BY ORDER OF THE
SECRETARY OF THE AIR FORCE

AIR FORCE INSTRUCTION 11-2B-52, VOLUME 3

22 JUNE 2005

Flying Operations

B-52--OPERATIONS PROCEDURES

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

ACCESSIBILITY: Publications and forms are available on the e-Publishing website at **www.e-publishing.af.mil** for downloading or ordering.

RELEASABILITY: There are no releasability restrictions on this publication.

OPR: HQ ACC/DOTV

Certified by: HQ USAF/XOO
(Col Quentin L. Peterson)

Supersedes AFI 11-2B-52, Vol 3, 20 August 1999

Pages: 74

This volume implements AFPD 11-2, *Aircraft Rules and Procedures*; AFPD 11-4, *Aviation Service;* and AFI 11-202V3, *General Flight Rules*. It applies to all B-52 units. Paragraphs **2.5.1.**, **2.5.2.** and **A4.2.** of this publication do not apply to Air Force Reserve Command (AFRC) units and members. This publication does not apply to the Air National Guard (ANG). MAJCOMs/DRUs/FOAs are to forward proposed MAJCOM/DRU/FOA-level supplements to this volume to HQ USAF/XOOT, through HQ ACC/DOTV, for approval prior to publication IAW AFPD 11-2, paragraph 4.2. Copies of MAJCOM/DRU/FOA-level supplements, after approved and published, will be provided by the issuing MAJCOM/DRU/FOA to HQ AFFSA/XOF, HQ ACC/DOTV, and the user MAJCOM/DRU/FOA and AFRC offices of primary responsibility. Field units below MAJCOM/DRU/FOA level will forward copies of their supplements to this publication to their parent MAJCOM/DRU/FOA office of primary responsibility for post publication review. **NOTE:** The terms Direct Reporting Unit (DRU) and Field Operating Agency (FOA) as used in this paragraph refer only to those DRUs/FOAs that report directly to HQ USAF. When guidance in this instruction duplicates, changes or conflicts with already published information contained in other ACC documents, the material in this instruction takes precedence. Keep supplements current by complying with AFI 33-360V1, *Publications Management Program*. See paragraph **1.5.** of this volume for guidance on submitting comments and suggesting improvements to this publication.

This instruction contains references to the following field (subordinate level) publications and forms which, until converted to departmental level publications and forms, may be obtained from the respective MAJCOM publications office:

Publications: ACCI 11-456, ACCI 10-450V2, MCR 55-125 (ACC), ACCM 3-3V19.

SUMMARY OF CHANGES

This revision incorporates Interim Change 2005-1 and adds BRNAV operating procedures. A bar (|) indicates a revision from the previous edition. The entire text of the IC is at the last attachment.

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Chapter 1

INTRODUCTION

1.1. Aircrew Responsibility. In conjunction with other governing directives, this regulation prescribes procedures for B-52 aircraft under most circumstances, but it is not a substitute for sound judgment or common sense. Operations or procedures not specifically addressed may be accomplished if they enhance safe, effective mission accomplishment.

1.2. Deviations. Deviations from these procedures require specific approval by the MAJCOM/DO unless an urgent requirement or an aircraft emergency dictates otherwise, in which case the pilot in command, or instructor, will take the appropriate action to safely recover the aircraft.

1.3. References. The primary references for B-52 operations are T.O. 1B-52H-1, T.O. 1B-52H-1-12, T.O. 1B-52H-1-13, T.O. 1B-52H-1-13-1, and other applicable T.O.s, the Electronic Combat (EC) Mission Guide, ACCI 11-456, *ACC Electronic Combat Training and EMCON Procedures*, CJCSM 3212.02, *Performing Electronic Attack in the United States and Canada,* AFTTP 3-1V19, *B-52 Tactical Employment*, AFI 11-214, *Aircrew, Weapons Director, and Terminal Attack Controller Procedures for Air Operations*, and this instruction. A reference for techniques is ACCM3-3V19 (AFTTP 3-3V19), *B-52 Fundamentals*.

1.4. Waivers. Forward waiver requests through NAF/OV to the HQ ACC/DO, or HQ AFRC/DO for approval. Waivers, if approved, will be issued for a maximum of 1 year from the effective date. Information copies of approved waivers will be provided to the other numbered air force OPRs. Information copies will be provided IAW AFRC procedures.

1.5. Instruction Changes. Submit recommendations for change to this instruction on AF Form 847, **Recommendation for Change of Publication**, through the NAF/OV to HQ ACC/DOTV. HQ USAF/XO is the approval authority for Interim Changes to this instruction.

Chapter 2

MISSION PLANNING

2.1. Flight Manuals. Individuals not issued flight manuals are personally responsible for maintaining adequate knowledge of emergency procedures.

2.2. Checklists. Each crewmember will have and refer to appropriate checklists during flight operations to ensure accomplishment of prescribed actions. Verbatim responses are not required; however, memorize and accomplish critical actions sequentially as listed in the flight manual. Conditions permitting, complete remaining items by reference to the checklist.

2.3. Local Aircrew Aids. Develop locally produced aircrew aids. As a minimum, include the following:

2.3.1. Briefing guides.

2.3.2. Weight and balance data for calculating local aircraft configurations.

2.3.3. Local radio channelization and airfield diagrams.

2.3.4. Impoundment and radio out procedures.

2.3.5. Recovery procedures with weapons onboard, jettison areas, and hot brake areas/procedures.

2.3.6. Divert/alternate and emergency airfield information including runway data, approximate course/distance/estimated time enroute (ETE)/altitude, coordinates, and fuel required.

2.3.7. Other information as deemed necessary by individual units, for example, stereo flight plans, turnaround procedures, local training areas, instrument preflight, and maintenance brevity codes.

2.4. Mission Planning Responsibility. Individual aircrews, unit operations, and intelligence functions jointly share responsibility for mission planning. Aircraft commanders are ultimately responsible for ensuring all mission planning materials are current and command guidance is followed.

2.5. Mission Planning Procedures. Accomplish sufficient flight planning to ensure safe mission accomplishment for all phases of flight. As a minimum, mission planning includes takeoff data, a winded flight plan, en route procedures, planned simulated/actual threats, target study/weapons delivery, air refueling, fuel requirements (amount and type), chart preparation for all crew positions, applicable Special Instructions (SPINS) and landing data. In addition, for night sorties planned with Night Vision Goggles (NVGs), review lunar illumination and elevation, anticipated ground light sources, and weather for the planned low level period. Prepare crew mission folders in accordance with ACCI 10-450V2, *Operations Nuclear Committed Aircraft Nuclear Planning*, and MCR 55-125, *Preparation Of Mission Planning Materials*.

2.5.1. (Does not apply to AFRC) **Planning/Preparation Requirements:**

2.5.1.1. Units will maintain mission planning facilities where all information and materials required for flight planning are available. Maintain appropriate weather information and climatological data for flight planning. Aircraft modification status boards must be readily accessible.

2.5.1.2. Unit staff will provide flight crews sufficient time to accomplish crew mission planning and mission briefing. This period is normally 8 hours, but may be reduced in proportion to the

planned sortie complexity and amount of staff and computer prepared mission data available to the crew. However, in no case will less than 2 hours be allocated to allow the crew to review mission data and complete an aircrew mission briefing. Mission planning must be accomplished as a crew. Unit staff will ensure other activities, such as recurring academic training, training device periods, additional duties, etc., do not interfere with time allotted for mission planning and aircrew mission briefing. The aircraft commander/flight lead/mission commander is ultimately responsible for the proper conduct of mission planning and must ensure sufficient time and materials are available to effectively plan the sortie.

2.5.1.3. If unable to comply with the mission planning requirements of this chapter due to weather divert, the mission will not include low level. However, the crew may fly the same low level as the original mission if re-briefed and flown within 72 hours of the original brief.

2.5.1.4. Make crew substitutions with sufficient time for the substitute crewmember(s) to comply with paragraph **2.5.1.2.**. Substitutions require squadron TOP-3 or higher approval.

2.5.2. (Does not apply to AFRC) **Crew Mission Planning:**

2.5.2.1. All crewmembers must be present during mission planning unless specifically excused by the squadron operations officer or higher authority. The aircraft commander will direct detailed mission flight planning, including tactics, techniques, and procedures to employ. Review all crew and crewmember training requirements/currency and schedule outstanding items to the maximum extent possible. Review aircrew and aircraft restrictions for each activity planned. Plan an alternate mission/activity including activity in the event equipment failure or weather prevents accomplishing the primary mission.

2.5.2.2. The aircraft commander/flight lead/mission commander is ultimately responsible for the accuracy and completeness of all mission data. The aircraft commander must ensure crew substitutions are made in time for the substitute crewmember(s) to be thoroughly briefed and familiar with the applicable mission data.

2.5.3. **Target Study.** Target study familiarizes the crew with ingress/egress routing, en route threat locations and applicable tactics, detailed description of the target area, and procedures for weapon employment. Target study must be accomplished as an integral crew and under supervision of a unit designated Target Study Officer (TSO). Prior to giving target study, TSOs must: certify IAW local procedures outlined in **Chapter 8** and have current information on the routes and targets to be briefed. Tactics and threat review portions should be supervised by weapons and tactics and intelligence personnel, as available. Units may document completion of target study on AF Form 4037, **OAS Briefing/Debriefing Analysis and Review**.

2.5.3.1. **Route Study (Low Altitude Only):**

2.5.3.1.1. Crewmembers will review procedures for descent to low altitude, route altitude structure (Terrain Avoidance {TA} and Instrument Flight Rules {IFR}), navigator/pilot information blocks, obstructions, noise sensitive/avoidance areas, altimeter changeover points, special operating procedures/notes, low level abort procedures, and applicable CHUMs. Plan routing around any man-made obstacles at or above the planned flight altitude. They will also review conflicting low altitude route/airway crossing areas and all airports within or near low level route corridor. When scheduled through open Electronic Scoring Sites (ESS), crews should fax information to the sites and 99 RANSS for Range Integration Instrumentation System (RIIS) scoring.

2.5.3.1.2. The TSO will brief the primary and alternate TA calibration peak/area procedures, significant terrain, possible terrain masking opportunities for briefed threats, any changes for the last 30 days (noise complaints/avoidance areas, CHUMs, new operating procedures, etc.), and minimum safe altitude for the route. The TSO will also discuss location, description, acquisition ranges, and optimal tuning of en route fixpoints for equipment updates prior to the Initial Point (IP) of the bomb run.

2.5.3.2. **Weapons Employment:**

2.5.3.2.1. For the bomb run review, the TSO will place particular emphasis on identifying overall radar and visual patterns/pointer systems to aimpoints, optimum tuning techniques, IP, the target, and Bomb Release Line (BRL). Review the target description and radar/visual predictions of the target and/or aimpoints for more precise crosshair placement, especially if area terrain may cause radar return breakup and visually obscure the target. Also, provide visual timing points and photos (if available) to assist the pilot team during the run.

2.5.3.2.2. The TSO will discuss equipment characteristics/limitations/procedures, weapon impact intervals, stop release, train length, number and type weapons to be released. He will brief weapon release parameters including airspeed, altitude, and axis of attack, timing tolerance/frag deconfliction, and primary, alternate, and emergency bombing procedures. In addition, cover weapon preflight procedures, fuse settings, probability of damage required, altitude calibration points, and other pertinent data from the bomb form.

2.5.3.3. **Tactics and Threat Study.** Unit weapons and tactics and intelligence personnel will develop realistic threat scenarios for specific sortie profiles/low level routes the unit will fly each quarter. Brief threat location, type, and capabilities during target study. Crews will develop an Emissions Control (EMCON) plan (coordinated within the formation, as applicable) based on the threat scenario. Also, review applicable tactics to defeat/degrade the threat while still effecting reliable weapon delivery. These scenarios should be changed often to maximize training.

2.5.4. **Aircrew Mission Briefing.** The aircraft commander will conduct an aircrew mission briefing for all missions. A crewmember excused from the briefing, or substituted following the briefing, must receive appropriate target study and a detailed briefing by the aircraft commander covering all requirements of paragraph **2.5.4.1.** below.

2.5.4.1. The briefing includes all scheduled activities and required items in **Attachment 2** in order of accomplishment from takeoff through mission termination. The aircraft commander must brief recovery base and planned alternate location, radio aids, approach lighting, runway markings and lights. Review procedures and crew coordination required to identify runway environment and transition from instrument to visual landing cues. Brief the descent, approach, and landing phase in sufficient detail that only a short review is required inflight during the pre-descent phase. Brief alternate mission activity.

2.5.5. **Formation Briefing.** The formation leader will conduct a briefing for all crewmembers in the formation covering the planned activities, procedures, techniques, specific EMCON procedures, and division of formation responsibilities. If planning lead changes, each formation lead should brief their portion of the mission. Formation briefing guides are in **Attachment 2** and units may augment these guides as necessary. Units flying missions not covered by this regulation or its supplements (for example, Operational Test and Evaluation (OT&E) weapons delivery profiles) will develop and maintain briefing guides for those missions as applicable. As a minimum, the briefing must include all

applicable items listed in the guide. The formation leader must ensure all crewmembers in the formation thoroughly understand their responsibilities, to include assumption of formation leadership. Resolve any questions during the briefing. If aircraft depart from separate bases and rendezvous for formation activity, the formation leader will conduct a telephone briefing. **NOTE:** For non-collocated aircraft, SIOP study meets formation briefing requirements.

2.5.6. **Pretakeoff Meeting.** The aircraft commander/flight lead/mission commander will conduct a pretakeoff meeting in accordance with the procedures defined in the local **Chapter 8** to this regulation. The aircraft commander/flight lead/mission commander will review with the crew any changes to the mission to ensure complete knowledge of all scheduled activity including changes to the arrival and approach procedures for the first destination. All crewmembers should attend the weather briefing.

2.5.6.1. If the interval from initial aircrew briefing to takeoff exceeds 72 hours, the aircraft commander/flight lead/mission commander must personally rebrief the entire flight mission again with the aircrew. This does not apply to off duty station training missions where the crew has planned and briefed to fly several missions in a 3-4 day period. For missions of this type, the crew will review the planned route to be flown during the pretakeoff meeting prior to each individual mission.

2.5.6.2. The aircraft commander's signature on the DD Form 175, **Military Flight Plan**, indicates all the items in the briefing guides were briefed/accomplished.

2.5.7. **Chart Preparation:**

2.5.7.1. Prepare charts for low level navigation IAW ACCI 10-450V2 and MCR 55-125.

2.5.7.2. Color reproduced charts are authorized provided it is a quality facsimile of the original raw chart. Black and white reproductions may be used for high altitude coverage.

2.5.7.3. Pilots, radar navigators, and navigators must use low level charts constructed on Tactical Pilotage Charts (TPC). Areas not covered by TPCs may be constructed on Operational Navigation Charts (ONC) or a suitable NIMA-approved replacement. Electronic Warfare Officers will be provided, as a minimum, a chart with expected threats, terrain features, and turn points.

2.5.7.4. For training purposes, use simulated surface-to-air missile rings of 20 nautical miles (NM) for strategic SAMs, 10 NM for tactical SAMs, and 50 NM for low early warning/controlled intercept sites.

2.5.7.5. Annotate emergency/alternate airfields at approximately 300 NM intervals.

2.5.7.6. Obtain JN/ON charts to cover 200 NM either side of course and alternate bases.

2.5.7.7. Update charts from the Chart Update Manual (CHUM) and annotate all noise sensitive areas along the route of flight.

Chapter 3

NORMAL OPERATING PROCEDURES

3.1. Air Refueling. Air refueling operations are authorized on an IFR flight plan and along published or special tracks/anchors. In addition, under certain circumstances, en route refueling may be conducted between aircraft comprising a formation. During these operations, it is the primary responsibility of the tanker aircrew to remain within the protected lateral, longitudinal, and vertical airspace. For the dimensions of protected airspace and other conditions/procedures affecting air refueling operations, refer to Federal Aviation Administration Handbook (FAAH) 7610.4H, *Special Military Operations*, Chapter 10.

3.1.1. Fly anchor air refueling tracks, or tracks that require frequent turns, in an offset trail position rather than echelon formation. Fly slightly left or right, depending on turn direction, of the preceding aircraft's flight path. This will prevent the receiver from descending into the path of the aircraft in trail position during an emergency breakaway.

3.1.2. **Military Assumes Responsibility for Separation of Aircraft (MARSA):**

3.1.2.1. MARSA between the tanker(s) and the receiver(s) begins when the lead tanker advises Air Route Traffic Control Center (ARTCC) they accept MARSA.

3.1.2.2. After MARSA has been declared, controller assigned course or altitude changes prior to rendezvous completion will automatically void MARSA. Once rendezvous is completed, headings and altitude assignments may be made with tanker concurrence and MARSA can remain in effect.

3.1.2.3. After rendezvous, the tanker will keep receiver(s) within 3 miles of the tanker until MARSA is terminated.

3.1.3. **Rendezvous:**

3.1.3.1. **Point Parallel Rendezvous.** Receiver aircraft shall arrive at the Air Refueling Control Point (ARCP) no earlier than the scheduled Air Refueling Control Time (ARCT) minus 5 minutes and depart no later than ARCT plus 10 minutes. If unable to meet timing tolerance, attempt to contact a unit scheduler/duty officer for a new rendezvous time. If unable to schedule a new rendezvous time, air refueling is permitted provided ARTCC clearance is received.

3.1.3.2. **Buddy, On-Course, and Enroute.** Aircraft should arrive at the Rendezvous Point ± 5 minutes of the scheduled rendezvous time. If unable to meet timing tolerance, attempt to contact a unit scheduler/duty officer for a new rendezvous time. If unable to schedule a new rendezvous time, air refueling is permitted provided ARTCC clearance is received.

NOTE: Aircrews must be aware arriving outside the + 5/-10 minute window for point parallel rendezvous or the + 5 minute window for buddy, on-course, and enroute rendezvous may result in a conflict with other aircraft scheduled in the refueling airspace. If a conflict arises between two formations, the formation within their timing tolerance will take precedence.

3.1.4. Visual Formation. Visual formation during air refueling is authorized IAW T.O. 1-1C-1-15.

3.2. Cruise:

3.2.1. **Authentication Procedures.** Crews will authenticate all directed mission changes, when applicable.

3.2.2. Sorties that remain within UHF contact of local command post are exempt from Emergency Action Message (EAM) and HF requirements.

3.2.3. Adds BRNAV procedures and information.

3.2.3.1. Basic Area Navigation (BRNAV) Airspace. Airspace where BRNAV is applied is considered special qualification airspace. Both the operator and the specific aircraft type must be approved for operations in these areas. BRNAV navigation accuracy criteria is RNP-5. The B-52 complies with RNP-5 accuracy, integrity, and continuity and is approved for BRNAV operations requiring RNP-5 or higher criteria. Aircrew must update position as required to maintain actual centerline within +/- 5 NM of ATC cleared route.

