DUKE MISSION DRIVEN STARTUP SPRING 2020 INTERVIEWS

Template

Position and Name - month/day

Team member: team member on interview

1. Takeaway 1
2. Takeaway 2
3. …

Interview with key points in bold if possible

PILOTS

Captain X - 1/20

Team member: Full Team

Forms - done in flight on pre-printed sheets and pencils:
AFTO-781 - Air Force Technical Order - required to look exactly the same - biggest one

- Everyone does the math for this on a calculator
  781 Alpha
- Aircraft related forms are all the 781 series
  MERS sheet - regulatory requirement to log events accomplished only- also important and compared to 781. 2C-17 regulates standards for documentation but the rules change a lot.
  Trip report - Manually transcribed by the loadmaster
  Travel report
  1522 - ground events, maybe work on it later

Squadron Aviation Resource Management use ARMS and only ones that have access to it
ARMS: Aviation Recording Management System

Can you explain the process of data collection right now?

- While in the air loadmasters are loading AFTO-781.
  - Takeoffs
  - Landings
  - Air time
  - Blank will be sent to us
  - Done daily
- Once back on the ground the aircraft commander will assign people to load information into the database.
  - 3 hours sortie. 3 people on board. All 3 can't get primary time. You have to split it up.
    - Lots of similar rules.
  - Sortie: an attack made by troops coming out from a position of defense
- At some point on the trip the aircraft commander splits up the hours .
- Maintenance makes a copy. They input data into G081, a maintenance program.
  - They transcribe data + maintenance writeups into there.
- 781 Alpha-- discrepancies with airplane are recorded here

- Fill out MERS sheet. Every base has its own type.
    - Content is same for C17s: events that were accomplished.
    - Blank will be sent.
    - Mission Essential Readiness
- 781 is a by regulation requirement. Solution must generate something that looks like/acts like a 781.
- Regulatory requirement to log events accomplished (done by MERS) but form does not matter.
- Trip report: passengers, cargo, hours, notes. Different depending on the base.
- GTIMS (intermediary for ARMS) data and then ARMS (aviation record management system)
- Standard iPads. Controls are on them. Only approved app installations "manage" app. Approved for Government data. Only can receive AirDrop. Can not send AirDrop. They have WiFi and Bluetooth (they don't love Bluetooth)
- Also flying with windows laptop. Classified ones can not connect to network, unclassified ones can.
- Crew takes a "worldwide phone" that gives them hotspots and data around the world. Does not work in the air. Only on the ground.
- 2C17 Volume 1 regulation. Only allowed to record 1 air refueling a day.
    - Rules change a lot.
    - Rules need to be editable.
    - If rules are not met, there should be a warning, but should not prohibit you from recording.
- Short term: entered or robotic process to go into a database.
- Envisioning telling the app or system info once and it pushes that on different forms
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- Global Reach database. This is where Charleston stores their trip reports. Direct connection approval would take a while, but they can accept a file upload. JSON or excel type format probably.
- A couple of years ago someone tried to make an app that did the 781. Reservist. Sub par interface. Had to be in landscape mode.
    - No data would save while working on it.
    - Had to do the whole thing in one go.
    - Need an app that can data be updated and added to during the flight
    - Problem was only doing the 781 form as well.
- There has been talk of a GTIMS app, but prototypes still have not been seen.
- iPads are currently used for Flight Information (flinf?). Set of procedures for navigation. 10GB .
    - Rules, technical information on aircraft 10GB (PUBs?)
    - Moving map (aerolapp, foreflight - commercial, off-the-shelf)
    - Email.
- 2 pieces to app approval (for off-the-shelf apps)
    - AMC headquarters validates it as a requirement. Not too difficult.
    - Afnic (Air Force Network Integration Center). They run cyber testing on the app.
        - Unencrypted data being stored
        - Hijacking network connections
        - Does it use HTTPS connection?- It needs to be secure
        - They produce a report and then their leadership makes a decision.
            - We can contact Afnic at some point and we can see the form style that they produce.
- Blackberry Mobile Device Management.
    - Contracted out.
    - How email comes through.

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- MQF-- Built by Airmen. Built by Captain X.
    - https://apps.apple.com/us/app/mqf-built-by-airmen/id1467446220
- Printers are available in the air. Wireless printers.
    - Thermal printers.
- Current cases are Otterbox. No keyboards.
- Computers are Panasonic laptops.
    - Software approval time for laptops is a lot longer.
- Every crew member gets an iPad. They bring the iPads with them on the ground into hotels and such.
- No requirement to write all the data by hand
- Various degrees of confidence when it comes to technology
- Perhaps printing out after everything gets recorded digitally
- They just got OneDrive and it's only available to the laptops
- Good Reader can sync with server but you have to be on the same connection as that server.

Robotic Process Automation software already available on government computers for down the road when we're talking to a server.

Understanding the different roles and where people in those roles come from:

- Pilots: coming from a time-saving perspective. Wanting to get things to where we're not expending time on menial activities.
- Loadmasters: Enlisted airmen. Recording take-off and landing times. Transcribe the trip report afterwards. Many are working on their bachelors degree. Some want to just do this for a few years and go on and others ant to
- SARM-- Squadron Aviation Resource Management: Enlisted members that don't get to fly. Spend time in squadron transcribing data and doing data validation. Low job satisfaction. $300,000 to train one of these people. They have been trying to push work onto the air crew members. When orders are generated they have a fly/no-go order. They make sure that everyone that's about to go on a mission is eligible to do so. Majority of job is data transcription.

Next round:

Maintenance

Captain Y 01/24

May you explain for me the data capturing process you have to do when you go on a mission?

- We do not just capture data when we go on missions. We have local training flights as well, and when we go on those, there are some forms we fill, but yes, we have way more data to capture when we go on missions
- We use different platforms to fie paperwork, and most of the paperwork can't be done while airborne
- Sometimes we go on missions and the return trip could be 8 hours, this could be time we could utilize to do paperwork, yet we spend it idle since most of the paperwork can only be done after landing
- SARMs team also responsible to validate if the crew are legal to fly

- Previously, they were required to hand over a hard-copy sheet showing what each pilot did during the mission: take-off, instrument approach & landing. Now, they are required to fill that info online on the GTIMS platform upon returning to their squadron
- Sometimes missions can be up to 14 days
- General complaint that filling out paperwork is slow and time consuming
- What I would love
    - Log currency while airborne
        - Currency is sort of like a table that directs every pilot based on their flight level and experience required to do certain flight manouvres. If you do not do certain tasks, you become NMR. They want pilots to be experienced. You can't send a pilot who hasn't done certain manouvres on mission-critical flights.
    - Even if we have no internet onboard, what if we have a form that talks to GTIMS? We can log it on in flight, and it is uploaded to GTIMS upon landing
    - What if we could do all things under one roof?
- It can even take an hour to fill out info on the GTIMS platform upon arrival
- If SARMs are willing to accept paper copies of the forms, it would be better, but that is not actually solving the problem, it's putting the pilot's problem onto the SARMs
- 781 paper copy. This is an airforce form with all info on what occurred during the mission. Flight record piece and currency piece.
- 781 & MERS forms are all pushed onto the GTIMS platform
- 3 pilots and 2 loadmasters
- Calculations: Flight time is divided among the crew as primary, secondary, and other. The hour is divided into 10, so if a flight takes 1 hour, it's regarded as 1.0 and if it is 1 hour 6 minutes, it is regarded at 1.1 and this would be divided between the 3 pilots
- You need to do a paper copy of 781 everytime you land, and it depends on the leadership who puts stuff on the GTIMS: either pilots or the SARMs team
- Defense Travel System (DTS) program owned by Northrop Garmin & you need Internet to access this
- SARMs do not deal with the DTS system
- DTS is not specific to the flying community. It is the reimbursement platform for the whole defense system. You upload your receipts on the DTS platform.
- Government computers are really slow
- DTS minimum hours can be 2 hours
- Every aircraft commander has to fill out the Training Management System (TMS)
    - Aircraft commanders on a mission have to do a writeup on all other members
    - This is an evaluation of copilots + loadmasters
    - You need Internet access to do this. Captain Y often does a writeup on board if he goes with his personal computer, then uploads it later.
- Maintenance Debrief Form
    - This is turned in upon landing & you also turn in all fuel receipts
    - The first place they go to upon landing is to the maintenance debrief
    - The maintenance people also take copies of 781 forms
    - This can take up to 15 minutes
    - Can we get all that under one roof?
        - No maintenance debrief form, but a digital copy of it

Captain Z 01/24

May you explain for me the data capturing process you have to do when you go on a mission?

