

**BY ORDER OF THE 375TH
AIRLIFT WING COMMANDER**

**AIR FORCE INSTRUCTION 11-2C-21
VOLUME 3**



**SCOTT AIR FORCE BASE
Supplement 1**

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Flying Operations

**375TH AIRLIFT WING (AW) C-21A LOCAL
OPERATING PROCEDURES**

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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AFI 11-2C-21, Volume 3, C-21 Operations Procedures, 1 September 1999, is supplemented as follows: This supplement sets forth procedures for all C-21A aircraft operating under the direction of the 375 AW. Send comments and suggested improvements to this supplement on AF Form 847, **Recommendation for Change of Publication**, through channels to 375 OG/OGV, 859 Buchanan Rd, Room 427, Scott AFB IL 62225-5117, or E-mail to: <mailto:375og-ogv@scott.af.mil>. The Commander, 375th Operations Group (OG) (375 OG/CC), has overall responsibility and waiver authority for this supplement. **NOTE:** To eliminate potential misunderstandings, the following definitions apply: Squadron delineates responsibility at the squadron level; unit delineates responsibilities at the unit level, (i.e., each squadron and geographically separated unit).

SUMMARY OF REVISIONS

This supplement has been substantially revised and must be completely reviewed.

10.1. **Applicability.** This chapter is applicable to all individuals/units assigned or attached to 375 OG that operate the C-21 aircraft. Paragraphs that include a parenthetical reference amplify guidance in the basic Air Force Instruction (AFI).

10.2. (Added) **Command and Control.**

10.2.1. (Added) Execution Authority. The 375 AW C-21 units will E-mail their next day's flying schedule to the 375 OG Executive Offices (375 OG/CCE) at: (<mailto:375OG.CCE@scott.af.mil>) by the close of business the day before the scheduled flights. E-mail will include nonduty and next duty days for weekends and holidays. All units are responsible for accomplishing initial GDSS/C2IPS mission cuts.

10.2.1.1. (Added) Training Mission Execution. Units will notify the Scott Command Post (SCP) of any training mission changes for the current day's missions, as well as delays, cancellations, or any unusual circumstances. The SCP is responsible for closing out all training missions in GDSS/C2IPS.

10.2.1.2. (Added) The Joint Operational Support Airlift Center (JOSAC) Mission Execution. The JOSAC mission changes should normally be initiated by JOSAC through the Tanker Airlift Control Center (TACC); however, this does not preclude JOSAC from calling the aircrew directly with a mission change during execution. Units receiving mission changes directly from the user need to ensure JOSAC has validated the mission change. The AC must ensure TACC/JOSAC is advised of any delays, cancellations or any unusual circumstances. The TACC is responsible for closing out all JOSAC missions in GDSS/C2IPS.

10.2.2. (Added) Training missions. Request for Off-Station Trainer (OST) will be approved IAW procedures contained in the 375 AW Operations Policy (WOP) (see paragraph 2.2.2.).

10.2.3. (Added) Mission Clearance Decision. Aircraft commanders must keep senior leadership informed of mission delays that impact our customers (see paragraph 2.4.).

10.2.3.1. (Added) Aircraft commanders will notify the 375 OG/CC or CD under the following circumstances:

10.2.3.1.1. (Added) Any distinguished visitor (DV) is delayed and there is a potential for negative feedback through the chain of command or the DV is in the 375 AW's chain of command.

10.2.3.1.2. (Added) Any unusual circumstance that does not meet the OPREP-3 Home Line Report criteria, but may generate questions from the AMC staff or others.

10.2.3.1.3. (Added) If in doubt, make the phone call.

10.2.3.2. (Added) Aircraft commanders should use their normal chain of command to notify the 375 OG/CC or CD; however, if they are unable to contact their respective unit or squadron commander/operations officer or time is of the essence, the ACs will contact the 375 OG/CC or CD directly through SCP.

10.2.3.2.1. (Added) Unit leadership will ensure the initial contact is followed up with an E-mail to the 375 OG/CC or CD.

10.2.4. (Added) The Continental United States (CONUS) En Route Reporting. All 375 AW C-21 units will use the SCP for all CONUS C2 requirements on CONUS training missions. The TACC will flight-follow all 375 AW JOSAC missions and OCONUS off-station trainers and will be the single point of contact for en route crews. Crews will contact the TACC at each en route stop as soon as possible after landing to report arrival/departure times, receive messages, and coordinate mission changes (i.e., crews will coordinate mission changes through TACC, who will, in turn, establish a phone patch with JOSAC). Crews will also call the TACC prior to mission termination to determine if JOSAC has any additional lift requirements (see paragraph 2.6.3.1.).

10.2.5. (Added) OCONUS En Route Reporting. Crews operating OCONUS missions (includes trainers) will use the TACC for all C2 requirements. To ensure an effective and efficient command and control process, TACC needs prompt notification of aircraft departures and arrivals. TACC initiates an overdue aircraft checklist when they cannot confirm aircraft arrival at the destination within 1 hour of estimated time of arrival at OCONUS stations. If they do not receive a departure message within 1 hour, they consider an aircraft overdue at its destination when it exceeds the time limits above based on the aircraft's estimated time of departure. If mission controllers are unable to confirm aircraft status within 1 hour, they request

TACC/DO (senior) approval to notify the appropriate rescue coordination center to begin an extended communications search. If communications capability is limited at the next destination, TACC recommends advising the controller that you will not contact them until the subsequent destination to prevent unnecessary initiation of the overdue aircraft checklist (see paragraph 2.6.3.2.).

10.3. (Added) **Crew Management.**

10.3.1. (Added) Additional Crewmembers (ACM) and Mission-Essential Ground Personnel (MEGP). Refer to AMCI 11-208, *Tanker/Airlift Operations*, for detailed ACM policies. Refer to AMCI 11-208 for detailed MEGP policies (see paragraph 3.1.)

10.3.2. (Added) Crew Complement. Units will ensure all scheduled aircrews have 400 hours PAA in the C-21A between the ACs and copilot. Instructor Pilots (IP) and above are exempt. The unit commander is the waiver authority (see paragraph 3.2.).

10.3.2.1. (Added) Each C-21 unit commander will designate IPs to perform as 4-Star IPs IAW the Employment Training Plan.

10.3.3. (Added) En Route Ground Time. Heavy traffic commercial airfields are defined as those fields listed in AP-1 associated with Class B airspace. Fields with known fueling delays are those listed in the IFR Supplement or ASRR with remarks indicating that fueling delays can be expected. Planners should use 2+00 en route ground time at OCONUS locations (see paragraph 3.7.2.).

10.3.4. (Added) Standby Force Duty. Units will set up crew alerting procedures at their respective base (see paragraph 3.8.).

10.3.4.1. (Added) The 375 AW uses three types of BRAVO alerts: Medevac Alert, Priority Alert, and the Wing Bravo Alert (see 375 AW WOP for specific stand-by force duty procedures).

10.3.4.2. (Added) When an alert crew is launched, the affected alert will not normally be reconstituted before the new crew is LFA the following day (or 1 hour after the expected return of the launched alert aircraft). Units may work with JOSAC to reconstitute earlier if aircraft and crewmembers are available.

10.3.5. (Added) Orientation Flights and Incentive Flights. Request IAW AFI 11-401, *Aviation Management*, AMCI 11-208, and 375 AW WOP (see paragraph 3.9.).

