Mission Check Pilot Checkout (F91)

Candidate Guide

The contents of this guide are unofficial non-mandatory guidance that do not replace procedures and standards from official sources such as the CAP regulations, CAP guidance, the airplane's POH, other Cessna and Garmin applicable documents, and FAA sources. This guide also does not dictate test standards. Use only as advisory for training purposes.

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Introduction

This guide is meant to make the mission pilot checkout, usually affectionately abbreviated by the number of the form (form 91 or F91), less scary. This document is especially meant for initial candidates who have not previously experienced a F91 and are wondering what it is like. This document is not going to tell you all the secrets to pass. There is no substitute for good judgment, airmanship, planning, workload management, and all other skills the F91 is looking for. This document also does not supersede civil air patrol (CAP) regulations, whether from NHQ, pacific region, or CA wing (CAWG). It also doesn't supersede FAA regulations and airplane manufacturer guidance. Also, bear in mind that many items are up to your evaluator's discretion, and certainly the order and to some degree the manner tasks are evaluated depend on your local area, airplane, and circumstances. So please ask your evaluator for guidance if you have questions. There many ways to conduct a F91, but the standards are the same.

There are instructional materials online that can help but remember that these are not necessarily the most up to date so always look for the most recent material. CAWG organizes two MP/MO ground schools per year, one north and one south, which have a wealth of presentation slides and other great information. Here are some other ones to use in your study:

- MP task guide: Published by NHQ. It outlines completion standards for each task required towards MP, as well as a summary of the knowledge required so it is a great reference tool.
- CAPR 70-1 and CAWG supplement to 70-1: The outline CAP regulations regarding flight.
- NESA training material: There is a wealth of information here for all aircrew. There is a set of slides for MP training as well as reference text that is perhaps the most relevant, but you can also find training material for APs, difference GPS units such as the G1000, worksheets for aircrew to fill out before and during flight, as well as training flight curriculum.
- AP for aircrew: This is a great and succinct guide on how to fly different patterns relevant to airborne photography missions.
- Aircrew reference guide: Not an official guide but contains many useful resources and reference material. Suitable for the cockpit.

This guide is not regulation and therefore is not binding for anyone, nor is it dictating test standards. It is simply meant to capture common practices currently. This guide begins with general information in the first section. In the second section, we examine each task in the F91 individually.

General Information

Eligibility and Prerequisites

For initial candidates, typically a F91 is the last item in your MP SQTR to be completed. That is, you should be a MP-T with all other tasks completed. This means that you should satisfy all prerequisites, have commander's approval, have completed all familiarization and preparatory training to make you MP-T, have completed all advanced tasks, and finally have two exercise participation signoffs. Please refer to eservices for the latest SQTR. You can find this at eServices -> emergency services (on the left) -> click on entry/view worksheet -> and select MP from the drop down menu.

Emergency Services
101 Card
SQTRs
   Entry/View Worksheet ⬅
   Print Blank Worksheets
   Multi Entry
Skill Evaluator
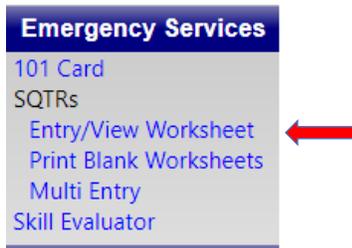
Please complete your SQTR items well before your F91 evaluation flight. Some signoffs require finding a mentor or your commander to approve. Also, other signoffs such as IS100, IS200, and IS700 are online courses that generate certificates, but those certificates are not generated instantly and in fact may take a few days. In addition, you must complete the CAPT 116 online exam. This is only done once, so for renewal F91s you need not worry. Also, for MP renewals the F91 is the one and only required SQTR item currently.

Currently, CAWG organizes mission aircrew school (MAS) that is how many MPs and MOs get qualified. In addition, some members have qualified as MP or MO through the the national emergency services academy (NESA). However, each of these happens only once a year and typically in the summer. They are not the only way. As long as you find a willing MP skills evaluator (SET), they can train you and help you with signoffs. However, there is usually no available funding for MP training outside of MAS or NESA, so if you find a MP SET you will likely have to self-fund your training flights.

For all F91s, the candidate must be able to legally act as PIC. That means that they must satisfy all FAA and CAP requirements, such as a valid F5 in the aircraft to be flown. The one possible exception to this is a combined F5/F91 evaluation flight. Combined F5/F91s are possible, but they make for a long day, especially if additional qualifications such as MFC and instrument endorsements are to be renewed. One particular example of a F5/F91 with MFC and instrument lasted 2.5 hours on the ground and a slightly less than three hours in the air. Long evaluations raise concerns for fatigue and can cause failures. If you are interested in a combined F5/F91, please coordinate with your evaluator in advance also to make sure they are qualified for both. It is usually preferable to complete your F91 before your F5 expires and then renew your F5 separately.

G1000 or Not?
F91s do not have G1000 endorsements or are specific to a make and model. If you pass a F91, it carries over to all other aircraft you are qualified to fly in CAP. Therefore, choose an aircraft and avionics package that you are the most comfortable in.

The Actual Form 91
Your first task is to download the F91 and read it carefully. It only has two pages but everything on it is important. Below are snapshots from the December 2017 version, which the latest as of today. When preparing for your evaluation flight, you are expected to print a F91 and fill out all information that you can. This is everything before section 1 (oral discussion) and yes this does include your ICUT date. A

great way to disappoint your evaluator when first meeting them is to leave fields black or have prepared an obsolete version of the F91.