- Before going on a mission there is a binder with each pilot's info
    - MERS forms that show the currency of each crew member
    - ORM => Operational Risk Management
    - Orders => sheet of paper illustrating what should be done on the mission
    - Defence Travel System (DTS) order => make sure everyone has an order to they will be able to file for reimbursements
    - NATO orders
- Missions are 24 hour days
- Upon arriving back at the squadron, the maintenance folks come to the jet and fill out info in the binder that is kept in the aircraft so other people who use the aircraft can know its status
    - After meeting the maintenance guy by the jet, they head over to the maintenance office where they have to resubmit the same info as what was left in the binder
    - Total time for this could be 10-15 minutes, but after a mission, this is a long time
- There is often dual logging of data to multiple databases.
    - Trip report also contains flight time, etc., and this is required for the 781 as well
- Air commanders also do write-ups for the younger crew members
- Captain Z does her 781s daily and upon landing it often takes her 10-15 minutes to fill out the forms
- The trip report is filled out by loadmasters
- One thing Captain Z would like to see is the cutting out of maintenance stuff
    - What if we can scan and upload the info we give to the guys who come by the jet so we cut off the time pilots need to go to the maintenance office upon landing?
- Calculations done are for flight hours

Captain X 01/27 & 02/11

May you explain for me the data capturing process you need to do, what you like, what you would like to see change?

This discussion took a very different twist because we ended up talking about how he doesn't like the process, and how he feels it should change.

- It would be great if we could have a system that allows us to easily log data into one system and this system distributes the information to other databases
- Maintenance is a real issue. We meet a guy by the jet, log in info and leave some of it by the jet, and go to the maintenance office and start answering questions about the same things we told the guy we met by the jet.
    - This process is tedious. After a mission, even 20 minutes is a long time because we would be tired
    - Maintenance usually takes us 20 minutes
- It takes a very long time to handwrite all the forms up to 1h 45 minutes to fill out all forms

Do you have any particular form you really have a hard time filling out?

- All the forms are equally not great, but I hate doing a lot of validations. Our time is logged in decimals, and that is not a very interesting process. I feel like this can be digitized and done easily

02/11

Key Takeaways

- Night time is a problem because it changes depending on where you are. To alleviate this problem, pilots are starting to rely on third-party apps on their phones. These help them know how much night time a flight took.

After talking to the SARM team, I realized that night time is a major problem. May you explain for me what it is?

- Night time is the time between sunset and sunset, civil twilight.

Well, that sounds complicated depending on where you are in the world because sunset and sunset depends on where you are. Do you account for this at all.

- Yes we do. We acknowledge that the sun rises and sets at different times depending on where you are in the world.

So, do you have a stipulated time you consider sunrise or sunset?

- Well, we normally use apps. Those are the ones that usually tell us what time is sunrise or sunset depending on where we are.

Great! Are these apps provided by the military or they are just basic apps by third parties?

- They are just basic apps by third parties.

We also had a brief chat on why nighttime is a problem because sometimes people do not use apps and end up being confused about what time to enter on nighttime.

Captain W

SUMMARY:

- Has to do all the flight times by hand. Does not like to manually split up all the hours and the currencies that people do.
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Please tell me a bit about your job.

- Show up in the morning. Getting the paperwork in order to fly—weather, notems (bulletins about certain things in airspace and airfields), flight orders (piece of paper saying who is on the flight), ORM (matrix with numbers. Bad factors=higher points. Cumulative high number is high risk mission), Flight plan (where you're going. Have to get it filed with air traffic control). FCIS (flight crew information files-- news bulletins for pilots. Notices for pilots. Check off). Pilot is in charge of crew-- he has to make sure all the crew members do their tasks.
- Once we come back from flying is MOST paperwork.
    - 781 form. Logs time aircraft flew-- maintenance, fuel. Air crew tracks their own hours+experience+promotions this way. He does the math of flight time by hand based off takeoff and landing time. Crew member is assigned hours based off of the role they took during that time.

    - No system tells him how many hours crew members do things for-- he has to manually say that they did 2 hours in this, 3 hours in this, etc. on a certain timed flight.
- 3 to 8 people on a crew.

How often do you go into the air?

- 4 times a month at least.
- If he's on a trip much more.
- 6 month time table. Has to have so many events in 6 month time limit in order to stay current. SEND TO ME.
- All times are in ZULU = Greenwich mean time.

What is the timeline of paperwork you fill out before a flight, in a flight, and afterwards?

- 781 is an evolving document filled out before, during and work is done afterwards.

Do you fill out the exact same paperwork every time?

- Same paperwork every time you fly.

How long does paperwork take you?

- Before flight: 20-25 minutes.
- During flight: Minimal paperwork during the flying. On long SORTIEs he will start organizing everything while they're cruising.
- After flight: 30-60 minutes.

What's your least favorite part of doing paperwork? (specific form or part of a form)

- Biggest waste of time for him: Calculating the flight time and dividing that up amongst the crew. THE MATH IS THE PROBLEM, not the role assigning. He wants to input the number and then a prompt to tell him "too many hours for Joe" etc.
- Once he portions out the time he has to manually make sure it adds up for each individual person and that he did not give anyone more time in a specific seat for more hours.
- Crews decides the roles that members assume.
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Do you know what happens with the data after collection?

- Data goes back to the squadron to go into the air crew system.
- Hard copy tracks flying hours
    - Accountant has to make sure that pilots are making their own flight time allocations per year.
- GTIMS-- Where pilots log the training that they accomplish.
    - Every person has their own spreadsheet for events (takeoffs). The pilot then goes in at the end of the trip and logs in this currency for each crew member for each day.
    - If the aircraft only did 2 takeoffs and 2 landings that day there is nothing keeping him from under logging a landing. No connection between GTIMS and 781 form.
- SORTIE-- a flight. A takeoff to a landing.
- Why is this data collected?

Does anything change for you based off of the collected data?

- Currency is what they need. They need the events to stay current.
    - They also need to stay in a certain amount of hours.
    - Maintenance occurs based off of a number of flight hours.

Who else should we talk to?-- Can you please forward my email to 25 colleagues?

- He said he will email me some forms and forward my email onwards.

Major V

SUMMARY:

- Has big problems with the splitting up of specific "time types" on flights (Primary, secondary, instructor, etc.)
- Hates the manual validation that has to take place because simple mathematical errors can cause lots of timer to be wasted down the line with the secondary verification that is now required.
- Says that usually primary flight hours are split evenly amongst the crew and would love a system in which that is automatically loaded into a form/system.
- He finds that there is too much unnecessary information being given to him on the Go-NoGo sheet.

Please tell me a bit about your job.

- Once a week flying.
- He is the aircraft commander: in charge of flight equipment.
- Has to go pick up the paperwork.
- There's a binder for the aircraft commander to look at. Flight orders, what they need instructor supervision for, currency sheet,

How often do you go into the air? Annual allotment of hours?

- About 300 hours a year.

How long does paperwork take you? Worst aspect?

- Worst is when you have to see different people's currency items and log those in.
- People hate the 781-- instructors take all instructor time and usually people split the primary time evenly. Would be nice to have it pre-evenly split.
- Pre-flight worst: Would love a simplified Go-NoGo sheet.
- Before flight: 30 minutes.
- 781 form: 15 minutes to get all the math straight.
- Accidents happen where flight times get logged incorrectly.

What validations do you have to do?

- Has to check currencies and times for each crew member.

Does anything change for you based off of the collected data?

What didn't I ask you about?

Primary Time: Actively controlling the plane. Multi-control aircraft. 2 control sticks. Only one person is really in control. That person is in primary time, unless they are an instructor in which case they are logging instructor time. Total amount of primary time cannot exceed total flight time. **Nobody is logging primary time while an instructor is showing a maneuver.**
Secondary Time: In a pilot seat not actively flying.
Only one person can be logging instructor time in this force at one time.
Special Ops (Sol2) is different.

Information on who can log times and when: https://static.e-publishing.af.mil/production/1/amc/publication/afi11-401_amcsup_i/afi11-401_amcsup.pdf

- Primary time

- Secondary time
- Instructor time
- Night
- Combat
- Night vision goggles.
- Evaluator time.

Who else should we talk to?-- Can you please forward my email to 25 colleagues?

