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 灵活的可持续管理参与协调工作

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SAM规则集具有捕捉分布式平台效果的能力，这些平台可以与定义组内的任何其他平台进行参与、提供跟踪支援、提供无线照射支援和提供拦截器IFTU通信。交战协调包括灵活SAM规则集的武器选择能力、灵活SAM发射原则以及灵活SAM与定义在协调平台组（CPG）内的其他平台进行对等交战解除冲突。

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.

灵活SAM规则集还可以通过定义一个自动交战协调小组，在不同层级的成员之间进行交战协调。虽然自动交战协调小组成员之间不会为防止双重交战而发生冲突，但可以利用其他成员的交战情况来调整交战的SAM所选择的射击原则。下面将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 灵活的SAM对等解冲突

##### 4.7.1.2.2.1.1 Flexible SAM Engagement Support

4.7.1.2.2.1.1 灵活的可持续农业管理参与支持。

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作战需要以下一种或多种支持功能：跟踪支持、无线照射支持和拦截器IFTU通信支持。如下文所述，对提供这些交战支援功能的候选平台进行了独立评估和确定。

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针对该目标上有本地轨道，则优先考虑由该发射平台提供轨道、无线照射和拦截器IFTU通信支持。如果发射平台不能提供所有所需的支援功能，则评估该平台的 "交战支援者名单"，以寻找能够提供所需支援功能的平台。如果在对发射平台的参与支持者名单上的平台进行评估后，所需的支持功能仍未得到满足，则将对在目标上报告轨道的其他CPG平台进行评估，以找到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.

如果经过对发射平台、参与支持者、CPG轨迹报告平台的评价，所需的支持功能仍不满足，则推迟参战。

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.

关于在确定轨道、无线照射和拦截器IFTU通信支持平台时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平台将同时查询外部交战支援者和其他CPG平台的交战支援、无线照射支援和通信支援。在EADSIM 7.00版之前，灵活指挥官规则集具有提供交战支援的能力，其中包括无线照射支援。但是，交战支援和无线照射支援不能分别分配给不同的平台。现在，灵活的SAM具有一定的交战支援和选择外部通信提供者的能力。

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Flexible SAM和作为外部交战支援器使用的Flexible Commander（灵活指挥官）都可以提供交战支援、无线照射支援或两者。对于默认情况下，通过等级制度以外的方法选择武器的交战支援，无线照射支援与交战支援是一样的。

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.

无线照射支援的任务分配和确认与交战支援相同。在选择武器时，将选择一个交战支援和无线照射支援平台。交战支援和无线照射支援的任务指令将被发送到指定的平台，发起交战的灵活SAM将等待确认。

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，SAM在锁定时才向外部交战支援者分配任务。由于CPG成员将使用等待延迟，使他们能够尽早规划和同级单位解除交战冲突，因此，在解除交战冲突之前，不会向战斗和无线照射支持者分配任务。这种冲突解除发生在用户指定的解除冲突时间。为了保证时间线的正常运行，解除冲突的时间被加到发射阶段开始时间上；因此，从交战决定到拦截器离开的最短时间是发射阶段开始时间加上解除冲突的时间。这样可以防止SAM在协调平台组的其他平台有机会提供交战信息之前进入发射。如果发生时间差异，SAM到达发射阶段而不向支援者分派任务，则可利用待命周期使发射阶段滑行等待。

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。为了代码的清晰和易于维护，两个规则集都访问相同的例程来检查约束条件和确认支持请求。如果支持平台不能阻断所需资源，将向分配的SAM发回一个CANTCO。如果资源可用，将发送WILCO。

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.

在收到分配SAM的确认时，将发生支援平台的锁定动作。C2\_LOCK\_IFTU命令是现有的以图形方式显示交战支援的命令。另外一个无线照射平台的命令C2\_LOCK\_ILLUM将显示交战的无线照射平台。此时SAM将可以继续发射。

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.

标准的交战支援能力利用交战支援响应时间。在SAM向其支援平台发送命令后，它将在中止交战前等待这个时间的响应。这可以防止SAM在交战中因为依赖一个已经被销毁的支援者而被卡死。CPG功能也利用这个超时时间来防止同样的情况；但是，由于CPG网络的高带宽，假定活动的支援者平台会立即作出响应。

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

每当一个交战完成或中止时，交战支持方和无线照射支持方都会收到一个交战完成的消息，表示交战已经终止，不再需要资源。支持平台将相应调整其资源

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.

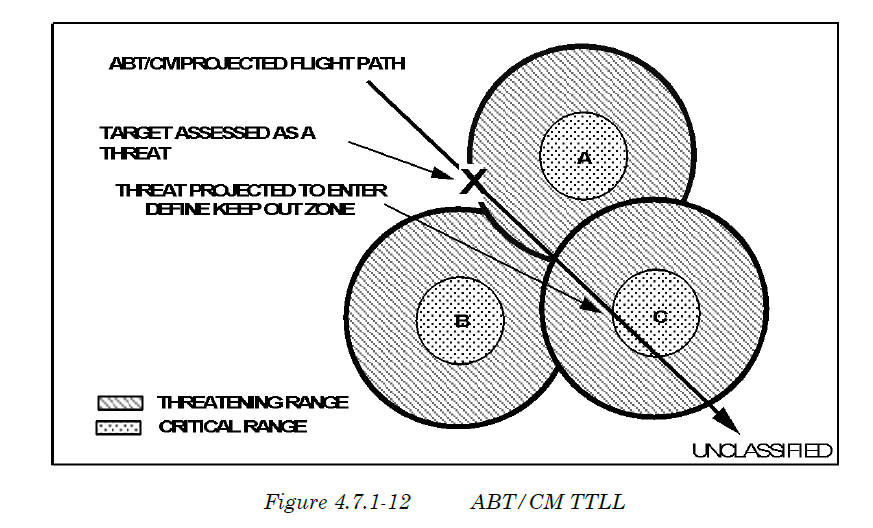
交战的通信提供者可以是一个独立于发射平台、交战支持者和无线照射提供者的平台。虽然将进行地形检查以核实通信提供者在导弹飞出的规定时间段内有视线，但不会向通信提供者发出明确的任务。在完成交战后，需要提供通信提供商的活动状态，才能使交战成功。目前，通信提供者不能给出用于交战的图形指示。

##### 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）。对发射平台上的每件武器进行单独评估，以确定对来袭威胁的最早有效拦截。一旦确定了这个最早的有效拦截，就会计算出该武器的TTLL。这一过程同样适用于发射平台上的每件武器。计算出的 "首次发射时间"（TTFL）和"最后发射时间"（TTLL）将被存储在每个武器上。如果使用FIRE控制台进行操作，操作员可以使用单个武器解决方案的数据来手动选择在交战中使用的武器。在计算了单个武器的TTLL后，最后的单个武器TTLL被认为是平台上所有武器的TTLL。这个总体TTLL值将包括在所选武器的交战报告中，并将用于交战解除冲突。



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.

单件武器的TTLL是根据感知的威胁类型计算的。对于TBM，TTLL的计算依据是导弹弹道的最后发射机会。如果威胁的预测飞行路径进入用户定义的临界下射程，单个武器的TTLL就会被计算出来，以便按等级选择武器。评估威胁的预测飞行路径，以确定最早进入临界下坠范围的防御资产。对于ABTCM交战，使用ABTCM预测的飞行路径来确定与被防卫资产临界下射程的交点，采用最接近点法。在计算武器的TTLL时，使用产生与临界下射程相交的最早接近点的被防卫资产。

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.

一旦发现这一受威胁的资产，就计算出一个拦截点，该威胁与被防御资产的临界下射程相交。如果计算出的临界下射程拦截点有效，则从临界下射程拦截时间中减去武器的飞行时间和姿态时间，计算出武器的TTLL。如果计算出的临界下射程拦截点无效，则从临界下射程开始，每隔一秒对威胁的预测位置进行反推，计算出额外的拦截点。

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.

在回传过程中，如果计算出的有效拦截点晚于该武器当前最早的拦截解，则从最新的有效拦截时间中减去武器飞出时间和姿态时间，计算出该武器的TTLL。在后面的传播过程中，如果没有发现比当前最早拦截时间晚的有效拦截，则从单个武器的当前最早拦截时间中减去武器飞出时间和姿态时间，计算出该武器的TTLL。

##### 4.7.1.2.2.1.3 Flexible SAM Engagement Report

4.7.1.2.2.1.3 灵活的SAM交战报告

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.

对于在灵活的SAM规则集下运作的平台的每一次计划的交战，都会创建一份交战报告。这是一个指挥信息，将传送给所有有指挥或综合网络连接的平台。交战报告包含有关计划交战的所有相关信息。该报告是协调平台组(CPG)内进行同级冲突消除的机制。

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.

交战报告和交战状态信息有一个与之相关的状态行动，并在交战进展到每个新行动时发送。交战报告可以有 "武器分配"、"跟踪/锁定/准备发射 "或 "发射/导弹飞行 "等操作。交战完成消息可以有“有效/目标被摧毁”、“无效或交战中断”。如果选择了信息传输提前分配选项，一旦找到拦截方案，即使计划的发射时间在未来，也可以在威胁上报告武器分配的早期交战信息。如果SAM处于半自动模式，并且选择了 "一旦授权就传送指定 "选项，则提前报告将被延迟，直到操作者授权SAM进行交战。对于带有机载武器的灵活SAM，当SAM锁定目标并安排发射时，将报告“跟踪/锁定/准备发射”。当发射发生时，报告 "发射/导弹飞行中"。如果是发射一枚炮弹，则报告每枚拦截弹的发射/导弹飞行中情况。如果SAM有远程发射器，且未选择执行早期交战报告选项，则在选择发射器并安排SAM的发射阶段时报告 "Weapon Assigned"。对于这两种情况，如果SAM处于半自动模式，则在发现拦截方案时报告武器已分配。进一步的状态报告将被推迟，直到交战得到授权并进一步进展。当战斗指令分配到发射器时，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/导弹在飞行中，并对炮弹中的每个拦截器单独报告发射/导弹在飞行中。成功交战的交战完成信息报告为有效/目标被摧毁，而不成功的交战则报告为无效。如果在发送初始交战报告后，交战因任何原因而中断，则会发送状态为 "交战中断 "的交战完成消息。当在拦截评估时，SAM发现目标被另一个平台击杀时，该状态被设置为 "交战中断"。当一个轨道上失去了战斗空间，而该轨道上已发送了 "已分配武器 "的交战状态，但该轨道从未交战时，也将发送状态为 "交战中断 "的交战完成消息。

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行动发生时发送一次，也可以定期发送。有一个选项可以按用户指定的更新速度定期发送交战状态信息。如果选择了这个选项，灵活的SAM就会向所有的平台节点发送交战报告和完整的消息，而不是仅仅向指挥官发送。消息的周期可指定为更新次数与更新速率的表格。例如，用户可以以6秒的速度发送两次交战状态的初始传输，然后以30秒的速度继续发送额外的传输。无论指定的更新次数是多少，表中的最后一个条目都将用于其余的更新。状态消息的发布和传输，在平台选择目标进行交战时开始，并一直持续到目标上的交战中断或信号丢失，但交战状态为交战中断的消息除外。交战中断消息仅针对表格第一行中指定的更新次数发送。对于状态为 "无效 "的交战报告，如果报告者无法重新加入战斗，用户可以选择在 "无效 "消息之后立即发送状态为 "交战中断 "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所规划的全部交战报告进行比较。同行解除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，定义标准的应用顺序，并指定任何适用的阈值以评估下一个标准。交战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.

