From: Commanding Officer, Marine Aviation Weapons and Tactics Squadron One
To: Distribution List

Subj: MARINE AVIATION WEAPONS AND TACTICS SQUADRON ONE TACTICAL AIR CONTROL PARTY TACTICAL STANDARD OPERATING PROCEDURES

1. This manual establishes standard Tactics, Techniques and Procedures (TTPS) for planning and execution within USMC Tactical Air Control Parties (TACPs). It is based on professional knowledge and experience and is grounded in doctrine. It provides a basis for the development of efficient and sound operational procedures. It is not intended to stifle individual initiative, but rather to aid unit aviation integration personnel throughout the spectrum of their responsibilities.

2. This SOP will be periodically revised due to the dynamic nature of TACP operations.

Distribution: Special
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Changes:

Change Recommendations are solicited and encouraged. Send all recommendations to the address below or e-mail them to a member of the MAWTS-1 Air Officer Department. MAWTS-1 AOD commercial phone numbers are 928-269-3362 / 5360 / 4553. DSN prefix is 269.

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Chapter 1: Assault Support

1000. Air Assault

The following section should not preclude the 7502 or 8002 from reading, in their entirety, Marine Corps Doctrinal Publications, such as the 3-24 or 3-11.24, on Assault Support and Air Assault Operations or the NTTP 3-22.5 Assault Support TACSOP. The appendices have a detailed checklist for mission planning.

![Air Assault Operations Planning Sequence Diagram]

Figure 1-1

1. Ground Tactical Plan

Before an air assault operation is planned, the ground scheme of maneuver must be firm. The foundation for a successful air assault operation is the Assault Force Commander's (AFC) ground tactical plan. Normally, the ground tactical plan is developed first and is the basis from which the other plans are derived. The ground tactical plan is a portion of the air assault scheme of maneuver.

*The ground tactical plan specifies actions in the objective area that ultimately accomplishes the mission.*

The plan also includes subsequent operations that can include link-up operations, repositioning of the force, and sustainment. The ground tactical plan for air assault operations contains essentially the same considerations as any other infantry form of maneuver except that it must capitalize on surprise, speed, and mobility in order to achieve mission success.
a. Actions on the objective identified
   (1) Ground Combat Element (GCE) Scheme Of Maneuver (SOM)
      (a) The terms hard hit and soft hit are being replaced with the terms “landing on the X, Y, or offset.” Definitions and a brief discussion follow:
         1. Definitions:
            a. X < 300m from objective (based on effective small arms range)
            b. Y > 300m < 1000m from objective (based on effective heavy weapons range)
            c. Offset > 1000m from objective (outside effective heavy weapons range)
         2. Considerations
            a. X: Capitalizes on speed but most difficult / highest risk.
               (1) Used for missions that are time sensitive in nature or significant ground movement would compromise mission
            b. Y: Balance between speed and threat mitigation
               (1) More likely to have squitters, must develop effective squirter control plan.
               (1) Used for same reasons as X, cannot mitigate threat to support X insert or no tenable LZs for X insert.
               (1) Works well for cordon / search of larger area where it does not make sense to land next to one building in particular.
            c. Offset: Capitalizes on stealth if outside audible compromise. Least difficult / lowest risk.
               (1) Used for missions not time sensitive, less proficient participants, and / or supports longer ground movement
         3. Tactics may differ between insert and extract or between different elements. In a densely populated area, the ACE might treat everything as an X insert due to the threat to aviation. See paragraph 2.a.1.
         4. Recommendations:
            a. X/Y insert: RW CAS, FW CAS, ISR on station.
            b. Offset: Any CAS asset, ISR on station
   (b) Mission of sub-elements
      1. Reconnaissance Element
      2. Assault Element
      3. Support Element
      4. Security Element
      5. Reserve Element
      6. Command Element
      7. Attachments such as Human Exploitation Team (HET), Combat Camera etc.
   (c) Combat power build-up
      1. Total lift required
         a. PAX and equipment
         b. 1st Wave requirement(s)
         c. Start to develop:
            (1) Assault Support Landing Table (ASLT)
               (a) Reference appendices
            (1) Assault Support Serial Assignment Table (ASSAT)
               (a) Reference appendices
      2. Go / No-go
         a. Min PAX
         b. Threat
         c. Weather / Atmospheric conditions
   (2) L-Hour identified
      (a) Time or event driven
(3) Geometry of fires
   (a) Direct
   (b) Indirect
      1. Include Battlefield Illumination (BI)
   (c) Aviation fires
      1. Include BI as applicable (see paragraph 1004)
      2. Include Electronic Warfare (EW) fires as applicable
(4) Priority of fires and terminal attack control
   (a) Pre L-hour – Typically Deep Air Support (DAS)
      1. Think of this by phase. In planning the detailed planning and integration with the SOM is completed. In execution, a pre L-hour strike does not require the detailed integration unless the SOM has changed. Also remember that Terminal Guidance Operations (TGO) do not equate to Close Air Support (CAS)
   (b) L-hour – Typically CAS
      1. Transition from DAS to CAS must be planned. The right answer might be at the “IP Inbound” call vice L-hour. Other options exist. Planners must discuss and agree on the right answer.
   (c) Post L-hour – Normally CAS
      1. BHO and passage of Terminal Attack Control
         a. i.e. from Forward Air Controller (Airborne) [FAC(A)] to Joint Terminal Attack Controller (JTAC) or Forward Air Controller (FAC)
      2. Battlefield Hand Over (BHO)- ref. Table 2-7
(5) Control of sensors
   (a) Unmanned Aerial System (UAS) sensors
   (b) Fixed Wing (FW) and Rotary Wing (RW) sensors
   (c) EW sensors
b. Contingencies
   (1) CASEVAC / MEDEVAC
   (2) Immediate Re-embark
   (3) Emergency Extract
   (4) Tactical Recovery of Aircraft and Personnel (TRAP)
c. Communication plan
   (1) Communication architecture and comm. diagram.
   (2) Nets monitored / call-signs
   (3) Signal plan
      (a) Ensure this is coordinated between the GCE, Aviation Combat Element (ACE) and Logistics Combat Element (LCE)

2. Landing Plan

The landing plan is a crucial aspect of the planning process requiring detailed integration of assault, escort, and ground maneuver assets. The landing plan is designed to support the ground tactical plan. The Landing Plan contains the details of how the assault force will be inserted or extracted, what fires will support the insert or extract, and the command and control procedures for the assault. The number, type of aircraft available, landing zone number, and sizes will directly affect the speed of combat build up in the objective area.

"The Landing Plan is arguably the most vulnerable time for aircraft and personnel."
Early in planning, the Mission Commander (MC) will specify necessary combat power required in the first wave. Considerations for wave timing and composition are METT-TSL dependant. Simultaneous landing of as many aircraft as possible is desired to maximize combat power on the deck and reduce aircraft exposure time / events. The plan for the landing zone should incorporate the following points:

a. Availability, location and size of LZs
   (1) The terms, X, Y, and Offset refer to distance LZs are from the GCE objective. ACE planners, esp. the ACE S-2, must still perform detailed Intelligence Preparation of the Battlefield (IPB) on the LZs and surrounding area WRT how the threat affects ACE assets.
   (2) Simultaneous or sequential landing(s) for elements within a wave. Waves are always seq.
      (a) See ASTACSOP for more detailed discussion and considerations that determine ability to land simultaneously or sequentially. This is primarily an ACE planning issue, but does have GCE considerations.
   (3) Primary LZs
      (a) Alternate LZ for each primary
         1. Aircraft don’t have alternate, serials (the personnel in the back of the aircraft) have alternates. This information is captured in the bump plan which is the last page of the Assault Support Serial Assignment Table (ASSAT).
   b. Tactical considerations
      (1) Winter / Devil criteria
         (a) Hot does not equal devil
            1. A zone could have small arms affecting it, but briefed devil criteria was HMG, so this “hot” zone would be called “winter.”
      (2) GCE debark plan
         (a) Direction
         (b) Rally Points and accountability
      (3) Geometry of fires
         (a) Direct
         (b) Indirect (Include Battlefield Illumination)
         (c) Aviation fires
            1. Assault Support sectors of fire
            2. Escort fires (to include Battlefield Illumination)
            3. Weapon condition (Hold, Tight, Free)
      (4) Priority of fires and terminal attack control
         (a) Pre L-hour - Normally DAS
         (b) L-hour - Normally CAS
            1. Transition from DAS to CAS must be planned. The right answer might be at the “IP Inbound” call vice L-hour. Other options exist. Planners must discuss and agree on the right answer.
         (c) Post L-hour – Normally CAS
            1. BHO and passage of terminal attack control (ref. Table 2-7)
               a. i.e. from Forward Air Controller (Airborne) [FAC(A)] to Joint Terminal Attack Controller (JTAC) or Forward Air Controller (FAC)
         c. Initial Terminal Guidance (ITG) (Reference para. 1003 for detailed discussion)
            (1) Who is providing for first wave, follow-on waves, and on what net?
            (2) Day
               (a) Near
               (b) Far
            (3) Night
               (a) Near
d. Extract plan
(1) Timeline
   (a) Time driven or event driven?
(2) LZs
   (a) Same or different than insert LZs. X, Y, or Offset considerations apply.
(3) Criteria
(4) Communications
   (a) No-communication signal
(5) Location of Marshalling Area Control Officer (MACO) gate
   (a) Loading plan
(6) ITG plan
(7) Minimum personnel remain in zone defined by GCE WRT how small of a force can provide required security in the zone. Therefore the ACE must plan final wave to pick that many up at once.

e. Contingencies
(1) CASEVAC / MEDEVAC
(2) Immediate Re-embark
(3) Emergency Extract
(4) TRAP
(5) Asset attrition (see ASTACSO)
(6)

f. Based on the information planned to this point, the ASLT should be completed with further refinements as necessary. This document assigns serials to waves of aircraft to an LZ on a time schedule.

3. Air Movement Plan

The Air Movement Plan is based on the ground tactical plan and the landing plan. The air movement plan specifies the air movement schedule and provides instructions for the air movement of troops, equipment, and supplies from the pickup zones (PZs) to the LZs. It also provides coordinating instructions pertaining to ingress and egress routes, air control points, aircraft speeds, altitude, and formations. The planned use of attack helicopters, to include security and linkup locations (rendezvous), should be included in the plan. During MAGTF operations, the Marine Air Ground Task Force (MAGTF) commander approves the air movement plan based on the recommendations of the ACE Commander, Air Mission Commander (AMC), AFC, and the LCE unit commander. The information essential to the AFC is obtained and disseminated by the ground unit air officer or FAC.

a. Ensure the Assault Force Commander / Mission Commander can be advised of:
   (1) Objective Intel updates
   (2) LZ changes
   (3) Route changes
   (4) Mission abort
   (5) Fires approval
   (6) L-hour ROLEXs
b. Command and Control (C2) platform if used
   (1) Location of Mission Commander / Air Mission Commander
c. Air Officer, FACs and JTACs should be aware of
   (1) Airspace Control Areas
   (2) Initial Points for assault support assets and FW aircraft
3. Communication check point
4. FW and RW routing, holding stacks and Holding Areas

4. Loading and Staging Plans

The Staging Plan assembles units in the pickup zone in preparation for loading. The PZ should be treated as an objective area. It is the responsibility of the PZ planners to ensure that ACE, GCE and LCE assets are integrated in the PZ.

Pickup zone operations will set the tempo for the air assault and is the first opportunity to gain momentum. It must be simple, briefed in detail, and easily understood by the ACE, GCE and LCE. Accountability of people and equipment is paramount during pickup zone operations. The pickup zone diagram should be treated much like an LZ diagram and depict the most efficient staging and embarkation of friendly forces and equipment.

a. Load Plan

1. The Assault Support Serial Assignment Table (ASSAT) should be completed during this phase. The ASSAT assigns serials to personnel and equipment, with weights, and includes a Bump Plan. Each line of the document represents one serial. Assigning serials to waves should be completed by the AFC as it represents how he will build combat power in the zone. Air Assault Waves, according to MCRP 5-12C, is a formation of assault support aircraft required to land about the same time. Air Assault Waves may be on-call (e.g. QRF) or scheduled. Waves can be further broken down into elements. The AFC knows where and when the aircraft are landing based on the Assault Support Landing Table (ASLT) completed during the Landing Plan by the MC, AMC, AFC and the Assault Flight Leader (AFL). GCE units generally possess a Serial Assignment Table that is transformed into the ASSAT.

b. PZ Planning

1. Ensure a PZ control group is established
   a. Key Personnel
      1. PZ CO: Usually GCE unit XO
      2. MACO: Usually GCE 1stSgt
      3. Helicopter Support Team (HST) Marines as necessary
      4. ACE LNO if available
      5. Air Officers, FACs and JTACs should generally not be used in these roles.
   b. Ensure PZ organized into rehearsal, staging, bump and C2 areas
   c. Ensure PZ is appropriately marked
   d. Ensure PZ CO and MACO have communication with:
      a. Aircraft
      b. Serial Leaders
   e. Establish a back-up, minimum communication or no communication plan is established.
      a. e.g. Chem. stick marking of aircraft to determine which serial should board which aircraft.
   c. Bump plan established by AFC ISO ground tactical plan
      1. Establish a Bump Serial Assembly Area
      2. Bump Plan is the last page of the ASSAT, ref. Appendix A.
   d. Ensure Serial Leaders have four Assault Support Serial Assignment Cards. Reference appendices.

One Assault Support Serial Assignment Card for:

1. PZ CO
2. MACO
3. Aircraft Crew Chief
4. Serial Leader
5. Capabilities and limitations of Assault Support assets are located in MCRP 3-16.6 JFIRE as well as the ASTAC SOP.

1001. Logistics / Aviation Integration and Aerial Delivery (AD)

1. Air shop and S-4 integration discussion
   a. The S-4 should handle air requests ISO Passenger, Mail and Cargo (PMC). Coordination should take place early and involve, at a minimum, the Air Officer, the Logistics Officer and the Operations Officer.
   
   b. Nothing should be pre-determined WRT how someone or something should be moved. The quickest and most efficient method should be used. With the S-4’s knowledge of the logistics system and pre-existing relationships to non-aviation assets, any PMC request should start in the S-4. If requesting aviation movement or once aviation movement is determined to be the best method, the Air Shop should be involved and aid the S-4 in submitting, tracking and executing the PMC movement.
      
      (1) Assault Support Requests (ASRs) ISO air assault could be an exception to the discussion above due to their operational focus. Depending on unit size, mission complexity and integration with outside agencies, the Air Shop might handle the submission, tracking, and execution of ASRs while keeping the S-4 informed.
      
      (2) Logistics vs. operational aviation could be a logical division of who is the primary on aviation requests. The Air Shop personnel are, however, the subject matter experts (SMEs) for aviation integration and must be prepared to integrate aviation in all required mission sets.

2. Air Delivery (AD) Operations:
   a. AD operations transport personnel, equipment and supplies to forward operating bases or remote areas. Airdrops (parachute or free fall) deliver equipment and supplies. Airdrops are conducted when surface or airborne platforms cannot fulfill resupply requirements due to range, closed lines of communications (LOC), lack of adequate airfields, prohibitive ground tactical situation, high tonnage, or the need to reduce response time. The primary USMC platform is the KC-130. The MV-22 and CH-53E are also capable of AD missions.
   
   b. All aircraft AD avionic systems function in yards. Supporting squadrons will communicate with supported ground units in meters and convert as necessary. Prior coordination with AD platforms should be accomplished to ensure all entities are using the same units of measure.
   
   c. Drop Zone (DZ) considerations:
      
      (1) Size
         
         (a) As a rule of thumb a DZ should be a circle with a diameter of 1,000 meters.
         
         1. A DZ of this size is required because a USMC KC-130 can carry 16 Container Delivery System (CDS) bundles which it drops two at a time at ~1 sec intervals while traveling approximately 69 meters per second. This equates to approximately 550 meters from first to last bundle landing. The remaining distance accounts for safety zones required for different parachutes, cargo loads, and drop altitudes specified by Air Force Instruction (AFI) 13-217.
         
         2. Crews generally place the first set of bundles within 100 meters of the intended point of impact (PI). This is due to parachute variability, wind estimations or changes, and other variables the aircrew estimates. The remainder of the bundles will be strung out from the first in the direction of flight as described above.
         
         3. A circular zone is desirable, but not necessary, because it allows for run-in headings to be varied.
         
         4. The size of a drop zone can be reduced with detailed integration between the Air Officer and the supporting squadron. The Air Officer will need to be prepared to discuss safety of ground units in the area, terrain, number of bundles dropped at once, ground support required to recover the bundles, and any other significant environmental factors.
5. When planning to receive an air delivery to a small drop zone, also consider any implications, such as unintended effects (landing on a building) or recovery issues, of cargo being dropped off zone.

(2) Threat dependant, aircraft can perform multiple passes dropping fewer bundles into a smaller zone. The run-in variability provided by a circular DZ becomes more important for multiple passes.

(3) Location:

(a) There are several factors to consider when selecting the DZ location:

1. Suitable terrain
   a. 1000 meter circular piece of suitable ground
   b. Usable for ground support equipment

2. Security
   a. Can load be secured once on ground?
   b. Can support personnel be protected during ground operations?

3. Distance to GCE operations
   a. See paragraph 1002.4.a.5, Cargo Fall, for further considerations

(4) Airspace

(a) Aircraft will normally perform high-low-high profile starting approximately 10,000 ft AGL. They will generally perform an infra-red (IR) cooled descent (engines throttled back) IOT decrease IR and audible signature of aircraft prior to passing IP (3.5-5 NM from DZ) at 400-1,500 feet AGL. Actual drop altitude will be parachute dependent. Near the IP, the aircraft will decelerate from ~240KIAS to ~140KIAS. It will take approximately 70 seconds for the aircraft to reach the Computed Air Release Point (CARP). See figure 1-2 for graphical depiction.

1. Drop altitudes above 1,500 ft AGL create excessive time under canopy increasing the variables involved in hitting an impact point.

2. Drop altitudes below 400 ft AGL do not generally allow enough times for the chute to function properly before the bundle impacts the ground thus destroying the load.

3. Only the IP to DZ needs to be a straight corridor of airspace. The descent from altitude can be done off axis IOT minimize airspace requirements.

4. Aircraft will usually drop as low as chute function allows IOT increase accuracy.
   a. AD platforms using GPS guided delivery systems (JPADS or SHERPA) will not descend to low altitudes. They will remain at 10,000 ft or higher, but cargo is delivered within an allowable distance (wind and chute dependent) from the desired PI.
(5) Cargo fall
   (a) There is a safety zone built around the DZ as discussed above. Air Officers should, however, strive to keep ground units and other collateral concerns outside of the IP to DZ run-in heading and along the same line beyond the DZ.

1. Although seldom occurring, there are circumstances on-board the aircraft which prevent the chute from functioning properly leading to early drops, drops without the chute opening and late drops.

(6) DZ Marking
   (a) USMC KC-130 aircraft drop on the coordinates of the DZ given in the request. They verify the coordinates of the DZ by cross checking it with the ground mark to ensure proper location.

(b) Zone marking can be offset, but this needs to be coordinated prior to the aircraft dropping.

1. Night mark: IR strobe, 3-4 chem. stick bundle
2. Day mark: Air Panel, smoke (which will also help with aircrew wind estimation)
3. An effective TTP for marking is a 35 by 35 foot letter indicating the center of the zone. Usually an ‘A’ or ‘T’ with the long axis of the letter indicating the wind direction.
4. FW, RW, or ground IR sparkles are also effective methods to mark a Point of Impact (PI).
5. The mark cannot be personnel operated (i.e. a IR buzzsaw) as the cargo doesn’t discern between the ground and personnel like an aircraft could during landing.
6. If there are personnel or vehicles in the DZ or within the potential hazard area, the aircraft will not drop.

d. JFIRE has a standard for DZ briefing, but there are four primary pieces of information the aircrew need:

(1) Airspace clear
(2) Zone marking
(3) Surface winds
   (a) See 1002.e.1 for wind information
(4) Clearance to drop
   (a) There is no specific doctrinal term associated for this clearance.
(b) “Cleared to drop” or “Drop approved” are accepted terms.

(5) Communications can be on any net. TAD has, however, shown to work well and increase SA of all players. Ensure the net chosen is coordinated prior to mission.

(a) No-communication drops can be performed, but more coordination must be done prior and:
   1. Mark must be on the point of impact and not offset
   2. No mark will result in no drop
   3. If using 35 by 35 foot letter as mark, a Tactic, Technique and Procedure (TTP) is to scatter the letter to communicate that the aircraft is not approved to drop.

  e. Other Considerations:
     (1) Winds
        (a) Some parachutes have surface wind limits as low as 13 knots. Contact the supporting squadron or the supporting Air Delivery platoon for increased SA on which chute is being used and its limitations.
        (b) Even light winds affect the aircraft’s drop solution a great deal. Providing precise surface winds greatly assist accuracy. Provide direction the winds are coming from and magnitude. Example: “Winds 150 at 10”.

     (2) Chute
        (a) Chutes are a limiting factor in two ways.
           1. Availability:
              a. Most parachutes are reused which makes recovery a necessity. Some newer parachute systems are designed for one time use. Ground personnel should make every effort to return the required assets (chutes, pallets, etc.) in a timely fashion.
           2. Type:
              a. Different chutes have different limitations WRT winds, altitudes and weight capacity. These can be obtained through discussion with the supporting squadron or supporting Air Delivery Platoon.

        b. Cargo needs to be appropriately matched to a parachute. Excessive sink rates can severely damage the delivered cargo. Cargo parachutes are classified as high and low velocity. High velocity parachutes can be dropped in much higher winds, are more precise, and more appropriate for loads such as MREs. Low velocity parachutes have lower wind limits and more variability in design which decrease accuracy. They are appropriate for fragile loads such as water bottles.

     (3) Air Delivery Platoon resides in the supporting logistics element. These personnel are trained to:
        (a) Survey and certify Drop Zones
        (b) Determine how cargo pallets / bundles will be built
        (c) Determine what chute is used. Ground units requesting AD support and the squadron supporting the mission have little to no control over what chute will be used.
        (d) The AD Platoon will also normally provide the Drop Zone Safety Officer (DZSO) and the Drop Zone Controller (DZC).

        e) AD platoon personnel are the link between the logistic chain and the supporting squadron. This is another reason for the S-4 and the Air Shop to develop a solid working relationship.

     (4) USMC Aircraft can drop in Instrument Meteorological Conditions (IMC) and Low Light Level (LLL) as long as geometry is supportable to ensure aircraft safety and a safe drop can be made.

     (5) Supporting squadrons can execute multi-plane drops to increase efficiency WRT ground support personnel work and aviation asset mission flow. Aircraft separation across the DZ will generally be no less than 15 seconds for multi-plane missions.

  f. References
     (1) AFIs, such as AFI 13-217 Drop Zone and Landing Zone Operations, govern all Department of Defense (DoD) AD missions. USMC AD platforms are not ruled by these instructions, but operating within
their guidelines is desirable. They will deviate IOT better support the GCE or requesting unit within safety parameters and mission requirements.

1002. CASEVAC and MEDEVAC

1. MEDEVAC v. CASEVAC:
   a. MEDEVAC is defined as the movement of patients using designated tactical or logistic assets that are temporarily **equipped and staffed with medical attendants for en route care** (MCRP 4-11.1G).
      (1) Provided Geneva Convention protection
   b. CASEVAC is defined as the unregulated movement of casualties that includes movement both to and between Medical Treatment Facilities (MCRP 4-11.1G).
      (1) No Geneva Convention protection
   c. Ground units should strive to coordinate MEDEVAC vice CASEVAC whenever available aviation assets allow. If no MEDEVAC plan or MEDEVAC assets are available, ground unit planners must develop and appropriately staff a CASEVAC plan.
   d. Definitions / description of 9 lines and Z-MIST
**CASEVAC REQUEST**

| LINE 1. | Pick up site: GRID Coordinates ______________________________ |
| LINE 2. | Pick up site: Freq and C/S __________________________________ |
| LINE 3. | Number of patients by precedence: |
|         | # of A – Urgent (1 hr) |
|         | # of B – Urgent Surgery (1hr) |
|         | # of C – Priority (4-6 hrs) |
|         | # of D – Routine |
|         | # of E – Convenience |
| LINE 4. | Special equipment needed by Patients: |
|         | A - None C - Extractor equipment |
|         | B - Hoist D - Ventilator |
| LINE 5. | Number of patients by Type: |
|         | # of L – Litter |
|         | # of A – Ambulatory |
| LINE 6. | Security at Pick up site (tactical) |
|         | N – No enemy |
|         | P – possible enemy troops |
|         | E – Enemy troops (caution recommended) |
|         | X – Enemy troops (armed escort recommended) |
| LINE 7. | Marking at P/U site: Day/Night |
|         | A – Panels (color) |
|         | B – Pyrotechnics (color) |
|         | C – Smoke (color) |
|         | D – None |
|         | E – Other |
| LINE 8. | Patient Nationality and Status: |
|         | A – US Military |
|         | B – US Civilian |
|         | C – Non US Military |
|         | D – Non US Citizen |
|         | E – EPW |
| LINE 9. | NBC Contamination: N – Nuclear B – Bio |
|         | C – Chem D – None |
| **Z-MIST:** | |
|         | Zap Number. Patient information: First Initial, Middle Initial, Last Name, Last 4 SSN, Blood type |
|         | M- Method of Injury (GSW, IED, Stab, Shrapnel, etc) |
|         | I- Injury sustained (Laceration, Break, etc) |
|         | S- Symptoms (Consciousness, Pulse, Heartbeat, bleeding) |
|         | T- Treatment given (Tourniquet, Pain Relief, CPR, ETC.) |

**Figure 1-3**

**Note**
Some theater or area of operation SPINS and SOPs might modify line 9 in a theater or AO where no known NBC / CBRN threat exists.

**1003. LZ and ITG Considerations**

1. **LZ**
   a. **Configuration**
      1. Location
         a. Military Grid Reference System (MGRS) or LAT/LONG
      2. Size
Table 1-4

<table>
<thead>
<tr>
<th>TYPE</th>
<th>LZ SIZE (LxW)</th>
<th>OTHER CONSID.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SINGLE</td>
<td>SECT. (2 A/C)</td>
</tr>
<tr>
<td>CH-53</td>
<td>200' X 300'</td>
<td>300' X 400'</td>
</tr>
<tr>
<td>CH-46</td>
<td>100' X 100'</td>
<td>200' X 200'</td>
</tr>
<tr>
<td>MV-22</td>
<td>160' X 180'</td>
<td>310' X 330'</td>
</tr>
<tr>
<td>UH-60</td>
<td>100' X 100'</td>
<td>200' X 200'</td>
</tr>
<tr>
<td>UH-1</td>
<td>75' X 100'</td>
<td>150' X 150'</td>
</tr>
<tr>
<td>AH-1W (escorts only)</td>
<td>75' X 100'</td>
<td>150' X 150'</td>
</tr>
</tbody>
</table>

(3) Soil composition of landing surface
   (a) Risk of brown-out (dusty landing) / White-out (snow)
(4) Elevation in feet MSL
(5) Hazards
   (a) Obstacles
       1. Surrounding trees, buildings, poles, power lines etc
       2. Micro-terrain, stumps, holes
       3. Unsecured Manmade and natural debris
          a. CH-53s and MV-22s will, as a reference, move unsecured small aircraft
(6) Slope
   (a) In general, any slope of five degrees or less will not be an issue for USMC Assault support aircraft. If slope of landing zone is obviously more than five degrees, effort should be made to locate a different zone or brief the aircrew during the LZ brief.
(7) Ingress and Egress corridors
(8) Friendly and threat positions
   (a) Ingress and Egress route based on threat or recent threat activity
   (b) Sectors of fire
   (c) Fire Support Coordination Measures (FSCMs)
      1. RFAs, NFAs, ROZs
(9) Landing sites and points (If applicable/necessary)
(10) Winds: **AIRCRAFT WILL ALWAYS WANT TO LAND INTO THE WIND**
   (a) Prevailing for long term LZ
   (b) Current for Hasty
(11) Wave-off direction
b. Control
   (1) Who
      (a) Air Officer, FAC, JTAC, Joint Fires Observer (JFO), FAC(A), GCE leader
   (2) Frequency
   (3) Call-sign
   (4) When to switch LZ Control
      (a) Communication Check Point (CCP) in Air Assault Operations
      (b) As required, necessary or told for coordination in assault support
   (5) No communication plan
   c. Brief
      (1) The format below represents a simple and useful tool to inform aircraft about a particular zone. If more information is necessary to ensure aircraft has an appropriate level of situational awareness, it should be included. The below format should not preclude a conversation or plain language dialogue from
occurring in order to ensure ground personnel and aircrew know exactly what needs to occur and why (i.e. threat).

(2) Transmit as applicable

<table>
<thead>
<tr>
<th>- ZONE LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>- GEOGRAPHICAL FEATURE, CHECKPOINT, GRID, ROAD INTERSECTION, ETC</td>
</tr>
<tr>
<td>- MARKED BY</td>
</tr>
<tr>
<td>- AIR PANEL, BUZZSAW, CHEM LITES, IR STROBES, SMOKE, TALK-ON, ETC</td>
</tr>
<tr>
<td>- OBSTACLES</td>
</tr>
<tr>
<td>- POWER LINES, TREES, ETC</td>
</tr>
<tr>
<td>- INCLUDE HEIGHT OF OBSTACLE</td>
</tr>
<tr>
<td>- WINDS ARE FROM: ________________</td>
</tr>
<tr>
<td>- TELL AIRCRAFT WHICH SUBCARDINAL HEADING WINDS ARE BLOWING FROM</td>
</tr>
<tr>
<td>- INCLUDE EST SPEED IN KNOTS OR EST. STRENGTH SUCH AS STRONG OR LIGHT</td>
</tr>
<tr>
<td>- FOR REFERENCE, 1 KNOT EQUALS 1.2 MPH</td>
</tr>
<tr>
<td>** AIRCRAFT WILL ALWAYS WANT TO LAND INTO WIND**</td>
</tr>
<tr>
<td>- FRIENDLIES</td>
</tr>
<tr>
<td>- DIRECTION DISTANCE FROM LZ AND ORIENTATION</td>
</tr>
<tr>
<td>- ENEMY</td>
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<tr>
<td>- DIRECTION DISTANCE FROM LZ AND ORIENTATION</td>
</tr>
<tr>
<td>- MOST RECENT ACTIVITY AND TYPE</td>
</tr>
<tr>
<td>- REMARKS</td>
</tr>
<tr>
<td>- DIMENSIONS AND SLOPE OF LZ</td>
</tr>
<tr>
<td>- WHERE TO LAND IN REFERENCE TO THE MARK</td>
</tr>
</tbody>
</table>

Figure 1-5

Example “Dust-off 01, LZ Location NU 123 456, marked by smoke. There are power-lines 400m north running east to west. Winds are from the North at 5 knots. Friendlies located 20m west of the smoke. LZ will be dusty with possibility of brown-out.”

(3) During time constrained operations, only transmit LZ Name/Location (if multiple), ITG (if applicable), Winds and clearance to land.

2. ITG
   a. General:
      (1) The recommendations below should not preclude personnel from using other means of ITG as long as the method used can cue the aircraft to the LZ.
      (2) Regardless of ITG type used, LZ personnel must ensure the ITG is secure. Assault support aircraft, esp. CH-53E and MV-22, create significant rotor downwash and will blow unsecure items, including the ITG, away creating debris hazard for ground personnel and aircraft.
   b. Far ITG: Orient the flight to the LZ location from greater distances as they are inbound. In certain environments, aircraft may need direction or signal to identify the zone from the air. The below represent examples of Far ITG.
      (1) Day: Pyrotechnic devices, star parachutes, illumination flares, signal mirrors, and radio communication
(2) Night: IR strobe, IR sparkle, Chemlite buzz saw, visible light, pyrotechnic devices, star parachutes, illumination flares and radio communication.

**CAUTION**

Visible light and pyrotechnic devices should not be used when aircrew are operating on Night Vision Goggles (NVGs). Visible light, as from a vehicle light, or the effects of pyro will cause the aircrew's NVGs to degain, effectively blinding the aircrew while they are in a critical stage of flight. Every effort should be made to use NVG compatible lighting in and around the LZ.

**NOTE**

IR Pointers are also used to mark targets for destruction. For this reason, an IR sparkle shall be used only by briefed personnel working with briefed aircrew who all understand the communication and signal plan. IR sparkles should never be held steady on an LZ, but moved around the LZ as if the operator were "snaking" the LZ.

**CAUTION**

Modern IR sparkles are typically Class IV LASERS and are not eye safe. Operators shall never aim the IR sparkle at personnel.

c. Near ITG: Designed to mark actual landing points within the site or zone. Special consideration should be given to ensure the LZ planners are familiarized with the sizes of each T/M/S and the associated rotor arcs. See figure Table 1-4.

(1) Day: Smoke, VS-17 "Air" Panel

(2) Night: Chem. stick buzz saw, IR chem. stick "NATO Y" on the ground and radio communication. See figures 1-6 for "Y" lay-out.

Note 1: Chem. sticks are a valuable ITG tool. A very basic understanding of night optics and aircraft safety considerations is necessary for successful usage. In general, blue and green chem. stick cannot be seen by aircrew using night vision goggles. If absolutely necessary, ground personnel can utilize these colors, but should inform aircrew. Putting the chem. stick, whatever the color, in a plastic water bottle filled with water will greatly enhance its visibility to aircrew. The bottle also offers a means to anchor, tie, stake, etc the chem. stick to the ground so aircraft do not blow the chem. stick / bottle away. If marking hazards with chem. sticks, all efforts should be made to place landing point chem. stick in a discernable formation, “Y” per figure 1-6.
Note 2: Figure 1-6 represents the 86% solution. Aircraft will generally land in the open end of the “Y” with the long axis extending in front of the aircraft. Different T/M/S might need to land differently based on mission and visual references required for landing in a particular zone. The above represents how USMC RW aircrew desire to land.

3. Figure 1-7 represents a potential lay-out for a hasty LZ ISO a CASEVAC, Emergency re-supply or extract. It does not preclude the necessity of deliberately planning an LZ ISO long term Forward Operating Base / Combat Outpost operations or air assault operations.

![Figure 1-7](image)

a. It requires the aircraft or its escort to provide security on the far side of the landing zone while ground personnel are responsible for security on their side of the zone.
   (1) This prevents ground personnel from being separated, trying to provide 360 degree security, without communication.
   (2) It also enables the LZ controller to have more positive control of personnel to ensure the landing zone is clear.
   b. Refer to Note 2 above WRT landing direction per T/M/S.

4. See Appendix A for LZ marking and ITG kit recommendations

1004. Battlefield Illumination

1. Battlefield Illumination (Bl) may aid the GCE, ACE or LCE in target acquisition, PZ or LZ acquisition, and ground scheme of maneuver. It must be approved by the Ground Commander. During planning, Bl employment must be coordinated with the Fire Support Coordinator (FSC). Additional considerations of wind, terrain, and enemy surprise must be accounted for in the illumination plan. Refer to MCRP 3-16A, JFIRE or appropriate SME for illumination ammunition information.
2. BI should be offset so that the illumination is not over friendly position and aircrew are not looking into the illumination as they make their landing or attack. It is important to take into account the winds and terrain when planning / employing illumination. Additionally, the element of surprise is gone with the ignition of the first illumination round. Ensure the illumination plan provides another source of illumination before the current illumination burns out.