3.2.3.1.1. Minimum equipment to operate in BRNAV airspace is one INS capable of updates from Doppler and/or Radar inputs (i.e., not tied to aircraft GPS). Flights entering BRNAV airspace after long over water flight must be especially aware of BRNAV tolerances and update accordingly. NOTE: The B-52 GPS receiver is not certified for BRNAV operations.

3.2.3.1.2. Minimum aircrew for BRNAV operations is a pilot, copilot, and radar navigator.

3.2.3.1.3. Aircraft must turn short of filed points to remain within +/- 5 NM of ATC cleared route. Aircrew should utilize the “Turn Short” feature when preparing mission data cartridges and during inflight operations.

3.2.3.1.4. Aircraft unable to maintain BRNAV tolerances must advise ATC immediately and take appropriate coordinated action.

3.2.3.1.5. Document (in the aircraft forms) malfunctions or failures of BRNAV required equipment, including the failure of this equipment to meet BRNAV tolerances.

3.3. Low Altitude Training. Conduct low altitude training in specifically approved mission employment areas. Mission employment areas are defined in **Attachment 1**.

3.3.1. **Communications:**

3.3.1.1. Prior to entering an IFR Military Training Route (IR), confirm with ARTCC the entry and exit fix time, the requested altitude after exiting, and if applicable, the number of reentries.

3.3.1.2. Refer to Flight Information Publication (FLIP) AP/1B, *Area Planning - Military Training Routes*, for communications procedures on VFR Routes (VRs).

3.3.1.3. During low level, monitor Flight Service Station (FSS) for Significant Meteorological Information (SIGMET) and Airmen Meteorological Information (AIRMET) advisories at all times except at reporting/monitoring points, on the bomb run, when in contact with ARTCC, or when inflight emergencies dictate otherwise.

3.3.1.4. **Communications Failure on an IR Route.** For most routes, FLIP AP/1B contains the communications failure altitude. This is the altitude to fly after route exit. When flying a route without a published communications failure altitude, file the communications failure altitude in the remarks section of the DD Form 175. Confirm this altitude with the controlling ARTCC prior to route entry.

3.3.2. **Weather Requirements:**

3.3.2.1. Prior to entering any mission employment area, crews will attempt contact with a Pilot to Metro Service (PMSV) station (or appropriate weather source) designated during the weather briefing. This contact should be as near to the area entry time as possible to ensure receipt of the latest significant weather information. Without updated in-flight weather information from any source, the decision to enter will be based on crew judgment, considering such factors as forecast weather, altimeter settings and "D" values, and observed weather.

NOTE: The requirement to obtain updated weather information in flight may be waived at the aircrew's option for missions where low altitude training is within 1½ hours after takeoff.

3.3.2.2. Use all available information to evaluate the possibility of encountering mountain wave effects. If it appears mountain wave effects could be encountered, climb to Minimum Safe Altitude (MSA)/IFR early enough to avoid the effects. If mountain wave effects are encountered at any altitude, abort the area.

3.3.2.3. DELETED.

3.3.2.4. Aircrews are prohibited from entering a mission employment area closed due to hazardous weather/flight conditions (thunderstorms, turbulence, large number of birds or numerous birdstrikes, etc.). Aircrew will abort the low level when notified of route closure if they have not passed the area of hazardous weather or flight conditions. If the aircrew is advised the route is closed after passing through the area of hazardous weather, the decision to continue or abort rests with the crew. Aircrews aborting a mission employment area due to hazardous weather or flight conditions will advise the home station WG/CP and provide a Pilot Report (PIREP) to the home weather unit.

3.3.2.5. **Icing.** Do not conduct low altitude flights in areas of forecast severe icing conditions or areas of reported moderate or severe icing conditions. If moderate or severe icing is encountered, abort the mission employment area.

3.3.2.6. **Turbulence.** Do not conduct low altitude flight in areas of forecast severe turbulence, forecast moderate or severe turbulence in mountain wave effect, or moderate or severe turbulence reported by military aircraft. If type aircraft (military or civilian) reporting moderate turbulence is unknown, contact appropriate ARTCC for advisory. If moderate or severe turbulence is encountered, abort the mission employment area.

3.3.2.7. **Wind Restrictions.** B-52 flight at TA contour altitude is prohibited in mountainous areas when winds at MSA/IFR are 40 knots or greater. During TA operations, if winds exceed 40 knots in a mountainous area, climb to MSA/IFR. When approaching a mountainous terrain area with winds over 40 knots, climb to MSA/IFR early. TA flight is permissible with winds over 40 knots in a non-mountainous area. Use all available information (e.g., wind readouts, drift information, blowing dust, turbulence, cloud formations, etc.) to evaluate the possibility of encountering mountain wave effects. If it appears mountain wave effects could be encountered, climb to MSA/IFR early enough to avoid the effects. If mountain wave effects are encountered at MSA/IFR (i.e., lenticular clouds with high winds), abort the route.

3.3.2.8. **Visibility/Cloud Clearance Requirements.** Weather for TA operations on IR routes must be at or better than TA Visual Conditions. If TA Visual Conditions cannot be maintained, climb to MSA/IFR as soon as practical. Weather conditions for operations on VR routes must be

IAW FLIP AP/1B. If these weather conditions cannot be met, abort the route. For night operations, weather must meet the applicable day criteria. In addition, sufficient light and visibility must exist to recognize major changes in terrain elevations such as mountain peaks, ridge lines, valleys, and sloping terrain (NVGs may be used to satisfy visibility requirement).

3.3.3. **Negative Altitude Variations.** Aircrews will use altitude variations from PMSV (or compute using PMSV altimeter settings and D values) to determine which route segments are affected by excessive altitude variations. This information should be obtained as close as possible to the planned entry time. Crews unable to contact a PMSV station may enter using information from the preflight weather briefing.

3.3.3.1. If any of the following situations occur during Instrument Meteorological Conditions (IMC) or at night and the crew is unable to clear terrain visually, abort the route (NVGs may be used to clear terrain visually during night Visual Meteorological Conditions {VMC}):

3.3.3.1.1. The difference between aircraft pressure altitude as indicated with the most current altimeter setting and the Offensive Avionics System (OAS)/Absolute Altitude (HA) computed true altitude exceeds -400 feet. This can be measured directly by taking an altitude calibration (for example, a 2420 Mean Sea Level (MSL) pressure altimeter reading and a 2000 ft OAS/HA value would yield a -420 ft altitude variation).

3.3.3.1.2. The aircraft radar altimeter indicates less than a 600 ft terrain crossing while at the MSA/IFR.

3.3.3.1.3. Flying and maintaining TA clearance plane settings and the aircraft pressure altimeters indicate at or above the route IFR/MSA altitude.

3.3.3.2. When only the entry point area is forecast with excessive altitude variation, the crew may enter the route even with IMC conditions at the entry point. However, the crew cannot descend below 1000 feet above the IFR/MSA altitude for the Primary TA Initiation Point (PTAIP) unless VMC is encountered and can be maintained.

3.3.3.3. When latter portions of the low level route are forecast with excessive altitude variation and the entry point is within prescribed tolerances, crews may enter the route in IMC conditions and fly MSA/IFR up to the area of excessive altitude variation. Prior to entering the area of excessive altitude variation, crews must be able to visually clear terrain in order to continue low level operations. Once the forecast/observed area(s) of excessive altitude variation is overflown, subsequent portions of the low level route may be flown.

NOTE: Altitude variation tolerances are amended as shown for the following route segments:

IR-800, points F to T: -600.

IR-801, points AL to AX and AX to AS for racetrack routing: -600 feet.

IR-801, points A to AL: Unlimited.

3.3.4. **Equipment Restrictions.** If equipment problems impair the crew's ability to clear terrain do not attempt low level flight.

3.3.4.1. **Flight Controls.** Abort low level if any flight control system malfunction denies the pilot a safe margin of control.

3.3.4.2. **Mapping Radar Failure (Scope Blank or Inadequate for Navigation).** Do not fly low level, during day IMC or night, with mapping radar failure. Aircraft without mapping radar may penetrate to low altitude during daylight hours provided TA Visual Conditions can be maintained. Abort the route if weather conditions fall below TA Visual Conditions at any time.

3.3.4.3. **OAS Processors.** Do not fly low level with less than two OAS processors during night or in IMC. Crews may penetrate to low level and fly the route as long as day TA Visual Conditions can be maintained.

3.3.4.4. **Multi-Function Displays (MFDs).** Do not fly low level unless there is at least one operable MFD at the RN station and one at the navigator's station.

3.3.4.5. **Attitude Heading Reference System (AHRS).** Do not fly low level with a malfunctioning AHRS. Exception: The AHRS does not need to be fully operational if one Inertial Navigation System (INS) is providing accurate heading and there is accurate MD-1 gyro stabilization for the pilot's attitude director indicator (ADI) (this exception applies for day TA Visual Conditions only).

3.3.4.6. **Radar Altimeter.** TA or EVS/visual contour flight without a properly operating radar altimeter is prohibited.

3.3.4.7. **Additional Night Equipment Restrictions.** The following equipment must be fully operational for night TA operations, with or without NVGs:

3.3.4.7.1. DELETED.

3.3.4.7.2. Terrain avoidance system.

3.3.4.7.3. Doppler/INS. Either Doppler or INS ground speed and drift information may be used.

3.3.4.7.4. EVS. Either Steerable TV (STV) or Forward Looking Infrared (FLIR) must be operational for night TA operations.

3.3.4.7.5. Do not fly night TA if the aircraft performance is degraded; for example, engine out or main gear extended.

3.3.4.8. Do not practice radar silent operations in IMC or at night.

3.3.5. **TA Procedures:**

3.3.5.1. Crewmembers must use all means available to clear terrain, including EVS equipment. Sound crew judgment must be used to determine whether current conditions warrant TA flight. If there is any doubt, the crew should climb to IFR altitude immediately.

3.3.5.2. Descent from IFR altitude must be accomplished in TA Visual Conditions. The PTAIP, or Start TA Point, is not a mandatory start descent point. The OAS radar will be in full scan TA (Plan Position Indicator {PPI} display or Displaced Center Plan Position Indicator {DCPPI} display) for all descents to TA altitudes. Range marks will be displayed to the maximum extent possible (N/A day Visual Flight Rules {VFR}).

3.3.5.3. TA flying under a cloud deck can be extremely hazardous, particularly under conditions of rising terrain or decreasing ceiling. In this case, climb immediately to MSA/IFR.

3.3.5.4. Visual contour flying is not authorized at night.

3.3.5.5. During TA or visual contour operations, aircrews are encouraged to deviate from centerline, within route corridor, for tactics training. Attempt to maintain route centerline when flying at IFR altitudes without visual terrain clearance. Crews are not authorized to deviate from published route corridor except when aborting the route. **NOTE:** If a conflict arises between the pilot's and navigator's information, climb to a safe altitude and resolve it; obtain further flight clearance if necessary. If differences are resolved resume scheduled training activity.

3.3.5.6. If aircraft position is unknown, immediately climb to MSA/IFR altitude. If position cannot be determined after climbing to MSA/IFR altitude or any time route corridor has been exceeded, abort the route.

3.3.5.7. Whenever bank angle exceeds 15°, the pilot flying the aircraft will make the turn visually or, if at night, initiate a climb to a safe altitude before executing the turn.

3.3.5.8. If the TA operational check is not completed by 30 NM prior to the Start Maneuver Area (SMA)/IP, discontinue the check and prepare for the bomb run. If either the Fuselage Reference Line (FRL) or Flight Vector Reference (FVR) compensation has been completed, TA procedures may be used. If not, revert to EVS/visual contour, conditions permitting, or the MSA/IFR. This does not preclude system evaluation of a previous check within the 30 NM restriction.

3.3.5.9. **Combat Altimeter Setting.** During day TA operations aircrews are encouraged to determine, set and maintain true altitude in the aircraft pressure altimeters. Enter the route using the latest ARTCC/FSS altimeter, then determine an altimeter setting after passing the Start TA point. Reset aircraft pressure altimeters using current FSS information before entering IMC flight conditions or before any climb to IFR altitude.

3.3.5.10. Crews may omit the circled items of the Descent, After Descent, and TA Compensation checklist when weather conditions or time constraints prevent accomplishment of the comparison/FRL compensation. During night mountainous conditions, crews will accomplish the entire checklist unless the TA set has been previously compensated.

3.3.5.11. Conduct low altitude ESS activity on a scheduled basis only. Unscheduled low altitude runs are prohibited. Unscheduled high altitude activity may be conducted provided such activity does not interfere with scheduled activity. Aircrews may request scoring racetrack (backside) activity when flying a scheduled re-entry.

3.3.5.12. Monitor ESS transmissions for Electronic Attack (EA) restrictions and question the site immediately if you do not understand the instructions. Do not jam signals in restricted bands. All threat signals will be considered when determining crew tactics. Practice realistic tactical scenarios throughout the EA/bomb run to the maximum extent possible.

3.3.6. **MASMS IR Route Timing Tolerances:**

3.3.6.1. Aircraft will only enter MASMS IR routes at scheduled times plus or minus two and one-half minutes. If the scheduled entry cannot be made within tolerances, the use of subsequent primary or alternate entry points/times is authorized provided the aircrew has been so scheduled and briefed.

3.3.6.2. After route entry, aircrews must maintain scheduled enroute point time tolerances of plus or minus two and one-half minutes. Aircrews unable to maintain these tolerances must abort the route.

3.3.6.3. When a mission is changed and new entry time(s) are assigned, the aircrew will not use previously scheduled entry/SMA times(s).

3.3.6.4. Aircrews conducting racetracks will not automatically be allowed route entry on second or later scheduled SMA times unless the aircrew owns the entry time for that SMA.

3.3.6.5. Aircrews using an alternate entry will ensure entry time is based on making scheduled enroute times good.

3.3.7. **Non-MASMS IR Route Timing Tolerances.** In the absence of specified requirements, aircrew will enter only at scheduled time plus or minus five minutes. If the scheduled entry cannot be made within the above tolerance, the use of subsequent primary or alternate entry points/times is authorized provided the aircrew has been so briefed and will maintain route timing.

3.3.8. **VR Route Procedures.** All flights on VRs will be conducted IAW AFI 11-202V3, *General Flight Rules*, (AFI 11-206). If FLIP AP/1B weather minimums cannot be maintained, the aircraft will abort the route. Aircraft will enter VRs only at designated route points. Aircraft will exit only at designated route points unless weather conditions or an emergency situation dictates otherwise.

3.3.9. If ARTCC issues instructions that cause the aircraft to deviate outside the route width or altitude structure (IRs or VRs), the aircrew may continue the mission provided the following conditions are met:

3.3.9.1. ARTCC controllers can assure positive radar surveillance until the aircraft is established back in the route structure.

3.3.9.2. Mission timing tolerance can be met at the next low level navigation point.

3.3.10. **Abort Procedures.** Crews aborting low level, will obtain clearance from ARTCC prior to departing the low level unless a safety of flight condition (turbulence, thunderstorms, equipment malfunctions, etc.) exists which necessitates an immediate climb or turn. If aborting without a clearance, climb to a safe altitude on a course which will avoid airways and Class A, B, C, and D controlled airspace to the maximum extent possible. In addition, aircrew aborting without a clearance will place the Identification Friend or Foe (IFF) to emergency setting, report the emergency and flight plan deviation as soon as possible and obtain a new clearance. **NOTE:** FAR 91.123 states that no pilot may deviate from an ARTCC clearance, except in an emergency unless he or she obtains an amended clearance.

3.4. NVG Procedures. NVGs enhance the capability to fly low level. Crews will fly the TA trace and use their normal instrument cross-check to maintain prescribed altitudes. High level, NVGs assist the pilots with threat identification (ID) and avoidance, as well as formation station keeping. Do not use NVGs for air refueling or pattern operations.

3.4.1. TA Visual Conditions are required when conducting low level operations with NVGs. This will ensure adequate illumination for proper NVG operation. If conditions of reduced visibility are encountered while wearing NVGs, use extreme caution as weather phenomena (e.g., fog, clouds, etc.) are difficult to perceive with NVGs until after penetrating the weather.

3.4.2. Individuals are cleared for NVG training after a flight surgeon reviews their medical records IAW AFI 48-123, *Medical Examination Standards*.

3.4.3. Optimum operation with NVGs requires at least one-quarter moon at 30 degrees or higher elevation. NVG training may be conducted under less than optimum conditions, but normal night weather and visibility restrictions still apply for low altitude operations.

3.4.4. Determine in advance specific crew duties and procedures for aircraft emergencies, inadvertent weather penetration, and the threat environment. Plan and brief details such as who will fly the aircraft, who will transition from NVGs, who will perform emergency actions, what maneuvers will be flown, cockpit lighting, etc.

3.4.5. Each crewmember whose duties require the use of NVGs will adjust and calibrate their respective NVG device on an approved NVG calibration lane or NVG tester prior to use.

3.4.6. Generally, all crewmembers requiring NVGs should be on or off goggles at the same time. Items such as terrain or weather which are obvious to a pilot on NVGs may not be visible to a non-NVG pilot. These differences in visual capabilities can cause problems in communicating information within the cockpit. For the same reasons, mixing different types of NVGs (AN/AVS-9 with AN/AVS-6, AN/AVS-6 with AN/PVS-5, etc.) within the cockpit is not recommended.

3.4.7. The aircraft commander will ensure sufficient operable sets are aboard the aircraft. Each crewmember whose duties require using NVGs will be current and qualified with the NVG, unless accompanied by a current and qualified instructor.

3.4.8. If possible, begin donning the NVG and associated equipment approximately 45 minutes prior to descent to low level or 45 minutes prior to the threat area for high altitude missions. During low level missions, terminate NVG operations when the mission dictates and adjust cockpit lighting to a suitable level to allow for safe instrument flight.

3.4.9. The pilot flying the aircraft will use TA procedures, radar altimeter, and visual inputs gained from the NVG to maintain the proper terrain clearance. NVGs will not be used for visual contour low level or visual formation.

3.4.10. If NVGs fail and sufficient lighting is not available, climb to a safe altitude. Resume NVG/TA operation only if sufficient light becomes available.

3.4.11. If any doubt exists concerning terrain clearance or visibility, immediately climb to a MSA/IFR.

3.4.12. **Cockpit Lighting.** ACCM 3-3V19 (AFTTP 3-3V19) will be used as the baseline for proper NVG cockpit setup. Units may supplement this information. Approved lighting systems include the indigenous NVG cockpit lighting (C+ modification), cyalume light sticks, and an approved battery powered LED light bar. Always carry cyalume lights sticks as a backup as they remain the most reliable means of cockpit lighting. In no case will NVGs be used without one of the cockpit lighting systems mentioned above.

