

## Welcome to ZDC

- **Becoming a Controller**

First of all, the ZDC Staff would like to thank you for your interest in controlling at the Virtual Washington ARTCC (ZDC) in the VATUSA division of VATSIM. The process of learning to provide virtual Air Traffic Control services on VATSIM will involve a substantial amount of time, study, and practice. It will involve studying material like the Standard Operating Procedure (SOP) documents for ZDC, VATSIM and VATUSA regulations, Federal Aviation Regulations (FAR) documentation, among other material, and taking written exams to prove your understanding. It will also involve collaborating with other members of ZDC, especially the Mentors and Instructors, both online and in the [ZDC forum](#). This guide is meant to get you started with that process.

- **What to Expect**

After reading this guide, you should know where to find all the written resources you will need as a controller at ZDC, and you should have a working instance of Virtual Radar Client (VRC), the software used to perform ATC functions on VATSIM. **It is required for all new ZDC controllers to read, understand, and follow the guidelines in this document before attempting to schedule training sessions with the instructing staff.** If you have any problems with the steps in this guide, please post in the ZDC Forum. If you do not yet have a forum account, please read below about how to get one.

- **Getting Started (Basic Exam)**

You will be expected to get started on your own by reading and following this guide. After reading through this guide and following all of the steps, you will need to pass the ZDC Basic Examination on the VATUSA Certification Center (details to follow in the “VATUSA Documentation and Resources” section below). You have 30 days to attempt the ZDC Basic Examination after the date on which you were accepted to ZDC. You do not need to pass the exam, but only to attempt it. A passing grade is 80% or higher (details to follow regarding the examinations in the “VATUSA Documentation and Resources” section below). An unsatisfactory grade will result in a 7 day wait period before you can attempt the exam again. If you do not pass the exam, it is your responsibility to e-mail the DATM ([datm@zdcartcc.org](mailto:datm@zdcartcc.org)) in order for it to be reassigned, and to attempt the exam again within 30 days, or you will be removed from the ZDC roster due to inactivity. You may attempt the exam as many times as you wish, but any lapse of 30 days or greater between attempts will result in removal from the ZDC roster.

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- **Major versus Non-Major Training**

Each ZDC Controller can choose to undergo the full (Major) training curriculum, which ultimately leads to being certified to control ZDC Center, but involves a more rigorous and detailed training curriculum. As an alternative, a controller may choose to undergo only the training which is necessary to control Class B, C, and D DEL, GND, and TWR positions plus Class C and D (Non-Major) TRACON positions. This greatly reduces the workload associated with the training curriculum, but results in the ability to control a smaller set of airspaces, and not being able to control ZDC Center. The Non-Major track terminates once you receive your S3 rating. You will be able to provide top down service at any Class C and Class D facility within ZDC. In order to control Class B Approach and Departure positions, you must continue with the Major track. Notes are made in the ZDC Training Checklist (below) to indicate which elements of the training curriculum are in the Major track.

- **Training with Instructing Staff**

The ZDC Instructing Staff consists of Instructors (INS) and Mentors (MTR) who will serve to provide more specialized training once you have demonstrated that you have a working computer setup and that you have the required basic knowledge of ATC. Upon passing the ZDC Basic Exam, each student will receive an e-mail from the Training Administrator (TA) indicating his/her assigned MTR and INS. Your MTR will be your first point of contact for all training-related issues here at ZDC, while your INS will be the one who assigns your written exams, performs your Over-The-Shoulder (OTS) examinations, and conducts advanced radar training. Generally, you will work with your MTR in order to learn new material as you advance through the controller ranks, whereas your INS will provide the more detailed part of training, as well as various behind-the-scenes aspects of your training. As stated above, your MTR and INS are your primary points of contact for all training-related inquiries. Though you are not required to train solely with your assigned MTR or INS, they are the first people with whom you should discuss or request training. Should specific issues concerning your MTR or INS arise (such as timing concerns, personality issues, etc), please e-mail the TA ([ta@zdcartcc.org](mailto:ta@zdcartcc.org)).

- **The Full Curriculum**

Starting from passing the VATUSA Basic Examination to getting a Controller (C1) rating and becoming certified to control Washington Center (DC\_CTR) is not something that can be done overnight. For illustrative purposes, going through the full curriculum can take anywhere from a few months to a year or more, depending on factors such as student commitment and learning ability, as well as instruction staff availability. There are many steps involved, and each step is aimed at ensuring that you have the right tools and experience to succeed at your current level, and to get you prepared for the next step. The following step-by-step guide enumerates each step involved. Since you have been accepted to the ZDC ARTCC, you have already passed the VATUSA Basic

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Examination. Print out the checklist on the following pages and keep it with you through your training. Check each step off as it is completed, and keep a record of your own to monitor your progress, and to ensure that your training continues on a timely basis.

**ZDC Training Checklist**

Check	Date	Step	Requirements
→		Pass VATUSA Basic Examination	
→		Join ZDC ARTCC	
		Pass ZDC Basic Examination	Passing grade is 80% or higher. If failed, 7 days wait is required. It is your responsibility to request, via the DATM, the exam be re-assigned so you can attempt it again. Make your request via direct e-mail to the DATM. During your initial training, any lapse of activity of 30 days or longer will result in automatic removal from the ZDC roster. If you fail the ZDC Basic Examination, make sure to attempt it again within 30 days or you will be removed from the ZDC roster.
		Complete all items in this Training Guide – <b>especially VRC setup.</b>	Be sure to read this entire Training Guide, and follow all directions. If you have any questions at any time, feel free to post a message in the forums or contact your assigned MTR to have your questions answered. Completion of all the items in this Training Guide is mandatory before training can begin.
		Study Basic ATC, Clearance Delivery and Ground training modules on VATUSA Training Resource Center	Access training modules at <a href="http://www.vatusa.net/training/tiki-index.php">http://www.vatusa.net/training/tiki-index.php</a> . Utilize the training center to learn the basics of DEL and GND before requesting the S1 Pre-Test.

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Check	Date	Step	Requirements
		Pass ZDC S1 Pre-Test	<p>Passing grade is 80% or higher. If failed, 7 days wait is required. It is your responsibility to request the exam be re-assigned so you can attempt it again. This request should be made via the <u>"Exam Request Thread"</u> on the training forum. During your initial training, any lapse of activity of 30 days or longer will result in automatic removal from the ZDC roster. If you fail the ZDC S1 Pre-Test, make sure to attempt it again within 30 days or you will be removed from the ZDC roster.</p>
		Request training session in Training Forum or by direct contact with your assigned MTR. Begin training DEL/GND positions with MTR/INS	<p>Depending on the preference of your assigned MTR, you should either e-mail him/her directly or make a request on the Training Forums to begin training. Make sure to allow a reasonable amount of time for your MTR to respond to your training request, and understand that MTR/INS schedules may not line up perfectly with your availability. If your MTR's availability does not match with your schedule, discuss that with him/her so arrangements can be made. Keep in mind that you are not required to solely train with your MTR; another MTR or INS may accept your training request on the forums. <b>Training must start within 30 days of passing S1 Pre-Test.</b> Expect training to span several sessions. The first session will cover the pre-test results and the basics of the position. Additional sessions will be on Sweatbox until the basics are covered. Live network sessions will be conducted once the basics are understood.</p>

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Check	Date	Step	Requirements
		INS assigns VATUSA S1 Examination	Once your MTR determines you are ready to control delivery and ground positions, he/she will notify your assigned INS who will subsequently assign the VATUSA S1 Exam.
		Pass the VATUSA S1 Examination	Passing grade is 80% or higher. Once you pass your exam, your INS will promote you from OBS to S1. You are now able to control live ATC positions on the VATSIM network and are a full active member on the roster. Your initial training is complete, and you are no longer subject to removal for inactivity periods of 30 days. You must remain current by logging at least one hour every 30 days, or you will be placed on the inactive roster. After a total of 90 days of inactivity you are subject to removal from the roster.
		Pass ZDC S2 Pre-Test	Passing grade is 80% or higher. If failed, 7 days wait is required. It is your responsibility to request the exam be assigned, or if failed re-assigned so you can attempt it again. Make your request via the <a href="#">"Exam Request Thread"</a> in the Training Forum.
		Request training session, begin training TWR positions with MTR/INS	
		Pass Potomac TWR OTS Exam	Once you have gained experience with all three Class B TWR positions, you must take the Class B TWR OTS exam. Once your MTR feels you are ready, he will notify your INS who will monitor your performance. Upon passing this practical exam you will be assigned the VATUSA S2 Exam.

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Check	Date	Step	Requirements
		Pass the VATUSA S2 Examination	Passing grade is 80% or higher. If failed, 7 days wait is required. It is your responsibility to request the exam be re-assigned so you can attempt it again. Once you have passed, an INS will promote you from S1 to S2. You are now able to work any TWR position within ZDC.
		Pass ZDC S3 Pre-Test	Passing grade is 80% or higher. If failed, 7 days wait is required. It is your responsibility to request the exam be assigned, or if failed re-assigned so you can attempt it again. Make your request via the " <a href="#">Exam Request Thread</a> " in the Training Forum.
		Request initial TRACON training session; begin training with MTR or INS on Departure and Approach positions at Non-Major facility.	Initial Departure and Approach training will take place at a Non-Major facility.
		Pass Non-Major TRACON OTS	Your INS will monitor your performance and, upon passing the OTS, you will be assigned the VATUSA S3 examination.
		Pass the VATUSA S3 Examination ( <b>Non-Major ends here</b> )	Passing grade is 80% or higher. If failed, 7 days wait is required. It is your responsibility to request the exam be assigned, or if failed re-assigned so you can attempt it again. Make your request via the " <a href="#">Exam Request Thread</a> " in the Training Forum. Once you have passed the exam, your INS will promote you from S2 to S3. You are now able to work any Approach positions outside of the Potomac Class B airspace.
		Request training session, Begin training with INS on Potomac Class B Departure and Approach positions ( <b>Beginning of Major Track</b> )	Training on Departure and Approach positions will begin at each of the three main PCT areas one at a time (usually SHD-CHP-MTV).

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Check	Date	Step	Requirements
		Pass Potomac APP OTS Exam <b>(Major Only)</b>	Three APP OTS Exams are required – one for each PCT Airport. Each OTS that is successfully completed results in a Certification for that APP Sector. Once multiple APP Certifications have been granted, you may combine the sectors in which you have been certified. All three PCT APP Certifications must be granted before proceeding to the next step.
		Pass the ZDC C1 Pre-Test <b>(Major Only)</b>	Passing grade is 80% or higher. If failed, 7 days wait is required. It is your responsibility to request the exam be assigned, or if failed re-assigned so you can attempt it again. Make your request via the <a href="#">“Exam Request Thread”</a> in the Training Forum.
		Request training session, begin training with INS on En-Route procedures within ZDC <b>(Major Only)</b>	Training on En-Route procedures will involve more advanced consultation, along with monitoring other certified En-Route controllers online
		Pass ZDC Center OTS <b>(Major Only)</b>	ZDC Center OTS exam is administered by the ZDC Training Administrator. Once this OTS is successfully completed, an INS will assign you the VATUSA C1 examination.
		Pass the VATUSA C1 Examination <b>(Major Only)</b>	Passing grade is 80% or higher. If failed, 7 days wait is required. It is your responsibility to request the exam be assigned, or if failed re-assigned so you can attempt it again. Make your request via the <a href="#">“Exam Request Thread”</a> in the Training Forum. Once you have passed, an INS will promote you from S3 to C1. You are now a CPC (Certified Professional Controller) and have full privileges to control within Washington Center.