Captain X - 1/28

Team member: B and C
Airman with capital A = anyone in the Air Force
Lowercase a = specific rank

Don't take yourselves too seriously - include rank + last name in initial email but after that you can just use their name [B note - I would still just ask to make sure it's cool]

MMK Program: Mobile Mission Kit, this was the previous app

- Validated the 781 and email a pdf of that
- To the best of Charleston's knowledge, MMK program is entirely dead - both usability and value-add problems
- Only one form, and make a digital version of it, when this was emailed, it didn't put data into the other form, (it couldn't save the data), it wasn't a time or effort saver
    - It became an extra step, so put in the data once and give multiple different forms
        - Ability to save data is extremely important
- MMK was made by air force reserves and they tried adopting it but now everyone dropped it. He (Robert Nethaway) may still be working on integration with Air Force Reserves

Contacts:

- Captain X works with all AFB Charleston guys all the time and can help chase up with his commander.
- Schedules are always changing all the time so get a time on the books and get a calendar invite to their personal email. Calendars are basically filled up first-come first-served
- They don't get their schedules every Monday or anything
- Be available for SMS
- Everyone we're talking to is our age - no need for voicemail
    - Text is definitely the way to go
- "I'm part of the team from Duke working on post-mission paperwork"
- L M is our contact for all the SARMs - he can even get them all in the conference room at once. But he's a pilot. We should definitely interview him regardless.
- They have normal day schedules sitting at a desk so it should be easier to schedule them

Blank Go-No-Go sheet:

- Go-No-Go is a huge pain point for people but more about next mission than the mission that just happened
- Caution about trying to bite that off in this process
    - Processing is necessary for this, so we shouldn't really focus on it right now

Data Validation: i.e. @ sign for email, making sure everything falls within certain rules and parameters, everything should line up, time should add up correctly, etc.
Captain X prefers personal email or Slack

- Give him a “bad boy” list. Everyone should do at least a discovery call

Captain U

Tell me about your job:

- Flight record- what type of hours are flown?
    - Secondary, primary, other, evaluator, instructor hours, loadmaster hours
    - Number of sorties - each time they go in the air
    - They use UTC time
    - Night vision goggle hours
- Cost worksheet-
    - Hotels
- Loadmasters start filling out paperwork through the mission detail
    - Take off and land times
    - Pilot fills out everything else (things described earlier)
- Standard process that has to be followed every single time
- Everything is paper & pencil
    - This then gets assessed by the SARMs
- Where do you see the most human error occurring?
    - Which hours get credited to which people
- It takes a really long time, a separate 781 for each sortie
- Pilots have jobs at home that are not pilot related
    - They have office jobs
- Too much paperwork can interfere with the other job
- The hours drive changes to the crew
    - More hours means upgrade to different tasks/jobs within the aircraft
    - Experience
- Night hours, instrument hours, combat hours, combat support hours, night vision goggles
    - All of these within the 781
    - User input
- The app:
    - Feature and suggestions?
        - Start 781 and populate new 781 based off previous info
            - A lot of this info stays the same
            - Prediction is not necessary
            - Since time is so variable
                - Time always need to be input
            - Being able to hit sync and send them where they need to go
            - Select which thing they can keep
        - Travel expense worksheets
            - Outside of the scope for now
        - Other forms?
            - It would be nice to use the 781s to see how long they were on the ground and where to start generating the cost travel worksheet
            - Converting time between local time and UST
            - On the ground longer than 12 hours, generate quick sheets for travel

        - Operational Risk Management Form
            - To keep track of changes
            - This is a very dynamic form
            - Certain risks can change throughout the mission
            - Keeping track of risk items to change for each day
- Other people?
    - May send me contact info of other people

Captain T - 01/28

May you explain for me the forms you have to fill out after a mission, and how long it takes you to fill them out?

- When we are going on a mission, we need to fill out the MERS forms and validate our currency and make sure we are not due for anything while on a mission
- We also have to fill out the ORM which will look into any risks associated with the mission
- We also have to check out if mission orders are filled out correctly

Oh, I would like to know more about the forms that you fill out during the mission and when you come back.

- Oh, we have the 781. Each log of this form takes a significant amount of time because we have to split the hours, and we need to make calculations on this one, and **many people make mistakes on this form.**

How long will you say it takes you to complete this form?

- From start to finish it can take about 10 minutes, but we need a lot of 781s when we go on missions depending on how long each mission is.
- People typically fill 781s at cruise, and finish them upon landing

How long would you say it takes you to complete it on the ground, and any other paperwork you need to do upon landing?

- I would say about an hour and half
- We also have the Defense Travel System portal where we put information about where we stayed, and how much it cost, basically a system for them to reimburse us. This can take up to 15 minutes.
- We also have the maintenance part where someone comes to the jet, we have a conversation with them and explain any maintenance problems we had, then we go to maintenance offices and have a maintenance debrief where we basically say the same things we told the guy on the jet. If there are more severe problems, then we have to fill out forms.

So, if someone could ask you about your experience, would you say things should change or remain as they are? If they are to change, do you have any ideas you feel would be great if implemented? Is there a particular form as well you would like to be targeted first?

- Well, people make lots of mistakes on the 781s. We go on a mission, usually with 3 pilots and 2 loadmasters, we have a total of 24 hour days, and on top of that doing paperwork.
- If we could have a way to fill out 781s electronically and have ways to validate the flight hours things could be better because a lot of times people miscalculate time.
- We could also have an iPad app that would allow us to fill out these forms on cruise then send them to all the other systems when we land.

Captain S

Can you please tell me a bit more about what a head scheduler does?

- Chief of scheduling for 16th squadron.
- Manages the schedulers.
- 6 pilots and 6 loadmasters
- Manages how people get put on flights. Requirements for filling missions.
- Different missions require different #s of people and crew qualifications.
- Who is available? Who is qualified? These are the questions he must ask.
- There's a loadmaster scheduler and pilot scheduler.
- GDSS— command and control system to run missions.
- Afterwards the paperwork goes to the SARMs.

Tell me about paperwork:
- 781 paperwork. You have to see who takes what time and in what position.

- The problem with the iPads was that people had to do it twice. They did have a calculation on there, though. Why did they have to do the work twice when they had the iPads?— There were issues printing it. Maintenance wanted a filled out paper copy and then Old Vice Group Commanded (O6) wanted the iPad done. Since people did not want to do the work twice people just did the paper.
- He doesn't think the paper is that hard.
- He thinks that people having learned the iPad was harder.
- Captain X has an app where calculations were done, but it does not divide up the crew time.
- People are not really guided through the process of filling out the 781: people kind of make it up as they go.
    - Worst problem with the 781s is that you have to do one for each day you're on a mission.

What is done with the collected information?
- 781:
    - 1 copy to maintenance. Logs. wear and tear of aircraft.
    - Pilots: logging flight time.
    - SARMs verify aviation records. HARM--

Does anything change for you based off of the collected data?
- They need this to log their hours and how long they have under their belt for qualifications
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What didn't I ask you about?
- Every time we have a good idea we come up with a new system
- 781 is only 1 paperwork. MERS is another.
- Land. Fill out paperwork. Hand over to SARMs. Used to be like that.
- Now it's like this. Constantly changing process. Land. Fill out paperwork. Go I to GTIMS and log it in their self. Now they have to grade training requirements after flight.

- Yesterday he got to work at 3:30. Landed back at 3am. Then they started a ton of paperwork. It took like 2 hours doing the paperwork.
- He has no idea why they got rid of the old system. SARMs has like 8 people they just have the desk job. Pilots and loadmasters do field AND desk job.

Captain X - Site visit

- GTIMS takes forever to load and get from page to page. Adds lots of time just sitting at desks waiting
- Local flight means a flight where you take off and land at the same place (KCHS→ KCHS)
- Current protocol in this squadron for data:
    - Local flight: aircraft commander fills out paperwork and loads information themselves into GTIMS.
    - Non-Local flights: aircraft commander fills out paperwork and then hands it off to SARM to be loaded into GTIMS.
- Funny Line: Captain X asks “Is your GTIMS moving at a snail’s pace?” She says: “Sounds like GTIMS.”
- Aircraft commander does 1st paperwork validation. Paperwork is then dropped off for second validation with ADO (Assistant Director Operations). Then it goes to SARM.
- SARM audits everything right after it is loaded into the system, even stuff that aircraft commanders put into GTIMS.

Major V - Site visit

- Second time speaking with him, first time doing so in person.
- Really struggling with the time wasted by loading local flight info into GTIMS.

Major Q - Site visit

- Marine by training. Got transferred to the USAF.
- Working as ADO.
- Talking about Marine and Navy program called M-Sharp and Sharp respectively.
    - These are systems that let paperwork be filled out and then be auto-uploaded to the server.
    - Allows people to see their qualifications, total time by machinery.
    - SARM checks info after operators load it in.
    - Air Force uses paper for the transfer of information to different departments: Navy and Marines use this system online.
    - M-Sharp has laptop mobile version. Allows for data to be collected while on a mission. It then gets uploaded when they return home.

