Howdy! If you're reading this, you decided to join the best ARTCC on VATSIM and made the fantastic decision to start controlling. Before reading this, it is essential that you have a couple of things done, which should have already happened before joining ZHU.

- Created a VATSIM account, and took the Basic ATC Exam in VATUSA.
- Have a basic understanding of how the VATSIM Controlling Structure works, here's a picture for reference:
- Have a general idea of where the ZHU ARTCC is located and the main airport locations.
- Be willing to learn!

This HATS document can/will be supplemented with videos of examples as time goes on, and will have references to the FAA Order 7110.65 (The holy grail of controlling) for further information. Additionally, expect photos for information.
Abbreviations used in this document:

- ATC-Air Traffic Control (AKA You)
- ATIS-Automated Terminal Information Service
- ATLT-Atlanta, GA Terminal Area
- AUS-Austin Bergstrom International Airport, Texas
- DEL-Clearance Delivery
- DFWT-Dallas/Fort Worth Terminal Area
- FL-Flight Levels used in cruise.
- GND-Ground Control
- HOU-Houston Hobby Airport, Texas
- IAH-Houston George Bush Intercontinental Airport
- I90-Houston TRACON
- LCH-Lake Charles Regional Airport, Louisiana
- TRACON-Terminal Radar Control
- TRSA-Terminal Radar Service Area
- VATUSA-VATSIM USA Division
- VRC-Virtual Radar Client
- ZHU-Houston Air Route Traffic Control Center
- Zulu-Universal Coordinated Time

This document is separated into every part of the S1 that VATUSA and ZHU Chapters:
Chapters:

1. A New Beginning
2. ZHU Basics
3. Basics of Clearance Delivery
4. So you want to fly to Fort Worth? Advanced Clearance Delivery.

5. Introduction to Ground
6. Making Tower's Job Easier: Sequencing
7. Preferred Routings & Event Requirements
8. Working Ahead: Learning vSTARS for Ground

Chapter 1: A New Beginning

Controlling VATSIM is one of the most fun hobbies (Get it, Hobby?) in the Flight Simulation Community, and in general, but it is crucial to get a good foothold when starting.

Getting software setup.

There are a couple of different programs needed for controlling, and their uses are explained here.

- Teamspeak 3: https://teamspeak.com/en/downloads/
    - Used for communicating with fellow controllers for coordination, training, and having a place to chat, TS3 is used for all ZHU .
    - ZHU Information: ts3server://ts.zhuartcc.org?port=1337&password=AEX2017
- Discord: Optionally, ZHU has a discord server that is used frequently, but no coordination typically occurs here. As such, joining is optionally but recommended.
    - https://discord.gg/Ag2cdZz
- VRC (Virtual Radar Client) https://vrc.rosscarlson.dev/download.shtml
    - Used for controlling, VRC is a great client to learn with and provides many tools for all levels of controlling on the network. Additionally, documentation is available on the same site.
- AudioForVatsim
    - https://audio.vatsim.net/downloads/standalone
    - AudioForVatsim allows the controller to connect the Voice Servers on the network, and as such, is an important tool for controlling.
- vATIS
    - https://vatis.clowd.io/
    - vATIS is the software used for putting an ATIS frequency on the network. Most tower and higher controllers typically use it; however, ground/delivery controllers are still encouraged to do so.
- ZHU Resources
    - https://www.zhuartcc.org/resources/
    - Here you will find all the files needed for each of the various clients for controlling,
- ZHU IDS
    - https://sites.google.com/view/vzhuids/home?authuser=0

- The Information Display System will contain SOPs and quick references for most ZHU Airports.

Getting Setup

https://youtu.be/NAwOU0SGnvI

(Note: Following the Video still works, however, the ZHU Site has since been updated)

After downloading VRC, AudioForVatsim & Teamspeak, go to the ZHU Resources and download the ZHU VRC Files Zip, located under the VRC tab; you'll need the POF, SCT2, and TXT File located inside. Put these three in a place you want, and open VRC. Here you'll create a new profile, and open the client.