## ZDC Forum

- **How to Register**

In order to facilitate communication between all members of ZDC, the website maintains a forum with which all ZDC members are required to be registered. In order to create an account, go to <http://forum.zdcartcc.org/> and click “Register” at the top right hand corner of the page. You must use your real full name as your username, and your account will need to be verified by the ZDC staff. Once you receive a verification email, you can access the forum via the link above, and then log in with your username and password.

- **Where to Post**

Once you have access to the ZDC forums, browse through all the main topics to see the kind of information that is available. Feel free to post in any of the available forums as appropriate. If you have trouble setting up VRC according to this guide for example, post your question in the “Software Help” forum. If you just want to say hello to your fellow colleagues, you can do that in the “General Chat” forum. In all cases, keep the forum conversation limited to topics that are related to aviation, ATC, and ZDC. Please make sure to read and abide by the Agreement Terms of the forum which are presented before registration.

## TeamSpeak Registration

In order to facilitate coordination while controlling and working events, easier training sessions, and building relationships with other controllers the ARTCC maintains a TeamSpeak 3 server. It is for **ZDC use only**. Detailed information can be found in the ATC Chat forum.

## **VATSIM Documentation and Resources**

- **Required Reading**

Virtual Air Traffic Simulation Network (VATSIM) was created in 2001, and is the organization under which the VATUSA division resides. To visit the VATSIM website, go to <http://vatsim.net/>. It is mandatory that all VATSIM users abide by the Code of Conduct (CoC), and understand the Code of Regulations (CoR). These documents can be found under the “Regulations” heading on the left hand side of the page, and selecting the appropriate documentation.

- **The Pilot Resource Center (PRC)**

It is common for most aspiring controllers to have already accumulated some experience as a pilot on VATSIM. If you have not already done so, please familiarize yourself with the material located in the Pilot Resource Center (PRC). These documents can be found under the “Pilot Resources” heading on the left hand side of the page, and clicking on “Pilot Resource Center”.

- **Radar Client**

As a controller, you will need to have software that enables you to connect to VATSIM and provide ATC services. In order to access links to download the software and associated documentation, go to the “Controller Resources” heading on the left hand side of the page, and click “Controller Software”. You will notice that there are several radar client software packages available – EuroScope, Virtual Radar Client (VRC), and Advanced Simulated Radar Client (ASRC). VRC is the preferred radar client of ZDC. This guide will only address VRC. If you wish to use a different radar client, it is recommended that you begin by using VRC and following the steps in this guide, and then familiarize yourself with the other radar clients by reading their documentation once you have a firm grasp of how to use VRC effectively.

Download the VRC software by clicking on “Virtual Radar Client”. This will take you to a page where you can choose a server from which to download VRC. Choose a server, and make sure to download the latest version of VRC, and not the VRC Tower View Modelsets. The file should be called “VRCSetup.exe”. Once you have saved this file to your computer, execute the file and follow instructions to let the program install in the directory “C:\Program Files\VRC”. We will return to this topic and configure VRC when we have downloaded the necessary files required to use the software when controlling within ZDC.

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- **VATSIM Forum**

VATSIM maintains its own forum here: <http://forums.vatsim.net/>. This forum is separate from the ZDC forum, and will require a separate registration and password. Your username for the VATSIM forum will be your VATSIM ID, issued to you when you registered with VATSIM. If you have any issue with your VATSIM ID or your forum access, you will need to go to the VATSIM homepage (<http://vatsim.net/>), and choose an appropriate selection under “Member Services” on the left hand side of the page.

## **VATUSA Documentation and Resources**

- **Becoming a VATUSA Member**

VATUSA is the division of VATSIM under which ZDC resides. To visit the VATUSA website, go to <http://www.vatusa.net/html/index.php>. You have most likely already registered with VATUSA, but just in case you have not, it is required that you register with VATUSA in order to become a controller at ZDC. If you are a new controller, click “New Members Click Here” on the top left hand side of the page, and follow the instructions on the website. If you are a transferring controller and already have a VATUSA membership, click “ARTCC Transfer Form” on the left hand side of the page, and follow instructions on the website to transfer into the Washington DC ARTCC.

- **VATUSA Staff**

To see the list of VATUSA staff, click on “VATUSA Staff” on the left hand side of the page. You can contact any VATUSA staff member by clicking on the appropriate name on this page.

- **VATUSA Training**

One of the most important resources you will have as a controller in VATUSA is the Training documents which are available by clicking “Training” on the left hand side of the page, or go here: <http://www.vatusa.net/training/>. You can review the ratings and training processes and procedures under the “Policies” tab. The majority of the information pertaining to controlling can be found under the “Reference” tab. This page consists of references and study guides for all aspects of controlling, from basic ATC knowledge, all the way up to En-route control. It is highly recommended that you take the time to study the “Overview” and “Basic Air Traffic Control” sections of this resource at this time. When it is time for you to learn how to control a Ground facility, you should first study the “Ground Control” section of this resource before specializing your knowledge with information specifically tailored to ZDC. This resource should provide you with the basic information you need to control at any level throughout VATUSA. In addition, the “Real-World References” section contains links to many Federal Aviation Administration (FAA) documents that are appropriate to learning how to provide ATC services. In particular, many questions that you may encounter on exams throughout your training will be based on information in the FAR 7110.65. A link to this document can be found in the “Real-World References” section of the VATUSA Training site, and is also located here:

[http://www.faa.gov/airports\\_airtraffic/air\\_traffic/publications/at\\_orders/media/ATC.pdf](http://www.faa.gov/airports_airtraffic/air_traffic/publications/at_orders/media/ATC.pdf).

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- **VATUSA Certification Center**

You will need to take examinations at the VATUSA Exam Center located here: <http://www.vatusa.net/test.php> . This website requires that you use your VATUSA ID and password obtained when you registered on VATUSA. This is where you will take all examinations for ratings promotions within VATUSA, in addition to examinations for specific position certifications within ZDC. All tests are open-book, and mostly based on the VATUSA Training Reference documents mentioned above, the ZDC Standard Operating Procedure (SOP) documents, and the Mandatory Briefing Item (MBI) forum posts on the ZDC Forum. It will be to your advantage to have all appropriate documents handy while you are taking the exams.

All tests on this site are multiple choice, and the exams have a time limit of roughly one hour. Once you finish answering all questions on a particular exam, it is highly recommended that you copy or print your completed exam before pressing "Submit". If more than one hour has elapsed while you were taking your exam, pressing "Submit" will erase all of your work, and you will be asked to log back into the Cert Center, and you will then need to answer all of the questions again. If this happens, it is handy to have a copy or a printout of your exam and your selected answers in order to re-enter your selections without having to research each question again.

## **ZDC Documentation and Resources**

- **The ZDC Website**

The Washington DC ARTCC (ZDC) is part of the Northeast Region of VATUSA. To visit the ZDC website, go to <http://www.zdcartcc.org/>. This is where you will find ZDC policies, procedures, documentation, training materials, and all appropriate downloads needed to provide ATC services for ZDC.

- **ZDC Policies**

Go to <http://www.zdcartcc.org/>, then click on “ARTCC Policies” on the left hand side of the page. From here you can click on “ARTCC Staff” in order to see a list of the current ZDC Staff members, and contact them as appropriate. You can also click “Crew Roster” in order to see a list of all current ZDC controllers and their current certifications. The remaining items on this page listed under ARTCC Policies are required reading for all ZDC controllers. Read all of the documents in this list. If you have any questions on these items, post a question in the forum under “General Chat” or “ATC Chat”, or contact one of the instructing staff (Staff Instructors or Mentors) listed on the “ARTCC Staff” page.

- **ZDC SOPs and LOAs**

The ZDC Standard Operating Procedures (SOPs) and Letters of Agreement (LOAs) can be found by going to <http://www.zdcartcc.org/>, and then clicking on “SOPs & LOAs” on the left hand side of the page. At this point you should limit yourself to studying the three Class B Airport Tower SOPs (Baltimore-Washington Tower SOP, Washington-Dulles Tower SOP, and Washington-National Tower SOP) listed at the top of the page. As a new controller, you should concentrate only on the Clearance Delivery portion of each of these SOPs. Material regarding Ground and Tower operations can wait until you are training for those positions. It is also recommended that you review the LOAs that ZDC has on file with each of its adjoining ARTCCs, but only a cursory knowledge of these documents is required at this point. Pay specific attention to the preferred routes that ZDC controllers must utilize for aircraft departing ZDC airports.

- **ZDC Training Materials**

The ZDC Training Materials can be found by going to <http://www.zdcartcc.org/>, and then clicking on “Training Materials” on the left hand side of the page. Under the

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“Policies” section, you can find links to the Training Policy and the Qualifications Table, both of which can also be accessed from the ARTCC Policies page, described above.

Under the “Training Material” section, you can find a link to the VATUSA Training Website described above, the FAR 7110.65 also described above, and the Mandatory Briefing Items (MBI) on the ZDC Forum. The MBIs encompass any changes from the latest published SOPs. As the SOP documents are revised, the MBIs are incorporated into the new versions, and are then removed from the MBI list.

Under the “Training Articles” section, you can find links to specific topics related to controlling within VATSIM in general.

Under the “Runway Selector” section is a link to the ZDC Runway Selector. This page shows a list of the major airports covered by ZDC, and gives current information about the weather at the airport, in addition to recommended runway configurations. This page is only a guide, and should not be used as the only source of information for runway configurations. The SOPs are the final authority for runway selection at each airport.

- **Flight Planning Resources**

As a controller, you will need to assist pilots in creating flight plans, and you may need to correct flight plans that contain errors. One useful website is [www.simroutes.com](http://www.simroutes.com). On this site, you can enter the departure and arrival airport codes in the appropriate fields, and the website will produce valid flight plans for routes between those two airports. A link to this website is also found on the ZDC website – go to <http://www.zdcartcc.org/>, and then click on “Routes” on the left hand side of the page under the “For Pilots” section.

You will also need to consult aviation charts, especially for airports within the ZDC airspace. From the ZDC website, click on “Charts” on the left hand side of the page under the “For Pilots” section. This will open a new window which contains links to all of the pertinent charts for some larger and frequently used airports within the ZDC airspace (KIAD, KDCA, KBWI, KRIC, KORF, and KRDU). All charts for airports within the United States can be found using the following link:

[http://aeronav.faa.gov/index.asp?xml=aeronav/applications/d\\_top](http://aeronav.faa.gov/index.asp?xml=aeronav/applications/d_top). You will need to click on the latest set of Terminal Procedures depending on the date – these charts are frequently updated. Another useful website used for flight planning is <http://www.airnav.com/>. This website also allows you to look up Nav aids and Airspace Fixes in addition to information about airports. There are many other websites available for such uses – we only mention a few here in order to get you started.

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- **ZDC Downloads**

The Downloads section on the ZDC website contains files necessary to configure the radar client software properly for controlling within ZDC. All of the files in this area are zipped archives, and will need to be extracted using WinZip, or a similar utility.

Go to <http://www.zdcartcc.org/>, and then click on “Downloads” in the top menu bar of the window. Under the “Sector Files” section, download the “ZDC Combined v3.1” file by clicking on “Download” to the right of the file name. Extract the ZDC Sector File into the directory in which you installed VRC (this should be “C:\Program Files\VRC\”). This file contains all of the information necessary for VRC to display graphics for the ZDC area.