如果确定交战报告中的信息优于自有交战，则将自有任务标记为交战；在通知交战已完成或以其他方式中止交战之前，不得对该任务进行进一步评估。收到完整报告后，该轨道将接受本地平台关于未来目标的选择调度。

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。每个平台针对每个威胁储存了整个CPG的最佳TTLL。每个平台利用这一TTLL信息来评估最后发射情况。

##### 4.7.1.2.2.1.4 Flexible SAM Engagement Deconfliction

4.7.1.2.2.1.4 灵活的SAM参与消除冲突

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规则集的解除冲突功能，允许用户定义要解除冲突的平台组。该功能可用于在用户定义为同一组的所有平台上解除冲突。此外，用户还可以定义一个TTLL阈值，如果计划中的交战启动时间被确定在这个时间内，则允许暂停解除冲突。这种解冲突功能将解冲突权限交给第一个具有TTLL覆盖的交战者。解除冲突有几个额外的选项，可通过不同的解除冲突标准进行交战选择。

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用来进行交战消除冲突的机制是交战报告。在收到任何一个灵活SAM平台的交战报告后，报告中包含的交战信息就会被储存起来；因此，每个灵活的SAM都会获得一份完整的清单，列出所有可以与特定威胁交战的平台的信息。最早信息的规划时间也会被存储。对于还没有针对特定威胁规划交战的灵活SAM来说，收到交战报告也是一个触发器，可以在目标选择阶段的下一次执行中规划和报告交战，即使规划的发射时间不在用户输入的Wait Delay定义的提前通知标准之内。

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.

用户可以通过界定“可选择的标准”来调整进行这种比较的原则。用户可以定义一个标准的层次，与武器选择所描述的基本相同，对每个标准进行评估，并与定义的阈值进行比较，以确定哪个平台根据这些选定的标准具有最佳射击机会。每一个参与交战协调的平台都将对其他一些平台是否最适合出手，或者自己的交战机会是否最好进行独立评估。对谁拥有最佳出手机会的判断是在解除冲突时间相对于存储的最早规划时间过去后，在每个平台的目标选择阶段的第一次执行中进行的。鉴于这种方法，不必设置等待延迟来保证解冲突发生的时间。解冲突时间需要设置为一个值，以保证CPG所有成员下一次执行“目标选择阶段”程序，可以在解冲突时间到期之前执行。例如，如果目标重新选择时间为两秒，那么解除冲突时间需要至少为两秒。

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.

如果选定的射击被打中，选定的平台就会确定在CPG内是否存在另一个射击机会。这是通过比较计算出的拦截时间加杀伤评估延迟与每个交战报告中包含的TTLL来实现的。如果任何协调平台的TTLL大于选定的交战拦截时间加杀伤评估时间，则假定至少存在一次额外的射击机会。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进行武器选择的标准等级重复进行解除冲突过程。这样，用户就可以对射击机会采用不同的消除冲突原则，以节省时间，并有可能获得一次额外的射击机会。

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.

如果根据自己的解除冲突评估，确定另一个平台最合适，则放弃自己的参与；并将威胁标记为已经被考虑。所有不参加交战的协调平台将暂停自己任务轨道上的交战任务，直到收到交战方通知交战完成。在收到该通知后，该轨道将可进行交战处理，所有有出手机会的协调平台将重复进行解除交战处理。

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)

需要注意的是，当发生以下任何一个事件时，交战平台将生成交战完成报告。

1. 完成杀伤评估
2. 发射失败（可靠性故障）
3. 飞行失败（可靠性故障）。

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.

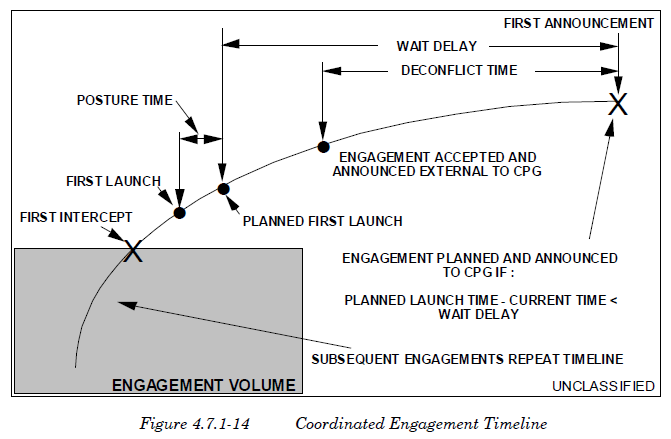
此外，上述解除冲突的前提是，每个协调平台都将按照相同的消除冲突标准等级运作。如果它们不是在同一标准下运作，则可能会出现针对同一威胁的多次同时行动。

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.

考虑到这一实施办法，可以使用较短的 "等待延迟 "输入。Wait Delay输入将迫使所有的SAM在需要作出第一次可能的交战决定之前的几秒钟内，在Wait Delay内评估和报告他们对特定目标的射击计划。这种方法将使解除冲突过程可靠地运行，同时使资源不至于被长时间封锁。目前的算法会封锁所有SAM对威胁进行射击的资源，将对其他威胁的射击推到未来。更快地决定由谁来射击，清理了交战渠道，使SAM能够更快地与其他威胁交战。

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.

所有平台都将监测交战轨道，以寻找到最后一次发射的时间。用户可以选择指定在最后一次发射机会时切换到最高Pk原则。每个平台将评估当前与威胁交战的平台，以确定该平台是否是具有最高Pk的平台。如果一个平台在达到TTLL阈值时正在交战，而这个平台确定它没有最高Pk武器，它将放弃对威胁的交战。拥有最高Pk武器的平台也将进行最后一次发射评估，并启动其对威胁的交战。如果已经与目标交战的平台拥有最高的Pk武器，它将恢复到火力制定阶段，以确定它应该发射多少发炮弹。



#### 4.7.1.2.2.2 SAM Command Chain Automated Engagement Coordination

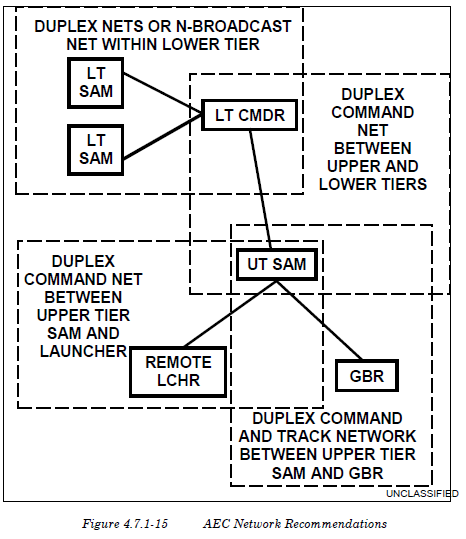
4.7.1.2.2.2 SAM指挥系统自动参与协调。

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，一个SAM指挥系统的成员可能希望与另一个指挥系统的成员协调。高层SAM指挥链在针对机动导弹威胁作出交战决定时，可与其他高层SAM指挥链或低层SAM指挥链进行协调。各指挥系统不一定要解除其联合交战的冲突，但如果知道另一个系统也在交战，它们可以调整其火力。这种协调可以通过与自动交战协调组（AEC）的联系来建立。AEC组应包含上层灵活SAM平台和下层灵活SAM的指挥官。图4.7.1-15说明了采用自动交战协调时建议的网络配置。

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。指挥员将在其指挥网上转发信息。灵活指挥官还可以选择将一个SAM的交战信息转发给指挥官的其他下属SAM。当SAM在NBroadcast网上与指挥官联网时，就会使用这个选项。其他SAM不会自动收到交战SAM的报告。图4.7.1-15说明了采用战场协调时的建议网络配置。



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系统内的层级协调功能还有额外的功能，使用户能够在多个防御层级之间协调交战并交换交战信息。协调的级别和发生协调的理论由用户选择，并根据所部署的SAM系统的类型(上层、下层、上下层、缺省)而有所不同。鉴于此，下面详细讨论协调和协调参数，分为三部分：协调信息的传输、上层对该信息的使用、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.

具体的层级报告信息和对该信息的处理构成了战场上各系统之间射击选择的部分依据。层级报告信息不影响是否进行交战，也不影响交战的时间。相反，层级报告信息提供了其他系统在受到威胁时交战能力的细节。这种关于其他系统对特定威胁的交战能力的信息被用来改变对任何特定交战机会的射击次数。

##### 4.7.1.2.2.2.1 Tier Report Message Transmission

4.7.1.2.2.1 层级报告信息传输

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.

层级报告消息由AEC组成员用于报告其对特定目标轨道的支持状况。消息中发送了一个协调说明，以表明该消息是宣布参战的意图、获得支持的需求、还是支持的可用性。作为AEC组成员的上层SAM首先报告是否打算与某一轨道对象交战。如果该轨道的对象不构成威胁，不存在战斗空间，或者对于上层SAM本身处于半自动的情况，如果轨道没有得到授权，SAM就会在所有的网络上发送一个带有Do Not Intend to Engage（不准备参战）说明的层级报告。如果该轨道具有威胁性，有战斗空间，并已获得授权，则SAM会在所有网络上发送 "打算参战 "的报告。经人工授权的非威胁性航迹也将被报告为 "打算参战"。

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，它就会评估其射击准则，以确定是否选择UT1与UT2 PK规范标准。如果使用UT1与UT2准则，并且它是AEC组中第一个与目标交战的上层成员，则上层SAM向AEC组中的其他上层成员发送一个带有Support Expected "期望获得支持 "说明的层级报告。当上层SAM收到Support Expected（"期望获得支持 "）报告并选择了Process Upper Tier Reports（向上层报告）选项时，SAM会检查其战斗空间，而不考虑轨道限制，如果能够在报告的SAM之后进行交战，则以可用的支持进行回报。如果SAM在报告的SAM之后无法参与，则不会发送消息。如果上层SAM在发射前没有收到上层SAM的可用支持，则将当前SAM设置为UT1，不支持UT2。如果不使用UT1与UT2的标准，那么Intend to Engage报告可以被其他上层系统用来调整其火力理论。

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协调，一旦确定上级SAM确实打算参与，它就会评估该威胁是否会影响到与AEC组下级成员有关的TMDA。脚本TMDA可由用户创建，并与下级指挥官和/或其下属相关联。动态TMDA可通过接收来自下级指挥官的防区信息来创建。如果威胁影响到下级防御区，上级SAM就会向“预测该TMDA影响包含到”的下级SAM的指挥官发送报告，并采取预期支持或不预期支持的行动。如果目标类型仅由上层协调参数中指定的上层参与，则发送行动为 "预期不能支持"。如果SAM先前已收到来自下层指挥官的协调消息，表明针对该目标无法获得支持，则将行动设置为 "预期不能支持"。否则，SAM将发送一条行动为 "预期支持 "的消息。当发送了预期支持消息后，上层SAM期望收到来自接收方指挥官的响应。响应的行动可能是 "可提供支持 "或 "不可提供支持"，上层SAM可利用该响应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.