3. BI may be controlled via attack briefs (9-line or 5-line) or with no attack brief using plain language. Either method will support the fire approval process and are familiar to aircrew. Utilizing an attack brief would require a “Cleared hot/cleared to engage” while “Approved sunshine” will be used for plain language. For attack briefs, game plans can include duration and/or type of illumination or may be more specific as necessary. Reference JFIRE for a potential way of doing it.

4. All air delivered illumination has cannisters / rocket motors that will continue downrange that must accounted for during the clearance process. Aircrew should be contacted for specifics details on the illumination being employed. The spent 2.75” rocket motor will impact the ground between 700 and 1000 meters beyond the target along the trajectory of the rocket.
Chapter 2: Close Air Support (CAS)

2000. CAS Planning Considerations

1. Joint Terminal Attack Controllers (JTACs), Forward Air Controllers (FACs), and Forward Air Controllers – Airborne (FAC(A)s) must conduct extensive pre-mission planning in order to properly prepare for the management of aviation assets and the execution of close air support. The following paragraphs provide amplification to the in-depth CAS planning considerations found in JP 3-09.3 Ch III. The generic term “JTAC” is used throughout.

2. Airspace Management
   a. JTACs must be familiar with the airspace structure that they will be working with. Depending on the tactical situation, JTACs may have varying levels of control over the routing and placement of CAS assets.
   b. CAS Holding Plan – JTACs must have a plan for arriving CAS assets, both pre-planned and immediate.
      (1) This holding plan should balance:
         (a) Surface to air threat
            1. Threat must be taken into account when considering CAS holding plan. The threat condition may be different for fixed and rotary wing assets within the same target area. Ref. MCRP 3-16.6 JFIRE and AFTTP 3-1 for max effective ranges of surface-to-air systems.
         (b) Aircraft sensor acquisition capabilities
            1. Sensor and visual acquisition capabilities are increased as aircraft are held closer to the target. This, however, must be balanced with the surface to air threat and whether or not a covert presence is desired by the supported unit.
         (c) Expected ordnance selection and employment profile
            1. JTACs should consider the employment profile of ordnance they expect to use from a CAS element when planning holding. For example, if a JTAC plans on using a specific fixed wing section to strafe, that section should be placed at the bottom of the CAS stack to facilitate diving deliveries.
         (d) Aircraft time on station
            1. Fixed wing aircraft may provide more time on station when assigned higher holding altitudes due to decreased fuel consumption, but higher altitudes also tend to decrease sensor acquisition capabilities.
      (2) Fixed wing holding rules of thumb
         (a) Section, day - no less than 1000’ block
         (b) Section, night - no less than 2000’ block
         (c) 1000’ between sections minimum
         (d) Holding altitudes between 13,000’AGL to 20,000’AGL are a good compromise between MANPADS threat avoidance, sensor acquisition, level-laydown employment altitudes, and minimizing visual and aural signatures
         (e) Contact points (CPs) and initial points (IPs) should be planned to allow CAS attack geometries that support the ground scheme of maneuver.
         (f) The Keyhole Template is a useful method for constructing hasty IPs. If, however, there is time to conduct deliberate planning, traditional CPs and IPs should be created and included in the Airspace Control Order (ACO).
      (3) Rotary wing holding rules of thumb
         (a) Holding areas (HAs) should be planned at least 2km by 2km for a section, and 3km by 3km for more than a section.
(b) Multiple elements of rotary-wing CAS should be de-conflicted laterally, not stacked in HAs and BPs.

(c) Battle positions (BPs) should be planned to facilitate expected final attack headings for PGMs. Rockets and gun attacks will normally occur forward of the BP. Similar to FW aircraft moving from CP to IP and inbound to target to meet approved TOTs, RW aircraft will move from HA to BP and inbound to target to meet approved TOTs per the attack brief.

(d) HAs and BPs should be planned to encompass airspace up to 3k’ AGL.

(e) Terrain must be considered for rotary-wing line-of-sight communications.

4. TR Holding
   (a) Recommend holding TR aircraft 5nm legs at the last check point prior to the IP.
   (b) If a stack is necessary, TR aircraft will hold above other assault support aircraft.

5. Unmanned Aircraft Systems (UASs)
   (a) May be assigned a single holding altitude or 1k’ block
   (b) RQ-7 Shadows should be held in an ACA of at least 3km by 3km
   (c) UAS ACAs can be placed above RW HAs / BPs

6. When designing a CAS holding plan, the AGL and MSL altitudes must be de-conflicted. RW assets prefer holding instructions in AGL, FW and UAS should be in MSL. Planners must ensure that AGL and MSL holding altitudes do not conflict with each other.

**2001. JTAC actions for developing CAS brief** – The following steps are actions a JTAC should accomplish to prepare for a CAS attack, starting with target information and working backwards. This sequence allows the JTAC to build a game plan, CAS brief, and remarks / restrictions in a logical order. Each step, however, may affect the other. For instance, SEAD requirements may influence game plan development.

1. Develop targeting data
2. Develop game plan
3. Determine / coordinate mark / terminal guidance requirement
4. Develop attack geometry
5. Determine SEAD requirements / SEAD plan

1. **Develop Targeting Data** – Planning for a CAS attack should begin with the target. In order to properly request and plan for CAS, the JTAC must first have a sufficient target location and description, friendly position, and the commander’s desired effects on the target.
   a. Target Description (line 5) – Type, composition, disposition
   b. Target Elevation / Location (lines 4,6) – The accuracy of the target elevation and location must be considered. Further refinement may be required in order to achieve the commander’s desired effects.
   c. Direction / Distance from nearest Friendly position (line 8) – When developing line 8, it must be considered that the observer / JTAC is not always the closest friendly location to the target.
   d. Ensure air is requested – Assuming the commander / FIST leader desires to engage the target with air delivered fires, the decision to request CAS assets should not be delayed due to the transit time often required for CAS assets to arrive on station. The above information (target description and location and friendly location) is generally sufficient to start the joint tactical air strike request process.

2. **Develop Game Plan** – While the game plan should be briefed in the T,M,O,I format, developing the game plan elements in the following order provides a logical flow working backwards from the target.
   (1) Determine ordnance or desired effects
   (2) Select Method of Attack
   (3) Select Type of Terminal Attack Control
(4) Determine aircraft interval if appropriate
   a. If the JTAC is planning on using more than one element (coordinated attack, 3rd party contributor) in a CAS attack, he should consider issuing an overall game plan prior to issuing individual game plans.
   b. JTACs should also plan for allocation of the multiple sensors that may be available for a CAS attack. Non-employing aircraft may be tasked to provide surveillance of areas of the target that the JTAC cannot observe. See para. 2012 for more discussion of sensor allocation.
   c. Select Ordnance
      (1) The JTAC should choose the best available weapon to achieve the commander’s desired effects. This will be dependent to the type of CAS asset that the JTAC is expecting. By starting game plan development with ordnance, the JTAC will be better able to determine the appropriate method of attack and type of control (if the JTAC has been given the authority to choose type of control).
         (a) During deliberate, pre-mission planning JTACs should develop a weaponeering plan to attack expected target sets using expected ordnance. The results of this process will allow the JTAC to quickly determine the best ordnance during game plan development. See MCRP 3-16.6 JFIRE for weaponeering guide.
         (b) When selecting ordnance or effect for Type 3 control, JTACs should give maximum flexibility to aircrew for ordnance selection in order to allow them to meet commander’s intent (per TPL, etc). This could be transmitted as an effect or as a restriction of certain types of ordnance, etc, but should be succinct so as to not repeat information passed later. Additional information may be passed in remarks and restrictions or post correlation as necessary.
      (2) JTACs should consider fusing as part of their weaponeering decision. If there is a question as to the appropriate fusing for a target set, they should plan to query the aircrew after correlation, when the aircrew will have their highest situational awareness to the target.
      (3) When conducting real-time weaponeering, JTACs must have a working knowledge of risk estimate distances (REDs), to include the conditions under which those numbers were derived. Current REDs can be found in the MCRP 3-16.6 JFIRE.
      (4) JTACs must balance the best weapon to target match with collateral damage concerns and commander’s intent. Collateral damage estimate methodology can be found in CJCSI 3160.01 and chapter 8 of this SOP.
   d. Select Method of Attack
      (1) The following recommendations for method of attack are paired to specific weapons types. Under each weapon type, the order of the method of attack is in order of precedence based on a balance of desired effects and time to engage.
         (a) LASER Guided Weapons (LGWs) -
            1. BOC ground-based laser – requires all of the following:
               a. Uninterrupted laser operator line of sight to desired point of impact
               b. Stationary target due to difficulty tracking a moving target with current ground based LASER systems.
            c. Acceptable spot size – Though LASER guided weapons are centroid trackers and can achieve desired effects when the LASER spot is larger than target as long as the LASER spot is centered on target, weapon precision is optimized when the LASER spot is smaller than target. Consider:
               (1) Designator beam divergence
                   (a) To determine spot size in meters, multiply the beam divergence (in mRad) by designator-to-target range (in km). Ex: \(0.3\text{mRad divergence} \times 1.5\text{km range to target} = 0.45\text{m (1.5") spot size}\)
               (2) Range to target
               (3) Target size
            d. LASER marksmanship
(1) Center spot on tactical targets. Spot should be placed 1/3 of the way down from the top of vertically developed targets for LGBs.

(2) Movement of the LASER spot should be kept to an absolute minimum. For LGBs, the last 8 seconds time of fall is especially critical, and movement should be minimized.

(3) Sort priority / downwind to upwind / targets more difficult to acquire

(4) LASER entrapment must be avoided, for example, do not place the LASER spot inside of the mouth of a cave or inside the open portion of a window.

e. Supportable geometry that accounts for the following considerations:
   (1) LASER safety cone
   (2) Podium effect avoided
   (3) Urban Canyon geometry considered
   (4) Winds

2. BOT aircraft self-lase – when BOC ground-lase not supportable

3. BOC airborne third-party LASER - May take precedence over BOT aircraft self-lase if the third-party is correlated prior to the delivering aircraft. This method may take significant coordination.

(b) Inertially Aided Munitions (IAMs)

1. BOC - JTAC is able to achieve target location accuracy sufficient to achieve commander’s desired effect.
   a. JTACs may derive target coordinates and elevation from a number of sources: Computer-based targeting systems, airborne platforms, map plot, observers. The accuracy of each of these sources must be known and balanced with the commander’s desired effects.

2. BOT – Aircrew will acquire the target via onboard sensors

(c) Hybrid weapons – may be guided by LASER and/or GPS-aided INS.

1. GBU-54 LASER JDAM is a weapon that can be employed in GPS only mode, like a JDAM, or dual mode where GPs guidance is used initially and updated by LASER guidance.
   a. BOC – Ground based LASER or GPS only
      (1) JTACs should ensure weapon is dropped with dual guidance capability.
      (2) GPS-only mode. Coordinate accuracy considerations are the same as for IAMs.
      (a) JTACs should ensure weapon is not dropped with dual guidance capability.
   b. BOT – Dual-mode with the aircrew providing LASER energy in the terminal phase for mobile or targets expected to move during weapon TOF. Obscuration and weather considerations for the GBU-54 as are the same as they are for LGBs.
      (1) JTACs should ensure weapon is dropped with dual guidance capability.

2. Griffin and HF employed by KC-130J Harvest Hawk
   a. BOT – Harvest Hawk aircrew acquire the target and employ the Griffin and HF with terminal guidance provided by the Harvest Hawk LASER.
   b. BOC – Griffin is capable of being employed in GPS-only mode for a BOC attack. Coordinate TLE must be considered due to the small warhead of the Griffin. It is not recommended to ground lase for Griffin from Harvest Hawk due to delivery profile. Ground lase of HF is acceptable.

(d) Unguided ordnance

1. Fixed wing
   a. BOT – Recommended method of attack due to the visual or sensor acquisition and cueing methods used for unguided ordnance deliveries.
      (1) JTACs should strive to coordinate a mark that will maximize aircrew’s ability to be “contact,” “tally,” or “capture” in order to maximize effects.
b. BOC – In those cases when the time is of the essence and the JTAC is able to generate target coordinates accurate enough to satisfy the commander’s desired effects, BOC attacks may be utilized. BOC attacks using unguided ordnance will most likely result in a suppressive effect. Miss distance, however, in a BOC attack can approach that of a BOT attack if low TLE coordinates are generated and slant range is reduced (i.e. dive deliveries).

(1) Due to weapon sighting systems, AV-8B aircraft are incapable of conducting BOC attacks using forward firing unguided ordnance (rockets and cannon).

2. Rotary wing
   a. BOT – Due to the weapon sighting systems in current rotary wing CAS platforms, they are required to be “tally”, “contact”, or “capture” prior to employing unguided ordnance.
   b. BOC – H-1s do not employ unguided rockets BOC for purposes other than a mark / illumination IAW H-1 TTPs, aircrew can “self-mark” and adjust off the first rocket employed subject to threat counter-tactics and survivability.

(1) “Venom 66, this is Flamer 14, this will be a Type 2, BOC, one rocket for the mark followed by Type 2 BOT rockets and guns.” A clearance will be given for the BOC mark and then post-correlation, clearance will be given for the BOT attack. Aircraft should be kept out of threat WEZ until correlation is complete.

(2) Theater specific ROE and SPINS may contain guidance regarding method of attack.

   e. Select Type of Terminal Attack Control – The ability to choose the type of terminal attack control should be delegated to the JTAC. JTACs must balance the need for control with maximizing the ability of the attack to achieve the commander’s desired effect.

   (1) JTACs shall be thoroughly familiar with the definitions and requirements for all types of terminal attack control as defined in JP 3-09.3.

   NOTE
   In those cases where all the conditions exist for a type 1 control, the JTAC should still have the discretion to choose the type of control he will use.

(2) Consider the following when selecting the type of terminal attack control:
   (a) JTAC’s ability to acquire and analyze aircraft attack geometry
      1. Aircraft delivery profile
      2. Aircraft visual signature
      3. Environmentals
      4. Weapon flight path
   (b) JTAC location and ability to visually observe target throughout attack
   (c) Need for multiple attacks
   (d) Operational considerations (ex. ROE, SPINs, Theater restrictions)

   NOTE
   As a general rule, all types of control can be used with all types of ordnance and methods of attack. GPS guided weapon attacks, however, cannot be controlled under type 1 control due to the guidance of the weapon system. The JTAC cannot assess the weapon is going to the briefed location based upon aircraft geometry or profile. The weapon will attempt to fly to the entered location regardless of aircraft geometry or profile.

f. Plan Aircraft Interval
   (1) Plan for all aircraft in an element:
(a) Shooter / shooter – all aircraft deliver ordnance

1. Consider which aircraft will attack first. Due to ordnance and sensor capabilities, the lead aircraft may not always be the first to attack the target.

2. The technique of delaying one aircraft’s attack allows the JTAC to assess the effectiveness of the first attack prior to the second aircraft pushing into the target area. This technique is not used for rotary wing attacks due to the mutual defense afforded by section tactics. Rotary wing aircraft will maintain element integrity for any attack that exposes them to the target area, but a sequential attack could be used IOT allow the JTAC to shift, correct, or abort fires for follow-on elements within a RW formation.

Ex: “Razor 53 this will be type 2, bomb on coordinate, one GBU-38v4 off each aircraft, Razor 54, remain at the IP, I will call your push after I assess Razor 53’s hits”

(b) Shooter / cover – one aircraft delivers ordnance and the other provides overwatch

(2) Simultaneous timing:
(a) Advantage: Massed fires, maximizes surprise.
(b) Disadvantage: Unable to adjust second aircraft’s fires to account for lead’s effects.

(3) Sequential timing:
(a) Advantage: Able to adjust, hold in reserve, or abort second attack based on lead’s effects. Allows battlefield obscuration to dissipate when employing LGWs.
(b) Disadvantage: Does not maximize surprise. Allows mobile targets to displace between attacks.
(c) Interval should account for weapon time of fall / time of flight. This allows corrections / aborts to be made prior to the second weapon being released.

(4) For Type 3 controls, JTAC should strive for maximum flexibility for aircrew. Interval will normally not apply and should be left to aircrew discretion.

<table>
<thead>
<tr>
<th>Table 2-1 Weapon Time of Fall / Time of Flight Rules of Thumb</th>
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</thead>
<tbody>
<tr>
<td>Delivery Profile / Ordnance</td>
</tr>
<tr>
<td>Fixed wing roll-in</td>
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<tr>
<td>Fixed wing medium-altitude level-laydown</td>
</tr>
<tr>
<td>Rotary wing Hellfire</td>
</tr>
<tr>
<td>Ordnance</td>
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<tr>
<td>---------------------------------------</td>
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<tr>
<td>Multiple IAMs, Same target</td>
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<tr>
<td>Multiple IAMs, Different targets</td>
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<td></td>
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<tr>
<td>LGBs / IAMs correcting from lead</td>
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<td>LGBs BOC</td>
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<td>LGBs BOT different codes same target</td>
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<td>LGBs BOT same code same target</td>
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<tr>
<td>LGBs BOT same code different targets</td>
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<tr>
<td>LGB / Hybrid &amp; IAM combination BOT</td>
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<td></td>
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<tr>
<td>LASER Maverick</td>
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<td></td>
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<tr>
<td>FW Unguided / Rocket / Strafe</td>
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<tr>
<td>Delaying second attack IOT assess of</td>
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<tr>
<td>effects of first attack (FW or RW)</td>
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*LGB considerations apply to Hybrid*

### RW

<table>
<thead>
<tr>
<th>Ordnance</th>
<th>Timing / Duration of Fires</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PGM (HF / APKWS) BOC</td>
<td>On call</td>
<td>- Driven by the designator’s ability to shift to the next target.</td>
</tr>
<tr>
<td>PGM (HF / APKWS) BOT</td>
<td>Aircraft will de-conflict within the flight</td>
<td></td>
</tr>
<tr>
<td>RW Rockets and Guns</td>
<td>Fires can endure for 30 sec per aircraft</td>
<td>- JTACs should expect a Sec to be IVO obj for 2 min / a Div for 4 min. If JTAC requires something different, it should be addressed in RMKs / Res.</td>
</tr>
</tbody>
</table>

3. Determine / coordinate mark / terminal guidance requirement – (line 7)
   a. BOC –
      (1) No mark required for attacking aircraft. Line 7 is “No mark.”
      (2) If terminal guidance is used for LGWs, Line 7 should state callsign of entity providing terminal guidance with LASER code. Considerations for 3rd party contributor correlation are covered below.
   b. BOT - Line 7 is the mark specific to the attacking aircraft.
   c. BOT and 3rd party contributor correlation:
      (1) 3rd Party Contributor - Due to the expanding technological capabilities of manned and unmanned platforms, weapons, and sensors, JTACs may employ a wide array of 3rd party contributors to aid in target location, precise coordinate generation, terminal guidance, BHA and ISR collection. A 3rd party contributor is any individual who is integral to the success of the CAS attack based on his ability to
provide target location, target marking, terminal guidance, or BHA. Therefore, correlation is also required with 3rd party contributors. A 3rd party contributor may be used to support BOT or BOC attacks. Examples of 3rd party contributors are remote observers (JFO, scout sniper, FiST, etc.), airborne platforms that can provide terminal guidance (LASER equipped UAS, RW, and FW platforms), as well as airborne platforms that can generate target location information or provide target marking.

2. Considerations
   (a) Aircrews generally use a combination of sensors and visual lookout to acquire marks and targets. JTACs should be generally familiar with aircraft sensor capabilities and employ marks that take advantage of those capabilities. For instance, when strafing, a FW aircrew may use a LASER spot tracker (LST) to track a JTAC’s LASER energy, and then create a system target designation to provide cueing to the target in their Heads Up Display (HUD) for visual acquisition.

   1. JTACs must always be prepared for a back-up marking plan. In addition, JTACs must be ready to use marks of opportunity on the battlefield. Anything the JTAC can find to cue aircraft sensors and aircrew eyeballs to the target may be useful as a mark.

   (b) LASER handoff - Using a laser target designator (LTD) to provide energy for an aircraft’s LST. Aircraft LST display provides cueing to aircrew. LTD may be ground-based or from another aircraft.

   1. Advantage
      a. When set up appropriately, LASER-handoffs are often the quickest way to cue an LST-equipped aircraft’s sensors onto a target.
      b. High confidence in target correlation if appropriate geometries are used.
      c. May be used day or night.

   2. Disadvantage
      a. Requires LTD and LST.
      b. Requires coordination and geometry set up to ensure aircraft LST does not track ground LTD. It is strongly recommended to use the standard LASER basket for LASER handoff.
      c. Ground LTD LASER marksmanship is often challenging. Low grazing angles often may cause beam skipping. Spot jitter can also be an issue due to ground LASER operators potentially being under fire.

   3. In order to ensure aircraft LST acquisition of a LASER mark and complete correlation prior to an aircraft arriving at its weapons release solution, it may be necessary to coordinate a target acquisition pass prior to the aircraft beginning its attack run. This is often a factor when employing standoff ordnance. LASER marks may also be used without a target acquisition run. Recommendations for coordinating a target acquisition pass are found in the execution template portion of this document.

   (c) Sparkle walk-on – Walking an aircraft’s IR sparkle onto a target using a verbal commands.

   1. Advantage
      a. Does not require ground operator to expose his position to an NVG-capable enemy.
      b. JTAC has visual confirmation of what the aircrew are correlated on.

   2. Disadvantage
      a. Night only.
      b. Enemy equipped with NVGs may become aware they are being targeted.
      c. Due to differing perspectives it can be very difficult for a JTAC to verbally talk an aircraft’s sparkle onto a target.

   (d) Match Sparkle – directing the aircrew to overlay their infrared (IR) sparkle onto an IR sparkle that is already on the target. Aircrew will be “heads-out” matching sparkles using their night vision goggles (NVGs) and slewing their sensor / sparkle. Aircrew will then look inside to see what is in their sensor field of view.

   1. Advantage
      a. Quick
      b. JTAC has visual confirmation of what the aircrew are correlated on.
2. Disadvantage
   a. Night only
   b. Requires coordination to ensure that aircrew are positioned to acquire the correct end of the IR sparkle
   c. With multiple IR sparkles near a target, it may be difficult for the JTAC to discern if the sparkles are actually on the target due to perspective and “blooming” of NVGs.
   d. When enemy are equipped with NVGs, the use of IR sparkles may expose the operator and/or result in a loss of surprise.

   (e) Ground IR sparkle
   1. Advantage
      a. Quickly gets NVG-equipped aircrew onto target
   2. Disadvantage
      a. Night only
      b. When enemy are equipped with NVGs, the use of IR sparkles may expose the operator and/or result in a loss of surprise
      c. Low grazing angles may cause skipping and spillover

   (f) Video Downlink talk-on
   1. Advantage
      a. Allows JTAC to see the aircraft sensor picture.
   2. Disadvantage
      a. Requires Video Downlink (VDL) receiver

   (g) Target Reference Point (TRP) / Geographic Reference Point (georef) offset
   1. Advantage
      a. Readily available if aircrew are familiar with the TRP or georef
      b. Day or night
      c. Provides a common starting point for talk-ons
   2. Disadvantage
      a. Requires aircrew to be familiar with the TRP or georef.

   (h) IDF mark
   1. Advantage
      a. Day or night
      b. Does not require the JTAC to expose their position
      c. Provides a starting point for talk-ons
   2. Disadvantage
      a. Takes time to coordinate. Coordination with firing agency should begin during CAS planning to ensure timely support.
      b. Accuracy of most indirect fires means that a correction from the mark will generally be required.
      c. Indirect fires must be de-conflicted from CAS assets.
      d. Sensor field of view may be an issue for aircrew using sensors to acquire the mark. If the mark is outside of the sensor field of view, the aircrew will not see it.
      e. Obscuration from IDF marks must be considered when employing LGWs.
      f. Illum. on deck at night will wash out aircrew NVGs.
      g. Sacrifices surprise

   (i) Direct Fire – Use direct fire weapon systems firing at a target to cue aircrew. Tracers or shooting the ground short of a target are techniques that may better cue the aircrew. M203 grenade rounds, especially smoke rounds, can be used very effectively as marks.
   1. Advantage
      a. Readily available
2. Disadvantage
   a. Depending on target composition, direct fire weapons effects may penetrate the target and continue on, i.e. a tank round penetrates a wall and continues on to hit another wall. As the effects may impact beyond the intended target, and out of view of the JTAC, this may lead to confusion between the JTAC and the aircrew as to what is being marked.
   b. Hard for RW to acquire visually during the day. Firing into the ground short of the target may kick up dirt, which may be more visible to the aircrew. This technique must be balanced with the ability to purposely not shoot the target.
   c. Hard for fixed wing to acquire visually day or night. Fixed wing aircrew may be able to see direct fire impacts on their sensors, subject to the impacts being in the field of view.
   d. JTACs should be aware of vertical surface danger zones (SDZs) associated with direct fire weapons and consider this when planning attack geometry.

(j) Talk-on – Generally, a talk-on of some sort will be involved in the correlation process. Talk-ons may also be the only mark available in some tactical situations. Techniques are discussed in the correlation section below.

   1. Advantages
      a. Readily available
      b. Day or night
   2. Disadvantages
      a. Requires practice to be proficient
      b. Differing perspectives may induce confusion
      c. May take significant time to conduct

(k) Link-16 handoff – Aircraft equipped with Link-16 may “hook” a track that has been created on the Link-16 network. This cues aircraft systems to the location of that track.

   1. Advantages
      a. Aircraft enroute to a target area can receive Link information well before checking in with the TACP, allowing them to gain SA early.
   2. Disadvantages
      a. Not all aircraft are Link-16 capable.
      b. Currently, USMC digital CAS systems are not capable of creating a track on the Link-16 network without a gateway.

(l) Radar beacon offset

   1. Advantage
      a. Day or night, all-weather
   2. Disadvantage
      a. Requires radar beacons not commonly carried
      b. Very little aircrew and JTAC training on the uses of radar beacon bombing

(m) Night considerations

   1. Limited visibility and differing perspectives make it difficult to correlate at night. If available, JTACs should consider using advanced optics such as PVS-17s or thermals to increase their capability.
   2. Battlefield Illumination may also be used to illuminate targets. Illumination should be planned to be offset from the target in order to avoid blooming out aircrew NVGs. Reference para. 1004.

(n) Marks of opportunity – anything

4. Develop Attack Geometry – JTACs must consider many factors when determining attack geometry and make an educated compromise amongst these factors.
   a. Final Attack Heading (FAH) size considerations
(1) JTACs should strive to give FAHs that are as large as possible to allow aircrew to maneuver for target acquisition, ordnance delivery and survivability.

(a) Be as permissive as possible and as restrictive as necessary

(2) The following rules of thumb are the minimum recommended FAHs for different types of deliveries. It is possible to assign FAHs that are more restrictive, but doing so may significantly restrict aircraft tactics and probability of success.

<table>
<thead>
<tr>
<th>Type of Delivery</th>
<th>Minimum Recommended FAHs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed wing roll-in dive delivery</td>
<td>30 degrees</td>
</tr>
<tr>
<td>Fixed wing level laydown or bunt / ramp</td>
<td>10 degrees</td>
</tr>
<tr>
<td>Rotary wing rocket and gun</td>
<td>30 degrees</td>
</tr>
<tr>
<td>Rotary wing PGM</td>
<td>10 degrees</td>
</tr>
</tbody>
</table>

b. Final attack headings should not be planned over friendly positions, including occupied HAs, BPs and ACAs.

(1) JTACS should be aware of the off-axis capability of RW platforms. This could mean that RW aircraft are not pointed at target, but the gun is pointed at the target in the briefed geometry. Aircrew should not call "in" if outside briefed geometry / restrictions.

(2) JTACs must be aware of the effects of short or long hits along the bomb-fall line or weapon-to-target line. In general, FAHs should be planned to be as close to parallel to the FLOT as possible. Table 2-4 displays the closest point of approach of bomb-fall line or weapon-to-target line as a function of final attack heading offsets from a line from a friendly position to the target and the friendly position distance from the target.
### Table 2-4

<table>
<thead>
<tr>
<th>Friendly-to-Target Distance</th>
<th>Final Attack Heading Offset from Friendly-to-Target Heading</th>
</tr>
</thead>
<tbody>
<tr>
<td>250m</td>
<td>10° 20° 30° 40° 50° 60°</td>
</tr>
<tr>
<td>250m</td>
<td>43m 86m 125m 161m 192m 217m</td>
</tr>
<tr>
<td>500m</td>
<td>87m 171m 250m 321m 383m 433m</td>
</tr>
<tr>
<td>750m</td>
<td>130m 257m 375m 482m 575m 650m</td>
</tr>
<tr>
<td>1000m</td>
<td>174m 342m 500m 643m 766m 866m</td>
</tr>
<tr>
<td>1250m</td>
<td>217m 428m 625m 803m 958m 1083m</td>
</tr>
<tr>
<td>1500m</td>
<td>260m 513m 750m 964m 1149m 1299m</td>
</tr>
<tr>
<td>1750m</td>
<td>304m 599m 875m 1125m 1341m 1516m</td>
</tr>
<tr>
<td>2000m</td>
<td>347m 684m 1000m 1286m 1532m 1732m</td>
</tr>
</tbody>
</table>

- Closest point of approach of potential of bomb-fall line / weapon-to-target line to friendly position

---

c. De-confliction from other fires – lateral or vertical de-confliction may be necessary if de-confliction through time is not possible

d. LASER geometry

e. Target disposition / orientation
   1. For linear target sets, FAHs should be planned along the long axis of the target set
   2. Movement direction – attack along expected axis of target movement if able
   3. Obstacles
      1. Urban canyon – optimally, plan to attack along urban canyons
      2. Terrain – significant terrain, such as mountains, may influence FAHs due to terrain masking targets or interfering with delivery profiles

f. Weather
   1. Winds – crosswinds >30kts may affect probability of LASER acquisition for LGBs. Priority for LGB FAHs is tailwind, then headwind, then crosswind.
   2. Sun / moon position and angle
      1. FAHs that force an aircraft to attack into the sun, or a bright moon that is low on the horizon, make it difficult for aircrew to acquire targets. This is especially true for FW diving and bunt attacks and RW attacks.
(b) FAHs that allow aircraft to attack out of the sun may provide increased protection from IR MANPADS.

(3) Cloud decks in the target area may affect FAHs.
   (a) JTAC visual acquisition of aircraft
   (b) Aircraft acquisition of the target / mark
   (c) LASER terminal guidance – minimum of 7k’ AGL required

g. Preplanned ACMs / FSCMs / other restrictions

h. Determine IP / BP and Egress plan to support attack geometry (lines 1,2,3,9)
   JTACs should strive to use control points for ingress and egress that do not cause aircraft to have to make inordinately large turns to abide by FAHs

5. Determine SEAD requirement / SEAD plan
   (1) Plan for SEAD when attacking aircraft cannot avoid exposure to a threat based on expected aircraft delivery profile and the threat’s max effective range. Depending on the threat system, SEAD planning may be extremely complicated and require detailed integration with EW systems and fires agencies. Coordination with firing agency should begin during CAS planning to ensure timely support.
      (a) Reference TTECG Battalion Fires Handbook for detailed discussion of aviation and indirect fire integration. Although this is a training handbook, no procedures exist for operational integration. The Battalion Fires Handbook should be used for planning considerations until further study can be accomplished.

   (2) When planning IDF SEAD, the SEAD timeline should be planned to suppress the threat from the first aircraft’s entry into the threat’s max effective range until after the last aircraft’s exit from the threat’s max effective range. If attack geometry does not allow for this, interrupted / non-standard suppression may be utilized.
      (a) Ref. MCRP 3-16.6 JFIRE and AFTTP 3-1 for max effective ranges of surface-to-air systems.

<table>
<thead>
<tr>
<th>Table 2-5 IDF SEAD Timing Equation Rule of Thumb</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDF SEAD duration = time first aircraft enters threat’s max effective range until time last aircraft departs threat’s max effective range</td>
</tr>
<tr>
<td>Assumptions:</td>
</tr>
<tr>
<td>IDF SEAD planned for the portion of the attack that terrain masking and altitude sanctuary are not available</td>
</tr>
<tr>
<td>FW CAS 8nm/min (A-10 6nm/min)</td>
</tr>
<tr>
<td>RW CAS 4km/min</td>
</tr>
</tbody>
</table>

*Example: Fixed wing section conducting an attack with 1 min separation, Threat has 5nm max effective range, threat co-located with the CAS target*

- Assuming 8nm/minute, the lead aircraft will enter the threat range approximately 45 seconds prior to TOT. The second aircraft will exit the threat range approximately 1+45 after lead’s TOT
- Suppression should be planned as non-standard, -1+00 until +2+00, impacting every 30 seconds.

1. Consideration must be given to the ability to de-conflict via altitude. In the above example, based on delivery profile, altitude de-confliction may not be possible if the SEAD target is in close proximity to the CAS target. In this case a non-standard SEAD mission with a gap in the middle may be required. Reference TTECG Battalion Fires Handbook for detailed discussion of aviation and indirect fire integration. Although this is a training handbook, no procedures exist for operational integration. The Battalion Fires Handbook should be used for planning considerations until further study can be accomplished.
(3) IDF SEAD and CAS may both prosecute the same threat, but consideration must be given to obscuration caused by SEAD impacts. Effects of SEAD must not prohibit successful CAS attacks.

(4) EW SEAD – Modern RF threat systems may also require EW support in order to effectively employ CAS, requiring detailed planning and coordination.

(5) Threats may also be mitigated:
   (a) Laterally
      1. Use of standoff PGMs
   (b) Vertically
   (c) Terrain masking
      1. Lock-On After Launch (LOAL) Hellfire
      2. FW pop deliveries

2009. Close Air Support Execution Template (for MIR-to-CAS, see page 51) – By its very nature, the execution of CAS differs in every tactical situation. The following considerations and recommendations are meant to be a guide for USMC execution of CAS, so that both CAS aircrew and JTACs have a standard, repeatable format to expect in the highly dynamic CAS environment. They are meant to augment, not replace, doctrine found in JP 3-09.3. The execution template is a technique used to organize the flow of events from when an aircraft first checks in with a JTAC, through a CAS brief and attack, to when the aircraft checks out.