1. Inside VRC, click File; Open Sector, and select the ZHU Sector File.
2. Under settings, click General, and in the first tab, select your POF and Alias (TXT File) in their boxes. Additionally, check the box for set squawk codes in random order.
3. In the Airspace Tab, set your range to 20 Miles or less. 10 Miles is sufficient for working ground. Also, set the departure and arrival fields to the airport you are working. At ZHU, your first airport will likely be KAUS or KHOU.
4. Now, close your settings and open the views tab, and enable static text. This will let you see taxiway diagrams.
5. Under tools, open Controllers>Comms>Aircraft List and Weather Panel.
6. Under the Comms Panel, set your position name (Ex AUS_DEL) and the frequency. This can be found on the Airport Diagram, TS3 Channel, and the IDS.
7. Under the connect tab, enter your name, CID and Password.
8. Lastly, save the profile as something such as AUS_DEL, to have everything saved.
9. Done!

Chapter 2: ZHU Basics

ZHU has the general policy, along with general expectations for controllers. For instance, controllers are asked to control two hours a month (With Observers getting a different requirement). Along with the hours, ZHU Controllers are required to be on the Teamspeak whenever controlling.

Major vs Minor

ZHU, in accordance with the VATSIM Global Ratings Policy, has assigned KIAH as a major airport, along with the I90 as a Major Designated Airspace. Upon completion of the S1, controllers are allowed to control any field in ZHU, excluding KIAH. Major airspace requires further training with a member of the training staff.

Starting Fields

In ZHU, with this document, you will see the perspectives of three different airports, each with its own procedures and requirements; KAUS, KHOU, and KLCH. With the usage of the SOP for each, and with this training to guide you, the procedures for all airports in ZHU can be learned from these three.

Pre Duty Brief

All ZHU Controllers must complete the Pre Duty Brief located on the IDS prior to controlling and is highly encouraged before training sessions. This includes a weather briefing, a log for controlling, and a position relief, depending on the situation.

Runway Flows

Covered more in Chapter 4, Understanding the Flows for KIAH and the DFWT and the ATLT are required for controlling, due to flow-dependent SIDs/STARs.

Notes about Training Fields

- KAUS (Austin)
    - Austin is a Class Charlie Airspace, located 5 Miles Southeast of Downtown Austin, Texas. Founded as a military base, the airport has become a hub of traffic for Central Texas, complementing the Austin Metropolitan Area's growth.The airport saw 209,729 Total Aircraft Operations in 2019, and with more development on airport property, the field serves an significant role in ZHU.
- KHOU (Hobby)
    - Houston-Hobby is the older of the two Class Bravo airports located in the I90/Houston Metropolitan Area. While it is smaller and has less traffic than its north side brother, the field's 8 Mile Proximity to Downtown Houston serves as a hub for Southwest Airlines. It houses much Corporate Traffic for the city's industrial area. With the new international terminal and work done for equipment on the field, Hobby serves a crucial role in the Aviation Market and is responsible for much of the flying within Southeast Texas and Southwest Louisiana.
- KLCH (Lake Charles)
    - Lake Charles Regional is a field located 5 Miles South of the city of Lake Charles, Louisiana. The airport is a Class Delta field, surrounded by a TRSA encompassing the nearby Chennault Airport. In 2015, the airport saw 31,961 movements, many of which were flights supporting rescue efforts along the Gulf Coast and connections to Houston for the city's casinos. LCH is a small but an crucial field, as it serves to relieve Houston during inclement weather.

Chapter 3: Basics of Clearance Delivery

Ahh Clearance Delivery, the beginning for every flight. DEL is typically not used on the network but is absorbed into GND for workload, excluding events. However, it is still essential to know everything there is to know about delivery.