3.5. Formation:

3.5.1. **Concept.** Maintain formations to provide mutual support provided it does not unduly interfere with mission accomplishment.

3.5.2. **Safety.** Formation is a potentially hazardous operation. Strict compliance with the specified procedures is essential to the safe conduct of any mission. These procedures, however, cannot substitute for proper aircrew judgment during fluid formation operations.

3.5.3. **Definitions:**

3.5.3.1. **Formation Flight.** Formation flight by FAA definition is more than one aircraft which, by prior arrangement between the aircrews, operate as a single aircraft with regard to navigation and position reporting. Separation between aircraft within the formation is the responsibility of the flight leader and the crewmembers of other aircraft in the flight. This includes transition periods when aircraft within the formation are maneuvering to attain separation from each other to effect individual control and during join-up and breakaway.

3.5.3.2. **Standard Formation.** One in which each wingman maintains a proximity of no more than 1 mile laterally or longitudinally and within 100 feet vertically from the flight leader.

3.5.3.3. **Nonstandard Formations.** Those operating under any of the following conditions (B-52s typically fly this type formation):

3.5.3.3.1. When the flight leader has requested and ARTCC has approved other than standard formation dimensions.

3.5.3.3.2. When operating within an authorized altitude reservation (ALTRV) or under the provisions of a letter of agreement.

3.5.3.3.3. When operations are conducted in airspace specifically designed for special activity.

3.5.3.3.4. The formation leader shall notify ARTCC upon initial contact that the formation operations are being conducted in a nonstandard formation, and if required, advise ARTCC of the separation and spacing being employed. (FAAH 7610.4H)

3.5.3.4. **Formation Departure.** A formation departure is the departure of multiple aircraft at intervals of 1 minute or less which, by prior arrangement between the aircrews, operate as a single aircraft with regard to navigation and position reporting. The departure portion of the flight may terminate at a preplanned breakup point, which may be located up to, but not beyond, the planned initial level off at cruise altitude. Formation requirements of para **3.5.3.1.** apply.

3.5.3.5. **Enroute Formation.** An en route formation is two or more aircraft with the same intended route of flight, maintaining station-keeping operations by either visual and/or electronic means. Formation flight requirements of para **3.5.3.1.** apply.

3.5.3.5.1. When flying nonstandard formation, advise ARTCC of the longitudinal, lateral, and/or vertical separation between flight lead and the last aircraft in formation so they can provide appropriate separation from other aircraft.

3.5.3.5.2. Should separation between the flight leader and any other aircraft in the formation exceed ARTCC separation limitations or vary significantly from that reported to ARTCC for the nonstandard formation, the aircraft outside the formation limits will no longer be considered part of the formation. The pilot will inform the leader of his or her position and request ARTCC provide individual control until reestablished in formation.

3.5.3.6. **Stream Formation.** A stream formation flight is defined as two or more aircraft (or flights of aircraft) operating along the same intended route of flight as individual aircraft with regard to navigation and position reporting. Separation between consecutive aircraft or flights should not be less than 30 seconds nor more than 3 minutes longitudinally and 3,000 feet vertically. Stream formation, as flown by B-52s, is "nonstandard" by FAA definition.

3.5.4. **Responsibilities:**

3.5.4.1. **Lead Responsibilities:**

3.5.4.1.1. Only aircraft commanders who are certified, IAW AFI 11-2B-52V1, *B-52--Aircrew Training*, to be flight lead may be formation leaders unless under IP supervision. The IP may supervise an uncertified aircraft commander from a wingman position. This does not prohibit the wingman from leading the flight for training or tactical considerations (i.e., equipment malfunctions). However, the qualified flight lead is ultimately responsible for safe and effective mission accomplishment, regardless of his position in the formation. The most qualified aircraft commanders or crew will be designated as formation lead for operational missions.

3.5.4.1.2. Formation integrity and discipline begin with the formation briefing. The leader must ensure all aspects of the mission are clear and understood.

3.5.4.1.3. The leader will direct deviations from the briefed mission when necessary. Take no actions until all formation members coordinate and understand those changes.

3.5.4.1.4. Leaders must remember aircraft control is a basic element of good formation. Consistent aircraft control when accomplishing turns or changing altitude enhances formation integrity.

3.5.4.1.5. The leader must be aware of the position, performance, and capabilities of his flight members at all times.

3.5.4.2. **Wingman Responsibilities.** The best wingman is one who understands and can accomplish the duties of the leader, understands the responsibilities involved in formation flying, and helps maintain the integrity of the flight. The wingman should:

3.5.4.2.1. Keep the leader in visual or electronic contact at all times.

3.5.4.2.2. Maintain briefed position.

3.5.4.2.3. Anticipate corrections and plan ahead.

3.5.4.2.4. Monitor all aspects of formation operations and advise the leader if an unsafe condition is noted.

3.5.4.2.5. Be prepared to assume the lead.

3.5.4.3. **Crew Coordination.** Maintaining formation integrity requires each crewmember to assist the pilot in monitoring the position of all flight aircraft. In order to properly maintain formation position, the radar navigator, navigator, or pilot not flying the aircraft must keep the pilot advised of the distance from other aircraft and will provide trend data. Close attention is essential during join-ups, position changes, lost wingman procedures, air refueling, and cell breakup.

3.5.4.4. **Unit Responsibilities.** All units will develop formation takeoff and departure procedures. These procedures will include provisions for aborts, lost communications, EMCON, and the recovery of formation aircraft. Include these procedures in **Chapter 8** of this regulation.

3.5.5. **Communications and Radio Procedures:**

3.5.5.1. **General.** Radio terminology should be standardized to the maximum extent; however, it is impractical to prescribe specific radio calls for all situations. The leader will develop and brief a radio monitor plan, including AFSATCOM (voice and data) operations.

3.5.5.1.1. Radio and interphone discipline are critical factors in maintaining formation integrity. Enforce strict radio and/or interphone discipline to ensure flight safety and mission effectiveness.

3.5.5.1.2. Transmit only information essential to safe mission conduct. Radio calls will be clear and concise.

3.5.5.1.3. UHF radio normally will be the primary means of communication between aircraft. Do not fly formation on training sorties without interplane communications capability, except in an emergency. Except for loss of radios, all flight members will maintain a common frequency. All capable aircraft should monitor the same ARTCC frequency.

3.5.5.1.4. Use Have Quick, Secure Voice, and Voice AFSATCOM equipment and procedures to the maximum extent possible. Formations should consist of similarly equipped aircraft; this ensures adequate training opportunities with the associated equipment.

3.5.5.1.5. One aircraft in the formation will be the AFSATCOM monitor for the formation.

3.5.5.2. **Use of Radios.** Refer to ACCM 3-3V19 (AFTTP 3-3V19).

3.5.5.3. **Call Signs:**

3.5.5.3.1. Unless otherwise directed by a specific operations or communications plan, the flight call sign for ARTCC reporting will be the flight leader's assigned call sign. Crews should not using colors etc. for interplane call signs as this practice caused confusion with other package assets during Desert Storm. Crews should use the tactical call sign for ARTCC and interplane communications however, crews may use abbreviated call signs for interplane purposes.

3.5.5.3.2. To preclude confusion by ARTCC, if aircraft positions within a flight are changed, do not change the flight call sign or IFF squawk. However, change the position numbers within the flight to the ones assumed.

3.5.5.3.3. Formation aircraft will retain and use individual tactical call signs for all rendezvous and air refueling operations unless directed otherwise in operational plans. For large formation air refueling operations, aircraft may use assigned air refueling position for communications with their air refueling mate. For any abnormal or emergency situations use tactical call sign.

3.5.5.4. **EMCON.** Practice EMCON to the maximum extent possible during peacetime in preparation for combat operations. Do not sacrifice safety in an effort to adhere to EMCON procedures. Refer to AFI 11-214 or T.O. 1-1C-1-15 for EMCON levels.

3.5.6. **Formation Takeoff.** Takeoff interval is no less than 30 seconds for conventional and nuclear operations. The receivers usually roll first, followed by the tankers in that element. Takeoff intervals or sequence may be varied as necessary depending on aircraft acceleration and performance, training requirements, weather, airfield conditions, and mission requirements. Make an abort call anytime the takeoff is aborted.

3.5.6.1. Do not conduct Quick Taxi/SIOP Departure Exercises as defined in AFI 11-2B-52 Vol. 1, *Training*, with nuclear weapons loaded aboard the aircraft and/or in excess of aircraft gross weights of 450,000 pounds.

3.5.6.2. **Quick Taxi/SIOP Departure Taxi Procedures.** Units will establish taxi plans from the normal parking area to each runway. Follow the taxi sequence, established in the briefing, to ensure proper launch sequence. Lead will confirm takeoff data computations, accomplish guard receiver check, and copy ARTCC clearance in the chocks. When possible, crews should start engines, taxi, and launch without interruption. If for any reason takeoff clearance is canceled after the aircraft are rolling, the formation should stop on predetermined points (normally 1/4 to 3/4 mile from the end of the runway). Following aircraft will set or adjust power as necessary to maintain proper spacing and a safe speed during taxi and alignment for takeoff roll.

3.5.7. **Formation Aborts (nuclear and conventional).**

3.5.7.1. Whenever a pilot makes a decision to abort the takeoff, the pilot not flying will, simultaneously with initiating abort procedures, call aircraft type, airspeed, and the word "abort" three times on the ARTCC frequency. (*EXAMPLE:* "Bomber 80 knots abort, bomber 80 knots abort, bomber 80 knots abort.")

3.5.7.1.1. DELETED.

3.5.7.1.2. DELETED.

3.5.7.1.3. DELETED.

3.5.7.1.4. DELETED.

3.5.7.1.5. DELETED.

3.5.7.1.6. DELETED.

3.5.7.2. Aircraft with an indicated airspeed greater than the announced abort speed will continue takeoff. Aircraft with an indicated airspeed less than the announced abort speed will abort.

3.5.7.2.1. DELETED.

3.5.7.2.2. DELETED.

3.5.7.2.3. DELETED.

3.5.7.3. Aborting aircraft will continue to the end of the runway prior to turning off. If collision with the preceding aircraft is imminent, the overtaking aircraft will turn off the runway, if necessary, to avoid collision.

3.5.7.4. DELETED.

3.5.7.5. DELETED.

Table 3.1. DELETED.

3.5.7.6. DELETED.

3.5.7.6.1. DELETED.

3.5.7.6.2. DELETED.

3.5.7.6.3. DELETED.

3.5.7.6.4. DELETED.

3.5.7.6.5. DELETED.

3.5.7.7. DELETED.

3.5.7.7.1. DELETED.

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3.5.7.7.3. DELETED.

3.5.7.8. DELETED.

3.5.7.8.1. DELETED.

3.5.7.8.2. DELETED.

3.5.7.8.3. DELETED.

3.5.7.8.4. DELETED.

3.5.7.9. DELETED.

3.5.7.9.1. DELETED.

3.5.7.9.2. DELETED.

3.5.7.9.3. DELETED.

3.5.7.9.4. DELETED.

3.5.8. **Departure:**

3.5.8.1. Fly formation departures according to unit developed formation routing, published instrument departure procedures, and the provisions of any existing letters of agreement between the local unit and ARTCC facilities. During departure and climb, use all available means (radar, EW receivers, visual and radios) to maintain safe aircraft separation and effect join-up. If safe separation cannot be established by visual, radar or radio contact, accomplish lost wingman or locally developed abort procedures. During climb out, if an intermediate level off is necessary, do not climb through the wake turbulence of the preceding aircraft. Carefully monitor altitude separation during rejoin. During IMC or when visual contact is lost, each aircraft in the flight will make periodic altitude calls, a minimum of every 5,000 feet, to ensure safe separation. Maintain formation integrity during any cutoff maneuvering; i.e. number three will close on number two, etc. The closing aircraft (numbers three, four, and five) will monitor lead's relative position. Lead must monitor the formation using all available means during departure/join-up and be prepared to assist wingmen having trouble locating lead.

3.5.8.2. **Formation Closure/Join-up.** Cutoff, differential airspeed, and power management expedite formation closure and join-up. Aircrews must be constantly aware of their closure rate as they approach formation position. Visual cutoff should be used by the formation during departures in day VMC conditions. Obtain clearance for visual cutoff either by prior agreement with ARTCC or from the controlling agency prior to turn. Exercise extreme caution to prevent an overshoot. Too much overtake can easily result when you combine too large a cutoff angle and differential airspeed. If bank angles become excessive, or misjudgment in closure occurs, take the necessary corrective actions and inform the formation of your intentions.

3.5.8.3. When using differential airspeed throughout a formation, each succeeding aircraft must increase its lead point for deceleration consistent with formation position. As an example, when lead is maintaining 280 Knots Indicated Airspeed (KIAS), two is maintaining 300 KIAS (until in

position), and three is maintaining 320 KIAS, three should reduce power approximately 1 NM prior to reaching position on two.

3.5.9. **Aborts.** Aborting aircraft will clear the planned launch stream and take appropriate actions dictated by the reason for abort. Advise lead of abort. Lead should attempt to assist the aborting aircraft in any way possible. If the mission allows, lead may designate an escort. Aborting aircraft will obtain ARTCC clearance prior to altering their route or declare an emergency and deviate as necessary, whichever is appropriate.

3.5.10. **Level Off.** Lead must initially maintain a briefed airspeed to level off to allow formation closure. Adjust to cruise airspeed at briefed action point. Obtain an altitude block for all intermediate and final level off altitudes (normally a 1,000 foot altitude block for a formation of three aircraft). Block altitudes must provide a minimum of 500 feet altitude separation between aircraft. Upon reaching an intermediate level off altitude, aircraft should "stack down" at 500 foot intervals and close to en route formation spacing. All aircraft will normally stack up at final level off. Direction of stacking will be as required by mission tactics and as briefed by formation lead. If ARTCC will not approve a block altitude, request IFR separation or hard IFR altitudes for each aircraft in formation. **NOTE:** The technique of maintaining 250 feet above or below a single altitude assigned to two aircraft in formation is a *direct violation* of FAR part 91.75a. This technique is *not* acceptable and will not be practiced or used.

3.5.11. **Enroute Formation:**

3.5.11.1. En route formation consists of two through six aircraft, in trail, stacked at 500 foot intervals with 1 or 2 NM separation between aircraft. AFTTP 3-1V19, outlines other authorized tactical formations. The primary means of maintaining proper position are the radar system under instrument conditions and visually under visual conditions. Secondary means include the air-to-air Tactical Air Navigation (TACAN) system, Forward Looking Infrared (FLIR), or the Steerable Television (STV), NVGs, etc. In instrument conditions, the apparent movement of a return on the radar scope is the best aid in maintaining position. Because of allowable equipment tolerances and limitations, air-to-air TACAN and ARTCC radar are not recommended for use in maintaining precise formation. Weather, tactical considerations, and mission objectives dictate the degree that electronic emissions are used. When visual conditions permit, minimize radio transmissions; heading and airspeed changes need not be announced.

3.5.11.2. Maintaining proper position requires constant attention and effort, and is essential to an effective formation. Once established in formation, following aircraft should maintain their position with reference to lead and be aware of the position of other formation aircraft. Following aircraft should use the same amount of wind drift correction (crab angle) as lead in order to fly the same ground track. Whenever drift is significant, flying tail-to-nose with the preceding aircraft is not possible. Each aircraft must be crabbed into the wind.

3.5.11.2.1. **Turns.** To maintain position during turns, all aircraft must initiate the turn over the same geographic point. This requires each succeeding aircraft to delay turning a set amount of time after lead has started turning. For example, at 450 Knots True Air Speed (KTAS) the number two aircraft will not begin its turn until approximately 8 seconds after lead, if at 1 mile separation.

3.5.11.2.2. **Airspeed and Altitude.** Closely monitor and control airspeed and altitude throughout formation flight. Power settings and rates of climbs, descents, airspeed increases

and decreases must be prebriefed or announced on interplane frequency to allow formation members to maintain position. Plan the mission to consider the airspeed requirements of the highest or heaviest aircraft, whichever is more restrictive.

3.5.11.2.3. **Power and Heading Corrections.** If the leader and formation aircraft make small power and heading corrections, formation aircraft should never be out of position more than 1/4 mile. Overcorrecting with power and airspeed usually results in even larger deviations. An excellent heading and airspeed tolerance for lead to shoot for is +/- 5 degrees and +/ - 5 KIAS. If lead deviates from these tolerances for a significant time, he or she should notify the formation and correct back immediately.

3.5.11.2.4. **Autopilot Operation.** Use the autopilot to reduce fatigue and aid in altitude separation. Consider placing an aircraft with an inoperative or malfunctioning autopilot in the last position in the formation for extended periods.

3.5.11.3. Monitor the position of all other aircraft and notify any aircraft that is excessively out of position (i.e., inside one-quarter NM or outside three NM). It is possible they are having equipment or performance difficulties.

3.5.12. **Midmission Join-ups.** Use the following generalized procedures for scheduled or unscheduled midmission join-ups.

3.5.12.1. **Join-up.** A midmission join-up should provide a sufficient straight leg beyond the planned rendezvous point to effect join-up.

3.5.12.2. **On Course.** An easy method of join-up is to arrive over a common navigational control point and then depart on a common leg. Lead should cross the rendezvous point, followed by the joining wingmen at approximately 1-minute intervals, depending on groundspeed, and at least 1,000 feet of altitude separation. As each aircraft crosses the rendezvous point, the aircrew may call airspeed, altitude, and heading over UHF interplane frequency, if deemed necessary. Lead will instruct all aircraft to maintain altitude separation and will coordinate airspeed changes as required to establish spacing for radar or visual contact. Once contact is established and verified, lead will clear the wingmen to close to en route formation and effect altitude changes as required. ARTCC radar assistance may be used, if necessary, to provide initial positioning.

3.5.12.3. **Point Parallel.** A second method of effecting midmission join-ups is a point parallel rendezvous as described in applicable air refueling manuals. Aircraft utilizing this procedure will maintain a minimum of 1,000 feet altitude separation between aircraft/formations during the rendezvous.

3.5.13. **Position Changes.** Changes in formation may be required for the purpose of changing lead or moving wingmen with inoperative radar to a position where following aircraft can monitor their position. Prior to executing any position change, lead must ensure all formation members understand the procedures for position changes. Cover position change procedures in the leader's briefing.

3.5.13.1. Altitude is the most critical element during position changes. Make altitude changes only when assured of lateral spacing, or when coordinated on interplane frequency.