Under the “Radar Client Files” section, download the “ZDC Position File” and the “ZDC Alias File (VRC)” by clicking on “Download” to the right of each file name. Extract these two files into the directory in which you installed VRC (this should be “C:\Program Files\VRC\”). The Position File contains information used by VRC to provide codes which enable communications between other controllers, and provides transponder code ranges for aircraft as well. The Alias File contains commands which serve as shortcuts for use when communicating with pilots via text. We will examine these files in more detail when we set up VRC. For now, simply ensure that the files are extracted properly into the VRC installation directory (“C:\Program Files\VRC”).

## Setting Up VRC

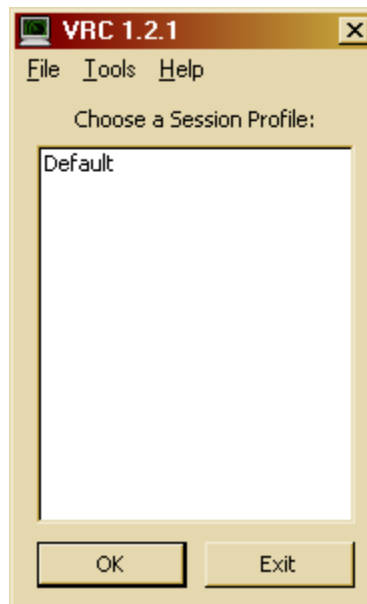
- **Initial Setup**

The first thing we need to do is to ensure that your installation of VRC is working. Ensure that you have downloaded and installed VRC as described in the “VATSIM Documentation and Resources” section above. Ensure that you have downloaded and extracted all of the associated files needed to operate VRC as a ZDC controller in the “ZDC Documentation and Resources” section above. Ensure that you know the location of all of the files. Ideally, everything should be in the VRC installation directory “C:\Program Files\VRC”).

Note that if you have a router, you will need to ensure that port 3290 is forwarded under UDP protocol – this is what enables incoming voice communications through VRC. If you have trouble at this point, it is likely that your installation was not performed correctly. Consult the VRC Documentation here:

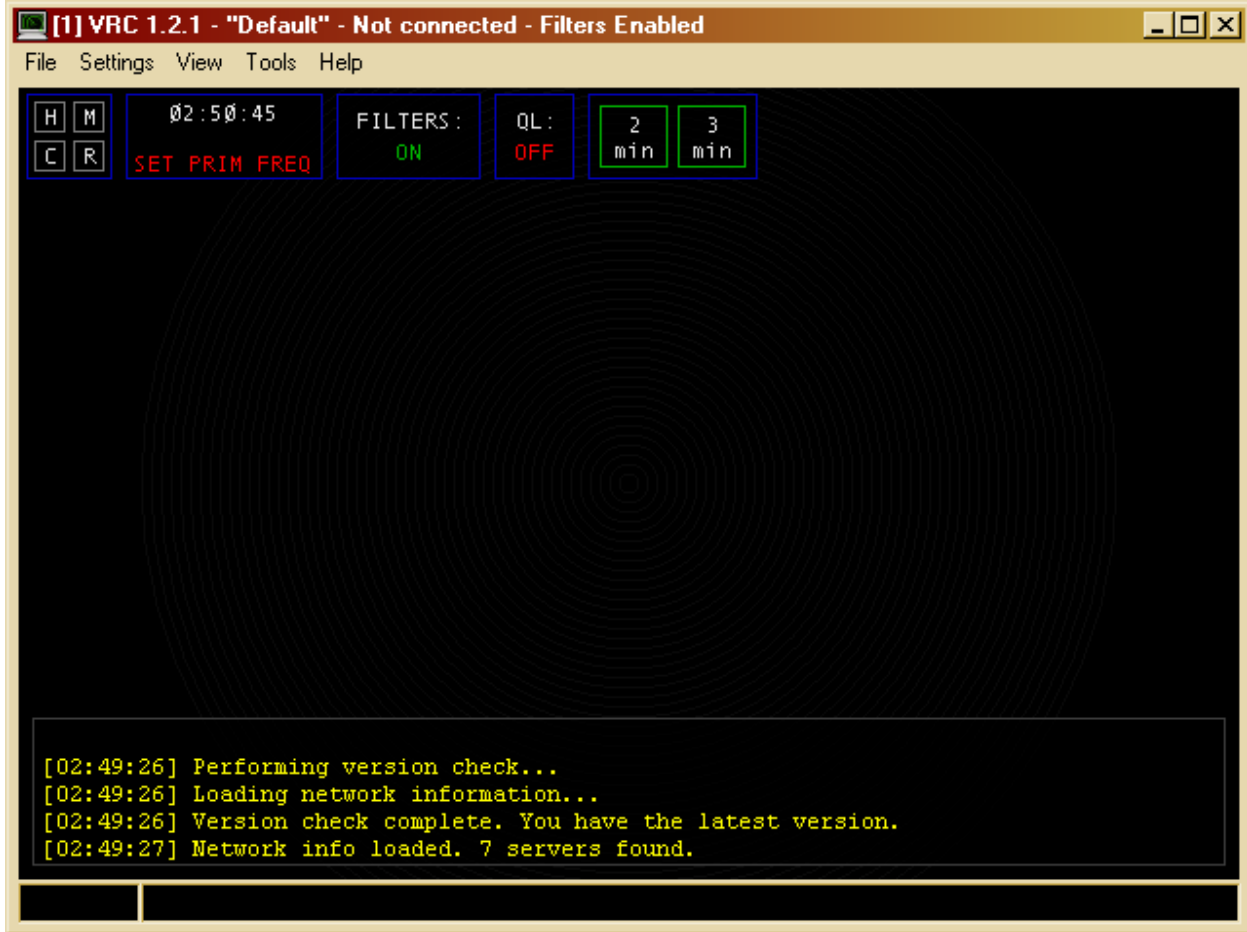
[http://www.metacraft.com/VRC/docs/single\\_page.html](http://www.metacraft.com/VRC/docs/single_page.html).

Go ahead and start VRC. When you first start VRC, the following window should appear, asking you to choose a profile from a list:



This list will only contain the “Default” profile at first, so go ahead and choose it. You will likely create many profiles throughout your controlling career. VRC Profiles are meant to save all of the settings within VRC so that you can access them easily during startup. You will likely create a profile for each position you control, and one for an observer. We will now create a profile that you can use to observe traffic within ZDC. Close the “Controllers & Chat” window so that we can work with the VRC main window only. The main window should look like this:

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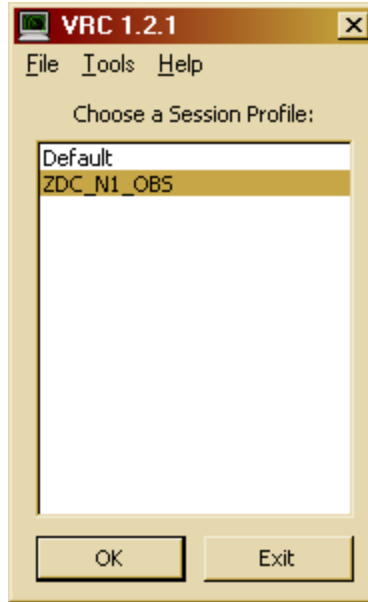


Go to “File->Save Session Profile As...”, and a window will appear that says “Enter a name for the profile:”. Type “ZDC\_N1\_OBS” in the text field and press “OK”.

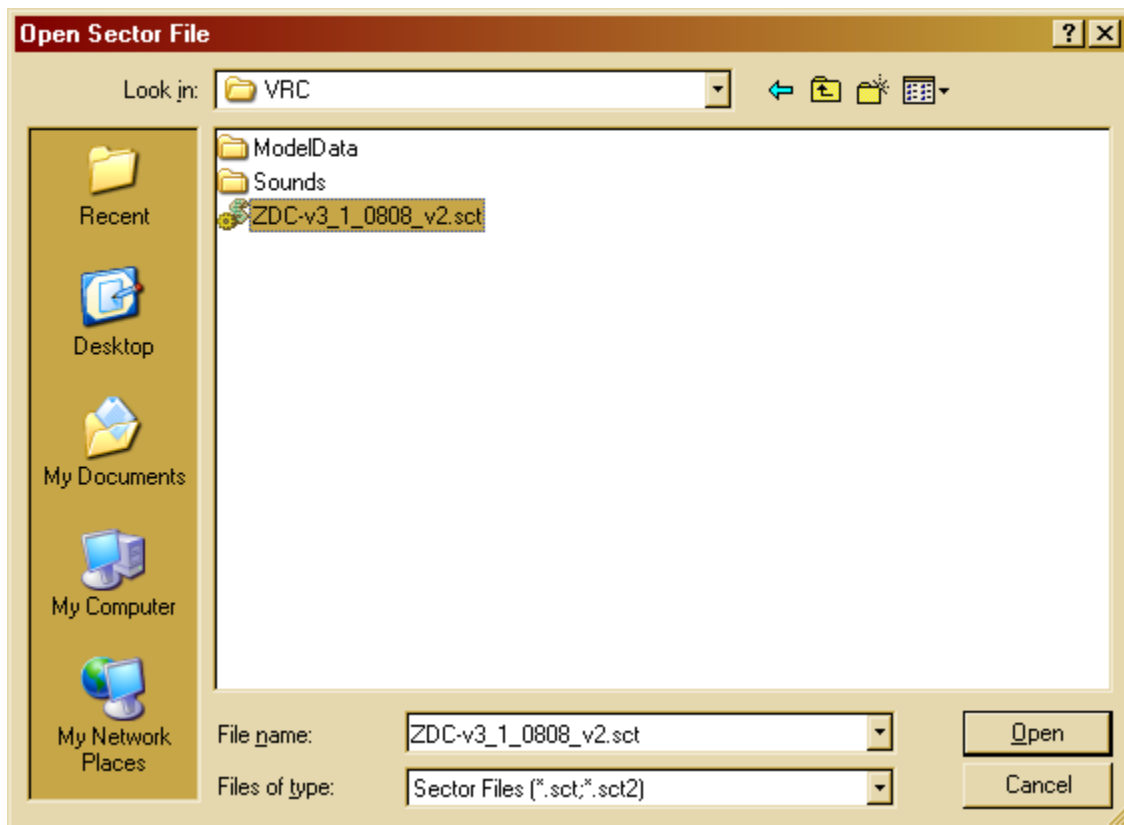


You now have a profile within VRC called “ZDC\_N1\_OBS”. Close VRC, and then restart it again. This time when VRC starts, the first window that appears will have the Default profile as well as your ZDC\_N1\_OBS profile to choose from. Choose the ZDC\_N1\_OBS profile and press “OK”.