Page 1

CAP MISSION PILOT CHECKOUT			DATE OF FLIGHT CHECK:		
MEMBER'S NAME (print or type)	CAPID	CHARTER NO.	ICUT DATE		CAPF 5 ANNUAL DATE

I. ORAL DISCUSSION
- A. CAPT 116 Witten Exam Passed (initial only) ☐
- B. Mission Base Procedures (Sign In, Flight Plans, Reimbursement Forms) ☐
- C. Air-to-ground Signals ☐
- D. Mission Safety Principles ☐
- E. CAP Radio Procedures (as req) ☐
- F. Individual & Crew Equipment/Clothing ☐
- G. Search Procedures ☐
- H. Map and Chart Reading ☐

II. PREFLIGHT PLANNING
- A. Determine Performance Limitations ☐
- B. Obtain Mission Briefing ☐
- C. Gridded Sectional ☐
- D. Observer Briefing ☐
- E. Fuel Planning & Reserve ☐
- F. Ground Team Coordination ☐

III. VISUAL SEARCH PATTERNS & PROC
- A. Locate Grid or Area (without electronic aids) ☐
- B. Establish Search Altitudes ☐
- C. Grid Search Patterns ☐
- D. Creeping Line Search Procedures ☐
- E. Expanding Square or Sector Search ☐
- F. DAART System Procedures ☐
- G. Airborne Photographer Procedures ☐

IV. ELECTRONIC SEARCH PATT & PROC
- A. Locate Starting Point (with & without elec aids) ☐
- B. Establish Appropriate Search Altitudes ☐
- C. VHF-DF Procedures ☐
- D. Wing Null Procedures ☐
- E. Aural (build-fade) Procedures ☐

V. MOUNTAINOUS TERRAIN PROCEDURES
- A. Locate Grid/Area (with &without elec nav aid) ☐
- B. Establish Search Altitude ☐
- C. Contour Search Procedures ☐
- D. Canyon Search Procedures ☐
- E. Ridge Crossing Procedures ☐
- F. Communication Procedures ☐
- G. Wind/Updrafts/Downdrafts ☐
- H. Mountain Wave Effect ☐

VI. SAFETY AWARENESS
- A. Clearing and Collision Avoidance ☐
- B. Vigilance ☐
- C. Cockpit Resource Management ☐
- D. Risk Management ☐
- E. Judgment ☐

I certify that I have administered a CAP mission pilot flight check as indicated and that the above named member (evaluator initials blanks):

___☐___ Has demonstrated proficiency required to fly as a mission pilot, see comments below.

___☐___ Has demonstrated proficiency required to fly as a mission check pilot, see comments below.

___☐___ Is not qualified, requires additional training and recheck. See comments below.

COMMENTS

DATE	FLIGHT TIME	EVALUATOR'S NAME & GRADE	EVALUATOR CAPID	EVALUATOR'S SIGNATURE

CAP FORM 91, DEC 17   Previous Editions Will Not Be Used   OPR/ROUTING: DOV

The first page contains yours and your evaluator's information, as well as the date and flight time. There is a rather sizable field for comments. The primary use of this comments field is to explain any items that were unsatisfactory. However, even in satisfactory evaluations some evaluators point out some really good things you did, others clearly state whether you passed or not, and others do not use it at all.

Above the comments field is the overall recommendation. That can be two flavors of satisfactory (mission pilot or mission check pilot), or an unsatisfactory. Being evaluated for a mission check pilot carries additional requirements such as 25 sorties, instructing and evaluating maneuvers, prior CAWG approval, as well as online and in-person national check pilot standardization course attendance (in CAWG). Therefore, if you are being evaluated for a mission check pilot you would know. In case of an unsatisfactory evaluation, the evaluator will explain what items were unsatisfactory, report it to CAWG, and work with you and CAWG to formulate a training plan. Often times, this is as simple as practicing a few tasks and asking for another evaluation flight. Many great mission pilots have had unsatisfactory evaluations, so this is by no means measure of future success.

Finally, the first page contains a list of all tasks. Each task can be marked S, U, V, or N/A. "S" means satisfactory completion of the specific task. This means that you completed the task in the air, or it's an item in the oral discussion that you completed satisfactorily. Hopefully you will see many "S" marks in your F91. "V" means that something was completed verbally. For example, this can be used to discuss on how you would prosecute a practice beacon instead of actually doing it in the air. "N/A" means that something does not apply. For instance, you can't be evaluated in DAART without appropriate equipment. In addition, some mountain flying tasks do not apply to candidates that are not mountain flying qualified from a mountain flying clinic (MFC). Finally, any tasks that were unsatisfactory are marked with a "U" to make it clear what item should be repeated and were weaknesses lie. Every task should be filled out with one of these four completion marks.

It is up to your evaluator what will be accomplished with actual flying and what verbally. This is a discussion you should have in advance so there are no surprises. You should expect most or all flying items to be completed in the air. Sometimes when evaluators have seen candidates in previous missions or are confident of their experience, they may instead complete items verbally such as prosecuting a practice beacon or AP procedures. There is currently no written guidance on a minimum set of tasks that have to be completed in the air.

INSTRUCTION PAGE FOR CAP MISSION PILOT CHECKOUT

These instructions specify how to fill out the CAPF 91. CAPR 70-1 and CAPR 60-3 requires specific actions and steps to be taken for the successful completion of a CAPF 91 flight check.

All items for the appropriate type check must be completed indicating S – Satisfactory, U – Unsatisfactory or V – Verbally briefed. Items or maneuvers not applicable to certain checks (such as DAART or Airborne Photographer) are marked as N/A. Pilots are evaluated on their ability to satisfactorily perform the tasks assigned, knowledge of procedures and judgment. Failure to meet the standards of performance for any task performed will result in an unsatisfactory evaluation.

MISSION CHECK RIDE PROCEDURE

The applicant for a CAPF 91 check ride should bring the following materials for review by the mission check pilot:

1. Evidence of current CAPF 5 valid for the aircraft used for the mission flight check.
2. Evidence to show completion of initial mission pilot qualification training requirements (CAPF 101 or MP-SQTR).
3. CAPF 91 with identifying data entered.
4. Valid FAA pilot certificate and current FAA medical certificate.
5. If applicable, CAP radio operator's permit and/or FCC restricted radiotelephone permit.

The mission check pilot will review all materials and conduct the CAPF 91. All forms will be returned to the applicant at the conclusion of the check ride for further distribution and entry into the CAP Pilot Ops Qual system.