层级报告信息会在最多可重传次数限制下被不断传送，直到收到响应。用户可以指定报文的重传次数和频率。这些值是根据这是一个“响应消息”，还是一个“原始消息”，以“是否需要响应”来定义的。在所有网络上发送的原始消息会根据Response Not Required（未收到回应）的值进行重传。向特定平台发送的原始消息会使用 " Response Required "（需要响应）输入的值进行重传。响应消息使用响应指定的值进行重传。响应消息只能从外部控制的平台接收。如果场景中没有任何平台，建议将Response Required Max Transmits（最多可重传次数）设置为0。

##### 4.7.1.2.2.2.2 Upper Tier Automated Engagement Coordination

4.7.1.2.2.2.2 上层自动参与协调机制

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，需要其他层级的支持，以确定总体射击任务制定系统（overall firing doctrine）的有效性。"上层 "的SAM可以针对全部任务轨道，逐个评估支持的可用性，或者用户可以选择让SAM跨TBM轨道组执行AEC。使用该选项时，可使一个轨道组内的所有轨道，在该轨道组的任何一个成员都可获得支持时，被视为具有支持能力。当选择跨轨道组执行 AEC 的选项时，本地和远程轨道组都有资格在参与协调中使用。对于与下级系统的协调，需要的信息是下级系统是否可以与威胁交战，如果可以，"上层 "的SAM将检查下级系统的武器库存状况。

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.

用户有两种选择来获取这些信息：上层自行决定下层是否可以提供支持，或者等待下层报告信息。如果用户选择了上层独立评估的选项，用户可以选择下层被认为可以提供支持的标准。可选择的选项有：下层仍存活，威胁影响到相关的TMDA，威胁在下层传感器视野内，以及下层有武器。根据选定的标准，进行评估并确定下层的交战支持。通过检索AEC组内所有低层SAM的未分配武器数量，并将该数量与用户定义的低库存阈值进行比较，确定低层武器库存状态。对于按轨道组进行的评估，如果被评估轨道的轨道组的所有成员被认为能够在被评估的轨道上提供支持，则该轨道组的所有成员将被评估为具有 "可用支持"。但是，在对每条轨道进行交战评价时，将对低级武器库存进行单独评价。

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.

如果用户选择由下层报告武器可用性的选项，则SAM使用层级报告信息中收到支持可用性状态报告来确定其射击原则。在上层SAM进行射击原则决策时，如果没有收到下层的层级报告消息，用户可以选择上层的假设条件，包括“下层的武器库存状态高”、 “武器库存低”或“下层不可用”。在按轨道组进行评估时，如果收到了关于某个轨道组成员的层级报告，且说明为 "支持可用"，那么该轨道组的所有成员都将被定性为具有支持可用状态。使用此评估方法时，该轨道组成员的武器库存将被设置为低武器库存，除非该特定轨道的上层SAM收到武器库存设置为高的层级报告消息。

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.

关于与其他上层系统的上层协调，可根据另一个上层SAM是否报告说打算与目标交战以及该SAM的潜在库存状况来确定系统的有效性。如果从AEC组的上层成员那里收到了带有 "打算参与 "行动的层级报告，则认为可以获得上层支持。用户有两种选择来获取支持的上层SAM的库存状态：上层SAM自己确定支持SAM的库存状态，或者使用层级报告中收到的状态。如果所有上层成员都报告了Do Not Intend to Engage，那么上层就被认为是不可用的支持状态。当使用UT1与UT2 PK规范标准时，如果从AEC组的上层成员收到了动作为Support Available的层级报告，则UT2支持可用。如果从AEC组的上层成员那里收到了行动为 "Support Not Available "的层级报告，则UT2支持不可用。如果选择了轨道组协调选项，并且收到了来自另一个上层SAM的报告，并打算参与或获得可用的支持，则轨道组的所有其他成员将被评价为获得了上层支持。

##### 4.7.1.2.2.2.3 Lower Tier Automated Engagement Coordination

4.7.1.2.2.2.3 较低层级的自动参与协调。

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.

对于被定义为下层的SAM，它们是否能够提供交战支持的方法与上层SAM的方法基本相同。用户可以规定，如果威胁影响到其TMDA，而且威胁在其传感器的视野范围内，则低层系统可以提供支持。然而，确定它们的支持可用性和报告该可用性状态是由它们的指挥官执行的，而不是由低层SAM本身执行的。在确定可用时，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，以确定武器库存将被报告为高或低。

##### 4.7.1.2.2.2.4 Deconfliction Among Tiers

4.7.1.2.2.2.4 各层之间的冲突消除

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.

层级也可以通过组ID来定义。在作出交战决定时，会使用这些ID。如果来自一个组（层）的SAM报告威胁的交战，该组（层）中的另一个SAM将不会对威胁进行射击，除非它在用户指定的TTLL阈值内。其他组的SAM可以参与。这使得下层可以查看上层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.

当在指挥系统中使用灵活SAM时，指挥官要与其他指挥系统或战场进行报告协调，以消除冲突。灵活SAM将所有交战信息报告给其指挥官。指挥员将在其指挥网上转发信息。通常情况下，信息不会在接收信息的同一网络上转发。当所有下属的SAM与指挥官在一个NBroadcast网上联网时，会使SAM无法了解其他SAM的交战情况。为了解决这个问题，灵活指挥官可以选择将一个SAM的交战信息转发给其他下属的SAM。这将允许在所有网络上转发交战报告，包括最初传送报告的网络。

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)中利用对等解冲突自主运作时，则使用不同的战场协调机制。必须首先在协调平台组内解除交战，然后将由此产生的交战报告发送给其他战场。

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.

**在使用带有灵活SAM的指挥官时，早期解除冲突的机制是等待延迟。等待延时使SAM能够尽早的宣布其与目标交战的意图。指挥员收到下属SAM的所有报告，选择一个SAM进行交战，向其他SAM发送停止指令，并将交战报告转发到其所有指挥网。**

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.

等待延迟被用来给CPG处理留出一个解除冲突的时间线；注意，等待延迟应该设置得大一些，以便让CPG成员在平台知道可以与目标交战时，能尽快分享规划信息。

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.

当早期交战报告被发送时，它将不再只发送给指挥官；它将被报告给所有SAM的指挥网络。交战报告将被标记为not\_deconflicted。

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成员收到一个未解除冲突的参与报告，且该报告来自其CPG组成员时，CPG平台将对该报告应用自己的解构逻辑。如果报告平台是参与目标的最佳平台，解除冲突平台将停止行动。

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.

用户指定的解冲突时间可以进行第二次参与报告，这次宣布报告是为了在同行之间解除冲突。这个解冲突报告表示报告平台发送了早期的交战报告，与其他CPG平台的报告进行了协调，并被选为参与目标的平台。

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.

当其他战场的SAM和指挥官收到解除冲突的报告时，他们可以利用该报告协调自己的交战。当其他战场的SAM和指挥官收到非冲突报告时，这些报告将不被处理。灵活指挥官的解除冲突处理会用解除冲突标志来标记其解除冲突结果，表示其转发的交战报告也可以被其他战场使用。这使CPG和指挥系统能够协调交战，利用消除冲突的名称来确定应处理哪些报告。

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.

在使用等待延迟来宣布早期交战时，灵活的SAM将建立发射记录并标记其跟踪档案，以表明其对目标的交战。如果该交战随后被取消，灵活的SAM将发送交战完成报告，以表明它已完成交战，现在可以由其他人跟目标进行战斗。

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.

在灵活的SAM收到来自“被SAM记录和目标交战平台”的交战完成报告时，SAM将清除其跟踪参与记录，以便让该SAM现在有资格和目标交战。

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平台在收到另一平台的完成报告后，仍有资格参与目标，则随着CPG平台之间的冲突解除，将重新开始早期参与报告和解除冲突流程。

#### 4.7.1.2.2.3 The Launch Queue

4.7.1.2.2.3 发射队列

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.

对于每一对武器-目标，对目标进行的每一次射击都会创建一个发射记录。创建发射记录的时间被指定为发射记录进入发射队列的时间。在确定调度延迟时，将发射记录中进入发射队列的时间与发射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下一次执行目标选择阶段中重新评估优先级，则对发射记录进行有限处理。该发射记录被标记为不被安排，并暂时放在队列中。此记录用于姿势计时计算。在完成所有评估之前，不会对该记录进行进一步处理。任何标记为不安排的发射记录将在阶段处理结束时删除。

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.

**在创建了武器目标对的发射记录后，灵活SAM立即进入对目标的交战和锁定模式。如果交战是指挥任务的结果，则向指挥官发送WILCO确认；否则，将生成交战报告，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.

该轨道被标记为交战，并在轨道文件中增加对该目标的射击次数。然后将这一数字与所选武器的射击准则进行比较，以锁定目标。如果已经安排了必要的射击次数，则该轨迹被标记为已安排了最大的射击次数。在当前针对该轨道的预定发射完成之前，不会再次评估该轨道。

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.

如果射击理论规定应对目标进行更多的射击，则会创建一个新的威胁记录。然后，在当前的威胁清单中对该记录进行优先排序。附录B4讨论了优先顺序安排。

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.

对于每个创建的发射记录，发射调度程序评估何时将安排发射。如果没有安排发射，将计算当前发射的延迟，并安排发射。如果有其他发射，则计算当前发射的预计发射时间，发射将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.