VFR in General

VFR is often overworked on the DEL side, without much rhyme or reason. The only differences are the type of airspace the Aircraft is in and their intentions. For the sake of generalization, VFR flights are split into three categories:

- Class Delta:
    - VFR Aircraft *can* be given a squawk if they request Flight Following, or TRSA service, however, clearances are not required. For this reason, many Deltas do not have a clearance frequency.
        - At Lake Charles, a TRSA is surrounding the airspace, so two scenarios exist for VFR Aircraft:
        - Example: Piper N59221, Lake Charles Clearance, departure frequency 119.35, Squawk 7272.
            - This is in the case that Aircraft requested either Flight Following or TRSA Radar Service. This is assumed if a pilot contacts Clearance.
        - Example 2 (Pilot Perspective): Lake Charles Ground, Pilatus C-CFEG at the Terminal, Ready for Taxi, **Negative TRSA.**
            - This leads into the Ground Chapter, but notice the Aircraft requested Negative TRSA, resulting in no prior instructions needing to be assigned.
- Class Charlie
    - As controlled airspace, squawk codes are *almost always required* (See Chapter 4 for more details). VFR Aircraft shall be given a squawk code (If they are flying through the outer ring of the Charlie, if they are departing from the Surface Ring, the Squawk is not required) and departure frequency, which may be terminated as the Aircraft leaves the Charlie. For Flight Following, the code is usually kept.
        - Example: N1663D, Austin Clearance, Departure Frequency 119.0, Squawk 4211.
- Class Bravo
    - Class Bravo is Virtually the same for the DEL controller as ground; however, Aircraft must be given an explicit clearance with the squawk. This is done as "Cleared out of Class Bravo Airspace/City Class Bravo Airspace" or in some cases "Cleared to enter Bravo Airspace/City Bravo Airspace". A Squawk code is still given, along with a departure frequency.
        - Example: Cessna 559AD, Hobby Clearance, Cleared out of the Houston Class Bravo Airspace, Departure Frequency 120.05, Squawk 2015.

IFR in General

The more common clearances on the network are for IFR Aircraft. Here, we follow the CRAFT Format (**C**learance, **R**oute, **A**ltitude, **F**requency, **T**ransponder). There are a few exceptions located in Chapter 4, but here, we'll go through a few examples.

Format:

- Aircraft/Route
    - Clearance
- SWA1511/KAUS ILEXY2 ILEXY KIDDZ3 KHOU
    - Southwest 1511, Austin Clearance, **C**leared to the Hobby Airport, ILEXY2 Depa**r**ture, MNURE Transition, then as Filed. M**a**intain Four Thousand, expect FL210, One-Zero Minutes After Departure, Departure **F**requency One, One, Niner Point Zero. Squawk Two, One, Four, One.
        - Whenever a SID is being used, an Aircraft should be cleared via that SID, then as filed.
- ENY8822/KLCH LCH DCT CRIED BEREE1 KDFW
    - Envoy 8822, Lake Charles Clearance, **C**leared to the Dallas Fort Worth Airport As Filed. M**a**intain Three Thousand, Expect FL220, One-Zero Minutes after departure, Departure **F**requency One, One, Niner Point Eight, Squawk One, Tree, Fife, Niner.
        - As Filed in this route is because there is no procedure the Aircraft needs to fly at the first leg. Lake Charles Approach will vector them to LCH, where they will resume their own routing.
- JSX14/KHOU DCT PSX DCT CRP DCT HRL KBRO
    - Bigstripe 14, Hobby Clearance, Cleared to the Brownsville Airport, via Radar Vectors Palacios, Direct Corpus VOR, Direct Harlingen VOR, Maintain Fife Thousand, Expect FL400, One-Zero Minutes After Departure, Departure Frequency One, Two, Zero, Point Zero, Fife, Squawk Four, Tree, One, Six.
        - Notice Here that the entire route was given. In this scenario, a full route clearance was given. This could have occurred for a reroute, or a controller felt like it. Having a full Route Clearance available can be tedious, but is helpful in the right scenario. On the network full route clearances are given for short routes that require changes, or events that require a specific route for traffic. Additionally, these full route clearances ensure the aircraft is on the correct route, even if they file it.

Amendments (Simple)

There are times where you will have to amend part of an Aircraft's flight plan. It should be noted that VFR Aircraft do not require amendments since they do not have to follow their

own flight plan unless ATC is giving instructions while en route (You will learn this during Radar/TRACON). Here are some simple examples before we move into the advanced side.