The second page contains instructions that you should be familiar with. Importantly, it contains a list of items to bring with you to present to your evaluator. For choice of uniforms, please refer to applicable regulations from NHQ or CAWG. Currently, any authorized uniform is allowed, but most candidates and evaluators prefer the green USAF-style flight suit or the blue corporate CAP flight suit. Whatever you choose, you must wear it correctly. So please study what the requirements are for the uniform you choose to wear in your evaluation flight or really any time you wear that uniform.

Before the F91 Evaluation Flight

Your first task is to find an evaluator. You can use CAWG's online tool or Pacific region's online tools (also mobile friendly) to locate nearby evaluators. Ask early and ask often. Many evaluators get many requests especially around summertime and their volunteer time may be limited. Don't be picky otherwise if you ask a subset of available evaluators it may be a while until you find someone. Upon initial contact, you should agree on a date, time, and a location with your evaluator. Expect to have to drive or fly to them if necessary. They will also expect you to create a sortie and find a flight release officer on your own. You may be eligible for a funded evaluation ride depending on rules and available funding of that year.

Your evaluator will provide you with a scenario and their flying weight. If not, ask for it. Typically, these scenarios provide information about a missing airplane and then ask you to plan a flight to maximize the probability of detection while doing so safely and following regulations. This is somewhat different than what can happen in an actual mission where base staff may ask you to fly a specific search pattern, i.e., do some of the planning process for you. In a F91, you are expected to demonstrate that you can make

use of available information and utilize any of the tools and search patterns you were taught efficiently. In addition, you are expected to prepare the sortie and all preflight planning on your own and to sufficient detail to prove that this flight is safe and has a high probability of detection for the circumstances. The sortie should be completely filled out, no blanks, with a weight and balance, takeoff and landing distance calculation, and ORM done. In an actual mission, planning and sortie creation is done jointly with the rest of your crew.

Here is one example of a scenario with an example grid number, which by no means represents them all: We are asked to locate a missing blue and white Cessna 172 with a tail number of N738PC. The airplane departed KLVK at 3:30pm yesterday headed approximately NE. It fell off radar approximately 5nm after departure. Initially, we are assigned to search grid SFO-245C.

As given, the above scenario gives you some context and then assigns you a grid. Your job at this point is to plan for the provided information, which means search the grid. This hints to a parallel search but depending on the grid it may not be that simple. First, you should locate the four corners of the grid using no electronic aids (more on that later). Then you should box the grid at a safe altitude. Then, you should use whatever combination of search patterns appropriate to maximize the probability of detection. In a flat grid this can be a single parallel search at 1000 AGL. However, what happens if there is sloping terrain? Do you want to perform multiple parallel searches, a combination of parallel and other searchers such as contour, or perhaps a single parallel search with changing altitudes?

During the course of the F91 or before, you will be given more information to point you to other search patterns. For instance, you may be told that the missing airplane was in fact headed to O83. This can point you to a route or creeping line search. Or, you may be told that there were reports of an ELT over Dublin at 5000 feet. Finally, you may be given a target for airborne photography with desired photo configurations that will point to specific photo flight profiles.

Risk planning and mitigation is a big factor of all preflight planning, and this is no exception. Real or simulated factors may pose risks. Your job is to identify them and mitigate them satisfactorily such that the flight can be completed safely. Remember that you don't have to complete a flight you don't feel comfortable with.

Many experienced evaluators can tell if a candidate is likely to succeed based on how well they prepare before they show up. Don't leave anything to chance. Planning an efficient flight but forgetting to calculate fuel requirements is not good planning. Neither is ignoring current weather when planning because that may invalidate some of the search patterns you wanted to fly.

During the F91 Evaluation Flight

On the Ground

If you can't arrive on time, arrive early. If your evaluator has told you that it's ok, prepare the plane by completing the preflight check and obtain a complete weather briefing before your evaluator arrives. Also, be in appropriate uniform. That means, be in a uniform that is approved for the flight according to current CAP regulations. Currently, any CAP uniform is approved for funded missions though most

candidates prefer the green USAF-style flight suit or the blue corporate flight suit. Any uniform you choose to wear, <u>wear it correctly</u> according to <u>regulations</u>. Otherwise, similar to a real mission, you may be turned away if you cannot correct uniform discrepancies.

Unfortunately, the most popular choice, the green USAF-style flight suit is also the one most likely to be worn incorrectly. Remember that currently the U.S. flag, grade patches (unless the member has no grade, is an NCO or a cadet), CAP emblem, and name patches are all mandatory. You must wear a black t-shirt underneath, with the zipper no lower than the middle of your name tag. When outdoors and not in a flight line a flight cap must be worn. Last but not least, USAF-style uniforms come with weight and grooming standards. These are part of the agreement that lets us wear USAF-style uniform partly because the public views us as the same as any other USAF member. If we do not respect that the privilege of wearing USAF-style uniforms may be taken away.

Initially, you will provide your documents to your evaluator who will verify eligibility and that everything is in order. The next step is the oral discussion that will accomplish the required items in any order. The oral discussion is not a memory test, but the evaluator has to verify that you meet the standards, have prepared adequately, and have all information necessary with you to complete the flight. For instance, when discussing air-to-ground signals, evaluators may provide you with a scenario and ask you what signals you'll use. In that case, it is acceptable to refer to documents that you have with you in the cockpit. However, knowledge that you may require in the cockpit on a short notice, such as the minimum altitude above ground per CAP regulations, should be memorized.

Questions in the oral can be asked directly but can also be phrased as part of a scenario that requires you to apply knowledge instead of simply reciting it. The items you will accomplish during the oral are everything in sections 1 and 2 at a minimum. Frequently, evaluators choose some items in other sections and accomplish them verbally (marking them with a "V"), but that depends on whether this is an initial F91, if the evaluator has seen you perform tasks before, the weather, location, and many other factors. For instance, sometimes a candidate in a renewal has flown many ELT missions and a practice beacon that day could not be arranged. In that case, your evaluator could complete some tasks in section 4 verbally. You should coordinate this with your evaluator in advance.