随着早期交战通知的采用，灵活SAM系统得到了升级，以监测待发射状态。对待发射状态的监测是为了防止在提前交战通知到实际拦截器发射这段时间内，对优先级下降或变得不具威胁性的目标进行发射。轨道文件中轨道的优先级保持在该SAM系统能够支持的空中同时拦截器的最大数量。如果已作出交战决定，如果目标在拦截器升空前不在优先名单上，这一过程将停止拦截器的发射。

#### 4.7.1.2.2.4 Launch Preemption

4.7.1.2.2.4 发射优先权

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，一旦计划好了拦截（即满足了所有交战限制条件），它们就会被固定下来，不会从发射队列中删除。唯一的例外是存在高优先级（特别关键）目标（在附录B4.0中描述）。列入这些目标类型是为了反映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.

如果存在高度优先目标，而传感器资源的可用性（附录B5所述）不允许规划额外的拦截，则将进行先发制人的发射。先发制人发射的程序确定哪些发射在高优先目标需要支持的情景区间内消耗传感器资源，然后先发制人一次或多次发射，以释放足够的传感器资源支持高优先级交战。

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.

由于只有在传感器资源可用性不足以规划后续发射的情况下才会发生发射先发制人，因此，只有在与第4.11小节所述的系统限制型复合传感器一起使用时，或为灵活SAM设置了平均无线照射器数量时，才会调用发射先发制人功能。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.

一旦确定必须进行先发制人的发射以支持高优先级的活动，就必须决定哪些发射必须取消，以便为新的活动腾出空间。此过程使用上述威胁评估逻辑来确定所有候选优先发射的总体排名（优先级）。候选抢占是指与高优先级交战竞争资源的发射。然后，将计算出的高优先级参与的优先级与已经在任务列表中的候选者进行比较，并选择优先级最低的候选者进行优先处理。这个过程会一直持续下去，直到释放出足够的传感器资源来适应发射，或者直到所有的在任务列表中的候选者被从考虑中移除。当被选为优先购买的发射是一次发射的一部分时，该次发射的所有炮弹将被移除。对所有可用的武器进行评估，以确定是否存在不需要抢先发射的武器。

#### 4.7.1.2.2.5 SAM Weapon Performance in HOJ

4.7.1.2.2.5 SAM武器在HOJ的性能

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来对付系统中的噪音干扰。对于某些系统来说，其中一种选择是发射一种设计成以干扰源为原点的导弹，从而形成以干扰为原点（HOJ）的制导能力。HOJ有能力决定对干扰目标进行发射，可以通过单平台探测目标，也可以通过对多个信号源的三角测量，获得有关干扰源位置的额外信息。HOJ的另一种能力是，如果在导弹飞出过程中引入了干扰，则可将飞行中的导弹转入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.

有若干因素导致决定向干扰威胁发射HOJ导弹。这些因素是在SAM系统上放置的具体武器上用户所选择的选项的功能。在发射HOJ导弹的情况下，有三角数据和没有三角数据的情况下，决策标准大不相同。

##### 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武器可选择在当地传感器被动探测到目标时向干扰目标发射。***干扰频闪被确认为除信号探测器外没有其他本地数据的轨道。***这一定义使数据可被确认为在本地轨道清理时间内可用，以防止因目标模型波动而造成不真实的轨道误差。

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导致宣布该目标为威胁。要被宣布为威胁，信号探测器数据的局部DFD等级必须大于或等于在没有三角数据的情况下发射HOJ武器所需的最低值。这种方法可以将无源射频传感器设置为无源探测源，从而可以规范干扰信号与背景噪声的水平，在这个水平上，SAM系统将决定发射武器。这种发射可能导致拦截点超出HOJ武器的能力。在针对干扰目标选择武器时，会绕过约束检查。对于飞出约束空间的情况，一旦拦截器达到最大运动距离，空间外方案会考察拦截器最大范围飞行，宣布拦截失败。

##### 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.

如果有三角数据，且产生的DFD等级大于或等于根据三角数据发射所需的最低限度，则可选择发射特定的SAM系统。如果有三角数据，则假定目标射程足够明确，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位置的几何形状确定的。在计算武器选择时，要考虑到所有的交战制约因素。

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.

系统允许从两个不同的线程进行三角测量。频闪灯的三角测量是带有轨迹文件的平台轨迹处理线程中的一个选项。该选项可在所有轨迹选项窗口中选择。当接收到来自两个不同来源的轨迹时，将评估轨迹之间的角距离。如果角距离大于最小三角测量阈值，则将轨道标记为已进行三角测量，并在轨道中报告两个轨道的最高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的规则集。关于角度阈值的管理参数与跟踪处理线程中使用的参数相同。情报收集和分析中心规则集允许进一步为三角信息设置新的DFD等级和情报数据级别。然后可将这一信息提供给SAM系统，无论是指挥官还是FU，以便确定交战的优先次序，并根据三角数据进行发射。

##### 4.7.1.2.2.5.3 HOJ Mode Transition in Flight

4.7.1.2.2.5.3 飞行中HOJ模式的转换

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过渡到HOJ模式。这种能力支持隐式和显式导弹弹出能力。向HOJ模式的过渡取决于拦截器的当前模式。如果拦截器工作在指令制导或半主动模式下，则在FU失去对目标的主动跟踪并检测到干扰的存在后，就会向HOJ模式过渡。对于处于主动制导模式的拦截器来说，向HOJ模式的过渡取决于正在进行隐式或显式弹出。对于隐式弹出的情况，如果目标在拦截器的HOJ频谱范围内有发射干扰器，则会启动HOJ模式。就显式弹出而言，如果目标上有频闪轨迹，HOJ 模式就会被激活。

#### 4.7.1.2.2.6 Flexible SAM CANTCO Reason Trace

4.7.1.2.2.6 灵活的SAM 无法执行原因的追踪。

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消息要么在达到某些条件时立即生成，要么在指令轨道分配的最大尝试时间到期后生成。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.

消息处理功能和威胁评估逻辑都可以立即发出CANTCO。当收到指令性任务时，如果SAM系统目前处于LASHE模式，或者如果SAM系统的跟踪文件中已经充满了指令性任务，就会产生一个CANTCO。指令性任务将替换任务列表文件中已经存在的非指令性任务的目标。每当一个轨道被确定为安全轨道或如果目标被确定为在LLTR上，威胁评估逻辑中也会立即生成一个CANTCO。关于LLTR的判定，在第4.6.5.4.3小节中进行了说明。只有当规则集在Truth模式下运行时，才会进行LLTR的确定；否则，LLTR的确定会通过程序识别来反馈总体ID的确定。

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.

一旦命令轨道分配的最大尝试时间到期，其余的CANTCO消息就会在威胁评估中产生。尝试时间的到期是每个轨道的首批检查之一。因此，记录的CANTCO的原因是SAM在上一次执行其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

由于在威胁评估过程中无法将目标称为威胁，或在武器选择过程中无法选择武器与目标交战，所以发送CANTCO消息。只有导致不宣布目标为威胁的第一种情况才会被记录下来，尽管其他原因也可能导致失败。这种方法为用户提供了SAM不能与目标交战的最直接原因。

以下是威胁评估CANTCO消息，从高到低排序。

1. 跟踪已被评估为销毁。

2. 指挥分配延迟还没有过期。

3. 轨道仍为交接轨道。

4. 轨道的时间大于清除时间，即为前任务轨道。

5. 需要本地轨制，但未建立。

6. TBM轨道无法拦截/打击的。

7. 未预测到TBM轨道的影响点。

8. 轨道优先级太低。

9. 由于INTEL信息，轨道优先级显示为不射。

10. 轨道不在相关MEZ内。

11. 轨道在相关的FEZ内。

12. ABT评估延迟没有过期

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.

任务轨道尽管通过威胁评估处理，还可能因无法选择特定武器与目标交战而推迟交战。通过“最多武器选择”逻辑的武器所导致的交战失败的原因将被记录下来。该武器将是最接近能够与目标交战的武器。

以下是因为武器选择失败而发送CANTCO信息的原因，从高到低排序：

13. 发现拦截点，但SAM已达到最大交战次数。

14. 找到了NLOS以外武器的拦截点，但目标上没有保持局部跟踪。

15.半自动武器发现拦截点，但雷达未对目标进行局部跟踪

16. 发现拦截点，但轨道DFD等级低于该武器的最低交战等级。

17. 发现拦截点，但计划中的拦截点在最大高度或范围之外。将来有可能进行拦截。

18. 发现拦截点，但计划拦截点低于最小高度或在最小范围内。

19. 发现拦截点，但计划拦截点在半主动武器所需的火控传感器的视场之外。

20.无法为该SAM上的任何武器找到拦截点。

21. 由于针对目标类型的默认 Pk 已被设置为-1，所有武器都不在此轨道上。

22. 由于武器上的 ABT/TM 开关状态问题，所有武器都不在此轨道上。

23. SAM没有具有针对该目标类型的能力的武器。

### 4.7.1.2.3 Flexible SAM Launch Phase

4.7.1.2.3 灵活的SAM发射阶段

#### 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).

发射阶段是根据队列中的发射记录进行操作的。有四种时间延迟会影响到发射的时间安排：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.

首先评估队列中所有正在滑行/等待的发射记录。对于这些记录中的每一条，利用发射阶段的平均和增量重复时间，加上发射的潜行时间，计算出发射的时间。每一条滑行/等待发射记录都会进一步受到最小发射间隔的限制，以确定应该安排发射的时间。如果发现一个滑行/等待发射记录的执行时间与平台最后一次发射时间的最小间隔时间相差不到两倍，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.

如果发射阶段没有安排任何一个处于滑行/等待状态的SAM，则对所有非滑行/等待发射的SAM进行评估。根据平均值和delta值，对第一个非滑行/等待记录进行发射阶段开始时间的评估。接下来评估基于最小发射间隔的调度时间。如果这次射击是第二次射击，则接下来检查针对目标的齐射延迟。这个延时的计算方式是将前一发对该目标的发射时间加上的齐射延时。这三个值的最大值决定了这个发射记录的发射阶段的时间安排。如果没有滑行/等待记录，发射阶段将安排在这个时间。如果有滑行记录，则将安排应该最早执行的记录进行发射。

#### 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.

发射阶段是向威胁发射拦截器所需的过程。在发射阶段进行若干评估，以确定是否继续发射。如果针对目标的跟踪时间超过了平台规定的清除时间，或者目标被确定为友军，则发射将被中止。除了NLOS武器和当交战支持者为交战提供编队中目标更新(IFTU)支持时，平台必须针对目标持有本地轨道才能发射武器。如果这些武器没有本地轨道，则将在用户指定的发射周期数内进行待命。这些周期的频率是发射阶段的重复时间。如果没有获得本地轨道，发射尝试将被中止。在当前发射的同时，对队列中的下一次发射进行评估，以便如上所述进行可能的安排。

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.