- GTI1121/KBFM-KSAT cruising at FL230
    - What is the issue here? That's right, the altitude for the direction of flight. The easiest way to fix this is simply to ask the pilot if they can take a different altitude. After they confirm an altitude, change their Flight Plan and give clearance with the new altitude.
        - Giant 1121, Houston Clearance, your altitude is incorrect for your direction of flight, can you accept FL220 or FL240?

Congratulations! You just learned how to give clearances! Time to work on the fun parts.

Chapter 4: So You Want to Fly to Fort Worth? Advanced Clearance Delivery.

Clearance is easy until you begin working with LOAs with other ARTCCs and flights within ZHU. This document is current as of March 14th, 2021, but you should ensure your information regarding Letters of Agreements are current when logging on to the network.

Flights within Houston

The most crucial part of giving clearances within Houston is ensuring arrivals are correct into airports that have flow or equipment- dependent STARs. In this section, KIAH is used to show both examples; however, the lesson also applies to KAUS, KHOU, and KSAT.

Flow Dependent

Arrivals may be dependent on if the airport is landing East or West. At KIAH, this is important as altitudes and fixes change on the STARs, along with the last transition to the runway and their localizers.

Take UAL2736, flying from Austin to Houston on the route ILEXY2 ILEXY DRLLR5. DRLRR5 applies to Houston when KIAH is landing West (26L, 26R, 27); however, if KIAH is East, the corresponding STAR should be used. This can be found via Charts, the IDS, and Alias Commands. Before clearing an Aircraft, ask if they can take the new arrival, then clear them via it.

- Austin Clearance, UAL2736 with Information Alpha, Request IFR to Houston-Bush.
- UAL2736, Austin Clearance, can you accept the GUSHR3 Arrival, ILEXY Transition?
- Affirmative, UAL2736.
- UAL2736 Cleared to the Houston Airport, via the ILEXY2 Departure, ILEXY, GUSHR3 Arrival. Maintain 4000, expect FL230, 10 Minutes after Departure. Departure Frequency 119.0, Squawk 2144.

Equipment Dependent

While some Aircraft may file the correct route, others may file Arrivals or Departures not designed for their equipment. In this example, SWA804 has filed IDU9 IDU MARCS1 from Hobby to San Antonio, but he can comply with RNAV Procedures. At this point, his whole route has to be redone so that he will be given a full reroute. Advise the pilot before providing the new clearance, so they are ready to copy.

- Hobby Clearance, SWA804 Ready to Copy IFR to San Antonio.
- SWA804, Hobby Clearance, I have a reroute (Or you can say amendment, but it does not work well here). Advise ready to copy.
- SWA804 Ready to Copy.
- SWA804 is Cleared to the San Antonio Airport Via the RETYR5 Departure, WAILN Transition, BRAUN3 Arrival. Maintain 5000, expect FL240, 10 Minutes after departure, Departure Frequency 134.45, Squawk 2171.

Alternatively, say the Aircraft had filed the BRAUN3, but not the RETYR5. (IDU9 IDU WAILN BRAUN3) You could clear them by:

- SWA804 is Cleared to the San Antonio Airport, via the RETYR5 Departure, WAILN Transition, then as filed. (Rest of the Clearance as above).

That's it for ZHU Internal Flights! Please make sure they are on the correct procedure for their Aircraft and the airport's flow.

Fort Worth and Atlanta LOAs

Flights going to Dallas-Fort Worth (D10) and Atlanta-Hartsfield Jackson (A80) should adhere to the LOA.

Links used here:
https://sites.google.com/view/vzhuids/documents-controlling-files/loas/zfw?authuser=0
https://sites.google.com/view/vzhuids/documents-controlling-files/loas/ztl?authuser=0

D10

ZHU **is** responsible for ensuring Aircraft going to any field within the D10 is on the correct Arrival.