10.4. (Added) **Aircraft Operating Restrictions.**

10.4.1. (Added) Policy. The following procedures apply when maintenance is required at en route stations: (1) Contact the TACC when maintenance is required. The TACC will coordinate with JOSAC and can provide the crew a phone patch to the home-station contract maintenance personnel to determine the actions required to repair the aircraft. Crews may call Raytheon direct, but must keep the TACC/JOSAC informed as to mission status; (2) When maintenance problems result in delaying or diverting a JOSAC-scheduled mission, ensure JOSAC is advised at the earliest opportunity, so that alternate arrangements may be made for passengers (see paragraph 4.2.).

10.4.2. (Added) Bird Strike. Comply with 375 AW Flight Crew Bulletin (FCB) for aircrew actions after a bird strike.

10.4.3. (Added) Waiver Procedures. For waiver requests for items listed in AFI 11-2C-21, Volume 3, Chapter 4 (see paragraph 4.3.):

10.4.3.1. (Added) Training Missions. Aircraft commanders will contact the SCP. The SCP will contact 375 OG/OGV, who will forward waiver requests to the 375 OG/CC (see paragraph 4.3.1.)

10.4.3.2. (Added) AMC or JOSAC-Directed Missions. The ACs will contact TACC. TACC will forward waiver requests to HQ AMC/DOV, who is the waiver authority. Be prepared to provide the following: (1) nature of maintenance problem; (2) local stan/eval guidance; (3) Raytheon's guidance regarding the problem; (4) nature of mission (high priority); (5) pre-/depositioning, etc.; (6) remaining crew duty day; (7) crew experience; (8) and departure/arrival weather. Aircraft commanders are encouraged to contact 375 OG/OGV on-call pilot through SCP if the AC desires assistance or guidance (see paragraph 4.3.2.).

10.4.4. (Added) Minimum Equipment List. "En Route" in Table 4.1. of this instruction is defined as those locations where contract maintenance is not available. A contract location that does not have parts available may also be considered an en route location (see Table 4.1.).

10.4.4.1. (Added) A "one-time" flight to a maintenance location may include multiple fuel stops, if required, to reach the maintenance facility (see Table 4.1.).

10.4.4.2. (Added) Spoilers (Flight Mode). Inoperative spoilers in flight require cruise operations at or below FL250 for emergency descent compliance (see Table 4.1.).

10.4.4.3. (Added) Ground Proximity Warning System. Required for operational night Tactical Arrival and Departure (TAD) maneuvers (see Table 4.1.).

10.4.4.4. (Added) Radio Altimeter. Required for operational night TAD maneuvers. Current OG policy is not to conduct night TAD maneuvers, except for the normal overhead pattern (see Table 4.1.).

10.4.4.5. (Added) Traffic Alert and Collision Avoidance System (TCAS). The TCAS will be operational for all training missions including 26PX JOSAC (if not being used by JOSAC to carry passengers) lines. If the system fails once the trainer has started, a local training mission may continue. A TCAS failure on an out and back trainer or 26PX requires 375 OG/CC waiver to continue the training mission; however, a one-time flight back to home station does not require a waiver (see Table 4.1.).

10.4.4.5.1. (Added) The 375 OG/CC may entertain waiver requests based on unit training requirements. The unit commander or operations officer should provide the following information if requesting 375 OG/CC waiver to continue or start a training mission with a failed TCAS.

10.4.4.5.1.1. (Added) Training required (LPS, VFR, TAD, upgrade, etc.).

10.4.4.5.1.2. (Added) Impact if training is not accomplished.

10.4.4.5.1.3. (Added) Location of training fields.

10.5. (Added) **Operational Procedures.**

10.5.1. (Added) Checklists. The abbreviated Flight Crew Checklists will be carried in its entirety and not broken down into separate sections (i.e., a Normal Procedures Checklist and an Emergency Procedures Checklist) (see paragraph 5.1.).

10.5.1.1. (Added) Checklist Inserts. Additional pages will not be inserted between Flight Crew Checklist pages. The only approved checklist insert is the 375 AW In-Flight Guide (IFG); other pages may be used separate from the IFG, but may not be inserted in the IFG (see paragraph 5.1.1.).

10.5.1.2. (Added) Normally, the pilot in the right seat will operate the landing gear. Actuate the landing gear upon command of the pilot flying the aircraft and acknowledgement by the other pilot. The pilot not flying the aircraft should normally operate the flaps. Actuate the flaps upon command of the pilot flying the aircraft, acknowledge the flap setting commanded, and visually confirm the flap gauge indicates the desired setting. Instructors may operate the flaps as required on training missions.

10.5.2. (Added) Takeoff and Landing Policy (see paragraph 5.4.).

10.5.2.1. (Added) The AC will make all takeoffs and landings for the first 25 hours in command after certification when flying with a FP or MC. The unit commander is the waiver authority for prior-qualified pilots.

10.5.2.2. (Added) Per HQ AMC FCIF 96-10-10, multiple approaches and touch-and-go landings may be flown on JOSAC missions. Mission support is primary, and training is to be done on an opportune basis only. Aircrews must provide availability for JOSAC add-ons and space-available travel opportunities. The following procedures will be followed when performing multiple approaches and touch-and-goes:

10.5.2.2.1. (Added) The AC must be IP/EP qualified to perform touch-and-go and multiple approach training.

10.5.2.2.2. (Added) Transition training will not be accomplished with passengers on board.

10.5.2.2.3. (Added) Accomplish all transition training during the first 12 hours of the flight duty period.

10.5.2.2.4. (Added) Training may be accomplished at en route locations on the prepositioning leg (day prior) or on the depositioning leg of JOSAC missions:

10.5.2.2.4.1. (Added) Prepositioning. Training may be accomplished on a prepositioning leg that occurs the day before the passengers are scheduled. The crew will full stop at prepositioning base NLT 15+45 hours prior to the next day's scheduled departure and support no higher than a DV-5. Missions carrying DV-4 or above will not do transition work on the positioning leg.

10.5.2.2.4.2. (Added) Depositioning. Training may be accomplished after the last leg of regular JOSAC missions (or after the last en route stop, if duty or space-available passengers are not scheduled to be carried on the last leg and the crew confirms with JOSAC that there are no additional mission requirements for the crew).

10.5.2.2.5. (Added) Drop-In Training. Training will take place only at fields approved by the unit CC/DO or fields that are on the "Approved Airfields for CONUS C-21 Training Missions" spreadsheet on the 375 OG/OGV website: <https://www.scott.af.mil/375aw/375og/375ogv/ogvhome.htm> .

10.5.2.2.6. (Added) The AC will obtain approval to conduct transition training from the home unit DO/CC and obtain a training mission number for use prior to mission departure.

10.5.2.2.7. (Added) Home unit current operations will provide training mission number on the flight order.

10.5.2.2.8. (Added) Upon arrival at the training location, the crew will close out the current line on the AFTO Form 781, **ARMS Aircrew/Mission Flight Data Document**, and log the training time on the next line using the appropriate mission number and symbol.

10.5.2.2.9. (Added) 26PX Missions. For 26PX missions, only paragraphs **10.5.2.2.1. (Added)-10.5.2.2.3. (Added)** and **10.5.2.2.5. (Added)-10.5.2.2.6. (Added)** apply.

10.5.3. (Added) Advisory Calls. The pilot not flying will acknowledge the altitude clearance from ATC, set the altitude in the Altitude Alerter Window, and verbally state the altitude. The pilot flying will verify by verbally stating the altitude. If the pilots disagree, ask ATC for verification of the altitude clearance (see paragraph 5.11.1.).