如果灵活的SAM选择发射时进行敌我识别，则将对目标进行询问。如果结果确定目标是友好的，则发射中止。

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

如果武器能够根据远程数据发射，则灵活SAM可在没有本地跟踪的情况下发射武器。在这种情况下，必须有一个灵活指挥员或另一个与SAM有关的灵活SAM作为交战支援者。一旦SAM发射武器，交战支援者可以选择负责向导弹拦截器提供IFTU。如果交战支援者具有这种能力，那么SAM可以通过向该交战支援者发送IFTU支持请求，将IFTU部分转移给交战支援者。在收到交战支持者的WILCO后，SAM就可以使用远程数据发射武器。如果它确实试图将交战权限给予交战支持者，那么SAM就会发送消息，并为这次交战重新安排其发射阶段。发射阶段将继续被重新安排，直到SAM收到来自交战支持者的确认，或者直到超过支持者响应时间。如果确认是WILCO，则发射武器。如果确认是 CANTCO，或如果超过了支援者的反应时间，则发射中止。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支援消息的处理。如果在导弹飞行过程中的任何时候，交战支援者必须退出交战，SAM可以收回交战控制权。

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LASHE交战的一部分。对于针对未识别目标的交战，用户可以指定是否应在发射前对目标进行询问。如果目标被识别为友军，则将随机抽签，判定自己是在与友军交战的概率，将这个概率与友军的攻击概率进行比较。如果抽签结果小于或等于“友军”发起攻击的概率，则发射将继续进行；否则，发射将被终止。在消除随机性的情况下，友军的轨道永远不会作为LASHE交战的一部分被交战。

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.

如果通过判定失败的约束条件组，SAM将进行发射。如果灵活SAM正在发射武器，则将对目标进行发射，并安排提供IFTU支持的平台，进入拦截阶段。灵活SAM的最后一次发射时间将被设置为当前模拟时间，用于调度延迟计算。然后对队列中的下一次发射调度进行评估。

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.

如果在拦截器的制导中使用IFTU和跟踪连续性检查，则必须为发射的武器定义Guidance/IFTU阶段。每个阶段都定义了更新率和滑行/待命时间，作为拦截时间的函数。IFTU从其拦截阶段开始就得到灵活SAM和指挥官的支持。在武器发射后，如果SAM要为交战提供IFTU支持，那么SAM的拦截阶段是根据当前IFTU阶段的更新率来安排的。如果交战支持者要提供IFTU，那么它的拦截阶段就按照这个更新时间来安排。如果没有为武器定义Guidance/IFTU阶段，则不使用IFTU和跟踪连续性，SAM的拦截阶段将被安排在计算出的拦截时间里。

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.

在安排拦截事件之前，拦截点要重新计算。之所以重新计算拦截点，是因为能够为发射阶段指定一个随机的姿态时间，而且需要准确的拦截地点信息。此外，如果交战状态是正在滑行待命的，则之前计算的拦截时间不再有效。如果武器发射导致特定武器的消耗达到需要重新装填的程度，则将安排重新装填阶段的开始时间。

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.

如果有SAM发射器正在发射武器，灵活SAM就会向SAM发射器发送分配命令。灵活SAM的最后一次发射时间设置为当前模拟时间，用于计算调度延迟，并对队列中的下一次发射进行评估调度。

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武器类型，那么就定义了这个武器是一个明确的飞行导弹平台。在发射时，导弹拦截器是由所有四个模型动态创建的，并作为一个平台进入场景。导弹平台被赋予了武器系统参数中定义的传感器、通信装置、机体、规则集和信号。导弹平台的指挥官是SAM。如果要使用显式网络，那么此时在SAM和导弹平台之间动态创建一个网络。如果交战支援者要提供IFTU，那么一旦支援者接受IFTU的责任，就与该平台建立网络。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小节解释了这个规则集。第4.13小节介绍了如何设置和使用显式弹出的导弹。

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.

在完成了发射拦截器所需的所有处理工作，并安排好拦截阶段后，将进行发射和飞行中故障的测试。对于发射可靠性故障，随机抽取一个数字，并与成功发射的概率进行比较。如果该数字大于概率阈值，则认为将发射失败。鉴于这一判定，平台认识到失败并重新安排发射所需的延迟被进一步用来迭代，重新安排交战。安排发射失败事件包括：将失败情况记录在交战日志文件中，并将失败情况通知灵活SAM。然后终止轨道的发射阶段处理。如果消除了随机性，则不会发生发射失败。

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.

在拦截阶段可能发生的飞行中故障在用户指定的清单中有记载。该清单所依据的是与拦截器发射或实际拦截事件有关的定时事件。如果已经发射，则测试每个飞行中的失败概率，以确定是否发生。当随机抽签表明某一特定事件将发生故障时，将在事件延迟确定的时间内安排故障事件，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，拦截器仍被置于空中，因为发射平台要在实际故障发生后的某个时间延迟之前才能知道这一故障。如果消除了随机性，飞行中的故障将永远不会发生。

### 4.7.1.2.4 Flexible SAM Intercept Phase

4.7.1.2.4 灵活的SAM拦截阶段

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拦截阶段用于两个独立的功能。(1) 跟踪连续性检查，发送IFTU；(2) 拦截处理。这个阶段实际上是由灵活SAM、战斗机和灵活指挥官使用的。

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SAM目标选择阶段窗口上有一个选项，使灵活SAM有能力向另一灵活SAM发射的隐式或显式导弹拦截器提供IFTU和无线照射。当灵活SAM以遥控数据发射武器时，它要求交战支援者向武器提供IFTU，使武器引导到目标位置。如果该武器具有半主动能力，即需要无线照射，那么交战支援者灵活SAM也必须具有无线照射目标的能力。这个选项说的是灵活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.

拦截阶段窗口上显示的开始和重复时间不用于本阶段的安排。如果没有为正在处理的交战中使用的武器定义Guidance/IFTU阶段，则该阶段由灵活的SAM发射阶段或SAM发射器发射阶段安排在计算的拦截时间发生。然后进行拦截处理。

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，那么这一阶段由灵活SAM或SAM发射器发射阶段安排，以执行跟踪连续性检查，并向导弹拦截器发送IFTU支持。如果交战支援者要提供IFTU，那么这个阶段由担任交战支援者的灵活SAM或指挥官安排。如果来自机外信息的IFTU要通过发射平台上报，则该阶段安排给发射平台，灵活SAM为遥控发射机的情况下下令交战。后一种情况代表在控制SAM系统保持通信，而不是从机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 跟踪连续性检查飞行中目标的更新

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.

如果在交战中使用的武器定义了Guidance/IFTU阶段，那么该阶段用于执行跟踪连续性检查，并向导弹拦截器发送飞行中目标的更新。Guidance/IFTU阶段定义了更新率、航行时间和导弹制导模式，作为拦截时间的函数。

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.

**通过跟踪连续性检查，可以确保为导弹拦截器提供制导支持的平台(SAM或交战支持者)在支持导弹制导时保持对目标的跟踪。如果跟踪丢失，导弹处于指令制导或半主动状态，那么导弹就会开始滑行巡航，以使支援平台有时间重新获得对目标的跟踪。**如果超过了当前IFTU阶段的巡航时间，如果导弹拦截器具有主动寻找目标的能力，那么支援平台就会向导弹发出信息，命令它主动出击。如果导弹不具备主动寻的能力，那么交战将被中止并记录为失败。还存在一个选项，允许在失去跟踪和超过巡航时间时，交战自动失败。无论导弹是隐式还是显式飞行，都会进行这些跟踪连续性检查。

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，必须在规定的待命时间内主动向拦截器提供轨道。如果选择了来自交战支持者的通信选项，并且交战的灵活SAM 失去了轨道，那么它将试图将交战控制权交给其相关的交战支持者之一。灵活的SAM会在交战支持者列表中搜索正在发送活动轨道的交战支持者，并选择一个。优先选择来自交战支持者的航迹，这些航迹也在所选支持者传感器的FOV范围内进行拦截。然后，SAM向被选中的支持者发送一条消息。如果收到WILCO，则将交战控制权移交给选定的支持者。如果它收到CANTCO，那么它就会尝试选择另一个交战支持者。如果在当前指导/IFTU阶段待命时间结束前，还没有选择新的交战支援者，那么SAM将选择激活导弹搜索器或中止交战，并将其记录为失败。如果IFTU目前正由一个交战支持者提供，而支持者失去了跟踪信息，则发射SAM将与其名单上的任何其他交战支持者一起被视为交战交接的潜在候选者。为了将IFTU任务发送到选定的交接平台，交战支持者必须联网在一起。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.

如果选择了发射装置的通信选项，只要被列为交战支持者的任何机载轨道支持者在当前制导阶段的指定巡航时间内提供轨道更新，则认为轨道良好。

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.

在进行跟踪连续性检查的同时，制导支持平台向导弹拦截器发送IFTU。一旦平台确定它仍可跟踪到目标的轨道，就会发送这些信息。如果导弹是隐式的，那么就不会产生真正的IFTU消息。如果导弹是显式的，如果使用的是显式网络，那么就会产生IFTU消息，并传送给显式导弹平台。收到这些消息后，导弹平台再根据IFTU消息更新其制导。如果使用的是隐式网络，那么导弹平台的制导就会根据这个IFTU立即进行更新，而不会受到任何信息延迟。

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.

导弹制导模式也从拦截阶段内更新。隐式和显式导弹都可以使用指令、半主动或主动制导模式飞行。指令制导和半主动制导都要求支援平台保持对目标的跟踪。主动制导对支援平台的跟踪没有要求。

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，所有三种制导模式的处理都需要根据目标的当前轨迹和导弹的运动能力重新计算拦截点。还要进行拦截评估，以确定隐式导弹是否成功地对目标进行了拦截。

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.

对于显性导弹，指令制导处理需要重新计算拦截点，并将该点发送给飞行控制平台，使导弹能够向该点引导。半主动制导模式处理只需将目标的轨道位置发送给飞行控制平台，让导弹在该位置上原地不动。灵活SAM拦截阶段内没有主动制导处理，因为导弹规则集为导弹平台处理。4.7.34小节详细介绍了导弹规则集。显性导弹的拦截评估由飞行控制平台执行。当导弹达到最接近方针时，就会发生拦截。第4.13小节介绍了如何设置和使用显式导弹。

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.