- Aircraft landing at KDFW should be given BEREE1 when D10 is South, and WHINY4 when D10 is North from the I90, and anywhere west of the I90.
- Aircraft landing at KDAL should be given REDDN2 for when D10 is South, and MNNDO4 when D10 is North from the I90, and anywhere east of the I90.
- Aircraft landing at KDFW should be given BOOVE2 for when D10 is South, and SOCKK4 when D10 is North from the I90, and anywhere west of the I90.
- Aircraft landing at KDAL should be given BACHR3for when D10 is South, and DRYYE1 when D10 is North from everywhere west of the I90.

Aircraft Altitudes also change depending on D10 Flow.

- DFW (Landing North): Cross Boundary at or below FL380.
- DFW (Landing South): No altitude restriction
- DAL (North or South): Cross boundary at or below FL300.

Atlanta

Atlanta arrivals should be routed on the GNDLF2 Arrival if Atlanta is landing East and the HOBBT2 if Atlanta is Landing West.

Additionally, suppose the Aircraft is departing from anywhere within the New Orleans or Gulfport Areas. In that case, the cruise should be restricted at FL330, and the reason if a pilot asks for any of these is simply, LOA.

Chapter 5: Introduction to Ground

Now that you have learned how to clear Aircraft from the airport, we still have to get them to the runway and back to the gate or apron. Ground in itself is not as complex as one may make it out to be; however, this guide will discuss the basics and examples to use. It is recommended that for each section, you have the Airport Diagram open for that field. This can be found on the IDS or any chart source.

ASDE-X: Radar for the Ground

Many major airports are beginning the rollout of Airport Surface Detection Equipment, Model X, or ASDE-X for their fields. This technology allows controllers to view a radar display of the Aircraft area and can help prevent runway incursions (An Aircraft enters a runway without permission).Additionally, Airport Surface Surveillance Capability or ASSC is used to protect the runways in a similar fashion. On VATSIM, ASSC is used as ASDE-X for practical purposes. This allows us to split training and controlling ground into ASDE-X Airports and non-ASDE-X. This data is usually found on Airport Diagrams and may be advertised in the ATIS and NOTAMs (Notice to Airmen) or NOTACs (Notice to Controllers). Here, KHOU and KIAH feature ASDE-X, KMSY uses ASSC, and all other airports do not have the technology used.

Part 1: Airports without Radar

At airports without Surveillance equipment, Aircraft must inform the Controller of their position at the airport. This could be on initial contact for clearance, or when contacting ground, however, if the pilot has not informed ATC at any point, and requests taxi, the Ground controller must say "Callsign, Say Position". This can be slightly edited to help the pilot by saying "Callsign, Say Position/Location at the Airport". Once the Aircraft has been located, instructions can be given. This is done to simulate the tower having to look outside to verify the location of an Aircraft or ground equipment.

Part 2: Airports with Surveillance Equipment

At airfields with the equipment available, the controller's job gets a bit easier, but a bit more difficult. In order to verify an Aircraft's location, the plane **must** be on the correct Squawk code given, and must be Mode C, or Altitude Reporting. Otherwise, the location and other information cannot be verified. Additionally, while not required, Ground may ask an Aircraft to state their position for random Aircraft to verify the equipment is functional, however, on the network it is safe to assume that such tools will not stop working.

Basic Taxing

In this section, we will assume that all equipment or Aircraft have given their location. Taxing is split into three areas to be concerned: Departures & Arrivals and Helicopters. Each will have a subsection here. Departures are our flights that have pushed from Terminal Areas or taxied out from their FBOs or tiedown areas. Arrivals are the flights that have landed on the runway, and are ready to taxi to the positions mentioned above. Helicopters are a mix of both

Departure and Arrival Phraseology, but may have special instructions given. At the minimum, the instruction given is “Callsign, Location, Taxi Via …”

Departures & Arrivals

For the purposes of simplicity, we will assume that all departures will be going straight to the runway. Practically, this could change depending on weather, airspace, or airport configuration. These will all be discussed more in Chapter 6. In a perfect world, or a general day on the network, the only thing to do would be to get the Aircraft from their origin, to the runway. In this document, only departure examples have been taken from the network for actual Aircraft, however arrivals would have the same instructions, but may be given taxi to “The Terminal”, “The Ramp”, “North Cargo”, “The FBO”, or “Signature (FBO)”.