Most candidates are well prepared and therefore do not have a hard time during the oral. Do not underestimate it and become the exception.

The Flight

Be sure to ask your evaluator what role he or she is simulating during the flight. This is critical. Most evaluators pretend to be trainee mission observers (MOs) in their first flight. That is, they will carry out instructions that are provided to them clearly but will not take any initiative. For instance, you can ask them to read the checklist or tune a COM frequency, but they will not let you know that you entered the grid coordinates incorrectly. They will not fix your mistakes but are there for you to delegate tasks. If they want clarification, such as which checklist you'd like read, they will ask you. If you simply ask them to "read the checklist" without prior coordination, they may start reading performance charts.

Since the evaluator is part of your crew, this is partly how you demonstrate proper crew resource management. In addition, you must brief your evaluator both on the ground and in the cockpit as you

would a trainee MO on their first flight. Use an appropriate checklist (such as this or the one in CAP-approved aircraft checklists) for your briefing as you would to accomplish airplane tasks. Also, be sure to check in with your crew during flight to make sure they are feeling well. Also remember that cockpit resource management is more than just handling your crew, it also involves using available resources inside and outside of the cockpit to best accomplish your mission. This includes avionics, ATC, tablets, charts, and others.

F91s typically have a two-person crew: The candidate as MP and the evaluator as MO. Therefore, the only crewmember who would be scanning is the MO and therefore you should plan to make turns to the right for example in an expanding square and to put the area to be scanned to the right. This is different than if you had a mission scanner (MS) or an airborne photographer (AP) because they usually sit to the left. Plan your search patterns to match your crew. That said, there is nothing that precludes someone else to fly as an MS during a F91. This can make the F91 more realistic and can be a good experience for the scanner.

While in flight you will demonstrate specific tasks to specific standards, the entire flight is a demonstration of good judgment, risk management, airmanship, and collision avoidance. While takeoffs and landings do not appear in the F91, scaring your evaluator and landing unsafely shows that you cannot complete this flight safely, and therefore is grounds for failure or even F5 suspension. Also, your evaluator is not in the business of tricking you. Therefore, they will not intentionally ask you to perform something unsafe of illegal to gauge your reaction. However, if this happens, do not perform anything that makes you uncomfortable or would violate a regulation. Instead, you can express your concerns or refuse like you would to mission base in an actual mission. In that case, the tasking may change, or you can discuss with your evaluator after the flight. The same applies to ATC, similar to any other flight.

Most evaluators will speak up if a task was not satisfactory. Therefore, you can assume that no news is good news. Even if a task was not satisfactory, you can ask your evaluator to allow you to continue the flight so you can perform the rest of the tasks. This makes your second evaluation much easier and you can better focus your remedial training. Also, some evaluators appreciate when candidates realize their own mistakes. Similar to an actual flight, if you exceeded tolerances during a particular task or didn't set up the flight plan in the flight management system correctly, it demonstrates good judgment and professionalism to say "That was not correct. I'll fly away, set it up again, and retry".

After the F91 Evaluation Flight

Passing your F91 is hardly an excuse for causing damage to the airplane or hangar. So make sure you secure the airplane safely as you would after any flight. Remember NHQ's postflight checklist. You are also expected to close out your sortie and deal with finances if the sortie was funded within the time limits specified in regulations. Remember to demonstrate that you truly deserved to pass by completing the debrief section of the sortie in detail.

If you don't upload your F91, it didn't happen. You should go to eServices -> pilot -> CAPF 91. There, you first upload a scanned PDF of your F91 in "view/upload documents". Also email your evaluator a copy

for their record. Then, you should enter the date, check pilot, and click the submit button at the bottom. This will then be validated by your chain of command before it appears as completed in eServices.
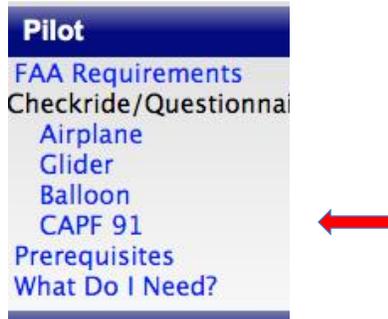
Mountain Flying Clinic (MFC)

CAWG holds two MFCs per year, one north and one south. Because of the amount of training that in turns limits available student spots, they are meant for qualified MPs with mission experience already to let them conduct search and rescue operations above density altitudes and other considerations specified in CAWG's supplement to 70-1 (currently density altitude above 7,500 feet). MFCs consist of a number of training flights leading to an abbreviated F91 that focuses on the mountain specific items, typically performed in an actual mountainous grid. Many say this is the most fun they have had training in CAP and it is a great way to build skills. There are some online training material available as well as summary documents.

If you are initial F91 applicant, this does not apply to you. However, some tasks in section 5 such as a contour search may still be expected. Ask your evaluator in advance. If you are renewing your F91 and are already MFC qualified, tell your evaluator so that they can plan accordingly and to make sure they are qualified to renew your MFC qualification. MFC is an ES rating so after your F91 you should renew that as well.

Individual Task Guidance

This section provides some comments on each task in the F91. This is by no means a complete guide but rather a discussion of what to consider and more information for what the task refers to.

Oral Discussion

This section is completed on the ground before the flight. It is meant for tasks that do not necessarily relate to the specific flight to be conducted, but rather other necessary knowledge for an MP. Remember that CAPR 70-1 (including CAWG supplements) is always relevant, especially as it related to MP operations.

CAPT 116 Written Exam Passed

This only applies to initial applicants. Make sure you bring with you or email in advance your completion certificate for the CAPT 116 online exam.

Mission Base Procedures

This task checks your understanding of how a typical mission base operates. You should be familiar with key base staff personnel as well as whom you should talk to and in which order in order to complete your flight. Examples include: What is the role of the mission safety officer? Who is in command? Who is the first person you talk to when you walk in? Who releases your flight? Who provides you with taskings? Who completes your electronic form 104? Is there a mandatory large briefing? Other questions that relate to how to perform a remote launch if the mission base is remote are also in scope.