根据当前的拦截时间更新制导模式。如果导弹当前处于指挥制导模式，并且正在进行无线照射，那么当导弹的拦截时间低于无线照射时间阈值时，导弹将过渡到半主动状态。这个阈值由恒定的平均无线照射时间或由无线照射时间表的动态设定。如果导弹当前处于其指令或半主动制导模式，并且为武器定义了主动制导的制导IFTU阶段，那么导弹进入该制导IFTU阶段时，就会过渡到主动制导。导弹一旦转入半主动或主动制导，就不能后退：**即主动导弹不能转回半主动或指令制导。**

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，制导模式转换是信息驱动的。导弹一旦收到支持平台的信息，就会过渡到新的模式。如果导弹或网络是隐式的，那么导弹会自动过渡到新的制导模式。所有制导模式的转换都会被记录下来。

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

如果导弹已经拦截了目标，那么接下来就进行拦截处理。

#### 4.7.1.2.4.2 Intercept Processing

4.7.1.2.4.2 拦截处理

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.

拦截处理包括实际的拦截事件和对该事件的结果确定。

拦截阶段的执行包括若干检查，以确定交战的结果。如果平台已经销毁，则交战记录为失败。如果目标已经死亡，则该次交战也被记录为失败。如果目标还活着，将检查目标是否现在被标记为好友。如果是，则会在假设信息发生变化而无法及时取消交战的情况下，取消交战。

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，则接下来会评估目标上的跟踪状态。如果目标仍在跟踪列表中，但已超过跟踪的清除时间，或跟踪文件中已没有跟踪，则交战将被中止。如果武器具有半主动制导功能，灵活SAM平台必须对目标进行本地跟踪。所有其他情况都不需要举行本地跟踪------例如射后不管的导弹。

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，将根据武器的能力评估目标。如果到目标的距离大于武器对给定目标类型的致命范围，则记录为失败。接下来评估武器对目标的Pk。这要么是一个单值的Pk，要么是基于几何依赖性。对于单值情况，Pk是用户指定的Pk，达到用户定义的武器致命范围的百分比。Pk从用户定义的武器致死范围百分比的指定值到武器致死范围指定值的第二个用户定义百分比线性递减。基于几何学的Pk表在附录B6中讨论。

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:

防御性反制措施在EADSIM中表示为拖曳式诱饵武器和反武器，用于制作金属箔片、无线照射弹或任何可用的技术，以降低灵活SAM武器对ABT的有效性。将被用作防御反制措施的特定ABT武器是对灵活SAM武器类型提供最大效力的武器。然后，灵活SAM武器的Pk被所选ABT武器的有效性[R(eff)]降低。减幅计算如下：

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到1之间随机抽取一个数字来评估交战的结果。如果这个数字小于有效的击杀概率，则判定为成功，否则判定为失败。如果消除了随机性，则永远判定交战成功。

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LASHE交战，用武器Pk的一部分来评估结果。Pk减去的系数等于用户指定的LASHE正常Pk的分数。

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，拦截处理执行时都会记录拦截结果的真实性，模拟实际的拦截器最终结果。在导弹已被拦截器命中的情况下，将从均匀分布中抽出的概率——Pdraw与可信TM威胁剩余的概率——Pcredible进行比较。如果Pdraw小于Pcredible，则TM目标仍然是一个可信的威胁。如果随机性被消除，TM将始终被评估为可信威胁，除非Pcredible被输入为0。威胁的可信度是TM参数和拦截导弹的函数。如果威胁被认为是可信的，导弹将继续飞行。导弹被标记为死弹，以说明其撞击时的状态，情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，导弹不再飞行。记录一个行动，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.

在确定了交战的真实结果和威胁的可信度之后，错误概率决定了进行最终分析的平台将如何评估交战的结果。最终分析由SAM或作为SAM的交战支援者的灵活指挥官进行。交战结果由执行最终分析的平台记录。如果使用显式拦截器，交战结果也由拦截器记录。如果使用隐式拦截器，则拦截器的名称将在几何行动历史报告中的武器平台名称一栏中获得。如果SAM处于最后阶段的战斗，它就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。如果交战支持者处于最后阶段的战斗，那么它就会向SAM发送一个结果信息，SAM再向其指挥官发送一份报告。

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.

泄漏概率，Pleak，是将一枚活的导弹评估为销毁的概率。该概率是平台的杀伤评估逻辑的一个函数，在规则集中规定。Pleak取决于被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，即Pfa，是将一枚死亡导弹评估为活着的概率。该概率是规则集中规定的平台杀伤评估逻辑的一个函数。该概率取决于被拦截导弹和拦截导弹。该概率还取决于该导弹的可信度。当导弹已被评估为可信威胁并在拦截后飞行时，采用第一种虚警概率。当导弹不是可信的威胁，并且在拦截后没有飞行时，则采用第二种虚警概率。如果消除随机性，存活的导弹将被评估为存活，销毁的导弹将被评估为销毁。

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.

根据交战的真实结果选择概率。对于仍存活的导弹，采用泄漏概率Pleak。从均匀分布中抽取一个概率与Pleak进行比较。如果Pdraw大于或等于Pleak，目标被评估为活着。如果Pdraw小于Pleak，活着的导弹被评估为销毁。将记录评估的交战行动。

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.

误报概率用于评估被销毁的导弹。这一概率是导弹被拦截后是否仍在飞行之参数的函数。如果导弹正在飞行，则使用误报概率作为导弹正在飞行的函数Pfa(MF)。从均匀分布中抽取概率与Pfa(MF)进行比较。如果Pdraw小于Pfa(MF)，则评估该导弹为活弹。如果Pdraw大于或等于Pfa(MF)，则评估导弹为死弹。评估后记录一个交战行动。

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不再飞行的情况，但误报的概率作为导弹不再飞行参数的函数Pfa(NF)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

在一次交战中，对每一发炮弹进行概率抽签。成功射击的结果会被保存下来。在所有的齐射被拦截后，杀伤评估功能被安排在TM延迟后执行。这个延迟代表了从拦截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.

在执行杀伤评估时，对交战的每一次射击结果进行评估以确定结果。如果任何一发炮弹被评估为成功，则交战结果被评估为成功；否则被评估为失败。交战的行动将被记录下来，显示结果的真实性以及评估结果。

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，而目标被摧毁，则向指挥官报告情况。如果目标未被摧毁，而SA炮仍有可用的武器，则计划对该目标进行另一次发射。在目标被摧毁或SA炮的武器用完之前，不会向指挥官发送信息。

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.

在完成一次交战并发送消息后，对于以单次交战模式或LASHE响应方式运行的灵活SAM，目标选择阶段将安排在其开始时间。

### 4.7.1.2.5 Flexible SAM Reload Phase

4.7.1.2.5 灵活的SAM重装阶段。

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.

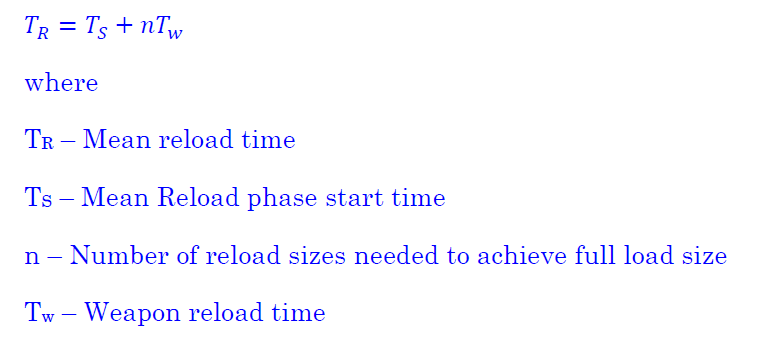
重装阶段在重装过程完成后执行。重装阶段处理使用灵活的SAM规则集或使用SAM发射器规则集（如果是远程发射器）的平台的重装。武器根据系统要素定义上的武器清单进行管理。每个列表中的武器都是单独管理的，并定义了武器装载量、初始武器装载量、每次重装阶段执行时要重装的武器数量以及可重装的总武器库存。装载量大小定义了系统被认为是100%武器库存的武器数量。初始载荷决定了系统在激活时有多少武器。重装操作总是在当前武器数量达到0时启动，但系统可以根据重装大小选择配置为执行部分重装。如果相同的武器类型被多次列出，当第一个实例耗尽时，将对列表中的该项目启动重装过程，尽管具有相同武器类型的另一个条目可能仍有武器。多次列出同一武器是一种可以实现部分重装功能的方法，但它没有考虑到发射和重装活动是否可以同时进行，而且在武器选择过程中会造成冗余处理，因为每个武器条目都会被单独评估。使用 "允许部分重装 "选项可在武器数量达到0之前启动重装活动，但在系统有发射任务要执行时不允许重装，而且一旦安排了重装，就会防止安排新的发射任务，直到重装完成。

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.

如果不允许部分重装，则当平台当前武器数量达到0时，重装阶段由发射阶段安排，执行重装阶段后，如果武器清单上特定行的可用库存中还有武器，则消耗的武器数量按重装数量递增。在执行部分重装时，在当前武器数量比满载尺寸至少少一个重装尺寸数时，就认为需要重装。但是，如果已经安排了其他发射，则不能安排重新装填阶段。此外，对部分重装能力的控制可以通过用户规则进行管理。部分重装授权响应允许根据触发条件开启或关闭部分重装，如平台一定范围内存在威胁性轨道。一旦重装阶段被安排，平台将被阻止安排任何未来的发射，直到重装发生。当重装阶段执行时，该平台将按重装尺寸数的倍数进行重装，以达到满载尺寸，但不超过装载尺寸或剩余可用库存。

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:

重新装填阶段的开始时间是准备重新装填所需的后勤时间，例如将武器运到发射场。每个武器规格都包含装填作为再装填规模的武器数量所需的时间。然后计算出重新装填所需的平均时间为：

  
 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.

通过随机抽签，利用计算出的平均重装时间TR和重装阶段开始时间sigma来安排重装阶段。如果选择均匀分布模型，则将武器重装时间𝑛𝑇𝑤与a和b值相加，以确定可用的最小和最大重装阶段时间。如果随机性已被消除，则使用平均值。重装阶段重复时间不用于重装调度。如果这个特定的列表项目没有更多的武器可供重新装填，列表中的其他武器将被评估以装填到发射器上。如果列表中后续武器的初始装填数为0，则该武器将在列表中前一个武器耗尽后装填。重装的顺序取决于武器列表的顺序。在这种情况下，该新武器的武器数量将按其所列的重装量递增。

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.

如果武器在使用SAM发射器规则的发射器上，而发射器上没有更多的武器可供重装，则将评估其指挥的灵活SAM或SAM弹道导弹清单。如果发现初始装填数为0的武器与发射器上列出的武器类型相同，则发射器上的该武器将从其指挥平台上发现的库存中装填再装填。如果启用了部分重装，则指挥平台将利用指挥员的重装尺寸和武器重装时间来确定需要多少次部分重装和重装时间，重装到其系统上为该武器类型指定的全部装弹量。否则只重装指挥官系统上指定的单次重装尺寸。指挥官的这种用法可以使电池的可用库存在整个电池中进行管理。同样，一个灵活的SAM可以从位于其指挥的灵活指挥官上的普通武器库存中重新装填。

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.