P - Site visit

- SARM gives MERS filled out.
- Parameters exist to make risk assessment sheet objective.
    - Captain has to sign off for each person having done what’s listed on each person’s MERS.
    - **Trip Report and 781 have overlapping info,** 781 is for SARM and Trip Report is for the squadron.

- Trip Report “Sortie type” information is not on the 781 but is important for a pilot’s career and later applications.
- 781 only does flight time but maintenance needs engine running time. There’s no good way to document engine run hours
- Funny Note: Data analysis has shown that people forgot tail numbers for fuel billing, so planes on a stick (decommissioned planes put on display) were getting billed millions of dollars of fuel because it was the only tail number the crew remembered.

Major O - Site visit

- baseops.net→ links to useful info/programs.
- Constant change in the protocol as to whether SARM will process local/mission flights.
    - He has been at KCHS for 7 years and the policy has changed almost every year.
- Mission symbol tells what the mission is for.
- Reserves had iPads for the MMK program. This was very good in Troutman’s eyes, but he only used it twice.
- Flight Auth Duty Code: tells a person’s position on that flight
- SARM “Air Force Instruction” has all the rules about times and what cannot be greater than what.
    - You can log instructor time concurrently with primary time in ghost time.
- **Data entry is taking time away from the peoples’ actual jobs.**
    - **Troutman is in charge of Tactics for the whole base and he can’t do that job as well when he’s spending time plugging data.**
- Note: SARM left Charleston at 3pm because they had nothing else to do that day.
- The process for captains used to be as easy as filling out the 781 and then giving it over to SARM.
- 781 needs to have the names of everyone on every sheet.

Captain N-- February 11, 2020

- Flies MC-130s
- Designated to special operations— can bring cargo and forces.
- Sensitive/hostile forces
- Works closely with helicopter units.
- Similar in the cargo—more tactical than C-17
- About 1/10 of the cargo than a C-17

Paperwork for MC-130s:

- A lot of documentation. 781
- Squadron-specific post mission report (PMR)
- Mission Accomplishment Report (MAR)
- Everything is given off to SARM.
- Right now SARM doing it is pushing time from one person to another.
- 4 flights a day local, 4 days a week. 2 flights per day, 1 day a week.
    - 18 flights a week
- Biggest difficulty with paperwork:

    - Problem with the validation.
    - Lots of time for SARM to input and when stuff is missing/incorrect a lot of man hours are invested in fixing it.
    - In flight computer does the flight time for you.
        - Built into aircraft.
    - iPads that they have right now have all of the manuals and navigation charts.
- Night time hours: information taken from a cellular data service or phone.
    - Most of their flying is at night because it's special operations.
- Paperwork is almost always done back on the ground—intensive training. Little cruising time for paperwork.
    - Sometimes there's time coming back from a mission.
- Section that takes them the longest: the fixing of data.
- His vision: end result has something where stuff is electronically filed.
- MAR and C-17 MER has different stuff.

Captain X-- February 11

- Take each piece of information only once
- Prototype that helps think about collection of data differently
- "Hit next"
- Move back and forth
- Different pages
- Cross between 1 sheet and next on boarding pages
- Keep in mind people will become VERY acquainted with the app— no need to make crazy basic
- Dark + light mode.
- Human factors
- Establish the goal (not an electronic version of the form) when showing people mockups.

Captain N-- February 18

- Would like a system where he can move in an order inputting data
- Ability to print forms from a system to give to maintenance, SARM
- Wants to not have to convert decimals or calculate night time. Major V-- February 19
- Definitely wants a way to split up the different types of times
- Wants rules to be implemented that have checks and balances (NVG does not exceed night time hours, for instance)
- Electronic system is great—look into code on how to print for SARM. What would be needed.

Captain T 02/18

Key Takeaways

- This is definitely a tool I would use
- Can we have a way to add names and track hours of each person?

We came up with a prototype and we would like to show you. I know people are not trained to call your baby ugly, but we would really appreciate your honesty coz whatever we launch will benefit or shortchange you.

- The app looks good and definitely helps a lot in breaking time

- It is definitely a tool I would use
- I believe this is definitely helpful
- Sometimes we take off and land at the same airport, and I don't know how that plays out. Will we have to manually input times for that??
- Can we have a way to add names and track hours of each person
- I believe this is really good and it is easy to read and understand

Captain Z 02/18

Key Takeaways

- The idea of having an app to sanity-check my math is great
- You might also want to take into account crew-qualification, combat and support time, and also familiarize yourself with the SARM handbook

We came up with a prototype and we would like to show you. I know people are not trained to call your baby ugly, but we would really appreciate your honesty coz whatever we launch will benefit or shortchange you.

- The idea of having an app to sanity-check my math is great
- Can you also have a way of checking who is flying
- There are many rules you have to follow in time allocation
- Also take into account crew qualification as the rules change depending on who is on board
- You might also want to add combat time and combat support time

Captain Y 02/18

Key Takeaways

- I like the idea of an app. I believe it will be very helpful
- You might want to add combat and combat support time
- You might also want to have data for each crew member. We usually have a maximum of 10.

Captain M - 2/20

Team member: B

1. Check "add to MVP" below for things that are missing from the MVP
2. Digital 781 would be way more useful than mission calculator; calculator would only save about 10 minutes/day
3. Didn't even know about the iPad being in the mission kit - but they do have iPhones.

add to MVP:
combat time
combat support time
NVG = night vision goggles
four-letter codes
logging events - would be useful to just add .1 hours of primary time

instructor + 2 students = .1 for the instructor and 4.9/2 for each student

Percentage might make more sense but usually everything is basically split evenly, except when there's an instructor. ratio/percentage thing doesn't really matter in their unit.

Having a button that basically says "start timer" could be ok but there's so much swapping around so people don't actually record the exact amount of time on everything.

Landed last night at midnight so didn't do the paperwork. Probably takes 30 minutes if he does everything quickly. Log everyone's events, do TMS on students (he's an instructor) which takes 10 minutes per student. Probably 10 minutes flat + 10 minutes per student.

SARMs usually fix tiny errors themselves, but they don't have to send his paperwork back to him too often.
Only the sortie profile in TMS is from the 781 so not much overlap. We might save 10-15 minutes per sortie. Multi-sortie mission but a single day doesn't add much paperwork time.

9 sorties over 3 days - each sortie not really meaningful. But each day will have a few different sheets on which they have to log events. So we should look at days instead of sorties.

Would give app 7 on a scale of 1-10.
Digital 781 would be way more awesome. Loadmasters put in data and there are a ton of mistakes made with that. Every person that puts in information adds human error.
Loadmaster is sitting at the loadmaster station and their hands are free so they are recording events as they happen.
Too confusing if it's not on a person's designated iPad. iPhone is also part of mission kit. He thinks iPhones can use Bluetooth.

Didn't even know iPad was in mission kit.

Colonel K-- 2/20

- Squadron Commander
- 150 people working underneath
- Leads the SARM crew that works in squadron as well as the captains
- “Exhaustive, bureaucratic nightmare”
- Process of paperwork is always evolving. Goal is to make things easier.
- Change in the way ARMS was working forced pilots to do ALL flights loading into GTIMS
    - It was way too much work for pilots, so they compromised with the local and mission split.
    - ARMS became more difficult
- Nothing in the job description makes it something that a civilian person can’t do.
    - USAF would need congressional involvement (or even machines) to remove
- 1C career field does more than just SARM. One piece of that is SARM, but there are other jobs at that level.
- Go-No-Go Process is NUMBER 1 piece of SARM
    - Error in this could get commander fired
- For trial he could do it for anything, but would only trial what he thinks could get approved
- Humanity— commercial program for scheduling.
    - Squadron purchased it and was scheduling with it
    - Did not have level of security for Operational Use Only (not even classified) info.

- Approval process to work iPads
    - Captain X knows process really well
    - Personal “test” iPads could be used. Getting that out faster
- 760-458-XXXX

Captain X - 02/23

Team Members: C

Main Takeaways

- Make sure to automatically do all of the math, minimize the amount of data points that have to be input manually
- We picked apart the 781 and talked about what was and wasn’t necessary (for example, the entire bottom part should be left blank when a pdf gets generated)
- An autofill feature for dividing the hours would be useful

I J-- 02/22

Team Member: A

- Likes the setup of the mockup picture
- Being smart about what you have to fill out.
- 781 form asks for a mission symbol. Generated from mission number.
    - Automatic connection to mission symbol from mission number would be nice
- Make sure mission number makes it onto the page—> the page “Mission Information” would be good for pre-mission stuff that could be filled out any time.
- Mission number is more directive towards command and control structure— says which planner owns it and supports this unit and leaves on this day. **Individual to each mission.**
- Mission symbol— supporting something more general. Comes from a table. **Could be coded in.**
- Recurring screen with crew’s information.
- Biggest struggle— logging structured time **(THIS IS THE OFFICIAL TERM FOR TYPES OF TIME)**
- Would definitely want currency logged down, because he wouldn’t want to do paper for that
- Keep an eye out for text like a 781 filled in with structured time.