Air-To-Ground Signals

This task asks you to communicate with a ground team in the event that you do not have radio communication. You should be familiar with air-to-ground signals that help guide ground teams through streets for example by having them turn, dismount, and locate a crash site. In addition, you should be familiar with signals that acknowledge messages that the ground team provides, such as yes and no. This task is a great example of information that you are allowed to refer to instead of memorizing, as long as those references are with you in the cockpit and are reasonably accessible.

Mission Safety Principles

This task tests your understanding of typical hazards in a mission from start to finish. It is not limited to the flight itself, but it includes it. In addition, it is not just about keeping yourself safe but also your crew by making sure you communicate with them and check in with them every now and then. This task also includes what you should do if you spot anything unsafe. Hazards can be electrical hazards on mission base, the importance of following procedures and not rushing, trip hazards, hazards on the flight line, dehydration from heat, motion sickness in flight, and others. Finally, operational risk management (ORM) procedures are part of this analysis by not only identifying hazards, but also attaching a likelihood and level of severity to each in order to calculate risk.

CAP Radio Procedures

This refers to not only typical radio communications during the course of a flight, but also available communication means. For instance, you should be familiar with the two types of CAP FM frequencies (duplex and simplex), and when each is typically used. The same is true for VHF frequencies, which are typically used for air-to-air communication if at all. Communication means includes other equipment such as the Garmin InReach that CAWG airplanes contain. Knowledge of typical radio communication that is important for this task includes when to report ops normal to base, as well as what you should do if communications are lost.

Individual & Crew Equipment Clothing

If you show up in correct uniform, you already satisfy part of this task. However, you may get asked about other uniforms that you could fly missions in, how uniform requirements differ for your crew, and what are common uniform regulation violations. Such questions can include anything that is relevant but often focus on patches, insignia, and grooming standards.

Search Procedures

This covers not only search patterns that appear in the MP SQTR but not in the rest of the F91 (such as a route search), but also considerations such as what side of the airplane to search from, the tradeoffs of leg spacing and leg length, how to coordinate with your crew on when to rest their eyes, who keeps a log of the search operation and drawing of major elements in the grid, and what to do and how to

approach the grid before the first search pattern is flown. This discussion certainly includes risk versus effectiveness such as altitude above ground, as well as mitigating the risk for traffic collision. As you can tell, this task is rather broad because there are many elements to consider towards approaching a grid and conducting search patterns safely while also maximizing the probability of detection.

Map and Chart Reading

As obvious as this may sound, this task is about correctly interpreting maps, charts, and other publications that relate to missions. This does not only refer to aviation related charts such as sectionals and gridded sectionals. You may get asked to guide to a simulated ground team using a street or topological map, for example.

Preflight Planning

Preflight planning refers to items and preparation that relate to the specific flight that is being planned for this F91.

Determine Performance Limitations

This is not limited to takeoff and landing distance to determine the risk of operating from your planned airport(s). Pay particular attention to your planned grid. Example questions: If you are planning to change altitudes, how much time and distance will it take for the airplane in planned conditions and weight to climb? If you have to leave the grid because of weather moving in, is there a particular direction that you cannot outclimb the terrain? What throttle configuration do you expect to have to use, and therefore what fuel consumption, to keep 90 knots of ground speed? Finally, do not forget about the route to and from your grid, especially when it comes to terrain you have to fly over or how fast you can go if mission base would like to know how soon you can be over the target.

Obtain Mission Briefing

This task relates to receiving and asking for all relevant information that you would in an actual mission, including a weather briefing and other information that may be relevant such as equipment operating instructions. This task is partly accomplished in advance when your evaluator sends your tasking. However, do not assume that the tasking is complete because you may be expected to investigate or ask for more information. In addition, this task includes how and from whom you would receive a briefing in an actual mission or an exercise, including if you are launched remotely from mission base.

Gridded Sectional

For this task make sure you have a sectional with CAP grids. This sectional may be paper, whether the CAP grids are printed or hand drawn, or electronic in a tablet. Whichever method you choose, you must be able to read and understand the CAP grid system and have reliable access to the sectional in the cockpit.

Observer Briefing

Remember that your evaluator is acting as your MO. This means that you are expected to brief him or her both before entering the cockpit and afterwards. The former briefing focuses on the mission, weather, communications plan, filling out the appropriate forms, and all other information that you want your crew to know before you leave mission base. Your briefing inside the cockpit, similar to how

you brief any passengers, focuses on CRM (who does what), operating airplane equipment, speaking up if feeling unwell, location of the emergency checklist, emergency egress, sterile cockpit, use of seatbelts, scanning for traffic, and everything else you would like your crew to know. Remember to refer to a briefing checklist such as the one in CAP-approved aircraft checklists or other examples.

Fuel Planning & Reserve

You should know how many gallons of fuel you have to have on board before launching in order to complete all expected taskings, land at an airport, plus the required reserves by regulation. You may also be asked in the air how much time you have remaining, or if you can accept additional tasking. Also be mindful of landing weights in case you cannot land right after launching.

Ground Team Coordination

For this task you can get asked to outline how you would guide a UDF team towards the location you identified for an ELT. This includes latitude and longitude format, street maps, what frequencies to use, how to visually identify a CAP vehicle and members, how ground team members may be trying to visually attract your attention, and how you may ask as a communication relay if they cannot reach base directly.

Visual Search Patterns & Proc

These tasks are meant to be completed in the air and focus on visual search patterns applicable to search and rescue (SAR) and AP operations.