10.5.4. (Added) Runway, Taxiway, and Airfield Requirements (see paragraph 5.15.).

10.5.4.1. (Added) When performing an intersection takeoff or a takeoff past a barrier, the minimum runway length requirement of paragraph 5.15.3.1. must be in front of the aircraft.

10.5.4.2. (Added) Minimum recommended taxiway width is 40 feet IAW HQ AMC Airfield Suitability and Restrictions Report (ASRR).

10.5.4.3. (Added) Airfield Suitability and Restrictions Report. The commander or operations officer of a unit conducting operations into the Central or South American Theaters will analyze the operational risk of the mission and pick the best qualified crew. The 375 OG supplements those certification airfields cited in Part One of the ASRR with the following: Eagle County Regional, CO and Mariscal Sucre, Ecuador (Quito), both of which are limited to day VMC conditions. Prior to operating into either of these airfields, one of the pilots flying the aircraft must have previously actively monitored (flying or observing from the jump seat) an approach in the C-21A and have an MP or higher certification. Waiver authority for the above airfields is 375 OG/CC (see paragraph 5.15.4.).

10.5.5. (Added) Arresting Cables. Aircrews must takeoff/land beyond unrecessed cable barriers. Ensure adequate takeoff/landing distance is available beyond approach end cable barriers (see paragraph 5.15.5.).

10.5.5.1. (Added) Approach End Cable. Pilots planning to land just beyond the cable may consider the first 1,000 feet prior to the approach end cable as runway available. Pilots planning to cross the cable at 50 feet will consider the approach end cable as the runway threshold for calculating runway available.

10.5.5.2. (Added) Departure End Cable. Consider runway beyond the departure end cable as runway available for meeting minimum runway length requirements.

10.5.5.3. (Added) Takeoff Distance. Calculated DRY takeoff distance must be less than or equal to the distance between the unrecessed barriers regardless of the RCR condition.

10.5.6. (Added) Functional Check Flight (FCF) Pilot Checkout. Unit commanders will review the qualifications of assigned and attached crewmembers and will select only highly qualified individuals to perform FCFs. Train FCF qualified pilots IAW the 375 OG Employment Training Plan. Normally, an FCF crew will be comprised of two certified FCF pilots. However, if only one FCF pilot is available, the second pilot will be an IP. An IP in FCF upgrade training meets the intent of two certified FCF pilots (see paragraph 5.21.2.5.).

10.5.7. (Added) C-21A Magnastar Flight Phones. The C-21A Magnastar Flight Phones provide service using the GTE AIRPHONE Digital Telephone Network. Aircrew may reference their C-21 Flight Manual, IFG, or the User's Guide (located in the Welcome Aboard Folder) on the aircraft for flight phone procedures. The aircrew will ensure that the DV is briefed on the following items prior to using the phone:

10.5.7.1. (Added) Instructions for the use of the phone are located in the Welcome Aboard Folder.

10.5.7.2. (Added) The DV must obtain a cabin phone number from the crew and pass to ground party if the DV would like to receive incoming phone calls.

10.5.7.3. (Added) The calls will be billed directly to the credit card account used when making the call (\$3.00 per minute).

10.5.7.4. (Added) Initial swipe of the credit card will pay for all of the calls made for that flight. Billing will be disabled when power is removed from the system.

10.5.7.5. (Added) The telephone use is limited to O-6 rank (or equivalent) and above.

10.5.7.6. (Added) The phone may not work on the ground due to the lack of line of sight signal strength.

10.6. (Added) **Aircrew Procedures.**

10.6.1. (Added) In accordance with HQ AMC/DOV guidance, wearing Nomex gloves is recommended for all primary crewmembers during engine start, takeoff, and landing (see paragraph 6.1.2.2.).

10.6.2. (Added) Permission Actions. See **Attachment 3 (Added)**, 375 AW Guide to OCONUS Operations, and **Attachment 4 (Added)**, C-21 High Altitude Airfield Operations (see paragraph 6.3.).

10.6.3. (Added) Aircrew Publications Requirements. The AC will carry the FCB on all missions (see paragraph 6.4.).

10.6.4. (Added) The AC will sign off the GO/NO-GO worksheet prior to departure.

10.6.5. (Added) Mission Kits. Squadrons/flights will ensure mission kits, as a minimum, contain the items in **Table 10.1. (Added)** (**NOTE:** Individual units may add additional items to this list as desired): (See paragraph 6.10.).

Table 10.1. (Added) Mission Kits.

Publications	(See paragraph 6.10.1.)
	IFM Aircrew Flimsy
	HQ AMC ASRR
	Area Planning 1 (AP-1)
	General Planning (GP)
	375 OG OSA Passenger Handling Guide
	TACC Pamphlet
	AMCI 11-208, <i>Tanker/Airlift Operations</i>
	375 OG Departure Flowchart (Attachment 5 (Added))
Forms	(See paragraph 6.10.2.)
	DD Form 2131, Passenger Manifest
	AFTO Form 781, ARMS Aircrew/Mission Flight Data Document
	AF Form 15, United States Air Force Invoice
	AF Form 70, Pilot's Flight Plan and Flight Log
	AF Form 315, United States Air Force Avfuels Invoice
	AF Form 457, USAF Hazard Report
	AF Form 651, Hazardous Air Traffic Report (HATR)
	AF Form 853, Bird Strike Worksheet
	AF Form 4040, C-21A Take Off/Landing Data (TOLD) Card
	AMC Form 54, Aircraft Commander's Report on Services/Facilities
	AMC Form 97, AMC In-Flight Emergency and Unusual Occurrence Worksheet
	375 OGV Tab Data Sheets
Orders	(See paragraph 6.10.3.)
	Flight Authorization
	Mission Itinerary
	375 AW ORM Worksheet
	Mission Accomplishment Report (MAR) Sheet

10.6.6. (Added) AC Briefing. Use "Mission Briefing Guide" in the 375 AW IFG (see paragraph 6.12.1.).

10.6.7. (Added) Call Signs. The Reach 02 call sign will be used by HQ AMC/CV (see paragraph 6.13.3.).

10.6.8. (Added) Take Off and Landing Data (TOLD). The TOLD departure information will be completed in its entirety prior to engine start. The TOLD arrival information may be completed along with departure information, but must be completed in its entirety prior to accomplishing the approach checklist. All blocks must be filled in; those factors that are insignificant for given conditions (RCR, Crosswind, Headwind) may indicate reviewed or N/A with a dash or check mark (see paragraph 6.15.5.).

10.6.9. (Added) Departure Routing/Climb Out Performance. When calculating second segment climb gradient, as a minimum use 2.5 percent net climb gradient or the climb gradient required minus 48 feet/

nautical mile (NM). The second segment net climb gradient chart provides a 0.8 percent buffer from the gross climb capability (best possible) of the aircraft (see paragraph 6.16.2.).

NOTE: When the departure field has an ATC climb gradient published, the crew is permitted to use two-engine climb performance to meet the requirement. Two-engine climb performance will always be more than double the engine-out climb performance. This is due to having nearly twice the thrust and a reduction in drag associated with two engines operating versus one engine operating and one engine wind milling. For example, if the aircraft is capable of an engine-out climb gradient of 2.5 percent, the two-engine climb gradient will always be 5.0 percent or greater.