Major V- 02/25

Team Member: A

- Thinks the idea of not having to type things multiple times is good
- Likes the layout
- **Could be good to have date drop down as calendar, so you don’t have to worry about correct date format**
- Serial numbers for sims. There are only so many serial numbers for sims, so it would be nice to have the Charleston sims on the drop down. There are only like 4 pilot sims and 2 loadmaster sims.
    - They would not
- They occasionally fly planes from other bases, so it would be nice to have a way to get the codes for US-C-17 bases to put under Unit.

- Unit: for 781s it's actually Unit Charged for Flying Hours. "Aircraft home station." It's the unit of the AIRCRAFT, not people.
- HARM location: That (he believes, we can check) is where the people are based.
- **Serial number is supposed to be XX-YYYY. Maybe tell people how many digits are supposed to be in that field.**
    - Maintenance uses a 5 digit tail number system, and because 781 uses 6 digit you have to make sure you're using the right one.
- Block 16 on 781 they use "Special use" for gear cycles.
    - If they have to deploy landing gear but do a go around, they note that here.
    - Something KEY to put in the 781 because maintenance needs it.
- Would like the 781 Grand Totals on the bottom of the screen but only for that Zulu Day.
- Three to four flights could happen in one day
- **Would be nice to log a 781 "gross" (the whole day— even if there are multiple sorties that day) or by flight. And make sure that gross ends up generating one 781 for the whole day.**

Captain X-02/25

Team Member: D

1. A digital form generator with an in-built "mission calculator" would be very useful. We definitely need the functionalities of the calculator like calculating total time, night time, and validating overall time.
2. Don't think of this as a 781 form. Think of it as a way of collecting data and using generated data to generate pdfs for 781, MERS and other forms, but only asking for a piece of information once. Something like TurboTax if you have used it. It generates forms but you have a modern app experience.
3. Have rules, but don't limit people or prevent people from submitting the forms or generating pdfs because they are missing something. Have some sort of "submit anyway" or "generate form anyway" since rules change, or you can miss out something in building the app. Also pdf generation and electronic submission to the SARM team are great ideas. Please provide functionalities for both in case you have days when one is working or another is not.

- Ask yourself: how do we ask people about this info? Think of a new way of collecting information so that you can give users a modern app experience. Collect data to produce other data in a pdf.
- **Are there any special rules when calculating night time?**
    - Night time is considered to be 30 minutes after sunset and 30 minutes after sunrise (I need to confirm one of the afters)
    - You need to also account for simulated events. These can simulate night during the day. So yes, you can have automatic nighttime calculation, but also allow an override.
- Have a functionality for splitting time evenly and allow individuals to manually correct it
- Create a new user interface and only collect a piece of information once

N-- 2/26-- Flies MC-130s

Team Member: A

- Ideal world: you would input
- Would be nice if SARM logged in that first page themselves. Would save a lot of time on behalf of the air crew.
- Right je you have to write info again for new 781 even on same mission. Would be nice for mission information to be copied through to another day.

Lt. Col. H G - 03/24

Team member: B

1. Main concern is who would own the app and keep it updated. Burnt from MMK experience
2. There's another app called Mission Binder that we need to look into

Main concern is sustainment.
Would Air Force own it?
Who would pay to keep it up?
He knows about Airmen Coders and the MQF(S?) app

App called Mission Binder is very similar to MMK
- Jim something made it
- had a copy on his iPad but it wasn't on MDM and his new iPad can't get it

To answer our questions:
- 781 form is based on when the mission starts - so two-day sorties are no problem
- no problem combining all forms into one
- division of data into three categories is good

Giving me contact info for John Airs, instructor at Randolph
Look into Bespin Air Force app development team

M Sgt F E - 03/24

Team member: B

1. Demo looks very intuitive
2. Remarks section could be useful - although it's not on the 781 now
3. Make sure we can change the rules

Demo is very intuitive; you don't have to do much other than fill in the numbers.
Only foreseeable problem is that rules change quite often - like night NVG time

People will be happy to have all of the data go into the same place.
- Should tell people if they don't fill out fuel tracker, mission history, etc.
- Could stop people from progressing

Mission Information, Mission Sorties, and Aircrew Data division is good
- Remarks section could be helpful

Extracts will be a different thing to deal with - when someone jumps on or off a crew
- Only happens once every 1.5 years or so

- Cameramen, AE crew - Air Force personnel have to log time but don't belong to squadron
- Their numbers don't even go on the squadron totals

Multi-day sorties still go all on one form

- If you took off and landed Monday, then had another sortie the next day, two forms. (one mission)
- If it's just one sortie, no need to do anything weird - it all just goes on the first day

Captain T-03/24

Team Member: D

1. The demo looks very good. I would definitely use such an app.
2. The error propagation needs fine-tuning. A drop-down of all aircrew members allowing us to see their flight hours at once would be very helpful because we divide the total time between all of them, and we are constantly comparing their times to make sure all rules are met.
3. We need flight conditions and a way to automatically calculate night time.

- A drop-down of all aircrew members allowing us to see their flight hours at once would be very helpful because we divide the time between all of them, and we are constantly comparing their times.
- We need to see more on the error propagation. What kind of errors will we have? Are we going to be allowed to submit the form if we have errors?
- The arrival and departure info is done very well, and I like the idea of auto-filling the form
- I did not see flight conditions. I think it would be great to show us how you can integrate that info on this app and how night-time is calculated.
- I believe the form could save people a lot of time

Captain X-03/24

Team Member: D

1. I like the feel of the form you have demoed especially how it can automatically correct issues. I believe this is exactly what the aircrew is looking for.
2. I think you need to show us how you can automatically split time between multiple crew members, not just one.
3. Please talk to Captain X about mission history, and how we can use this app to collect mission history information.

- I believe the app could be great if you work on the error messages, flight information, and also combine mission history and the current app, and other features.
- It would be great to also have a comments section where one can write a description of the mission.
- This is a good piece of software. Keep reaching out to more people to get their input, but this looks like something I could actually use.

Captain Y-03/24

Team Member: D

1. The app seems pretty user-friendly, and it looks like what the crew is looking for.
2. When deploying this app, it would be great to use the proprietary deployment platform MDM because there are some apps, such as Humanity, which were deployed on the public App Store, but they ended up being removed because of security issues.
3. The Airforce can be pretty particular about form generation. They will most likely not want a form that looks like a 781, but an actual 781, so this should be accounted for when generating PDFs.

- WorkApps is specific to the Air Force, and it contains all the apps deployed on MDM
- Think about safety and correct encryption for your app as well
- Mission numbers can change along the sorties, for example when you pick-up or drop cargo, so it would be great to account for that in the app, not just automatically populate everything.

Major V- 3/24

Team Member: A

- Rocket chat— maybe some way to send files.
- Liked the error message.
- Air crew member total—> ensure that people have that split up in “real time” in a mission so that we can allocate correctly.
- Put a button on the home page that says “Generate 781s” or something.
- Would love to preview form before actual download/print

Captain Z 03/31

Team member: D

1. The app is very intuitive and easy to understand. I especially like the ability to print and email the form.
2. Focus more on getting it to work before you worry about aesthetics. I think many people really don’t care about fonts and colors as long as they can use it and minimize time and errors.
3. It would be great to actually see the promised error propagation, night time calculation, and more options for time splitting.

- It would be great to lookup someone, and find their profile with aggregate hours and other important details
- You might want to talk to loadmasters about mission symbols. They usually reference some pdf, and it would be great to put a hyperlink for that.

- You might want to have a description box to allow writing a description of the mission. This can also be necessary for the trip report. A description is usually at the back of a trip report.
- Can we have a send all capability so that you send all forms at once instead of sending many different emails
- It would also be great to get total hours flown for all these trips and bring awareness to how much we are flying
- What is the */3????
- Instead of an arrow on the home, you could use an edit button
- The status circles are great
- Does the print option allow you to choose how many copies to print?
- The name is kinda funny, but it is of low priority. Call it whatever you want as long as we can use it.

Captain X-04/07

Team Member: D

An SBIR grant would have been the best way to get funding if you were to start a company

1. Instead of marketing, if you were to form a company, you would need an enterprise sales team
2. If you were to form a business, a good approach would be to start small then branch out to other squadrons or start with the rest of mobility then branch out to bigger and fighter planes.