Locate Grid or Area (Without Electronic Aids)

This is perhaps the most famous task of a F91 largely due to the reaction from candidates when they first learn that they have to complete it. The objective is to locate the four corners of the assigned grid without any electronic aids to navigation from takeoff until your evaluator declares this task complete. Anything that is electronic and aids in navigating or locating the grid is not allowed. That includes VORs. This means, that the airplane's navigation maps must be hidden as well as any navigational information such as nearby waypoints. Also, having a tablet with GPS enabled is also not allowed. Really the typical list of tools is: a stopwatch, charts or maps (paper or in most cases electronic in a tablet with GPS disabled), and the windshield. You should plan to box the entire grid (all four corners) from takeoff without electronic aids to navigation.

This is where preflight planning shines. Depending on grid features and your familiarity with the area, you can use a combination of pilotage and dead reckoning to complete this task. However, nothing restricts you to using only one method. Redundancy is helpful. Therefore, you can use dead reckoning for the entire duration and identify as many landmarks as you can en route and in the grid as a means to cross check. The very least, after finding the first corner, you can use heading (with wind correction) and timing to identify the other three corners.
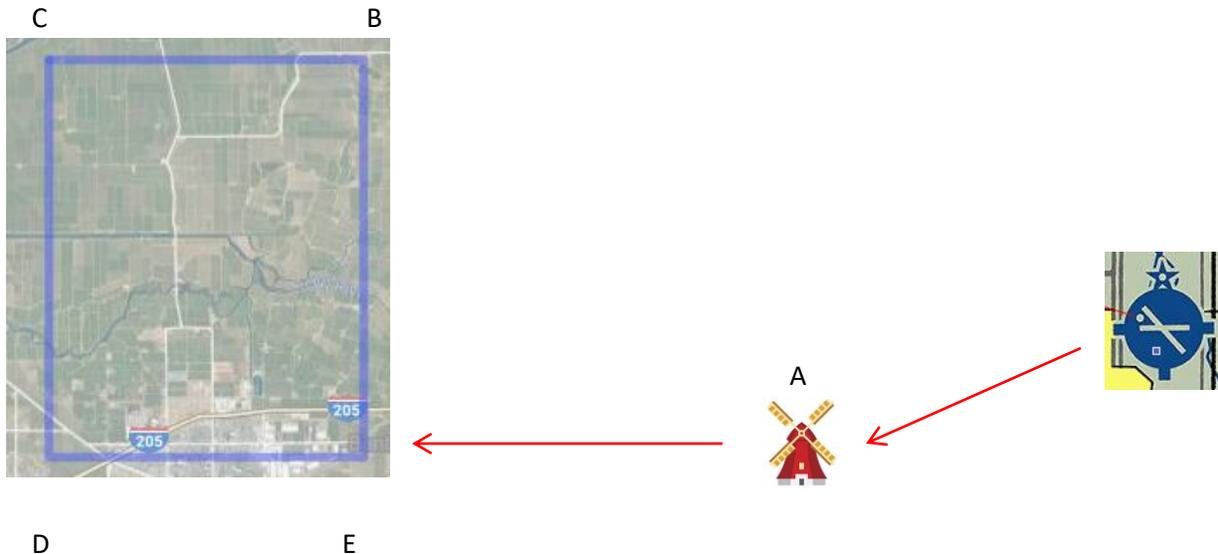
In the above example, our pilot arrives from the east. Between corners B and E, he or she chooses E because it has more visual landmarks. To make identification easier, he or she identifies a prominent landmark (A) that is due east of corner E. Navigation from A to E uses both pilotage and dead reckoning. Once our pilot identifies corner E, he or she continues west to corner D that is identified by time/distance as well as visually (road shape and highway intersection). Corner C is more challenging due to a lack of terrain features but heading/timing works well. In a good visual day, the road that parallels the north grid corner that is by corner B is visible from corner C to help identification of both C and B.

How much accuracy? It's hard to attach specific numbers but perfection is not expected. But even if you are not right on, remember that it is equally important that your preparation and method to complete the task are good and you communicate that to your evaluator.

Why is this task part of the F91? One view is that it prepares us to complete missions even if our navigation equipment acts up. While that is true, a large value of this task is developing pilotage, dead reckoning, and looking outside the windshield that we do not usually these days.

Establish Search Altitudes
This task spans across others in this section. To complete it, you should demonstrate proper decision-making and planning in choosing the altitude to box the grid and then perform each visual search. While this is straightforward in a flat grid, what if there is a 1000 feet elevation rise from east to west? Do you perform a parallel search at 1000 AGL from the highest point and sacrifice probability of detection at the lower parts of the grid, do you plan for a combination of search patterns each one at different altitudes, or do you change altitudes before or during each leg? The tradeoff here is safety of flight versus probability of detection. Usually there are no strictly right or wrong answers, as long as you realize the hazards and tradeoffs, and reach reasonable decisions.

Grid Search Patterns
This task refers to a parallel search in order to efficiently search the grid. Typically, you choose the parameters of the search such as starting corner, orientation, and leg spacing. Remember to make

reasonable choices with safety of flight and probability of detection in mind and be prepared to explain your choices. Search patterns are typically flown at 90 knots <u>ground speed</u>. The reason for ground speed is because that is what determines how quickly the ground moves and therefore how well the scanner can scan. That, however, should not jeopardize safety of flight because the stronger the tail wind, the slowest the true airspeed required to achieve 90 knots ground speed. Also, remember to take wind into account when making turns from one leg to the other, and don't fall into a common trap in the G1000 that wants you to lead turns and therefore turn inside the grid before the leg is complete, reducing the quality of the visual scan. You can avoid this by hand flying or using the HDG or OBS in the G1000. If you are hand flying, you have to be reasonably accurate in airspeed control, altitude hold, and lateral navigation.

There are multiple ways to set up for this task, but most pilots choose the search and rescue package if they are flying a G1000 aircraft and one is available. Note that GTN 650s with upgraded software also have a search and rescue package. As always, crew coordination remains part of this task. You can remind your MO like you would a scanner when you are out of the grid so they can rest their eyes. Also check in with them to make sure they are doing well throughout.

