，则需要在灵活防空导弹及其指挥官之间建立单独的网络。这些链路应为双工链路，以确保正确传递交战报告。

All Flexible SAM and Flexible Commander engagement supporters to a SAM site must also be interconnected with the ability to pass command and track information. This network is necessary to allow a handover of engagement support if track is lost by the current supporter.

所有到SAM站点的灵活SAM和灵活指挥官参与支持者也必须与传递指挥和跟踪信息的能力互连。如果当前支持者失去跟踪，则该网络是允许交战支持移交的必要条件。