10.6.10. (Added) Obstacle Clearance Planning. Departure climb gradient restrictions apply to initial departures and touch-and-goes. Be aware when the aircraft goes below the published Minimum Descent Altitude (MDA) or is past the MAP; the published missed approach will not guarantee obstacle clearance--for this reason it is necessary to meet all the same requirements of initial departures during touch-and-goes that return to IFR. It is prudent to review these requirements prior to any approach, in case of a go-around or balked landing. Some military approaches have higher missed approach climb gradients that must be met as well. For these reasons, calculating a performance climb gradient at your destination or transition airfield is necessary (see paragraph 6.17.5.1.).

10.6.11. (Added) Aircrews will not use the procedure detailed in paragraph 6.17.6.

NOTE: Paragraph 6.17.6. is only applicable to IFR departures and does not apply when operating in and out of fields, where the ASRR restricts to VFR operations only.

10.6.12. (Added) Adverse Weather.

10.6.12.1. (Added) Due to potential personnel hazard when lightning is reported within 5 NMs of the airfield, aircrews will depart the flight line and seek suitable cover or enter the aircraft until lightning is no longer within 5 NMs. No passenger/patient loading, refueling, fleet servicing or maintenance will be performed under these conditions (see paragraph 6.21.4.).

10.6.12.2. (Added) Mountain wave turbulence usually occurs on the downwind side of mountain ranges and may be indicated by the presence of rotor or standing lenticular clouds. Refer to AFH 11-203, Volume 1, *Weather for Aircrews*, for an in-depth discussion of this phenomenon. Crews should use good judgment when flying into any area conducive to mountain wave turbulence (see paragraph 6.21.6.3.1.).

10.6.12.3. (Added) Correlation Between Freezing Precipitation and the Level of Icing. After consultation with the Air Force Weather Agency and HQ AMC/DOW, aircrews should be aware of the following: In accordance with Air Force Weather Agency Technical Note (AFWA/TN) 98/002, Meteorological Techniques, 15 July 1998, observed or forecast freezing drizzle correlates to "moderate icing." Freezing rain correlates to "severe icing." According to HQ AMC/DOW, military forecasters should NOT issue a forecast for severe icing when the forecast calls for freezing drizzle. However, if the forecaster insists on calling for severe icing with freezing drizzle, the crew should consider the icing to be severe. (**NOTE:** Other agencies (e.g., other services and National Weather Service) may not restrict forecasters from calling for severe icing with freezing drizzle in the forecast. If their forecast is for severe icing, accept the forecast as authentic (see paragraph 6.21.7.).

10.6.13. (Added) Fuel Conservation. Crews will use the procedures detailed in **Attachment 6 (Added)** (see paragraph 6.22.).

10.6.14. (Added) Aircraft Fuel Purchase. Aircrews will comply with the procedure outlined in the IFR Supplement (see paragraph 6.24.).

10.6.14.1. (Added) The Aviation Into-plane Reimbursement (AIR) Card is assigned to each aircraft, also known as AVCARD. It is used to purchase aviation fuel and ground services. If there is not an AIR Card acceptor at an airport location to support a mission, the planners should contact AVCARD, the AIR card contractor at 1-800-AVCARD, or call collect at 1-410-771-3083 (number also located on the back of the AVCARD) to prearrange acceptance of the AIR Card.

10.6.14.2. (Added) If the AVCARD is unsuccessful in arranging acceptance of the AIR Card at the commercial location, aircrews should use the AF Form 315 to purchase fuel and the AF Form 15 to purchase ground services.

10.6.14.3. (Added) In accordance with 375 OG Budget Analyst guidance, the AF Forms 15 and 315 should be preprinted with the following address in the "Send Bill To" block: DESC AIR Card Contractor (ACC), P.O. Box 1697, Baltimore, MD 21203-1697. Aircrews should advise the commercial vendor to send the AF Forms 15 and 315 to the ACC for processing and payment.

10.6.15. (Added) Operational Procedures in Support of DVs. To expedite block out when carrying DVs, crews should be ready to start engines (i.e., clearance to start and checklists complete) 30 minutes prior to scheduled departure time. Attempt to confirm the impending arrival of the DV as appropriate (see paragraph 6.28.1.6.)

10.6.16. (Added) Aircrews should release seats to the maximum extent possible. The JOSAC may authorize a DV to space block two seats for extra baggage (see paragraph 6.28.1.7.).

10.6.17. (Added) C-21A Flight Data Recorder Trip and Date Setting Procedures. Set the trip and date recorder as follows: the unit's two-digit designator from **Table 10.2. (Added)** followed by the last two digits of the call sign, and finally the calendar date of the first leg of the mission. Example: 458 AS, JOSA 123 on 1 Apr should set 08 23 01.

Table 10.2. (Added) Flight Data Recorder Unit Designators.

Unit	Unit Designators
458 AS	08
311 ALF	11
84 ALF	21
332 ALF	32
457 AS	01
47 ALF	47
54 ALF	54
12 ALF	12

10.6.18. (Added) Prior to takeoff, use the "Crew Briefing Guide" in the 375 AW IFG (see Section 6D).

10.6.19. (Added) Obstacle Climb Procedure. When takeoff climb capability is within 1 percent of the takeoff climb requirement, accomplish the following on takeoff (see Section 6D).

10.6.19.1. (Added) Make a static takeoff and retract the gear normally.

10.6.19.2. (Added) Maintain takeoff power (do not exceed ops limits), flaps 8 degrees, and pitch to hold V2+20 KIAS or 20 degrees nose-up until clear of the obstacle or altitude restriction. Do not exceed 20

degrees nose-up. If the aircraft continues to accelerate at 20 degrees nose-up, retract the flaps at V2+30 KIAS and continue to climb using normal procedures.

10.6.19.3. (Added) Once clear of the obstacle or altitude restriction, reduce power to approximately 795 degrees ITT, lower the nose, retract the flaps at V2+30 KIAS, and climb using normal procedures.

10.6.19.4. (Added) If an engine fails at V2, maintain V2 per the flight manual procedure. If the engine fails above V2, maintain the speed at the time of the failure until the obstacle is cleared. Once cleared, accelerate to V2+30, and follow the flight manual procedure.

10.6.20. (Added) Navigation Aid Capability. The C-21 is not minimum navigation performance specification compliant (see paragraph 6.34.1.).

10.6.21. (Added) Use the "Crew Briefing Guide" in the 375 AW IFG prior to descent (see Section 6F).

10.6.22. (Added) Obstacle Clearance Requirements for Landing and Go-Around. Do not subtract 48 feet per NM for approach climb gradient calculations (see Section 6F.).

10.6.22.1. (Added) Approach Climb Gradient Published to an Altitude within 1,500 feet of Runway Elevation. Calculate the climb gradient capability using airfield pressure altitude and temperature.

10.6.22.2. (Added) Approach Climb Gradient Published to an Altitude greater than 1,500 feet Above Runway Elevation. Calculate the climb gradient capability using a pseudo-pressure altitude (the altitude published on the minimum climb rate chart minus 1,500 feet) and a pseudo-temperature (airfield temperature minus the standard lapse rate (3.6 degrees Fahrenheit per 1,000 feet) times the difference between the pseudo-altitude and the airfield altitude divided by 1,000). For example, TAC Runway 12, Davis-Monthan AFB AZ, has a published minimum approach climb rate of 290 feet per mile to 10,000 feet. Field altitude is 2,704 feet. Assuming an airfield temperature of 95 degrees, use the following to compute the approach gross climb gradient: Pseudo-altitude = $10,000 - 1,500 = 8,500$ feet. Pseudo-temperature = $95 - (3.6 (8500 - 2704)/1000) = 74.1$.