Examples:

- **Section 1: Austin**
    - Austin Ground, Southwest 1218, Ready for Taxi
    - American 1218, Austin Ground, Runway 17 Left, Taxi via G3, G, B.
        - In this first example Southwest 1218 is told to taxi to Runway 17 Left, and they should taxi via taxiways Golf 3, Golf, Then Bravo. Pretty simple right?

    - Austin Ground, Frontier Flight 441, Ready for Taxi, Request 17R for Weight.
    - Frontier Flight 441, Austin Ground, Runway 17R, Taxi via S, C, Hold Short of Taxiway G.
        - Aircraft Reaches Golf.
    - Frontier Flight 441, Continue Taxi.

        - Or, if needed for traffic:
    - Frontier Flight 441, Cross Taxiway Golf, *Without Delay*.
        - That was a lot of words! Let's talk about what happened. Frontier was told to taxi via Sierra, Charlie, But to hold short of Golf. Likely this was for an Aircraft landing, then vacating. Then, they were told to continue taxi, or in the second possibility, to cross Golf, again, possibly for traffic.

    - Austin Ground, United 1128, Ready for Taxi.
    - United 1128, Austin Ground, Runway 17L, taxi via G1, G, B, Follow (the) Company 737.
        - Here, the United was told to taxi by following the Company Boeing 737. Company implies they were also a United, but could have been a different airline if conditions warrant it.

    - Austin Ground, Cessna 121KP Ready for taxi, Request Intersection Departure at J.
    - Cessna 121KP, Runway 17L at J, taxi via L, B, J.
        - Here, the Cessna requested to depart runway 17L at Taxiway J. If the pilot requests the Intersection, and Tower approves it (See later in this chapter, Coordination), give them a taxi to it. If you would like to provide the Intersection Departure, you **must** have the Feet Remaining available to give the pilot.
- **Section 2: Hobby**
    - Hobby Ground, Southwest 101, Request Taxi.

- Southwest 101, Hobby Ground, Runway 13R, Taxi Via Y, E, Hold Short Runway 13L.
    - Southwest Reaches Runway, and Tower has been informed prior to the taxi about the runway crossing.
- Southwest 101, Cross Runway 13L at Taxiway E, Hold Short Runway 13R.
    - Nothing too complicated here, Southwest was Informed to Hold Short Runway 13L, and was later cleared to cross the runway.

- Hobby Ground, Southwest 442, Ready for Taxi
- Southwest 442, Hobby Ground, Runway 31L, Taxi via Z, H1, H, M, Cross Runways 31R and 4, Give way to the Regional Jet Passing Left to Right on M.
    - Again, pretty simple here. The only notable things here are multiple runway crossings together, and told the Southwest to give way. This means that the Southwest should allow the Regional Jet (Usually given when the airline is a Regional Carrier that flies for multiple Major Airlines, such as Skywest) to pass, before they continue taxi on Mike. Additionally, the runway to cross is numbered based off of the active direction, and flow for 31R and 4 Respectively.

- **Section 3: Lake Charles**
    - Lake Charles Ground, Brickyard 6712, Ready for Taxi.
    - Brickyard 6712, Lake Charles Ground, Runway 15, Taxi Via E, A, J, Hold Short Runway 15 ILS Critical Area.

        - The only notable thing here is that the Aircraft was told to hold short of the ILS Critical Line. On VATSIM this is not needed, as equipment issues are not simulated, but could have been used for an Aircraft on final.
    - Lake Charles Ground, Bluestreak 9399, Ready for Taxi.
    - Bluestreak 9399, Lake Charles Ground, Runway 5, Taxi via E, A, J, J1, Cross Runway 15 Without Delay.
        - Without delay is used to tell the Aircraft to cross the runway quickly, likely used in this case for an Aircraft landing Runway 15.

Helicopters

Helicopters are split into three movement types: Air, Hover and Ground. For Ground Control, we are just concerned with Hover and Ground. Ground is the same phraseology as fixed-wing Aircraft, however hover is a bit different. Simply saying Hover taxi is sufficient, as long as you ensure the Helicopter will not cause any issues such as propwash or debris to be scattered.