Creeping Line Search Procedures

Sometimes you will be given all information necessary to perform a creeping line in advance, and other times that information will arrive as an inject in the air similar to when mission base passes on updated information. For instance, you may be told that new information arrived that our target aircraft was in fact flying from KLVK to O88 and disappeared shortly after takeoff. This doesn't tell you explicitly to fly a creeping line, but you should be aware that a creeping line is best suited for that kind of a scenario.

Once you have the information, fly a creeping line with the method that you are most comfortable with. You will also typically be expected to pick the parameters that maximize the probability of detection while maintaining safety, just like any other search pattern.

Expanding Square or Sector Search

Both the expanding square and the sector search are point-based searches and are best used if there is a high-confidence last known point (LKP). Therefore, consider flying one of those if you are given an LKP. Which one? Remember that the two point-based searches are not equivalent. A sector search keeps returning to the LKP so it is a good choice if there is high confidence that the target is close to that. However, the sector search doesn't scan the exact LKP well (because it has the plane flying exactly over it at every leg). In addition, the sector search does not scan beyond the chosen leg lengths, whereas the expanding square can more easily continue to father distances and will only do so after scanning the area close to the LKP first.

DAART System Procedures

Currently, use of DAART equipment in CAWG is impractical due to the lack of appropriate communication systems, so most F91s do not include this task. Confirm with your evaluator in case this changes by the time you take your F91.

Airborne Photography Procedures

AP constitutes a large number of our actual taskings therefore this task is important. Typically, you will be given a target and photo parameters that fit one of the [AP flight patterns](#). Often times photographers

ask for a 45-degree angle from the plane to the target. This means that your distance from the target should match your altitude above ground, typically 1000 feet. It is important to fly smoothly and maintain wings level when the picture is about to be taken. Remember to demonstrate proper crew coordination by receiving feedback from your AP on how to fly as well as after photos are taken to make sure they are good and do not have to be repeated. Also remember that targets should be placed on the same side as the window in the back seats that APs open to take pictures.

Electronic Search Patt & Proc

Your evaluator may arrange for a practice beacon in advance and provide you with information similar to an actual mission. If a practice beacon is not practical, some of the tasks below may be accomplished verbally by describing how you would complete the task in the air.

Locate Starting Point (With & Without Elec Aids)

Your evaluator will provide you with some information to guide you towards a location where you can pick up the practice beacon. Similar to actual missions, that information may be vague. For instance, you may be told that another airplane picked up the practice beacon over the city of Dublin at 5000 feet. Using that information as well as weather conditions, airspace, and traffic, you are expected to locate the most prudent starting point for your search. In the event that you do not pick up the practice beacon at that location, you should expand your search to increase your chances of acquiring the signal.

Establish Appropriate Search Altitudes

Similarly to the previous task, you are expected to establish an altitude that is high enough to first acquire the signal, but is mindful of conditions. After acquiring the signal, this task includes how you adjust your altitude throughout the procedure to maximize the accuracy of the position that you report to base. Typically, this means that the last pass should be performed at 1000 feet AGL, but this depends on terrain and other factors.

VHF-DF Procedures

This task refers to the entire procedure from first acquiring the signal in order to locate the practice beacon with the highest accuracy. There are a few elements to this task: planning and executing efficient and safe flight paths, traffic and collision avoidance, detecting station passage, marking the suspected position and extracting coordinates from the aircraft's avionics, and proper CRM with your evaluator acting as a MO who you can ask to guide you by relaying information from on-board direction-finding equipment. Remember that your final deliverable is information that you can relay over the radio to a ground team. Therefore, pointing to an area to show your evaluator where you think the practice beacon does not suffice. Also, your reported coordinates should be as accurate as possible. UDF teams may have a hard time acquiring a signal even a few blocks from the beacon due to signal blockage.

If there is no practice beacon, this task can be accomplished either verbally or by tuning your direction-finding equipment to another frequency such as a nearby AWOS. The same is true for the next two tasks. Also, don't assume that the practice beacon is the same as what you trained with. Sometimes evaluators ask for practice beacons "half-mast" or batteries are weaker, therefore signals are in turn weaker.

Wing Null Procedures

Typically, on-board VHF radios (i.e., COM1 and COM2) are more sensitive than on-board direction-finding equipment. Therefore, it may be possible that you first acquire the signal on a VHF radio and have to perform a wing null procedure. Even if this is not the case, your evaluator will likely explicitly ask you to perform a wing null. Remember to make sure there is no traffic around and perform the wing null only if you feel it is safe. CRM is also important here because your MO can be helpful in marking the heading where you do not hear the signal anymore.

Aural (Build-Fade) Procedures

You may be asked to describe or perform this procedure either explicitly, or in response to a scenario such as simulated malfunctions of direction-finding equipment. In any case, the important element is gaining an understanding of the approximate direction that a signal is coming from without direction-finding equipment.

Mountainous Terrain Procedures

Except for contour search, the rest of the tasks apply only to MFC qualification. If you are looking to renew your MFC qualification, make sure to communicate that to your evaluator. MFC qualification rarely applies to initial F91 applicants.

Locate Grid/Area (With & Without Elec Nav Aid)

This task is similar to the one previously discussed, except it can be for a mountainous grid that MFC qualification is requires to conduct SAR operations over. Mountainous grids usually have fewer man-made landmarks so you should focus on terrain shape, lakes, and other aids.

Establish Search Altitude

This task is also similar to the aforementioned one, with the addition that a safe altitude that always allows for an assured escape from the grid if necessary is both important and less obvious. Mountainous terrain can have more of a slope, and also airplane performance is diminished making proper altitude usage more important. Choosing proper search altitudes applies to all SAR operations in the grid, not just the initial altitude.

Contour Search Procedures

This procedure is currently taught to all MP candidates in CAWG to prepare them to operate around hills and other low-altitude terrain. Please discuss with your evaluator whether and how you will be expected to demonstrate a contour search. If so, this task is a great opportunity to exercise judgment. For instance, the ridge you may be asked to search may wrap around or otherwise be shaped such that maintaining 1000 feet laterally may be hard. In that case, do the best you can while maintaining safety. The same is true if winds aloft are considerable or if you encounter considerable turbulence.