1. Routing / Safety of flight
2. CAS aircraft check-in
3. Situation update
4. Game plan
5. CAS brief
6. Remarks / Restrictions
7. Readbacks
8. Correlation
9. Attack
10. Assess effects – Execute re-attacks or issue game plans / CAS briefs as necessary
11. BDA
12. Routing / Safety of flight

1. Routing / Safety of Flight
   a. At initial aircraft check-in, AirO / JTAC shall respond with, in order
      (1) Aircraft routing / holding instructions
         (a) Upon initial contact each controller shall at least give “maintain” instructions in order to establish control of aircraft: “Razor 53, maintain Chevy-Dodge 14-15”
            1. If unsure of aircraft’s current position and altitude, JTAC must request this information prior to giving routing / safety of flight instructions in order to avoid potential conflicts:
               a. “Hawg 23 say current pos and altitude”
            2. If using an unbriefed keyhole template for holding, the JTAC must pass the center of the keyhole to the aircraft prior to passing holding instructions. Keyhole template is recommended for FW only.
               a. “Latch 65, point echo is november uniform nine one eight three five seven, proceed Alpha ten, angels 14-16”
      (2) Other aircraft on station
         (a) If no other aircraft, that should be stated
            1. “Latch 65 proceed Chevy-Dodge hold 13-15, you are the only aircraft on station.”
(3) Any other info necessary for safety of flight
   (a) Immediate threats
      1. “Deuce 21 proceed Emily to Adder maintain below 1500’ AGL, there is a ZSU-23-4 vicinity of compound 34, you are the only aircraft on station.”
      2. Significant weather / terrain
   (4) To maintain SA to where aircraft are during routing, JTACs may request status calls from aircrew. Some common calls used to maintain awareness are:

<table>
<thead>
<tr>
<th>Table 2-6 Common Procedural Routing Calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Proceed xxxx and report established”</td>
</tr>
<tr>
<td>“Maintain xxxx”</td>
</tr>
<tr>
<td>“Report passing xxxx”</td>
</tr>
</tbody>
</table>

(5) Routing and safety of flight examples:

“Razor 57 proceed Frog-Gambler angels twenty-five, at Frog-Gambler, descend and hold sixteen block eighteen, report established; you have Latch 65 flight of 2 at Chevy-Dodge thirteen block fifteen, Wildcard 73 in ACA Sony seven to 8k’, and Venom 15 in Betty 2k’ AGL and below; hold your check-in, attack in progress”

“Deuce 23 proceed HA Betty, stay below 2k’ MSL enroute, gun position 12 is hot, gun target line three four zero. You are the only air on station, send your check-in”

2. CAS Aircraft Check-in
   a. JTACs should be directive about when they want the aircraft check-in.
      Ex: “Latch 65 send your check-in”
   b. There may be a reason to delay taking the aircraft check-in: an attack in progress, JTAC not ready to copy, or JTAC waiting for aircraft to contact a different terminal controller prior to passing the check-in.
      (1) JTACs and CAS aircrew should strive to minimize multiple unnecessary check-ins. If the JTAC is planning on passing the aircraft to another controller, consideration should be given to waiting until talking to the JTAC that will be working with the aircraft to give the full CAS check-in.
      Ex: “Latch 65 hold your check-in, attack in progress”
      Ex: “Latch 65, Broadsword 11 will take your check-in once you contact him on Amber”
   c. Authentication – If not using secure communications, authentication should be used to determine if a station on the net is friendly.
      Ex: “Venom 15, do you have Papa Hellfire aboard?”
   d. Depending on the situation, a JTAC may ask for only those parts of the check-in he currently needs.
      Ex: “Venom 15, do you have Papa Hellfire aboard?”
   e. MNPOTTA – CAS aircraft should use the standard CAS check-in format found in JP 3-09.3. The abbreviation MNPOTTA is useful for remembering the order of this check-in.
      (1) Mission number
      (2) Number & type of aircraft
      (3) Position & altitude
      (4) Ordnance
      (a) If not stated by the aircraft, JTACs should ask for the following in order to develop coherent game plans:
         1. LASER code for LGBs / Hybrids
2. Model of Hellfire
3. Bomb fusing options – instantaneous / airburst / delay

(5) Time on station
(6) Type of sensor and capabilities
  (a) If not stated by the aircraft, the following items may be asked for by the JTAC
   1. Video Down-link capability and code(s)
   2. Current sitrep(s) / Pilot Update Codes
   3. Map / Reference graphic version
   4. FAC(A) capability
   5. Sensor type and capability
   6. VMF / Link-16 (Timber)

(7) Abort code (if TAD net is unsecure)

(8) If the JTAC is unfamiliar with any of the aircraft’s capabilities, they should ask questions in plain language at this time in order to avoid developing and issuing unsupportable game plans and CAS briefs.

3. Situation Update
   a. The situation update brief is a tool used to increase all players’ SA to the level required by the tactical situation. The brief must be missionized based on the JTAC’s expectations of the use of the CAS asset. Elements that should be included are: enemy activity, surface-to-air threat activity, friendly situation, remarks, weather and hazards.

   (1) The length and depth of the situation update must be balanced with the need to pass game plans and CAS briefs in order to achieve timely and desired effects. Not all elements must be passed to all aircraft. The objective of the situation update is to build the oncoming aircrew’s SA to the level necessary to conduct the expected mission. Situation updates that are read too quickly, are excessively long, or pass unnecessary information waste time and decrease SA. JTACs should break up the situation update into manageable transmissions using the brevity term “break”. A situation update that is rattled off to aircrews who are just arriving into a dynamic scenario will most likely not be copied. For example, in a situation where the JTAC is in a TIC, has requested air, has done thorough coordination with the fires approval chain, and is simply waiting on aircraft to check-in to execute a BOC attack, the situation update would be relatively short. On the other hand a JTAC giving a situation update to an aircrew who is preparing to conduct urban MIR overwatch of a friendly patrol may require a more detailed brief.

   (2) Pilot Update Codes (PUC) - Situation updates may be given alphanumeric identifiers and passed from the Air Officer to the DASC. The DASC will then pass these PUCs to CAS aircraft, allowing for higher aircrew SA upon check-in, and alleviating the need for the JTAC to pass a full situation update. Changes to the PUC may be passed by the AirO or JTAC as aircraft check on station. If appropriate, JTACs may pass specific AO situation updates as well.

   b. Format - TEFACHR is a format that may be used to pass situation update information from controller to aircrew. Not every line of TEFACHR must be passed in every situation, only those lines that apply should be passed. TEFACHR is also a format recognized for battlefield handover (BHO) between terminal controllers (i.e. JTAC to FAC(A)). The TEFACHR format should be missionized and only those items required to accomplish the expected mission should be passed. Passing redundant or non-essential information increases time-to-kill and should be avoided. The following table points out differences in how TEFACHR should be used for a CAS situation update vs a BHO to a FAC(A).
# TABLE 2-7 TEFACHR Recommendations

<table>
<thead>
<tr>
<th>Sit Update Line</th>
<th>CAS Situation Update</th>
<th>Battlefield Handover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threat</td>
<td>- General locations of surface to air threats not already covered&lt;br&gt;- Time of last observed surface to air fires may also be passed</td>
<td>- General locations of surface to air threats not already covered&lt;br&gt;- Time of last observed surface to air fires may also be passed</td>
</tr>
<tr>
<td>Enemy Situation</td>
<td>- General enemy disposition&lt;br&gt;- Avoid giving a list of grids. Specific targets and locations will be addressed in CAS briefs</td>
<td>- General enemy disposition&lt;br&gt;- Include GCE targeting priorities&lt;br&gt;- Include target location grids, may require breaking up the transmission&lt;br&gt;- GCE Attack Guidance Matrix (AGM) and Target Priority List (TPL)</td>
</tr>
<tr>
<td>Friendly</td>
<td>- General friendly situation and scheme of maneuver&lt;br&gt;- Use georefs, phase lines, checkpoints etc. Technique is to use general terms: <em>all friendlies are east of the 94 easting</em>&lt;br&gt;- Friendly grids should not be passed if it can be avoided. If necessary, use no more than 6 digits.&lt;br&gt;- Should include all friends that may be a factor during TOS, not just JTAC.&lt;br&gt;*- Include all CAS assets, ordnance, and TOS remaining for BHO</td>
<td>- Firing unit location, callsign, frequency, status</td>
</tr>
<tr>
<td>Artillery</td>
<td>- IDF assets that may be a factor during TOS, may include location/direction of fire</td>
<td>- Firing unit location, callsign, frequency, status</td>
</tr>
<tr>
<td>Clearance Authority</td>
<td>- May be omitted if the speaker has control.&lt;br&gt;- If there may be confusion due to multiple voices on TAD, roles should be clarified: <em>Broadsword 11 has control and is located in the COC, my JFO callsign Mustang is located with Charlie company, and is up this net</em>&lt;br&gt;- Define who has which elements of brief, stack, mark, and control&lt;br&gt;*- If not already pre-briefed, a game plan for the approval of fires should be passed for BHO</td>
<td></td>
</tr>
<tr>
<td>Hazards</td>
<td>Towers, MSA, Weather- to include surface winds, etc. JTAC should request winds aloft for LGB geometry development.</td>
<td></td>
</tr>
<tr>
<td>Remarks &amp; Restrictions</td>
<td>- Additional radio calls that will be included for the whole TOS.&lt;br&gt;- JTAC capabilities (LASER, IR sparkle, VDL, etc)&lt;br&gt;- Intent for aircraft (CAS, MIR, etc)&lt;br&gt;- Other remarks</td>
<td>- Additional radio calls that will be included for the whole TOS.&lt;br&gt;- Other remarks&lt;br&gt;- At the conclusion, a positive passing of the appropriate elements of brief, stack, mark, and control should occur</td>
</tr>
</tbody>
</table>

## Example Situation updates:

**CAS:** “Current surface to air threat is an unlocated ZSU 23-4, last seen west of MSR 5, Enemy situation is a light armored company attempting to flank us to the north and two companies dug in three klicks to our west, break”

“Friendly are two companies in the vicinity of OP 2, one on the high ground, and the other in a blocking position to the east. I am with the company on the high ground. There is also a STA team at the northwest tip of Blue Mountain, 81mm mortars are firecapped south of OP 2, firing generally northwest, break”

“Winds on the deck are 15-20 knots out of the north west, I have a videoscout, but no LASER, request in with a heading for all type 2 controls, I plan on using you to disrupt the light armor, say winds aloft and advise when ready for game plan”

**MIR for a patrol with JFO:** “Current threat is MANPADS, we had two shots from sector Juliet yesterday at a Huey. Enemy situation is in insurgents throughout the town, break.”

“Friendly is located per the CONOPs, with the addition of two squad-sized patrols, one currently on Yankees, with a JFO callsign Mustang 3, the other on Cubs, with a JFO callsign Mustang 4, break.”

“I am located in the COC and have control, but you can expect to hear Mustang 3&4 up this net, advise when ready for reconnaissance tasking”
4. **Game plan** – A concise and SA enhancing tool to inform all players of the flow of the following attack. Avoid repeating information that will be given in other parts of the attack brief / remarks / restrictions.

   a. If there are questions regarding aircraft capabilities, ordnance, tactics etc, these should be cleared up using plain language prior to issuing the game plan to avoid injecting confusion via an unsupportable game plan or CAS brief.

   b. “Individual” game plans are used for attacks involving a single element. When conducting coordinated attacks, an “overall” game plan should be issued to all players, followed by individual element game plans as appropriate.

   c. **Individual element game plan**
      
      (1) “**Latch 65 advise when ready for game plan**”
      
      (2) TMOI*
         
         (a) Type of control
         
         (b) Method of attack – BOC or BOT
            
            1. Type 1 is always BOT
         
         (c) Ordnance / effect requested
            
            1. For BOC LASER guided weapon attacks the callsign of the third party lasing platform may be given
            
            2. Fuzing – instantaneous, delay, airburst may be requested here
         
         (d) Interval
            
            1. Should always be included for FW attacks
            
            2. For RW attacks, the interval might / might not apply. Ref. Table 2-2.

         Ex: “**Deuce 21, this will be a type 1,bomb on target, with your guns only, sequential attacks, advise when ready for 9-line**”

         Ex: “**Latch 65, this will be type 2, bomb on coordinate, one GBU-12 off each aircraft with Deuce 21 LASER, instantaneous fusing , 2 minute spacing, advise when ready for 9-line**”

         Ex: “**Venom 15, this will be type 3, bomb on target, destruction, advise when ready for 9-line**”

   d. **Coordinated attack**
      
      (1) An “overall” game plan to should be given to all players as an SA-enhancing way to frame a complicated engagement.

         Ex: “**Latch 65 and Venom 11, in order, advise when ready for overall game plan**”

         (a) Using the term “in order” establishes the order the aircrew should respond to the JTAC’s calls, establishing good comm cadence. In the above example Latch 65 should roger up prior to Venom 11. This cadence order should match the order the JTAC is planning on executing the attack.

      (2) The overall game plan should include the following information

         (a) Type of coordinated attack
            
            1. Combined
            
            2. Sectored
            
            3. Simultaneous
            
            4. Sequential
         
         (b) Flow of attack
            
            1. If combined, the order and separation that the elements will use.
            
            2. If sectored, which general target area each element will be responsible for.
         
         (c) “**C/S , type of coordinated attack, sequence / geo area, advise when ready for game plan**”

         Ex: “**Razor 55 and Deuce 23, this will be a combined sequential attack with Razor flight attacking first, followed by Deuce 23 two minutes in trail of Razor 56’s impacts, Razor 55 advise when ready for game plan**”
Ex: “Latch 65 and Venom 11, this will be a sectored simultaneous attack, Latch 65 to the east, Venom 11 to the west; Latch 65 advise when ready for game plan”

(3) The JTAC should read an element’s entire individual game plan, CAS brief, and remarks / restrictions prior to the second element’s game plan in order to maintain good comm cadence. By giving the overall game plan first, all aircrew should be paying attention to the game plans and CAS briefs given to other elements.

(a) If both elements are attacking the same target (combined attack), the JTAC has the option of issuing a CAS brief to the first element, and simply issuing changes to the CAS brief for the second element.

(4) When briefing coordinated attacks, the JTAC may state “Hold all readbacks” in the remarks portion of each CAS brief so the JTAC transmits briefs for all elements prior to receiving readbacks. The JTAC should then request readbacks when he is ready. The JTAC may also get readbacks immediately following the attack briefs to each element if this better fits his habit pattern.

e. 3rd party airborne lasing - When using an aircraft outside the delivering element to host a LASER guided weapon, the JTAC may include the lasing entities callsign in the game plan.

(1) Airborne platforms providing LASER to other elements requires detailed coordination among all players. USMC templates are provided below. JTACs shall also ensure they correlate with the lasing platform.

Ex: “Razor 55 and Venom 11, type 2, bomb on coordinate, 1 GBU-12 from Razor 55, Venom 11’s LASER, code 1688, advise when ready for 9-line”
FIGURE 2-1 Fixed Wing Lase for Rotary Wing Hellfire Template

**LOAL Shot**
JTAC correlates target with FW
FW: “Latch 61 captured 1112 set”

JTAC: Pass 9-line to RW
RW: Read back lines 4, 6, & restrictions
Lasing platform sets tempo
Shooter sets laser comm
RW maneuvers for shot
RW: “Venom 11 weapon-target-line 270, Time of flight 14 seconds”
RW: “1 minute” (When 1 min from “Rifle”)
FW Maneuvers to designate (+/- 60° of the WTL)
RW: “In position”
FW: “Standby xx seconds (or) Capture”
RW: “Venom 11, 10 seconds”
FW: “10 seconds”
RW: “Venom 11, In, heading 270”
TAC: “Venom 11 Cleared Hot”
RW: “Rifle, TOF 14 seconds”
RW: “LASER on”
FW: “Latch 61 lasing 1112”
FW: “Impact”
RW or FW: “Shift / Cease LASER”

**LOBL Shot**
JTAC correlates target with FW
FW: “Latch 61 captured 1112 set”

JTAC: Pass 9-line to RW
RW: Read back lines 4, 6, & restrictions
Lasing platform sets tempo
Shooter sets laser comm
RW maneuvers for shot
RW: “Venom 11 weapon-target-line 270, Time of flight 14 seconds”
RW: “1 minute” (When 1 min from “Rifle”)
FW Maneuvers to designate (+/- 60° of the WTL)
RW: “In position”
FW: “Standby xx seconds (or) Capture”
RW: “Venom 11, 10 seconds”
FW: “10 seconds”
RW: “Venom 11, In, heading 270”
TAC: “Venom 11 Cleared Hot”
RW: “Rifle, TOF 14 seconds”
FW: “Impact”
RW or FW: “Shift / Cease LASER”

1) Correlation with lasing platform may occur may occur before or after the passage of game plan and 9-line to the releasing platform.
2) Call to allow FW maneuvering for designation solution.
3) RW will call “LASER on” before or after “Cleared Hot” depending on laser delay requirements and missile time of flight.
4) Multiple Hellfire shots will have a minimum of 8 seconds between them to allow for shifting of the LASER to additional targets.
**FIGURE 2-2 Rotary Wing Lase for Fixed Wing Template**

<table>
<thead>
<tr>
<th><strong>Continuous Lase</strong></th>
<th><strong>Delay Lase</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>JTAC correlates target with RW</td>
<td>JTAC correlates target with RW</td>
</tr>
<tr>
<td>JTAC: Pass game plan and CAS brief to FW</td>
<td>JTAC: Pass game plan and CAS brief to FW</td>
</tr>
<tr>
<td>FW: Read back lines 4, 6, &amp; restrictions</td>
<td>FW: Read back lines 4, 6, &amp; restrictions</td>
</tr>
<tr>
<td>Lasing platform sets tempo</td>
<td>Lasing platform sets tempo</td>
</tr>
<tr>
<td>Shooter sets laser comm</td>
<td>Shooter sets laser comm</td>
</tr>
<tr>
<td>FW begins run-in</td>
<td>FW begins run-in</td>
</tr>
<tr>
<td>FW: “Razor 51 IP Inbound”</td>
<td>FW: “Razor 51 IP Inbound”</td>
</tr>
<tr>
<td>RW Maneuvers to designate.</td>
<td>RW Maneuvers to designate.</td>
</tr>
<tr>
<td>FW: “Razor 51, In heading 230, 10 seconds”</td>
<td>FW: “Razor 51, In heading 230”</td>
</tr>
<tr>
<td>JTAC: “Razor 51 Cleared Hot”</td>
<td>JTAC: “Razor 51 Cleared Hot”</td>
</tr>
<tr>
<td>FW: “Razor 51, One away, LASER on, Time of fall 24 seconds”</td>
<td>FW: “Razor 51, One away, Time of fall 24 seconds”</td>
</tr>
<tr>
<td>RW: “Deuce 21 lasing 1776”</td>
<td>FW: “10 seconds”</td>
</tr>
<tr>
<td>RW “Impact”</td>
<td>RW: “10 seconds”</td>
</tr>
<tr>
<td>RW or FW “Shift / Cease LASER”</td>
<td>FW: “LASER on”</td>
</tr>
<tr>
<td></td>
<td>RW: “Deuce 21 lasing 1776”</td>
</tr>
<tr>
<td></td>
<td>RW “Impact”</td>
</tr>
<tr>
<td></td>
<td>RW or FW “Shift / Cease LASER”</td>
</tr>
</tbody>
</table>

1) Correlation with lasing platform may occur may occur before or after the passage of game plan and 9-line to the releasing platform.

---

f. See figures 5-1 and 5-2 for UAS templates

g. Game plans may cover more than one attack, even for a single element (Hellfire into rockets and guns)

Ex: **“Venom 11, first attack will be a Type 2 BOT using two papa Hellfire, then expect approval forward of the BP for Type 1, rockets and guns, request a separate “in” call for each attack”**
5. CAS Brief
   a. CAS brief can be prefaced by: “Razor 53 advise when ready for 9-line”. JTACs should ensure they are ready to pass the CAS brief prior to asking the aircraft.
   b. 9-lines should be read in 3 transmissions of three lines each. JTACs must read the 9-line at a moderate pace. Information that is read too quickly increases confusion and delays time to kill when it is required to be said again.
   c. Multiple target format: when issuing multiple lines 4&6, read one standard 9-line, then changes to lines 4&6 prior to remarks.
      Ex: “Razor 53, I will read your 9-line followed by changes to lines 4&6 for Razor 54’s target, advise when ready to copy”
      Ex: “Latch 65, I will read a 9-line for your first target followed by changes to lines 4&6 for your second target, advise when ready to copy”
   d. Line 1
      (1) IP or BP by name
      (2) Hasty BP: “Hasty BP, Papa Uniform One-two-three-four, center grid 2x2”
         (a) If more than one hasty BP is created, consider naming for future use
      (3) Keyhole : “Alpha eight right”
         (a) Only one point echo can be in effect at a time
      (4) Overhead: “From the overhead”
      (5) For FW level-laydown, or ramp/bunt deliveries, the distance required for the attack should be considered and used in lines 1-3. The airspace required for these attacks does not support “From the overhead”. For example, a FW PGM delivery run will typically begin about 8-10nm from the target,
      (6) “Lines 1-3 N/A” shall not be used to abbreviate the 9-line. Lines 1-3 will always be applicable in a 9-line, and must be considered due to their implications on airspace de-confliction.
   e. Line 2
      (1) 3 digits sequentially “One eight zero”
   f. Line 3 as per 3-09.3
   g. Line 4
      (1) Read as sequential digits. It is also recommended to include the word “feet” after the digits to break up elevation from the line 5
      (2) MSL is understood, If using any other datum it must be stated, i.e. “Three six five feet HAE”
      (3) If lines 1-3 were abbreviated, the elevation transmission should begin with “Elevation…”
   h. Line 5
      (1) Plain language. Concise but descriptive. If target sorts are required, they should be given later as part of amplifying information so as not to disrupt the flow of the 9-line.
   i. Line 6
      (1) 100,000 meter square zone ID and sequential digits: “Papa Uniform one two three … four five six”
      (2) If other than 6 digits, Line 6 should be prefaced by “8 (or 10) digits, Papa Uniform one two three four….five six seven eight”. There should be a noticeable pause between the easting and northing when reading MGRS grids so as to maintain an expected cadence.
      (3) The number of digits in a grid coordinate is the level of precision of the grid, not a measurement of accuracy. That being said, the number of digits provided in line 6 should reflect the estimated accuracy of the coordinate that was derived:
### TABLE 2-8 Implied Target Coordinate Accuracy

<table>
<thead>
<tr>
<th>Digits Read in Line 6</th>
<th>Implied Accuracy of Line 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 Digits</td>
<td>100m</td>
</tr>
<tr>
<td>8 Digits</td>
<td>10m</td>
</tr>
<tr>
<td>10 Digits</td>
<td>1m</td>
</tr>
</tbody>
</table>

(4) If passing a Lat. / Long., give a preparatory call to allow for aircraft systems setup, preferably before the 9-line is passed. Ex: “Razor 53, advise when ready to copy 9-line, be advised line 6 will be Lat/Long”

(5) There are rare times when a JTAC is unable to provide a target elevation and coordinate, making lines 4&6 a georef, TRP, GRG or an offset from a georef, TRP, or GRG. In this case, lines 4-6 may be abbreviated as “Lines 4-6, 3 tanks 300m northeast of the tip of Blue Mountain”.

**WARNING**

This technique should be used with caution due to the potential for confusion and the lack of ability to plot the target for the fires approval process, collateral damage, and fratricide mitigation.

j. Line 7

(1) The mark referenced in Line 7 of the CAS brief should be specific to marks intended for the attacking aircraft vice cueing for 3rd party contributors.

   (a) When marking using a LASER for LASER-spot handoff to an LST: “Broadsword 11’s LASER handoff, code 1688”

(2) Terminal Guidance referenced in Line 7 of the CAS brief should be specific to the ordnance being employed by the attacking aircraft.

   (a) LASER considerations: callsign of the LASER operator and code should be included.

   (b) When conducting a BOC attack using LGWs, the JTAC states line 7 as the callsign and LASER code of the platform / individual that will provide terminal guidance for the weapon.

   (c) Note: While this is not technically a mark, it is SA enhancing for all players executing a complex game plan.

   (d) When conducting a BOC attack with LGWs –

   1. “Venom 11’s LASER, code 1775”

k. Line 8 - as per 3-09.3

l. Line 9 - as per 3-09.3, plus egress altitude in actual numbers, not “in your block”

Ex: “Razor 55 egress right pull to Charger-Moon, block 15-17”

6. Remarks / Restrictions

   a. Order – the following order of the remarks / restrictions portion of the CAS brief is recommended for a standard, logical flow of information. Only those elements that are applicable should be included.

   (1) FAHs

   (2) LASER Target Line (LTL) / Pointer Target Line (PTL) If using ground-based LASER designators or IR sparkles

   (3) Surface-to-air Threat

      (a) Type of threat

      (b) Direction and distance from line 6

      (c) Type suppression - Continuous, interrupted or non-standard

      1. If non-standard, state the duration of the suppression relative to the CAS TOT

      (d) Suppression gun target line

   (4) Additional fires

      (a) Gives aircrew SA to other explosions, fires, etc on the battlefield

   (5) ACAs
(a) Stay above / belows
(b) Approval out of the BP for RW
(6) Danger Close and initials
(7) Additional radio calls requested
   (a) IP inbound
   (b) In with heading or direction
   (c) Time to roll-in / release
(8) Additional remarks
   (a) Depending on the tactical situation or theater requirements, additional information may need to be passed such as rules of engagement or collateral damage considerations.
(9) TOT – or standby TOT
   (a) To indicate the end of the remarks / restrictions portion, TOT should be last. If the TOT has not been assigned yet, “Standby TOT”, or “TOT will be issued after correlation” should be used.
      1. Assigning TOTs has a synchronizing effect on the battlefield. TOTs allow for efficient fires approval, and effective integration with fire and movement. However, JTACs must be smart about when they assign a TOT.
         a. BOC – TOTs may be assigned as part of remarks / restrictions since BOC correlation is complete with correct readbacks. JTACs should assign TOTs that allow aircrew time to set up their systems, provide readbacks, and ingress to the target area. TOTs must also take into account other fires and movement integrated with the CAS attack.
         b. BOT
            (1) TOT assigned after correlation - For a BOT attack that may require lengthy correlation, JTACs should consider waiting until after correlation is complete to assign the TOT. This alleviates multiple TOTs being passed due to correlation taking longer than expected.
            (2) TOT assigned before correlation – When correlation is to occur as an offset from a mark, TOTs may be established prior to correlation since correlation requires the mark to be in place.
         c. “Push when ready” vs “Immediate” – There may be times when issuing a TOT is unnecessary and aircrews may proceed on a timeline of their discretion. JTACs should use the terms “Push when ready” in this case. The word “Immediate” in relation to TOT infers a level of urgency that may result in task-shedding on the part of all players. “Immediate” TOTs should be reserved for when that level of urgency truly exists.
   (b) For Type 3 control, clearance to engage should be given after correlation and approval
      1. With correlation complete at 15 and approval passed at 20, at time 21 JTAC say, “Latch 61, cleared to engage, time 30 to 40.”
      2. “Commencing engagement” should be expected prior to initial weapons release to achieve effects at beginning of the engagement window.

7. Readbacks
   a. Required readbacks of lines 4, 6 and restrictions
   b. JP 3-09.3 states that if issued, FAHs, ACAs, Danger close, and TOTs shall always be considered restrictions and will be read back. In addition if the JTAC requires additional information to be read back, the aircrew shall do so.
      (1) JTACs should respond to correct aircrew readbacks with “Callsign readback correct” or “Callsign good readback”.
      (2) If the readback is not correct the JTAC should restate the portion in question correctly, using voice inflection to draw attention to the portion that had been read incorrectly.
         Ex: “Deuce 21 be advised, final attack headings 1-8-0 through 2-1-0”
   c. USMC SOP is that all readbacks shall come from the aircraft system if the aircraft are capable of providing it. When working with joint aircraft, JTACs may request a “system readback” if required.
Caution
If lines 4&6 were not a coordinate and elevation, aircrew will not be able to conduct a readback from their system. This technique should be used with caution as it is imperative that both the JTAC and aircrew are referring to the same GEOREF, TRP, GRG, or feature for targeting.

Note
Cases may arise when an aircraft has a known bad navigation system. Therefore, a readback of lines 4&6 from that system may induce confusion and error into the attack. In these instances, the affected aircrew should alert the JTAC of the situation and that they will not be providing system readbacks. Depending on the ordnance being used, the aircraft may still be able to safely and effectively employ. More in-depth correlation, however, may be required.

d. There are currently differing interpretations as to whether all attacking aircraft or only the lead aircraft of the element is required to read back lines 4, 6, and restrictions. If the JTAC does not receive readbacks from all aircraft, but desires them, he should continue to request those readbacks required to positively control the attack.

8. Correlation – The process by which the JTAC coordinates and confirms that the attacking aircraft and/or a 3rd party contributor have acquired the correct target or mark. Correlation is required on each and every CAS attack.
   a. BOC – Correlation is complete when the attacking aircraft correctly reads back lines 4, 6, and restrictions IAW 3-09.3 requirements. When using a third-party for terminal guidance for a BOC attack, it is still necessary to conduct correlation with that third-party.
   b. BOT and/or 3rd party contributor required – Correlation is mandatory with the attacking aircraft or a 3rd party contributor (if used). 3rd party correlation may occur outside the normal timeline of the CAS attack. During correlation, the JTAC coordinates actions to mark the target and position the aircraft to acquire the mark and/or target. Depending on the tactical situation, JTACs must determine whether the aircrew need to acquire the target, or if employing on an offset from a mark is sufficient to achieve the commander’s desired effects. Target composition, camouflage, and concealment may make it difficult for aircrew to acquire the actual target. In addition, certain attack profiles, such as fixed-wing aircraft rolling in on an IDF mark, may not allow time for precise target acquisition. Throughout correlation, JTACs should confirm that aircrew are looking at the same reference points as the JTAC by asking questions with unique and distinct answers that will indicate that correlation is on track.
   c. Once the JTAC is comfortable the aircrew have acquired the correct target, the JTAC should transmit “The xxxx is your target.” Aircrew should respond with “tally” or “capture” as appropriate. JTACs should strive to include what the target is in this statement, such as “The third vehicle is your target” or “The individual north of the road is your target”. Simply saying “That’s your target” is ambiguous and should be avoided.
     (1) If the JTAC determines that there was significant potential for confusion during correlation, he may ask the aircrew to provide an updated coordinate for the target once it has been acquired. In order to avoid “ping-ponging” of coordinates the JTAC is not required to readback this updated coordinate. The JTAC should plot the updated target location given by the aircrew and ensure that it satisfies required geometry. Requesting updated coordinates is not required, and doing so must be weighed against delaying effects on target.
   d. The following paragraphs outline procedures for conducting correlation using different marking plans
     (1) LASER hand-off – JTACs must be directive in order to ensure proper LASER safety geometry is adhered to when executing a LASER hand-off. This is especially crucial when aircraft are in the overhead, since if aircraft are on the far side of the overhead from the designator, there is potential for the LST to track the designator.
(a) LASER hand-offs may be conducted as part of a target acquisition run after readbacks, or as the aircraft are ingressing on the attack run.

(b) Instructions should be assigned for the LASER hand-off after remarks and restrictions. The inbound directions / headings that are used for the hand-off may be different than the final attack headings. In this case, the directions / headings used for the target acquisition pass should not be called final attack headings.

(c) After read-backs, JTAC begins LASER hand-off with: “Latch 65 proceed inbound heading 230 to 280, LASER target line 220, call for LASER.” or “Latch 65 proceed northeast of the target area, LASER target line 220, call for LASER.”

(d) Aircrew initiates LASER comm when in position: “10 seconds”…“Broadsword 11 LASER on”. JTAC should echo calls to his LASER operator (if applicable) prior to responding to the aircrew.

Note
When JTACs use a dedicated co-located LASER operator, ensure the operator is trained to respond to internal TACP comm brevity calls for LASER operations

(e) LASER operator responds to JTAC: “Lasing, 1688.”

(f) JTAC to aircraft: “Broadsword 11, lasing, 1688.”

(g) The JTAC shall ensure continuous lasing until the aircrew directs “Aircraft callsign, spot, cease LASER.”

(1) JTAC should direct “cease LASER” to the LASER operator.

(h) Once the aircrew has called “Spot, cease LASER”, the JTAC shall confirm the aircraft’s sensor was cued to acquire the correct target.

TAC: “Latch 65 what do you have under your crosshairs?”

A/C: “Latch 65 has a single armored vehicle oriented north-south”

TAC: “Latch 65 that armored vehicle is your target”

A/C: “Latch 65 captured”

Note
The terms “spot” and “capture” are not synonymous. After an aircraft calls “spot”, JTACs should still confirm what the aircrew has acquired via their LST.

1. After an LST handoff, JTACs should avoid going “back out” to use big to small confirmers, as this will likely induce confusion and unnecessarily increase time to engage.

Note
JTAC should not cease LASER until directed by aircrew (common sense and judgment apply). In situations where it is apparent that a “cease LASER” call was not made or missed, the JTAC should query the aircrew with “Aircraft callsign, status”.

(b) If aircrew reports “negative LASER” during the LASER hand-off:

1. JTAC verifies proper LASER set-up and pointed at correct target

2. Verify aircraft on correct code

3. Verify aircraft in a position to receive reflected LASER energy.

4. Many factors influence whether airborne platforms are in a position to receive properly coded LASER energy (angle of incidence, reflectivity, power out, environmental, etc.).

5. Re-initiate LASER hand-off procedures. If unsuccessful and unable to resolve, choose another mark.
(2) Sparkle Walk-on (preferred for FW over Match Sparkle) – When the tactical situation prevents the JTAC from using a ground based IR sparkle (dead batteries, broken equipment, concealment from enemy observation, excessive skip / overspill, etc.), a sparkle walk-on may be used to orient the aircraft’s sensor to the target. The JTAC observes the aircraft’s IR sparkle and directs the aircrew to move their IR sparkle using cardinal / semi-cardinal direction and distance slew commands until the aircraft’s IR sparkle overlays the target.

(a) If holding at an IP, aircraft may need to proceed inbound in order to acquire the target on their sensors.

(b) JTAC begins sparkle walk-on with: “Aircraft callsign, sparkle”.

(c) JTAC observes aircraft IR sparkle and gives verbal slew commands

1. Slew commands should be “Aircraft callsign, slew, cardinal / semi-cardinal direction and distance in meters”

   Ex: “Latch 65 slew north 150”

2. Slew commands may also include a limiting feature

   Ex: “Razor 53 slew south 50 to the east-west road”

3. Do not use “left, right, up, down” when conducting a sparkle walk-on.

4. JTACs must be aware of the difficulties of estimating directions and distances at night as well as the disparity of perspective between themselves and the aircrew. In addition, since aircrew are splitting time between looking outside and their sensors, it is extremely difficult to precisely measure direction and distance over the ground when slewing the IR sparkle. JTACs must be careful not to give directions that cause the IR sparkle to continually bracket back and forth across the target: “Latch 65 slew north 100” “Latch 65 slew south 100” “Latch 65 slew north 100”. If JTACs note this occurring they should reevaluate their direction / distance estimations and use limiting features.

(d) When the aircraft’s IR sparkle overlays the target the JTAC should direct “Aircraft callsign, Steady”.

(e) JTAC completes correlation by confirming what the aircrew sees where their IR sparkle is.

(f) Aircrew call “Tally” or “Capture”

(g) JTACs may also request that aircrew sparkle the target as they ingress during the attack run in order to provide additional confirmation.

(3) Match Sparkle

(a) When matching IR sparkles, all players must be disciplined in callsign usage to avoid confusion as to who is to “Sparkle on” or “Cease Sparkle.”

(b) JTACs should ensure that prior to attempting to match sparkle, the aircraft is in position to allow observation of the sparkle they are to match. This may require pushing FW aircraft into the overhead, or allowing RW aircraft forward of the HA or BP.

   TAC: “Aircraft callsign, proceed into the overhead and advise when ready to match sparkle”

   1. JTAC verifies own IR sparkle is pointed at the correct target

(c) Aircrew, initiates when in position: “JTAC callsign, Sparkle”.

   1. JTAC should echo calls to his IR sparkle operator (if applicable) prior to responding to the aircrew. The JTAC may have to direct the sparkle operator to shift to ensure the correct target is marked.

(d) JTAC may initiate match sparkle if required. When aircrew reports ready, JTAC turns on his IR sparkle and transmits “Aircraft callsign, match sparkle”.

   (e) JTACs should be prepared to facilitate “Snake” and “Steady” calls by the aircrew.

   (f) JTAC should then observe the aircraft’s IR sparkle move to overlay the ground IR sparkle.

   (g) Once the aircrew’s pointer is on the correct point, the JTAC confirms what the aircrew sees there.
In some cases, the ground-based pointer can 'wash-out' the aircraft's pointer. In this case the JTAC should cease the ground-based IR sparkle in order to confirm the aircraft's sparkle is on the appropriate location. JTAC should transmit the informative call “Broadsword 11 ceasing sparkle”.