3.5.13.2. Accomplish formation position changes only in straight and level flight. Once initiated, they take priority over all other activities. Prior to initiating a position change, lead will ensure sufficient straight and level time and airspace is available to complete the change. Maintain radar or visual contact throughout the position change. If radar and visual contact are lost during a posi-

tion change, maintain altitude, advise lead that contact is lost, and attempt to reestablish contact by all available means. Do not attempt to rejoin the formation until establishing positive radar or visual contact. The last aircraft in formation with operable radar will monitor the position of other aircraft to ensure proper separation.

3.5.13.3. Aircraft that have changed positions will assume the call sign of their new position and formation leadership, if appropriate, when all aircraft are level at their new altitude and established in their new position. All aircraft will acknowledge with their new call sign. The new lead aircraft will use the formation lead call sign for ARTCC communication and assume the current mode 3 squawk for the formation, unless otherwise briefed/directed by the controlling agency.

3.5.13.4. Use the following procedure to effect an aircraft lead or position change with other aircraft during VMC. Prebrief or coordinate on interplane frequency all changes in heading, position, and altitude.

3.5.13.4.1. Wingmen will maintain a minimum 1/2 mile in trail and maintain 500 feet altitude separation. The aircraft to assume the lead will move laterally to the right approximately 1/2 mile. Use 15 degrees of bank to turn 15 degrees from heading then turn back to heading using 15 degrees of bank. The wingman will accelerate and pass lead on the right (Maintain 1/2 mile lateral separation).

3.5.13.4.2. As the wingman passes the leader, the leader will pass the lead to the wingman. The new lead will check the formation in, assume lead responsibilities, and climb or descend to base altitude after positive visual separation is confirmed.

3.5.13.4.3. The new wingman (old lead) will obtain 500 feet altitude separation, place IFF to standby, notify the new lead when approaching position in trail, and confirm altitude. Then the new lead will decelerate to briefed airspeed.

3.5.13.4.4. The wingmen will assume trail or tactical position behind the leader and make a normal closure to proper position.

3.5.13.5. Use the following procedure to effect a position change in IMC conditions. The following procedure is to move any aircraft to lead. However, the procedure can be modified to accomplish a change to the end of the formation. Use the same bank, heading and airspeed changes, but stabilize ¾ NM aft of the last aircraft when moving to the end of the formation, before returning to the trail position.

3.5.13.5.1. Lead determines the maneuvering aircraft. The maneuvering aircraft will echelon (normally right) using 30° of bank and turning 30° from formation heading. When 30° off heading, reverse the turn and return to the formation heading. This should provide an approximate two nautical mile offset.

3.5.13.5.2. After established in echelon, the maneuvering aircraft will accelerate approximately 15 KIAS (airspeed may be increased if required). The maneuvering aircraft should stabilize on formation airspeed at approximately 1¼ NM forward range from the original lead. After stabilizing in the forward echelon position and visual or electronic contact is established, lead will direct an altitude change.

3.5.13.5.3. The maneuvering aircraft will then move into the lead position using no more than a 15° heading change.

3.5.14. **Echelon Formation:**

3.5.14.1. Echelon formation procedures are in the applicable air refueling manuals. Maintain proper echelon spacing and angle using radar and/or visual means. Normally fly echelon formation on lead's right wing.

3.5.14.2. Turns greater than 30 degrees into the echelon are permitted only in an emergency. Turns into an echelon are limited to 15 degrees of bank. All aircraft must execute the turn at the same time, or when time permits, start with the last aircraft, then the next to last aircraft, etc. If turns greater than 30 degrees are necessary for mission requirements, lead should direct all succeeding aircraft to trail formation.

3.5.15. **Radar Failure.** Lead will provide guidance if an aircraft experiences radar failure resulting in difficulty in navigation or maintaining position.

3.5.15.1. During visual conditions, maintain formation position by visual/EVS means and notify the leader if you anticipate instrument conditions.

3.5.15.2. During instrument conditions, maintain position using trailing aircraft radar to assist in spacing. If conditions warrant, make a position change to put the aircraft with radar failure in front of an aircraft with operating radar. Position two is optimum for radar-out aircraft in a three-ship formation.

3.5.15.2.1. If lead experiences radar failure, you may maintain position, but pass responsibility for formation navigation to the number two aircraft.

3.5.15.2.2. Upon notification from a wingman of radar failure, lead should immediately announce formation heading, airspeed, and altitude. Lead will maintain a stable platform on the announced heading, airspeed, and altitude until the situation is under control.

3.5.16. **Complete Radio Failure.** In the event of complete radio failure, maintain position by radar or visual means and attempt to restore radio communications. The emergency radios in the aircraft's survival kits may be used for emergency communications.

3.5.17. **Lost Wingman Procedures.** Use these procedures when visual, radar and radio contact are lost and positive separation can not be assured. In any lost wingman situation, immediate separation of aircraft is essential to maintain safety. Upon losing sight of and radar contact with the leader, or if unable to maintain formation due to disorientation, the wingman will simultaneously execute the applicable lost wingman procedure, transition to instruments, and notify lead. Use a bank angle equal to the number of degrees to turn to achieve separation. Smooth application of control inputs is imperative to minimize the effects of spatial disorientation. Any aircraft, which can maintain visual and/or radar contact with an aircraft executing a lost wingman maneuver, will remain in formation with that aircraft until otherwise directed by the leader. When lead is notified by a lost wingman, lead will take appropriate action, as the situation dictates, until assuring positive separation. Lead will establish a reference heading and altitude after initial separation is assured. During recovery, if the flight has a block altitude clearance, wingmen should establish appropriate altitude separation.

3.5.17.1. **Two-Aircraft Flights:**

3.5.17.1.1. In wings level flight (climbing, descending, or level) simultaneously transition to instruments, inform lead, turn 15 degrees away and maintain new heading for 15 seconds, then resume course. Return to formation or obtain separate clearance if required.

3.5.17.1.2. On the outside of the turn, transition to instruments, roll to wings level, and inform the leader. Continue straight ahead to ensure separation prior to resuming turn. Return to formation if able or obtain separate clearance as required.

3.5.17.1.3. On the inside of the turn, simultaneously transition to instruments and maintain established bank angle, reduce airspeed by 10 KIAS to ensure clearance, and inform lead. Lead will simultaneously roll wings level, maintain airspeed, and acknowledge wingman's call. If lead has acknowledged the lost wingman call and confirms lead aircraft is wings level, the wingman will, after 15 seconds, roll wings level, establish 500 feet altitude separation, turn to lead's referenced heading and attempt to acquire lead on radar. If lead does not acknowledge loss of visual contact, maintain established bank angle, establish 500 feet altitude separation and roll out on new heading. Attempt to acquire lead on radar and form into enroute formation position. If radar contact cannot be reestablished, obtain separate clearance from the controlling agency.

3.5.17.2. **Three-Aircraft Flights.** If only one aircraft in the flight is separated, the procedures listed above will provide safe separation. However, as it is impossible for number three to immediately ascertain if number two still has visual or radar contact with lead, it is imperative that number three's initial action be based on the assumption that number two is also separated. Number two will maintain position if in visual or radar contact. If number two goes lost wingman, follow the procedures outlined above; number three will follow the procedures listed below:

3.5.17.2.1. In wings level flight (climbing, descending, or level) simultaneously transition to instruments, inform lead, turn 30 degrees away, and maintain new heading for 30 seconds, then resume course. Adjust to formation or obtain separate clearance as required.

3.5.17.2.2. On the outside of the turn, simultaneously transition to instruments, inform lead and reverse direction of turn for 15 seconds to ensure separation from lead and number two. Adjust to formation or obtain separate clearance as required.

3.5.17.2.3. On the inside of the turn, simultaneously transition to instruments and maintain established bank angle, reduce airspeed by 20 KIAS to ensure clearance, and inform lead. Lead will simultaneously roll wings level, maintain airspeed and acknowledge the wingman's call. If lead acknowledges the lost wingman call and confirms wings level, establish 1,000 feet altitude separation, turn to lead's referenced heading, and attempt to acquire lead and number two on radar. If lead does not acknowledge loss of visual contact, maintain established bank angle, establish 1,000 feet altitude separation, roll out on new heading, attempt to acquire lead on radar, and form into en route formation position. If radar contact is not reestablished, obtain separate clearance from the controlling agency.

3.5.17.3. **All Aircraft.** At night, after establishing positive separation, all aircraft will display anti-collision and position lights to aid in reestablishing contact, if applicable.

3.5.18. **Low Level Formation.** Weather, tactical considerations, and mission objectives will dictate the degree and type of electronic emission and the extent of radio communications. Sound aircrew judgment is needed at all times to ensure safety is not compromised.

3.5.18.1. **Spacing:**

3.5.18.1.1. **Establish Spacing.** Normally, obtain low level en route spacing, with ARTCC clearance, at high altitude prior to the entry point. The point to obtain spacing should be far

enough from low level entry to ensure normal ARTCC notification and allow aircrews time to stabilize in position. Additionally, this point should be identified at the formation briefing. If not obtained prior to entry, spacing for the low level route may be acquired after all aircraft have entered the route structure by using airspeed differential or "S" turns within the corridor at the aircrew's discretion.

3.5.18.1.2. **En route Spacing.** Maintain low level en route spacing by precise time control at each low level action point. Each unit will develop and maintain, in its local **Chapter 8** to this instruction, action point tolerances and specific procedures to follow if these tolerances are exceeded. In visual conditions, no electronic emissions are required.

3.5.18.1.3. **Degraded Aircraft Performance Spacing.** If any aircraft has degraded performance (gear down, air refueling door open, etc.) to the extent they cannot meet formation time tolerances, but can meet published SMA time tolerances, place that aircraft at the end of the formation before low level entry. There can be no more than one degraded aircraft per low level formation if you anticipate or encounter instrument conditions.

3.5.18.2. **Descent.** Lead will discuss descent procedures, tactics, and airspeeds in the formation brief to ensure deconfliction.

3.5.18.3. **Altitude.** All aircraft should plan to fly the same altitude schedule (TA or MSA/IFR) during low level formation operations. Lead will direct formation to climb to MSA/IFR altitude prior to entering instrument conditions. **NOTE:** Lead will inform all aircraft in the formation of any significant low level weather change prior to descent into the route. If the formation will transition from high altitude visual conditions to low level instrument conditions, all aircraft will ensure a means exists to ensure safe aircraft separation prior to descending. If in instrument conditions, all aircraft will level off and fly MSA/IFR altitudes and maintain briefed timing separation for spacing.

3.5.18.4. **Airspeed.** Control airspeed to ensure meeting low level action points within briefed timing tolerances. Bomb run airspeeds will ensure TOTs and weapons release parameters are met.

3.5.18.5. **Navigation:**

3.5.18.5.1. If visual, maximize EMCON procedures. Each aircraft will fly autonomously and need not be in trail of preceding aircraft. Terrain masking ground track may be different for each aircraft within the formation. Each crew must be constantly aware of the position of all other aircraft in the formation. Maintain appropriate spacing.

3.5.18.5.2. Before flight, lead must brief en route threats, tactical considerations, update points, terrain masking plan, EMCON procedures, and visual or instrument procedures. **NOTE:** If conducting tactical maneuver training during en route navigation, it should take place in all aircraft. Turns of, or in excess of 90 degrees heading change offer the potential for spacing conflicts when lead masks to the outside of a turn point and following aircraft masks to the inside. All aircraft must work from the same tactical scenario. Additionally, all aircraft should maneuver in response to threat signal activity.

3.5.18.6. **Abort Procedures.** Refer to paragraph **3.3.10.** for additional procedures.

3.5.18.6.1. **Individual Aircraft.** If an individual aircraft aborts during low level, immediately notify the formation and follow appropriate procedures. All aircraft in the formation will

place radars and air-to-air TACAN to operate/on. The aborting aircraft will clear the formation and notify them of intentions. Aborting aircraft have priority over all other activity.

3.5.18.6.2. **Aborting as a Formation.** If the entire formation must abort the low level route, follow appropriate procedures. Additionally, all aircraft will immediately establish radio contact while placing appropriate radars and air-to-air TACAN to operate/on. Lead will direct altitude separation, headings, and airspeeds. Establish positive radar and/or visual contact before the formation performs any climbing maneuver other than to establish immediate altitude separation and maintain a safe terrain clearance. Establish abort routing, altitude, and procedures during the formation briefing.

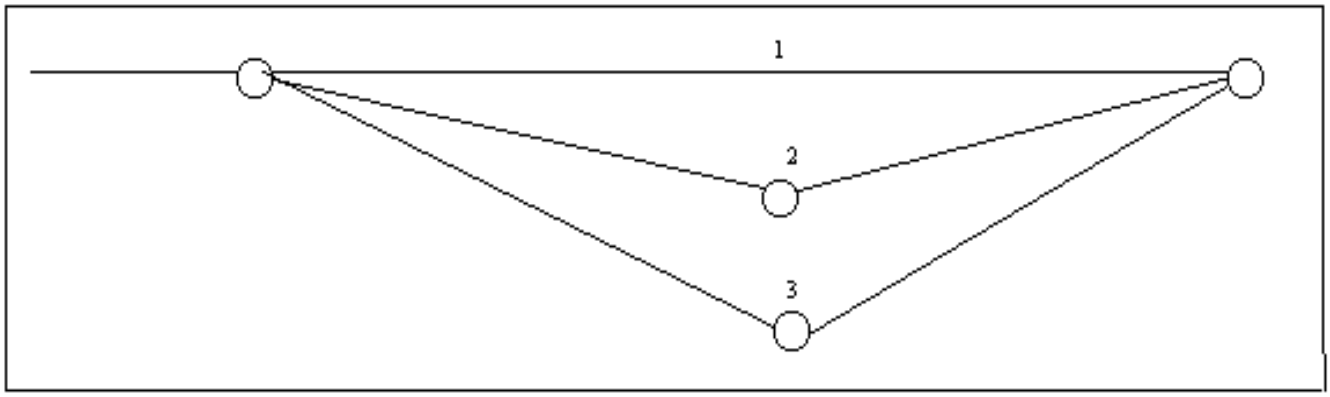
3.5.18.6.3. In instrument conditions, if an aircraft can not assure positive separation from other aircraft or is unable to maintain formation, immediately initiate a climb out of the low level route and follow lost wingman procedures.

3.5.19. **Formation Breakup and Recovery.** Long delays in acquiring separation can result in delays or extensive vectoring during recovery. This becomes critical if fuel is low. Therefore, develop a formation spacing plan during mission planning. Flights must be able to achieve spacing of 5 NM or 1,000 feet vertically, below FL290 (2,000 feet above FL290), before they may expect ARTCC to assume responsibility for aircraft separation. Do not initiate formation separation procedures without ARTCC approval.

3.5.19.1. **Altitude.** Aircraft planning on the same published high altitude penetration may take altitude separation prior to the holding fix, then start the penetration in succession.

3.5.19.2. **Separation Routing.** Aircraft routing may be designed to provide formation spacing. This may be mission planned and filed as routing following the breakup point or be provided as air traffic control vectors. When planning a breakup for filing purposes, a turn between the breakup point and the initial approach (see **Figure 3.1.**) can provide sufficient spacing.

Figure 3.1. Separation Routing.



3.5.19.3. **Differential Airspeed.** Differential airspeed may be used to gain lateral separation during cruise flight and penetration. If differential airspeed is used to gain lateral separation during penetration, all aircraft must allow sufficient time to complete descent and before landing checklists.

3.5.20. **Mixed Formations.** Although standard formation procedures normally apply during mixed formations, give consideration to performance differences between participating aircraft. Lead must

know these differences and thoroughly prebrief all aspects of the formation. Wingmen must ensure all formation members know the performance characteristics of their aircraft.

3.5.20.1. **Launch, Departure and Level Off.** Lead must determine the optimum sequence for launch of mixed aircraft formations based on performance, weather, airfield conditions, wake turbulence, and mission requirements. Normally, the fastest accelerating or highest climb speed aircraft should lead. For formations including KC-10 or E-4s with other lighter aircraft, the lighter aircraft will normally launch first due to wake turbulence considerations. One-minute interval is the standard for formation takeoffs. If weather conditions preclude 1 minute departures, do not accomplish formation takeoffs. Plan an en route or point parallel rendezvous.

3.5.20.2. **Climbs and Descents.** Due to performance differentials, exercise caution if climbs or descents are necessary with mixed formations. Thoroughly brief the procedure before flight.

3.5.20.3. **Cruise:**

3.5.20.3.1. Tradeoffs between optimum altitudes and airspeeds for aircraft type may be required to achieve maximum overall formation efficiency. Leaders will determine and brief the best cruise parameters consistent with mission requirements.

3.5.20.3.2. Wingman consideration is paramount during altitude or airspeed changes. Leaders must consider the most performance limited aircraft when making these changes.

3.6. Postflight:

3.6.1. Before landing, the aircraft commander will call the unit command post and request a combat intelligence branch representative debrief the aircrew immediately after landing whenever encountering hostile or suspected hostile activity during a mission. Air Force Reserve (AFRC) will contact an appropriate agency.

3.6.2. Flight crews will attend the operations and maintenance debriefings and will conduct a crew and formation flight critique in accordance with procedures defined in the local **Chapter 8** of this instruction. Complete applicable logs, forms, and charts and turn them in at this time. Units must establish procedures to ensure this paper work is distributed to the proper agency in a timely manner. Conduct the maintenance debriefing as soon as possible after flight so maintenance actions are not delayed.

3.7. Tactics. Each crew will plan, brief, and execute a realistic and sound tactical profile on every mission-oriented sortie.

Chapter 4

INSTRUMENT PROCEDURES

4.1. Takeoff and Join-up. Formation departures for the B-52 will comply with the applicable restrictions and instructions for a nonstandard formation as defined in FLIP. Flight lead will ensure ARTCC assigns IFF squawks for wingmen prior to departure.

4.2. Navigation. The B-52 is approved to use inertial navigation system (INS) for enroute Area Navigation (RNAV). RNAV approaches have not been adopted for use by the USAF and will not be flown. A discussion of Area Navigation can be found in the Airman Information Manual (AIM) and FLIP. Other navigation and instrument information can be found in FAAH 7110.65.

4.3. Simulated Instrument Flight. Use of vision restricting devices to simulate instrument flight is prohibited.

4.4. Instrument Approaches. See paragraph **2.5.4.1.** for approach review procedures. Refer to T.O. 1B-52H-1 Section II, Instrument Approaches, for applicable approach categories.

4.5. Airborne Radar Directed Approach (ARDA). In an emergency, it is possible for the navigator team to direct the pilot through a safe nonprecision approach. When aircrews request to practice an ARDA, they must meet the following conditions:

4.5.1. Use a Department of Defense (DOD) FLIP terminal approach procedure with a designated FAF. This does not restrict accomplishing an ARDA when cleared for a visual approach from the radar pattern provided VFR conditions can be maintained.