- Helicopter 44BU, Lake Charles Ground, Runway 15, Hover-Taxi via F, A, J.
- Petroleum 5, Austin Ground, Helipad 1, Hover-Taxi via P, B, L.

Progressive Taxi

Progressive Taxi is to provide step-by-step instructions for an Aircraft. An Aircraft can request Progressive Taxi instructions, or you, as the controller can give them at your discretion if you feel it is in the best interest of safety and expeditious flow. Instructions can be given as either immediate instructions, or direction at a point. Only two examples will be given here, as these instructions are very situationally dependent and will not be easily portrayed through text.

- Airbus 73M, Austin Ground, Runway 35R, Turn Left on Taxiway Golf. Turn Right on Taxiway Bravo.
- TBM N55W Hobby Ground, Taxi to Million Air (West Ramp) Northwest Bound on Taxiway N, West on Taxiway L, North on Taxiway J, West on Taxiway K, Northwest on Taxiway K1, North on Taxiway G, Cross Runway 4 at Kilo 1.

Conclusion

Ground is easy to learn, but has some key things to note when starting out. In the next chapter, you'll learn about those advanced concepts, and what you can do to aid other controllers simply by changing the order of Aircraft going to a runway. Additionally, the coordination used for runway crossings will be displayed and how you can do some simple sentences in order to keep the airport safe.

Chapter 6: Making Tower's Job Easier: Sequencing

Ugh, Tower Controllers, who needs em'? They just sit in the cab, telling Aircraft to land and takeoff, then send them to you. Well, the important thing is, everything you, as Ground and Clearance do, affects Tower and the Aircraft all the way to their destination (Or on VATSIM, the end of Radar Coverage). Doing a couple of different things on the ground can highly influence traffic levels, and end up saving both the Aircraft, and you some time.

Direction of Flight

This one is self-explanatory, but needs to be mentioned. Unless traffic conditions warrant otherwise (Your Tower, TMU [See Chapter 7] or Departure Controller will tell you in advance), you should try to assign Aircraft a runway based on their direction of flight. At Austin for instance, an Aircraft going to Los Angeles should be given 17R, while an Aircraft going to Boston should be given 17L. Of course, this should be done in accordance with flow unless your

Tower dictates otherwise, or it is operationally advantageous to go against flow. Lastly, this task can be ignored at fields that would make it more difficult to assign separate runways, such as Lake Charles, New Orleans, and Hobby to an extent.

Departure Sequencing

The fun one. You will learn at the Tower level how efficient one can be for departing Aircraft, however, Ground can aid in this task. The easiest way to do this is to put Aircraft going to the runway in an order so that they do not use the same departure or direction of flight, in order to efficiently get Aircraft off the ground. For instance, let's say we have Southwest 1, United 2, and Delta 3 at Austin. Their destinations in order are KHOU, KIAH, KSLC. Say all these Aircraft want to depart at the same time, and Runway 17R is closed. The best order to give these Aircraft is Southwest or United first, Delta second, then whatever Aircraft is left. This way, Tower will launch the first plane, have the second lined up and take off immediately, then allow the third to go off without a hitch.

There are two ways to do this. The easiest is shown at Austin, where two taxiways are at the departure end of 17L. Giving the Delta one taxiway, and the United and Southwest the other will easily separate the Aircraft. Additionally, giving ground instructions by giving way or following another will put them in order from the terminal.

Lastly, the best thing to do for sequencing is to be concerned about Aircraft class. If you put a Heavy before a Cessna or other light Aircraft, the Cessna will have to wait three minutes for departure, so although the Cessna will take off slower, the plane will turn allowing the Heavy to take off quicker. This is why an intersection departure for a light Aircraft can be highly beneficial.

Coordination

The most important of Ground (Besides working Aircraft of course) is ensuring that all information is transmitted to your Tower. There are two key coordination procedures that need to be discussed, however on the network you will discover more things that will be quickly resolved.