Note
RW IR sparkle will often not be steady on the target due to vibration of the aircraft.

Note
JTACs should be aware that since current aircraft FLIRs are unable to sense IR sparkle, aircrew must compare what they see outside the cockpit to what their sensor is centered on during correlation.

(h) If aircrew reports "no joy" or indicates problems with skip / overspill that preclude locating the target:
   1. JTAC verifies IR sparkle pointed at correct target.
   2. Verify aircraft is NVG equipped.
   3. Verify aircraft in a position to acquire IR energy and is searching in the correct area.

Many factors influence whether airborne platforms can see IR sparkles (IR sparkle power out, light levels, distance from target, cloud cover, NVG performance, etc.). Generally speaking, the JTAC should expect that aircrew will attempt to position themselves to have unobstructed line of sight to the target area.

(i) Re-initiate match sparkle procedures. If unsuccessful and unable to resolve, attempt sparkle walk-on, or choose a different type of mark.

(j) JTACs must be aware that using their IR sparkle may exposit them to NVG-equipped enemies. Ground IR sparkle should not be left on for excessive amounts of time.

4. Aircraft LASER designation on target
   (a) JTACs equipped with AN/PAS-25 TLSI or SEESPOT devices may correlate by directing the aircrew to lase the target with their LASER designator.
   (b) On vertically developed targets, the aircraft LASER must be on a surface that the JTAC can observe.

5. Ground IR sparkle only
   (a) The JTAC must ensure that the aircraft is in a position to acquire the target end of the IR sparkle. This may require bringing FW aircraft into the overhead, or pushing RW aircraft forward from the HA. Depending on the target and the attacking aircraft profile, this may require a target acquisition run or may be conducted on the attack run.
   (b) Depending on target size and composition, JTACs may need to cease sparkle to avoid the IR energy washing out the target. When attacking tactical size targets, attacking aircrew may be able to see the target end of the IR pointer, but unable to acquire the target. In this case, aircraft should make a “contact sparkle” call indicating they are able to discern the target end from the friendly end of the IR sparkle, but unable to make out the exact target. Prior to receiving weapons release authorization, aircrew must call “visual” and either “contact sparkle” or “tally” when ground forces employ IR sparkle, as per JP 3-09.3.

6. Visually-significant mark
   (a) IDF, direct fire, or aviation fires may be employed specifically as marks for CAS aircraft. Marks of opportunity, such as battlefield fires or smoke not specifically employed for CAS may also be used. Aircrew will generally use a combination of sensors and visual lookout to acquire these marks.
   (b) Consider the timing of the mark. JTACs may coordinate a mark to arrive on deck 30-45" prior to an assigned CAS TOT, or they may coordinate a mark earlier to take advantage of aircraft sensors while the aircraft is holding at an IP or HA. This technique gives the aircrew more time to discern hard to find targets before the attack run, but sacrifices surprise.
1. For BOT attacks using IDF, direct fire, or aviation fires as visual marks that are deliberately synchronized to arrive 30-45" prior to CAS TOTs, there is minimal time to conduct correlation. For these types of attacks, correlation is satisfied by the JTAC providing an accurate correction from the visual mark once observed, i.e. “**Razor 53, from the mark, east 50**”. Transmitting ‘mark is on the deck’ is not required.

2. There is currently no requirement for aircrew to transmit “contact mark.” JTACs may request this call in remarks if desired for additional SA.

   (c) When using direct fire weapons to mark, the JTAC must consider when the mark will be visible to attacking aircraft. FW aircraft will most likely only be able to acquire direct fire impacts using their sensors from inside traditional IP distances. If the threat allows, JTACs should coordinate moving them to the overhead to aid in acquisition. JTACs must also be aware that the presence of multiple direct fire assets on a battlefield could lead to confusion.

   (d) If the IDF, direct fire, or aviation fires mark falls out or is unusable, the JTAC must weigh the risk of continuing the attack. JTACs should have a plan to deal with a mark fall-out. This may involve flexing to a back-up mark, using a mark of opportunity, or aborting an aircraft or the entire attack. In addition, attacking aircrew may call contact of something besides the intended mark. JTACs must be able to quickly weigh whether to use the object the aircrew is contact as a new mark.

   (e) If something other than the mark referenced in Line 7 is being used for cueing, it should be not be called “the mark”, it should be called by a different label, i.e. “lead’s hits”, “the black smoke”, etc.

3. **Talk-on**

   (a) When coordinating a talk-on, the JTAC should be specific about which type of talk-on he will be using, i.e. map, GRG, VDL, visual, etc. The JTAC should also be specific about when he switches from one type of talk-on to another. For example, a JTAC may begin a talk-on using a GRG, but transition to a visual talk-on once a common frame of reference has been established.

   1. When using GRGs, TRPs, georefs etc, it is essential that both the JTAC and aircrew have a common understanding of the product or feature being used.

   2. **“Latch 65, advise when ready for a GRG talk-on using the version 4.8 GRG”**

   (b) JTACs should consider the best way to begin the talk-on. Generally visual talk-ons should be conducted “big-to-small.” Sensor talk-ons in an urban area may, on the other hand, start by orienting the aircrew’s sensor to a specific intersection or recognizable building in order to ensure a common starting point.

   (c) Talk-on descriptions and directions should be simple and short, “driving” the aircrew’s eyes from one point to another. A technique for doing this is to give directions in the following format:

   1. From a known point
   2. Go a direction and distance
   3. To a new point
   4. Do something (call contact, name a new point, have aircrew describe a feature)

   **TAC:** **“Razor 53, from the Cubby-hole, proceed south across MSR Michigan to the first building and call contact”**
   **A/C:** **“Razor 53 contact”**
   **TAC:** **“Razor 53, that building will be called the bank, from the bank go two buildings east and call contact on a building with a courtyard in the middle”**

   (d) Short, directive transmissions using “call contact” as an instruction, are more likely to result in a successful talk-on. If directions are too open-ended, there is significant likelihood of a talk-off occurring.

   (e) Limiting the number of cardinal directions in a transmission to two helps to reduce confusion.
(f) Features such as buildings, roads, and intersections should be named throughout the talk-on if they do not already have names assigned. This allows all players to quickly reference them without having to resort to “this road” and “that building”.

(g) Establishing units of measure may be helpful to aid in estimating distance over the ground. JTACs should attempt to use features along the route of the talk-on when establishing these units of measures.

(h) When conducting visual talk-ons JTACs may use linear terrain features to orient aircrew to cardinal directions. Even if those linear features do not line up exactly with a cardinal direction, establishing them as “north/south” or “east/west” may aid in the talk-on.

(i) A 2 and 1 ratio should be used when conducting talk-ons, give two directive statements, then ask a confirming question of the aircrew.

A/C: “Razor 53 is contact the building with the courtyard”

TAC: “Which side of the courtyard opens to the street?”

(j) JTACs should make aircrew aware of their avenue of observation to the target, helping the aircrew to visualize what the JTAC can and cannot see.

1. When transitioning from a map or GRG talk-on to a visual talk-on, the JTAC must be aware of the limitations of his perspective. The JTAC should not ask the aircrew to describe features that the JTAC cannot visually see.

2. If aircrew describe a feature that is not observable by the JTAC, the JTAC should inform the aircrew.

(k) Once the JTAC has talked the aircrew onto the correct target, correlation should be completed by verifying the aircrew is looking at the correct target. This should be done by asking specific questions about the target that are unique and distinct. Time permitting, 3-point verification is ideal, asking three specific questions.

1. Examples include:
   a. “Which direction is the lead vehicle facing?”
   b. “How many individuals are on the north side of the lead vehicle?”
   c. “What do you see directly south of the lead vehicle?”

(l) Additional talk-on techniques and considerations can be found in JP 3-09.3.

(8) Video downlink (VDL) talk-on

(a) When the JTAC and aircrew are both properly equipped, a VDL talk-on provides good certainty as to what the aircraft is looking at.

(b) For ease of JTAC use, aircrew should strive, within a section, to select downlink freq. IAW the table in the appendices titled VideoScout Band separation and with at least 30 MHz separation. This will allow the JTAC to rapidly switch between aircraft downlinks within a section while not dealing with bleed-over from the other aircraft.

(c) Most aircraft downlink video feeds provide symbology, including sensor aimpoint reticle, target location and elevation, and aircraft position and elevation. JTACs should strive to be familiar with general symbology, but if they are not, may query aircrew regarding the display.

1. Some aircraft systems are also capable of transmitting metadata that allows aircraft position and sensor point of interest (SPI) to be overlaid on the map feature of some VDL receiver systems.

(d) When conducting VDL talk-ons, JTACs should use appropriate brevity terms. Reference Tables 2-9 through 2-11.

(e) When using the term slew to directively move a sensor, JTACs should use up, down, left, and right instead of cardinal directions to avoid confusion. VDL talk-ons should drive the sensor directly from one point to another to avoid excessive slewing.
(f) JTACs should keep aircrew informed of Handshake or Hollow status, providing a common frame of reference to both parties.

<table>
<thead>
<tr>
<th>TABLE 2-9 Video Downlink Brevity Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check Capture</td>
</tr>
<tr>
<td>Check Focus</td>
</tr>
<tr>
<td>Handshake</td>
</tr>
<tr>
<td>Hollow</td>
</tr>
<tr>
<td>Set</td>
</tr>
<tr>
<td>Shadow</td>
</tr>
<tr>
<td>Slew</td>
</tr>
<tr>
<td>Stake</td>
</tr>
<tr>
<td>Switch Camera</td>
</tr>
<tr>
<td>Switch Polarity</td>
</tr>
<tr>
<td>Zoom In / Out</td>
</tr>
</tbody>
</table>

(9) Aircraft Position Target Designation (APTD) – currently FA-18 only if JTAC is STRIKELINK equipped. Map scale must provide the JTAC with sufficient resolution and coverage to translate APTD to actual target location.

(10) Link-16 handoff
(a) If a target has been published as a Link-16 trackfile, aircraft sensors will be cued to the approximate target location. A talk-on will still be required to correlate the exact target.

(e) Additional Considerations
(1) After correlation is complete, and before the attack, any questions that remain must be answered. If, during correlation, either the aircrew or JTAC realize that an element of the CAS brief should be changed in order to facilitate a successful attack, it should be discussed. Additionally, other information necessary for the attack may not be decided until correlation is complete and should be discussed in plain language between the JTAC and aircrew prior to beginning the attack. Examples of this include:
   (a) Delay vs Continuous lase
   (b) Section vs Individual approval for RW attacks
   (c) Ground commander’s intent for fires
   (d) Does ordnance selection make sense based on aircrew’s analysis of the target
   (e) Fuzing
(2) JTACs must remember to issue the TOT if it has not already been issued and confirm mission with their fires approval chain.
(3) JTACs may also need aircrew to state the type of delivery profile they will execute in order to allow the JTAC to plan appropriately.
(4) Additional information for Type 3 controls can be added here to amplify game plan and to keep the transmission succinct. Examples would include but not be limited to target priorities, ordnance restrictions, etc.

9. Attack
   a. Throughout a CAS attack, the JTAC must maintain awareness to the aircraft position, the friendly situation, and the objective area.
b. JTACs should compare the distances required by attack geometry, from IP or HA to target with the time it will take the CAS aircraft to transit that distance and relate this to the TOT. By developing this timeline, and using aircraft calls to update it, JTACs can monitor the CAS attack timeline in order to ensure effective integration with fire and movement.

c. Changes to the friendly situation must be monitored to ensure their fire and movement will remain integrated with the CAS attack timeline. If changes occur, JTACs must weigh their ability to continue, shift, or abort the attack based on the attack timeline.

(1) For instance, if SEAD is required, the JTAC must know the SEAD timeline so that he can shift the CAS TOT if the SEAD is late. The earlier these adjustments can be made, the greater the chance of mission success.

d. The JTAC must also maintain awareness to the objective area for the timely recognition of changes, such as target movement entrance of non-combatants.

e. TAD discipline – The TAD net can become very congested very quickly. All players on a TAD net must use “active listening” and appropriate comm. discipline and cadence. Ultimately, the TAD belongs to the JTAC, and he must control it with his voice.

(1) Once an aircraft calls “In” all other calls should be held until after the JTAC has issued weapons release authority or abort. An exception to this is that anyone can and should call an abort at any time they deem necessary.

10. Assess Effects – Execute reattacks or issue new game plans / CAS briefs as necessary

a. Once ordnance impacts the target, the JTAC must assess whether the commander’s desired effects were achieved. This assessment will determine whether to continue the attack, abort sequential attacks, or set up a reattack.

(1) Obscuration may preclude effect assessment for several minutes. JTACs should weigh the need for follow-on attacks with the need to preserve ordnance until an assessment can be made.

(2) If reattacks are required, the JTAC must determine if there is a need for a new game plan and also determine whether a new CAS attack brief is required.

(3) If the reattack is against the same target, the JTAC should state “Venom 21, continue for a reattack, restrictions remain the same”

(4) If an additional target is in close proximity to the previous target, the JTAC must ensure the aircraft is correlated to the new target, but does not require a whole new CAS brief.

(5) JTACs shall also ensure that previous restrictions are still applicable to reattacks, and change them if necessary.

(6) Give consideration to changing final attack headings for aircraft survivability when conducting multiple reattacks.

11. BDA

a. Accurate and timely battle damage assessment (BDA) leads to a more accurate operational picture of the current enemy order of battle, which helps the C3 system correctly dictate asset flow and allocation

b. BDA is crucial in determining CAS mission effectiveness, enemy disposition and re-attack requirements. JTACs must ensure that BDA is accurate, and should not overestimate BDA, or report BDA that they cannot observe.

c. BDA reports may be passed throughout the time on station or prior to aircraft egressing, and should be given for a flight, not individual aircraft. BDA reports should include size, activity, location, time, observed damage and remaining targets, if any.
12. Routing / Safety of Flight
   a. JTACs are responsible for providing routing and safety of flight instructions to aircraft as they egress. This provides safe passage for exiting aircraft, and allows JTACs to maintain a picture of their CAS stack and positions of assets.

2012. MIR / ISR into CAS

1. When aircraft are tasked to conduct multi-sensory imagery reconnaissance (MIR) or intelligence, surveillance, and reconnaissance (ISR), and there is not an immediate need to conduct CAS attacks, the following caveat to the execution template may be used.
   (1) Routing / Safety of flight
   (2) CAS aircraft check-in
   (3) Situation update / Reconnaissance / Surveillance briefing
      (a) JTACs may use the briefing format found on page 66 of JFIRE.
      (b) Sensor Allocation
         1. JTACs should develop and brief a comprehensive sensor allocation plan that provides tasking for all available sensors. Redundancy should be minimized.
         2. Table 2-10 provides terms for tasking FW aircraft sensors providing overwatch for patrols and convoys. While the terms below can be used for RW, they do not dictate where each aircraft is looking (due to aircraft capabilities and survivability).

<table>
<thead>
<tr>
<th>TABLE 2-10 FW Sensor Postures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor postures:</td>
</tr>
<tr>
<td>“Neutral”</td>
</tr>
<tr>
<td>“Offensive”</td>
</tr>
<tr>
<td>“Defensive”</td>
</tr>
</tbody>
</table>

(4) MIR / ISR
   (a) While MIR / ISR is being conducted, JTACs should remain engaged with aircrew and update tasking and sensor allocation as the tactical situation develop.
   (b) Labeling –Specific labels may be assigned to individuals, vehicles, etc that aircrew acquire while conducting MIR / ISR. This enables JTACs and aircrew to quickly refer to these items of interest using the unique label assigned. These labels should be distinctive and unique to each item to reduce confusion, such as “Bongo truck 1” or “Person 2”
      1. Table 2-11 provides brevity terms that can be used with these labels to provide quick, directive tasking.
TABLE 2-11 Sensor Tasking Brevity Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Track _____”</td>
<td>Directive call assigning responsibility to maintain sensors / visual awareness on a defined object or area</td>
</tr>
<tr>
<td>“Sort _____”</td>
<td>Directive call to assign sensor priority within a group of vehicles / personnel</td>
</tr>
<tr>
<td>“Drop”</td>
<td>Directive call to discontinue sensor / visual track responsibility</td>
</tr>
<tr>
<td>“Meld _____”</td>
<td>Directive call for assets to bring sensors onto a single point of interest</td>
</tr>
<tr>
<td>“Status _____”</td>
<td>Call from JTAC requesting aircrew update the activity of the track responsibility or requested label</td>
</tr>
<tr>
<td>“Squirter”</td>
<td>A ground-borne object of interest departing the objective</td>
</tr>
</tbody>
</table>

(c) This step may continue into correlation if the aircrew discover a target
(d) If aircrew are the first to gain SA to a target, the JTAC should request target coordinate and elevation from the aircrew

(5) Game plan
(6) CAS brief
   (a) If the aircrew were the first to gain SA to the target, the lines 4&6 passed should be the same as provided by the aircrew during MIR / ISR
(7) Remarks / Restrictions
(8) Readbacks (may be IAW JP 3-09.3 p V-42)
   (a) If the aircrew were the first to gain SA to the target, readbacks will be in accordance with JP 3-09.3 pV-42.
(9) Attack
(10) Assess effects and repeat 4-9 as necessary
(11) BDA
(12) Routing / Safety of flight

2. JTACs should strive to remain engaged with the aircrew while they conduct MIR / ISR.

3. When it appears likely that a CAS attack will be required, JTACs should be proactive in executing the steps discussed in para 2000 “CAS JTAC Actions” to develop targeting data, game plan, CAS brief, and restrictions. Developing this information early will allow JTACs to issue a preemptive CAS brief, minimizing time to kill once the attack has been approved.

2013. Rotary Wing CAS 5-line

The Rotary Wing CAS 5-Line brief is a “friendly-centric” brief that is used to quickly orient RW CAS assets to a target. It must be noted that the format of the RW CAS 5-Line is the same as an Army attack aviation Close Combat Attack (CCA) brief, and the SOF call for fire used with SOF RW assets or AC-130 gunships. The difference between the RW CAS 5-line and other 5-line briefs is that the RW CAS 5-line is still considered a CAS brief, and transmission of the brief itself does not constitute clearance to fire. This shall be made clear by prefacing the brief with a type of control. JTACs must be aware that when working with Army or SOF RW assets, they may not be familiar with the restrictions of the RW CAS 5-line, and the
restriction “At my command” should be added to the end of the brief to allow the JTAC to control the timing of fires.

a. By its nature as a friendly-centric brief, the 5-line assumes the RW assets have sufficient SA to the friendlies to locate them and find the target using them as a frame of reference. If this SA does not exist, a target-centric 9-line brief should be used. An example of this is an immediate RW CAS element checking into an unfamiliar battlespace with no clearly defined FLOT.

<table>
<thead>
<tr>
<th>TABLE 2-12 Rotary Wing CAS 5-line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not transmit line numbers. Units of measure are standard unless briefed. Restrictions are mandatory readback (*). JTAC may request additional readback.</td>
</tr>
</tbody>
</table>

1. Observer / Warning Order / Game plan
   "(Aircraft Call Sign)______________, (JTAC Call Sign)______________, 5-line, Type(1, 2, or 3) Control, MOA (BOC or BOT), (Ordnance Requested)"

2. Friendly Location / Mark
   "My position ________________, marked by ___________________
   (TRP, Grid, etc) (Strobe, Beacon, IR Strobe, etc.)"

3. Target location
   "Target location,_____________________________________
   (Bearing [magnetic] and Range [meters], TRP, Grid, etc.)"

4. Target Description / Mark
   "____________________, marked by ______________________
   (Target Description) (IR sparkle, Tracer, etc.)"

5. Remarks / Restrictions
   *Final Attack Headings (FAHs)
   LTL / PTL
   Surface-to-air threat, location and type of SEAD
   *ACAs
   *Danger Close and initials
   Additional calls requested
   Additional remarks (GTL, weather, hazards, friendly mark)
   *TOT / TTT

The RW CAS 5-line should be passed as one transmission. If the restrictions portion is lengthy, it may be a separate transmission.

1. Warning Order
   a. The warning order informs the attacking aircrew they are about to receive an attack brief. For RW CAS 5-lines, this warning order should contain the game plan information found in a standard attack brief, type of control, method of attack, ordnance requested. Interval will generally not apply to a 5-line.

2. Friendly Location / Position marking
   a. JTAC should pass the friendly observer location and how it is marked if applicable. JTACs should avoid passing friendly grids here, instead using named locations or georefs.

3. Target location / Marked by
   a. JTAC passes the target location using any or all of the following information: Direction and distance from line 2, a TRP, GEOREF, or GRG location (or an offset from a TRP, GEOREF, or GRG location), or
coordinates. Generally, since aircrew executing a 5-line are “heads-out” looking for the target, coordinates are not the ideal method of target location compared to an offset from a known point.

4. Target description / Marked by
   a. Target description should be specific enough for aircrew to find and identify the target yet concise and brief. Further details may be passed as the aircraft is ingressing. Type, number, orientation, and degree of protection is a good format.
   b. If the target is marked, how it is marked should also be passed.

5. Remarks
   a. The remarks section should include other information necessary for a safe and effective attack.
      Some items may include:
      (1) Final attack headings
      (2) Surface to air threat
      (3) SEAD game plan
      (4) Illumination game plan
      (5) Gun target line
      (6) LASER target line
      (7) ACAs
      (8) Hazards to flight
      (9) Weather in the target area
      (10) Danger close
      (11) Timing coordination
   b. RW CAS 5-line briefs assume that the CAS aircraft will push immediately after the receipt of the mission and readbacks. JTACs may use a TOT, but should make this clear when reading the restrictions portion of the brief to prevent the aircraft from pushing prematurely.

6. Readbacks - Readbacks for a RW CAS 5-line should include all restrictions.

7. RW CAS 5-line example:
   JTAC: “**Deuce 31, Broadsword 11, 5 line, type 1 control, BOT, rockets and guns, my position is checkpoint 295 marked by IR strobe, northwest 200, single technical vehicle marked by IR sparkle, make all attacks over my right shoulder, left pull, keep all effects of fires west of MSR Clovis**”
   A/C: **“Deuce 31 copies over your right shoulder, left pull, keep all effects of fires west of MSR Clovis, pushing”**
   JTAC: **“Deuce 31 continue”**
   A/C: **“Deuce 31 and flight, visual, tally, In”**
   JTAC: **“Deuce 31 and flight cleared hot”**
Chapter 3: JFO Integration

3000. Introduction

1. A Joint Fires Observer (JFO) is a trained and qualified service member who can request, adjust, and control surface fires, provide targeting information in support of Type 2 and Type 3 close air support terminal attack control, and perform autonomous terminal guidance operations (JP 3-09.3). In order to maximize the effectiveness of the joint fires available to the ground commander, the JTAC and JFO should be employed as a team with the JFO acting as an extension of the JTAC. While JFOs provide timely and accurate targeting data for Type 2 and Type 3 controls to the JTAC, the JTAC maintains terminal attack control authority. At any time the JFO or the JTAC can issue an abort to prevent fratricide or for safety of flight.


3001. JFO Integration

1. A JFO may be an organic member of a ground maneuver unit executing their observer responsibilities as collateral duty, or a JFO may be an observer assigned to the TACP executing their observer responsibilities as a primary duty. The ground maneuver element of which the JFO is an organic member, or to which the JFO is attached, must understand the JFO’s responsibilities as an extension of the TACP. It is necessary for the supported maneuver commander and TACP to define the relationship between the JFO, JTAC and maneuver element. If aviation support is required (e.g. CAS and/or Assault Support), the JFO will serve as the key enabler, especially in the absence of a JTAC. In situations where the JFO is executing his observer responsibilities as a collateral duty, this may require special consideration to facilitate effective aviation support.

2. A JFO may execute his responsibilities as a trained observer with FAC(A) qualified aircrew. The FAC(A) is normally an extension of the TACP. (See Chapter 4 for information regarding FAC(A) integration).

3002. Planning & Preparation

1. For successful JFO employment, it is imperative that both the JTAC and JFO participate in the planning process. This requires the supporting Air Officer / JTAC to understand the mission of the JFO’s supported unit to include the Scheme of Maneuver (SOM) and Essential Fire Support Tasks (EFSTs). The JTAC and JFO should pay particular attention to the communication plan and ensure it is supportable, executable, and understood by all fires agencies.

2. JFO Preparation Guidance: The JFO should review this checklist with the supporting JTAC / Air Officer in order to identify mission specific planning requirements.
   a. Plan, coordinate, and synchronize CAS and other fire support assets; request as needed
   b. JFO reviews commander’s intent for fires
   c. Plan / submit recommended air support to the JTAC or Air Officer
   d. Identify / review preplanned targets
   e. Update / review Fire Support Coordination Measures (FSCMs) / operational graphics
   f. Review / plot applicable Initial Points (IPs), Contact Points (CPs), Airspace Control Measures (ACMs), Fire Support Coordination Measures (FSCMs)
   g. Identify / plan for Suppression of Enemy Air Defenses (SEAD) requirements
h. Assist in the planning of Unmanned Aerial Systems (UAS) (organic and non-organic)
i. Verify target marking procedures
j. Verify friendly marking procedures
k. Review available air support assets
l. Review Type 1, 2, and 3 control guidance
m. Review Bomb on Target (BOT) and Bomb on Coordinate (BOC) method of attack guidance
n. Confirm call signs and code words
o. Identify / verify communication plan
   i. JTAC / Air Officer primary and alternate frequencies
      (Tactical Air Direction [TAD], TACP Local [TACP(L)])
   ii. Confirm observer / conduct of fire frequencies
      (Arty Conduct of Fire [CoF], 81mm Mortars CoF, Company Tac)
   iii. Special communication capabilities
      (e.g. Tactical Chat [Tac Chat], SATCOM, High Frequency)
p. JFO capabilities
   i. Target Location / Marking
      (e.g. LASER rangefinder, designator, kinetic mark, IR pointer, Thermal Imager,
        Video Downlink (VDL), Digital Situational Awareness (SA) tools)
   ii. Friendly Position Marking
      (e.g. IR Strobe, Air Panel, Smoke Grenade, Signal Mirror, Buzz Saw)
q. Confirm authentication procedures (authentication table)
r. Perform communication checks on all nets and devices
s. Ensure all supported and supporting units have the same Gridded Reference Graphics (GRGs)

3. Combined Arms and Fire Support Rehearsals
   a. Rehearse CAS execution with ground maneuver element, Fire Support Coordinator (FSC), and JTAC.
   b. Rehearse primary / alternate observation points
      (1) Identify observers
      (2) Identify force protection
      (3) Identify infiltration / exfiltration routes
      (4) Identify CAS triggers
(5) Identify displacement criteria
(6) Review weather considerations
(7) Review night procedures
(8) Review FSCMs and Attack Guidance Matrix (AGM) for CAS targets (found in Tab F of Appendix 19 of Annex C of the Operations Order).

(9) JFO location and communication with the supported maneuver element leadership

c. Rehearse actions when CAS triggers are met
d. Review purpose, location, observer(s) (primary and secondary), triggers, and comm. nets
e. Rehearse engagement procedures for CAS targets
   (1) Identify observers (primary / secondary)
   (2) Review ROE / positive ID requirements (PID)
   (3) Identify closest friendly locations
   (4) Verify friendly marking procedures
f. Rehearse SEAD procedures with firing unit Fire Direction Center (FDC)
g. Rehearse CAS target marking procedures
   (1) Review the integration / de-confliction plan of air and surface fires
   (2) Review indirect fire assets available
   (3) Review marking, SEAD plan, and method of control
   (4) Review indirect fires asset positions
   (5) Review gun target lines for planned targets
   (6) Review minimum / maximum ordinate(s)
   (7) Review ordnance available and effects
h. Rehearse communications plan
   (1) Confirm callsigns
   (2) Review JTAC primary and secondary frequencies
   (3) Review mission specific brevity and pro-words
      (e.g. JFIRE, mission execution checklist)
   (4) Conduct radio checks – TADs, TACP(L), Company/Battalion Tac, Arty CoF, Bn 81mm Mortars.
   (5) Confirm Crypto / ComSec requirements and procedures (Crypto Rollover)

1. Once established in the assigned location / area or when departing for a mission, the JFO will contact
the JTAC on the briefed communications net. Upon initial contact with the JTAC the JFO should pass his
position report followed by a Situation Report (SITREP) using the same format as the CAS situation
update brief, only including those items that are applicable. (See 2012 JFIRE, pg 47-49, Table 10)

2. After transmitting the initial SITREP, the JFO should conduct periodic communication checks and
position updates as required; this will ensure constant communication connectivity as well as allow the
JTAC to conduct battlefield tracking of friendly units. The JFO should also provide updates as the
battlefield situation changes. The JFO should monitor TAD any time the aircraft are on station.

3. Ideally, the Marine JFO and JTAC have an established working relationship and the JFO is
communicating with with the supporting JTAC prior to requiring aviation support. However, due to the
tactical situation the JFO may not establish communication with the JTAC until aviation support is
required (e.g. Troops in Contact. In this case, the JFO can quickly communicate his situation to a
supporting JTAC using the Observer Lineup brief (See 2012 JFIRE pg 57-58, figure 6).

Note

The Observer Lineup is primarily used by Army JFOs to integrate with Air Force JTACs. Doctrinally the Army JFO
works directly for the Army Fire Support Officer (FSO) not a specific JTAC. The US Army TTP requires the JFO to
contact the FSO to provide a SITREP in the form of a SALT report. The FSO will forward that SALT to the Air Force
JTAC, who will then contact the JFO and begin mission execution with the Observer Lineup brief.

4. Targets may be nominated for attack by unit leaders (e.g. platoon commanders, squad leaders) via
maneuver frequencies (Co Tac, Bn Tac) or by a JFO via TACP frequencies (TAD, TACP(L)) or surface
fires (CoF) frequencies. It is imperative that the communications plan is understood by all.

   a. JFO Target Brief. When the decision has been made to attack the target using aviation fires
      based on the JFO’s SITREP or Observer Lineup, The JTAC should pass his Plan of Action to
      the JFO, which should consist of a request for a Target Brief from the JFO, and an update
      from the JTAC to the JFO on the status of air support. (See figure 3-2 JFO Target Brief)
```
<table>
<thead>
<tr>
<th>JFO Target Brief</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Advise when ready for lines 4-8&quot;</td>
</tr>
<tr>
<td>Line 4: Tgt Elevation (ft MSL)</td>
</tr>
<tr>
<td>Line 5: Tgt Description</td>
</tr>
<tr>
<td>Line 6: Tgt Location</td>
</tr>
<tr>
<td>Line 7: Tgt Mark</td>
</tr>
<tr>
<td>Line 8: Closest Friendlies</td>
</tr>
<tr>
<td>&quot;Advise when ready for Remarks&quot;</td>
</tr>
</tbody>
</table>

FAHs

LTL / PTL

Threat | Direction/Distance from Tgt to Threat

SEAD | Int / Cont / Non-Stan

GTL / LOF | Max Ord

Restrictions

TOT
```

(1) If any lines between 4 and 8 are omitted from the brief, the line must be prefaced with the description of the line to identify the line associated with the information.

**Note**

It is the responsibility of the JFO to provide as much information in the JFO Target Brief as possible / required. However, dependent on the tactical situation, the JFO should not delay passing available elements of the JFO Target Brief to the supporting JTAC. The JFO can / should provide remaining elements of information when able. Additionally, the JFO should be prepared to provide additional information as required by the supporting JTAC.

(2) JFOs shall ensure that line 8 references the closest friendlies to the target which may or may not be the JFO position. It is incumbent on the JTAC to verify this direction and distance by all available battle tracking methods.

(3) Remarks may include, but are not limited to, LASER-Target Lines (LTL), IR Pointer-Target Lines (PTL), threats to aviation, recommended / requested attack geometry (e.g. FAHs), ordnance, etc.

(4) The JTAC will validate the information and then verify the target location / attack geometry.
b. The JTAC will then conduct CAS mission preparation IAW chapter 2.

5. After the JFO Target Brief, the JTAC will pass instructions or an updated Plan of Action to the JFO.
   a. The JTAC to JFO instructions identify actions required by the JFO to support the JTAC’s intended Plan of Action.
   b. The Intended Plan of Action communicates the details of the CAS attack so that the JFO can brief the supported unit leader and confirm he is able to execute or provide information as required by the JTAC.
   c. Prior to the CAS brief, the JTAC should communicate the plan to the JFO and identify observer responsibilities in support of mission execution.
   d. If the JFO has any questions regarding the plan or limitations that will affect the mission they must communicate that to the JTAC.

<table>
<thead>
<tr>
<th>Examples of TACP Information to Coordinate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target refinement, if applicable</td>
</tr>
<tr>
<td>Ordnance / effects requested</td>
</tr>
<tr>
<td>Direction of attack</td>
</tr>
<tr>
<td>Abort code</td>
</tr>
<tr>
<td>TOT</td>
</tr>
<tr>
<td>Mark Information / JFO marking responsibilities (if required)</td>
</tr>
<tr>
<td>Mark the target</td>
</tr>
<tr>
<td>Suppression effects on SA threat</td>
</tr>
<tr>
<td>Provide corrections from the mark</td>
</tr>
<tr>
<td>Set LASER PRF code for marking or designation</td>
</tr>
<tr>
<td>Note: With the information the JFO confirms the ability to provide any required marks, TGO, talk-ons, etc. and briefs the CAS mission to the ground commander.</td>
</tr>
</tbody>
</table>

6. The JTAC will direct the JFO to switch to the TAD frequency prior to CAS, conduct a comm check with all stations and then monitor the Game Plan and CAS attack brief. During the execution of the CAS attack, the JFO will provide terminal guidance operations, correlation, or target / situation updates as required for mission success.

7. JTAC conducts the CAS mission using the Execution Template (refer to Chapter 2).
   a. Execution Template considerations specific to JFO integration are:
      (1) **Routing / Safety of Flight**: N/A
(2) **CAS aircraft check-in**: If able, the JFO should be on TAD and monitor mission execution.

(a) This will enable the JFO to brief the ground commander on CAS mission status.

(b) If the JFO is unable to monitor the check-in, the JTAC should pass pertinent check-in information to the JFO (e.g. Type of A/C, C/S, ordnance, and TOS)

(3) **Situation Update**: The SITREP should include the use of the JFO during the mission (general location, equipment / capabilities, and duties with regards to the CAS mission).

(4) **Game Plan**: JFO monitors to provide maneuver element leader with pertinent information regarding weapon(s), effects and timing.

(5) **CAS Brief**: JFO monitors to validate accuracy.

(6) **Remarks / Restrictions**: JFO monitors to identify attack geometry, TGO requirements and TOT.

(b) JFO confirms established TOT to maneuver element leader

(7) **Readbacks**: JFO monitors to validate accuracy

(8) **Correlation**: Target correlation can occur either between the JFO and the JTAC or between the JFO and the CAS aircrew. Some correlation considerations are listed below:

(a) JFO to JTAC Correlation

   i. It is recommended that the JFO utilize the TAD frequency.

   ii. Should occur prior to aircraft check in if possible. With systems available in the COC, this could enable the JTAC to conduct a BOC attack, minimizing time to first effects, vice a BOT attack.

   iii. May be required to refine target location to a high enough fidelity for mission approval.

   iv. May enable JFO to continue to search for additional targets once target correlation occurs.

(b) JFO to aircrew correlation

   i. JFO must be on TAD frequency.

   ii. May be required for BOT attacks when the JFO is the only observer who is tally target and JFO to JTAC correlation has not occurred prior to aircraft check-in.

   iii. When aircraft are already on-station and in a position to participate in a target talk-on.

   iv. When visual marking is the means to effect target correlation (e.g. IR sparkle, smoke, direct fire).
Note

Target correlation can be time intensive since it involves three-way communication. This will have to be trained to. For effective correlation techniques see the CAS execution chapter of this manual.