Canyon Search Procedures

This task contains two elements: searching a canyon and performing canyon turns. You may be asked to demonstrate any combination of those. In the case of searching a canyon, this can be accomplished with properly shaped terrain, even at low altitudes. Still, you must demonstrate safe execution and being

mindful of performance limitations of your aircraft. For canyon turns, any of the variations should be acceptable as long as it is properly and safely performed.

Ridge Crossing Procedures

This task involves judgment, weather considerations, and other factors when crossing a ridge in a typical CAP airplane at high density altitudes. It is important to be mindful of all potential hazards and cross the ridge such that the airplane can safely turn around if conditions such as winds are worse than anticipated.

Communication Procedures

This task refers to communication procedures specifically to mountainous operations. In remote mountainous terrain, especially when operating inside a canyon, there may be no repeaters in sight. Therefore, you are expected to number different ways to establish or regain communications with base in that situation. This can include procedures on communicating with a highbird if one is provided. Otherwise, you can describe how to use the Garmin InReach, use the VHF radio, establish alternate arrangements with base instead of the typical check in every half hour, regain altitude in order to reach the repeater, or any other procedure that will allow you to maintain communication with base.

Wind/Updrafts/Downdrafts

This task examines if you can predict the location and severity of updrafts and downdrafts, as well as how to safely exit one with the minimum altitude loss (or gain). Remember that it is usually favorable to turn towards low terrain when encountering a downdraft and fly at speeds faster than Vy in order to be subjected to the downdraft for shorter.

Mountain Wave Effect

This task includes how a mountain wave is formed, but more importantly where you expect one given current conditions, how to identify one in the air, how long mountain waves can extend for, how strong winds aloft can produce a mountain wave, and other factors that may affect flight safety when operating around mountains.

Safety Awareness

The tasks in this section span the entire evaluation flight and oral discussion, and you will likely not be directly asked to demonstrate any of them. Instead, your evaluator will be looking for the required elements throughout the other tasks you accomplish. As you can probably tell, these tasks are fundamental towards safely concluding any flight. The golden rule remains to not scare your evaluator.

Clearing and Collision Avoidance

Other airplanes do not know or care that you are being evaluated. The same is true for terrain. Therefore, never assume that no other traffic is around you. Make sure the area is clear before initiating maneuvers, especially more steep ones like wing nulls, look at the direction you are about to turn, and keep scanning for traffic no matter how busy you are inside the cockpit. You should remind your evaluator, acting as an MO, to help you with traffic avoidance, but remember that MOs and MSs may get busy with other duties such as scanning the ground, but the safe outcome of the flight is primarily responsibility of the MP.

Terrain avoidance becomes a factor when choosing altitudes to conduct operations, altitudes in transit, as well as workload management. It is never a good sign to fly towards terrain because the candidate is busy planning for the next procedure instead of looking ahead.

For both terrain and traffic avoidance, you should be familiar with cockpit resources such as onboard avionics and personal electronic flight bags to help your situational awareness.

Vigilance

This task refers to swiftly performing tasks and responding to outside information timely. This can be terrain alerts, ATC communications, inject information from your evaluator, but it can also be maintaining your instrument and traffic scan and maintaining your situational awareness. As you can tell, it is a rather broad task that captures being ahead of the airplane and always aware of the airplane's current location as well as what is coming next.

Cockpit Resource Management

CRM appears throughout the flight by dividing the work between you and your MO, finding a proper method to have your MO help you with the aircraft checklist, using your MO to maintain traffic and terrain avoidance, communicating with your crew for different phases of flight and what is expected of them in different SAR operations, and many others. However, notice that this task refers to the cockpit, not just crew. Cockpit resource management is broader because it includes ATC, electronic flight bags, charts and other publications, other equipment such as for direction finding, and more generally any resource available to you. The goal is to demonstrate that you can use and prioritize different resources effectively.

Risk Management

Risk management starts before the flight and ends when the airplane is secure in its parking location. Remember to not perform anything that makes the safe conclusion of the flight doubtful. This means not flying if conditions are bad, adjusting your plans before taking off, refusing any unsafe taskings that may be given in the air, cautiously approaching sloping terrain if winds are a factor, and others. Completing ORM in order for your sortie to be released is also part of this process.

Judgment

Judgment is related to risk management and is another important aspect. You may be placed in a situation where the task you are asked to do seems unsafe, but you are concerned that refusing it may look bad to your evaluator. If anything, evaluators tend to be impressed by good and safe judgment, and less appreciative of caving to pressure. Many times, the question is not if you will perform a task, but how. Perhaps the way (such as altitude or direction) you were asked you think is not safe, but you can come up with an alternative method. In that case, communicate your thoughts to your evaluator who is acting as mission base, who will likely really appreciate your safe attitude and planning.

Frequently Asked Questions

Q: If the airplane I'm flying has an autopilot, how much can I use it?

A: Currently there is no written guidance on this so talk to your evaluator preferably before you fly. However, you have to be able to meet standards with and without the autopilot. Most evaluators ask candidates to demonstrate both with and without the use of an autopilot.

Q: What is a typical duration for a F91?

A: There is no standard because it depends how fast all items are evaluated that in turn depends on many factors. Around 1.5 – 2.0 hobbs is typical with 1-2 hours for the oral.

Q: What should I bring with me?

A: Refer to the second page of the F91.

Q: What do I wear?

A: Any allowed uniform per current CAP regulations from NHQ or CAWG. Any uniform you choose to wear you must do so correctly. The most popular choice is the USAF-style or corporate flight suits.

Q: I can't find an evaluator.

A: Technically not a question, but the solution is to plan early and ask many evaluators. If you give evaluators only a few days of advance notice you it likely won't succeed.

Q: Should I bring a gridded sectional?

A: You should bring something that has CAP grids whether that's on your tablet, a paper sectional with printed CAP grids, or a sectional that you drew CAP grids on.