4.5.2. Obtain an ARTCC clearance for the specific approach procedure selected.

4.5.3. Advise the appropriate ARTCC facility that the ARDA will be flown along with the requested DOD FLIP terminal approach, if applicable.

4.5.4. Request ground radar monitor and traffic advisory service.

4.5.5. VMC weather conditions must prevail from the FAF to the MAP. ARDA under lower weather minimums is restricted to emergency conditions when no other type of approach is available.

4.5.6. Terminate the ARDA and resume pilot navigation any time it becomes apparent to any crewmember that the aircraft will exceed the parameters established for terminal instrument procedures (TERPs) as defined in AFJMAN 11-226, *United States Standard for Terminal Instrument Procedures*.

Chapter 5

AIR EXPENDABLES EMPLOYMENT

5.1. General. This chapter establishes procedures for B-52 expendable training activity. Also reference ACCI 11-456 and CJCSM 3212.02.

5.2. Flare Drop Activity:

5.2.1. Conduct live flare drop activity only in authorized special use airspace contained in current FLIP planning documents and overwater firing areas.

5.2.2. Do not drop flares if uncertain of aircraft position. If practical, survey the fallout areas visually and with radar before and during all flare drops.

5.2.3. **Safety Precautions:**

5.2.3.1. Do not power the flare ejector system until within the approved flare drop area.

5.2.3.2. Flare activity will be suspended or terminated whenever the aircrew is unable to sufficiently ensure safe conduct of the activity.

5.2.4. A right hand empty light on the ALE-20 control panel should illuminate when all flare stepper switches have been activated. This occurs when the flares are individually or fast train dispensed. It doesn't guarantee all flares have been expended. Therefore, do not accomplish low approaches or touch-and-go landings after making or attempting a flare drop. Touch-and-gos are authorized after munitions specialists confirm all flares were dispensed (none remaining). Do not attempt a taxi-back sortie with confirmed hung, retained, or misfired flares.

5.2.5. In case of an inadvertent flare drop, take the following actions:

5.2.5.1. Immediately safe the flare ejector system.

5.2.5.2. Record time and geographic coordinates of the inadvertent release.

5.2.5.3. Contact the applicable airspace controller and advise them of the incident, approximate location and estimated damage.

5.2.6. Units will develop local procedures to handle hung/hot flare situations.

Chapter 6

AIR-TO-GROUND WEAPONS EMPLOYMENT

6.1. References. AFI 11-214 contains air-to-surface procedures applicable to all aircraft. AFI 13-212V1, *Weapons Ranges*, applicable range supplement and AFJI 11-204, *Operational Procedures for Aircraft Carrying Hazardous Materials*. The procedures contained in this chapter specify additional procedures or restrictions applicable to B-52 operations.

6.1.1. Direct questions concerning weapon ranges and restrictions to the local OSS/CC or HQ ACC/DOR if unable to find the OPR or responsible agency.

6.2. Responsibilities and Definitions:

6.2.1. On OT&E sorties, specific portions of this chapter may be waived by instructions contained in the operations order, test plan, or implementation message which directs the test.

6.2.2. **Terms:**

6.2.2.1. **Attempted Release.** The bombing system issues a release pulse in either automatic or manual mode with all switches correctly positioned.

6.2.2.2. **Weapon.** Any live, inert, or training munition.

6.2.2.3. **Hung Weapon.** A weapon that doesn't separate from the aircraft after an attempted release. This may occur as a result of a release system or release unit malfunction resulting in a partially released bomb or a released bomb lying on closed bomb bay doors. **NOTE:** This includes weapons released and separation not confirmed or release status unknown.

6.2.2.4. **Retained Weapon.** Weapons on board the aircraft with no release attempt or after successfully releasing the intended number of weapons in a partial load. For example, an aircraft with nine MK-82s plans to drop three bombs on each of three targets. Due to weather it attacks only one target. The aircraft now has six retained weapons. Weapons not released due to procedural errors are considered retained.

6.2.2.5. **Range Control Officer (RCO).** RCO or other range control personnel qualified to issue release clearance, confirm weapon release, or authorize use of jettison/salvo areas.

6.3. Planning Guidance:

6.3.1. Non-nuclear bombs, pods, Air to Ground Missiles (AGMs), or training weapons may be carried on training flights provided that:

6.3.1.1. A target study officer or designated equivalent briefs aircrew on proper procedures prior to any flight carrying weapons.

6.3.1.2. Positive locking devices, when installed, remain locked and sealed for all ground and air operations except as required to conduct scheduled or emergency release.

6.3.1.3. Aircrews comply with applicable flight manuals and aircrew weapons delivery handbooks.

6.3.1.4. Aircraft follow a route to the release area that minimizes overflight of heavily populated and congested areas.

6.3.2. Releases may be performed only within a designated training range, approved weapons release area, or approved salvo area.

6.4. Bombing Profile Mission Changes. The radar navigator/navigator is responsible for ensuring the proper ballistics are loaded for the target and the proper B-XX is input into Format 10 for the target destination.

6.5. Air to Ground Missile (AGM) Procedures. Conduct AGM training in accordance with the following.

6.5.1. **Fuel Transfer.** The copilot is responsible for accomplishing the actual/simulated fuel transfer. The process should be started to allow enough time to complete it before the first actual or simulated missile launch, but not so early as to create an unstable flight condition. All applicable data for the fuel transfer will be determined during mission planning.

6.5.2. **Transfer ALignment (TAL) Maneuver.** Perform the TAL as depicted in the appropriate 30-series technical order. A single turn TAL will suffice to simulate the launch of a missile, but only after every effort has been made to accomplish the depicted TAL maneuver.

6.5.3. **Planned Time of Arrival (PTA) Reference.** Set the planned time of arrival to the first ALCM/ACM launch point in CF-61 PTA Reference time. Since ALCM/ACM launches are control times, always launch missiles with the PTA differentials as close to zero as possible. For MAN SAIR procedures, ensure the PTA reference time has been updated for the selected missile launch point prior to commencing launch procedures.

6.6. Target Data Verification. Conduct a thorough and complete verification of all target data for gravity weapons and missiles on all sorties with weapon events of those types.

6.7. Inflight Procedures:

6.7.1. Do not open bomb bay doors during flight with internal weapons on board other than for intentional release or jettison.

6.7.2. After an unsuccessful release attempt contact the RCO for permission to release or jettison hung weapons in a suitable area. Follow RCO instructions and all warnings and cautions in the appropriate tech order.

6.7.3. If a hung weapon cannot be jettisoned, the crew will accomplish the post release/abort checklist and return directly to home station or other suitable landing base, avoiding overflight of populated areas. Air refueling may be conducted to ensure safe recovery of the aircraft.

6.7.4. While carrying weapons, do not conduct approach to stall, touch-and-go landings, or other potentially hazardous activity. While carrying internal weapons, do not simulate internal weapons release and while carrying external weapons, do not simulate external weapons release. Carrying weapons does not preclude accomplishing fighter intercept exercise, air refueling, transition excluding touch-and-go landings, or AGM-142 training using a Captive Air Training Missile (CATM). Furthermore, it does not preclude accomplishing simulated external weapons or missile runs, with SMO simulations, while in "full sim" with actual weapons carried internally.

6.7.5. Accomplish "Weapons Preparation for Release" check over open water or sparsely populated areas when possible.

6.7.6. Do not complete the release configuration check until the aircraft is within the designated bombing range.

6.7.7. While carrying weapons configured for release (Release Configuration Check-Complete), do not conduct Fighter Intercept Exercises (FIEs) (unless planned as part of an exercise and conducted in range airspace), simulated bomb/AGM runs, transition, air refueling (unless required for mission completion), or other potentially hazardous activity.

6.7.8. Observe the following safety precautions for continued activity with retained training weapons:

6.7.8.1. No weapons will be programmed against any target that is not within an approved training area.

6.7.8.2. Accomplish post release/abort checklist before conducting any subsequent training activity.

6.7.8.3. No release system, indicator, or weapon bay door malfunction may exist.

6.7.9. If release is verified by the RCO and internal light indications are consistent with RCO observations, aircrews may conduct additional training without restriction provided no weapons remain on the aircraft. The RCO must positively confirm the exact number of weapons programmed for release.

6.7.10. If all weapons were loaded externally in positions visible to the aircrew, releases may be visually confirmed by the aircrew in lieu of confirmation by an RCO. Internal light indications must be consistent with visual observation. Do not rely on visual inspections by other aircraft or non-range personnel to clear the aircraft for subsequent training activity.

6.7.11. If RCO confirmation of internal release is not possible, crews must perform a visual bomb bay check prior to conducting any additional training. For release of a single live weapon at night from low altitude, if the RCO is not available to confirm the weapon impact, visual confirmation of weapon detonation by any trailing aircraft in the formation will fulfill the requirements of paragraph **6.7.9.** and **6.7.10.** above. Internal light indications must still be consistent with visual observation. This applies to both internal and external weapons.

6.7.12. Any crewmember entering the bomb bay must be mission and weapons qualified and must avoid inadvertent contact with the release mechanisms.

6.7.13. Crewmembers will not enter the bomb bay to release bombs or to perform maintenance on release equipment.

6.7.14. Crews experiencing retained training weapons due to contingencies other than release malfunctions may conduct training activity excluding simulated bombing or missile activity, simulated engine loss procedures, and touch and go landings.

6.8. Weapons Range Activity Training and Restrictions:

6.8.1. Prior to operating on weapon ranges, all crewmembers will comply with AFI 13-201, *Air Force Air Space Management*, AFI 13-212, and all associated range guides.

6.8.2. Unit staff must ensure aircrews have the most current range information prior to flight. Schedule ranges per the range guide or MASM instructions.

Chapter 7

ADDITIONAL AIRCREW AND AIRCRAFT OPERATIONAL LIMITS AND RESTRICTIONS

7.1. New/Modified Aircraft Equipment/Weapons. Crewmembers not qualified in the operation of new or modified aircraft equipment (e.g. ALCM, Harpoon, AGM-142, etc.) are restricted in aircrew duties as follows:

7.1.1. They will not be placed on alert with an aircraft so equipped or modified.

7.1.2. They will not operate that equipment on any flight unless under the supervision of a current and qualified instructor of like specialty.

7.2. Number of Personnel Authorized Aboard B-52 Aircraft. When the number of crewmembers required aboard a tactical aircraft exceeds the number of basic crew positions in the aircraft, provide each additional crewmember with appropriate safety, communications, and survival equipment.

7.3. Authorized Full Fuel Loads and Sequences. Load aircraft with fuel in accordance with requirements of the T.O. 1B-52H-5*, Basic Weight Checklist and Loading Data*. Fuel usage sequences in the flight manual were designed for use in conjunction with proper fuel loading procedures to realize maximum aircraft service life. Adhere to fuel loads specified in the B-52 technical orders for all peacetime missions. Submit requests for waiver of this policy by joint unit OG/CC and LG/CC message to HQ ACC/DOTV and HQ ACC/LGFB with informational copies to NAF/OV and OCALC/ LAHR. Only HQ ACC/DOTV, in coordination with HQ ACC/LGFB, can authorize deviations to normal fuel loads. (AFRC will submit a waiver to HQ AFRC/DO and an information copy to 10 AF and HQ ACC/DOTV).

7.4. Performance Planning Criteria:

7.4.1. A minimum of 1,000 feet overrun must be available in addition to the minimum runway required (MRR). When 1,000 feet of overrun is not available, reserve a portion of the runway to satisfy the minimum overrun requirements. Runway available for takeoff planning must be actual runway length minus any portion of the runway used to satisfy overrun requirements at the liftoff end of the runway.

7.4.2. As a general rule, normal peacetime performance criteria and the provisions of paragraph **7.4.1.** apply to conventional operations and must be observed in the interest of safety and economy.

7.5. Steep Turns. Limit the maximum target bank angle to 45 degrees (not to exceed 50 degrees). The aircraft must remain clear of clouds throughout the maneuver. This does not restrict combat breakaway maneuvers defined in the flight manual. Do not perform steep turns during traffic pattern operations. For steep turns at or below 5,000 feet AGL/ASL, the following restrictions apply:

7.5.1. Weather must be day VFR.

7.5.2. Maneuver must be accomplished at or above 1,000 feet AGL/ASL with the flaps up. The aircrew will maintain at or above the minimum recommended airspeed or Mach for the planned bank angle throughout the maneuver.

7.6. Unusual Attitudes and Stalls. Prohibited.

7.7. Initial Buffet:

7.7.1. Perform all inflight initial buffet practice as prescribed in the flight manual and under instructor pilot supervision.

7.7.2. Pilots must review and discuss the correct recovery procedures and limitations for accomplishing initial buffet with the crew during mission planning.

7.7.3. Practice recovery from initial buffet at a minimum altitude of 20,000 feet above the terrain. If clouds exist between the aircraft and the terrain, the aircraft must be at least 10,000 feet above the tops of the clouds. Do not practice recovery from initial buffet above FL 300 or at gross weights above 300,000 pounds.

7.7.4. Perform the entire initial buffet maneuver with wings level.

7.7.5. Do not practice initial buffet with weapons or missiles loaded.

7.8. Chase Operations. When B-52 pilots participate in chase operations the following restrictions apply:

7.8.1. Prior to each chase sortie, supervisory personnel will ensure the lead and chase pilots are briefed on the mission content, restrictions, and responsibilities.

7.8.2. The lead and chase aircraft must maintain radio contact throughout the chase operation.

7.8.3. It is unsafe to fly in close vertical proximity to another aircraft due to the interrelated aerodynamic effects. Never fly directly over or under another aircraft. The chase position is defined as:

7.8.3.1. Wings level position - at least 150 feet between wing tips or;

7.8.3.2. Stern position - approximately 1/4 mile behind and 100 feet below lead.

7.8.4. The normal chase position will be on the right wing of lead.

7.8.5. The lead aircraft must inform the chase aircraft and receive acknowledgment prior to initiating any of the following:

7.8.5.1. Turns.

7.8.5.2. Climbs and descents.

7.8.5.3. Airspeed change.

7.8.5.4. Configuration change (e.g. flaps, gear, airbrakes, etc.)

7.9. Fuel Minimums:

7.9.1. The fuel reserve requirements of AFI 11-206 (AFI 11-202V3) apply except as outlined below:

7.9.1.1. Plan missions to accomplish final landing with a minimum of 20,000 pounds.

7.9.1.2. Plan the mission so the usable fuel over the alternate, if required, is a minimum of 24,000 pounds.

7.9.1.3. Fuel reserves for conventional operations will be as designated in the operations order.

7.9.1.4. The minimum fuel reserve for remote or island destination is 34,000 pounds. If weather conditions are such that an alternate airfield is required in accordance with AFI 11-206 (AFI

11-202V3), then minimum fuel reserve is 54,000 pounds. The definition of a remote or island airfield is contained in ACC Supplement 1 to AFI 11-206 (AFI 11-202V3).

7.9.2. Certain safety of flight conditions such as emergencies, go-arounds, etc., may occasionally necessitate final landing with less fuel than specified above.

7.10. Air Refueling Limitations and Restrictions:

7.10.1. Instruction in air refueling procedures, excluding rendezvous, is prohibited when the receiver aircraft is loaded externally or internally with nuclear weapons.

7.10.2. Do not attempt EMCON rendezvous or refueling training unless at least 1,000 feet vertical separation is assured between tanker and receiver. Do not close within 1000 feet vertically of the tanker unless reliable radio communications are established except for actual nuclear operations, critical fuel shortage, as directed in governing operations orders, or during Emission Option 2, 3, or 4 training. Brief Emission Option 2, 3, or 4 procedures before flight.

7.10.3. Do not accomplish air refueling during training missions when any of the following conditions exist:

7.10.3.1. When encountering turbulence which, in the opinion of the pilot or boom operator, denies a safe margin of control of either aircraft or boom.

7.10.3.2. When two or more engines are shut down or when any engine has been shut down due to fire or fire indication .

7.10.3.3. When the tanker has less than all engines operating.

7.10.3.4. When any flight control problems are suspected or encountered which, in the opinion of the receiver pilot, would deny a safe margin of control.

7.10.3.5. When tanker aircraft is unable to retract landing gear.

7.10.3.6. When the aircraft gross weight is less than 230,000 pounds or more than the maximum limits specified in the appropriate flight manual.

7.10.4. Do not conduct air refueling after known losses of tanker disconnect capability (including tanker manual operation without tanker disconnect capability or manual boom latching) except as authorized below:

7.10.4.1. During an emergency fuel situation.

7.10.4.2. When necessary to complete the following missions: operational nuclear or conventional, ORI, Global Guardian, emergency evacuation, deployment, and redeployment.

7.10.4.3. When conducting air refueling under any of the above conditions, limit contact time and number of contacts to that necessary to complete mission requirements.

7.10.5. Reverse air refueling and manual boom latching procedures training must be under instructor pilot supervision. Brief procedures used between receiver pilots and boom operators during mission planning. Inflight coordination between receiver pilot and boom operator must include briefing items as required by applicable air refueling technical orders. Both tanker and receiver air refueling system must be fully operable.

7.10.6. Do not accomplish breakaway training from the contact position or boom limit demonstration unless:

7.10.6.1. The receiver signal system is in normal.

7.10.6.2. The receiver and tanker have assured normal disconnect capability prior to initiating maneuver.

7.10.7. For breakaway training, the tanker pilot and boom operator and the receiver pilot will coordinate the maneuver prior to inflight accomplishment. Inflight coordination must include when the maneuver will occur and who will give the command of execution.

7.10.8. For boom envelope demonstrations, the receiver pilot and the boom operator will confirm normal disconnect capability and discuss the maneuver prior to accomplishment. Inflight coordination must include the receiver pilot informing the boom operator when commencing the demonstration, the limit to be demonstrated, and when terminating the demonstration.

7.10.9. To strengthen the safety aspects of copilot air refueling training the following procedures apply:

7.10.9.1. Accomplish receiver copilot refueling, autopilot on or off, only under the following conditions:

7.10.9.1.1. Instructor pilot supervision or supervision by a mission ready pilot, who has been designated in writing by the squadron commander.

7.10.9.1.2. The receiver pilot must inform and receive acknowledgment from the tanker pilot and boom operator.

7.10.9.2. Accomplish tanker copilot refueling with the tanker autopilot off only under the following conditions:

7.10.9.2.1. The tanker pilot must inform and receive acknowledgment from the receiver pilot.

7.10.9.2.2. During this time the receiver must be flown by a qualified receiver pilot (N/A FTU).

7.11. Low Altitude Limitations. This paragraph establishes operational limitations for mission employment area training activity. The low altitude environment defined by this regulation is at or below 5,000 feet AGL/ASL.