在任何一种情况下，已装武器的可用重装库存都会按重装武器的数量减少。如果平台被标记为没有更多的武器，平台将根据可用武器的信息进行重新设置。

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.

一个平台上至少有一件将发射武器的武器必须有一个初始武器载荷数。该平台上的后续武器的初始装弹量可为0，表示这些武器在最初放置在该平台上的武器耗尽后可重新装弹。此外，灵活指挥官、灵活SAM或SAM长程巡洋舰的武器清单可将所有武器的初始载弹量设置为0，这使得指挥官的下属可以重新装填武器。

### 4.7.1.2.6 Flexible SAM User Rules Phase

4.7.1.2.6 灵活的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规则集能够在受到ARM攻击、被干扰、或指挥官或下属丢失、死亡或重新获得时采取反制措施。它还可以根据平台事件对传感器进行重新定位。用户指定的触发事件（如识别到ARM）会导致用户指定的反应发生。这些响应包括关闭发射器、转发ARM的警报、激活诱饵、选择备用指挥官以及触发另一个平台。触发条件由事件组成--例如，识别到ARM已被发射--与SAM的状态相结合。SAM的状态包括SAM当前是否锁定目标或有拦截器需要在空中引导到目标。用户规则阶段在第4.12小节中说明。

## 4.7.1.3 Flexible SAM Received Message Processing

4.7.1.3 灵活的SAM接收信息处理方式

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.

灵活的SAM规则集内与其他参与方的协调大多是通过收到的信息进行的。这些电文是各个SAM单位之间以及与在同一地区作业的飞机协调作业的关键。将灵活SAM平台指定为外部控制，就会使其失去处理命令型报文的能力。本小节将讨论该规则集所处理的报告信息。

### 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信息。第4.6小节介绍了灵活的SAM规则集所使用的跟踪处理。

### 4.7.1.3.2 Flexible SAM Commanded Assignment

4.7.1.3.2 灵活的SAM指挥分配。

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.

指挥性任务是灵活指挥官规则集用来向其下属传达任务命令的方法。指挥性任务信息总是在灵活指挥员的目标选择阶段产生，并直接传送给下属。

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系统以LASHE反应方式行动，SAM向其指挥官发出CANTCO。这一行动允许指挥官向不同的下属分派任务。

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，SAM将进行检查，以确定该平台是否已经与有关目标交战。假设在发送任务决定时，指挥平台尚未收到交战报告。如果该平台正在与目标交战，则忽略分配信息。然后，规则集确定平台当前是否已将目标纳入轨道。如果威胁已经在轨道上，平台接受指派命令，并将该轨道标记为指挥指派。

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.

对于目前未持有轨道的情况，将向指挥员发送更新请求信息。在收到指令的轨道更新后，将继续处理任务。如果仍然没有找到轨道，则将该威胁添加到轨道文件中，并标记为不可接触。将其添加到轨迹文件中会向检测发送一条消息，以将该轨迹放在平台可能拥有的任何依赖性传感器的搜索列表中。一旦接收到跟踪数据，该跟踪就会从从属传感器或远程跟踪消息中变得可参与。

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.

信息中包含了发出命令的指挥官的航迹中的DFD等级。该信息用于更新接收平台轨道文件中的当前DFD等级，或启动轨道条目。DFD等级控制哪些传感器通过指令分配被提示。

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规定的分配尝试时间内对交战采取行动，则向指挥官发送CANTCO消息，允许分配给不同的下属。

### 4.7.1.3.3 Flexible SAM Commanded Launch

4.7.1.3.3 灵活的SAM指挥发射。

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.

指挥发射是灵活指挥员用来指挥灵活机动导弹发射命令的方法。这种指令发射可以发送到任何灵活机动导弹，而灵活机动导弹指挥官是其交战支援者。灵活指挥员不需要在该灵活SAM的指挥链中。指挥发射信息总是在灵活指挥员的目标选择阶段产生，并直接发送到选定发射武器的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系统以LASHE反应方式行动，SAM向其指挥官发出CANTCO。这一行动允许指挥官向不同的下属分派任务。

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，指挥发射基本上被视为一项指挥任务。它的优先级高于自我分配的交战。主要区别是，发出发射指令的平台将自动成为其交战支持者。这种情况下不会产生IFTU支持请求信息。SAM接受发射武器的责任，然后向目标发射武器。发出指令发射的平台向导弹拦截器提供暗文或明文的IFTU，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.

**在收到非SAM指挥官的平台发出的指令发射信息后，灵活SAM向其指挥官发出报告，通知其指挥官它正在向指令目标发射武器。然后，指挥员将报告传给其网内所有平台，说明目标正在交战。这样可以防止其他平台对已经交战的目标进行射击。**交战完成后，交战支援者向SAM发送消息，通知其交战结果。然后，SAM向其指挥官发送报告，同样让指挥官将这些信息报告给周围的人，这样其他平台就会知道，如果目标幸存，他们现在应该对目标进行交战。

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规定的分配尝试时间内对交战采取行动，则向指挥官发送CANTCO消息，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交战报告

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。虽然所有的交战报告的发送目的都是一样的，但存在两种交战报告。两者的区别在于报告的来源。SAM规则集为每个交战生成一个单一的交战报告。战机规则集创建的交战报告可以包含多个目标。灵活的SAM规则集处理这些消息，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.

首先讨论对收到的单次交战报告的处理。如果之前已经收到过交战报告，则忽略该消息。如果平台在其轨迹文件中找不到报告的轨迹号，平台会向交战报告的来源发送更新请求消息。收到请求的轨迹更新后，如果平台仍然没有目标的轨迹，则不做进一步处理。报告中的信息被存储起来，以便在FIRE中显示外部交战数据。收集灵活SAM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、拦截器轨道号和拦截时间，无论该消息是否将用于任何进一步的解冲突评估。接收到的交战报告如果不是来自于灵活SAM的指挥官、其同级解除冲突名单，或“避免兄弟相残”名单，那么一旦外部交战数据被存储，就不再进一步处理。

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.

如果该轨道目前没有被标记为交战，则说明该平台没有交战目标，并且在该轨道上没有收到其他平台的交战报告。此时，该轨道被标记为交战，以防止平台自行为该轨道组织交战。如果轨道已经被标记为分配或配合交战，则执行的处理与接收停止命令消息的处理相同。**SAM规则中的假设是，除非指挥官接受交战，否则不会报告交战情况。在这一假设下，向这一级别报告的交战相当于收到停止命令。**

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.

灵活SAM规则集收到的所有多次交战报告信息都被认为是指挥官转发的信息。对这些消息的处理是对报告消息中的所有目标进行循环。对每个单独目标进行的处理与前面所述的单次交战报告相同。

### 4.7.1.3.5 Flexible SAM Acknowledgments

4.7.1.3.5 灵活的SAM确认

### 4.7.1.3.6 Flexible SAM Engagement Status Reports

4.7.1.3.6 灵活的SAM交战状况报告

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一交战状态报告和多目标交战报告两种形式，报告的发起人分别是SAM和战斗机。如果报告是失败的，但报告平台没有被标记为交战者，则忽略该消息。如果报告的航迹号在平台的航迹文件中找不到，则会向报告源发送更新请求。在收到请求的轨道更新后，如果在轨道文件中仍然找不到轨道，则不进一步处理报告。**对于战术导弹交战，交战状态报告包含交战评估而非实际情况的记录。记录了一个行动，表明收到了另一个平台的评估。**在收到被评估为成功的交战后，SAM轨道文件中的TM轨道被标记为被评估为已销毁。ABT 交战报告包含 ABT 交战结果的真相。在收到成功消息时，SAM的跟踪文件中的ABT跟踪将被标记为已销毁。如果交战成功或评估为成功，则考虑该平台可能有一枚导弹预先锁定或在空中对目标进行攻击。如果有提前锁定的导弹，则停止交战，以防止浪费导弹开支。如果导弹正在飞行中，则导弹中止，交战视为失败。这一行动使平台可以腾出时间再进行一次交战。

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.

在出现故障报告的情况下，交战状态被清除，以便今后进行交战。但是，如果该平台仍有一枚导弹在飞行，则交战状态被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.

在收到交战状态报告后，上层灵活的SAM会删除表明报告平台正在交战的记录，但收到关于未被击毙的目标的报告时除外。在这种情况下，上层SAM将交战标记为完成交战，但保留该交战的计划Pk，以便在随后决定交战目标时使用。

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.

转发的多个交战状态报告按多个单项状态报告处理。每个目标的处理方式与单次交战报告的处理方式相同。

### 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.

指挥官规则集使用停止命令来执行解除冲突过程的行动。接收到停止命令后，表示平台要对给定目标实施停火行动。停火行动是通过允许飞行中的拦截器继续拦截来实现的。

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.

如果之前已经收到停止消息，则忽略该消息。如果在平台的跟踪文件中找不到被命令的任务号，平台就会向停止命令的来源发送更新请求。收到更新跟踪请求后，如果任务仍然不存在，则不进一步处理该命令。如果平台正在交战，则对交战状态进行评估。如果导弹尚未发射，则停止交战。如果导弹已经在空中或分配信息已经发送到SAM发射器，则允许导弹继续拦截。在停止指令中会收到正确的交战器。无论当前平台是否有导弹在空中，甚至是否正在与目标交战，正确的交战者都将被记录在跟踪条目中。

### 4.7.1.3.8 Flexible SAM Communications Check

4.7.1.3.8 灵活的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规则集运作的平台依赖于与其指挥官的指令信息通信。如果这种通信中断，该平台通过进入用户指挥模式来确定适当的行动。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监测是否有能力通过接收指挥官的命令信息与其指挥官进行通信。指挥信息可以是为报告和消除冲突而产生的任何标准信息。该平台的指挥官将使用灵活指挥官规则集进行操作，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没有进行交战的时期，通信能够正常运行。消息的生成周期由指挥平台的Send To Subordinate（向下级发送…）输入定义。如果从指挥员处收到任何一种类型的消息，则为平台存储从指挥员处收到消息的时间。

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.

作为下级平台，灵活的SAM将定期验证收到来自其指挥官的信息，以确保与其指挥官的通信链路存在。检查的周期性由 "验证来自指挥官 "（Verify From Commander）输入定义。周期代表了识别通信已中断并对该识别作出响应的时间长度。平台将最后一次收到来自其指挥官的消息的时间与最后一次验证的时间进行比较。如果最后一次收到的时间在最后一次验证时间之前，则认为已经失去和该指挥官的联络。灵活的SAM在其通讯器丢失时，可以选择执行其用户规则阶段所定义的规则。这将使灵活的SAM能够选择一个备用的指挥官并且进入自主行动，以及执行其他用户规则所规定的响应。

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.