10.6.23. (Added) Altimeter Setting Procedure. On descent, when cleared to an altitude below the transition level, the pilot not flying may set the local altimeter. The pilot flying will leave 29.92 set until passing through transition level (see paragraph 6.41.).

10.6.24. (Added) Insect and Pest Control. These aerosol products are considered hazardous waste and are to be disposed of properly. They are not to be thrown in the regular trash. It is costly to dispose of hazardous materials. Therefore, it is imperative you off-load the products at the originating base. If off-load is done at Scott AFB, contact Fleet Service for proper disposal. In addition, any suspected or confirmed hazardous material should be brought to the attention of 375 AW/SE, DSN 576-6311.

10.7. (Added) **Aircraft Security.**

10.7.1. (Added) Unit commanders and operations officers must ensure aircrews scheduled to participate in a static display review AFI 11-209, *Air Force Participation in Aerial Events*, and review the 375 AW Air Show Participation briefing prior to the static display. During static displays, aircrews should use rope and stanchions to prevent unsupervised/unsecured contact with the aircraft. When the aircraft is attended, rope off from the nose of the aircraft clockwise to the left wing. When the aircraft is unattended, it will be closed and completely encircled with the rope. Aircrews will coordinate with the host unit or their local Security Forces as necessary to obtain rope and stanchions. Review the 375 AW Wing Operations Plan for further guidance (see paragraph 7.2.).

10.8. (Added) **Operational Reports and Forms.**

10.8.1. (Added) Reportable Mishaps. All items listed in AFI 11-2C-21, Volume 3, Chapter 8, paragraph 8.4.2., will be reported to the SCP as soon as possible after landing. Events that are not listed in Chapter 8, but must be reported in an OPREP-3 Home Line Report include: (1) Engine rollbacks; report engine rollback only if rollback exceeds 15 percent N1 or N2 loss, or if the engine fails to respond to manual control; and (2) All unexplained ground engine flameouts (see paragraph 8.4.2.).

10.8.2. (Added) Bird Strikes. Comply with “C-21 Aircrew Bird Strike Inspection Procedures” in the 375 AW FCB (see paragraph 8.4.2.14.).

10.8.3. (Added) Notify flight and squadron commanders/operations officers and 375 OG/OGV of any known or possible Air Traffic Control violation as soon as possible after the incident. Provide information using the format in AFI 11-2C-21, Volume 3, Chapter 8, paragraph 8.5. Both pilots will make a detailed written record of the event (see paragraph 8.5.).

10.9. (Added) **Training Policy.**

10.9.1. (Added) Flying General IP Checkout. Unit commanders will review the qualifications of assigned and attached crewmembers and will select only highly qualified instructors to perform flying general duties. Ensure that all flying general qualified IPs are trained in accordance with the Flying General Checkout Program outlined in 375 OG Employment Training Plan. HQ AMC/DO distributes a list of “General Officers Flying AMC Operational Support Airlift (OSA) Aircraft” to all C-21 units, indicating those general officers authorized to fly the C-21. Flying general IPs will check the general’s currency the day prior to the mission by contacting the Host Aviation Resource Management where the general’s flight records are kept. (**NOTE:** Contact the 15 AF/CCA for 15 AF/CC; see paragraph 9.1.)

10.9.1.1. (Added) Flying General Certified IPs are not required for 375 AW senior officers.

10.9.2. (Added) Examiner Certification Process. By definition, the flight examiner position is not a qualification but a certification. Accomplish Examiner Certification in accordance with the 375 OG Employment Training Plan (see paragraph 9.1.).

10.9.3. (Added) Off-Station Trainers. Refer to 375 AW WOP for approval procedures for all off-station trainers (e.g., training missions which will remain overnight at other than home station, OCONUS trainers, and air show/aerial event missions) (see paragraph 9.1.).

10.9.4. (Added) Mission-Essential Ground Personnel. The MEGPs are considered passengers when practicing simulated emergencies (see paragraph 9.2.4.). Officers Awaiting PCS Training Air Force Academy Cadets and Reserve Officer Training Corps Cadets (on summer training program) may fly in MEGP status in accordance with AFI 11-401; however, they are considered passengers and will not be onboard the aircraft during touch-and-go landings or multiple practice approaches. Life support personnel may be onboard an aircraft performing touch-and-go landings during an AERPS training flight (see paragraph 9.3.2.6.).

10.9.5. (Added) Engine Out Limitations. The IP’s may log SE currency events with a copilot onboard the aircraft. The IP will brief the copilot on duties and expectations during the mission brief (see paragraph 9.4.2.).

10.9.6. (Added) Simulated single engine missed approach or go around (see Table 9.1.).

10.9.6.1. (Added) It is not advisable to initiate a safety (SE) go around once the yaw damper is disengaged (landing assured).

10.9.6.2. (Added) An unplanned SE go around initiated below the training minimum is no longer a training maneuver. The objective is to recover the aircraft to a safe airspeed and altitude. The PF should initiate a go around. The IP will determine the rate in which the idle engine should be brought back into the normal operating range; the IP may elect to take control of the aircraft or allow the PF to continue to fly. Either way when bringing the idle engine back to the normal operating range, great care should be taken with the application of power and coordinated rudder.

10.9.6.3. (Added) Maximum crosswind for a simulated single-engine landing or touch-and-go will be 20 knots.

10.9.7. (Added) Traffic Pattern Limitations (see paragraph 9.6.).

10.9.7.1. (Added) Closed Pull Ups. Pilots should normally use a maximum of 45 degrees of bank in the closed pull up. When conditions require the use of more than 45 degrees of bank, pilots should maintain airspeed at or above 185 KIAS. 185 KIAS provides a minimal buffer above approach to stall warning at 15,300 pounds.

10.9.7.2. (Added) Pilots may fly the overhead pattern pitch-out up to 60 degrees of bank.

10.9.8. (Added) Instructor Pilot Briefing. Instructor pilots will use the "Training Briefing Guide" in the 375 AW IFG (see paragraph 9.9.)

10.10. (Added) **Employment Training.** Review the 375 OG Employment Training Plan for guidance on TAD Flight Training, TAD Currencies, and VFR Arrival and Departure Certification (see Chapter 17.)

10.11. (Added) **Aeromedical Evacuation.** Report any patient medical complications to GPMRC as soon as possible (see paragraph 20.23.)

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

AFH11-203, Volume 1, *Weather for Aircrews*

AMCI 11-208, *Tanker/Airlift Operations*

T.O. 1C-21A-1, *Flight Manual USAF Series C-21A Aircraft*

Abbreviations and Acronyms

ACM—Additional Crewmember

AFI—Air Force Instruction

AVCARD—Aviation Into-Plane Reimbursement Card

CONUS—Continental United States

DO—Director of Operations

DV—Distinguished Visitor

FCG—Foreign Clearance Guide

FLIP—Flight Information Publication

IFG—In-Flight Guide

IP—Instructor Pilot

JOSAC—Joint Operational Support Airlift Center

MDA—Minimum Descent Altitude

MEGP—Mission-Essential Ground Personnel

OCONUS—Outside the Continental United States

OG—Operations Group

SE—Safety

SCP—Scott Command Post

TAD—Tactical Arrival and Departure

TACC—Tanker Airlift Control Center

TCAS—Traffic Alert and Collision Avoidance System

WOP—375 AW Operations Policy

Attachment 3 (Added)**375 AW GUIDE TO OCONUS OPERATIONS**

A3.1. (Added) This guide should aid aircrews in preparation for operating outside the CONUS. It is not meant to replace currently published documents such as Flight Information Publications (FLIP), Foreign Clearance Guide (FCG), AFIs, Multi-Command or AMC Instructions.