7.11.1. Low altitude weight restriction is 230,000 to 420,000 pounds. These restrictions apply whenever the aircraft is operated at or below 5,000 feet above ground level or during ocean surveillance/ reconnaissance operations at or below 5,000 feet MSL. The minimum low altitude weight restriction does not apply to en route, cruise or traffic pattern operations.

7.11.2. Use of the autopilot nonsteering modes, other than second station, is not recommended for low altitude operations. Do not use nonsteering modes of the autopilot below 1,000 feet AGL except for the stab modes comparison check.

7.11.3. Bank angles during low level or operations below 1,000 feet AGL/ASL are limited to 30 degrees maximum. Use steep turn guidance as applicable for higher altitudes.

7.11.4. Minimum clearance plane settings: 300 feet day and 500 feet night. These are the minimum altitudes authorized under prevailing conditions. Units will plan and train toward these minimum alti-

tudes, but the actual altitude flown may be anywhere between the minimum TA altitude and the MSA. The determining factor will be crew judgment, based on evaluations of aircraft equipment, weather conditions , aircrew capabilities, proficiency, and fatigue.

7.11.4.1. Basic Mission Capable (BMC) individuals must maintain appropriate low level currency or fly with an instructor of like specialty.

7.11.4.2. Crewmembers will fly their first FLAG sorties, during an exercise, no lower than 500' AGL to allow training area familiarization and orientation.

7.11.4.3. Minimum TA altitudes for MTRs in FLIP AP/1B and AP/3 and those altitudes published in the applicable clearance plane letter will take precedence if higher than the above listed altitudes.

7.11.4.4. Aircrews using NVGs will fly the appropriate night clearance plane settings.

7.11.4.5. Fly visual contour during day TA Visual Conditions only. The visual contour altitude will be no lower than the minimum day TA clearance plane setting or the minimum altitude for the route segment/area, whichever is higher. Man-made obstructions must be taken into account when determining the clearance plane and the altitude to be flown.

7.11.4.6. Busy Luggage weapon tests may be conducted at test plan prescribed altitudes but no lower than 200 feet AGL. Non-instructor aircraft commanders and radar navigators will be briefed by squadron instructors on the characteristics of very low altitude flight and will fly at least one practice sortie with highly experienced instructors of like specialty, stepping down to the altitude required for the test.

7.11.4.7. Do not conduct low altitude bomb/EA runs against scoring sites at an altitude below the minimum tracking altitude for any target being attacked unless accomplishing a Defensive Action Bomb Run.

7.11.4.8. Aircrews must be constantly aware of weather conditions. Crews that encounter IMC will immediately climb to MSA. Climb to MSA under visual conditions whenever possible.

7.11.4.9. 79 Test and Evaluation Group (TEG), ANG and AFRC Test Center (AATC), Central Flight Instructor Course (CFIC), and Weapons School will continue to fly low level as required for test or school syllabi sorties, but no lower than 200 feet.

7.12. Traffic Pattern Limitations:

7.12.1. Use the following procedures for all landings.

7.12.1.1. To safely land a large jet aircraft, all landings (IFR and VFR) should look the same. The recommended eye position is level with the bottom of the instrument approach chart holder bracket mounted on the post between the number 2 and 3 windows respectively. Fly a stabilized approach with a standard 2.5 to 3.0 degree glidepath which is compatible with standard ILS/ Visual Approach Slope Indicator (VASI). Use a visual aim point of 1,000 feet down the runway corresponding with the "Fixed Distance Markers" on a precision runway.

7.12.1.2. Plan to land (IFR and VFR) within the designated touchdown zone (TDZ). AFJMAN 11-226, *US Standard for Terminal Instrument Procedures (TERPS),* defines the TDZ as the first 3,000 feet of the landing runway beginning at the threshold.

7.12.1.3. Plan normal landings (IFR and VFR) to touch down on centerline within the TDZ at a point not less than 1,000 feet beyond the threshold. For all landings, use a runway of sufficient width and length to permit a safe, full stop landing without the drag chute. The desired TDZ is 1,200 to 2,500 feet beyond the threshold. Make the actual touchdown at a point and speed which will permit a safe, full stop landing within the remaining runway. Initiate a go-around if this is not possible. Brief procedures to use in the event of an unplanned go-around before landing.

7.12.2. Touch-and-go landings are authorized only under the following conditions:

7.12.2.1. Flight manual restrictions and procedures apply.

7.12.2.2. Use a runway of sufficient width and length to permit a safe, normal full stop landing without the drag chute. Make the actual touchdown in the designated TDZ of the runway at a point and speed which would enable a safe full stop landing on the remaining runway. Initiate a go-around if this is not possible.

7.12.2.3. The Runway Condition Reading (RCR) must be 9 or higher for touch-and-go landings.

7.12.2.4. The flight duty limitations of AFI 11-202V3 (flight duty limitations were formerly contained in AFI 11-401) and MAJCOM supplement apply.

7.12.2.5. Non-IP aircraft commanders are limited to a maximum of 4 degrees crosswind crab.

7.12.2.6. Non-IP aircraft commanders require a minimum 1,000 feet ceiling and 3 miles visibility.

7.12.3. Instructor pilots or aircraft commanders will brief, either inflight or during mission planning, the individual being supervised on the following items prior to supervising touch-and-go landings.

7.12.3.1. Flight manual procedures.

7.12.3.2. The importance of smooth power application and stabilizing power before advancing throttles.

7.12.3.3. Compressor stalls, including proper preventive action, recognition, and corrective action.

7.12.3.4. Emergency jettison of drag chute.

7.12.3.5. Proper use of airbrakes and stabilizer trim.

7.12.3.6. Instructor Pilot (IP) or Aircraft Commander (AC) taking control of aircraft when necessary.

7.12.3.7. Unplanned go-around using all throttles.

7.12.4. Do not practice landings with less than 100 percent flaps, except where noted.

7.12.5. Normally, deploy the drag chute on all full stop landings. Should operational requirements dictate a full stop landing be made without a drag chute, comply with flight manual taxi back limitations.

7.12.6. Do not perform taxi back landings on wet runways.

7.12.7. See **Table 7.1.** for inflight and traffic pattern limitations.

7.13. Emergency Limitations:

7.13.1. Emergencies place unique demands on all crewmembers. Each situation requires proper analysis, correct application of appropriate procedures, preventive action to preclude recurrence or further degradation, and careful assessment of the aircraft and aircrew's capability to continue the mission. The following general guidance provides the aircraft commander a framework for making decisions in response to emergency situations:

7.13.1.1. Maintain aircraft control.

7.13.1.2. Assess the need for emergency egress.

7.13.1.3. Perform required critical actions, assess the degree of degradation, and evaluate the capability to continue the mission.

7.13.1.4. Contact the unit or controlling command post when encountering emergencies. While this should be accomplished as soon as practical, it should not interfere with immediate concerns dictated by the situation (i.e. aircraft control, checklist procedures, and notifying ARTCC agencies). Weigh carefully the impact of continuing the mission versus the capabilities of the aircraft and the aircrew.

7.13.1.5. If aborting the mission, consider the following options:

7.13.1.5.1. Return to the departure base or continue to the destination base via the most direct route.

7.13.1.5.2. Land at the nearest suitable B-52 base.

7.13.1.5.3. Land at the nearest suitable ACC base.

7.13.1.5.4. Land at the nearest possible airfield.

7.13.1.5.5. Only limited training is authorized while returning to the local area or reducing gross weight for landing. Prohibited activities are: low level navigation and bombing, fighter activity, transition, and air refueling (unless required for safe recovery of the aircraft).

7.13.1.6. If continuing the mission, consider the effects on the mission of the following malfunctions:

7.13.1.6.1. Loss of pressurization.

7.13.1.6.2. Loss of mapping radar.

7.13.1.6.3. Loss of navigation capability.

7.13.1.6.4. Degraded instrument capability.

7.13.1.6.5. Weather avoidance capability.

7.13.1.6.6. Potential effect of multiple or compound equipment malfunctions.

7.13.2. Takeoffs with one or more engines inoperative (peacetime) from start of takeoff roll are prohibited. **EXCEPTION:** During emergency evacuation, launch of aircraft with one or more engines inoperative may be accomplished at the discretion of the wing commander or when specifically directed by higher headquarters. At no time will launch be directed when computed takeoff distance exceeds 95 percent of runway available.

7.13.3. If it becomes necessary to shut down two or more engines, or one engine for fire or fire indication, abort the mission.

7.13.4. Refueling is not authorized with two or more engines inoperative or when any engine is shut down due to fire or fire indication, except when fuel is required to safely recover the aircraft.

7.13.5. Compute performance with one or more engines inoperative assuming the loss of another engine.

7.13.6. Aircraft with confirmed or suspected fuel leaks will abort the mission. Remain in the local area or proceed to the departure base or destination base by the most direct route. If circumstances permit, reduce to routine landing weight. Do not allow the center of gravity to exceed safe limitations or attempt any training activity, which would jeopardize safe recovery of the aircraft. Contact ACC controlling agencies for assistance.

7.14. Fuel Quantity Indication System Failure. During peacetime mission, each fuel quantity indicator for each fuel tank must be fully operational. If a fuel quantity indicating system failure is discovered prior to flight, the following exceptions apply:

7.14.1. When a standard fuel load results in one or more empty tanks, the respective fuel quantity indicator for the empty tank need not be fully operational provided:

7.14.1.1. The tank will remain empty throughout the flight, including inflight refueling.

7.14.1.2. The fuel quantity gauge indicates zero.

7.14.1.3. The circuit breaker for the respective indicator is pulled and a safety clip installed to prevent inadvertent resetting.

7.14.2. Aircraft may be flown with either one external or one outboard, but not more than one, wing tank gauge inoperative or malfunctioning, provided the following procedures are adhered to:

7.14.2.1. The aircraft is loaded with a standard fuel load.

7.14.2.2. The circuit breaker for the inoperative or malfunctioning gauge is pulled and a safety clip installed to prevent inadvertent resetting. In this situation, the pilots must realize that regardless of the gauge indication, the total fuel quantity indicator will be receiving indications that the tank is empty. Therefore, there will be a discrepancy between the total fuel quantity indication and the actual amount of fuel on board.

7.14.2.3. The fuel flow indicator for that tank is fully operational.

7.14.2.4. Pilots must be particularly watchful when using fuel from a tank having an inoperative or malfunctioning fuel gauge since the only indication of fuel flow will be the fuel flow indicator light, lateral trim indications, and balance of fuel between main tanks one and four. The Fuel Quantity Indicating System (FQIS) sends a voltage to the total fuel quantity gauge rather than a restrictive value. When the circuit breaker is pulled, the indication to the total fuel quantity indicator from that gauge will be zero.

7.15. Aircrew and Aircraft Limitations:

7.15.1. Brief all practice MCM 3-1V19 (AFTTP 3-1V19) maneuvers or emergency procedures before the maneuver (either inflight or during mission planning). The pilot should alert all crewmembers prior to all maneuver demonstrations or inflight emergency procedures practice.

7.15.2. Do not practice compound emergencies during critical phases of flight except those specifically authorized for CFIC training.

7.15.3. In an actual emergency, terminate all training and emergency procedures practice. Resume training only when the pilot in command determines no hazard to safe aircraft operations exists.

7.15.4. Seat occupancy guidance:

7.15.4.1. During AFTTP 3-1V19, maneuvers and during emergencies, crewmembers will return to their respective crew positions and remain there unless operational requirements or the nature of the emergency dictate otherwise.

7.15.4.2. When carrying nuclear weapons, mission ready crewmembers or instructors must occupy basic crew positions.

7.15.5. RCR for typhoon or emergency evacuations. With NAF approval, an RCR of 12 may be used for wet runway takeoff data computations during typhoon or emergency evacuations.

Table 7.1. Inflight and Landing Limitations.

Maneuver	Max Wt	Weather	IP Supervision	Additional Restrictions	Remarks
Simulated Engine Loss on Takeoff	290,000 lbs	*NOTE 1*	Required	N/A	Limited to one engine simulated inoperative above S-1 speed or 100 KIAS, whichever is higher. Dry runway. Max 10 kt crosswind component.
Simulated Six Engine Approach	290,000 lbs	*NOTE 1*	Required for other than day VFR	*NOTE 2*	
Simulated Six Engine Landing	290,000 lbs	*NOTE 1*	Required	*NOTE 3*	Dry runway. Max 10 kt crosswind component.
Simulated Six Engine Approach and Go-Around (Symmetric)	250,000 lbs	*NOTE 1*	Required for other than day VFR	*NOTE 2*	
Flaps Up Approach	290,000 lbs	*NOTE 1*	Required for other than day VFR	*NOTE 2 & 5*	Landing data and procedures must be reviewed by an instructor pilot during mission planning (N/A AFRC).
Flaps Up Touch-and-go Landings	250,000 lbs	*NOTE 1*	Required	*NOTE 4 & 5*	Combat Flight Instructor Course (CFIC) only
Low Approaches with One Engine Shut Down	290,000 lbs	*NOTE 1*	Required for other than day VFR	*NOTE 2*	Prohibited if engine(s) was shut down for fire, fire indication, or fuel leak.
Traffic Pattern Operations	325,000 lbs				

Maneuver	Max Wt	Weather	IP Supervision	Additional Restrictions	Remarks
Landing Attitude Demonstration	290,000 lbs	Day/Night *NOTE 6*	Required		Flaps down, touch-and-go limitations apply

Notes:

1. Day/Night. No lower than circling minimums or 1,000 feet ceiling and 3 miles visibility (2 miles if under radar contact), whichever is higher.

2. 200 feet Height Above Touchdown (HAT) or Decision Height (DH)/Minimum Descent Altitude (MDA) for the approach being flown, whichever is higher.

3. Comply with the following if a touch-and-go is to be accomplished: Touch-and-go limitations apply. No other simulated emergencies may be practiced during the maneuver. Rudder trim must be centered when decision is made to land. Eight engine symmetrical thrust must be used for takeoff. If unplanned go-around is executed, symmetrical thrust will be established on all engines.

4. Dry runway crosswind component is 10 knots maximum. Touchdown must be made in the first third of the runway or go-around will be initiated.

5. 200 feet AGL to make decision to land or go-around.

6. Discernible horizon and the end of the runway visible.

Chapter 8

LOCAL OPERATING PROCEDURES

8.1. General. Distribute this chapter to MAJCOM/NAF OPRs, as applicable. This chapter should not duplicate and will not be less restrictive than the provisions of this or any other publication. Specific items should include, but need not be limited to, the following:

8.1.1. Purpose.

8.1.2. Applicability.

8.1.3. Recommended Changes.

8.1.4. Normal Operating Procedures.

8.1.5. Instrument Procedures.

8.1.6. Weapons Employment.

8.1.7. NVG Procedures.

8.1.8. Abnormal Operating Procedures.

8.1.9. Classified Local Electronic Warfare Mission Guide.

8.2. Form Prescribed. AF Form 4037, **OAS Briefing/Debriefing Analysis and Review**.

MARVIN R. ESMOND, Lt General, USAF
DCS, Air and Space Operations

Attachment 1

GLOSSARY OF SUPPORTING INFORMATION

Abbreviations and Acronyms

A/A—Air to Air

AC—Aircraft Commander

ACC—Air Combat Command

ACCMAN—Air Combat Command Manual

ACCR—Air Combat Command Regulation

ADI—Attitude Director Indicator

AFI—Air Force Instruction

AFR—Air Force Regulation

AFRC—Air Force Reserve Command

AFTO—Air Force Technical Order

AFSATCOM—Air Force Satellite Communications

AGL—Above Ground Level

AGM—Air to Ground Missile

AHRS—Attitude Heading Reference System

AIRMET—Airman's Meteorological Information

ALCM—Air Launched Cruise Missile

ALTRV—Altitude Reservation

AR—Air Refueling

ARCP—Air Refueling Control Point

ARCT—Air Refueling Control Time

ARDA—Airborne Radar Directed Approach

ARTCC—Air Route Traffic Control Center

ASL—Above Sea Level

BMC—Basic Mission Capable

BRL—Bomb Release Line

CATM—Captive Air Training Missile

CFIC—Central Flight Instructor Course

CHUM—Chart Update Manual

DCPPI—Displaced Center Plan Position Indicator

DH—Decision Height

DOD—Department of Defense

DTUC—Data Transfer Unit Cartridge

EA—Electronic Attack

EAM—Emergency Action Message

EC—Electronic Combat

EMA—End Maneuver Area

EMCON—Emissions Control

EVS—Electro-Optical Viewing System

EW—Electronic Warfare Officer

FAAH—Federal Aviation Administration Handbook

FAF—Final Approach Fix

FAR—Federal Aviation Regulation

FIE—Fighter Intercept Exercise

FL—Flight Level

FLIP—Flight Information Publications

FLIR—Forward Looking Infrared

FQIS—Fuel Quantity Indicating System

FRL—Fuselage Reference Line

FSS—Flight Service Station

FTU—Formal Training Unit

FVR—Flight Vector Reference

HA—Absolute Altitude

HAT—Height Above Touchdown

HHD—Higher Headquarters Directed

HF—High Frequency

IAF—Initial Approach Fix

IAW—In Accordance With

ICAO—International Civil Aviation Organization

ID—Identification

IFF—Identification Friend or Foe

IFR—Instrument Flight Rules

ILS—Instrument Landing System

IMC—Instrument Meteorological Conditions

INS—Inertial Navigation System

IP—Initial Point or Instructor Pilot

IR—IFR Military Training Route

KIAS—Knots Indicated Airspeed

KTAS—Knots True Airspeed

MAC—Mean Aerodynamic Chord

MAJCOM—Major Command

MAP—Missed Approach Point

MARSA—Military Assumes Responsibility for Separation of Aircraft

MDA—Minimum Descent Altitude

MFD—Multi-Functional Display

MITO—Minimum Interval Takeoff

MOAs—Military Operating Areas

MRR—Minimum Runway Required

MSA—Minimum Safe Altitude

MSL—Mean Sea Level

N/A—Not applicable

NAF—Numbered Air Force

NM—Nautical Miles

NVG—Night Vision Goggles

OAS—Offensive Avionics System

ONC—Operational Navigation Charts

OT&E—Operational Test and Evaluation

OG/CC—Operations Group Commander

OPR—Office of Primary Responsibility

ORI—Operational Readiness Inspection

PAR—Precision Approach Radar

PECP—Primary Entry Control Point

PIREP—Pilot Report (Weather)

PMSV—Pilot to Metro Service

PPI—Plan Position Indicator

PTA—Planned Time of Arrival

PTAIP—Primary Terrain Avoidance Initiation Point

RAPCON—Radar Approach Control

RCO—Range Control Officer

RCR—Runway Condition Reading

SIF—Selective Identification Feature

SIGMET—Significant Meteorological Information

SIOP—Single Integrated Operational Plan

SMA—Start Maneuver Area

SOF—Supervisor of Flying

SPINS—Special Instructions

STV—Steerable Television

TA—Terrain Avoidance

TACAN—Tactical Air Navigation system

TAL—Transfer ALignment

TDZ—Touchdown Zone

TERPs—Terminal Instrument Procedures

TOT—Time over Target

TSO—Target Study Officer

TDY—Temporary Duty

UHF—Ultra High Frequency

VASI—Visual Approach Slope Indicator

VFR—Visual Flight Rule

VHF—Very High Frequency

VMC—Visual Meteorological Conditions (5BW)

VR—VFR Military Training Route

Terms

Alternate Entry Control Point (Alternate Entry Fix)—The route point(s) upon which a control time for an alternate entry into the route is based.