该平台将继续定期验证来自其指挥官的通信链路。如果在下级已经进入自我管理状态后，收到来自其指挥官的信息，则恢复所有目标类型的原始作战模式。如果选择 "向指挥官报告更新 "（Update Commander）选项，则平台在恢复作战模式时向其指挥官报告其当前的所有交战情况。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.

与SAM发射器和SAM低空通信系统的通信也可以得到验证。如果灵活SAM失去了与SAM发射器的通信，灵活SAM将把这个下属标记为非活动状态，然后灵活SAM将向其指挥官发送命令信息，表明该发射器不再可用。这可以防止在武器能力模式下操作的指挥官评估一个不再活动（active）的发射器。当失去一个下级发射器时，灵活的SAM也可以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.

灵活的SAM验证与其SAM LCS的通信。如果一个LCS丢失，灵活的SAM将把该LCS标记为非活动状态。当SAM发射器在武器选择过程中被评估时，指挥该发射器的LCS的状态会被评估。如果LCS不活动，则不能分配隶属于LCS的发射装置。LCS不是灵活SAM的直接下属，因此，它的处理方式与SAM发射器不同。当一个LCS失去了与所有与它相关联的灵活SAM的通信时，LCS可以执行其用户规则阶段来选择一个备用的SAM。然后，该SAM可以使用该LCS指挥的发射器。

### 4.7.1.3.9 Flexible SAM Engagement Support Request

4.7.1.3.9 灵活的SAM交战支持请求。

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SAM如果作为另一个灵活SAM的交战支援者，可以收到向SAM发射的隐式或显式导弹拦截器提供IFTU的请求。如果收到这一信息，SAM就会检查是否有目标的踪迹。它还验证拦截点是否在它的视场范围内，必要时它可以提供所需的无线照射。只有当拦截点在其视场范围内时，SAM才能充当无线照射支援器。SAM还将检查是否会超过其飞行中的最大拦截物约束。如果它能支持交战，则向请求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警报信息

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SAM可以通过用户规则的方式生成和接收ARM和干扰警报消息。当灵活SAM收到警报消息时，将评估灵活SAM的用户规则触发器。如果灵活SAM具有与警报类型相匹配的触发器，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 灵活的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信息。EMCON管理模块使用这些消息来确定哪些平台改变了其传感器状态。

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.

只有当灵活的SAM是EMCON管理模块时，它才会处理传感器状态信息。如果它是EMCON管理模块，灵活SAM将从其EMCON网格中放弃或增加报告传感器的覆盖范围。然后，它启动其制定规则程序，以替换或放弃其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放弃受命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小节详细介绍了传感器更改的响应。

### 4.7.1.3.12 Flexible SAM Sensor Assignment Message

4.7.1.3.12 灵活的SAM传感器分配信息

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管理模块的分配，以打开或关闭传感器。收到该命令消息后，Flexible 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，Flexible 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 灵活的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.

上层的灵活SAM可以处理来自其自动交战协调(AEC)小组成员的层级可用性报告。这些报告显示了其他成员的交战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。打算交战、不打算交战、预期支持、可提供支持和不可提供支持。拟交战和可用于支持的信息包括上层武器库存状态，该状态存储在每一个AEC成员身上。在收到 "打算交战 "或 "不打算交战 "消息后，SAM会在轨道上标示是否有上层支援可供交战使用。当收到 "预期支持 "行动并选择 "处理上层报告 "选项时，SAM会评估其当前战区，而不考虑跟踪限制，如果在其收到消息中所描述的拦截时间之后能够交战，则会以 "可用于支持 "消息作为回应。如果在拦截时间后不能交战，则发送 "不可用支持 "消息。收到 "可供支持 "报文后，SAM对该轨道进行标记，以表示本次交战可获得UT2支持。如果选择了按轨道组协调选项，并且收到了另一个上层SAM的报告，有交战意向或有可用的支持，则轨道组的所有其他成员将被评价为有上层支持可用。

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.

从较低层级的成员那里，层级报告可能会有 "可用于支持 "或 "不可用于支持 "的操作。"可供支持 "信息还显示下层武器库存。收到层级消息后，灵活的SAM在目标的跟踪记录中指出下层是否可以在未来与目标交战，并记录下层的武器库存。这一信息在确定上层对目标需要应用多少弹药的火力准则设定中使用。

### 4.7.1.3.14Flexible SAM Command Information Message

4.7.1.3.14 灵活的SAM命令信息电文

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。该信息将包含根据通信信息激活或停用的下属发射装置的信息。灵活SAM将为其下属记录这些信息，并将信息转发给其指挥官。

### 4.7.1.3.15Flexible SAM Update Request Message

4.7.1.3.15 灵活的SAM更新请求信息

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.

当灵活的SAM发送交战报告或交战状态报告等命令信息时，它包含目标上的跟踪条目编号。然后，接收平台试图在其跟踪文件中找到命令的跟踪编号。如果没有找到该跟踪号，接收平台就会向SAM发送一个更新请求消息，以获取该跟踪号。收到请求消息后，灵活的SAM会生成包含目标的跟踪数据的指令性跟踪更新消息。命令式跟踪更新信息还包含了前一命令信息的所有信息，接收平台在处理完跟踪信息后，将对该信息进行处理。

### 4.7.1.3.16Flexible SAM Commanded Track Update

4.7.1.3.16 灵活的SAM指挥跟踪更新。

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.

发送跟踪更新报文请求的命令中，包含了所请求的跟踪号的跟踪数据，以及之前对该跟踪的命令中包含的数据。平台收到更新消息后，首先将跟踪信息处理到其跟踪文件中。跟踪数据的处理方式与跟踪更新或新建跟踪相同，详见4.6节。跟踪数据处理完毕后，平台再对请求该跟踪的原始命令消息进行处理。

## 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规则集有助于建立若干现有和预计系统的模型。从系统定义的角度来看，规则集所采取的行动和系统对传感器的需求是由系统上放置的武器驱动的。支持几种制导武器类型。如果制导是半主动的，则要求平台通过拦截跟踪目标；因此，需要传感器。如果导弹的制导方式不是NLOS或半主动制导--例如，射后不管的导弹--平台只需通过发射进行跟踪，也需要一个传感器。地对空炮的处理方式与射后不管的导弹类似：需要通过发射进行跟踪。因此，使用地对空炮或迄今讨论的任何一种武器都需要一个传感器。这种传感器的要求可以用与交战支援者的网络来代替。

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.

NLOS武器的预期配置要求在导弹发射前获得目标信息。这种目标信息可以来自NLOS上的传感器；但是，一个远程传感器或传感器网络可以向NLOS提供跟踪目标数据。NLOS能力不需要NLOS平台上的传感器；因此，如果在系统定义中只使用了具有NLOS能力的武器，并且采用了灵活的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.

如果武器属于复杂武器类型，即一旦发射，就是一个明确的导弹平台，那么对SAM的另一项要求就存在。如果使用的是显式网络，如果要用无线电来检查连通性，那么SAM能够发射的每个导弹平台必须有一个通信装置。SAM与导弹平台之间建立的动态网络使用一个非专用的通信设备来建立通信链路。组网时，SAM通信装置的指向模式自动设置为 "对平台 "的指向模式，以导弹平台为目标平台。

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，则必须设置灵活的SAM，以便能够进行这种无线照射。SAM的平均无线照射器数量必须大于零，以允许发射需要无线照射的武器。这样就可以根据武器的平均无线照射时间或无线照射时间表，自动设置调度SAM对目标的无线照射能力。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.

其他武器类型不应该与本规则集一起使用；但是，本规则集将忽略大多数其他类型。SAM发射器可以和灵活SAM一起使用，进行实际的武器发射。灵活SAM必须被指定为SAM发射器的指挥官。SAM发射器使用的武器类型与灵活SAM相同。每个灵活SAM和SAM发射器之间都需要一个仅有指令的通信链路。

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.

使用灵活的SAM规则集，可将探测有关威胁的任何类型的传感器、ABTs和TMs与系统上的武器一起使用。一个独立的搜索传感器可以放在系统上，并被用于探测威胁，以及通过拦截进行跟踪。而一个不独立的搜索传感器只能和其他系统配合使用，如表示需要采集传感器来提示火控或跟踪雷达的系统。最后，独立搜索传感器和不独立的搜索传感器的组合可以用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能力，例如爱国者雷达。SAM系统上的传感器将被要求提供大于平台上武器的最低交战DFD等级的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有一个设计特点，就是不指定武器。该规则集将在目标选择阶段通过威胁评估逻辑继续运行。由于该规则集具有跟踪报告能力，这一特点允许建立一个具有导弹预测能力之传感器处理节点的模型；但是，传感器必须在平台上，以便能够预测影响和发射点。不指定武器的另一种选择是，给规则集零最大同时交战对象限制和NLOS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.

该规则集能够生成和接收信息。如果要评估不完美的连接性，则需要一个通信设备。

## 4.7.1.5 Flexible SAM Network Recommendations

4.7.1.5 关于灵活的SAM网络的建议

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规则集在各种配置下运作的能力受到可以与规则集通信的平台的限制。除非它处于自主模式，否则与平台的指挥官的通信应设置在一个具有指挥能力的网络上。这个指挥官应该有一个灵活的指挥官规则集。这个网可以是任何一种网络类型。如果要选择N-to-N net 或者N\_Broadcast net（一对一或全向广播），那么该指挥官应该有向选定的下属报告交战情况的选项。如果不选择这个选项，同时又将指挥官的所有下属都放在网中，那么火力单位之间的协调性就会减弱。如果没有选择这个选项，并且交战报告和状态报告是由他的一个下属单位产生的，指挥官将不会把它们转发给其他火力单位。他将被要求解除潜在的大量双重交战。可以根据需要，利用承载轨道数据的链路来提供空中情况。

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

如果灵活SAM指挥SAM发射器，则需要从灵活SAM到SAM发射器之间建立一个具有指挥能力的链接。

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 要得到交战支持者的支持，那么就需要在该 SAM 和其交战支持者名单上的每个灵活SAM 或指挥官之间建立双向网络链接。该网络需要同时传递指挥和跟踪信息。网络链路可以是SAM与其支援者之间的单一多参与网络，也可以使用单个双向链路。如果交战支援者想要指挥非其下属的灵活SAM的发射，则需要在灵活SAM和其指挥者之间建立单独的网络。这些网络应该是双向链路，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.

所有前往SAM站点的灵活SAM和灵活指挥官的交战支援人员也必须相互连接，以便能够传递指挥和跟踪信息。这一网络是必要的，以便在当前支援者失去轨道时，能够移交交战支援。