A3.2. (Added) Information on hazards, restrictions, and limitations not found in other publications is solicited from all operators. All units/personnel are tasked to submit pertinent data for updating this summary whenever a condition is identified which will adversely affect our operation. After each scheduled mission outside the CONUS (except Canada), submit to HQ AMC/TACC/XOO, DOA, and DOV an after-action report with a brief description of minor problems and items of interest. For 375 AW-generated missions, submit a report only to 375 OG/OGV.

A3.3. (Added) General Information . It is important that you research all of the airfields you will transit to include possible alternates. Since Department of Defense (DOD) approach plates provide only limited coverage of Central and South America, Caribbean, and some European international airfields, you may need to obtain Jeppesen approach plates. The DOD coverage may include some approaches to the airfields you will transit but not to all runways available. In some cases, DOD has a published non-precision approach to an airfield when Jeppesen has an ILS. Units must arrange for their own Jeppesen approaches through the appropriate contracting process for local purchase. Jeppesens are approved for use in IFR only when specifically cited by HQ AMC. Usually only one or two Jeppesen procedures are approved for a field and they often involve following HQ AMC- imposed restrictions. Approval information is available through the Internet at: <http://www.gdss.safb.af.mil>. Units must have AMC TERPS review the approach for those approaches not already approved for use.

A3.3.1. (Added) Certification/Restricted Airfields. HQ AMC ASRR has designated certain fields as certification, restricted, or daylight only due to unique hazards or operating procedures. Crews may call any AMC CP or TACC for the latest changes and updates that are available from GDSS or access the GDSS database at <http://www.gdss.safb.af.mil>. **NOTE:** See paragraphs 10.5.15.3.4.-10.5.15.5., this supplement, for additional 375 AW-imposed ASRR restrictions.

A3.3.2. (Added) There are many additional sources for information about non-CONUS airfields. Units should maintain continuity books containing information such as parking location, hotels, transportation, etc., to help future crews. This information should be updated as part of after-action reports provided by each crew. The 375 OG/OGV will file these reports and can provide a summary of this information on request. Trip reports are available on the 375 OG/OGV homepage at <http://www.scott.af.mil/375aw/375og/375ogv/ogvhome.htm>.

A3.3.3. (Added) Command and Control. Aircrews will pass command and control information as directed to HQ AMC/TACC. United States AF Global HF/SSB stations listed in FLIP include a chart depicting areas of coverage and suggested frequency band selection based upon time of day. Keep in mind that atmospheric and other factors affect reception making it necessary to attempt contact on all available frequencies. On the ground, you can call your controlling agency from embassies, consulates, or have them send a message to HQ AMC/TACC/XOPE/XOPN.

A3.3.4. (Added) Many ATC agencies, particularly those operating a nonradar facility, do not have the capability to quickly translate coordinates in a position report. With the exception of Oceanic Position Reports, when asked for your position, it is usually easier to give your position as a radial and DME from

a navigation aid or point on an airway rather than LAT/LONG from your UNS/GPS/INS. Coordinates are appropriate when passing a pilot report to weather personnel who may not be familiar with navaids by name.

A3.3.5. (Added) Be prepared for communication difficulties. Language barriers, accents, and unfamiliar names make radio communication a challenge. Some techniques for minimizing problems are:

A3.3.5.1. (Added) Monitor the radios closely. If you do not hear the controller for some time, try a radio check.

A3.3.5.2. (Added) Monitor your position on the en route charts. As you approach FIR/UIR and sector boundaries, expect a frequency change. If this does not happen, query the controller. En route charts usually have the sector controller's frequencies annotated on them.

A3.3.5.3. (Added) If you are unable to raise the controller, try disabling the squelch function on your radio. You can also attempt a relay with another aircraft on frequency. Many regions have listed a VHF frequency that is monitored by other aircraft operating within that area and can offer assistance with relaying information and position reports.

A3.3.5.4. (Added) If you have two VHF radios, set the one not in use to VHF guard and monitor. Many foreign civil ATC facilities do not use UHF guard. If you are in a bind, UHF guard may at least get you in contact with a military facility that can relay information or get a usable VHF frequency for you.

A3.3.5.5. (Added) Be prepared when calling a new agency. Have a position report prepared, especially if you are operating in a nonradar environment. Being familiar with your filed routing and navaids along your route will make it easier to copy clearances and re-routes.

A3.3.6. (Added) Aircrews will carry TPC scales or better terrain charts (Falcon View product may be used) for intended destinations.

A3.4. (Added) Flight Planning. While this guide cannot provide an all-inclusive checklist for flight planning, it will attempt to highlight several publications, shortcomings, and special emphasis items to address during the planning phase of your mission.

A3.4.1. (Added) Mission Tasking. If diplomatic clearance is required for the routing, destination or alternate, the clearance number and routing specified in the diplomatic clearance request should be available to the crew. Some airports cannot be used as alternates, and this may be published in the IFR Supplement, Area Planning or FCG. The diplomatically cleared routing may not be the preferred or standard routing. This routing could be because of political reasons or simply because the person sending the clearance request was not aware of preferred routings. If time permits and a routing is specified in your diplomatic clearance, try to ensure that the computer flight plan request includes your cleared routing. In any event, file and fly the routing specified in the diplomatic clearance. The diplomatic clearance may also specify the use of a special call sign. If so, this call sign will be used and filed on the flight plan for that particular leg.

A3.4.2. (Added) FCG. Check both the unclassified and classified editions for your destination and for countries you will overfly along your route. Ensure that you are entering the destination country at an Aerodrome of Entry at a time when Customs is available and that you will have the required paperwork for Customs and Immigration; check the valid time for diplomatic clearances if needed. Some clearances are valid from 0001L on the date requested and early or late arrival is no problem. Others are valid for meeting the requested time at the FIR boundary, no earlier. The expiration times vary and may be by date, requested time + 24 hours or longer. Look for restrictions to imports and other limitations that you may

need to brief to your passengers, such as no photography on the flight line or whether military or civilian government employees require an official passport or visa. A handy item to jot down is the phone number of the embassy, consulate, or defense attaché in that country. They can be very helpful when scheduling changes, maintenance, or other problems arise and you need access to DSN to contact your controlling agency. The FCG also addresses spraying for insects before landing. If you need to spray, be sure you get the proper insecticide before leaving home.

A3.4.3. (Added) FLIP Area Planning. Use the volume that is appropriate for the area of operation. Check Section A, Regional Supplementary Procedures, Section B, FIR/UIR Supplementary Procedures and Section C, National Supplementary Procedures for the country you are traveling to and for those you overfly. Look for any special flight planning information, such as required remarks on flight plans, ETAs for boundaries that may be required, and transponder settings to be used. The Route and Area Restrictions Section and Additional Information Sections contain information applicable to overflight and when landing in that country. Finally, Supplementary Airport Remarks may be published for your destination or alternate. In some cases, the preferred routing between two countries is published in the listing for the country you overfly. Because information is spread out between the three sections and under many titles, Area Planning is full of "gotcha" types of information. A great example is a required radio call 5 minutes prior to entering Barranguilla FIR (Columbia). "ATC will not offer safe control over aircraft that do not comply." You may easily miss that as it is buried under the heading "Position Reporting" in National Supplementary Procedures for Columbia. Don't forget the Planning Change Notices filed in the front of the book. They are published every 8 weeks and are cumulative; (i.e., 16 weeks after a new Area Planning is published, there will be two PCNs to check until the next AP comes out at the 24-week point.