Climbout Track—A track on a bomber IR, normally associated with the TA Termination point. Permits a climbing departure to the Exit Fix.

End Maneuver Area (EMA)—A control point terminating the bomb run area.

Entry Control Time—The scheduled time over the Primary/Alternate Entry Control Point.

Entry Track—A track, usually associated with a bomber IR and beginning at the Primary or alternate Entry Point, along which descent is made to the low altitude portion of the route.

Low Altitude Navigation Leg—The route segments of a bomber IR between the TA Initiation Point and TA Termination Point. For non-bomber IRs, the low altitude navigation leg is that portion of the route designed primarily for low altitude flight; does not include segments intended for descent into and climbout from the route.

Man-Made Obstructions—Structures which present a hazard to flight. Structure height is measured from the groundbase.

MASMS—Military Airspace Management System. The term MASMS in this instruction refers to Detachment 1, HQ ACC/DOR, the Military Airspace Management System Office at Offutt AFB, NE.

MASMS IR Route—A route scheduled through Det 1, HQ ACC/DOSR using the MASMS scheduling system.

Mission Employment Area—Areas used to conduct training in weapons employment, tactics, low altitude navigation, threat avoidance, intercepts, and other areas directly related to B-52 employment. These areas include, but are not limited to, IR and VR routes, MOAs, ranges, and Restricted/Warning Areas.

Non-MASMS IR Route—A route in which scheduling activity in AP/1B is other than Det 1, HQ ACC/DOSR.

Primary /Alternate Exit Point—The final waypoint published in FLIP for the primary or alternate exit route. For bomber IRs, the final point on the climbout track. For other routes, may coincide with the final TA Termination Point.

Primary/Alternate TA Initiation Point (Initial/Start TA)—The waypoint at which aircrew are authorized to begin TA operations.

Primary/Alternate TA Termination Point (Final/End TA)—The point which denotes the end of TA operations.

Primary Entry Control Point (PECP)—Referred to as the Entry Fix. The route point upon which a control time for route entry is based.

Reentry Track—A track, commencing at the end of a Maneuver Area, on which low altitude re-entry to the route can be achieved to execute additional bomb/ECM/AGM runs.

Route Width (Route Perimeter)—The route boundary limits within which aircraft are restricted to conduct operations.

Start Maneuver Area (SMA)—The point that defines the start of the bomb run area. Timing control must be within applicable tolerances.

Squadron Top—3--Squadron ADO, DO, CC.

Terrain Avoidance (TA)—Method of maintaining ground clearance by Terrain Trace, EVS, or Radarscope Interpretation as close the terrain as equipment, command directives, and crew judgment allow.

TA Visual Conditions—Weather conditions that permit aircraft operations clear of clouds, provide the pilots visual contact with the ground, and three miles forward visibility.

Visual Contour Flight—Operation at a predetermined altitude above the ground, following contours visually using the FLIR/STV with radar altimeter crosscheck. An operating radar altimeter is required.

Attachment 2

BRIEFING GUIDES
NORMAL BRIEFING GUIDE

A2.1. NOTE:
Ensure the majority of time is used for discussion of tactics, complicated mission segments/special activities, and other new or important items. If regular briefing items have already been discussed during mission planning or are standard, specialty checklist items, they may be reviewed briefly or omitted as appropriate.

A2.2. Roll call (crew number), security classification.

A2.3. Review of weather planning factors.

A2.4. Mission data and duration, takeoff and landing times. (Mission itinerary)

A2.5. Aircraft identification (call sign and tail number).

A2.6. Aircraft status, weapons load, takeoff gross weight, fuel loaded, weapons load, and Electronic Counter Measures (ECM) configuration.

A2.7. Start engine and taxi procedures.

A2.8. Planned takeoff performance.

A2.8.1. % MAC.

A2.8.2. MRR.

A2.8.3. S1 speed.

A2.8.4. S1 time.

A2.8.5. Takeoff distance.

A2.8.6. Takeoff speed.

A2.9. Training requirements in order of accomplishment:

A2.9.1. Departure (radar directed or standard instrument departure).

A2.9.1.1. Danger and prohibited areas.

A2.9.1.2. Air Defense Identification Zone (ADIZ) penetration points.

A2.9.1.3. Highest terrain en route and highest obstructions on low level routes.

A2.9.1.4. Altitudes.

A2.9.1.5. Air refueling area, entry/exit times, altitudes, rendezvous procedures, fuel transfer, and emergency breakaway procedures, and planned EMCON option.

A2.9.1.6. Control points and times to include ARCT, ARCP, pre-IP, IP, bomb release, missile launch, high and low level navigation entry and exit points/times as applicable.

A2.9.1.7. Targets and methods of bombing. Review weapon release parameters/special restrictions, (visual cues, speed, altitude, timing tolerances, emergency release methods, etc.) and visual cues.

A2.9.1.8. TA activity.

A2.9.1.8.1. Low level chart and flight plan compatibility.

A2.9.1.8.2. Procedures for descent to IFR and TA altitudes.

A2.9.1.8.3. Significant terrain on each leg emphasizing available terrain masking and probable ridge crossovers.

A2.9.1.9. Tactics. Discuss en route/target area threats and appropriate crew coordination/maneuvers.

A2.9.1.10. AGM activity.

A2.9.2. For formation flights, coordinate with other formation flight crews all formation action points, altitudes and control times, and communication plans.

A2.9.3. EA activity to include tactics and expendable exercises as applicable.

A2.9.4. Pilot proficiency activity and requirements.

A2.9.5. Fighter intercept activity and procedures.

A2.10. Communications to include UHF/VHF, SATCOM (voice and data) and HF:

A2.10.1. Launch communications procedures.

A2.10.2. Air refueling procedures and frequencies.

A2.10.3. Range procedures and frequencies.

A2.10.4. IFF/SIF procedures.

A2.10.5. Special communications monitoring and reporting.

A2.10.6. Peacetime recall procedures.

A2.11. Air traffic control procedures.

A2.12. Fuel reserve at destination and planned alternate.

A2.13. Flight Information Publications review (planned recovery and alternate bases):

A2.13.1. General Planning as applicable to mission requirements.

A2.13.2. En route supplement for field facilities, radio navigation aids, and other pertinent information.

A2.13.3. Review and brief (as required) procedures and crew coordination techniques required for identifying runway environment and transition from instrument to visual landing cues.

A2.13.4. Terminal Instrument Approach Procedures Charts (high or low altitude) reviewed for approach procedures, weather minimums, emergency and minimum safe altitudes, approach lighting, DH/MDA, and published missed approach procedures.

A2.13.5. Foreign Clearance Guide:

A2.13.5.1. Passport requirements.

A2.13.5.2. Clothing requirements.

A2.13.5.3. Other requirements.

A2.13.6. Customs requirements.

A2.14. Alternate mission plan in the event of inflight malfunctions or inclement weather preventing accomplishment of scheduled requirement including a detailed review of the planned alternate low level activity.

A2.15. Aerodrome restrictions and hazards to ground operation.

A2.16. Safety of flight items, aircraft restrictions for activity scheduled (e.g. ordnance recovery procedures).

A2.17. Emergency procedures review.

A2.18. Flight manual publications, currency, mission preparation and briefing requirements.

A2.19. Qualification and currency of crewmembers, and FCIF status.

A2.20. (Not Used)

A2.21. Training mission folder items in accordance with ACCI 10-450, Vol 2.

A2.22. Crew rest starts _____.

Crew assembly time _____.

A2.23. Specialized briefings as required (MITO, formation, tactics, air refueling, etc.)

A2.24. Formation/MITO Briefing Guide. This minimum briefing guide is provided as an example to stress mission events and objectives rather than reinforce technical order procedures. A standardized briefing format is especially important when flying with other units. Brief only actions required to meet mission and EMCON objectives. If regular briefing items have already been discussed during mission planning or are standard, specialty checklist items, they may be reviewed briefly or omitted as appropriate.

A2.24.1. **Roll Call/Time Hack:**

A2.24.1.1. Mission commander's mission objective overview

A2.24.1.2. Formation/Aircraft commander

A2.24.1.3. Call sign

A2.24.1.4. Aircraft number

A2.24.1.5. Parking locations

A2.24.1.6. Time hack

A2.24.2. **Weather:**

A2.24.2.1. Takeoff

A2.24.2.2. En route

A2.24.2.3. Air refueling

A2.24.2.4. Low level

A2.24.2.5. Destinations

A2.24.2.6. Alternates

A2.24.3. **Mission Overview**

A2.24.3.1. Takeoff time

A2.24.3.2. ARCT

A2.24.3.3. TOT

A2.24.3.4. PECP

A2.24.3.5. Weapons employment

A2.24.3.6. Tactical considerations

A2.24.3.7. FIE

A2.24.3.8. TCM

A2.24.3.9. Landing

A2.24.4. **Communications/EMCON Plan**

A2.24.4.1. **Ground Operations**

A2.24.4.1.1. EMCON plan or allowable emitters

A2.24.4.1.2. Radio check-in times

A2.24.4.1.3. Authentication/launch

A2.24.4.1.4. DELETED

A2.24.4.1.5. ARTCC clearances

A2.24.4.2. **Takeoff**

A2.24.4.2.1. EMCON plan or allowable emitters

A2.24.4.2.2. Interplane frequency

A2.24.4.2.3. Airborne calls

A2.24.4.3. **En route**

A2.24.4.3.1. EMCON plan or allowable emitters

A2.24.4.3.2. Lost wingman

A2.24.4.3.3. Weather Update

A2.24.4.3.4. Comm log requirements

A2.24.4.3.5. AFSATCOM/HF

A2.24.4.4. **Air Refueling**

A2.24.4.4.1. EMCON plan or allowable emitters

A2.24.4.4.2. Radio frequencies

A2.24.4.4.3. A/A TACAN channel

A2.24.4.4.4. APN-69 procedures

A2.24.4.4.5. HF

A2.24.4.5. **Low Level**

A2.24.4.5.1. EMCON plan or allowable emitters

A2.24.4.5.2. FSS

A2.24.4.5.3. ARTCC clearances

A2.24.4.5.4. AFSATCOM procedures

A2.24.4.5.5. ECR

A2.24.4.5.6. Special frequencies

A2.25. Taxi

A2.25.1. Engine start time

A2.25.2. Taxi time

A2.25.3. Sequence (including spare)

A2.25.4. Performance data

A2.25.5. Takeoff clearance

A2.26. Takeoff

A2.26.1. Interval

A2.26.2. Abort

A2.26.3. Emergencies

A2.27. Departure (Visual vs. Instrument)

A2.27.1. Airspeeds

A2.27.2. Routing

A2.27.3. Climb rates or power settings

A2.27.4. Intermediate level offs

A2.27.5. Turns and bank angles

A2.27.6. Visual cutoff

A2.28. Level Off

A2.28.1. Join-up

A2.28.2. Altitude block

A2.28.3. Airspeed (indicated/true/mach)

A2.28.4. Minimum maneuvering airspeed

A2.29. En Route (Visual vs. Instrument)

A2.29.1. Airspeed changes or mission timing

A2.29.2. Turns and bank angles

A2.29.3. Climb and descent rates

A2.29.4. Position changes

A2.30. Air Refueling

A2.30.1. Call signs

A2.30.2. Onloads and sequence

A2.30.3. Base altitude

A2.30.4. Track

A2.30.5. Type rendezvous

A2.30.6. AR formation

A2.30.7. AR airspeeds

A2.30.8. Bingo fuel

A2.30.9. Abort bases

A2.30.10. End Air Refueling request

A2.30.11. Breakup

A2.31. Weapons Employment

A2.31.1. **High Level**

A2.31.1.1. Targets

A2.31.1.2. TOT

A2.31.1.3. Altitude, airspeed, and separation

A2.31.1.4. Emergency bombing procedures

A2.31.2. **Low Level** (Visual vs. Instrument)

A2.31.2.1. Descent

A2.31.2.2. Formation/separation

A2.31.2.3. Abort procedures

A2.31.2.4. Targets

A2.31.2.5. TOT

A2.31.2.6. Climb out

A2.31.2.7. Rejoin

A2.31.3. **Tactical Considerations**

A2.31.3.1. Expected actual/simulated threats

A2.31.3.2. Tactical plan

A2.31.3.3. Maneuvers

A2.31.3.4. Countermeasures

A2.31.3.5. Expendables

A2.31.3.6. Comm/notification requirements

A2.32. Recovery

A2.32.1. Formation breakup procedures

A2.32.2. Penetration sequence/airspeeds

A2.33. Special Subjects

A2.33.1. Wake turbulence avoidance

A2.34. Formation Debrief

Attachment 3

STRANGE FIELD FAMILIARIZATION

A3.1. Procedures for Flights Into Strange Airfields. The following procedures aid crewmembers in their preparation for flights into strange airfields. This outline is a guide and crewmembers should review only the information that is appropriate to their mission (for example, load bearing capacity need not be reviewed for flights into airfields with similar aircraft).

A3.1.1. During mission planning, crews should review the following information for each base of intended landing:

A3.1.1.1. **FLIP En route Supplement:**

A3.1.1.1.1. Traffic pattern/special practices.

A3.1.1.1.2. Navaids maintenance periods.

A3.1.1.1.3. Facilities/services available.

A3.1.1.1.4. Load bearing capacity.

A3.1.1.2. **FLIP Planning Documents:**

A3.1.1.2.1. Special notices.

A3.1.1.2.2. Preferred routing.

A3.1.1.2.3. Terminal Control Areas.

A3.1.1.2.4. International Civil Aviation Organization (ICAO) information.

A3.1.1.3. **Approach Plates:**

A3.1.1.3.1. Airfield layout/obstacles/runway length and width.

A3.1.1.3.2. Final approach runway alignment.

A3.1.1.3.3. Airfield lighting.

A3.1.1.3.4. Navigation chart (review for local terrain features and ARDA considerations).

A3.1.2. Before departure from each base, crews may use the following guide as a means of reviewing the arrival/approach procedures for the next intended landing base:

A3.1.2.1. **Departure:**

A3.1.2.1.1. Obstacles.

A3.1.2.1.2. Rate of climb required.

A3.1.2.1.3. Emergency/minimum safe altitudes.

A3.1.2.1.4. Routing/navaids/altitude restrictions.

A3.1.2.2. **En route Descent:**

A3.1.2.2.1. Start descent point.

A3.1.2.2.2. Rate of descent required.

A3.1.2.2.3. Transition altitude.

A3.1.2.2.4. Terminal fix (IAF, FAF, Procedures turn fix, PAR, etc.).

A3.1.2.2.5. Lost communications procedures.

A3.1.2.2.6. Emergency/minimum safe, sector altitudes.

A3.1.2.3. **Published Penetration:**

A3.1.2.3.1. IAF/holding fix.

A3.1.2.3.2. Initial rate of descent required.

A3.1.2.3.3. Transition altitude.

A3.1.2.3.4. Altitude restrictions.

A3.1.2.3.5. Emergency/minimum safe altitudes.

A3.1.2.3.6. Final approach fix.

A3.1.2.3.7. Lost communications procedures.

A3.1.2.4. **Final Approach--Published or Radar:**

A3.1.2.4.1. Rate of descent.

A3.1.2.4.2. Timing.

A3.1.2.4.3. Weather minimums/MDA/DH.

A3.1.2.4.4. Missed approach procedures.

A3.1.2.4.5. Lost communications procedures.

A3.1.2.4.6. Transition to landing/runway environment.

Attachment 4

DATA TRANSFER UNIT CARTRIDGE IDENTIFICATION AND HANDLING PROCEDURES

The following procedures apply for the use of Data Transfer Unit Cartridges (DTUCs).

A4.1. Identification of Classified DTUCs. Mark the DTUC in plain English language with the following:

A4.1.1. Security classification in the color codes:

A4.1.1.1. DELETED

A4.1.1.2. TOP SECRET Orange

A4.1.1.3. SECRET Red

A4.1.1.4. CONFIDENTIAL Blue

A4.1.1.5. UNCLASSIFIED Green

A4.1.2. Review/declassification instructions.

A4.1.3. Control number.

A4.1.4. Creation date.

A4.1.5. Sortie IDs (Full 28 character ID for SIOP sorties and any variation of the 28 characters available from training missions).

A4.2. Identification of Unclassified DTUCs. Mark the DTUC in plain English language with the following:

A4.2.1. White color coded unclassified marking (New unclassified DTUCs to be used as flight data recorders and will record classified data in the course of the mission may be marked with the appropriate classification level before issuing to crews).

A4.2.2. Control number.

A4.2.3. Creation date.

A4.2.4. Sortie ID(s).

A4.3. (Does not apply to AFRC) Aircraft DTUC Loading:

A4.3.1. DTUC loading and verification must be accomplished by personnel with appropriate security clearance (see appropriate security directive).

A4.3.2. DTUC loading must be accomplished in accordance with the applicable technical order.

A4.3.3. DTUC loading and verification process. Ensure no classified data is displayed on any of the Multi-functional Displays (MFDs) when unauthorized individuals (i.e., crew chiefs, other maintenance personnel) are present in the cockpit and could possibly view the data if displayed.

A4.3.4. Upon completion of DTUC loading, make an entry in section C, AFTO Form 781, identifying the classification level of the data loaded.

A4.4. Aircraft Computer Downloading. Erase classified mission data from the aircraft computer when the mission/alert period is terminated. Make an annotation in the respective AFTO Form 781, section C, that the classified data has been removed. Remove DTUCs from the aircraft.

A4.5. OAS Classified Data. Erasure of OAS classified data is not required for normal training or ORI missions, if landing at a USAF base. In cases of weather diverts, emergencies, air shows, etc., aircrews will ensure compliance with DOD 5200.1R/AFR 205-1 regarding safeguarding of classified equipment on aircraft. Follow special instructions that direct classified data erasure on specified HHD missions.