- For Bill of Materials (BOM) think of:
  - App
  - Backend
  - Help Desk (who to call when there are problems)
  - Database
  - Administration Panel
  - Interface for SARM
  - Link with Airforce ARMS
  - Onboarding and training teams
  - Email provider
- The app shall be delivered as a service, therefore, there is no need for a hosting service like AWS or cloud1. The DoD should provide the hosting service.
- Instead of marketing you need an enterprise sales team
  - You need people who are good at convincing generals to work for them or providing services
- You could get a $1.5 million small business innovation research (SBIR) fund and the Air Force can match $500 000 using the aviation fund.
- You could aim at setting up everything within 18 months on the server
  - Give it a month to finish up the initial wireframe and 12 months or so to add features
  - Towards the end of the 18 months, you could add more help and try work on a bigger contract
  - You could build up your app on all platforms and a software enablement entity does all of the Air Force testing

- A small one-time purchase cannot be >$10 000 per year
- Form 9 can go into $100k+
- An Air Force level contract would take years
- SBIR is a better funding opportunity. As other bases wanna come in, charge them a certain amount
- Bases can't handle over $100k
- Your aim would be building the C17 product really good such that other bases and mainframes would want to use it.

Captain X Y - 04/07

Team Member: D

1. It would be great to highlight all errors and direct the user to the first error when they click "Fix errors"
2. I believe the app makes it easier for everyone to fill out the forms
3. One error that usually happens is calculating decimal time. It would be great if you could actually show us more timing calculations especially the promised automatic nighttime calculation.

- Maybe we could also clear everything in certain sections
- I believe the settings will suffice. I can't think of any extra settings we might need.
- I would appreciate a video of the full app with a voice-over

Captain X - 04/07

Team Member: D

1. I really like the settings; however, we might use different timing settings for each crew member, so it is better if you have the timing settings within the form, perhaps, as a dropdown menu
2. When fixing the error, I prefer to be taken to the first error that has occurred in the form, and it should be highlighted
3. I would appreciate to see nighttime calculation and video of the whole app. It makes things easier when we give feedback.

Captain Y - 04/07

Team Member: D

1. I like having settings, but for time, we will most likely use different settings for different people, so it would be great to have a drop-down menu of timing for each crew member.
2. When you would like to fix an error, it would be great to be redirected to the first error. All errors should be highlighted.
3. The app is really coming up, and I like the progress you are making.

- I like that you can generate the pdf

Captain T - 04/07

Team Member: D

1. We use different settings depending on who is flying, so an in-app dropdown for times would be great.
2. Flag all errors, and redirect the user to the first error and step through till the last.
3. It would be great for you to actually demonstrate night time calculation and other errors that can be encountered.

- Besides the timing issue, all other settings are fine.
- It would be great to have a video that demos the full app from the moment you launch it to the pdf generation or email sending.

LOADMASTERS

Senior Master Sergeant D

- Internal Form- Trip Report, timeline of paper of where they went, who they picked up, what cargo the picked up
- Redundancies in Data?
  - There is to some extent
  - Sometimes used for people who moved the most cargo or had the most flight hours
    - Used for comparing people and having a way to catalog that
- 781 is Air Force - dictated form
  - Tried to changing electronically
  - There was a problem with changing the recording medium, there was some resistance to it
  - Logging currency: MERS, there is a more efficient way of doing this
    - Used for assessing crewmembers' performance
    - Dictated that certain procedures need to be performed periodically
- Paperwork:

    - He fills out the paperwork and they give the paperwork to another office for validation and processing
    - Columns need to add up to total flight time
    - Have validation automated in the program, make sure everything adds up
    - 6 SARMs and 150 fliers that are trying to log data
        - They have other responsibilities
    - Sort of views at as a part of life
    - Recognize that paper
    - One-Charlies use a program to fill out their databases
    - The program that is used for the currency forms is a separate program
        - However, they don't talk to each other
    - Automating currency logging process is important
- 781, Mission Histories, and 664
    - Take care of these mostly on the ground
    - Loadmasters serve a sort of "flight-attendant" role while in the air
    - Most of the writing for Loadmasters is done before going in the air through a digital version of this form and fill out the rest as needed
- iPad App?
    - Talk to SARMs
    - Loadmasters feel the struggle when SARMs have to go back and check their work and tell them "hey, you didn't fill out your flight hours correctly"
    - Checks and balances already built in, and then data burst "push" that to databases once the WiFi is connected
    - If it adds more work then it's not worth it
        - 8 hours in flight, so a lot of times it's not as big of an issue for Pilots and Loadmasters
- Maintenance Review
- Aircraft commanders also need to review the Trip Report before it goes into the database
- Keeping track of fuel is important
- iPad's have their cameras disabled because they are in classified environment
- Other people to contact?
    - SARM
    - People that verify the Trip Reports
- Fuel tracking form might be a bit too far for this initial version

Senior Master Sergeant D - 2/11

Team Member: C

Key Takeaways

1. Referred me to 7 more people
2. Matching event to time is also an issue in addition to math issues
    a. For example, if there is an event logged, there needs to be a minimum amount of currency/hours allotted to that specific type of event

Notes:

- Mathematics an issue - calculator?
- Simple solution and expand to a more complex solution
- Once a first mistake is made it waterfalls through
- Captains vs SARMS documentation of local flights

    - Solution could be each person logs their own events/hours
    - Spread the work so that each person logs their own currency
- Other errors:
    - Example: Log an instrument approach but no instrument time
        - Log an event but no time
    - Matching the events to the time

TSgt C B - 2/10

Team member: B

1. Loadmasters don't have nearly as much paperwork as pilots or SARMs, but they have the same difficulties of doing conversions to decimal time.
2. Loves the MVP of just a calculator to work out the decimal version of time between two points.
3. Most annoying paperwork is the trip report because the boxes are so small, so the next most useful thing to the calculator would be a fillable PDF.
4. Loadmasters are already required to use iPads for their checklists so old people have to get used to it.

Paperwork they have to do:
781 for flying sortie missions -
Calculate flight time, split up time during flight.
- Overall time of sortie - takeoff to landing
- Loadmaster time breakdown, but that's pretty easy because they log their own primary
- Instructor or evaluator time
- Pilots do their own

MERS airdrop personel: heavy or CDS airdrops
- heavy platform: for airdrops (check lists)
- CDS - container delivery system, gravity fed

Mostly time is really quick; the hardest part is just calculating it. Conversion to decimal time is the hardest part there is.

An MVP to convert times would be super useful.
781 provided has a little conversion table that shows how many minutes per tenth of an hour but sometimes their tired or try to do it in their heads. The simple math of trying to subtract to find the difference between two times is difficult.

Trip report is particularly annoying because the boxes are super tiny and if they did six legs in one day they have to do it six times. Over a few weeks it's a ton of legs and then when they get back to home station they have to type it out in Global Reach which takes a lot of time. It can take anywhere from 30 minutes to an hour and longer for newer loadmasters. Right now they can do it after their post-mission (R&R) but that depends on the commander and some require it before they can go home. It can take 3 hours if they have to download (unload cargo). Then only one person can actually get on the computer but they all have to wait around while they do it.

If they hit a bird on flight, there's a paper they have to fill out for that as well. Pilots have to complete them but loadmasters start them. They actually have something like ten different forms that they carry just in case something happens. Formfinder in the PUBS kit has them all.
A fillable pdf version of forms would save them a ton of time.

Pilots have to do most of the validations and make sure everything is right. If they have two pilots it's pretty easy but if there are more it gets trickier. Loadmasters are usually simpler and sometimes there are more than two loadmasters but usually that's an instructor or evaluator and they just get 100% of the instructor time. 75% of the time there's an instructor on board and maybe 20% there's an evaluator. If the instructor is getting evaluated then there can be both on the same flight. Same loadmasters across a whole mission unless there's a rare case that someone has to jump off and go back home - she's only seen it (crew-change mid-mission) maybe once in eleven years.

The trip report is her least favorite part. The boxes are so small that it's too hard to even write in (and then read when they get home). If that were digital it would be so much better and it would help them capture the whole incident immediately rather than taking a shorthand.

Not everyone is computer-competent but they have to do all of their checklists on their iPads so it's already forcing the older people to get rid of their paper checklists. They have to have iPads and ONLY iPads. Rule is already in place.

Would be willing to talk.

A B - mast sargeant.