Note

If line of sight (LOS) communication cannot be established or reliably maintained between the JFO, JTAC and aircrew, the JFO and JTAC should consider relaying necessary information through the aircrew. Communication relay between JFO, aircraft and JTAC will likely require more time for communication.

(9) **Attack**: Mission Execution. The JFO should be kept informed as the mission progresses. The JFO must know CAS mission specifics that may include when aircraft are prosecuting attacks, how many aircraft are attacking the target, when they release ordnance, and approximate time of weapons impact.

The JFO will **not** issue weapons release approval (i.e. the JFO will not say “cleared hot” or “cleared to engage”). However, the JFO always has “Abort” authority. The JFO should monitor TAD and be prepared to provide an “Abort” call in order to prevent fratricide, ensure safety of flight and satisfy commander’s intent.

*In circumstances when the JFO is unable to monitor TAD, he should monitor the JTAC to JFO communication frequency and be prepared to provide an Abort call.*

1. During mission execution, the JFO will pass pertinent information to the JTAC. This includes, but is not limited to:
   a. Target updates, target location refinement, target movement, and change in target priority.
   b. Troops in contact.
   c. Friendly location updates and maneuver plan after the attack.
   d. Collateral damage considerations and updates.
   e. Weapons impact correction and/or new desired aim point. The JTAC should be proactive and ensure the JFO provides timely corrections.
   f. Threats to aircraft (MANPADs, small arms, AAA equipment).
   g. Inputs to Battle Damage Assessment.

(10) **Assess Effects**: JFO provides assessment of weapon(s) effects and updated commander’s intent.

(11) **BDA**: JFO monitors and updates ground commander on CAS mission status.

(12) **Routing / Safety of Flight**: N/A

**Example Communication Flow between JTAC, JFO and CAS Aircrew**

**JTAC** (c/s “Aztec 11”), **JFO** (callsign “Aztec 11A”), **CAS Aircrew** (callsign “Devil 23”, “Devil 24”)

**JFO**: “Aztec 11, this Aztec 11A, radio check on TACP(L).”

**JTAC**: “Loud and clear.”
JFO: “Aztec 11, this Aztec 11A, radio check on TAD.”

JTAC: “Loud and clear.”

JFO: “Aztec 11, this Aztec 11A, advise when ready for SitRep.”

JTAC: “Aztec 11A, Aztec 11 is ready to copy.”

JFO: “T – No observed threats, E – No enemy contact, F – All elements passing phase-line green, A - No active IDF missions, C – N/A, H – Winds are 10-15 knots out of the West, R – N/A.”

JTAC: “Aztec 11A, Aztec 11 copies SitRep.”

JFO: “Aztec 11, this Aztec 11A, request CAS, advise when ready for JFO target brief.”

JTAC: “Aztec 11A, Aztec 11, ready to copy.”

JFO: “Update to last SitRep, my current position is MS 665 843. We are currently engaged by squad-size enemy element, advise when ready for JFO target brief.”

JTAC: “Aztec 11A ready to copy JFO Target Brief.”


JTAC: “Aztec 11A ready to copy remarks.”

JFO: “Recommended Final attack headings, 120 through 170. Observer-Target line 005. The ground commander has no ordnance restrictions, request earliest TOT.”

JTAC conducts mission coordination as required with FSCC, DASC and CAS aircrew

JTAC: “Aztec 11A, this Aztec 11, advise when ready to copy mission game plan.”

JFO: “Aztec 11A ready to copy.”

JTAC: “Aztec 11A we will use the target location you provided, expect PGMs from FW aircraft, with final attack headings of 130 through 160. Abort will be ‘abort’ x3 on TAD Blue, TOT of 15 has been approved. Be prepared to update friendly sit, give target talk-on instructions and provide TGO, how copy?”

JFO: “Aztec 11A, copy all, WILCO.”

JTAC: “Aztec 11A, switch TAD Blue at this time.”

JFO: “Aztec 11A WILCO.”

JTAC: “Aztec 11A, Aztec 11, radio check on Blue.”

JFO: “Aztec 11, Aztec 11A on TAD Blue, I have you loud and clear”
JTAC: “Aztec 11A, Aztec 11 I have you loud and clear. I’m expecting a flight of 2 x F-18s callsign “Devil 23” to check in momentarily, be prepared to copy.”

JFO: “Aztec 11A, standing by, ready to copy”

Aircraft Checks in with JTAC. JFO monitors the aircraft check-in and the JTAC’s CAS brief to aircraft.

Following aircrew readbacks to the JTAC:

JTAC: “Devil 23, Aztec 11, good readbacks, contact my JFO, callsign Aztec 11A for target talk-on, at this time.”

CAS Aircrew: “Devil 23 copies all, break break, Aztec 11A, Devil 23.”

JFO: “Devil 23, Aztec 11A, I have you loud and clear, advise when ready for target talk-on.”

JFO conducts target correlation with CAS aircrew.

JTAC monitors JFO-Aircrrew talk-on, and after correlation, conducts the attack utilizing JP 3-09.3 procedures.

JFO monitors the attack and provides real-time updates.

JFO: “Devil 23 good hits. Devil 24, from leads hits, west 100.”

JTAC: “Aztec 11 and Devil 23 flight, Aztec 11A, advise when ready for BDA.”

JFO passes BDA to JTAC and CAS aircrew

JTAC completes CAS mission with aircrew

3004. LASER Terminal Guidance Operations (TGO) for CAS.

1. When the JFO is providing TGO with a Laser Target Designator (LTD), the JTAC should ensure that all LASER communications occur between the JFO and attacking aircraft (It is recommend the JTAC ask A/C to conduct JLASE communication with the JFO in the remarks section of the CAS brief). This communication will occur on TAD (Reference JP 3-09.3 CAS). A communication check between the JFO and the aircrew should be accomplished prior to LASER employment. The JTAC and JFO should be aware of the LASER profile the A/C will be using for LASER Guided Weapon (LGW) employment (e.g. continuous or delay ASE).

3005. Fixed-Wing Precision Guided Munition (PGM) CAS employment.

1. Due to extended time of fall associated with PGM employment, the JTAC should notify the JFO of weapons release and time of fall, if the JFO is unable to monitor communication with the employing aircraft on TAD. This will give the JFO situational awareness and allow him time to notify others in the target area of pending weapons impact.

3006. Night CAS Operations.

1. When the JFO is using an IR pointer to mark a target, the JTAC must ensure that all proper IR terminology is utilized (ref. MCRP 3-25B Multi-Service Brevity Codes).
2. IR TGO communication should occur on TAD between the aircraft and JFO.

3007. CAS With non-JTAC Personnel

1. Aircrew in this situation will make a timely effort to involve a JTAC / FAC(A) in the situation, be prepared to "pull" information from the ground personnel to complete the attack, and exercise vigilance with target identification, weapons effects, friendly locations and execution of the final attack / abort procedures.

2. Refer to MCRP 3-16.6A, JFIRE pg. 60 and 3-09.3, CAS pg. V-33.
Chapter 4: FAC(A) Integration

4000. Chapter 4 FAC(A) Planning and Integration

1. General
   a. The inclusion of the FAC(A) handbook in the TACP TACSOP is a move to reinforce the FAC(A) as a key member of the TACP. The FAC(A) is a key integrator in that team and therefore has to be well versed in the duties and operation of the entirety of the Tactical Air Control Party. All information previously contained in the FAC(A) handbook falls into two categories:
      (1) Contained in external sources that are the current accepted tactical references
          (a) MCRP 3-16.6 JFIRE
          (b) JP 3.09-3 Close Air Support
          (c) MCWP 3-16
      (2) Contained within this reference in other sections
   b. The Forward Air Controller (Airborne) (FAC[A]) is a specifically trained and qualified aviation officer who exercises control from the air of aircraft engaged in CAS of ground troops. The FAC(A) is normally an airborne extension of the TACP. The FAC(A) can serve as another terminal attack controller for the TACP and extend the acquisition range of a Tactical Air Control Party. See figure 4-1.

   c. FAC(A) tasks include reconnaissance, asset coordination and de-confliction, call for fire, target marking and designation, terminal attack control, battle damage assessment (BDA), radio relay, and suppression of enemy air defenses (SEAD).
   d. Many CAS aircrew are able to perform some FAC(A) tasks; however, a FAC(A) qualified aircrew has been certified to perform all eight tasks simultaneously. Terminal attack control can only be conducted by a FAC(A) qualified aircrew.
   e. The FAC(A) will execute the ground commander’s intent. To accomplish this, the FAC(A) must conduct detailed planning and integrate with the supported maneuver element.
   f. The FAC(A) Mission Commander is the single point of contact for an aviation unit that has been tasked with providing FAC(A) for a ground maneuver element. There may be more than one FAC(A) Mission Commander in a theater for any given day, since not all of the FAC(A) aircraft will be located at one airfield or with one Carrier Strike Group. The FAC(A) MC must be familiar with the OPLAN, OPORD, and any applicable Theater / Operation SOPs. Liaison with the supported unit’s FSC / AO / ALO should
clarify the information contained within the OPLAN / OPORD / ATO and any specified tasks of the supported ground unit. Upon completion of the liaison, the FAC(A) MC is responsible for disseminating the following information to the rest of the squadron / group:

(1) Ground Scheme of Maneuver (SoM)
(2) Ground Commander’s Intent
(3) Fire Support Coordination Measures
(4) Expected area of operation
(5) Supported unit’s expected locations
(6) Initial positions of TACPs
(7) Fire Support Plan
(8) Target Precedence List (TPL)
(9) Fire support assets
(10) SEAD SOP
(11) LASER employment plan
(12) FAC(A) employment plan
(13) CAS assets available
(14) FAC(A) assets available
(15) Tanker assets available
(16) FARP locations
(17) Routing
(18) Control Points and Initial Points (CPs / IPs)
(19) Battle Positions and Holding Areas (BPs / HAs)
(20) Communications plan and nets
(21) Code words / Pro-words
(22) CASEVAC
(23) TRAP / SERE plan

g. As the FAC(A) or FAC(A) MC there are several personnel that are critical to planning and executing FAC(A) in support of the GCE:

(1) **Air Officer / Air Liaison Officer (AO / ALO)**. The AO / ALO advises the supported Commander, S-3, and the FSC on the employment of CAS and FAC(A). The AO / ALO is expected to have a working knowledge and understanding of CAS and FAC(A) aircraft capabilities and limitations. The AO / ALO will conduct liaison with the FAC(A) Mission Commander(s) to ensure that the FAC(A)s understand the scheme of maneuver and the Commander’s Intent. The AO / ALO will be ready to provide the following information:

   (a) Ground Scheme of Maneuver and Commander’s Intent
   (b) Specified and implied FAC(A) tasking
   (c) Initial unit and TACP locations
   (d) Air Fire Plan. Defines how CAS (preplanned and immediate) missions will be integrated into the overall fire support plan
   (e) Plan for FAC(A) employment. Will the FAC(A) be an airborne extension of an existing TACP or as an additional TACP for a maneuvering unit? Positioning and planned tactics of the FAC(A) should be discussed
   (f) Target Area Coordination. The plan for combining RW and FW CAS assets with indirect fire support assets in the target area (combined / sectored / simultaneous / sequential)
   (g) Control of CAS assets. How terminal attack control will be passed from the JTAC to the FAC(A). This includes who will provide marks, who will provide terminal attack control when required, and approval authority to run a mission
   (h) Contact Points, Initial Points, Battle Positions, and Holding Areas. Expected points that will be used in conjunction with the ACO and supports the scheme of maneuver
   (i) CASEVAC Plan. Theater / AOR plan for using aviation to provide this support
   (j) Communications. Verification of the expected TACP(Local) / TACP(Admin), TAD nets, and call signs of the TACPs and FACs
   (k) Reference map datum / spheroid / coordinate format. This may be defined by higher for the entire theater but must be verified with the supported unit

(2) **Fire Support Coordinator (FSC) / Fire Support Officer (FSO)**. The FSC is the officer responsible for the integration of all fires in support of the operation. This officer will meet with the unit
AO / ALO to coordinate the employment of CAS and FAC(A) aircraft. The FSC is the key person that FAC(A)s must coordinate with for preplanned fires approval. The fires approval process can be streamlined with early planning with the FSC / FSO and / or the GCE commander. This preplanning can be one of the most effective methods to streamlining the time to attack process during FAC(A). The FSC / FSO should provide the FAC(A) and Air Officer the following information:

(a) The Essential Fire Support Task(s) (EFSTs) that the FAC(A) will be supporting
(b) Target List. Preplanned targets and other targets of interest
(c) Attack Guidance Matrix (AGM). Defines the high priority targets
(d) No Strike Target / Restricted Target List
(e) Fire Support Assets. General and Direct Support artillery, HIMARS, mortar units and positions, counter battery RADAR sites, and displacement schedules
(f) Fire Support Plan. The extent of the fire support plan varies with the tactical situation. The fire support plan may be written as an appendix (Appendix 19) to the Operations Annex (Annex C) of an OPORD. Aspects of the fire support plan may consist of verbal orders, e.g., positioning of fire support units. At a minimum, documentation should include:

1. Priorities and attack guidance (Attack Guidance Matrix (AGM), High Payoff Target List HPTL), or Target Precedence List (TPL)
2. FSCMs / ROE
3. Fire support coordination procedures when these are not covered in SOPs
4. Restrictions or changes to restrictions (Attack Guidance Matrix)
(g) Fire support schedules (scheduling worksheets)
1. FSCMs. FSCMs are used to facilitate timely and safe use of fire support and may be permissive or restrictive in nature. Commanders employ permissive and restrictive FSCMs based on the recommendations of the FSC. FSCMs are used to facilitate timely and safe use of fire support. FSCMs are created with the following considerations:
   a. Commanders intent
   b. Exploitation of all available target acquisition assets
   c. Use of all available lethal and non-lethal fire support
   d. Safety of friendly forces and installations
   e. Provide the type of fire support requested
   f. Provide for rapid and effective coordination
(h) LASER employment plan. Available assets and expected employment guidelines. Verify LASER code assignments and coordination as per the ATO
(i) SEAD SOP. The plan for suppressive fires including targets requiring suppression, suppression assets, fire plans and standard calls for fire
(j) Communications. Verification of the Conduct of Fire and / or Air Spot nets, and the call signs of the artillery and mortar units

To aid the FAC(A) in planning there are several documents that include information key to FAC(A) planning. The following are a list of non exclusive documents that aid in FAC(A) planning:

(3) Operations Order (OPORD). The OPORD is a directive from the commander issued to subordinate commanders to coordinate the execution of an operation. A thorough understanding of the OPORD, its annexes and appendices will provide the FAC(A) planner much of the information required to successfully plan for the mission. Information on the scheme of maneuver is found in Annex C, the Operations section. Annex W, the Air Operations section, will contain the majority of details that will affect the FAC(A) mission. The following sections and respective information must be understood.

(a) Annex B: Intelligence
1. Appendix 1. Priority Intelligence Requirements
   a. Lists items identified as crucial to the MAGTF’s mission
2. Appendix 4. Target Intelligence
   a. Contains information on items on the target list and lists of targets including physical characteristics
3. Appendix 7. Enemy Courses of Action (COA)
   a. Enemy’s most likely and most dangerous COAs
(b) Annex C: Operations. Overall scheme of maneuver will be found in this section.
1. Appendix 6. Rules of Engagement
2. Appendix 17. Aviation Ops (omitted when Annex W included)
3. Appendix 18. Operations overlay
4. Appendix 19. Fire Support
   a. Tab A. Air Fire Plan.
      (1) Enclosure 1. Preplanned Air Support
         (a) Contains the preplanned scheduled and on-call missions
      (2) Enclosure 2. Air Targets
         (a) List of air strike targets
      (3) Enclosure 3. Air Target Overlay
         (a) Depicts the planned air targets, FSCMs and unit boundaries
   b. Tab B. Artillery Fire Plan
      (1) Enclosure 1. Artillery Targets
         (a) Contains list of preplanned artillery targets. A target list worksheet may be used.
      (2) Enclosure 2. Initial Position Area / Fire Capabilities
         (a) Includes boundaries as well
      (3) Enclosure 3. Artillery Target Overlay
         (a) Targets / Groups / Series / FSCMs / Boundaries
      (4) Enclosure 4. Artillery Fire Support Tables
         (a) Schedule of fires / Worksheet possibly
   c. Tab C. Naval Gunfire Plan.
      (1) Enclosure 1. Naval Gunfire Support Operations Overlay
         (a) Boundaries / boat lanes / zones of fire / fire support areas and stations / naval
gunfire targets / target areas / marginal data / helicopter lanes / landing force objectives
      (2) Enclosure 2. Schedule of Fires
         (a) Identifies the firing ships / radio frequencies / armament / targets / ammunition
         allowance / time periods / restrictions of fires / remarks or notes
   d. Tab E. Targeting
      (1) Targeting priorities / AGM / target list / list of targets
   e. Tab F. Fire Support Coordination Plan
      (1) Contains coordination measures and procedures, as well as firing restrict
      (2) Enclosure 1. Fire Support Coordination Overlay
   (c) Annex K: Communications-Electronics. Contains information on the locations of C3 assets,
   the planned nets, casualty plans, CEOI / AKAK / AKVH / AKTV procedures, and COMSEC procedures
   1. Appendix 1. Communications Security
      a. Contains those nets and information that must be guarded from the enemy
      b. Encryption use will be covered here
      a. Contains the approved alternative communication means, such as panels.
   (d) Annex W: Air Operations. Contains procedures for affecting the support proscribed in
Appendix 11, Annex C.
   1. Appendix 2. Air Support
      a. Contains details on operations by assets performing this function. Includes several
tabs that may be modified.
      b. Tab A. Tactical Air Control Procedures
      c. Tab B. FAC(A) Procedures
      d. Tab C. MISREP Procedures
      e. Tab D. Target Marking for Air Attack
      f. Tab G. Interdiction and Armed Reconnaissance
      g. Tab H. USMC CAS Briefing
      h. Tab L. Attack Helicopter Brief
      i. Tab M. Preplanned request numbering system
      j. Tab O. Direct Support Aircraft Operations
   2. Appendix 3. Assault Support
      a. Contains details on operations by assets performing this function.
   3. Appendix 6. Armament
      a. Contains the ordnance codes used in the operation
4. Appendix 7. Air Control  
   a. Contains details on airspace control measures  
   b. Tab F. Air Control Points (CPs and IPs)  
   c. Tab G. Tactical Routing.
5. Appendix 8. Air Communication.  
   a. Tab C. Air Control Comm Brevity List.
6. Appendix 10. Aircraft Schedules.  
   a. Generally omitted
   a. Specific tasking for aviation assets will be complimented by the ATO.

2. **Theater / Operation SOPs.** These documents will supplement the information that is found in the OPORD. There may be Memorandums of Agreement / Understanding that FAC(A)s will be familiar with and comply.

3. **Air Tasking Order (ATO).** The ATO or equivalent Integrated Tasking Order (ITO) contains the ACE / JFACC’s plan for providing the air support required in the OPLAN / OPORD. FAC(A)s must read the ATO, the Airspace Control Order, and the Special Instructions (SPINS) thoroughly to derive the following information:
   a. CAS and FAC(A) assets available (MSN#, Type / Model / Series, Ordnance, Time on Station, etc.
   b. Routing (RW and FW)
   c. Pre-planned 9-Lines
   d. Airspace Control Measures
   e. Expected Area of Operations
   f. Tanker availability / locations / times
   g. Code words / pro-words
   h. Communications plan
   i. FSCMs
   j. FARP / FOB locations

4. **Automated Communication Electronic Operating Instructions (ACEOI).** The ACEOI provides the daily communications plan including monitored nets, frequencies, call signs, and encryption / authentication tables.

4001. **Aircraft capabilities**  
1. The following Marine Corps aircraft train to and have qualified FAC(A) aircrew. Not all aircrew are FAC(A) qualified, so that information will be provided by aircrew during the CAS check-in.
   a. UH-1
   b. AH-1
   c. F/A-18
   d. AV-8B
   e. Specific aircraft and sensor capabilities are found in MCRP 3-16.6 JFIRE.

2. FAC(A) tasking duration, time on station, and FARP / tanker availability will influence FAC(A) execution and needs to be addressed during planning.

4002. **FAC(A) Planning**  
1. Planning. FAC(A) planning should mirror that of JTAC planning found in Chapter 2. Some planning specific to FAC(A) operations are outlined in the following section. Planning is a key element of the FAC(A) mission and drives an aircrew’s decision on the ability to conduct the mission in support of the GCE. While an aircrew may be FAC(A) qualified and proficient, without sufficient knowledge of the tactical situation, fires plan, and ground scheme of maneuver, a FAC(A) should consider whether or not to assume the FAC(A) mission.
a. Determine if a situation requires the use of a FAC(A). Potential scenarios in which a FAC(A) can be used include but are not limited to the following:

1. JTAC not in a position to observe.
2. JTAC not present in a ground unit that requires CAS.
   a. JFO may be present and can provide battlefield information to the FAC(A) aircrew.
   b. FAC(A) aircrew can coordinate with the JFO for target acquisition and terminal guidance operations. More information can be found in Ch. 3, JFO Integration.
3. Air assault (JTAC will be inserted during the operation)
4. Workload exceeds what the JTAC is able to control and the JTAC / FiST task sheds some or all tasks to the FAC(A).

b. Environmental Assessment. The FAC(A) must make an assessment of environmental and geographical factors that impact the FAC(A) and CAS player's ability to provide timely and accurate fires for the GCE. A FAC(A) should always study these factors during mission preparation and preflight planning. However, the actual conditions and their impacts are not always what were expected during mission planning, so a reassessment must be conducted airborne. The following is a sample list of environmental and geographical considerations and the potential impacts they could have. This list is not all inclusive. It is simply a tool to get FAC(A)s thinking about all the potential impacts to execution.

1. Sun: Sun azimuth and elevation can have positive and negative impacts on both FAC(A) and CAS platforms. On the positive side, the sun can be used to deny the enemy tallies and degrade earlier generation IR SAM systems. On the negative side, the sun can also cause difficulties in visual acquisition of targets and CAS players during deliveries, making type 1 terminal attack control very difficult. A good technique is to keep the sun at least 20-30 degrees off the ingress and egress heading of the CAS players, especially if it is relatively low on the horizon. As with all rules of thumb, this rule should only be applied after carefully analyzing all other factors.
2. Moon: As with the sun, moon angle and elevation can also cause a target to be difficult to acquire, especially when aided. In general, if the moon is low on the horizon, FAC(A)s should strive to keep it 20-30 degrees off the CAS platforms final attack heading(s) if visual acquisition of the target is required. Additionally, the light level of the moon must also be considered. Low light levels can make IR and HE marks easier to see. However, actual targets and delivering platforms will be more difficult to visually acquire, making type 1 terminal attack control extremely difficult. High light levels will usually have the opposite effect, causing IR and other marks to be more difficult to see and actual targets a little easier.
3. Winds: Winds will primarily impact weapon ballistic profiles and the drifting of marks and battlefield illumination. In general, a tail or head wind (vice a cross wind) works better for most ordnance. Winds from the surface to the delivery altitude should be considered.
4. Decks: Cloud decks and obscurants need to be considered for their effects on target acquisition, terminal guidance, and type of control, as well as surface-to-air threat avoidance. At night with IR sensors, the FAC(A) may not fully be able to determine if obscurants are present, so FAC(A)s need to be aware that target coordinate generation could be adversely impacted when using the LASER for ranging. Additionally, it could also have an impact on terminal guidance of LASER guided weapons.
5. Terrain: The effects of terrain need to be considered in regards to line of sight (both visual and communications) for the TACP and its use to mask RW and FW aircraft in the low altitude environment. Additionally, the FAC(A) should look at the terrain and other features of the battlespace to develop geographical reference points and a unit of measure that can be used both for their own SA, the expeditious talk-on of targets to the CAS players, and indirect fire employment.

a. Map / chart / imagery study and preparation techniques.
   1. Chart study – For the expected working area, FAC(A) aircrew should become familiar with and determine the following based on mission planning factors.
      a. FW control points (CP) selection
      b. RW holding areas (HA) selection
      c. Initial point (IP) selection
      d. Battle position (BP) selection
      e. UAS holding areas
      f. Weapon to target match
(g) Anticipated types of control
(h) Anticipated attack geometry
(i) Anticipated azimuth of fire and maximum ordinates
(j) Target area flow

(2) Chart preparation - Each member of the FAC(A) crew shall fly with charts appropriate to the mission for every objective area in which they may operate

(a) For planning and briefing purposes only, aircrew should consider drawing the following:
1. 3, 4, or 5 NM ring around the objective area to represent potential Roll-in Points (RIP) / release ranges of the FW CAS aircraft
2. 1000 meter ring around the objective area to represent potential RW rocket and gun employment ranges
3. 8000 meter ring around the objective area to represent potential RW PGM employment ranges

(b) These techniques will give FAC(A)s a better understanding of area management, ground track, and expected control position of the FW / RW players for geometry planning.

1. As time and resources permit, recommended charts and graphics include:
   a. Suitable overview charts for entire AO
   b. 1:250,000 JOG for AO
   c. 1:100,000 scale charts or imagery
   d. 1:50,000 scale chart or imagery
   e. Gridded Reference Graphic (GRG) - Ensure produced / distributed by proper agency
   f. Each target area graphic chart shall at least contain:
      g. Correct datum and spheroid (WGS-84 / MSL is the default)
   h. Target areas
   i. All FSCMs
   j. Airspace coordination measures (ACMs)
   k. Friendly positions (current and anticipated)
   l. CPs, Has, IPs, BPs
   m. Planned geographical reference points
   n. Planned Target Reference Points (TRPs)
   o. Attack geometry tools
   p. Scale for measuring both nautical miles and kilometers. Grid lines and lat. / long. lines are sufficient.
   q. Elevation conversion scale for meters to feet
   r. Draw in the center of azimuths of fire for known artillery positions. Artillery will be able to adjust roughly 400 mils either side of centerline
   s. Magnetic headings
   t. Compass rose oriented to magnetic north
   u. Magnetic radials every 5 degrees from expected IPs / BPs through the target area (may clutter the chart)
   v. Fires integration compass superimposed on top of the target area or very near to facilitate development of 9-lines and final attack geometry.
   w. Using JMPS Bullseye tool, drop a compass rose oriented to magnetic north over the top of the target area or offset from the target area in the direction of known or anticipated friendly positions
   x. Delineate radials in twenty to thirty degree increments. Set font size such that it will be visible in all cockpit lighting conditions. One technique is to box the radial with a rectangle thus making it stand out more against the chart background.
   y. Set line width and color to stand out from imagery and grid lines.
   z. Use range bearing tool to draw a line from various IPs / BPs to the center of the target area. Use this to facilitate quick 9-line generation.
   aa. The below graphic is intended to depict ONLY the Fires integration compass.
(3) Integrated planning
   (a) Face-to-face planning preferred
   (b) Telephone
   (c) Electronic (real-time or email)
(4) Mission-specific planning
   (a) Identify mission objective
       1. Essential Fire Support Tasks (EFSTs)
       2. FAC(A) role in achieving the commander’s intent for fires
       3. Current rules of engagement (ROE) and establishing / maintaining PID of enemy targets.
   (b) Friendly situation and scheme of maneuver
       1. FSCC / JTAC / Air Officer location
       2. Location of fire support assets
       3. Friendly unit locations and Forward Line of Own Troops (FLOT)
   (c) Enemy situation
       1. Surface-to-air threat
       2. Enemy’s most likely course of action (MLCOA)
       3. Enemy’s most dangerous course of action (MDCOA)
   (d) Fire support plan (Appendix 19)
       1. Target Precedence List (TPL)
       2. Attack Guidance Matrix (AGM)
       3. Fire Support Coordination Measures (FSCM)
       4. Map study / GRG / imagery preparation
   (e) Command, control, and communications
       1. Fires approval process (kinetic or electronic)
          a. Identify mission approval authority
          b. Required information for mission approval
             (1) Recommend a minimum of target elevation, location, attack geometry, TOT, and ordnance employed.
             (2) Additional requirements should be identified during planning with the FSCC.
          c. Communications path for mission approval
             (1) Identify who the FAC(A) will contact to request or verify mission approval
Identify the primary and alternate net

2. Airspace management
   a. Aircraft routing
      (1) Airspace Control Order (ACO) and SPINS
   b. Stack management

3. Communications for terminal control
   a. Nets available
   b. Digitally Aided CAS (see Chapter 6)
   c. GCE guard chart

(f) Air Tasking Order (ATO) / mission assets available
   1. FAC(A) Assets
   2. CAS Assets
   3. Other assets (UAS, assault support, EW)
   4. FARP / tanker availability and location

(g) Passage of terminal control
   1. Trigger (time / event driven)
   2. FAC(A) TOS and time off station for refuel

4003. Asset specific considerations.

1. FW CAS planning
   a. Capabilities
      (1) Mobility. FW CAS assets provide great mobility and flexibility, usually operating on the forward edge of the battle area or well beyond.
      (2) On station time. Decreased time on station compared to RW. Some FW CAS assets have the ability to FOB closer to the objective area.
      (3) Situational Awareness. In many tactical scenarios, SA may take more time to develop due to different perspective from the JTAC. The proliferation of digital video feeds has reduced the time to build common SA.
         (a) Normally mid teens and higher in altitude
         (b) Increased stand off from the objective area than RW
         (c) ID of friendly forces can be challenging
         (d) Visual ID of targets can be challenging and may require FW CAS to sacrifice their vertical standoff from threats
      (4) Weather.
         (a) FW CAS are often capable of penetrating under ceilings but are now very exposed to surface to air threats
         (b) Ability to fly ‘above’ the weather
         (c) Ability to employ through the weather
            1. IAMS
            2. LGBs
            3. Unguided munitions
      (5) Desired effects and TLE must be balanced
      (6) Speed. FW CAS use speed to improve survivability by complicating or denying the enemy’s ability to detect and track while preserving energy for reactive defenses.
      (7) Sensor suites. Vary considerably from targeting pods on FW CAS. This is a constantly changing and evolving technology.
         (a) FLIR (Mid and FAR IR)
         (b) CCD – TV
         (c) Air to Ground Radar
         (d) LASER designators
         (e) LASER Spot Search/Track
         (f) Integrated IR sparkle
         (g) Most FW CAS assets have most if not all of the above sensors
(8) Point Target / Anti-Armor Capability (Precision Guided Munitions). FW CAS generally bring at least 1 PGM per aircraft in addition to gun.

2. RW CAS planning.
   a. Capabilities
      (1) Mobility. Helicopters provide great mobility and flexibility, usually operating on the forward edge of the battle area.
      (2) On station time. Increased time on station compared to FW and the ability to FARP in close proximity to the objective area.
      (3) Situational Awareness. In many tactical scenarios, RW have increased SA due to a common perspective with the JTAC.
         (a) Normally low altitude and in close to proximity to the JTAC
         (b) Less stand off from the objective area than FW
         (c) Easier ID of friendly forces
         (d) Easier Visual ID of targets
      (4) Weather.
         (a) RW CAS is often capable of flying under ceilings and in decreased visibility that would be prohibitive to FW.
         (b) No ability to fly ‘above’ the weather
      (5) Terrain flight. RW CAS use terrain to improve survivability by complicating or denying the enemy’s ability to detect or locate flights.
      (6) Sensor suites. RW sensor suites vary considerably from targeting pods on attack helicopters to navigation FLIRs on scout / utility helicopters. This is a constantly changing and evolving technology.
         (a) FLIR (Mid and FAR IR)
         (b) CCD – TV
         (c) Direct View Optics
         (d) Low altitude flight modes increase target acquisition
         (e) LASER designators. Found on almost all current and planned sensors
         (f) GPS / INS coupled with IMU in sensor can provide for extremely accurate target coordinates
         (g) LASER Spot Search/Track
         (h) Integrated IR sparkle
         (i) Sensor fusion available on some but not all systems
      (7) Point Target / Anti-Armor Capability (Precision Guided Munitions). Attack helicopters (AH-1/AH-64) are capable of carrying large numbers of PGMs compared to most FW assets.
         (a) AGM-114 Hellfire
      (8) Limitations
         (a) Vulnerability to surface to air threats. RW CAS may be able to defeat acquisition / engagement of some systems with low altitude flight (RF threat), but normally operate in the heart of ADA / MANPADS / small arms envelope.
         (b) RW CAS must limit exposure to threats and use suppression whenever possible
         (c) Pre-mission planning is critical to ensure the correct asset is utilized, i.e., asset or weapon to target match
         (d) Ordnance load out. Most load outs consist of some combination of cannon, rockets, and PGMs
         (e) Not all RW CAS assets have a PGM capability
         (f) No IAMs
         (g) Weather. The “4Hs” are the ambient conditions that most impact performance
            1. High altitude
            2. Hot temperatures
            3. Heavy loads
            4. Humidity
         (h) Range. RW CAS limited speed and lack of aerial refueling capability limits overall range compared to FW CAS.
            (i) Communications. Terrain / low flight profiles will severely limit RW CAS communications.
               1. Most RW CAS are limited to LOS communications (UHF / VHF)
               2. Some carry HF / SATCOM for BLOS comm.
3. Low altitude may limit comm. with ground forces and the command and control system (j) RW CAS noise. Terrain masking, cover of darkness, and acoustic masking can minimize the impact of rotor noise, but the element of surprise will always be somewhat limited with RW CAS.

3. Geometry Templates. The following are basic templates for FAC(A) positioning with regard to GCE maneuver. These are only examples and far from inclusive. Battlefield geometry and FAC(A) must be planned rigorously and in the level of detail available for the mission at hand.

**Day Low Threat**

**Day Low Threat Overhead Pattern (Escort offset)**

Good FAC(A) positions for control. Gives FAC(A) ability to determine CAS heading and ensure friendlies are not targeted.
FAC(A) Positioning to Provide Terminal Clearance

Day Low Threat Overhead Pattern (Escort overhead)
Day Medium / High Threat Geometry

Night Low Threat Overhead Pattern
Keyhole Technique

4004. **Execution**

1. Battlefield Handover (BHO). The ideal situation will be for the FAC(A)s to conduct a battlefield handover on TACP(L). The inbound FAC(A) should monitor the TAD net and TACP(L) net of the FAC(A) to be relieved prior to establishing contact. When the brief is given on a VHF net, it should be on the supported unit’s frequency if that net is not too congested. The FAC(A) should avoid switching off the supported unit’s frequency. The FAC(A)’s first consideration is to maintain communications with the supported ground unit during the BHO.
   a. Situation Update by exception
      1. The BHO between FAC(A)s must be accomplished in the minimum amount of time. The objective for the off-going FAC(A) is to build the oncoming FAC(A)’s SA in the area as quickly as possible. This may be accomplished through a variety of verbal and digital methods.
      2. More detailed than CAS BHO and continuously updated as required, including:
         a. Commander’s intent
         b. All pertinent friendly locations
            1. Ground (include maneuver if applicable)
            2. Air (include pertinent CAS check-in information)
      3. Target nomination
      4. Preplanned / active missions
         a. IDF
         b. CAS attacks
         c. ASR (includes CASEVACs / MEDEVACs)
      5. Clearance
         a. Mission approval authority
         b. Extent and duration of FAC(A) aircrew responsibilities / authority
            1. Brief / stack / mark / control (see JP 3-09.3)
            2. Priority of fires for supporting arms
            3. Self employed ordnance / LASERs
            4. Type(s) of terminal attack control authorized
         c. Ordnance restrictions based on ground commander’s allowable risk
(6) Frequencies / nets currently in use
b. A BHO is required as the FAC(A) completes assigned tasks. The same SITREP / BHO format (See Table 2-7) can be used. Pass information by exception based on JTAC situation awareness.