Attachment 5

IC 99-1 TO AFI 11-2B-52 VOLUME 3, B-52--OPERATIONS PROCEDURES

20 AUGUST 1999

SUMMARY OF REVISIONS

This change incorporates interim change (IC) 99-1. It authorizes visual formation, deletes redundant low level paragraphs, removes NVG minimum acuity guidance, deletes MITO training guidance, and modifies bomb release verification guidance. See the last attachment of the publication, IC 99-1, for the complete IC. A bar (|) indicates revisions from the previous edition.

3.1.4. Visual Formation. Visual formation during air refueling is authorized IAW T.O. 1-1C-1-15.

3.3.2.3. DELETED.

3.3.4.7.1. DELETED.

3.4.5. Each crewmember whose duties require the use of NVGs will adjust and calibrate their respective NVG device on an approved NVG calibration lane or NVG tester prior to use.

3.5.6. Formation Takeoff. Takeoff interval is no less than 30 seconds for conventional and nuclear operations. The receivers usually roll first, followed by the tankers in that element. Takeoff intervals or sequence may be varied as necessary depending on aircraft acceleration and performance, training requirements, weather, airfield conditions, and mission requirements. Make an abort call anytime the takeoff is aborted.

3.5.6.1. Do not conduct Quick Taxi/SIOP Departure Exercises as defined in AFI 11-2B-52 Vol. 1, *Training*, with nuclear weapons loaded aboard the aircraft and/or in excess of aircraft gross weights of 450,000 pounds.

3.5.6.2. Quick Taxi/SIOP Departure Taxi Procedures. Units will establish taxi plans from the normal parking area to each runway. Follow the taxi sequence, established in the briefing, to ensure proper launch sequence. Lead will confirm takeoff data computations, accomplish guard receiver check, and copy ARTCC clearance in the chocks. When possible, crews should start engines, taxi, and launch without interruption. If for any reason takeoff clearance is canceled after the aircraft are rolling, the formation should stop on predetermined points (normally 1/4 to 3/4 mile from the end of the runway). Following aircraft will set or adjust power as necessary to maintain proper spacing and a safe speed during taxi and alignment for takeoff roll.

3.5.7. Formation Aborts (nuclear and conventional).

3.5.7.1. Whenever a pilot makes a decision to abort the takeoff, the pilot not flying will, simultaneously with initiating abort procedures, call aircraft type, airspeed, and the word "abort" three times on the ARTCC frequency. (*EXAMPLE:* "Bomber 80 knots abort, bomber 80 knots abort, bomber 80 knots abort.")

3.5.7.1.1. DELETED. .

3.5.7.1.2. DELETED.

3.5.7.1.3. DELETED.

3.5.7.1.4. DELETED.

3.5.7.1.5. DELETED.

3.5.7.1.6. DELETED.

3.5.7.2. Aircraft with an indicated airspeed greater than the announced abort speed will continue takeoff. Aircraft with an indicated airspeed less than the announced abort speed will abort..

3.5.7.2.1. DELETED.

3.5.7.2.2. DELETED.

3.5.7.2.3. DELETED.

3.5.7.3. Aborting aircraft will continue to the end of the runway prior to turning off. If collision with the preceding aircraft is imminent, the overtaking aircraft will turn off the runway, if necessary, to avoid collision.

3.5.7.4. DELETED.

3.5.7.5. DELETED.

Table 3.1. DELETED.

3.5.7.6. DELETED.

3.5.7.6.1. DELETED.

3.5.7.6.2. DELETED.

3.5.7.6.3. DELETED.

3.5.7.6.4. DELETED.

3.5.7.6.5. DELETED.

3.5.7.7. DELETED.

3.5.7.7.1. DELETED.

3.5.7.7.2. DELETED.

3.5.7.7.3. DELETED.

3.5.7.8. DELETED.

3.5.7.8.1. DELETED.

3.5.7.8.2. DELETED.

3.5.7.8.3. DELETED.

3.5.7.8.4. DELETED.

3.5.7.9. DELETED.

3.5.7.9.1. DELETED.

3.5.7.9.2. DELETED.

3.5.7.9.3. DELETED.

3.5.7.9.4. DELETED.

4.4. Instrument Approaches. See para **2.5.4.1.** for approach review procedures. Refer to T.O. 1B-52H-1 Section II, Instrument Approaches, for applicable approach categories.

6.7.11. If RCO confirmation of internal release is not possible, crews must perform a visual bomb bay check prior to conducting any additional training. For release of a single live weapon at night from low altitude, if the RCO is not available to confirm the weapon impact, visual confirmation of weapon detonation by any trailing aircraft in the formation will fulfill the requirements of paragraph **6.7.9.** and **6.7.10.** above. Internal light indications must still be consistent with visual observation. This applies to both internal and external weapons.

Attachment 2

BRIEFING GUIDES

NORMAL BRIEFING GUIDE

NOTE*:* Ensure the majority of time is used for discussion of tactics, complicated mission segments/special activities, and other new or important items. If regular briefing items have already been discussed during mission planning or are standard, specialty checklist items, they may be reviewed briefly or omitted as appropriate.

A.2.1. Roll call (crew number), security classification.

A.2.2 Review of weather planning factors.

A.2.3. Mission data and duration, takeoff and landing times. (Mission itinerary)

A.2.4. Aircraft identification (call sign and tail number).

A.2.5. Aircraft status, weapons load, takeoff gross weight, fuel loaded, weapons load, and Electronic Counter Measures (ECM) configuration.

A.2.6. Start engine and taxi procedures.

A.2.7. Planned takeoff performance.

A.2.7.1. % MAC.

A.2.7.2. MRR.

A.2.7.3. S1 speed.

A.2.7.4. S1 time.

A.2.7.5. Takeoff distance.

A.2.7.6. Takeoff speed.

A.2.8. Training requirements in order of accomplishment:

A.2.8.1. Departure (radar directed or standard instrument departure).

A.2.8.1.1. Danger and prohibited areas.

A.2.8.1.2. Air Defense Identification Zone (ADIZ) penetration points.

A.2.8.1.3. Highest terrain en route and highest obstructions on low level routes.

A.2.8.1.4. Altitudes.

A.2.8.1.5. Air refueling area, entry/exit times, altitudes, rendezvous procedures, fuel transfer, and emergency breakaway procedures, and planned EMCON option.

A.2.8.1.6. Control points and times to include ARCT, ARCP, pre-IP, IP, bomb release, missile launch, high and low level navigation entry and exit points/times as applicable.

A.2.8.1.7. Targets and methods of bombing. Review weapon release parameters/special restrictions, (visual cues, speed, altitude, timing tolerances, emergency release methods, etc.) and visual cues.

A.2.8.1.8. TA activity.

A.2.8.1.8.1. Low level chart and flight plan compatibility.

A.2.8.1.8.2. Procedures for descent to IFR and TA altitudes.

A.2.8.1.8.3. Significant terrain on each leg emphasizing available terrain masking and probable ridge crossovers.

A.2.8.1.9. Tactics. Discuss en route/target area threats and appropriate crew coordination/maneuvers.

A.2.8.1.10. AGM activity.

A.2.8.2. For formation flights, coordinate with other formation flight crews all formation action points, altitudes and control times, and communication plans.

A.2.8.3. EA activity to include tactics and expendable exercises as applicable.

A.2.8.4. Pilot proficiency activity and requirements.

A.2.8.5. Fighter intercept activity and procedures.

A.2.9. Communications to include UHF/VHF, SATCOM (voice and data) and HF:

A.2.9.1. Launch communications procedures.

A.2.9.2. Air refueling procedures and frequencies.

A.2.9.3. Range procedures and frequencies.

A.2.9.4. IFF/SIF procedures.

A.2.9.5. Special communications monitoring and reporting.

A.2.9.6. Peacetime recall procedures.

A.2.10. Air traffic control procedures.

A.2.11. Fuel reserve at destination and planned alternate.

A.2.12. Flight Information Publications review (planned recovery and alternate bases):

A.2.12.1. General Planning as applicable to mission requirements.

A.2.12.2. En route supplement for field facilities, radio navigation aids, and other pertinent information.

A.2.12.3. Review and brief (as required) procedures and crew coordination techniques required for identifying runway environment and transition from instrument to visual landing cues.

A.2.12.4. Terminal Instrument Approach Procedures Charts (high or low altitude) reviewed for approach procedures, weather minimums, emergency and minimum safe altitudes, approach lighting, DH/MDA, and published missed approach procedures.

A.2.12.5. Foreign Clearance Guide:

A.2.12.5.1. Passport requirements.

A.2.12.5.2. Clothing requirements.

A.2.12.5.3. Other requirements.

A.2.12.6. Customs requirements.

A.2.13. Alternate mission plan in the event of inflight malfunctions or inclement weather preventing accomplishment of scheduled requirement including a detailed review of the planned alternate low level activity.

A.2.14. Aerodrome restrictions and hazards to ground operation.

A.2.15. Safety of flight items, aircraft restrictions for activity scheduled (e.g. ordnance recovery procedures).

A.2.16. Emergency procedures review.

A.2.17. Flight manual publications, currency, mission preparation and briefing requirements.

A.2.18. Qualification and currency of crewmembers, and FCIF status.

A.2.20. Training mission folder items in accordance with ACCI 10-450, Vol 2.

A.2.21.Crew rest starts _____.

Crew assembly time _____.

A.2.22. Specialized briefings as required (MITO, formation, tactics, air refueling, etc.)

A2.23. **Formation/MITO Briefing Guide** This minimum briefing guide is provided as an example to stress mission events and objectives rather than reinforce technical order procedures. A standardized briefing format is especially important when flying with other units. Brief only actions required to meet mission and EMCON objectives. If regular briefing items have already been discussed during mission planning or are standard, specialty checklist items, they may be reviewed briefly or omitted as appropriate.

A2.23.1. **Roll Call/Time Hack:**

A2.23.1.1. Mission commander's mission objective overview

A2.23.1.2. Formation/Aircraft commander

A2.23.1.3. Call sign

A2.23.1.4. Aircraft number

A2.23.1.5. Parking locations

A2.23.1.6. Time hack

A2.23.2. **Weather:**

A2.23.2.1. Takeoff

A2.23.2.2. En route

A2.23.2.3. Air refueling

A2.23.2.4. Low level

A2.23.2.5. Destinations

A2.23.2.6. Alternates

A2.23.3. **Mission Overview**

A2.23.3.1. Takeoff time

A2.23.3.2. ARCT

A2.23.3.3. TOT

A2.23.3.4. PECP

A2.23.3.5. Weapons employment

A2.23.3.6. Tactical considerations

A2.23.3.7. FIE

A2.23.3.8. TCM

A2.23.3.9. Landing

A2.23.4. **Communications/EMCON Plan**

A2.23.4.1. **Ground Operations**

A2.23.4.1.1. EMCON plan or allowable emitters

A2.23.4.1.2. Radio check-in times

A2.23.4.1.3. Authentication/launch

A2.23.4.1.4. DELETED

A2.23.4.1.5. ARTCC clearances

A2.23.4.2. **Takeoff**

A2.23.4.2.1. EMCON plan or allowable emitters

A2.23.4.2.2. Interplane frequency

A2.23.4.2.3. Airborne calls

A2.23.4.3. **En route**

A2.23.4.3.1. EMCON plan or allowable emitters

A2.23.4.3.2. Lost wingman

A2.23.4.3.3. Weather Update

A2.23.4.3.4. Comm log requirements

A.2.23.4.3.5. AFSATCOM/HF

A.2.23.4.4. **Air Refueling**

A2.23.4.4.1. EMCON plan or allowable emitters

A2.23.4.4.2. Radio frequencies

A2.23.4.4.3. A/A TACAN channel

A2.23.4.4.4. APN-69 procedures

A2.23.4.4.5. HF

A2.23.4.5. **Low Level**

A2.23.4.5.1. EMCON plan or allowable emitters

A2.23.4.5.2. FSS

A2.23.4.5.3. ARTCC clearances

A2.23.4.5.4. AFSATCOM procedures

A2.23.4.5.5. ECR

A2.23.4.5.6. Special frequencies

A2.24. **Taxi**

A2.24.1. Engine start time

A2.24.2. Taxi time

A2.24.3. Sequence (including spare)

A2.24.4. Performance data

A2.24.5. Takeoff clearance

A2.25. **Takeoff**

A2.25.1. Interval

A2.25.2. Abort

A2.25.3. Emergencies

A2.26. **Departure** (Visual vs. Instrument)

A2.26.1. Airspeeds

A2.26.2. Routing

A2.26.3. Climb rates or power settings

A2.26.4. Intermediate level offs

A2.26.5. Turns and bank angles

A2.26.6. Visual cutoff

A2.27. **Level Off**

A2.27.1. Join-up

A2.27.2. Altitude block

A2.27.3. Airspeed (indicated/true/mach)

A2.27.4. Minimum maneuvering airspeed

A2.28. **En Route** (Visual vs. Instrument)

A2.28.1. Airspeed changes or mission timing

A2.28.2. Turns and bank angles

A2.28.3. Climb and descent rates

A2.28.4. Position changes

A2.29. **Air Refueling**

A2.29.1. Call signs

A2.29.2. Onloads and sequence

A2.29.3. Base altitude

A2.29.4. Track

A2.29.5. Type rendezvous

A2.29.6. AR formation

A2.29.7. AR airspeeds

A2.29.8. Bingo fuel

A2.29.9. Abort bases

A2.29.10. End Air Refueling request

A2.29.11. Breakup

A2.30. **Weapons Employment**

A2.30.1. **High Level**

A2.30.1.1. Targets

A2.30.1.2. TOT

A2.30.1.3. Altitude, airspeed, and separation

A2.30.1.4. Emergency bombing procedures

A2.30.2. **Low Level** (Visual vs. Instrument)

A2.30.2.1. Descent

A2.30.2.2. Formation/separation

A2.30.2.3. Abort procedures

A2.30.2.4. Targets

A2.30.2.5. TOT

A2.30.2.6. Climb out

A2.30.2.7. Rejoin

A2.30.3. **Tactical Considerations**

A2.30.3.1. Expected actual/simulated threats

A2.30.3.2. Tactical plan

A2.30.3.3. Maneuvers

A2.30.3.4. Countermeasures

A2.30.3.5. Expendables

A2.30.3.6. Comm/notification requirements

A2.31. **Recovery**

A2.31.1. Formation breakup procedures

A2.31.2. Penetration sequence/airspeeds

A2.32. **Special Subjects**

A2.32.1. Wake turbulence avoidance

A2.33. **Formation Debrief**

Attachment 4

DATA TRANSFER UNIT CARTRIDGE IDENTIFICATION AND HANDLING PROCEDURES

The following procedures apply for the use of Data Transfer Unit Cartridges (DTUCs).

A.4.1. Identification of Classified DTUCs. Mark the DTUC in plain English language with the following:

A.4.1.1. Security classification in the color codes:

A.4.1.1.1. DELETE

A.4.1.1.2. TOP SECRET Orange

A.4.1.1.3. SECRET Red

A.4.1.1.4. CONFIDENTIAL Blue

A.4.1.1.5. UNCLASSIFIED Green

A.4.1.2. Review/declassification instructions.

A.4.1.3. Control number.

A.4.1.4. Creation date.

A.4.1.5. Sortie IDs (Full 28 character ID for SIOP sorties and any variation of the 28 characters available from training missions).

A.4.2. Identification of Unclassified DTUCs. Mark the DTUC in plain English language with the following:

A.4.2.1. White color coded unclassified marking (New unclassified DTUCs to be used as flight data recorders and will record classified data in the course of the mission may be marked with the appropriate classification level before issuing to crews).

A.4.2.2. Control number.

A.4.2.3. Creation date.

A.4.2.4. Sortie ID(s).

A.4.3. (Does not apply to AFRC) Aircraft DTUC Loading:

A.4.3.1. DTUC loading and verification must be accomplished by personnel with appropriate security clearance (see appropriate security directive).

A.4.3.2. DTUC loading must be accomplished in accordance with the applicable technical order.

A.4.3.3. DTUC loading and verification process. Ensure no classified data is displayed on any of the Multi-functional Displays (MFDs) when unauthorized individuals (i.e., crew chiefs, other maintenance personnel) are present in the cockpit and could possibly view the data if displayed.

A.4.3.4. Upon completion of DTUC loading, make an entry in section C, AFTO Form 781, identifying the classification level of the data loaded.

A.4.4. Aircraft Computer Downloading. Erase classified mission data from the aircraft computer when the mission/alert period is terminated. Make an annotation in the respective AFTO Form 781, section C, that the classified data has been removed. Remove DTUCs from the aircraft.

A.4.5. OAS Classified Data. Erasure of OAS classified data is not required for normal training or ORI missions, if landing at a USAF base. In cases of weather diverts, emergencies, air shows, etc., aircrews will ensure compliance with DOD 5200.1R/AFR 205-1 regarding safeguarding of classified equipment on aircraft. Follow special instructions that direct classified data erasure on specified HHD missions.

Attachment 6

IC 2005-01 TO AFI 11-2B-52, VOLUME 3, B-52 OPERATIONS PROCEDURES

22 JUNE 2005

SUMMARY OF REVISIONS

This revision incorporates Interim Change 2005-1 and adds BRNAV operating procedures. A bar (|) indicates a revision from the previous edition. The entire text of the IC is at the last attachment.

3.2.3. Adds BRNAV procedures and information.

3.2.3.1. Basic Area Navigation (BRNAV) Airspace. Airspace where BRNAV is applied is considered special qualification airspace. Both the operator and the specific aircraft type must be approved for operations in these areas. BRNAV navigation accuracy criteria is RNP-5. The B-52 complies with RNP-5 accuracy, integrity, and continuity and is approved for BRNAV operations requiring RNP-5 or higher criteria. Aircrew must update position as required to maintain actual centerline within +/- 5 NM of ATC cleared route.

3.2.3.1.1. Minimum equipment to operate in BRNAV airspace is one INS capable of updates from Doppler and/or Radar inputs (i.e., not tied to aircraft GPS). Flights entering BRNAV airspace after long over water flight must be especially aware of BRNAV tolerances and update accordingly. NOTE: The B-52 GPS receiver is not certified for BRNAV operations.

3.2.3.1.2. Minimum aircrew for BRNAV operations is a pilot, copilot, and radar navigator.

3.2.3.1.3. Aircraft must turn short of filed points to remain within +/- 5 NM of ATC cleared route. Aircrew should utilize the “Turn Short” feature when preparing mission data cartridges and during inflight operations.

3.2.3.1.4. Aircraft unable to maintain BRNAV tolerances must advise ATC immediately and take appropriate coordinated action.

3.2.3.1.5. Document (in the aircraft forms) malfunctions or failures of BRNAV required equipment, including the failure of this equipment to meet BRNAV tolerances.