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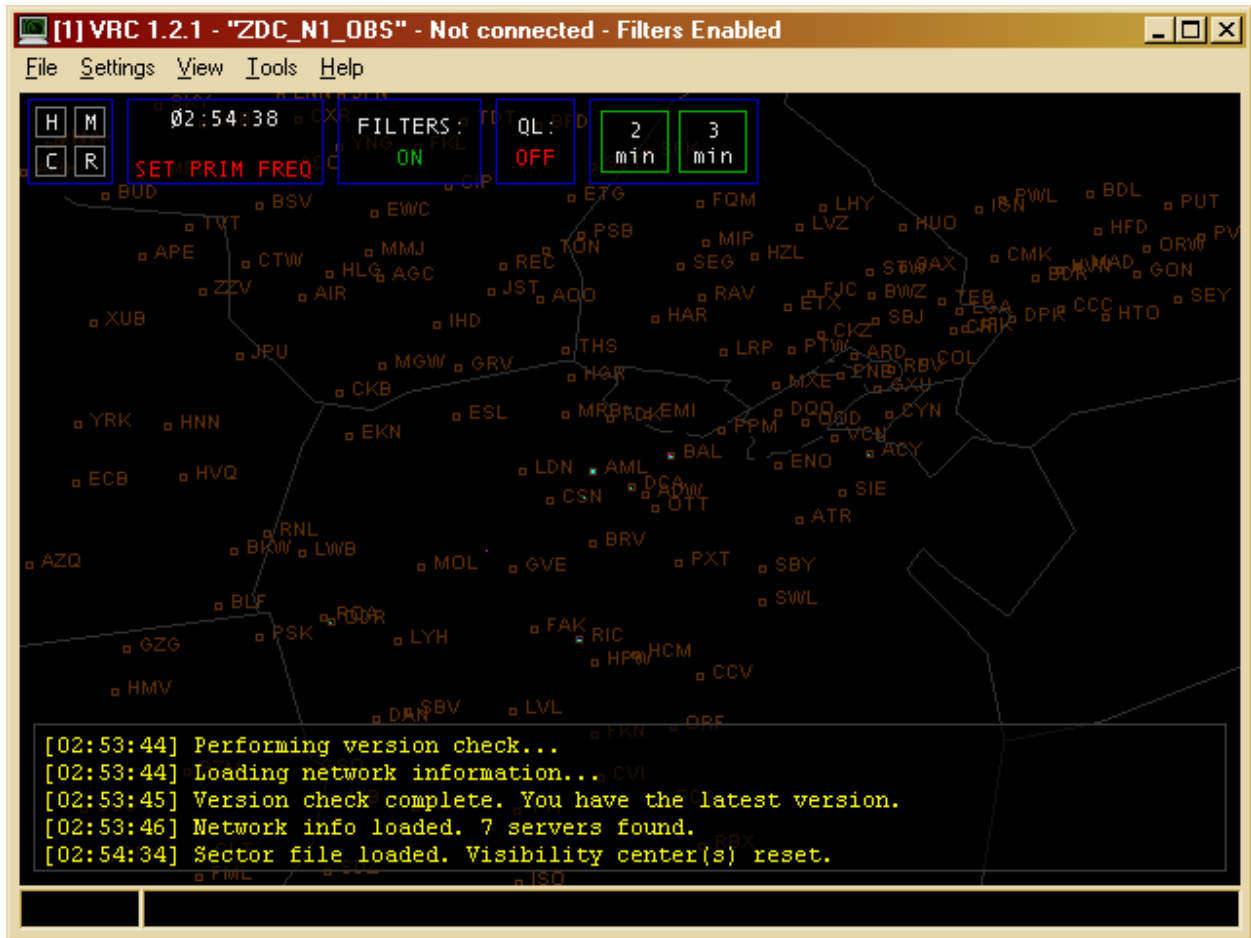
Now we must supply VRC with a Sector File to work with. Go to “File->Open Sector...”, and browse to the location where you extracted the latest version of the ZDC Sector file (this should be “C:\Program Files\VRC\” by default). Click on the Sector File (it should have “.sct” or “.sct2” as its extension) and press Open.



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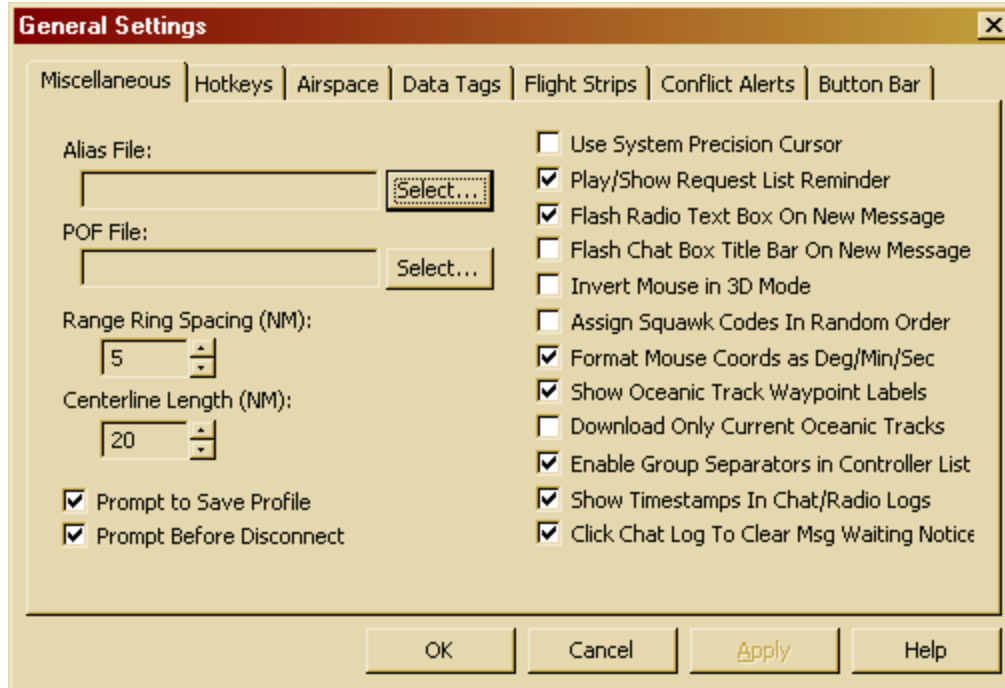
You should see an outline of the ZDC ARTCC airspace appear in the VRC window, along with assorted VOR stations.



We will now save the profile once again by going to “File->Save Session Profile”. Every time you make a change to the settings within VRC, it is wise to save the profile. If you don't, any changes you've made since the last time you opened that profile will be lost.

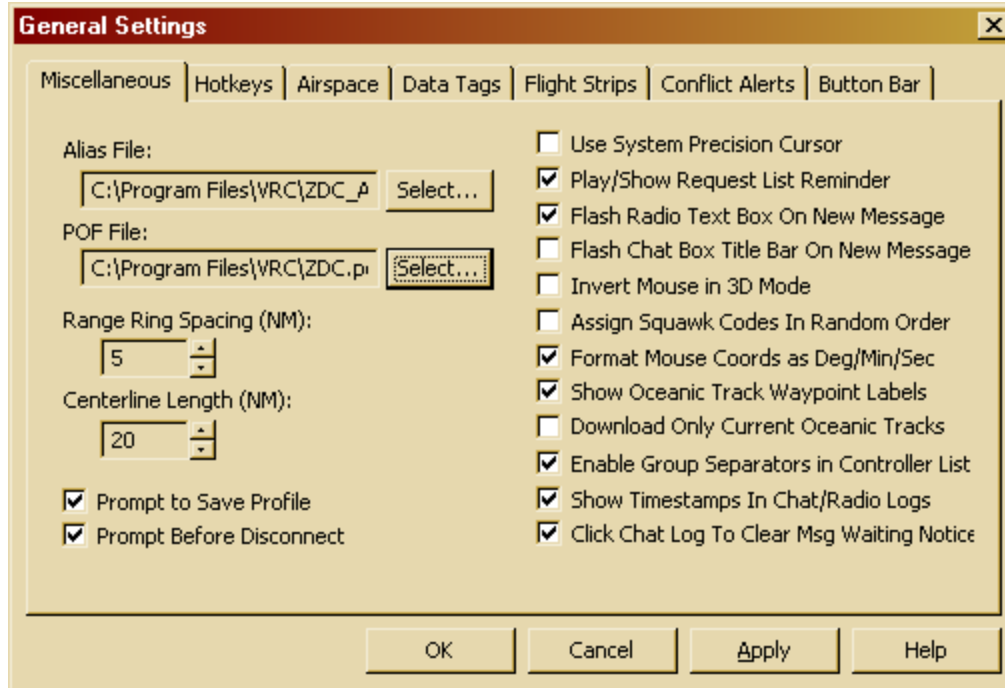
We will now supply VRC with the POF and Alias files that were downloaded from the ZDC website. Go to “Settings->General...”. You will see the General Setting window appear, and it should be open to the “Miscellaneous” tab.

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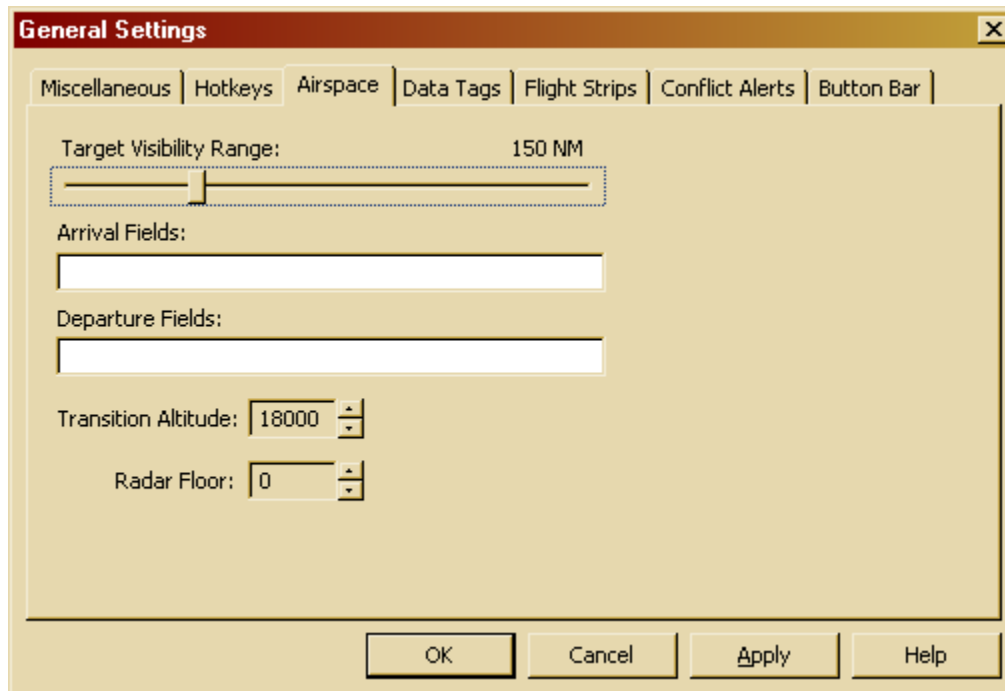


On the left hand side of the window, you should see a text entry field for the Alias File, and one underneath it for the POF File. Press “Select” to the right of the Alias File text entry field and browse to the location where you extracted the Alias File (this should be “C:\Program Files\VRC\”). Select the Alias File (it should have “.txt” as its extension) and press Open. Next, press “Select” to the right of the POF File text entry field and select the POF File in a similar fashion (it should have “.pof” as its extension) and press Open. You should see the locations of the files you chose in the text field entry boxes.