2. FAC(A) tasks / capabilities per JFAC(A) MOA and JP 3-09.3 CAS:

a. Asset coordination and de-confliction.
   (1) Stack management / routing
   (2) Information to be passed / collected by the FAC(A)
   (3) One of the most essential tasks for the FAC(A) is maintaining SA and control of the working area. There are two recommended techniques to keep track of aircraft working your airspace and both utilize a kneeboard card.
      (a) Table Kneeboard Card. The table follows the information format of the ATO with space for airspace management and BDA data. The ATO information should be filled in prior to the flight for anticipated missions. The remaining spaces can be used to keep track of aircraft during the mission. The TaskView application of PFPS is also very useful for breaking down the ATO by area, time on station, or mission number. TaskView can also be used to generate kneeboard cards.

<table>
<thead>
<tr>
<th>MSN</th>
<th>Preflight Data</th>
<th>Mission Notes</th>
<th>BDA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Call Sign</td>
<td>Num/Type</td>
<td>TOS</td>
</tr>
<tr>
<td>4101</td>
<td>Hawk 01-04</td>
<td>4 x F/A 18D</td>
<td>4-D3</td>
</tr>
<tr>
<td>4111</td>
<td>Snake 11-12</td>
<td>2 x F/A-18</td>
<td>6-D2</td>
</tr>
<tr>
<td>4121</td>
<td>Cat 21-22</td>
<td>2 x Av-8B</td>
<td>8-D2</td>
</tr>
</tbody>
</table>

(b) Schematic Kneeboard Card. Another technique is to draw a schematic of the target area on a kneeboard card to use for notes during the flight.
(4) Assault Support and CASEVAC.

(a) Assault support integration: FAC(A)s must be able to integrate the maneuver of assault support aircraft with fires in the objective area. Many of the principles for integrating assault support aircraft are similar to RW CAS aircraft considerations. The FAC(A) should build a fires plan that allows the assault aircraft to ingress without holding. The FAC(A) must ensure that the assault support aircraft have sufficient SA to the CAS attacks in progress in and around the flow of assault support assets into the objective area. This may be accomplished in several ways, the two most common TTPs are:

1. Have the assault support aircraft monitor the appropriate TAD net to build SA to CAS assets.
2. Ensure assault support aircraft only provide minimum required communication on the TAD as CAS attacks are usually in progress.

3. Required communications include:
   a. ‘IP INBOUND’
   b. ‘CONTINUE / HOLD’
   c. ‘WAVEOFF’ if executed
   d. ‘LIFTING’
   e. This technique will also raise the SA of the CAS assets to the assault package
   f. This method requires communication brevity and patience on the TAD as it can be very busy.

   g. Expect RW FAC(A)s to use this TTP.
4. Have the assault support aircraft monitor an alternate TAD or LZ control.
   a. This will reduce the amount of communication on the TAD being used for CAS attacks.
   b. This will isolate the assault support aircraft and CAS assets on different notes, reducing communication on the individual nets.
   c. This will increase the burden on the FAC(A) to pass information from one net to the other to provide SA to both assault support assets and CAS assets.

(b) Mission planning factors, specifically, the requirement to maintain an inter-flight net for the FAC(A) and wing / escort will determine which method to use.

(c) Regardless of method, assault support assets will contact the FAC(A) at a point prior to objective area ingress, usually the IP. On initial contact the FAC(A) should obtain the following information from the assault aircraft:

   1. Number and type of assault aircraft
   2. Landing location(s) for assault aircraft and number of aircraft utilizing each landing zone
   3. Requirements for ITG or illumination from the assault aircraft
   4. Preferred wave-off directions
   5. Estimated time on deck for assault support aircraft

(d) The FAC(A) should brief assault aircraft on the following information:

   1. Threats in the objective area
   2. “Devil” or “Winter” can be used based on pre-briefed planning criteria
   3. Restrictions to assault support weapons conditions and sectors of fire
   4. Winds in the objective area
   5. Possible obstacles (wires, towers) or obscurants (soil composition in the LZ that could lead to reduced visibility on landing).
   6. Location of other assets. For RW this can be limited to RW CAS assets, for tiltrotors, this will be based on the altitude profile of the tiltrotor aircraft and might include FW assets.
   7. Location of applicable friendly forces (pax that they will extract or forces that need to link up with pax the assaults are inserting)
   8. Indirect fire assets in the objective area
   9. Routing to the LZ from the contact point, including altitudes. For tiltrotors, the FAC(A) might need to clarify decent points or restrict climb on egress.
   10. During the assault support aircraft’s ingress the FAC(A) should ensure the safe ingress of the assaults to the greatest extent possible. The point of greatest risk for assault support aircraft will occur when the assault support assets are conducting their landing in the zone and are focused on the safe landing rather than threat protections. If the landing zone is secured by friendly forces, escort protection might not be required. If the LZ is hot, escort aircraft should be dedicated to protecting the assaults as they land and take off from the LZ.
11. Assault support aircraft should conduct their coordination for passenger loading on the LZ Control frequency and then switch back to the TAD net directed by the FAC(A) when lifting the LZ. FAC(A)s should avoid delaying the assault support aircraft in the LZ. If additional elements of assault Support aircraft area attempting to ingress to the LZ while other assaults are delayed in the LZ due to loading issues or some other factors, the FAC(A) should hold the following elements a safe distance from the LZ. The FAC(A) aircraft can then allow the following elements to proceed to the LZ when the Assault Support flight in the LZ is preparing to lift.

(e) Casualty Evacuation (CASEVAC). The evacuation of battlefield casualties requires rapid reaction, close coordination and sound judgment. CASEVAC requests are transmitted over the TAR / HR net using a version CASEVAC 9-line (ref. Appendix A). The request is normally relayed from the ground commander to the DASC by several possible means, including radio and mIRC chat. The ground commander is responsible for assigning CASEVAC precedence. The FAC(A) can assist the ground commander and CASEVAC flight leader by:

1. Recommending a new pickup LZ if the primary LZ is hot
2. Obtaining and coordinating suppressive fire support for the pickup LZ
3. Marking the LZ with various means to include an IR sparkle
4. Determining how much time on deck will be required to load the casualties
5. Coordinating the CASEVAC aircraft ingress and egress from the pickup LZ
6. Briefing the CASEVAC flight leader on:
   a. Friendly positions
   b. Enemy positions
   c. Enemy fire direction and distance with clock code
   d. Firing restrictions for CASEVAC helicopter gunners to protect ground unit personnel and escorts.

7. The FAC(A) should have a tactically sound plan to integrate the CASEVAC escort into the objective area fires. The escort(s) primary responsibility is the safe and expeditious conduct of the CASEVAC mission, but they can be used to provide suppressive fires in support of the CASEVAC mission. The FAC(A) should ensure that the CASEVAC aircraft or the escort provide planned lifting time, and notification of lifting from the LZ. FAC(A)s should provide expeditious routing out of the objective area.

(5) Assault support aircraft should conduct their coordination for passenger loading on the LZ Control frequency and then switch back to the TAD net directed by the FAC(A) when lifting the LZ. FAC(A)s should avoid delaying the assault support aircraft in the LZ. If additional elements of assault Support aircraft area attempting to ingress to the LZ while other assaults are delayed in the LZ due to loading issues or some other factors, the FAC(A) should hold the following elements a safe distance from the LZ. The FAC(A) aircraft can then allow the following elements to proceed to the LZ when the assault support flight in the LZ is preparing to lift.

b. Reconnaissance. FAC(A)s execute reconnaissance to develop and maintain their situational awareness (SA) with respect to the battle space they are tasked to control by the GCE. The reconnaissance tasks completed by the FAC(A) include: friendly force location and assessment, environmental assessment, and assessment and location of the enemy. (Note: In many cases, the GCE may maintain terminal attack control authority, and simply ask a FAC(A) element to conduct reconnaissance. The execution and elements remain in regardless of who has terminal attack control.)

(1) Friendly Force Assessment. The FAC(A) must ensure knowledge and understanding of the friendly situation. It is extremely important the FAC(A) determines the location of all factor friendly elements and their mission / scheme of maneuver. The FAC(A) should ensure the friendly locations are located visually and plotted on a chart and updated if there are any movements during the FAC(A)’s time on station. The FAC(A) needs to pay special attention to the TACP’s mindset and situation update to determine the expediency of action that is required.

(2) Enemy. The FAC(A) will usually need to find the enemy to engage them (unless type 2 or 3 control is being used with another observer). Not only will the FAC(A) likely have to detect them, they will have to recognize, and positively identify them as enemy. Although detect, recognize, and identify are often used synonymously. Each of these terms means something different.
1. Detection is simply being able to “detect” or tell something is there. It can simply be a large enough difference to tell something is there.
2. Recognition is being able to place the object in a class (e.g., artillery, truck, tank).
3. Identification is being able to tell it is a T-72 vice an M1A1.

(3) Visual reconnaissance can also be an effective initial cue for the presence of enemy. The capabilities of modern targeting pods have caused many FAC(A)s to skip visual reconnaissance and go to sensor reconnaissance. This is not an effective way for the FAC(A) to optimize sensor use. Poor light discipline and dust or smoke trails can frequently give the enemy’s location away from a large distance, especially when viewed from the air. FAC(A)s must use all sensors they have available to find and kill the enemy. Some keys to detecting targets visually are:
   a. Search all roads, tracks, and trails.
   b. Nature is not usually orderly and geometrical.
   c. Investigate smoke or dust.
   d. Investigate movement.
   e. Investigate any flashes of light or reflections.
   f. Standing pools of water may indicate previous personnel or vehicle movement.

   c. Call for fire. FAC(A)s bring the specific capability of LASER CFF, which can result in a single round adjustment prior to entering the fire for effect phase. Refer to the most current J-Fire for current call for fire procedures, as well as T/M/S ANTTP for specific systems procedures.
      (1) Airspot / COF Net
      (2) Relay through JTAC / Air Officer

d. Target marking and designation. FAC(A)s and their wingmen execute target marking and designation in order to either provide terminal guidance or build visual situational awareness (SA) to the target to support CAS engagement. This is one of the most likely skills a FAC(A) may be called upon to execute in combat. A thorough and redundant marking / designation plan is critical to a successful CAS engagement. FAC(A) planning and execution for marking and designation goes well beyond what is simply read in line 7 of the 9-line attack brief.
      (1) Authority to employ kinetic / LASER marks must be covered during battlefield handover
      (2) Mark types
      (3) Day / night considerations
      (4) Terminal Guidance Operations

e. Terminal attack control. Terminal attack control should mirror CAS execution in chapter 2 of this publication. Specific Tactics, Techniques and Procedures for the applicable Type/Model/Series can be found in the appropriate ANTTP or TACSOP that applies. General items found in execution of all terminal attack controllers to include FAC(A)s:
      (1) Transfer of terminal control
      (2) Shall be executed IAW JP 3-09.3 CAS
      (3) CAS mission approval
      (4) Approval for the FAC(A) to employ his own ordnance

f. Bomb Damage Assessment (BDA).
   (1) Regardless of the ordnance being expended, aircrews need to strive to acquire BDA of the target. BDA may be gathered by aircrew or various systems and will help the FAC(A) to determine weapon system and munitions effectiveness and help him to recommend any required changes to methodology, tactics, weapon systems, munitions, fuzing, and / or delivery parameters required to increase attack effectiveness. A FAC(A)s accurate BDA is invaluable to the C3 system when making determining weapon to target pairings. Estimates of BDA and decisions on whether to re-strike targets may depend on aircrew’s BDA.
      a. When delivering ordnance against threat systems, strike aircrew must make every attempt to assess their impacts in order to provide reasonable certainty that the threat system was destroyed.
      b. In general, either the FAC(A) or wing / escort should be in a more narrow field of view than the other aircraft in order to give the section multiple perspectives of the ordnance impact and
effectiveness. Varying techniques for sensor employment exist for collection of BDA and are specific to individual T/M/S TTPs. These TTPs are baseline recommendations for sensor employment to include fields of view, polarity, optical versus FLIR, depression angles, and optimal slant range. Below is one example is for a RW FAC(A) section. The “shooter” or “target oriented aircraft” could stay in the most narrow field of view usable. Simultaneously, the “cover” or wing aircraft could maintain a wider field of view in order to assess lead’s impacts or misses as well as maintain higher situational awareness and an “outside the soda straw” view of the battlefield.

(2) BATTLE DAMAGE ASSESSMENT (BDA).

(a) BDA is a timely and accurate estimate of damage or degradation resulting from the application of military force, either lethal or nonlethal, kinetic or non-kinetic, against a target. The key questions to answer are:

1. Did the weapons impact the target as planned?
2. Did the weapons achieve the desired results and fulfill the objectives (purpose) of the attack?
3. How long will it take enemy forces to repair damage and regain functionality?
4. Can and will the enemy compensate for the actual damage through substitution?
5. Are restrikes necessary to inflict additional damage, to delay recovery efforts, or attack targets not successfully struck?
6. What are the collateral effects on the target system as a whole, or on other target systems?
7. BDA as a whole answers the question: “Were the strategic, operational, and tactical objectives met as a result of the forces employed against the selected targets?” The most critical ingredient for effective BDA requires the FAC(A) to have a comprehensive understanding of the supported unit’s objectives and how they relate to a specific target.

(b) The three phases of BDA are described below:

1. **Phase 1 — Physical Damage Assessment.** A physical damage assessment is an estimate of the quantitative extent of physical damage (through munitions blast, fragmentation and/or fire damage effects) to a target element based on observed or interpreted damage.

2. **Phase 2 — Functional Damage Assessment.** The functional damage assessment is an estimate of the effect of military force to degrade or destroy the functional/operational capability of a target to perform its intended mission. At the higher levels, BDA analysts need to compare the original objective for the attack with the current status of the target to determine if the objective was met.

3. **Phase 3 — Target System Assessment.** Target system assessment is a broad assessment of the overall impact and effectiveness of military force applied against an adversary target system relative to the operational objectives established.

(c) FAC(A)s’ accurate and timely BDA leads to a more accurate operational picture of the current enemy order of battle, which helps the C3 system to correctly dictate asset flow and allocation.

(d) BDA is crucial in determining CAS mission effectiveness, enemy disposition, and re-attack requirements. Aircrew must be careful not to overestimate BDA in an effort to meet the “timely and accurate” requirements. Overestimated BDA is still inaccurate BDA.

(e) The FAC(A) should provide the CAS aircrew with the BDA from their attacks as they egress or throughout their TOS if able. The FAC(A) gives total BDA for the flight, not for individual aircraft in the flight.

(f) The BDA report should include at a minimum: Size, Activity, Location, Time, and Observed damage. Once the CAS aircraft have their BDA, they should pass it to the appropriate C3 agencies via the INFLTREP format.

1. CAS aircraft should ensure that they note in INFLTREP that they were working for a FAC(A) with specific call sign in order to clarify the BDA being reported.
2. FAC(A)s should ensure that if they report BDA for attacks they controlled and not their own attacks that they attach the call sign of the CAS aircraft in order to prevent redundant and confusing BDA reporting.

[g. **Radio Relay.** FAC(A) qualified aircrew are uniquely capable of serving as radio relays for TACPs and other FAC(A)s and supported units. FAC(A) aircrew’s understanding of the ground scheme of maneuver, correct transmission formats, communication architecture, and transmission meanings (explicit and implicit) lead to this unique capability. Additionally, the multi-crew and multi-radio capabilities of most
FAC(A) platforms further magnify this capability. (Note: FAC(A) radio relay should not be confused with TAC(A). FAC(A)s serve as an extension of the TACP and TAC(A)s work for the DASC or TACC.)

1. Information requiring radio relay. TACPs could require almost any type of information to be relayed. However, there are certain types of information that have specific formats with which FAC(A) aircrew should be familiar. Some of these formats are JTRAs, ASRs, CASEVACs, CFFs, INFLTREPs, and SPOTREPs. The FAC(A) executing the radio relay should ensure all required information is known prior to switching frequencies to pass the information. When a specific format does not exist, the radio relay should use plain language and communication brevity (per MCRP 3-25B, Brevity) terms to pass the information. The agency conducting radio relay should also ensure all communication security precautions are taken.

2. Methods of Radio Relay. Methods of radio relay include:
   (a) Radio relay platform personally relaying the message
   (b) Radio relay platform using some form of Automatic Collection and Transmission capability (FA-18s, AV-8Bs, AH-1Ws, and most UASs have this capability)
   (c) FAC(A) platform directing his escort to perform the radio relay. Extreme care must be taken for methods 2(a) and 2(c) to ensure the correct information is passed. The use of time stamps, full call signs, and communication clarity are all tools to ensure accurate and timely information is passed.

3. Primary and Alternate Communication Paths. In order to be able to successfully perform radio relay, FAC(A)s should be intimately familiar with primary and alternate nets used and monitored by all key agencies. This information can be found in annex K of the operations order and the ACEOI. Additionally, knowledge of a unit’s location (e.g., a geographically collocated DASC and FSCC) can be important to pass information to one of the agencies when the other cannot be reached. The following list of controlling agencies and nets typically monitored is included as a reference for FAC(A)s. However, FAC(A)s still need to determine during the planning process the primary, secondary, and tertiary nets pertinent agencies will be monitoring.

h. Suppression of Enemy Air Defenses (SEAD). Marine aviation assets must be able to provide CAS and facilitate terminal control despite the threat. In order to effectively and efficiently accomplish this task, FAC(A)s must be prepared to control and aid in coordinating SEAD to remove threats that interfere with the ACE’s ability to support the GCE. FAC(A)s must be aware of their own platform’s capabilities, as well as all other potential assets’ to efficiently accomplish this task.

1. SEAD. SEAD neutralizes, destroys, or temporarily degrades surface-based enemy air defenses by destructive or disruptive means, allowing friendly aircraft to operate in airspace defended by enemy air defense systems. SEAD is the application of sufficient, expedient force to facilitate achieving other missions or objectives. This force may be a part of a large-scale effort to suppress or destroy surface-based threats for the duration of a military operation, or it may be the small-scale effort to suppress or destroy an individual threat system. It also seeks to provide a window of opportunity—free from prohibitive interference, lasting a few minutes, hours or days—to conduct other missions. SEAD is divided into two primary categories: preplanned SEAD and reactive SEAD (RSEAD). This TACSOP will focus on RSEAD (a mission too urgent to wait for the next ATO cycle) since it is the most applicable to the FAC(A) mission set.

2. The Modern Threat. The proliferation of inexpensive, reliable, lethal, and ground-based air defense systems increasingly complicates the MAGTF’s ability to conduct its assigned missions. These systems provide the capability to quickly deploy redundant multispectral systems coordinated through robust command and control (C2) networks. As information technology continues to improve, software will become a more significant factor in the functionality of these weapons systems. Additionally, systems are increasingly Anti-Radiation Missile (ARM) and electronic counter-measures aware. Upgrades will be easier to incorporate, difficult to detect, and thus much harder to counter. The trends also include a migration toward mobile and moveable or semi-permanent air defense systems, vice the larger, fixed systems of the past. Additionally, migration toward more lethal and autonomous systems (less reliant on C2 networks) is underway. This will make it harder to detect, locate, and subsequently target these systems.

3. SEAD Decision. The decision to conduct SEAD depends on:
   (a) MAGTF’s mission, enemy, terrain and weather, troops and support available, time available, space, and logistics (METT-TSL).
   (b) Acceptable risk.
(c) Capabilities and complexity of enemy air defenses.
(d) Ability of friendly aircrews to evade enemy air defenses and aircraft survivability equipment to deny or negate the threat weapons systems’ engagements.
(e) Capabilities and availability of friendly systems to provide SEAD.

(4) Types of RSEAD. RSEAD is further subdivided into three types:
(a) Immediate RSEAD occurs when a MAGTF platform or weapon system locates enemy air defense assets and targets them while in the process of conducting another mission (e.g., a FAC(A) calling an IDF immediate suppression mission).
(b) Deliberate RSEAD is a coordinated response with assets diverted from other missions against enemy air defense assets located with enough time to organize such a response (e.g., a FAC(A) pulls JDAM equipped FA-18s performing armed reconnaissance to use as part of a RSEAD package (JDAM in this scenario provides adequate altitude and lateral standoff from threat)).
(c) Alert RSEAD is preplanned, dedicated RSEAD support, using pre-arranged assets. Planners may use alert RSEAD against a particular surface-to-air system, when requiring a multi-axis attack, or after having discovered multiple previously unprosecuted air defense assets. If aircraft are used, they may be airborne or strip alert assets (e.g., a FAC(A) setting up a RSEAD package with an EA-6B and two FA-18s with HARM, all of whom were on 30-minute strip alert).

4005. FAC(A) Debrief

1. The below matrices and debriefing cards are useful tools to aid the FAC(A) in reconstruction of the mission. Through accurate reconstruction of each CAS attack, the FAC(A) will quickly be able to focus on friction areas for the remainder of the debrief. Below is a sample knee board card used to guide a FAC(A) through reconstruction and analysis.
2. In addition to the knee board card, use of a simple reconstruction matrix, Figure 4-3, will aid the FAC(A) with accurate reconstruction and analysis. This quickly and efficiently highlights FAC(A) and CAS execution issues that should be debriefed thoroughly with the CAS asset.
3. FAC(A)s should use the required amount of detail needed to focus the debrief and bring out learning points. In most cases, Figure 4-2 will be sufficient, but Figure 4-3 is presented as another technique. Regardless of the matrix used, the following areas should be looked at on each exposure for learning points:
   a. Game plan development / attack brief communication
   b. Weapon to target match
   c. Threat awareness
      (1) Shots observed
      (2) RWR / MWS indications
   d. JCAS procedures
   e. J LASER comm / IR comm (if appropriate)
   f. Mark plan including redundancy
   g. FAC(A) control position
   h. BDA assessment
4. In addition to the above matrices for reconstruction, the following should be drawn to scale on either a whiteboard, chart, or over a projected image of the target area if able:
   a. Target areas
   b. Target orientation
   c. Final attack geometry
   d. Plotted impacts of marks and CAS attacks
   e. FAC(A) and CAS positioning at time of control
Chapter 5: UAS Integration

5000. The mission of the Marine Unmanned Aerial Vehicle Squadron (VMU) is to employ, operate, and maintain unmanned aircraft systems (UAS) in order to provide day and night unmanned air reconnaissance, surveillance, and target acquisition (RSTA) in support of MAGTF. The VMU employs the RQ-7B Shadow, which is a Group 3 UAS. The purpose of this chapter is to provide the TACP with a summary of RQ-7B capabilities and planning considerations. Further information can be found Air NTTP 3-22.3-VMU, the USMC RQ-7B Shadow Tactical Notes, January 2011, and the ALSA USA MTTP.

1. VMU Mission Essential Tasks
   a. Conduct air reconnaissance
   b. Analyze and synthesize information
   c. Control indirect fires
   d. Conduct Terminal Guidance Operations (TGO)

5001. RQ-7B Shadow Capabilities

1. Payload: Plug-in Optronic Payload (POP) 300. The POP 300 is a multi-spectral optical targeting system that contains an infrared / electro-optical sensor equipped with a LASER Pointer (LP), LASER Designator (LD), and LASER Range Finder (LRF).

2. Collection / debrief / products
   a. Near real-time video down-link
   b. Recorded video
   c. Still Imagery
   d. Video and still imagery intelligence analysis

3. POP 300D LASER Designator / Range Finder / IR sparkle
   a. LASER Designator
      (1) Class IV
      (2) Maximum employment slant range 4.0 km
         (a) The accuracy of this number is currently unsubstantiated. VMUs have had successful engagements at greater ranges in training and tactical demonstrations. It is primarily based on the beam divergence number below which is also uncorroborated. The templates included later in this chapter utilize 3.5km range as a maximum. Air Shops should coordinate with VMU SMEs IOT ensure planning and execution is accomplished with the most current and accurate information.
         (3) Unaided NOHD: 7300m
         (4) Beam divergence .4 milliradians (16 inches per km)
         (5) PRF Codes: 1111 through 1888 selectable in flight
         (6) Employment templates: see figures 5001 and 5002
            (a) Figure 5001 is a template that can be used for the RQ-7B lasing for the employment any laser guided weapon.
            (b) Figure 5002 is a template that can be used only for the RQ-7B lasing for LASER guided bombs on targets that are not vertically developed where LASER basket considerations do not restrict the LASER target line.
         (7) RQ-7B does not have a LST or see-spot capability
   b. LASER Rangefinder
      (a) Class IIIB
      (b) Unaided NOHD: 44m
(c) Not reliable for targeting outside of 5 km
(d) Category IV TLE coordinates or better inside of 5 km
(e) Category II TLE coordinates inside of 2 km

3. IR sparkle
   (1) Class IIIB
   (2) Unaided NOHD: 272m
   (3) LP cannot be viewed through RQ-7B sensor

4. Endurance:
   a. Legacy: 6 hours, typically 5 hours on station
   b. Big Wing: 9 hours, typically 8 hours on station
   c. As of Feb 2012, USMC UAS fleet was 50% legacy and 50% big wing.

5. Combat radius: 67 NM from Ground Control Station (GCS) or austere GCS

6. Signature:
   a. Shadow is assessed to be audibly significant below 8000 feet AGL in urban areas.
   b. Shadow is assessed to be audibly significant below 10000 feet AGL in rural areas.

7. Communications / retransmission / radio relay
   a. At ground control station:
      (1) 1 x VRC-103. Equates to 1 x PRC-117 with UHF / VHF / HQ / SINCGARS / SATCOM
      (2) 2 x VRC-92. Equates to 2 x PRC-119s with VHF / HQ
   b. In the Air Vehicle (AV):
      (1) 2 x PRC-152s. One is used to transmit and one to receive so it equates to one radio
      (2) System is capable of only SINCGARS / VHF-FM retransmission as currently configured. This is an issue when compared to current doctrinal TAD net and UAS integration in a CAS objective area. Upgrades are in progress which will make the system full VHF and UHF retransmission capable.

5002. Planning

1. Control of aircraft / control of sensor
   a. Determine who will control the aircraft and sensor:
      (1) DASC, AirO, JTAC, S-2 (RG/BN/ACE)
         (a) AirOs and JTACs need to know that they are ultimately accountable for the integration of UAS when operating within their airspace. They can delegate responsibility to S-2 to have the UAS look at areas of interest but the UAS, like all aviation assets, works for the AirO.
      b. VMU operational employment
         (1) Centralized. All VMU operations take place at a central site. This works well when the VMU is in general support, but requires a well-established means of communication and data between the VMU and the supported unit.
         (2) Decentralized
            (a) Distributed. VMU detachment co-locates with the supported unit to provide direct support. The detachment ground control station (GCS) is incorporated with the supported unit COC, increasing the access to the downlink feed. A launch / recovery site is not required at the distributed (austere) GCS. A “hub and spoke” concept can be used to base the aircraft at a central hub and hand off control to a forward GCS “spoke” at a distributed site.
(b) Dispersed. Similar to distributed operational employment, except that the VMU detachment will have additional capabilities forward with the supported unit and fewer capabilities at the launch and recovery location.

2. METOC effects can degrade the sensor capabilities. The following conditions must be taken into consideration during planning.
   a. Thermal crossover
   b. Temperature / dew point/icing
   c. Precipitation
   d. Cloud Cover
   e. Winds
   f. Time of day

3. Normal working altitude: 5000-8000 feet AGL (NOTE: higher altitudes increase fuel burns and reduce times on station.)

4. Speed
   a. Normal cruise: 65 knots (1.86 km / min)
   b. Dash: 110 knots 3.15 km / min

5. Airspace Coordination Area (ACA) size, location, naming convention
   a. Minimum size 2x2 km (3X3 is strenuously recommended for fuel and sensor employment considerations), located no further than 3.5 km for LASER designator use or 5 km when used for target coordinate acquisition.
   b. ACAs are named after camera manufacturers.
      (1) A common TTP is to have Nikon to the north, Epson to the east, Sony to the south, Walker to the west, and Olympus overhead as necessary.

6. Routing
   a. Stack management: the Shadow should be de-conflicted using the same methods as other aircraft in an objective area.
   b. Ingress / egress: Per FW or RW check points as other aircraft.
   c. RIO with the understanding that non-VHF FM communications will be to and from the ground control station.

7. Communications
   a. Review UAS-specific communication brevity terms
   b. Frequency requirements
      (1) Voice: UHF / VHF / HQ / SINCGARS / SATCOM
      (2) TacChat / HPW

5003. Execution

1. Reconnaissance, Surveillance, and Target Acquisition (RSTA)
2. UAS use during CAS
   a. Target marking (ITG)
   b. Terminal Guidance Operation (TGO)
      (1) Think of them as a flying JFO.
(2) Standard lasing pattern is a CCW 2 min orbit with 4 sec of LASER masking time and 1 min, 56 sec continuous lasing time. UAS will set-up in a “left off-set” or “right off-set” per shooter’s WTL as briefed / necessary per attack brief IOT provide continuous LASER capability during weapon fall (ref. figure 5-1.)

c. BHA / BDA

3. Communication relay
4. Convoy operations support
5. Emergency Considerations
   a. Mission and return home (Link Loss) profiles
      (1) Establish a brevity term to signify lost link. The UAS crew will broadcast this term via radio / data with the timestamp, altitude in feet MSL, last known grid, and forecasted heading (aspect).
      (2) When the uplink from the GCS to the Air Vehicle (AV) is lost, the AV will execute parameters set by the operator.
      (3) The AV will follow a pre-programmed route that can be updated in flight if required. This can be a return home (RH) profile or it can be a route to a final holding point.

5004. Other Unmanned Aircraft Systems (UAS)

1. Group 4 & 5 UAS references
   a. See AFTTP manuals found on the 561st JTS website:
   b. Employment of Group 4 / 5 non-organic UAS TPG
2. GCE organic UAS (typically Group 1)
   a. Organic UAS are lightweight, low-flying, and slow airspeed UA which must be de-conflicted / integrated with other aviation assets on station, in particular rotary wing aircraft.

Figure 5-1, Shadow LASER for LASER Guided Weapon (LGW) template
60 degrees preserved for Shadow orbit
300 degrees available for FW attack (WTL)
Applicable to low, not vertical targets*
Shadow holding point no closer than 1.6 km from target

Figure 5-2, Shadow LASER for FW LGB alternate template
Chapter 6: Digitally Aided Close Air Support

6000. Digitally Aided CAS (DACAS) has the potential to increase tempo, reduce time to kill, minimize human error in information transfer, and reduce the risk of fratricide. Empirical data has shown that DACAS reduces the effectiveness of communications jamming (friendly and threat) and JTAC vulnerability to threat direction finding capabilities.

6001. Purpose and Scope
   a. The Following chapter is broken down into three sub-sections: planning considerations, preparation, and execution.
   b. The planning section is weighted heavily towards the Air Officer. This section is focused on the basic requirements for use and does not encompass all functional capabilities of DACAS systems. This document does not replace the StrikeLink Technical Manual, Quick Reference Guide, and system training.
   c. The preparation section addresses recommended check-list items and system administration necessary for proper execution of DACAS.
   d. The execution section provides examples of how a digital mission can be executed in accordance with the CAS Execution Template discussed in chapter 2.

6002. Roles and Responsibilities
   a. Air Officer should ensure a standard baseline configuration of all DACAS systems. This should include digital network architecture, map data, FSCMs, ACMs, etc. This mission database should be distributed to all JTACs. He should ensure that the required digital network data is included during fires network planning (TAB-G). The Air Officer should strive to provide digital updates via the ground network to all JTACs.
   b. The JTAC is responsible for programming the communications nets into his StrikeLink in accordance with the TAB-G and the Air Officer’s direction.

6003. Planning
   a. Aviation and air communications. The StrikeLink communicates with aviation platforms over single channel UHF. This can either be plain text or encrypted. The JTAC utilizing StrikeLink will communicate directly with the aviation platform.
      (1) Variable Message Format (VMF)
         (a) FA-18A-F
            1. JMPS (mission number / callsign)
               a. JMPS is the tool that the CAS aircrew will utilize to configure their DACAS system. The JMPS configuration is provided as informational only to the Air Officer.
               b. Mission number can only be input during mission planning in JMPS. The following convention should be used for mission numbers and callsigns.
                  (1) Nickel 21 event 1
                  (2) Mission number NL21EV01
                  (3) Callsign NL21
            2. VMF addressing setup
               a. VHF requires four bits of information to work: IP address, link address, unit reference number (URN), and VMF callsign. The following VMF network information is applicable only for controller to aircraft communication over the StrikeLink air net. For ground digital comm. refer to the TAB-G.
               b. Aircraft standard IP / Link addresses
                  (1) 1.1.YYY.XXX
                  (2) YYY is squadron number
XXX is tactical callsign number
(4) VMFA 122 Nickel 21 = 1.1.122.021
(5) YYY is limited to 0-255. If squadron number is higher than 255, divide by two.
VMFA 314 = 157.
(6) The aircrew should use Link Address ZZ where ZZ corresponds to ATO callsign number.
(7) VMFA 122 Nickel 21 = Link 21
(8) Link address is valid for numbers 05-95, but numbers ending in 5 are reserved for JTACs and numbers ending in 6 are reserved for FAC(A).

**c. JTAC standard IP / Link addresses**

1. Air Officer 1.1.1.015 Link 15
2. FAC 1 1.1.1.025 Link 25
3. FAC 2 1.1.1.035 Link 35
4. JTAC 1 1.1.1.045 Link 45
5. JTAC 2 1.1.1.055 Link 55
6. JTAC 3 1.1.1.065 Link 65

**d. URNs for aircraft and JTACs are assigned in the Joint Master Unit List (JMUL). The JMUL is updated quarterly, and the current version is available on the MAWTS-1 and NSAWC websites.**

The Air Officer should only be concerned with looking up the URNs for his own unit. VMF DACAS systems automatically learn aircraft URNs when digital communications are established.

(2) Marine Tactical System (MTS)

(a) AV-8B

1. MTS addressing setup

   a. Link addresses

   1. The aircraft should use Link Address ZZ where ZZ corresponds to ATO callsign number.

   2. VMA 231 Spade 21 = Link 21

   b. JTAC standard Link addresses and callsign

   1. Air Officer Link 15 FAC15
   2. FAC 1 Link 25 FAC25
   3. FAC 2 Link 35 FAC35
   4. JTAC 1 Link 45 FAC45
   5. JTAC 2 Link 55 FAC55
   6. JTAC 3 Link 65 FAC65

2. Additional MTS information

   a. Initial Point configuration

   1. Initial Points for the Harrier and the DACAS system must match exactly and are limited to five characters in length. Be sure to enter all initial points and control points exactly as spelled out in the Airspace Control Order (ACO) and SPINS. The AV-8B is not capable of receiving a keyhole template initial point. This can be overcome by attaching a point “E” in the JTAR and by prior coordination with the supporting squadron. The naming convention of keyhole Initial Points in the StrikeLink must match exactly with what is programmed in the jet.

   a. Recommendation: “KEYA”, “KEYB”, “KEYC”, and “KEYD”
   b. Upcoming AV-8B OFP H6.0 will alleviate the need for this work around.