A3.4.4. (Added) Once you have studied all of FLIP, FCG, etc., you will find yourself with a wealth of information. One tip to ensure making the right radio calls and squawking the right codes is to highlight points on your computer flight plan or AF Form 70 and note the requirements in the margin. It can also be helpful to take a few extra minutes when preparing for descent and review your notes on the destination to ensure you are prepared not only for the approach and landing but for your reception by Customs and Immigration officials at your destination.

A3.4.5. (Added) Intelligence. Arrange for an Intelligence Briefing before your flight. Try to set this briefing up as soon as you know about the mission to give the Intelligence personnel time to adequately research your destination.

Attachment 4 (Added)

C-21A HIGH ALTITUDE AIRFIELD OPERATIONS

NOTE: The following procedures are for operations at airfields from approximately 8,000 feet pressure altitude up to 10,000 feet pressure altitude. Reference the Pressurization System Description in Section I, and Emergency Procedures in Section III, of T.O. 1C-21A-1, Flight Manual USAF Series C-21A Aircraft, for further information.

A4.1. (Added) Passengers. Passengers should be given a thorough briefing on the pressurization abnormalities to expect on arrival and departure. With these procedures, rapid changes in the cabin pressure will be experienced. Passengers should be briefed on how to clear their ears and warned of problems that may be encountered if they have sinus congestion. They should also expect a large volume of noise and hot air if the pressure altitude at the field is greater than 9,250 feet.

A4.2. (Added) Engine Start and Taxi. Engine start should be accomplished with the Pressurization Automatic-Manual Switch in MAN. Engine start should be normal at pressure altitudes below 9,250 feet. For engine starts above 9,250 feet pressure altitude, start the engines with the Bleed Air Switches off to prevent emergency airflow into the cabin. N1 and N2 idle RPM indications will be higher. Cabin air should be turned on normally during the Taxi Checklist.

A4.3. (Added) Takeoff.

A4.3.1. (Added) Pressure altitude less than 9,250 feet: Takeoff with the pressurization system in the manual mode, cabin air on, and the Bleed Air Switches on. The Cabin Altitude Light will be on above approximately 8,500 feet pressure altitude. After liftoff, the copilot should raise the gear upon command of the pilot. Simultaneously, with the other hand, the copilot should use the Up/Dn Manual Control Switch to decrease the cabin altitude to below 7,200 feet and return the pressurization system to automatic mode by placing the Automatic-Manual Switch to AUTO.

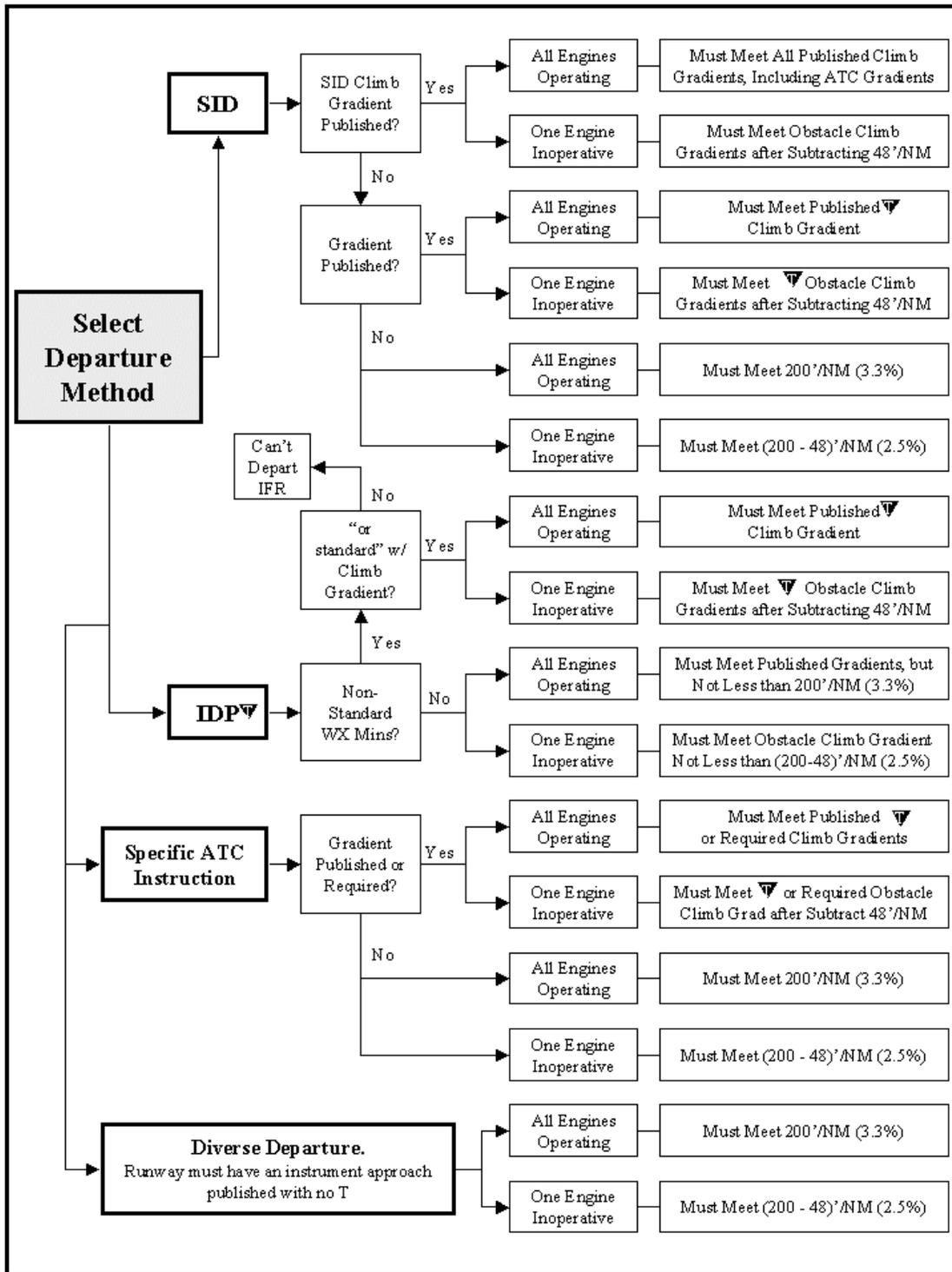
A4.3.2. (Added) Pressure altitude greater than 9,250 feet: Takeoff with the pressurization system in the manual mode, cabin air on, and the Bleed Air Switches off. The Cabin Altitude Light will be on. Pressurization will have to be reestablished after once airborne. After liftoff, the copilot should raise the gear upon command of the pilot. Simultaneously, with the other hand, the copilot should turn the Right Bleed Air Switch on and use the Up/Dn Manual Control Switch to decrease the cabin altitude to below 9,500 feet. Recycle the Right Bleed Air Switch from ON to OFF and then back to ON to reset the Emergency Pressurization Valves. Continue to decrease the cabin altitude to below 7,200 feet and return the pressurization system to automatic mode by placing the Automatic-Manual Switch to AUTO. Turn the Left Bleed Air Switch on.