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We will make one more change to the General Settings before we connect to the network so that we do not use excess bandwidth once we connect. Within the General Settings window, go to the “Airspace” tab and ensure that the “Target Visibility Range” is set to 150 Nautical Miles (NM), as shown here:



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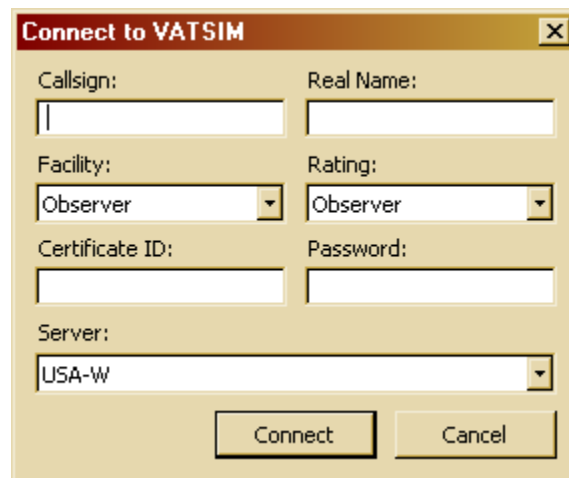
Now press “OK” to close the General Settings window. Now we have made a configuration change to our profile, and we should save it again. Go to “File->Save Session Profile”.

We have now setup VRC with all the necessary files it needs in order for you to use it to provide ATC services within ZDC airspace on VATSIM. All we need to do is to connect to the network.

- **Connecting to the VATSIM Network**

Before connecting to the VATSIM network, be sure that you are familiar with the rules and regulations of its use, governed by the VATSIM Code of Conduct (CoC) and the VATSIM User Agreement, both available on the VATSIM website as described in the “VATSIM Documentation and Resources” section above. You will need to use your real full name, and you will need to have your VATSIM ID and password in order to connect to the network.

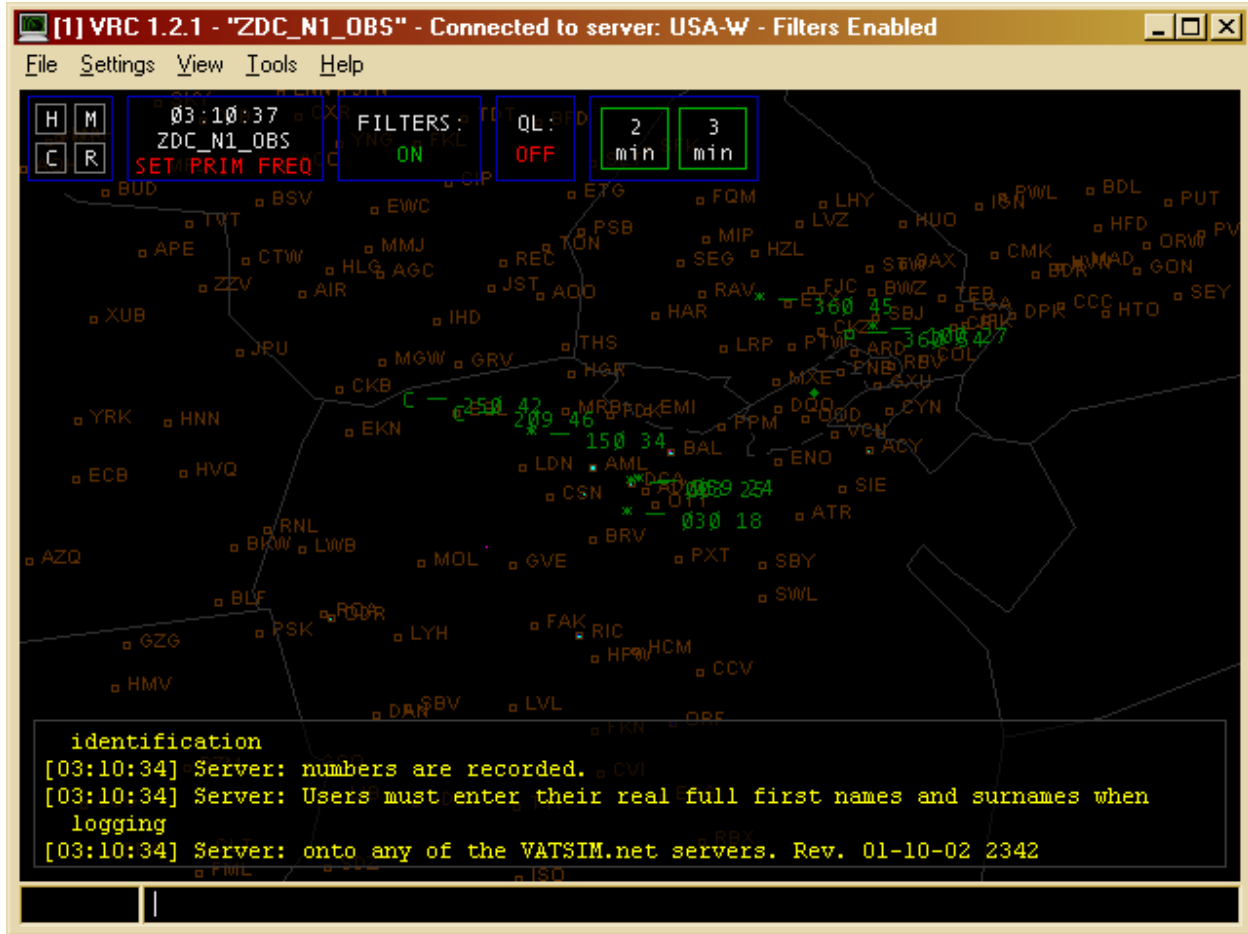
Go to “File->Connect...”, and you will see the following window appear:



Enter the following information. In the “Callsign” field, enter “ZDC\_N1\_OBS”. Enter your real full name in the “Real Name” field. Leave the “Facility” and “Rating” settings at “Observer”. In the “Certificate ID” field, enter your VATSIM ID (this should be a six or seven digit number”. In the “Password” field, enter your VATSIM password. The “Server” drop-down menu should have several servers listed in it. Choose one of the USA servers, such as “USA-W”. Lastly, to connect to the network, press “Connect”. If all of the information you entered was valid and correct, you should see the following messages on the VRC main screen, affirming that you have connected to the network successfully:

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If VRC returns a message that says “Callsign in use”, try to connect again, but use the Callsign “ZDC\_N2\_OBS”. If this callsign is in use as well, increase the digit again to “ZDC\_N3\_OBS”, and so on until you find a callsign that is not being used. Depending on network traffic, you may see aircraft data tags, as shown in the figure above. These are the locations of aircraft, live on the VATSIM network. We still need to make many adjustments to the VRC setup before it is of any use to actually be connected to the network, so go ahead and disconnect from the network by pressing “File->Disconnect”. This section was intended only to ensure that you are able to connect to the VATSIM network. We will return to the live network shortly. If you had any trouble connecting to the network, and you can not troubleshoot the problems yourself, post a question on the “Software Help” section of the ZDC Forum, as described in the “ZDC Forum” section above.

Once again, save your profile. The information you entered into the logon screen when you connected to the network is in your profile. This means that if you save your profile, you will not need to enter all of the information the next time you connect – it will appear automatically. The Callsign, Facility, and Server that you used are also saved – you will see that saving several profiles under different names will be beneficial when you need to change callsigns, facilities, and servers. For now, make sure that your ZDC\_N1\_OBS profile is saved.

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- **Configuring VRC**

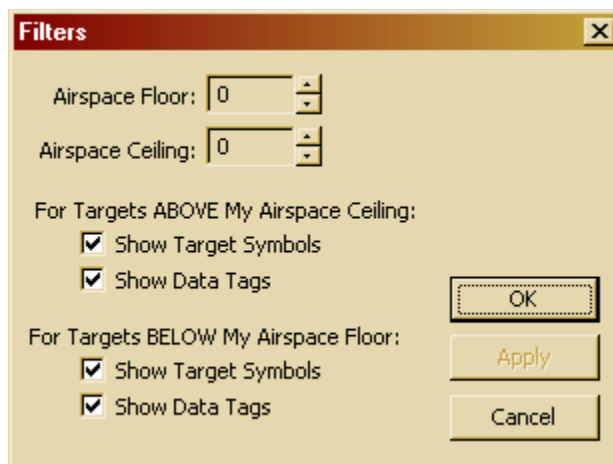
We will go through each of the VRC settings in order to optimize the radar client for our purposes.

Go to “Settings->Radar Mode” and choose “Ground”. The radar mode you choose dictates how aircraft data tags are displayed on the radar screen.

Go to “Settings->Color Profile” and choose “Default”. The color profiles are customizable, but several pre-defined sets are available.

Go to “Settings->Filters” and ensure that “Active” is checked. Filters will restrict aircraft from being shown on the radar screen according to the settings described below.

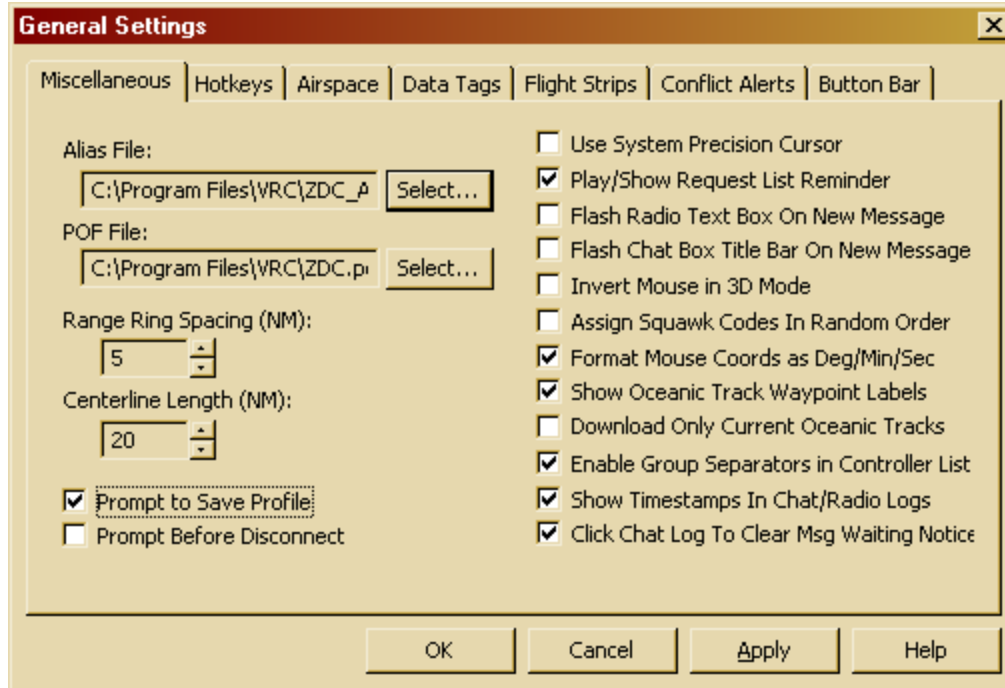
Go to “Settings->Filters->Configure...” and you will see the following window appear:



Ensure the settings are as they appear in the figure above. This window permits the user to describe an “Airspace Floor” and “Airspace Ceiling” which dictate the altitude at which aircraft will be shown on the main screen. We do not want to restrict any aircraft from being shown at this point, so ensure that the “Airspace Floor” and “Airspace Ceiling” are both set to zero, and that all the buttons are checked, meaning that the Target Symbols and Data Tags will be shown even when an aircraft is outside of the airspace described.