3. Air Force Applications Program Development (AFAPD)

   a. The StrikeLink can communicate to the F-16 utilizing the AFAPD protocol. Refer to the StrikeLink Technical Manual for system configuration.
(4) Ground Communications
   (a) StrikeLink communicates with other Strikelinks in the fires approval chain over either single channel VHF, VHF SINCgars, and either 5k or 25k dedicated SATCOM. By establishing a digital communications link with the Air Officer, the JTAC can quickly pass targets for FSCC approval. The same radio can be used for both voice and digital communications.
   (b) Advanced Field Artillery Tactical Data System (AFATDS)
      1. StrikeLink can communicate to an AFATDS using either VHF or Local Area Network. Targets, FSCMs, and unit locations can be exchanged digitally between the AFATDS and StrikeLink. In order for the StrikeLink to communicate with the AFATDS, the Air Officer StrikeLink must be incorporated into the TAB-G.
   (c) Navy Fire Control System (NFCS)
      1. StrikeLink can communicate directly with the Navy Surface Fire Support (NSFS) digital systems over VHF.
   (d) C2PC
      1. StrikeLink can connect to the C2PC gateway in a COC. Once connected to the COC gateway, StrikeLink contributes target and unit locations to the COC common operating picture. This capability is useful because the Air Officer can forward relevant unit location and battlefield geometries to JTACs located at the company level and lower. The COC Data Marines can assist the Air Officer in connecting StrikeLink to the network.
   (e) LINK-16
      1. StrikeLink has limited Link-16 connectivity and relies on a Joint Range Extender (JRE) to connect to the network. Only track and target position messages can be transmitted.
(5) Message Routing Considerations
   (a) StrikeLink has three separate mission routing functions: C2, Air Info-copy and Ground-info copy. All three are utilized to share different information and can all be transmitted on the same radio network (TACPL). To enable mission routing see StrikeLink Quick Reference Guide.
   (b) C2 Routing
      1. In order to facilitate automated communication between the JTAC and approving authority (FSC via the Air Officer), mission routing should be established. Mission routing will not affect direct digital communication to the aircraft. It is important to consider who needs to receive the information. Automatic position reports, call for fire missions, target lists, and CAS requests (JTARs) will be sent to whoever is selected as the C2 node. Only one station can be selected as the C2 node. It is recommended that the JTAC select the Air Officer and the Air Officer select the adjacent level AFATDS.
   (c) Air Info-Copy
      1. An info-copy of 9-lines sent to the CAS aircraft will be sent to whoever is selected to receive an air info-copy. Multiple stations can be selected. It is recommended that the JTAC select the Air Officer to receive an air info-copy and the Air Officer select the adjacent level AFATDS.
   (d) Ground Info-Copy
      1. An info-copy of all call for fire missions will be sent to whoever is selected to receive a ground info-copy. Once again, multiple stations can be selected.
6004. Preparation

(1) Supporting Documents: The documents listed below will contain information the Air Officer and JTAC might need in order to plan and execute DACAS.

(a) OPTASK CNR (future)
(b) SPINS
   
   1. Special Instructions document that governs aviation operations. Changes or additions to the ATO and ACO will be covered in the SPINS.
(c) ATO
   
   1. Air Tasking Order. This contains what aircraft missions are being supported.
(d) ACO
   
   1. Airspace Control Order. This contains all Airspace Coordination Measures in effect.
(e) JMUL
   
   1. Joint Master Unit list. This is the reference document that contains every individual unit’s Unit Reference Number (URN).
(f) TAB-G
   
   1. Digital communication plan contained within the Appendix 19 of the Operations Order. This will contain the digital TACP Local network information. The Air Officer will need to coordinate with the FSCC that is preparing the TAB-G to ensure that the TACP Local information is included.
(g) Automated Communications Electronic Operating Instructions Communications (ACEOI)
   
   1. Contains frequency assignments.

(2) Recommended software

(a) It is recommended that the Air Officer install the following software programs onto all DACAS systems.
(b) PSS-SOF
   
   1. Target coordinate refinement
(c) DPSS-SM
   
   1. Software that combines more recent imagery with PSS-SOF DPPBD.
(d) PFIG with Handheld sync
   
   1. Utilized to create precision fires images (PFIs) for use on smaller, more mobile systems.
(e) FalconView
   
   1. PSS-SOF DPPBD management
(f) Microsoft Office
(3) Mapping / Imagery Database
(a) MAWTS-1 recommends that DACAS systems should be configured the same within the unit.
(b) Install all programs into the suggested program default locations.
(c) Install all maps and imagery into the following locations.
   1. PSS-SOF DPPBD
      a. C:\Images\DPPBD
   2. Map Data
      a. C:\Images\Maps

(4) System setup
(a) Communications networks
   1. Air nets
      a. Information for air network addressing is contained in the SPINS. For each type of
craft the JTAC will have to create a separate comm net. For FA-18s a VMF network with the specific
Operational Flight Program (OFP). The OFP is the software loaded into the mission computers of the
aircraft. The OFP is updated every couple of years. If you are not certain which OFP that your supporting
aviation platform is operating ask the pilot.
      b. For each TAD create two digital networks. Name each network by TAD and T/M/S.
         (1) TAD2F18 for FA-18
         (2) TAD2AV8 for AV-8B
      2. Ground nets
         a. Information for ground network addressing is contained within the TAB-G. The Air
Officer will have to liaise with the highest level FSCC supporting the operation to make sure that digital
TACP Local information is written into the TAB-G.
         b. Voice and data communications can occur over the same radio.

(b) Database sharing
   1. Once the Air Officer or JTAC has configured one StrikeLink, that database should be
saved on an external hard drive. Be sure to use an appropriately classified hard drive when backing up a
system that has the security level set to secret. Of note, only StrikeLink program information is saved on
the database. All other programs, map data, and imagery are not saved and have to be manually copied
off of the TLDHS.
   2. The saved database can be uploaded into other StrikeLinks. This is useful when multiple
StrikeLinks need to be configured for use. Once a StrikeLink database has been restored, go back into
the communication plan and adjust the local station as needed.

(5) Mission Checklist
(a) Military Ruggedized Tablet (MRT) / Smaller Lighter Ancillary Tactical Equipment (SLATE)
(b) Batteries fully charged
(c) Map data loaded
(d) Assigned target block range set
(e) Assigned CAS request block range set
(f) Updated mission data to include control points, FSCMs, friendly tracks
(g) Communication nets set-up
(h) Digital Precise Point Data Base (DPPDB) loaded as necessary for PSS-SOF
(i) Appropriate power supply or battery adapter
(j) Radios configured
(k) Radio cable(s)
(l) External GPS antenna as required
(m) GPS fill
(n) Digital communication checks
(o) Mission routing configured
1. C2 Node
2. Air Info-copy
3. Ground Info-copy (as required)
(p) LRF and adapter cable
(q) Quick Reference Guide
(r) Keyboard and mouse as desired
(6) Free text messages
(a) The following free text messages are a sample of those that may be useful to have saved for ready use. These messages may enhance digital communications flow and are not mandatory to use.
   1. "SEND OSR THIS IS FAC15 LINK 15"
   2. JTAC gear capabilities “LASER // IR // ROVER // PSS-SOF // DACAS"
   3. SITREPS, example: “POS MANPADS//LIGHT ARMOR WITH INFANTRY//FRIENDLIES VICINITY OP FEETS//81MM SW OF OP//MARK AND CONTROL BS16//IN WITH HEADING ALL ATTACKS//WINDS FROM NORTH 10KTS”
   4. Game plans, example: “TYPE 2 // BOC // 1XGBU-38V4 EA // 2 MIN SPACING”
   5. "OSR RECEIVED"
   6. "FREETEXT RECEIVED"
   7. “READY FOR READBACK”
   8. “STANDBY”
(b) Due to aircraft display limitations and the inability to use special characters, the use of “//” is recommended in free text messages to separate data or statements to enhance aircrew readability.

6005. Execution
a. Assumptions
   (1) Digital communication systems are configured correctly.
   (2) DACAS should be used when feasible. In some instances, voice will take precedence due to SOF and / or timely execution.
   b. Digital Thread
   (1) Routing Safety of flight
      (a) May be sent via preplanned free text if coordination is made such that routing and safety of flight instructions are prepared prior to aircraft check-in and all aircraft on station are the same T/M/S. Due to the requirement to expeditiously transmit routing and safety of flight instructions as soon as possible after aircraft check-in, free text shall not be used if preplanned free text was not made prior to a/c check-in, if any changes to the preplanned free text are required, or if there are different T/M/S aircraft on station that will not receive the free text message.
      (2) JTAC sends “SEND OSR THIS IS FAC15 LINK 15"
         (a) Be sure to include your specific callsign and address. This ensures that the AV-8B can enter the JTAC address into the communication network page. The FA-18 will automatically learn JTAC addressing upon receipt of the freetext message.
         (b) Aircraft will send the OSR to the JTAC to establish a digital handshake. The JTAC will utilize the OSR to create an active flight within StrikeLink.
         (c) The aircraft should send an additional free text message that contains additional information that is not contained within the OSR. (ROVER downlink, LPOD, Helmet, etc.)
      (3) Situation update
         (a) There is a 200 character limit. Be brief and include only information that is pertinent. Be sure to include double slashes “//” to separate individual portions of the SITREP. The provided example is 159 characters.
1. POS MANPADS/LIGHT ARMOR WITH INFANTRY/FRIENDLIES VICINITY OP FEETS//81MM SW OF OP//MARK AND CONTROL BS16//IN WITH HEADING ALL ATTACKS//WINDS FROM NORTH 10KT.

(4) Game plan
   (a) JTAC sends free text game plan “TYPE 2 // BOC // 1XGBU-38V4 EA // 2 MIN SPACING”

(5) CAS brief and (6) Remarks / Restrictions
   (a) JTAC should utilize digital 9-Line, be prepared to revert to voice if the digital 9-Line is not received by the aircraft. The digital 9-Line does not allow the user to input an altitude into the egress instructions. This should be added into the remarks section. *Do not use special characters.
      1. EXAMPLE “EG L 18K TO 20K”

   (b) Other remarks and restrictions not included in the digital 9-line must be passed via free text or voice.

(7) Read backs
   (a) The aircraft will read back all required information.

(b) Aircraft Position Target Designation (APTD).

1. The JTAC can request a single APTD from the aircraft in order to display a momentary aircraft position and the designated ground target. An APTD may also be initiated by the ground station resulting in continuous tracking of aircraft position and target designation with updates provided every five seconds.

2. The JTAC can request a single APTD from the aircraft in order to display a momentary aircraft position and the designated ground target location graphically or display textual raw data. The JTAC should disable the APTD once the designation is verified.
   a. AV-8Bs will not transmit system designation.

(8) Correlation
   (a) In a BOC scenario correlation is complete after the read back requirement as been met.

   (b) In a BOT scenario correlation should be conducted voice.

   (c) Once correlation is complete the aircraft can send an APTD to the JTAC. This will show the updated target position on the JTACs map. The aircraft could also send an updated 9-line back to the JTAC with the updated target coordinate.

(9) Conducting the attack
   (a) If desired, the aircraft can send a Departing IP (DPIP) message to the JTAC in addition to or in lieu of a voice “IP Inbound” call.

   (b) The JTAC can initiate a continuous APTD track to graphically display the aircraft position and target designation. Due to this message re-occurring every five seconds, this functionality should be disabled after the JTAC is satisfied that aircraft or target designation location is confirmed depending on type of attack and method of engagement. This will avoid impact on necessary voice communication.

   (c) JLASE communication can only be conducted with voice.

   (d) Corrections from visual mark should be conducted with voice communication.

   (e) “IN” call may utilize a free text message, a DPIP, or aircraft initiated APTD based on prior coordination with aircraft or be sent via voice communication

   (f) “Cleared Hot / Cleared to Engage” and “Abort” SHALL be sent via voice communication as the primary method and may be sent via respective digital message as a secondary method immediately after corresponding voice call is transmitted.

   (g) JTAC should utilize “End Mission” function to administratively remove mission graphics from display and send pre-formatted BDA free text to aircraft.

(a) Re-attack instructions can be sent via free text message.

(b) BDA
(a) Summary BDA may be sent via free text or voice if not already sent at the end of each attack.

(12) Routing / Safety of flight should be performed with voice communication.

b. FSCC Digital Fires Approval

(1) Digital mission approval requires ground communications between controller and approving authority. This should typically be over TACP Local. The JTAC needs to ensure that the approving authority is selected as the C2 node in the StrikeLink mission routing tab. Additionally, the approving authority should be the recipient in the Air Info Copy in the mission routing tab.

(2) When the JTAC and Air Officer StrikeLinks are communicating and the message routing is set up properly, the Air Officer will receive an info copy of any 9-lines that the JTAC sends to the aircraft. These will be displayed on the Air Officers map. The Air Officer can choose to collaborate on the 9-line via a free text box and approve, modify, or deny the mission. If the Air Officer is connected to an AFATDS, any 9-line that he receives and accepts into his StrikeLink will be forwarded to the AFATDS. Once the target is in the AFATDS it can be sent to an artillery battery as a fire mission.

(3) There are several ways that the JTAC can digitally send targets to the approving authority.

(a) The JTAC can generate a JTAR after creating a 9-line within the StrikeLink (Figure 6001). The Air Officer will receive the JTAR and the target will populate on the StrikeLink. Only lines 4-6, 8, and any remarks of the 9-line will populate on the 9-line attached to the JTAR.

(b) If the Controller desires to send multiple targets for approval he can send a digital target list (Figure 6-2) to the approving authority followed by a free text message detailing specific mission details (final attack headings). Once the Air Officer accepts the target list all of the received targets will populate on his map.
(4) The following is a walk-through of the digital mission approval process.

(a) JTAC generates a 9-line and sends a CAS Request (JTAR) to the Air Officer (Figure 6-1). The JTAC should include restrictions for the attack in the remarks section of the CAS Request.

(b) The Air Officer selects “PEND” once the JTAR is received (Figure 6-3). The target will populate on his StrikeLink. The Air Officer can select “Collaborate” to send free text inputs for the mission back to the JTAC.

(c) The JTAC makes any changes to the 9-line as required and sends the 9-line to the supporting CAS aircraft.
(d) An info copy of that 9-line is sent over the ground net (TACP Local) to the Air Officer’s StrikeLink.

(e) If the Air Officer has received a JTAR for the same target that he receives a 9-line, the correct target number will automatically populate in the info-copy 9-line. If the Air Officer has not received a JTAR, the target number of the info-copy 9-line will be blank. The Air Officer will need to copy the correct target number from the remarks space in the 9-line and paste it in the target number block. Once this is done, the Air Officer can accept the 9-line into his StrikeLink. Once the Air Officer accepts the mission, all details of the 9-line will be automatically plotted on his StrikeLink, including IP to target heading, egress, and final attack headings.

c. Voice / Digital Template

(1) The following diagram shows a side by side comparison of the Execution Template and the digital equivalent. The JTAC can integrate these voice and digital templates. At any time during the aircraft time on station the JTAC can bounce back and forth from the voice and digital templates.

<table>
<thead>
<tr>
<th>Voice</th>
<th>Digital</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. CAS aircraft Check-in</td>
<td>2. Digital Checkin (OSR with amplifying free text)</td>
</tr>
<tr>
<td>3. Situation Update</td>
<td>3. Free text situation update</td>
</tr>
<tr>
<td>5. CAS brief</td>
<td>5. Digital 9-line</td>
</tr>
<tr>
<td>6. Remarks / restrictions</td>
<td>6. Additional remarks / restrictions not covered in digital 9-line will be sent voice or freetext to a/c</td>
</tr>
<tr>
<td>7. Readbacks</td>
<td>7. Voice Readbacks</td>
</tr>
<tr>
<td>8. Correlation</td>
<td>8. Correlation as required, A/C sends APTD or re-sends 9-line to JTAC after correlation</td>
</tr>
<tr>
<td>9. Conduct the attack</td>
<td>9. “Cleared Hot” / “Cleared to Engage” will be given voice to a/c</td>
</tr>
<tr>
<td>10. Assess effects / repeat 4-9 as required</td>
<td>10. Assess effects / repeat 4-9 as required</td>
</tr>
<tr>
<td>11. BDA</td>
<td>11. Free Text BDA</td>
</tr>
</tbody>
</table>
Chapter 7: Gridded References Graphics (GRGs)

7000. Macro GRG Production

1. Imagery oriented north. If using an image in conjunction with FalconView, you may have to geo-rectify the image in order to be able to use as a moving map.

2. Clearly label with map type (Macro, Micro, 1:50), OBJ name, date time group, and MGRS coordinates of main target building.

3. Image labeled to level of classification.

4. Clearly mark the objective building. In the Macro GRG, the details of the building can be compromised in exchange for clearly identifying the target. (Do not mark in red unless necessary due to trouble viewing at night).

5. Yellow grid lines dividing the image evenly.
   a. Vertical lines (Eastings)
      (1) Labeled on bottom with clearly readable numbers for day and night conditions.
      (2) Use first three digits of the Easting
   b. Horizontal lines (Northings)
      (1) Labeled on left with clearly readable numbers for day and night conditions.
      (2) Use first three digits of the Northing

6. The easiest way to make grid lines that line up on the MGRS coordinates (at this resolution) is to turn on grid overlay in FalconView.

7. Number all buildings.
   (1) Begin with the target location
   (2) Use a clockwise pattern
   (3) Separate neighborhoods into blocks of numbers.

8. Add georef / checkpoints throughout image.
   a. These can serve many purposes including key points ISO ground scheme of maneuver, casualty collection points, or to annotate important road intersections / locations.
   b. Follow a logical pattern.

7001. Micro GRG Production

1. Zoom in on the actual target building and the buildings immediately surrounding it.

2. Follow as many of the Macro GRG steps as realistically possible:
   a. Use the same numbering / lettering as were used in the macro GRG.
   b. The target was largely covered in the Macro for ease of orientation, but the target features and details should be mostly unobstructed in the Micro GRG
      (1) Details of the building will help JTACs get the pilots on the right building.

3. Additional considerations.
   a. Objective areas may be added if needed, but it must be explained in the CAS request
   b. If using a legend for target nomination, do not cover up the image and reduce it as much as possible to present a clean image.
Chapter 8: Collateral Damage Estimation

8000. The U.S. definition of Collateral Damage is the unintentional or incidental injury or damage to persons or objects that would not be lawful military targets in the circumstances ruling at the time.

8001. The purpose of Joint Collateral Damage Methodology (CDM) is to provide a logical, repeatable framework that describes and enables a process, supported by empirical Joint Munitions Effectiveness Manual (JMEM) data, to estimate and mitigate Collateral Effects; informing command decisions within in compliance with the Law of War (LOW) during the Planning and Execution of combat operations. The CDM will arrive at a Collateral Damage Estimate (CDE) level which will correspond to a Target Engagement Authority (TEA) or Strike Approval Authority (SAA) that is delineated by the Rules of Engagement (ROE). A formal CDE can only be accomplished by a certified CDE analyst and must be approved by the appropriate level commander IAW the ROE. If authorized by the ROE, field CDE usually conducted by JTACs, FAC(A)s, FOs or aircrew can be used in a time constrained environment with limited opportunity to engage a fleeting target. Field CDE will be a verbal call that is documented for future review/analysis.

1. The Joint CDM does not limit or supersede a commander’s:
   a. Responsibility to respond to Time Sensitive Targets (TST)
   b. Inherent right and obligation of Self-Defense.

2. Primary Causes of Collateral Damage:
   a. Failure to properly Positively Identify (PID) the target
   b. Improper weapon to target match in a given operational environment
   c. Weapon malfunction
   d. Conscious decision (knew about the Collateral Damage prior to the event)

3. The Joint CDM does not account for:
   a. Weapon malfunction
   b. Unknown delivery error
   c. Altered delivery tactics based on operator judgment
   d. Unknown transient civilian or noncombatant personnel and/or equipment in the vicinity of a target
   e. Individual marking or adjusting rounds when employing surface-to-surface ballistic munitions
   f. Secondary explosions

8002. There are 5 levels of CDE. CDE Levels 1 through 4 are a stair step process of refining the targeting IOT assess and / or reduce possibilities of collateral damage and still achieve the desired effects. Arriving at CDE level 5 means there will be collateral damage. While conducting the CDM commanders will be required to constantly determine if the collateral effects are excessive in light of the military advantage.

In its most basic form, the CDM centers on five simple questions that must be answered before engaging any target and can assist in determining proportionality:

1. Can I positively identify (what and where) the object that I want to affect? (target validation)
   a. PID: defined as “the reasonable certainty that a functionally and geospatially defined object of attack is a legitimate military target in accordance with the Law of War and the applicable ROE.
   b. PID
      (1) What: Legitimate military targets need to be vetted IOT ensure correct PID
(2) Where: Geospatially refine the target location / lower TLE using systems (PSS-SOF, GPS, etc)

2. Are there protected or collateral objects, civilian or noncombatant personnel, involuntary human shields, or significant environmental concerns within the effects range of the weapon I would like to use to attack the target? (initial assessment)

3. Can I mitigate damage to those collateral concerns by attacking the target with a different weapon or different method of engagement, yet still accomplish the mission (desired effect)? (collateral weapon effects mitigation)

4. If not, how many civilians / noncombatants will be injured / killed by my attack? (casualty estimation)

5. Are the collateral effects of my attack excessive in relation to the expected military advantage gained, and do I need to elevate this decision to the next level of command to attack the target based on the ROE in effect? (Strike Approval Authority [SAA] or Target Engagement Authority [TEA] decision)

<table>
<thead>
<tr>
<th>CDE Level</th>
<th>Name of CDE Level</th>
<th>CDE question</th>
<th>Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Target validation / Initial assessment</td>
<td>Question 1 &amp; 2</td>
<td>PGM, ASUGM, SSBM (1,3)</td>
</tr>
<tr>
<td>II</td>
<td>General / Target size assessment</td>
<td>Question 3</td>
<td>Specific delivery system, warhead and fuze (2, 3)</td>
</tr>
<tr>
<td>III</td>
<td>Weaponeering assessment</td>
<td>Question 3</td>
<td>Effect on structure(s) ID’d as collateral concern. (2, 3)</td>
</tr>
<tr>
<td>IV</td>
<td>Refine assessment</td>
<td>Question 3</td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>Casualty estimate / assessment</td>
<td>Question 4 &amp; 5</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
(1) Define weaponeering options that achieve the desired target effect and mitigate the potential for collateral damage. ie. determine if the collateral concern is mitigated by using a PGM v. a GP munition.
(2) Mitigation techniques
   a. Delay fuze is the primary mitigation technique for fragmentation, blast and thermal warhead effects. It is built into the CDE methodology beginning in CDE Level 3.
   b. VT / proximity fuze is the primary mitigation technique for debris and penetration.
   c. VT / proximity fuze is the secondary mitigation technique for blast and delivery error. blast dissipates rapidly in open air, reducing impulse to 1/3 of that encountered in a surface detonation. It is a recommended mitigation technique at CDE Level 4 for SSBM.
   d. Shielding is a valid mitigation technique only if it is present as a complete structure or significant terrain, located between the jdpi/dmpi and the collateral concerns. it is not a valid debris mitigation technique for outdoor collateral concerns.
   e. Delivery heading is the primary mitigation technique for delivery error. warheads have a tendency to impact long of an intended aimpoint.
   f. Delivery heading is a secondary mitigation technique for fragmentation. most fragmentation effects occur in the forward quadrants (270° - 90°) of a warhead in relation to the delivery/terminal attack heading.
   g. Aimpoint offset or move DPI to different portion of target IOT put collateral concern outside CER.
(3) Refer to classified CDE tables for specific numbers.
8003. CDE training can be obtained by contacting the Joint Targeting School (JTS) at Navy Marine Corps Intelligence Training Center (NMITC), NAS Oceana Annex (Dam Neck), Virginia Beach, VA.

1. For detailed information on Collateral Damage Estimation Methodology refer to CJCSI 3160.01A “NO-STRIKE AND COLLATERAL DAMAGE ESTIMATION METHODOLOGY”

8004. Below are tools available to conduct CDE.
   a. DCiDE
   b. JADOCS – Joint Automated Deep Operations Coordination System
   c. FalconView
      (1) No-strike target list tool (NSL)
      (2) Frag Zone Tool (FZT)
   d. PSS-SOF
   e. Mensurated Point Graphics (MPGs)

**WARNING**
Formal CDE must be conducted by a certified CD analyst. The tools above can assist observers in assessing weapon effects.
Chapter 9: Marine Expeditionary Unit Operations (MEU)

9000. MEUs work for the numbered fleet commander when in a specific AOR. The numbered fleet commander delegates the OPCON / TACON responsibilities to the ESG Commander.

9001. TACRON – Tactical Air Control Squadron

1. The TACRON is the unit that staffs the Navy Tactical Air Control Center (TACC) and is equivalent to the USMC Tactical Air Command Center (TACC). From the ship, the Navy TACC performs the same functions as a USMC TACC until those functions can be pushed ashore once the USMC TACC is established.

2. The TACRON Det. Air Resource Element Coordinator (AREC) supporting an ESG or Amphibious Ready Group (ARG) / MEU is the Commodore’s (PHIBRON Commander) Air Officer.

3. Staffing ISO ESG / MEU
   a. AREC, a Naval Aviator (O5) who is the senior officer of the detachment.
   b. Officer in Charge (OIC), a Naval Aviator (O4) who oversees the day to day operations within the TACC.
   c. 3 to 4 other Naval / Marine Corps aviators (O3-O4) for operations, helicopter operations/SAR, ASC
   d. Intelligence officer (O1-O3); this billet isn’t always staffed.
   e. Leading chief petty officer (LCPO)
   f. Approximately 20 enlisted consisting of a mix of Air Traffic Controllers (ACs) and Operations Specialists (OSs) and at least one Air Intercept Controller (AIC) supervisor
   g. Assortment of Intelligence Specialists (ISs), Information System Technicians (ITs), and other support personnel such as yeomen (YNs).
      (1) They have the expertise in Total Battle Management Core System (TBMCS) and WARP which allows the PHIBRON / MEU to input Air Tasking Order (ATO) information as applicable.
   h. The PHIBRON / ARG / Navy Air Shop has significantly more staffing than the MEU CE Air Shop.

4. TACRON trains to the following:
   a. Exercising coordination and / or control of all air traffic in the area of operations to protect friendly aircraft from collision, provide air navigational assistance, provide assistance to aircraft in emergency situations, and assist in early identification of enemy aircraft in the area.
   b. Functioning as the AREC
   c. Working closely with Amphibious Task Force (ATF) / ESG warfare commanders to coordinate and schedule air assets and airspace requirements.
   d. Consolidating and coordinating air support requirements with supporting air forces, ensuring aircrew receive the latest intelligence as to sea-based and land-based air forces scheduled to execute support missions.
   e. Monitoring and coordinating all aviation operations, including those conducted by MEU assets and supporting warfare commanders within the Amphibious Objective Area Air Space.
      (1) The TACRON works with N-4, ship supply, MEU Air Shop to coordinate transportation of Passenger, Mail, Cargo (PMC).
   f. Assisting the Air Defense Commander (ADC) in the identification of aircraft
   g. Relaying air warning and theater ballistic missile (TBM) information
   h. Providing situational awareness (SA) regarding the location of the forward line of own troops (FLOT) to aircraft executing support missions ashore
i. Providing an Air Support Controller (ASC) to advise the Supporting Arms Coordinator (SAC) or Fire Support Coordinator (FSC) regarding available CAS assets, including weapons load, fuel status, and other pertinent data that aid in supporting arms assignment and coordination
j. Providing a representative to the Joint Targeting Board
k. The TACRON Ops representative co-chairs the Air Planning Board (APB) with the AirO.
   (1) This does not always occur in execution, but they will always be a participant.
l. Will provide coordination between Carrier Strike Coordination (CSG), its associated Air Wing (CVW), and the ARG / ESG.
m. Can be tasked to provide Liaison Officers (LNOs) during split ARG operations or to the Joint Force Air Component Commander (JFACC), Combined Air Operations Center (CAOC), and / or the Carrier Air Wing (CVW).
n. Can be tasked to provide augment expeditionary operations ashore providing trained air traffic controllers. Usually a Marine officer in the TACRON Det. will be the OIC of this expeditionary detachment.

9002. Passenger, Mail and Cargo (PMC)

a. Coordination mirrors the ATO cycle and is managed by the PMC Board. The PMC Board members are the N4, MEU S-4 Rep, Ship Supply Officer, MSE reps, Debark Control, TACRON rep, and MEU AirO.
b. Flow of requests within MEU and its Major Subordinate Elements (MSE)s
   (1) The AirO should request a copy of the PMC policy from the N4 at the beginning of the work up. The MEU Logistics Officer and Air Officer, with Operations Officer input, should agree on how the MEU and its MSEs will conduct business. Include what level of signature is needed for a request to be considered, i.e. unit XO etc, and what level of signature is needed for late request, i.e. MEU Logistics Officer or Operations Officer inside 48 hours and MEU CO inside 24 hours. This ensures MSEs pay attention to the PMC process and entities involved can plan accordingly to support.
c. Once the PMC Board determines air will be used, the TACRON brings the requirement to the APB for sourcing. At this point, the ACE and Debark Control receive the details of the PMC.
d. Work-ups v. deployment
   (1) The PMC process will be very painful during work-ups. Since there are so many missions being planned and executed at once, personnel are moving all over on varying timelines. All of these timelines are mission driven. This reinforces the need to establish a process before the first at sea period. Planners should build-in extra capacity and flexibility IOT ensure a semi-smooth PMC process during work-ups. Once deployed, PMC work-load varies, but will always pick-up during an exercise and when the ARG is near land.
e. Leverage TACRON
   (1) The TACRON is critical to the planning and execution of PMC. In execution, the TACRON, Debark Control and the ODO are key to the success of this process.

9003. Other Aviation Assets and Agencies

1. Naval Aviation Logistics Organization (NALO)
a. “To provide time-critical and flexible air logistics support to the Fleet in order to meet wartime and emergent operational requirements.”
b. In laymen’s terms NALO aircraft are used for OCONUS movement of passengers and cargo. They have C-9s, 737s, and C-130s with various pallet / seat arrangements available. Requests go to the appropriate Marine Corps Installation (MCI) ATCO and from there to NALO at NAS New Orleans. This is
who you call when you need to get an advanced party to an exercise or personnel moved around a theater.

   (1) Under the Operations and the Training Tabs at the top of the webpage are some good informational links.

d. Telephone:
   (1) DSN: 678-1184/5
   (2) Comm: (504) 678-1184/5

2. Joint Operational Support Airlift Center (JOSAC)
   a. “JOSAC develops and implements CONUS Operational Support Airlift (OSA) solutions and provides movement visibility for the Department of Defense. As part of USTRANSCOM's Operations and Logistics (J3) directorate, JOSAC performs consolidated scheduling of CONUS OSA aircraft. During peacetime, OSA missions provide support to DOD command, installation, and management functions while improving readiness and providing cost-effective training of aircrews. Wartime OSA missions move high priority passengers and cargo in direct support of combat or contingency operations.”
   b. In laymen’s terms, JOSAC aircraft are used for CONUS movement of passengers and cargo. They control all the station aircraft of the four armed services, or rather they are charged with tasking and managing the joint schedule by sourcing the various station aircraft. They control C-9s, C-12s, UC-35s up through C-40s (737s). For USMC units, requests typically go to the appropriate MCI Command ATCO and from there to JOSAC at TRANSCOM, Scott AFB. This is who you call when the CO wants to go to Yuma to attend a conference.
   c. Website: [https://josac.transcom.mil/](https://josac.transcom.mil/)
   d. Telephone
      (1) DSN: 770-6194
      (2) Comm: (618) 220-6194

3. References for both types of assets are located on the websites. A decent amount of time should be allocated to learning the workings of these assets. They can be a force multiplier if used properly, but the user / requestor must know the systems and process. As with anything else, a few minutes spent with the MCI Marines who run the request process can pay significant dividends.
   a. Leverage the MEU’s associated PHIBRON N-4 or TACRON Det. for NALO requests. Navy personnel are generally familiar with the NALO system as it plays a significant role in supplying the fleet.
   b. Liaisons with higher
      (1) Combined Air Operations Center (CAOC)
         (a) Providing a liaison to the Central Command CAOC has proven beneficial for MEUs and PHIBRONs. This liaison often comes from the TACRON.

9004. Aircraft and Personnel Automated Clearance System (APACS) and the Foreign Clearance Guide (FCG)

1. APACS is a web-based tool designed to aid Department of Defense aircraft mission planners and operators, and DoD travelers on official business (and in some cases leave) overseas in meeting the clearance requirements outlined in the DoD Foreign Clearance Guide. APACS automates the process of requesting and approving diplomatic and personnel clearances via a common, centralized, and secure database.
2. APACS is mandatory for processing DoD sponsored foreign travel in all Combatant Commands effective 01 May 2008. The DoD Executive Agent for the Foreign Clearance Program has authorized APACS as the web-based tool to create, submit, coordinate, and approve aircraft diplomatic and personnel travel clearances (Special Area, Theater and Country) for DoD sponsored travel.

3. Website addresses:
   a. NIPR: https://apacs.dtic.mil/apacs/
   b. SIPR: https://apacs.dtic.smil.mil/apacs/
   c. Log-in pages and functionality are the same on NIPR and SIPR

4. Foreign Clearance Guide:
   a. This Manual establishes standards for requesting and approving DoD foreign clearance requests for aircraft diplomatic clearances and personnel travel clearances. It lays out the procedures, such as lead time required etc, to obtain approval for aircraft and personnel to entire other countries and their associated airspace.
   b. The DoD FCG contains information that may be sensitive, is based on bilateral arrangements between US and foreign government officials, and is not releasable outside the US Government unless approved by a competent authority. This document provides necessary information for aircraft international mission planning and execution, personnel travel to foreign countries, as well as general information on foreign locations. Since the DoD FCG is directive in nature for all DoD and DoD sponsored travel abroad, travelers must ensure they comply with this Guide.
   c. https://www.fcg.pentagon.mil/

5. International Flight Plans (DD-1801)
   a. DD-1801s might be required ISO an exercise even if the PHIBRON / MEU received prior APACS clearance. MEU air shops should have this paperwork on file and work to keep updated copies of applicable flight publications for areas the MEU is working in or transiting.
   b. TACRON has shown to be a capable entity to handle the MEU / PHIBRON APACS requests. The MEU Air Officer and Assistant MEU Air Officer should also obtain APACS accounts IOT track requests and assist TACRON.
   c. Notes:
      (1) Ensure submission of all USN and USMC assault assets on all clearances for flexibility.
      (2) i.e. Don’t forget the Navy’s MH-60s as they are often more available to carry PMC than USMC assets participating in an exercise. They still, however, need the clearance IOT to do so.
      d. Just because the Country Guidebook says there are no Blanket Clearances, doesn't mean a Blanket Clearance isn’t available. Call the Defense Attaché office at the Embassy and confirm process if that country’s process looks excessive WRT number of request for your exercise or lead time required.
      (1) Confirm process early and often so you are not unnecessarily compressing time for the Defense Attaché’s office. They manage the local relationship so do your best not to put them in a bad spot.

9005. Defense of the Amphibious Task Force (DATF)

1. Supported / Supporting
   a. This is mission set where the MEU assets will support the PHIBRON Commodore as he is the Supported Commander. Detailed discussions IRT how MEU assets, specifically aviation assets for the Air Officer, will be employed must occur prior. T/M/S capabilities and limitations must be understood by all involved so a viable plan is produced. The MEU’s GCE might also offer assets for defense of the ships. It’s all one plan so the MEU CE will take lead. If available, the SMEs for the respective weapon systems, AH, UH and applicable GCE personnel or the Bn Gunner, should be at the planning to ensure
supportability. There are multiple examples of past DATF agreements/plans available on most MEU share drives.