A4.4. (Added) Approach. Set the Cabin Controller to its maximum and place the Pressurization Auto-Manual Switch to manual prior to landing. Use the Up/Dn Manual Control Switch to raise the cabin altitude to field elevation. If landing at or above 9,500 feet pressure altitude, turn off the Bleed Air Switches to prevent emergency airflow.

A4.5. (Added) Landing. Follow normal landing procedures. At touchdown, expect the primary outflow valve to fully open and dump any remaining pressure. During the After Landing Checklist, turn the Cabin Air Switch off in the normal sequence. The Cabin Safety Valve will open, and further ensure that the cabin is unpressurized before opening the door.

Attachment 5 (Added)

375 OG IFR DEPARTURE FLOWCHART



Attachment 6 (Added)

C-21A FUEL CONSERVATION GUIDE

A6.1. (Added) Purpose. The primary purpose of this guide is obviously fuel savings. Admittedly, the C-21 is a fuel-efficient aircraft and mission restrictions preclude implementation of fuel savings techniques on each mission segment. The amount of fuel we can save is small when compared to larger aircraft in the Air Force inventory; however, each little bit helps. Although the C-21 is your current assignment, the fuel conservation mindset you develop here will carry over to other aircraft where fuel saving techniques pay bigger dividends. Knowledge of these techniques will also prove invaluable on a minimum fuel diversion where saving fuel is essential. Remember that safety and mission accomplishment always eclipse fuel savings as priorities. You should, however, make every effort to conserve when possible.

A6.2. (Added) Flight Planning.

A6.2.1. (Added) The basic rule is that it costs fuel to carry fuel. Carrying extra fuel results in: (1) increased takeoff and climb fuel, and (2) lower cruise ceiling and resultant higher fuel burn. This increased fuel usage requires additional fuel required for holding and an alternate that affects fuel load. As a rule of thumb, you will burn 3 percent of the extra fuel you carry per hour. For a C-21 containing 1,000 pounds of extra fuel, 60 pounds will be used on a 2-hour sortie and approximately 120 pounds will be used on a 4-hour flight. Our computer flight plans provide a required ramp fuel load that is essentially the minimum fuel required for the sortie. Theoretically, any fuel carried beyond the required is excess weight. It is important to remember what the required ramp fuel consists of and what it fails to consider when making fuel conscious decisions. Required ramp fuel consists of: en route fuel, reserve fuel (if required), approach and missed approach fuel (if required), holding fuel, approach and landing fuel, and any identified extra fuel. Remember to take into account fuel you may need for weather deviations and fuel ATC may cost you by delaying an immediate climb to your cruising altitude. The point here is that "Wings and Tips" fuel planning mentality is normally excessive. Take an extra minute or two and evaluate how much fuel you actually need to safely accomplish your mission to avoid hauling extra ballast around the country. The computer flight plans that we receive are optimized for forecast winds, aircraft performance, airspace structure, and user inputs. Recognize that optimum routing (both fuel and time) may not be the most direct routing due to winds aloft. The suggestion here is that you should file and fly the CFP as closely as possible, both in altitude and route. This method will not only allow you to use the winds to your advantage, but also allows accurate comparisons between actual and computed fuel usage.

A6.3. (Added) In-Flight Operations.

A6.3.1. (Added) Altitude and cruise speeds are the two factors, which have the greatest affect on your fuel burn at altitude. The greatest potential for fuel savings exists here, since the majority of time is spent at cruise. Climbing to higher altitudes yields the advantages of more NMs per pound of fuel and a longer time on the descent profile. Referring to the C-21 Specific Range Chart, the maximum NMs per pound of fuel varies with aircraft weight. At 18,000 pounds, maximum specific range occurs at approximately FL390, and by 12,000 pounds, maximum specific range occurs at FL450. **NOTE:** At 12,000 pounds, the C-21 burns almost 36 percent less fuel per mile demonstrating how excess weight diminishes fuel economy. The Specific Range Chart is based upon ISA temperatures at altitude and variations from ISA will correspondingly affect the optimal cruise altitude. Temperatures above ISA will lower the optimal altitude (by approximately 2,000 feet for ISA+15), while cooler temperatures will increase optimal cruise altitude (by approximately 1,000 feet for ISA-15). As a general rule, it is always better to climb if all things are

equal. Achieving a higher cruise altitude even for a few minutes will save fuel. The fuel spent climbing will be more than offset by a lower fuel burn at the new altitude and the longer en route descent.

A6.3.2. (Added) The selection of cruise speed is another important decision you can make regarding fuel conservation during the en route phase. Take for example the typical missions flown at FL390 and ISA Temperature for a gross weight of 15,500 pounds displayed in **Table A6.1. (Added)** You can easily see that considerable fuel savings exist through the use of long-range cruise profiles, while significant fuel penalties occur by flying a high-speed profile. **NOTE:** The mission en route time varies by only a few minutes depending upon the profile flown. The point here is that fuel savings can be significant while the time differences in the profiles are minimal. Remember that your long-range cruise speed varies with weight. Therefore, it is important to update your cruise speed as weight changes. As always, keep in mind DV requirements and mission impact when planning the profile to fly.

Table A6.1. (Added) Fuel Savings Example.

		400 NM Cruise Leg	800 NM Cruise Leg
Normal Cruise	En route Time	0+56	1+52
	Fuel Burn	1051 pounds	2102 pounds
Long Range	En route Time	0+59	1+58
	Fuel Burn	1003 pounds	2006 pounds
	Fuel Saved	5 percent	5 percent
High-Speed Cruise	En route Time	0+53	1+46
	Fuel Burn	1170 pounds	2342 pounds
	Fuel Wasted	11 percent	11 percent

A6.4. (Added) Descent, Approach, and Landing.

A6.4.1. (Added) Proper descent planning will also save fuel. It is most efficient to cover distance as high as possible and then make an idle power descent to landing. This approach, however, has practical limitations such as ATC speed and altitude requirements, weather, etc. The C-21A-1 Descent Performance Schedule provides a good no-wind plan for descent. In the real world, winds significantly affect your planning. Use the GPS for time to your destination and plan that you can easily achieve 2,000 feet/min descent between FL450 and FL310 and the 3,000 feet/min thereafter. For example, a descent from FL 390 to sea level should optimally begin about 15-minutes out from your destination. Using time is superior to the “Three Times Altitude” technique, since winds are accounted for. Consider whether or not you need to fly to the other side of the field for the approach and take that into account when deciding on a descent point. Plan to accomplish crossing restrictions with an idle power descent arriving at the fix no earlier than 10 NM prior if practical.

A6.4.2. (Added) Approach and landing fuel can also be minimized by prior planning. The big factors in regard to this phase of flight are time-configured and time spent at low altitude. Consider that fuel flow configured is approximately 50 to 60 percent greater than clean. Therefore, configuring closer to the FAF is advantageous. Do not delay configuring to the point of being unsafe or causing a missed approach. The miss will cost you more fuel than the extra mile dirty. A visual approach can save time and fuel if weather and conditions permit. Plan your approach and landing to a runway that will minimize taxi distance if practical.

A6.5. (Added) As a final word, fuel conservation should always be a consideration. Always ensure enough fuel is available for planned flight time with appropriate reserves. Never put yourself in a position where a lack of fuel forces you to make a bad decision or cause unnecessary disruption to the mission.

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