Go to “Settings->General...”, and you will see the “Miscellaneous” tab, as you did before. Ensure that all settings are as shown below:

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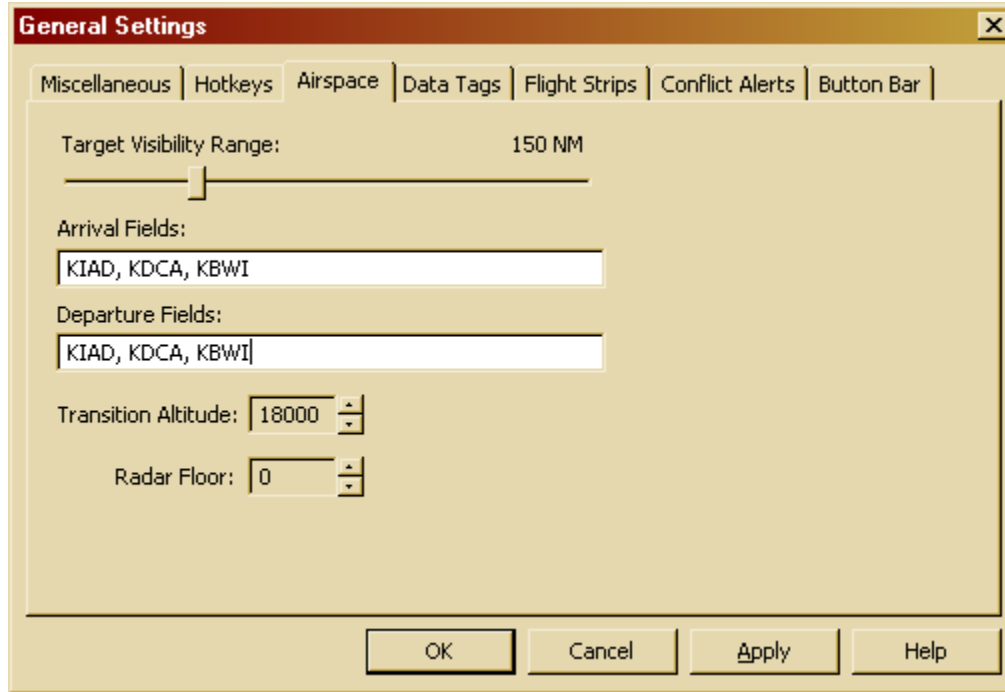
Next, go to the “Hotkeys” tab, and ensure all settings are as shown below:



The “Push to Talk Key” (PTT) is an important setting – this is the keyboard key you will press in order to transmit vocally (Vox). In order to change the key, follow directions on the screen. Make sure to pick a key that you will not use except to activate your microphone while controlling.

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Next, go to the “Airspace” tab, and ensure all settings are as shown below:



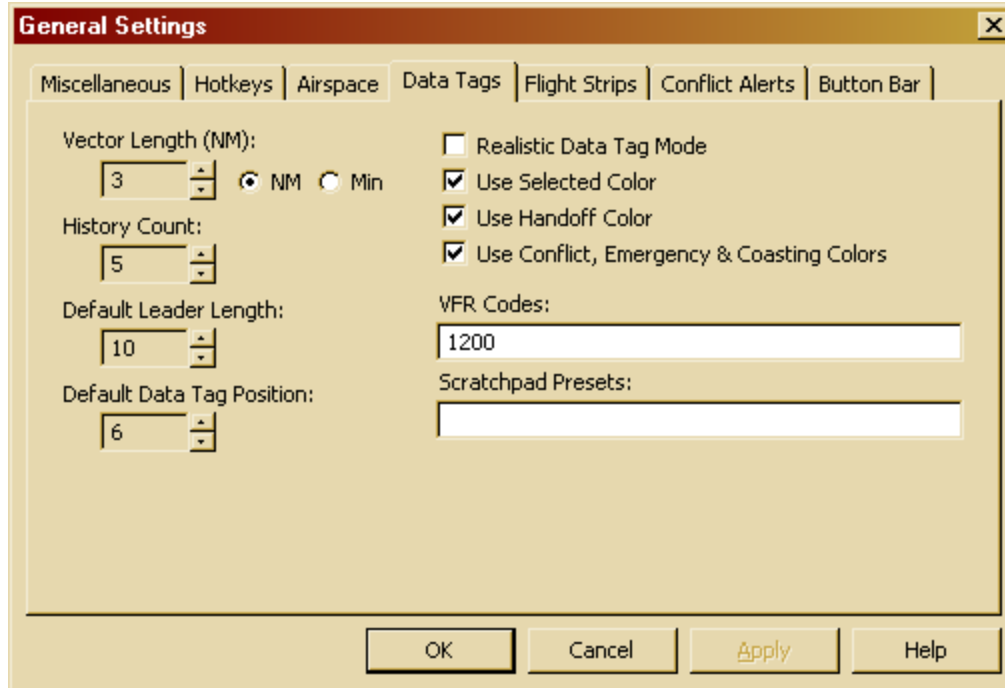
The “Target Visibility Range” dictates how far from your Visibility Center aircraft will be visible on the radar screen. We will review the concept of Visibility Centers shortly. For now, realize that the larger you make the Target Visibility Range, the more network bandwidth you are using. It is imperative that you keep the Target Visibility Range to a minimum for your purposes. This conserves network resources. As an observer, 150 Nautical Miles (NM) is acceptable. When you first connect to the network to provide Clearance Delivery or Ground Control services, you will be expected to keep your Target Visibility Range at less than 25 NM, as you do not need to see aircraft outside of that radius in order to provide that service. As an En-Route (CTR) controller, you will likely need at least 300 NM, so make sure to always have your Target Visibility Range set appropriately. If your visibility setting exceeds the maximum for your connection level and type, you will probably be contacted by a VATSIM Supervisor to reset it to a proper value.

The “Arrival Fields” and “Departure Fields” are text entry fields in which you can enter as many airport codes as you like, separated by commas. These entries will dictate how VRC automatically populates your Flight Strip Bay – Flight Strips will appear automatically if they contain an airport that matches entries in these fields. We will review the concept of the Flight Strip Bay shortly.

Next, go to the “Data Tags” tab, and ensure all settings are as shown below:

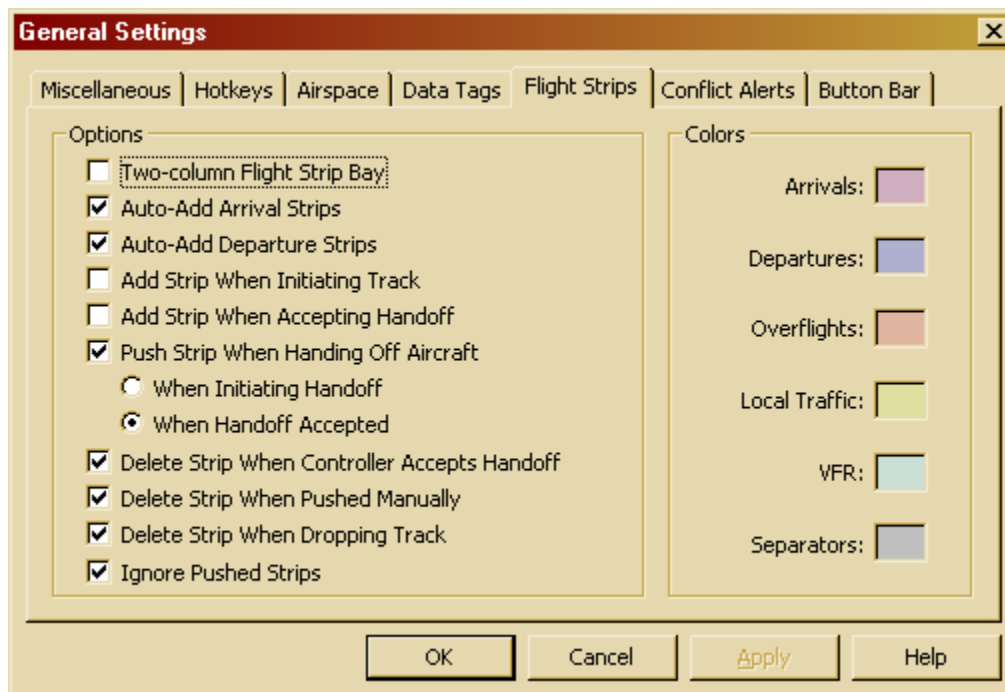
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We will not explain each of the settings in detail here – at the moment, we only want to ensure that the settings are optimized for the purpose of training with VRC. All of the settings are explained in detail in the VRC Documentation, available by going to “Help->Documentation”.

Next, go to the “Flight Strips” tab, and ensure all settings are as shown below:



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Once again, we will not explain each of the settings in detail here, although many are self-explanatory. At the moment, we only want to ensure that the settings are optimized for the purpose of training with VRC. All of the settings are explained in detail in the VRC Documentation, available by going to “Help->Documentation”.

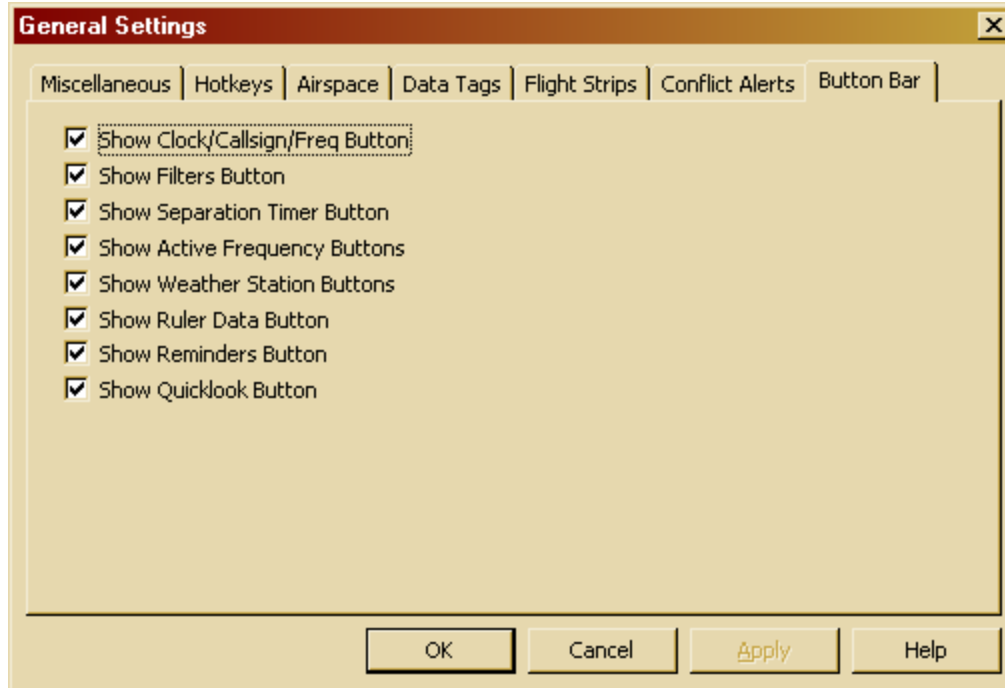
Next, go to the “Conflict Alerts” tab, and ensure that all settings are as shown below:



These settings dictate how VRC will depict Conflict Alerts between aircraft that are too close to each other.