Master Sergeant A - 2/14

Team Members: C

Key Points:

1. Also add combat time to ratios for the Mission Calculator
2. Given a potential iPad app, the user would prefer the information to presented in some sort of chart or spreadsheet instead of something like a Google Form/Doc
3. Global Reach is especially important for the Charleston Base (it’s unique to Charleston)

Notes:

- Global Reach is unique to Charleston base
    - Loadmaster has to input their info into this
- Input all the data individually, it takes forever and it’s easy to make errors
- Mission Calculator is a good idea
    - But how is it going to get the info into ARMS
- GTIMS is slow
- Either have one app for all forms (different tab for each form), Or have an app for each form, the former is probably better
- Base assignment, misspelling names, math are most common errors
- Chart form would be more useful
- What are the repetitive things that have to be filled over and over again?
    - Every sortie, has place you take off from, land, time: multiple sorties per mission

- 781 and Mission history are important to include in the app

Technical Sergeant Z - 2/17

Key Points:
Team Members: C

1. The mission calculator would be useful in addressing mathematical errors, but having a fully fledged app with the forms digitized would be a better alternative
2. The main issue is figuring out how and which databases to hook up the app to. Security is especially difficult to figure to ensure sensitive data does not get compromised
3. Allowing administrators to change forms (as the requirements change)
4. Have a quick link or hint so that people follow the guidelines correctly since the rules for each form are not followed or not known

MSgt Z - 02/19

Notes:

- A lot of people do not follow the guidelines for each form and try to figure it out themselves or completely ignore the guidelines
- Physical backups would be important, we could also send the physical versions already validated over to the SARMs instead of sync with the databases
- Only certain people should be able to edit the rules for each forms
- Digitized forms will be better than just the mission calculator alone
- It is possible to log more time than the actual sortie was
    - This is a problem
- Night time & instrument time
- Issues: syncing with GTIMS, so we need to get approval from AMC
- Work on getting the information to SARMS first then start working on GTIMS sync
- They can also use an Adobe Forms
- In Oklahoma base, they did everything on GTIMS and did not have paper forms (AETC)
- Physical proximity to GTIMS server can also affect how well GTIMS performs
- People are transitioning into GTIMS and the default is “GTIMS sucks”
- iPad app still has a function even if GTIMS exists
- Right now they do not have the capability to use the iPads to hook up to printers, so physical copies may not be feasible
- Have an auto-save feature, just in case iPad fails
- We’d have to get approval first but
- Not let you continue on in the form or change the color to red
- GTIMS shows a yellow bubble and then it won’t let you process until it is fixed
- Mission History is redundant with 781, the MH is built into Global Reach
- Global Reach would be easier internally but not necessarily outside of Charleston
- GTIMS has all of the information that Global Reach uses, no one gets trained into how to use GTIMS but there are a lot more features
- Training people to use GTIMS could be helpful too, there is no formalized way
- Having information that helps people fill out the forms but we need to make it so that as the rules change the app changes

C B - 04/08

Team member: B

1. Settings don't really update for loadmasters so they don't care about the settings screen.
2. Wouldn't want it to allow override of times not adding up properly
3. Add Mission History!

- only allow override of totals that are short, but not totals that are higher than the flight time
- adding the Mission History would be a lifesaver for loadmasters. It's lengthy and for long missions like 3-week missions that would save a lot of headaches

SARMs

Sergeant Y - Site visit

- SARM looks for errors:
    - I.e. Night time not being put down correctly. Disparity.
    - P/S/I/E→ All people should have the same.
    - INS (Instrument time) cannot exceed the primary time.
    - Total time error→ Take off to landing
- GTIMS does many calculations as a means of checks and balances.
- MERS sheets must be signed.
- SARM has to ask about “ghost time”--> Technicality with instructor time.
- **Some airlift squadrons make crews input into GTIMS themselves for all flights (15th squadron at Charleston, for instance)**
- SARM believes there are too many systems.
- ARMS has all the data to make sheets like MERS, but only Global Reach can extract the data for the sheets. There is a 24 hour delay between the systems which can make Global Reach a bit outdated for certain information.
- Says the iPad app wouldn’t print out correctly and that it would frequently die (Captain X later told me that SARM was in charge of charging the iPads but rarely did.)
- The original 781 goes to SARM and maintenance has a copy.
    - Original can be typed
- Sergeant Y would say that about 20% of the 781s he gets a day have errors. He processes about 15 781s a day.
- Time loaded into the system is always Zulu time
- SARM goes to the ADO who then goes to the aircraft commander when there are discrepancies. I have no clue how the Aircraft Commander remembers information from so long ago when SARM is inputting the data.
- GTIMS also calculates the amount of hours of night time the plane was in based off of airports and local sunrise.

Sergeant R - Site visit

- He uses a calculator before heading into GTIMS to manually add up the total time. This is a personal choice.

- When landing into an airport GTIMS automatically types in the same airport as the departure. You can always change this, though, but it's a handy feature. It also makes the arrival airport home (KCHS), but again, that can be changed.

Sergeant R-02/19

Team Member: C

Key Takeaways:

- Sync with Databases could create a lot of issues
- Could focus on getting all of the information to the SARMs instead of having to worry about security issues
- GTIMS: data puts into GTIMS and then transmit to ARMS, GTIMS already has a lot of verification
    - It is the primary system of record
    - Verification built in
        - For example, discrepancies in time are detected
    - GTIMS is slow and laggy
    - Search for any crewmember's name instead of having to worry about spelling
    - There is no way to save current progress in GTIMS
    - Do the checks yourself instead of inputting to GTIMS
- Most common errors: math, night-time logging, total time & primary time
- total time is broken down into separate blocks
- The format should be as close the 781 looks like, it will make for a good transition
- Box turns red whenever an error occurs

SARM Conference Call 02/11

TSgt R, SARM Flight Chief: Tsgt Y, SARM NCOIC A1C U, SARM technician

Key Takeaways

- Interviewees felt the data capturing process is tedious, and most of the errors they face have something to do with wrong time calculations.
- Approximately 50% of the 781 and MERS forms they receive have timing errors.
- Nighttime is a major issue. It is not always entered correctly.

May you walk me through the process you go through once pilots and loadmasters are back from a C17 mission. What kind of paperwork do you do as the SARM team?

- We receive a package which has 781 flight hours and MERS training documents. We then need to validate them before we enter them into GTIMS.
- We have a checklist that allows us to know all the rules, and if there is any error, we send the form to the Director of Operations who then sends it to the Aircraft commander who will send back the rectified form

How long does it take to process an average package?

- It can take up to 30 minutes if everything is entered correctly

On a given day, how many packages does one SARM personnel process on average?

- 5-7 packages

What kind of errors do you normally encounter in the packages?

- The big thing about 781 and MERS are timing errors
- 50% of the 781 and MERS forms have errors
- The other error we face is a pilot putting in that they flew as an instructor yet there is no instruction time
- Night time is also another major issue. It is often not entered correctly

Miscellaneous

- GTIMS pushes data to the Aviation Management Resource
- Many SARMs use a web-based calculator to do validation
- Total time off throws out every crew member's time
- It usually takes 1-2 days to have forms with errors rectified
- There is really no deadline as to when forms should be filled, but they do them ASAP
- The SARM folks feel the whole process is tedious and TSgt R suggested automation. Perhaps, if there were onboard computer systems crew members could use to log on their man hours and other data, and they submit upon landing

SARM & Pilot conference call 03/03

Interviewees

- Lt Col M: 16 AS Director of Operations (Pilot)
- TSgt X R: 16 AS SARM Chief
- TSgt Z Y: 16 AS SARM NCOIC
- AB U: 16 AS SARM

Team member: D

Key Takeaways

TSgt Z Y, AB U, TSgt X R

- The SARM team is willing to embrace any solution that reduces the error rate.
- Sending forms to a common SARM email might have drawbacks in the beginning because people might forget to check that email; however, it could come in handy because SARM can have access to the forms before the mission ends.
- GTIMS doesn't do everything we want it to, so an app that bridges the gap will be welcomed with open arms.

Lt Col M

- It would be great to have a form that states the encountered problem and allow an individual to click a "submit anyway" button to still submit after realizing there is an error.

- Eliminating paper doesn't actually save us, but eliminating math errors does. I am okay with using paper as long as I have some sort of app to help me with the math.
- A dropdown menu with split evenly, percentages, and ratio could be helpful in allowing people to have options for calculating time.

- ❖ Pilots are going to adopt GTIMS soon, but GTIMS does not check the Math and requires internet access
- ❖ An app that does our Math would be great
- ❖ GTIMS does not do everything we want, but a mechanism for automatically submitting forms to GTIMS would be great
- ❖ Sometimes I divide my time into percentages, so I am wondering how you envision diving time? Ratios and split evenly are great as well, but if you have a split evenly, you will need a way to figure out how to take that time from another box. Which box it is could be a problem.
- ❖ We have printers on the plane, and this is a good thing
- ❖ Errors and follow-ups are the biggest issues
- ❖ Really, just having software to do the Math means a lot to me. Our main problem is not a paper problem, but a Math problem.