- Runway Crossing:
    - Since Tower owns all runways, **you** must get permission to cross a runway, even if it is not being used. You should provide all information, including Callsign, Location and Runway to be crossed, and any relevant information. This additional information may be something like Wake Turbulence or simply that they may cross slowly. Always end the call with your ZHU Operating Initials.
        - Hobby Local, Ground.
        - Local.
        - Request to Cross Southwest 442, Runway 13L at E.
        - Southwest 442 Cross 13L at E Approved, RZ.
        - EW.
            - After Southwest has crossed the runway.
        - Local, Ground, Southwest 442 Crossing Complete.
        - EW.
- Intersection Departure/Inactive Runway
    - Ground should advise Tower of an intersection departure for any active runway, with the addition of the same phraseology mainly being used for an inactive runway.
        - Austin Local, Ground.
        - Local.
        - Horizon 2218 Requests 17R at G.
        - Horizon 2218 17R at G Approved, NM.
        - UK.

Many advanced concepts on Ground are much more scenario based, and simply don't have ways to be taught besides experience. When you do a Sweatbox session with your mentor or instructor, they will likely show you a couple things they do to manage traffic, however, you will learn more about what works for you, and what you can do in order to expedite traffic flow.

Chapter 7: Preferred Routings & Event Requirements

Now that we have gone through the main parts of Clearance and Ground, the more niche topics can be discussed here. This section will be split into Preferred Routings, Traffic Management Initiatives and Estimated Departure Clearance Times. For the purposes of training, these areas will all be lightly covered, and will be more supplemental knowledge for when your mentor or instructor discusses them.

Preferred Routings

This will be the shortest section of Chapter 7. Since we have LOAs to other ARTCCs, and have to ensure flights going to airports such as KIAH and KHOU are correct, it is important to ensure Aircraft are on the correct routes to make everyone's job easier. Most of Chapter 4's information applies to these cases, and thus won't be repeated. The only substantial thing to note is that preferred routes may exist for events, and additional ZHU Routings are available in the spreadsheet below which can have a route searched via Departure/Destination (KIAH/KCRP).

https://docs.google.com/spreadsheets/d/1GW9ii_0ZbjH6XalOb_w0s-V4siaIthvF7BQed9h2Vmo/edit?usp=sharing

Traffic Management Initiatives

Traffic Management Initiatives, or TMIs are put into place by the VATUSA Command Center, in conjunction with the facility Events Coordinator and/or TMU-Traffic Management Unit. These are put into place in order to alleviate traffic levels on the United States' National Airspace System. Since an airport has a Maximum AAR or ADR (Average Arrival Rate and Average Departure Rate), it is important to ensure that the number of Aircraft do not exceed these numbers. These TMIs can be important for ground when it comes to EDCT Times (See next part), maximum departures for a certain route, or other restrictions that affect Tower and beyond. Anytime these are issues, you should ensure that you comply with any restrictions in place, and let the TMU or any controllers that may be affected know that you have an issue complying with them.

Estimated Departure Clearance Time

Estimated Departure Clearance Times, or EDCTs are times assigned by either a Departure controller or TMU. These times should be provided to Aircraft as soon as possible, ideally immediately following a clearance and/or before an Aircraft pushes back from their gate or parking position. The EDCT is a time given to an Aircraft for when they will be cleared for takeoff. As you could guess, it is important for an Aircraft to know their EDCT in advance, so they know when to push on their own. Typically, an Aircraft will push about 5 Minutes before their EDCT, giving you time to taxi them.

Note 1: EDCTs are only given during events or high levels of traffic. They should **not** be used during everyday controlling.

Note 2: EDCTs may not be given to Aircraft departing a busy airport, going to an airport that does not have traffic.

There are many possible restrictions that can be given, and you should do your best to work with them, so that other controllers do not become overloaded, and pilots do not suffer holds in the air. For this reason, other restrictions such as Push Times may be used by controllers on a Metering frequency will serve a similar purpose (This will be covered more in your S1 Major lessons). Altogether, ensuring routes and TMIs are complied with, will enable a much smoother experience on the network.

Chapter 8: Working Ahead: Learning vSTARS for Ground