2. There are references that bear reading prior to meeting with Navy personnel. They are classified, but the references are below to aid in finding them on SIPR:
   b. NTTP 3-03.4 Naval Strike and Air Warfare
   c. TM 3-03/22.1-02 (C3F) – This is Commander 3rd Fleet’s (C3F) guidance.
      (1) An example to show that each Fleet will have further guidance above the baseline doctrine.

9006. Shipboard Ops considerations

1. What belongs to whom?
   a. Friction in LHA/LHD air operations can come from many entities where no specific one has reign over all the assets concerned.
      (1) The Ship’s Captain owns the airport.
      (2) The PHIBRON Commodore owns the airspace or most of it.
      (3) The MEU Commander owns the aircraft or most of them.
      (4) The MEU Air Officer’s job will be to help ensure all can play nice while accomplishing his CO’s objectives. This will not always be to fly aircraft. Embarked units will want to perform gun shoots on the flight deck. The Bn will want to perform PT. Commanders might want to have a steel beach. Bottom line is that there are a lot of entities looking to utilize the largest space on the ship and the Air Officer’s job will be to help oversee its efficient use and maintain aviation currency/proficiency.

2. Aviation Planning Board (APB)
   a. The individual who runs what meeting is codified in doctrine. It has been seen, however, that whoever is the most qualified, with the most SA, and experience is the right person. This could be the Ship’s Air Ops USMC O4, the TACRON Det. OIC or the MEU Air Officer. Knowing what can or cannot be done IAW all the applicable orders, directives, and policies is critical. Knowing how to run a meeting is just as critical.

3. See Appendix for T/M/S ship landing currency requirements.

4. Deck Cycle
   a. Spotting Rules of Thumb:
      (1) T/M/S numbers are conservative. T/M/S SMEs will know the capabilities of their personnel and times will decrease as proficiency increases.
      (2) Consider time it will take to load passenger and/or cargo.
      (3) 0+30 minutes to spot and launch a CH-46, AH-1W or UH-1N
      (4) 0+30 for AH-1Z and UH-1Y single ship operations with no ordnance
      (5) 1+00 minutes to spot and launch a CH-53, sections of AH-1Z or UH-1Y with ordnance
      (6) 1+00 to spot and launch a MV-22
      (7) AV-8Bs aren’t spotted like assault support aircraft, but taxi from the rear slash to their take-off point. Take-off will require all assault support aircraft to be clear of the foul line and required take-off airspace.
      (8) 4 tow crews
   b. Ordnance
(1) 30 min to upload ordnance on a section of H-1s, they typically cannot be loaded in the slash, it exceeds the maximum allowable towing weight.
(2) H-1s will have to be spotted with the nose pointed out 30-45 degrees to load ordnance.
(3) AH-1W/Z require the ship to go to HERO (Hazards of Electromagnetic Radiation to Ordnance) condition 2 when the rounds are run into the feed shoot and down into the gun.
(4) H-1s will need the Alpha Pattern when they come back from a shoot, this will hold everyone else in place until they land.
(5) Harriers can be loaded in the slash.
(6) If Harriers return with forward firing ordnance, they will have to land cocked out, like the H-1s.
c. Spread Spots
(1) A spread spot is a spot to put an aircraft on so that you can spread the blades to do maintenance on it.
(2) CH-46s will require a spread spot for any work on the rotor head.
(3) CH-53s will require a spread spot to work on either the head or the tail.
(4) MV-22s will require a spread spot for various routine maintenance actions.
d. SAR aircraft
(1) Need to refuel every hour per their NATOPS
(2) Can do PMC while doing SAR as long as they do not exceed 10 miles from the big deck.
(3) SAR can be taken care of by T/M/S other than the USN SAR Det. as long as it complies with the SAR matrix and commanders are comfortable with it.

5. Air Plan v ATO
a. In theory, the ATO drives the Air Plan, i.e. the deck cycle and aircraft flows are based off what higher requires as laid out in the ATO. In practice, it is a combination of what higher needs the MEU to do and what the MEU can do due to PHIBRON / MEU established crew day, current deck cycle and other training or operational commitments for PHIBRON / MEU forces.

6. Ordnance aboard ships
a. The MEU Air Officer and / or the MEU Ordnance Officer, from the MEU Command Element S-4, should liaise with the PHIBRON S-4 and various ships’ Ordnance POCs to ensure MEU ordnance is loaded aboard shipping in the proper quantity and location. This will be based, to a degree, on how the MEU plans on embarking various T/M/S. i.e. if the H-1 assets will be on a little deck, their training ordnance should be put on that ship.
   (1) NCEA v. MLA: these are not the same. The first is an allotment via the parent MAW for training while the second refers to the ordnance onboard shipping to be used for contingency operations. The MEU can drive, to a degree, where the NCEA is embarked. There are space limitations and MLA will have priority for that space aboard a particular ship. It is basically a paper drill to make MLA into NCEA, but this will then require the Navy to transfer ordnance from either the ship where the NCEA sits or from a shore based site. This is a significant amount of coordination and work to transfer ordnance. Again, this is why the MEU Air Officer and Ordnance Officer should check on what ordnance is loaded where early.

7. Authorization to Fly
a. Only DoD personnel are authorized to fly aboard USMC aircraft. The MEU cannot just transport civilians ISO training or exercises without authorization from higher. This is, to a degree, a process by which higher is made aware of what is going on with MEU aircraft. If a mishap were to occur and the MEU was transporting a high ranking civilian or member of the media, higher headquarters would want to know prior to rather than after the fact. The process, once ironed out, is relatively painless.
   b. MEU Air Officers should get in touch with their respective MEF Air Shop early and get the most updated copy of the Authorization to Fly message. It lays out what level of approval is required based on
who is being transported. These messages are required ISO work-ups and exercises. When conducting contingency operations, approval is given in the operations order received from higher.

   c. CONUS authorization to fly is received by releasing message traffic up through the approval chain as laid out in the Authorization to Fly message. This will need to be done for civilian contractors and Department of State personnel ISO a standard MEU work-up. Authorizations can take considerable time for approval and it is best to lead turn the request as much as possible. Keep in mind that naval surface movement does not require authorization or paperwork.

   d. Deployed Authorization to Fly is routed to HQMC for authorization by DC/A.
## Glossary

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tr>
<td>ACE</td>
<td>Aviation Combat Element</td>
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<tr>
<td>AD</td>
<td>Aerial Delivery</td>
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<td>AFC</td>
<td>Assault Force Commander</td>
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<tr>
<td>AFI</td>
<td>Air Force Instruction</td>
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<tr>
<td>AFL</td>
<td>Assault Flight Leader</td>
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<tr>
<td>AMC</td>
<td>Air Mission Commander</td>
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<tr>
<td>APACS</td>
<td>Aircraft and Personnel Automated Clearance System</td>
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<tr>
<td>AREC</td>
<td>Air Resource Element Coordinator</td>
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<tr>
<td>ARG</td>
<td>Amphibious Ready Group</td>
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<tr>
<td>ASLT</td>
<td>Assault Support Landing Table</td>
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<td>ASSAT</td>
<td>Assault Support Serial Assignment Table</td>
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<td>ATF</td>
<td>Amphibious Task Force</td>
</tr>
<tr>
<td>ATO</td>
<td>Air Tasking Order</td>
</tr>
<tr>
<td>BI</td>
<td>Battlefield Illumination</td>
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<tr>
<td>BOC</td>
<td>Bomb On Coordinate</td>
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<tr>
<td>BOT</td>
<td>Bomb on Target</td>
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<tr>
<td>BP</td>
<td>Battle Position</td>
</tr>
<tr>
<td>C2</td>
<td>Command and Control</td>
</tr>
<tr>
<td>CARP</td>
<td>Computed Air Release Point</td>
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<td>CAS</td>
<td>Close Air Support</td>
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<tr>
<td>CCP</td>
<td>Communication Check Point</td>
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<tr>
<td>CD</td>
<td>Collateral Damage</td>
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<tr>
<td>CDE</td>
<td>Collateral Damage Estimation</td>
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<tr>
<td>CDM</td>
<td>Collateral Damage Methodology</td>
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<td>CDS</td>
<td>Container Delivery System</td>
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<tr>
<td>CP</td>
<td>Contact Point</td>
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<tr>
<td>DAS</td>
<td>Deep Air Support</td>
</tr>
<tr>
<td>DATF</td>
<td>Defense of the Amphibious Task</td>
</tr>
<tr>
<td>DZ</td>
<td>Drop Zone</td>
</tr>
<tr>
<td>DZC</td>
<td>Drop Zone Controller</td>
</tr>
<tr>
<td>DZSO</td>
<td>Drop Zone Safety Officer</td>
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<tr>
<td>ESG</td>
<td>Expeditionary Strike Group</td>
</tr>
<tr>
<td>EW</td>
<td>Electronic Warfare</td>
</tr>
<tr>
<td>FAC</td>
<td>Forward Air Controller</td>
</tr>
<tr>
<td>FAC(A)</td>
<td>Forward Air Controller (Airborne)</td>
</tr>
<tr>
<td>FCG</td>
<td>Foreign Clearance Guide</td>
</tr>
<tr>
<td>FIST</td>
<td>Fire Support Team</td>
</tr>
<tr>
<td>FSC</td>
<td>Fire Support Coordinator</td>
</tr>
<tr>
<td>FSCM</td>
<td>Fire Support Coordination Measures</td>
</tr>
<tr>
<td>GCE</td>
<td>Ground Combat Element</td>
</tr>
<tr>
<td>Georef</td>
<td>Geographic Reference Point</td>
</tr>
<tr>
<td>GRG</td>
<td>Gridded Reference Graphic</td>
</tr>
<tr>
<td>HA</td>
<td>Holding Area</td>
</tr>
<tr>
<td>HERO</td>
<td>Hazards of Electromagnetic Radiation to Ordnance</td>
</tr>
<tr>
<td>HET</td>
<td>Human Exploitation Team</td>
</tr>
<tr>
<td>HUD</td>
<td>Heads Up Display</td>
</tr>
<tr>
<td>IAM</td>
<td>Inertially Aided Munition</td>
</tr>
<tr>
<td>IDF</td>
<td>Indirect Fire</td>
</tr>
<tr>
<td>IMC</td>
<td>Instrument Meteorological Conditions</td>
</tr>
<tr>
<td>IP</td>
<td>Initial Point</td>
</tr>
<tr>
<td>IR</td>
<td>Infra-red</td>
</tr>
<tr>
<td>ITG</td>
<td>Initial Terminal Guidance</td>
</tr>
<tr>
<td>Acronym</td>
<td>Definition</td>
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<tr>
<td>JDAM</td>
<td>Joint Direct Attack Munition</td>
</tr>
<tr>
<td>JFO</td>
<td>Joint Fires Observer</td>
</tr>
<tr>
<td>JMEM</td>
<td>Joint Munitions Effectiveness Manual</td>
</tr>
<tr>
<td>JOSAC</td>
<td>Joint Operational Support Airlift Command</td>
</tr>
<tr>
<td>JTAC</td>
<td>Joint Terminal Attack Controller</td>
</tr>
<tr>
<td>LCE</td>
<td>Logistics Combat Element</td>
</tr>
<tr>
<td>LGW</td>
<td>Laser Guided Weapon</td>
</tr>
<tr>
<td>LLL</td>
<td>Low Light Level</td>
</tr>
<tr>
<td>LOC</td>
<td>Line of Communication</td>
</tr>
<tr>
<td>LST</td>
<td>Laser Spot Tracker</td>
</tr>
<tr>
<td>LTD</td>
<td>Laser Target Designator</td>
</tr>
<tr>
<td>MACO</td>
<td>Marshalling Area Control Officer</td>
</tr>
<tr>
<td>MAGTF</td>
<td>Marine Air Ground Task Force</td>
</tr>
<tr>
<td>MANPADS</td>
<td>Man Portable Air Defense System</td>
</tr>
<tr>
<td>MEU</td>
<td>Marine Expeditionary Group</td>
</tr>
<tr>
<td>MGRS</td>
<td>Military Grid Reference System</td>
</tr>
<tr>
<td>MSE</td>
<td>Major Subordinate Element</td>
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<tr>
<td>NALO</td>
<td>Naval Air Logistics Office</td>
</tr>
<tr>
<td>NVG</td>
<td>Night Vision Goggle</td>
</tr>
<tr>
<td>OIC</td>
<td>Officer in Charge</td>
</tr>
<tr>
<td>OSA</td>
<td>Operational Support Airlift</td>
</tr>
<tr>
<td>PGM</td>
<td>Precision-guided Munition</td>
</tr>
<tr>
<td>PI</td>
<td>Point of Impact</td>
</tr>
<tr>
<td>PID</td>
<td>Positive Identification</td>
</tr>
<tr>
<td>PMC</td>
<td>Passenger, Mail and Cargo</td>
</tr>
<tr>
<td>PUC</td>
<td>Pilot Update Code</td>
</tr>
<tr>
<td>RED</td>
<td>Risk Estimate Distance</td>
</tr>
<tr>
<td>ROE</td>
<td>Rules of Engagement</td>
</tr>
<tr>
<td>SA</td>
<td>Situational Awareness</td>
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<tr>
<td>SAA</td>
<td>Strike Approval Authority</td>
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<tr>
<td>SDZ</td>
<td>Surface Danger Zone</td>
</tr>
<tr>
<td>SME</td>
<td>Subject Matter Expert</td>
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<tr>
<td>SOM</td>
<td>Scheme of Maneuver</td>
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<tr>
<td>SPINs</td>
<td>Special Instructions</td>
</tr>
<tr>
<td>TAC</td>
<td>Terminal Attack Controller (JTAC, FAC, FAC(A))</td>
</tr>
<tr>
<td>TACC</td>
<td>Tactical Air Command (Control if USN) Center</td>
</tr>
<tr>
<td>TACRON</td>
<td>Tactical Air Control Squadron</td>
</tr>
<tr>
<td>TBMCs</td>
<td>Total Battle Management Core System</td>
</tr>
<tr>
<td>TEA</td>
<td>Target Engagement Authority</td>
</tr>
<tr>
<td>TIC</td>
<td>Troops in Contact</td>
</tr>
<tr>
<td>TRAP</td>
<td>Tactical Recovery of Aircraft and Personnel</td>
</tr>
<tr>
<td>TRP</td>
<td>Target Reference Point</td>
</tr>
<tr>
<td>TST</td>
<td>Time Sensitive Targeting</td>
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<tr>
<td>TTP</td>
<td>Tactic, Technique and Procedure</td>
</tr>
<tr>
<td>UAS</td>
<td>Unmanned Aircraft System</td>
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<tr>
<td>VDL</td>
<td>Video Downlink</td>
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Appendices
# TTECG Recommended LZ Marking Kit (Company Level)

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Nomenclature</th>
<th>NSN</th>
<th>Cost</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>JDC Instruments SKYWATCH Xplorer 3 Wind Speed Meter (Anemometer) with Electronic Compass</td>
<td>N/A</td>
<td>$85.00/each</td>
<td><a href="http://www.partshelf.com/jdcsx3.html">http://www.partshelf.com/jdcsx3.html</a> Provides a means of measuring wind velocity</td>
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<tr>
<td>5</td>
<td>VS-20 Air Panel</td>
<td>GSA Schedule Contract GS-07F-5645R</td>
<td>Quote via GSA</td>
<td><a href="http://www.ez-info.com/VS-21.html">http://www.ez-info.com/VS-21.html</a> (Day-glo lime or day-glo orange, 6 foot size), with thermal visibility (can be seen on aircraft FLIR). 5 panels can mark 4 x landing points and 1 MACO gate or use all 5 to make 1 x NATO-Y or Helo “T”</td>
</tr>
<tr>
<td>20</td>
<td>Tent Stakes (8”)</td>
<td>Supply System</td>
<td>Supply System</td>
<td>To stake Down 5 x Air Panels</td>
</tr>
<tr>
<td>6</td>
<td>IR Power Flares</td>
<td></td>
<td>$734.95/6-pack</td>
<td><a href="http://www.tacticalleds.com/PowerFlare-6-Pack-PF200-LED-Sa-p/powerflare-sp6.htm">http://www.tacticalleds.com/PowerFlare-6-Pack-PF200-LED-Sa-p/powerflare-sp6.htm</a> Programmable IR light with 15 x LEDs Used to: (1) Mark center of 4 x landing points at night (steady dim) (2) Mark MACO Gate at night (steady dim) (3) Provide Far ITG at night (Flashing bright rotator)</td>
</tr>
<tr>
<td>20</td>
<td>IR Lights (9 volt)</td>
<td>5855-01-361-8987</td>
<td>??</td>
<td>To make “wings” for night NATO-Y or Helo “T”</td>
</tr>
<tr>
<td>1</td>
<td>IR Krill Light</td>
<td>6230-01-496-1462</td>
<td>$34.95/each</td>
<td><a href="http://www.kriana.com/pages/aalight.html">http://www.kriana.com/pages/aalight.html</a> Alternate source for far ITG at night</td>
</tr>
</tbody>
</table>

**Notes:**

(1) Pelican Case has room for extra batteries for all lights (1 x 3-volt SF123A for each PowerFlare, 1 x 9-volt for each 9-volt IR light, 2 x AA per Krill) Air panels and IR Buzzsaw will require 550 cord.
<table>
<thead>
<tr>
<th>WAVE</th>
<th>SERIAL</th>
<th>TYPE A/C</th>
<th>FROM</th>
<th>TIME</th>
<th>DESTINATION LZ</th>
<th>TROOP UNITS/EQUIPMENT/TOTAL WEIGHT</th>
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</thead>
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<tr>
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<td>A/C ORIGIN</td>
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## Assault Support Serial Assignment Table

**Bump Plan**

<table>
<thead>
<tr>
<th>Wave</th>
<th>Bump Plan in Order of Priority</th>
<th>Description</th>
<th>Notes</th>
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<tbody>
<tr>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTES:
CASEVAC REQUEST / MEDEVAC INFO

VHF (S/C/PT) (PRI) ___________ (ALT) ___________
UHF (PRI) ___________ (ALT) ___________
SAT PH ___________

CASEVAC REQUEST/NATO 10-LINE

LINE 1. Pick up site: GRID Coordinates ________________
LINE 2. Pick up site: Freq and C/S ________________________________
LINE 3. Number of patients by precedence:
   # of A – Urgent (1 hour)
   # of B – Urgent Surgery (1hr)
   # of C – Priority (4-6 hrs)
   # of D – Routine
   # of E – Convenience
LINE 4. Special equipment needed by Patients:
   A - None   C - Extractor equipment
   B - Hoist   D - Ventilator
LINE 5. Number of patients by Type:
   # of L – Litter
   # of A – Ambulatory
LINE 6. Security at Pick up site (tactical):
   N – No enemy
   P – possible enemy troops
   E – Enemy troops (caution recommended)
   X – Enemy troops (armed escort recommended)
LINE 7. Marking at P/U site: Day/Night
   A – Panels (color)
   B – Pyrotechnics (color)
   C – Smoke (color)
   D – None
   E – Other
LINE 8. Patient Nationality and Status:
   A – US Military
   B – US Civilian
   C – Non US Military
   D – Non US Citizen
   E – EPW
LINE 9. NBC Contamination: N – Nuclear   B – Bio
   C – Chem   D – None

Z-MIST:
Zap Number. Patient information: First Initial, Middle Initial, Last Name, Last 4 SSN, Blood type
M- Method of Injury (GSW, IED, Stab, Shrapnel, etc)
I- Injury sustained (Laceration, Break, etc)
S- Symptoms (Consciousness, Pulse, Heartbeat, bleeding
T- Treatment given (Tourniquet, Pain Relief, CPR, ETC.)

Bold indicates min info DASC needs to launch aircraft.
“ZAP CARD” Template

- The “ZAP Card” should contain **ONLY** the key information required to report an individual casualty and the basic LZ brief in the event a CASEVAC / MEDEVAC is required.
- The ZAP card is printed with a large font so that it is easy to read (at night or with impaired vision).
- It should provide the user with clear directions on what information is required and the order that information should be transmitted to the supporting agency.
- The included template can be photo-copied, filled in with pen or marker, folded in half and laminated to create a two sided document that can be easily flipped from front to back during execution.
- If possible, the ZAP Card should be printed on card stock and laminated.
- The ZAP Card is designed to fit inside the FROG Suit or MCCUU shoulder pocket.
- Example of a unit defined “ZAP Number”
  - H&S Company / Capt J.f. Shoes / Last four of the SSN **1234** / = “**HJS1234**”
  - Ensure service member “ZAP Numbers” and blood type match all locations maintained and published by the Battalion and Company staff / administration (e.g. S-1 personnel rosters, body armor identification patches issued by the unit).
- Coordinate with Battalion and Company staffs to complete the cards for their units
  - e.g. Company 1st Sgt/Co GtSgt/Pt Sgt / S-3 Clerk
- **NOTE:** This ZAP Card reflects OEF 9-LINE Format
  - It does not include the URGENT SURGICAL category (Not currently used in OEF)
  - Line 9 is Obstacles or CBRN contamination / condition as required
Transmit as applicable: Example "Dust-off 01, LZ Location NU 123 456, marked by smoke. There are power-lines 400m north running east to west. Winds are from the North at 5 knots. Friendlies located 20m west of the smoke. LZ will be dusty with possibility of brown-out."
<table>
<thead>
<tr>
<th>Days Since Last Ship Landing</th>
<th>FCLP Requirement</th>
<th>Weather</th>
<th>Deck</th>
<th>Divert Field</th>
<th>Currency Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 14 Days</td>
<td>FCLP Not Required</td>
<td>Ship's Minimums</td>
<td>All Conditions</td>
<td>Not Required</td>
<td>One Landing</td>
</tr>
<tr>
<td>15 to 29 Days</td>
<td>FCLP Refresh at Discretion of the CO</td>
<td>TACAN Minimums</td>
<td>Steady Deck Or (1)</td>
<td>Divert Available</td>
<td>One Landing</td>
</tr>
<tr>
<td>30 to 59 Days</td>
<td>FCLP Refresh (2)</td>
<td>TACAN Minimums</td>
<td>Steady Deck Or (1)</td>
<td>Divert Available</td>
<td>One Landing</td>
</tr>
<tr>
<td>60 Days to 6 Months</td>
<td>FCLP Refresh (2)</td>
<td>800/3 (3)</td>
<td>Steady Deck Or (1)</td>
<td>Divert Available</td>
<td>One Landing</td>
</tr>
<tr>
<td>6 to 12 Months</td>
<td>FCLP Refresh (2)</td>
<td>1000/3 (4)</td>
<td>Steady Deck Or (1)</td>
<td>Divert Available</td>
<td>One Landing</td>
</tr>
<tr>
<td>Greater than 12 Months</td>
<td>Refer to Initial Carrier Qualification</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
<td>Refer to Initial Carrier Qualification</td>
</tr>
</tbody>
</table>

Notes:
1. Steady Deck is defined as roll equal to or less than +/- 5 degrees and/or pitch equal to or less than +/- 1 degree.
2. See pilot performance in paragraph 3.4 of the V/STOL Shipboard & LSO NATOPS Manual, NAVAIR 00-80T-111.
3. May be waived to TACAN minimums by the Commanding Officer or his appointed direct representative.
4. May be waived to 800/3 by the Commanding Officer or his appointed direct representative.
5. All initial qualifications should have a steady deck, divert available and the same weather requirements as to 12 months.
<table>
<thead>
<tr>
<th>Days Since Last Night Ship Indng</th>
<th>Req. prior to a Night ship landing or T/O</th>
<th>Requirement prior to a Night ship landing or takeoff</th>
<th>Weather</th>
<th>Deck</th>
<th>Divert Field</th>
<th>Currency Req.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 14 Days</td>
<td>Not Required</td>
<td>None</td>
<td>Ship’s Mins</td>
<td>All Conditions</td>
<td>Not Required</td>
<td>One Landing</td>
</tr>
<tr>
<td>15 to 29 Days</td>
<td>CO Discretion (2)</td>
<td>1 day landing / takeoff same day or 2 day landings / takeoffs w/in 48 hrs</td>
<td>TACAN Minimums</td>
<td>Steady Deck (1) Or</td>
<td>Divert Available</td>
<td>One Landing</td>
</tr>
<tr>
<td>30 to 59 Days</td>
<td>FCLP Refresh (2), (8)</td>
<td>2 day landings / takeoffs w/in 36 hrs &amp; no less than 1 hr flight time (D/N)</td>
<td>800/3 (3)</td>
<td>Steady Deck (1) Or</td>
<td>Divert Available</td>
<td>One Landing</td>
</tr>
<tr>
<td>60 Days to 6 Mnth</td>
<td>FCLP Refresh (2), (8)</td>
<td>Same as 30 to 59 Day</td>
<td>1000/3 (4)</td>
<td>Steady Deck (1) Or</td>
<td>Divert Available</td>
<td>One Landing</td>
</tr>
<tr>
<td>6 to 12 Mnth</td>
<td>FCLP Refresh (2)</td>
<td>Same as 30 to 59 Day</td>
<td>1500/5</td>
<td>Steady Deck (1) Or</td>
<td>Divert Available</td>
<td>Four Landings</td>
</tr>
<tr>
<td>Greater than 12 Months</td>
<td>Refer to Initial Qual (2)</td>
<td>Refer to Initial Qual</td>
<td>Note 7</td>
<td>Note 7</td>
<td>Divert Available</td>
<td>Refer to Initial Carrier Qual</td>
</tr>
</tbody>
</table>

Notes:
1. Steady Deck is defined as roll equal to or less than +/- 5 degrees and/or pitch equal to or less than +/- 1 degree.
2. See pilot performance in paragraph 3.4 of the V/STOL Shipboard & LSO NATOPS Manual, NAVAIR 00-80T-111.
3. May be waived to TACAN minimums by the Commanding Officer or his appointed direct representative.
4. May be waived to 800/3 by the Commanding Officer or his appointed direct representative.
5. For initial CQ, a minimum of four landings must be completed one-half hour after sunset.
6. When a day ship takeoff/landing is required, a practice Case 3 approach utilizing OLS & HPI (or its equivalent) to complete the landing should be utilized.
7. All initial qualifications should have a steady deck, divert available & same weather requirement as 6 to 12 months.
8. When FCLPs are required, but an appropriate field facility (as defined in 3.3.1 of the V/STOL Shipboard & LSO NATOPS Manual, NAVAIR 00-80T-111) is not available, Day Case 3 recoveries may be substituted. Day landings should be followed by dusk approaches/landings.
9. NVD qualified pilots shall conduct one unaided Case 3 approach and landing every 30 days. If outside this 30-day window, the pilot’s next approach & landing shall be unaided, unless waived by the Commanding Officer or his appointed direct representative.
<table>
<thead>
<tr>
<th>Days Since Last Ship Landing</th>
<th>FCLP Requirement</th>
<th>Weather</th>
<th>Currency Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 30 Days</td>
<td>FCLP Not Required</td>
<td>500/3</td>
<td>None</td>
</tr>
<tr>
<td>31 Days to 12 Months</td>
<td>FCLP Not Required</td>
<td>500/3</td>
<td>2 Landings AH: see Note 1</td>
</tr>
<tr>
<td>Greater than 12 Months</td>
<td>5 FCLP Landings</td>
<td>500/3</td>
<td>5 Landings AH: see Note 1</td>
</tr>
</tbody>
</table>

Note 1: AH-1 pilots need 5 landings per year to maintain currency. If 12 months is exceeded since last ship landing, 2 FCLP landings must be completed prior to any ship landings.

<table>
<thead>
<tr>
<th>Days Since Last NVG Ship Landing</th>
<th>FCLP Requirement</th>
<th>Weather</th>
<th>Currency Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 15 Days</td>
<td>FCLP Not Required</td>
<td>1000/3</td>
<td>None</td>
</tr>
<tr>
<td>16 Days to 12 Months</td>
<td>FCLP Not Required</td>
<td>1000/3</td>
<td>2 NVG Landings AH: see Note 3</td>
</tr>
<tr>
<td>Greater than 12 Months</td>
<td>5 NVG FCLP Landings</td>
<td>1000/3</td>
<td>5 NVG Landings AH: see Note 3</td>
</tr>
</tbody>
</table>

* Administrative transport of pax to/from amphibious aviation and air capable ships at night is prohibited except under emergency situations or when authorized by the MAGTF Commander.

* T&R Program Manual currency requirements for carrying PAX still apply.

Note 2: All Helicopter Aircraft Commanders (HACs) must have flown within 15 days IOT sign for an aircraft.

Note 3: AH-1 pilots need 5 landings per year. If 12 months is exceeded since last night ship landing, 2 NVG FCLP landings must be completed prior to any night ship landings.
**Air Assault planning checklist:**

I. Mission Commander  
   A. Orientation  
   B. Situation  
   C. Mission statement  
   D. Commander’s intent  
   E. Commander’s planning guidance  
      1. CAS coverage required  
   F. CCIRs

II. Assault Force Commander  
   A. Ground tactical plan  
      1. Task organization  
         a. Air insert / extract  
            1) Total PAX / weight  
            2) PAX / weight / special equipment per subordinate element  
         b. Ground insert / extract  
            1) PAX / special equipment per subordinate element  
      2. Objective location  
      3. L-hour  
         a. Time or event driven  
            1) Criteria if event driven  
      4. Insert  
         a. Tactics (x, y, offset)  
         b. Pri / Alt LZ locations  
      5. Scheme of maneuver  
         a. Control measures  
            1) Phase lines  
            2) Objective rally points  
            3) Assault position  
            4) TRPs  
         b. Reconnaissance of the objective  
            1) Assets / locations  
            2) Sequencing into objective area  
            3) Reporting requirements / tasking  
         c. Isolation of the objective  
            1) Key terrain / avenues of approach for isolation  
            2) Blocking position locations / orientation / sequencing into objective area  
         d. Gaining a foothold  
            1) Support by fire  
               a) Location / orientation / sequencing into objective area  
               b) Priorities for support by fire weapon systems  
               c) Shift / cease fire triggers  
            2) Assault element actions  
               a) Sequencing into objective area  
               b) Movement from assault position to breach site  
               c) Method of breach  
         e. Seizing the objective  
            1) Geometries of fire  
            2) Repositioning of forces
3) Site exploitation
4) Casualty collection point
5) EPW collection point

f. Employment of the reserve
   1) Method of employment
   2) Response time
   3) Identify launch authority

6. Extract
   a. Tactics (x, y, offset)
   b. Pri / alt LZ locations
   c. Trigger
   d. Response time
   e. Changes to task organization
      1) EPWs (number / location / destination)

7. Total time on the objective
8. GCE Go / no go criteria
   a. Enemy
   b. Friendly
      1) Minimum PAX per wave
      2) Minimum PAX in zone
   c. Weather

9. Contingencies
   a. Immediate re-embark
      1) Trigger / response time
      2) LZs
      3) Identify launch authority
   b. Emergency extract
      1) Trigger / response time
      2) LZs
      3) Identify launch authority
   c. CASEVAC
      1) Criteria
      2) LZs
      3) Asset location / response time
      4) Location of medical facility
      5) Identify launch authority
   d. TRAP
      1) TRAP force location / response time
      2) Plan for downed aircraft down enroute / in zone
      2) Launch criteria
      3) Identify launch authority
   e. Contingency holding

10. Resupply
    a. Trigger / response time
    b. Type of supplies / weight / location
    c. LZs

11. Signal plan
    a. Friendly marking
    b. Nets / Freqs / callsigns
c. No comm. plan
   1) Extract
   2) Immediate re-embark
   3) Emergency extract
   4) CASEVAC

12. Location of key personnel (AFC, FiST, FAC / JTAC, MACO, Corpsman)

B. Landing plan
   1. Winter / devil criteria
   2. Insert
      a. Simultaneous or sequential landings
      b. Pri / alt ITG
         1) Lead aircraft’s landing point in relation to ITG
         c. Direction of offload
         d. Trigger to switch to alternate LZ
         e. Requested deception landings
   3. Extract
      a. Simultaneous or sequential landings
      b. Pri / alt ITG
         1) Lead aircraft’s landing point in relation to ITG
         2) Location of friendlies in relation to ITG
         c. Direction of load
         e. Requested deception landings

C. Air movement plan
   1. Requested offset or deception routing
   2. Enroute communications requests
      a. Objective area updates
      b. Time calls from LZ

D. Loading plan
   1. Serial size
   2. Bump plan

III. PZ CO
A. Staging plan
   1. PZ location
   2. Aircraft arrival time
   3. Comm checks with assault force
   4. ITG
      a. Lead aircraft’s landing point in relation to ITG
   5. Location of friendlies / MACO gate
   6. Bumped serial control point
   7. Signal plan
      a. Friendly / MACO gate marking
      b. Nets / freqs / callsigns
      c. No comm. plan

IV. FSC
A. EFSTs
   1. Task / Purpose / Method / Effects
      a. Method details determined in fires synchronization meeting
<table>
<thead>
<tr>
<th>Band</th>
<th>Band Breakdown (VideoScout-Insyte 4.2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>1620 – 1700 MHz&lt;br&gt;1700 – 1800 MHz&lt;br&gt;1800 – 1850 MHz</td>
</tr>
<tr>
<td>S</td>
<td>2200 – 2300 MHz&lt;br&gt;2300 – 2400 MHz&lt;br&gt;2400 – 2500 MHz</td>
</tr>
<tr>
<td>C_L</td>
<td>4400 – 4500 MHz&lt;br&gt;4500 – 4600 MHz&lt;br&gt;4600 – 4700 MHz&lt;br&gt;4700 – 4800 MHz&lt;br&gt;4800 – 4900 MHz&lt;br&gt;4900 – 5000 MHz</td>
</tr>
<tr>
<td>C_H</td>
<td>5250 – 5300 MHz&lt;br&gt;5300 – 5400 MHz&lt;br&gt;5400 – 5500 MHz&lt;br&gt;5500 – 5600 MHz&lt;br&gt;5600 – 5700 MHz&lt;br&gt;5700 – 5800 MHz&lt;br&gt;5800 – 5850 MHz</td>
</tr>
</tbody>
</table>
Observer Lineup

“__________” this is “__________ with observer lineup. Over”

(JTAC C/S) (JFO C/S)

Only to JTAC - “My position is ___________________

(i.e., grid and/ or reference point)

“I am in ________, located ________, from target area,

(Overwatch, Convoy, Defensive, etc.) (direction and distance

m/km)

marked by ________. I have ________ targets for CAS.

(Friendly mark

type) (Number of)

My specialized equipment is _______________. Over.”

(PSS-SOF, LTD w/JFO PRF code, LRF, GPS, IR Pointer, etc.)

Notes:

1. The JFO should be prepared to describe how the target coordinates

were derived for each 9-Line. For example: LRF coupled with a GPS,

PSS-SOF, or map and compass. This information provides the JTAC and

supporting aircrew situational awareness regarding the accuracy of

the target coordinates provided.

2. Friendly grid coordinates should not be passed on an unsecure net.

JFO Target Brief

<table>
<thead>
<tr>
<th>Line 4: Tgt Elvation (feet MSL)</th>
<th>“Line 4”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line 5: Tgt Description</td>
<td>“”</td>
</tr>
<tr>
<td>Line 6: Tgt Location</td>
<td>“”</td>
</tr>
<tr>
<td>Line 7: Tgt Mark</td>
<td>“”</td>
</tr>
<tr>
<td>Line 8: Friendlies</td>
<td>“”</td>
</tr>
</tbody>
</table>

“Advise ready for Remarks”

FAH

LTL / PTL

Threat	Direction/Distance

SEAD	Int / Cont / Non-

Stan.

GTL / LOF	Max Ord

Restrictions

TOT