OTHER

MMK team - 1/30

Team member: B
People on call:
AB M JR CIV USAF AFRC A3/A3RM - main contact
JK V GS-13 USAF AFRC HQ AFRC/A3RM
Captain X

Maintenance guys part of mission paperwork team

Commercial company - **Unisys - owned the code and any iOS release that comes up could wipe that app out.**
Had meetings with Adobe, other companies to see if they can replicate the app.
MMK is written in Objective C so it's basically useless anyway.

The app started with a process improvement event - AFC, National Guard sat together to try to see what the reserves were contributing to the war. If the captain has a squadron flying but they're short a co-pilot or loadmaster, they pull one over from the reserves. But they had no way of capturing that data to tell their boss when they go testify before Congress that they need those reserve units.
The app was based on the basic 781 and it has a critical field [maybe box 39 or something] that captures the data of what category that person is flying in - it's very important to the reserves and the guard and not really important to active duty guys.

Started capturing other things that helped them as well. Like tracking how much cargo they moved for the AF even though they were just doing a training mission. Started tracking tanker fuel offload and **found that one aircraft was being credited with all the fuel that someone was burning, even though it was a grounded plane - the app helped them discover that it was the only plane that they could remember the tail number from.**
Basic app was for reserves, then they kept modifying it - paying for a software maintenance license (software assurance?) to sustain it. He gave 40 licenses to the active duty guys in Charleston. Very expensive for one command to take control of the product.

To get it on the Blackberry UM they have to fill out a mobile app worksheet. It's a bit of a pain but if they can get it approved at one level they have reciprocity. They are looking for backdoors and data leaks out of the app, make sure it is encrypted, if there's any PII etc. and once it goes through there CCC (hq) approves it for a given app store. One thing they asked Unisys to do was to put it in the Apple app store but they didn't do that - had to send the .ipa file (ipk?) and put it manually on the Blackberry app store.
Airwatch - another EMM/MDM solution that they use.
Major versions need to go through the approval process, or any update that changes the security posture of the app.
In the early days, they didn't know what they were testing for - the individual who approved the MMK app the first time quit his job the next day.
"At least now they have a list of requirements" -Captain X

Using the MMK was like rocket science to the reserve command flyers because they're older and so used to paper forms. Also, the previous people in charge of the app were too worried about aesthetics or minor details and they were trying to appease everyone's cosmetics desires.
MMK did have the feature to duplicate previous information.
Captain X "The top half is what you want to copy over - mission information, air crew, reserve status crews etc. Bottom half - ICAO times for flights and everything are different every day."

The business rules are very complicated, from squadron to squadron and from weapon system to weapon system. It's critical that they would be able to override errors and update them easily.

AFI 11401 has a lot of the business rules (general flight rules) in it. Then there are other "we've always done it this way in this unit" kind of rules. When they wrote the MMK they took some of the biggest units and looked at their rules.
It's not a MajCom because there's no supplement?
The SARMs are the experts and we would need to bring in the experts from each crew position to find out exactly how to implement the rules. The aircraft commander needs to sign his name to the form but he has to trust his guys because he delegates it to them to fill it out. Often, the first time he even sees the data is when he's at the mission debrief with maintenance after the flight.
Need to make sure each person putting in information gets that data over to the aircraft commander's device.
If we can build it out to work for an Air Force Reserve Unit, we'll be able to meet AF's needs overall.

He'll look through his old paperwork to see what he can find for us to look through.

General X - 02/10/2020

Team members: A, B, C

Key takeaways:

1. Get a working app first before trying to integrate into existing DoD databases (problems with security issues, etc.)
2. Think of other ways to make the lives of the crewmembers easier, does not necessarily need to be a full-fledged product, even a basic solution could benefit C17 crew members
3. Resources and budget could potentially be an issue in the future, our solution should thus be cost-effective [I don't think Tommy cares about cost-effectiveness though so let's not jump on this one]

Notes:

- Issues with calculations, is there anything else we can automate?
- Submit remotely instead of waiting to sync once you get back to base?
- Fighting, bombing vs transportation community
- Transportation generally gets less automation and priority
- Almost completely a manual system, could it be automated? - it could help the data analysis team with their problem as well
- Morale of C17 crew - less positive than the fighter community
    - They generally tend to get less resources
- 'Cheap' is a key issue
    - Find an approved model that already exists could make the solution process faster
    - Defense budget will come down due to elections, cost-effectiveness is currently not a factor, but it WILL BE.
- Database transmission is not necessarily as important as getting a working app concept
    - Problems with security issues

Commercial Pilot - W V - 2/25

Team member: team member on interview

1. They have a substantial amount of paper to carry around but only two forms
2. HR-style information like C-17 pilots are collecting goes into personal logbooks
3. There are commercial systems for tracking things that you would expect pilots to have to record
4. There's an app called FliteDeck Pro that automatically reports stuff like night time

They collect 20 papers/person to 30/person + notices of around 120 pages long before each flight

Paperwork - all comes from the Operations and Navigation Department:
Flight plan
Voyage report
Weather reports
Notices

A flight plan app would be amazing.

They have to record the fuel consumption once an hour minimum so they know exactly when a leak started if it starts.
Two commercial systems:

- NavBlue Airbus system
- Jeppesen system Boeing

Integrating weather would be amazing because that is a lot of paper they have to look through and it wastes a ton of paper every flight.

FliteDeck Pro automatically reports night time
Info about hours, etc. goes into personal logbook

W V - 2/27

Team member: B

1. Look into LogTen Pro for a competitor, they also automatically calculate night time
2. Only the American system uses decimals, so if we want a universal system, it should also allow hour+minute input
3. I have examples of flight plans from commercial flights which look very different from what we see on a 781.

Correction from last interview: LogTen Pro is actually the app he uses. It's $250/year

- It allows export of certain time ranges, number of flights, etc
- Only the American system (military and commercial) uses decimals - he thinks LogTen Pro allows that input as well. Internationally, people use hours and minutes.

He gave me the files they have and I can share them with the team if anyone needs them for reference.

- Gave me flight plan docs - p21 of Jeppesen file is where the flight plan starts
- Capt and f/o are the main positions listed. Note that the pilot and copilot stay the same throughout the whole flight on a short route like this flight plan describes, but he can also get us copies of flights such as transatlantic ones where the positions switch off.

Next week: I will show him our MVP to get his feedback

Pilot U T- 3/2

Team Member: A

- **Most general aviation people don't do paperwork because it's a pain (even they have to and face penalties for not doing so)**
- **App that could help with weight and balance would be great.**
- UND aircrafts are in a database based off of people, baggage, fuel.
    - Commercial setting they use an average weight per person. (FAA—> child = 90lbs. Adult —> 170lbs)
    - General aviation does exact weight.
- Weight and balance distributions are based off of each plane. A lot of front and back considerations. Based on center of gravity. Range on the plane.

Commercial aviation paperwork:

- **Biggest piece of paper is origin, destination, weight and balance, route, passengers, etc. DISPATCH PAPERWORK.**

Pilot U T-- 3/31

Team Member: A

1. General aviation.
    a. Part 91
    b. ForeFlight. App that lets you plug in information and it calculates values for you—removes error.
    c. Has charts and maps saved on it.
    d. Can be customized for different planes.
2. Commercial Aviation training.
    a. Part 141 flight school
        i. Legal document with FAA that dictates flight training protocols.
    b. Filing flight plans.
    c.
3. Really likes the layout and thinks it would be excellent on the types of tablets he brings up for both general and commercial aviation purposes.

W V - 04/07

Team Member: B

1. I don't see how the settings screen is organized, so it doesn't make sense for us.
2. It doesn't look clear that you can click the "Generate" button when it's grey like that.
3. I wouldn't want my errors in chronological order. It should be in the order that it goes on the form, or probably the order that it goes into the app.

Mentors

A N-03/24

Team Member: D

1. The MVP looks good to me
2. Continue getting feedback from the beneficiaries and highlight key features. Do a voice-over video to allow seamless presentation of your ideas.
3. Make an efficient use of your time when presenting the MVP. What are the features you would like to highlight? Focus on that. You should probably focus more on error propagation, night time, and general splitting of time.

- I will send you our videos with voice overs, send them to the other folks, and try incorporate that in the next presentation
- Try not to spend too much time on the MVP, just highlight key features

PQ - 03/31

Team Member: D

1. I like the name “Uniform”. It is a simple name that makes it clear that you are integrating a number of forms into one.
2. Look beyond just capturing data. How can you do data analytics with your app, perhaps, capture how many overall flight hours crew members have flown, and how many hours a plane has flown?
3. The user interface is intuitive

- Also think about how you can scale this app to other departments
- Think dual use
- What is the meaning of the */3