Next, go to the “Button Bar” tab, and ensure that all settings are as shown below:

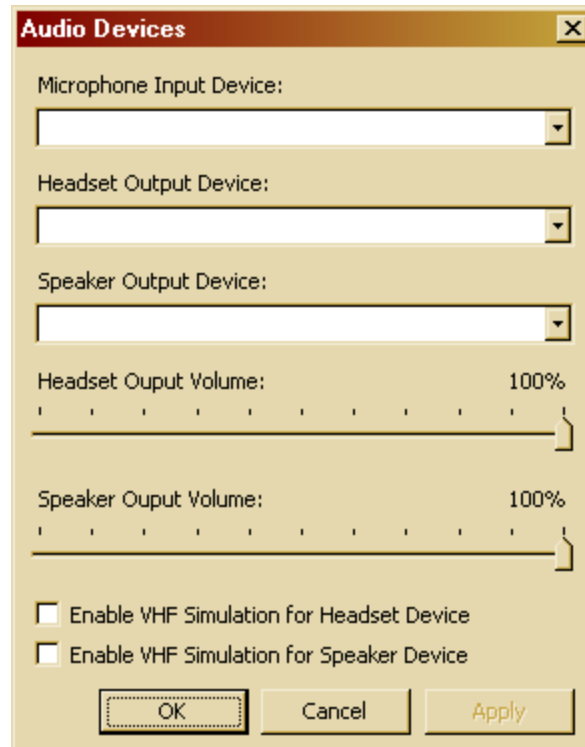
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These settings dictate what items are displayed on the VRC main screen. For the moment, we will choose all of them so that we can go through the uses of each item.

We can skip over some of the sub-menus in the "Settings" menu, as they are not necessary at this time. The next item we need to address is your Audio Device configuration. This will enable VRC to transmit and receive audio (Vox) to and from the VATSIM network. Go to "Settings->Audio Devices...", and the following window will appear:

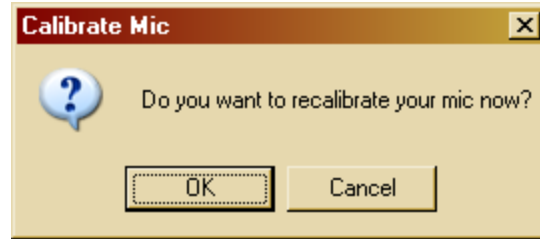
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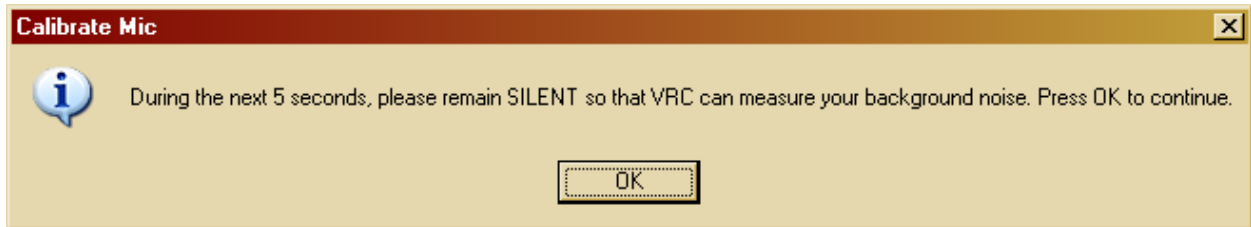
There are three drop-down menus at the top of this window, one each for your Microphone Input Device, your Headset Output Device, and your Speaker Output Device. If you do not have a Microphone Input Device, you will not be able to transmit audio while connected to the network. If you do not have separate devices for Headset and Speaker (typical case if you have an USB sound card or headset), you can use identical settings for both of these devices. In all cases, you will need to choose a device from the drop-down menu for each of these devices. VRC should automatically recognize what hardware (sound card) is attached to your computer, and offer you choices for each device. It is common to use a headset which contains a microphone and earphones while controlling, and to use speakers for auxiliary reasons. Each of these devices has an advantage for a particular use which will become clear as you begin controlling. For now, ensure that a valid device is chosen for each of the three drop-down menus shown above. If there are no choices in the drop-down menu, you will need to consult the VRC Documentation, and possibly research the VRC Forum on the VRC website, found by going to “Help->VRC Web Site”.

Next, if you have a microphone, you will need to calibrate it. Go to “Settings->Calibrate Mic...”, and you will see the following window appear:

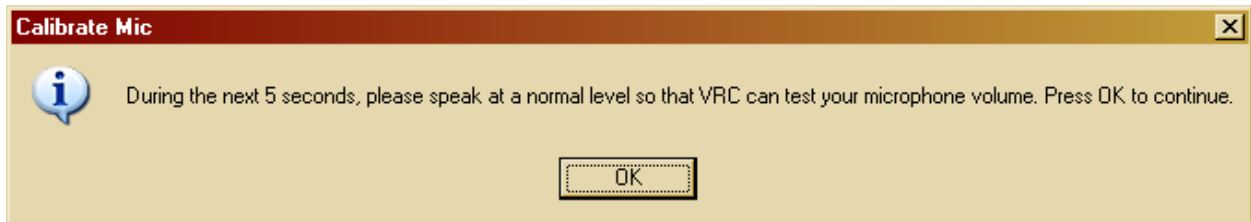
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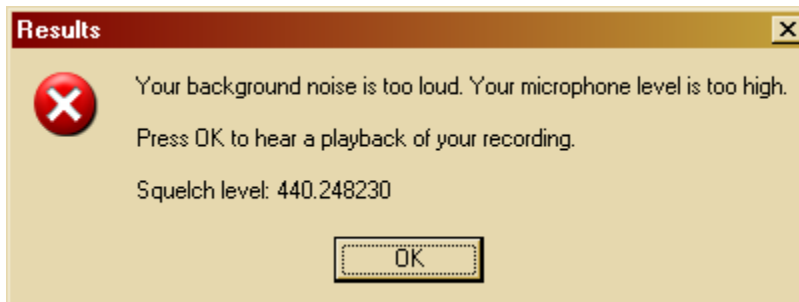
Press "OK", and you will see the following window appear:



Follow the directions, and press "OK". Five seconds later, you will see the following window appear:



Again, follow the directions and press "OK". Make sure to speak into the microphone at the same volume and distance that you would comfortably use to control. Speak continuously for five seconds by counting numbers or reciting the alphabet. VRC is recording your voice to calibrate the squelch level needed in order to distinguish your voice from the background noise in your system. You may see the following window appear when you are done:



Depending on your system, the calibration process may be delicate. Press "OK" to hear a playback of your recording, and if you can hear your voice clearly, the squelch

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level assigned during the calibration is sufficient. Once the playback is finished, the following window will appear:



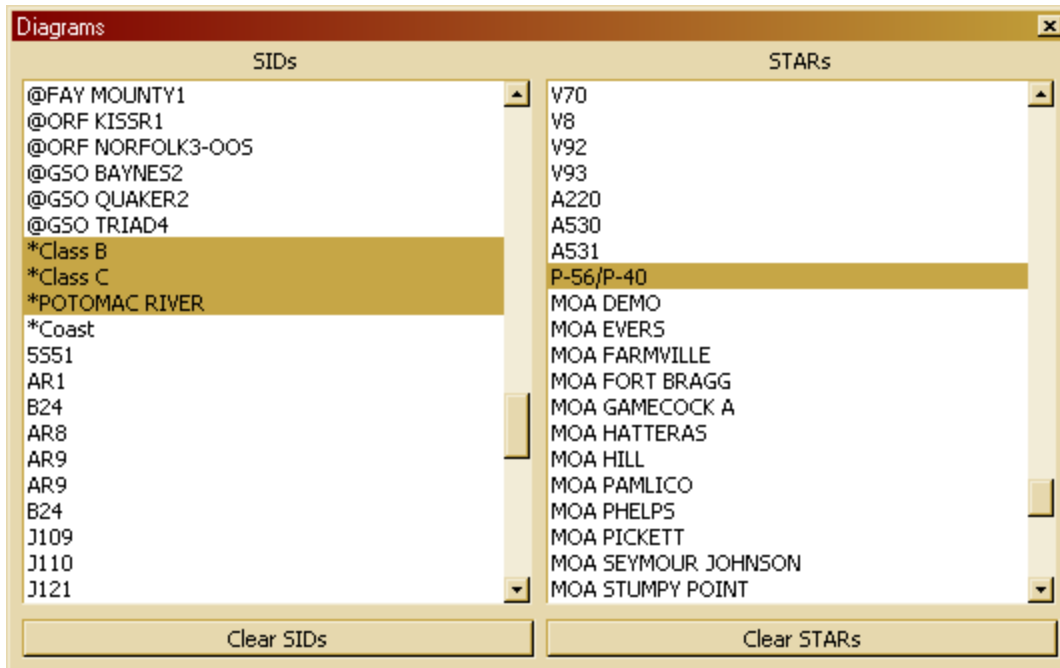
Press “OK”. The settings for your audio devices are now complete, and your microphone is correctly calibrated. Your VRC configuration is fully capable of transmitting and receiving Vox on the network. Save your profile.

Next, go to “View” and ensure that only the following items are checked, leaving the remaining items unchecked:

- Button Bar
- Radio History
- Anchor Lines
- Airports
- Airport Labels
- Runways
- Runway Centerlines
- Fix Labels
- VORs
- VOR Labels
- NDBs
- NDB Labels
- ARTCC Boundaries
- Low Boundaries
- Regions
- Static Text
- Geography

Next, go to “View->Diagrams...”, and the following window will appear:

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This window contains a list of diagrams – the left hand side are labeled “SIDs”, and the right hand side are labeled “STARs”. These are not specifically SIDs and STARs in the sense that we would expect from aeronautical charts, but are rather labeled as such in order to dictate to VRC the color in which we want these diagrams to be shown on the radar screen. Select only the items shown as selected in the figure above, and then close the window. Save your profile.

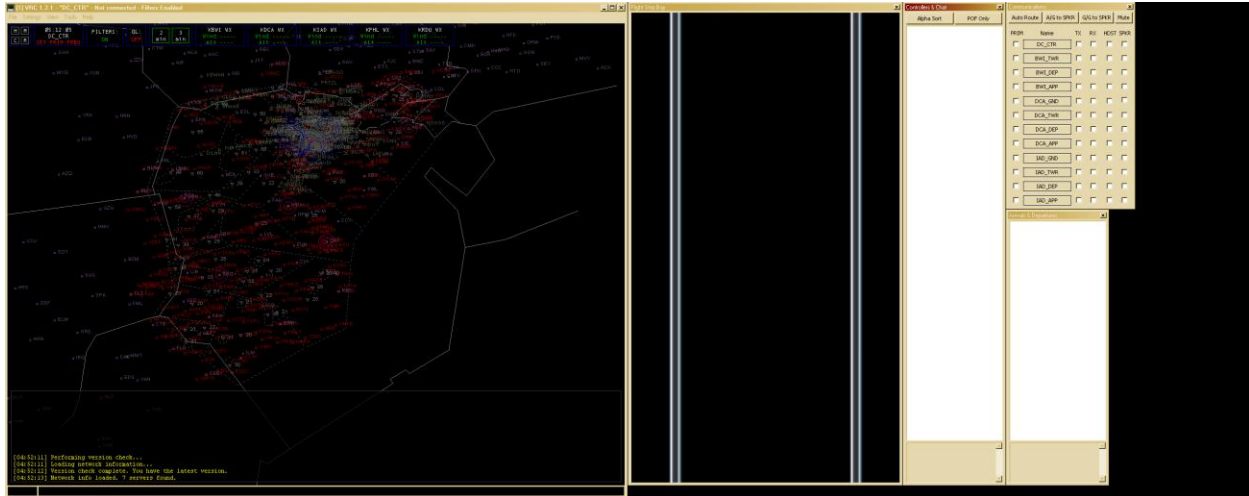
Next, we will choose which tools we want visible while we are controlling. To begin with, go to “Tools” and ensure that only the following items are checked, leaving the remaining items unchecked:

- Flight Strip Bay
- Controller List
- Aircraft List
- Comms Panel

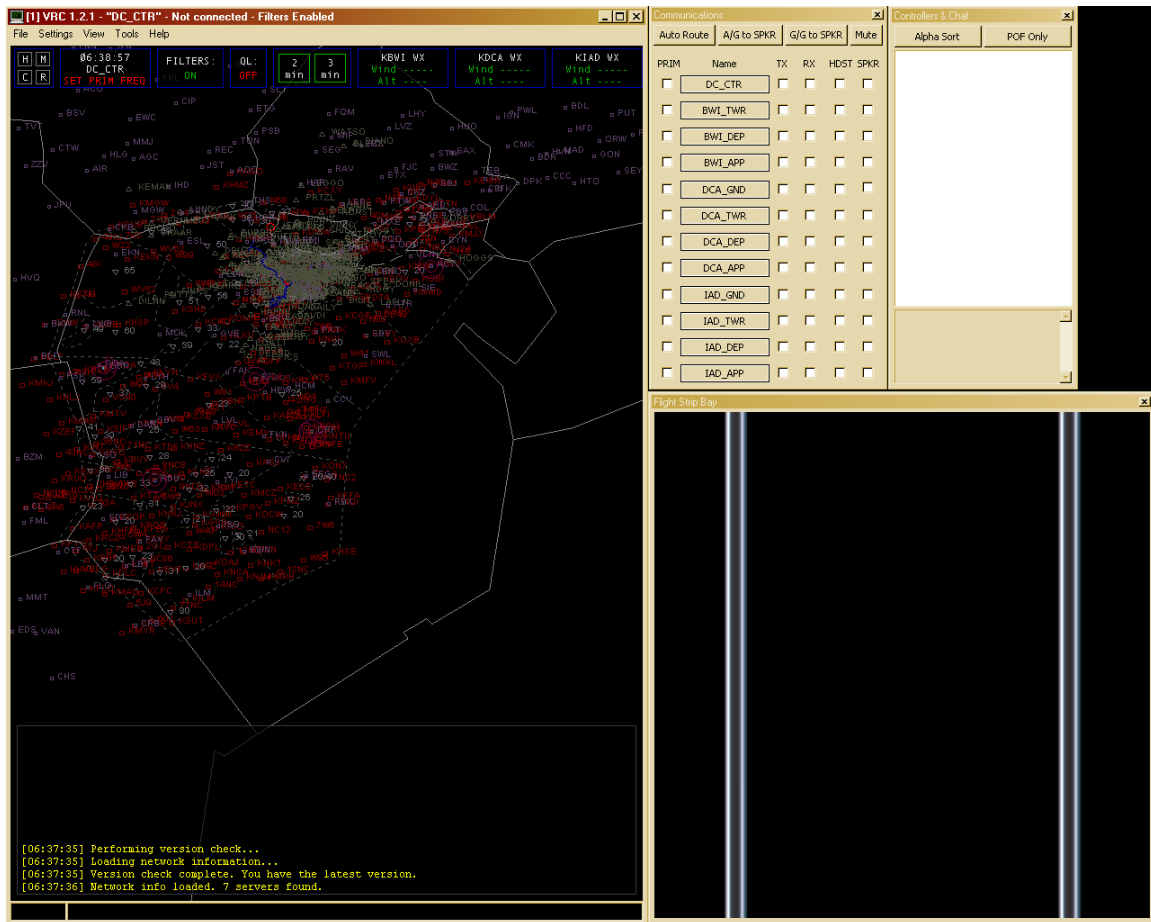
Each of the items you click in this menu will cause an associated window to appear on your screen. You will have to design your screen space to suit your liking, and in the future you may choose not to have some of these items displayed when you are controlling. Again, the goal at this time is to ensure that the settings are optimized for the purpose of training with VRC. You can customize the settings once you have an understanding of the purpose of each item. If you have two monitors for your computer, one possible configuration is shown below:

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If you only have one monitor, you might choose to de-select the Aircraft List, and arrange your windows in this fashion:



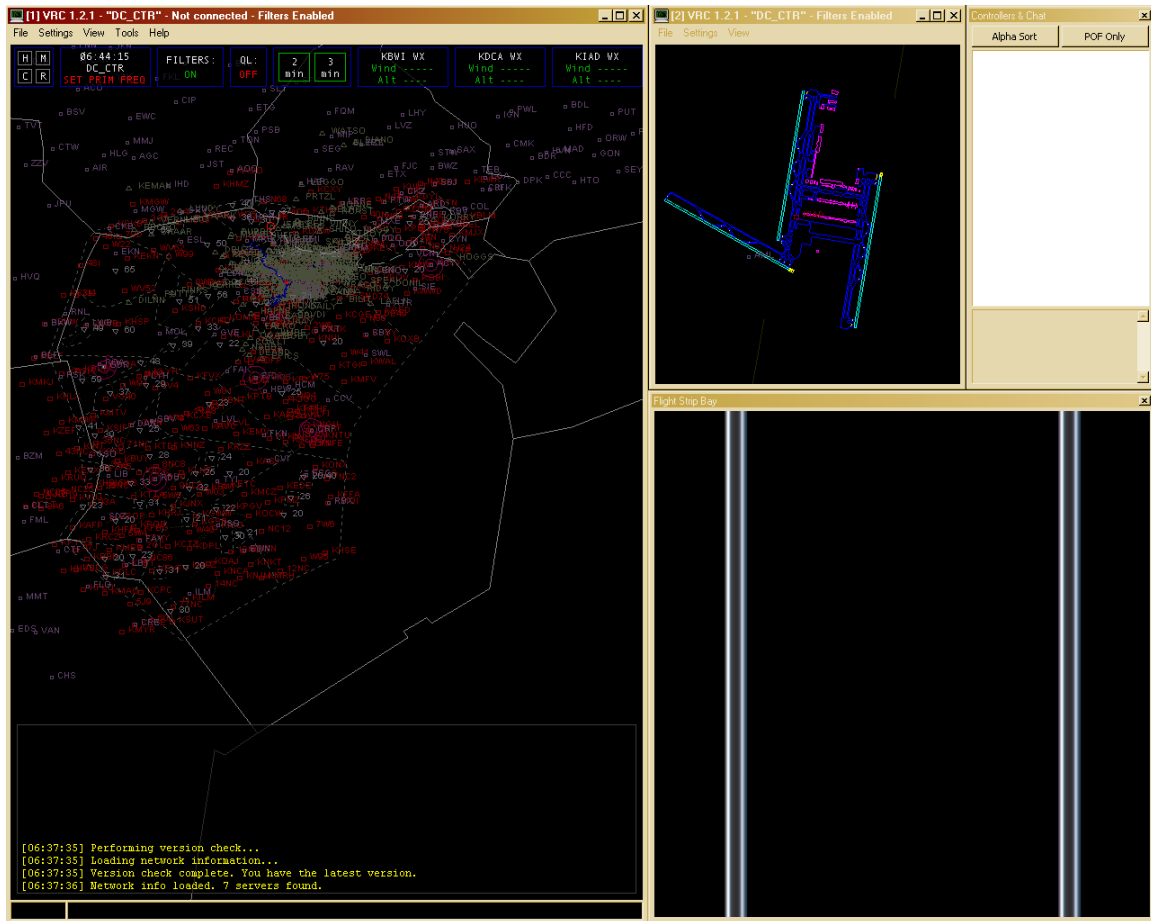
Normally the Comms Panel is only temporarily useful while you choose your primary frequency and prepare to control on the network, and then it can be closed.

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You could then choose to populate that portion of the screen with a secondary radar window. Go to “File->New Window” to open a new radar screen. You can manipulate this second radar screen in the same way as the primary one, and it serves all of the same purposes. A common use for a second screen is to offer a closer view of a particular area within the ZDC airspace while maintaining a global view on the main screen. This is more useful for En-Route controllers, and most likely not useful at this point in your training. The option is there, however, and in the future you might choose a layout like the one in the figure below:

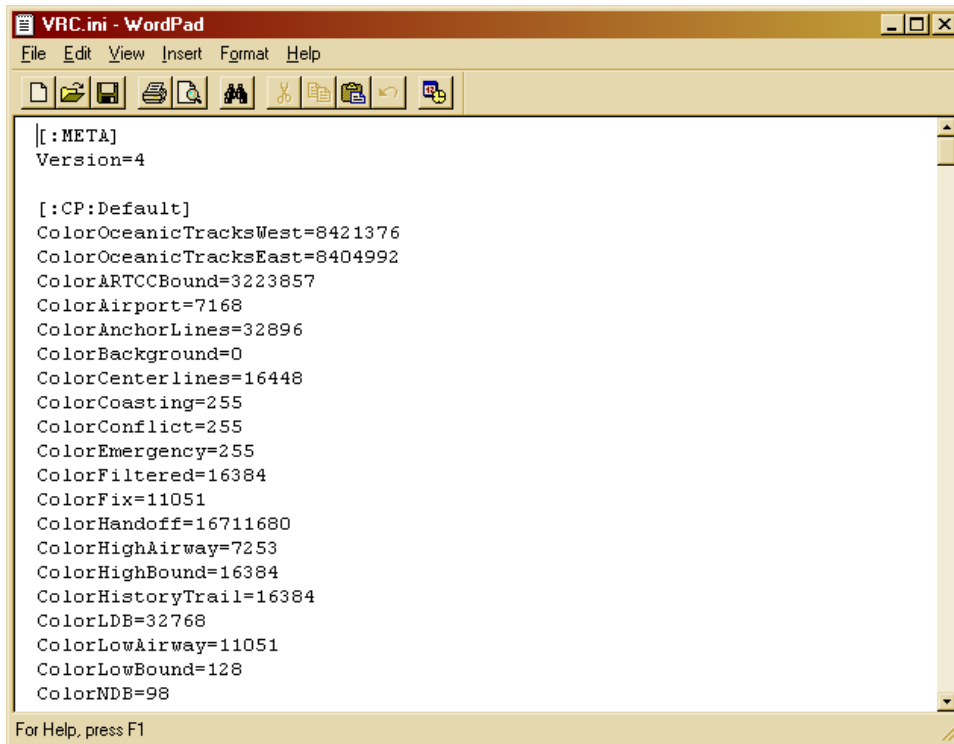


Close VRC, as we are about to manipulate some of the files which it uses to execute properly. The last step in configuring VRC is to set up your Comms Panel. This can be done through the Graphical User Interface (GUI) panel seen on your screen, as we will show in a moment. However, we would like to make some changes that would be rather time consuming if done through the GUI, so we will make the changes directly in the “VRC.ini” file. This is the initialization file that VRC uses to store all of your profile information, and it is read and parsed each time you start VRC. If you lose or otherwise corrupt this file, you will lose all of the information stored in all of the profiles you have saved, so take special care when manipulating this file.

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The VRC.ini file is located in the VRC installation directory (this should be “C:\Program Files\VRC”). If you can not find the file, it is possible that the extension is being hidden from you by Windows Explorer. Within Windows Explorer, go to “Tools->Folder Options...”, and go to the “View” tab. Ensure that the “Hide extensions for known file types” button is unchecked, and press “OK”. You should now be able to see the “VRC.ini” file in your VRC installation directory.

Before we make any changes to the “VRC.ini” file, make a copy of the file, and store it in the same directory, and call it “BackupVRC.ini”. Now we can open the “VRC.ini” file with WordPad or any text editor. The beginning of the file should look like the figure below:



```
VRC.ini - WordPad
File Edit View Insert Format Help
[ :META]
Version=4

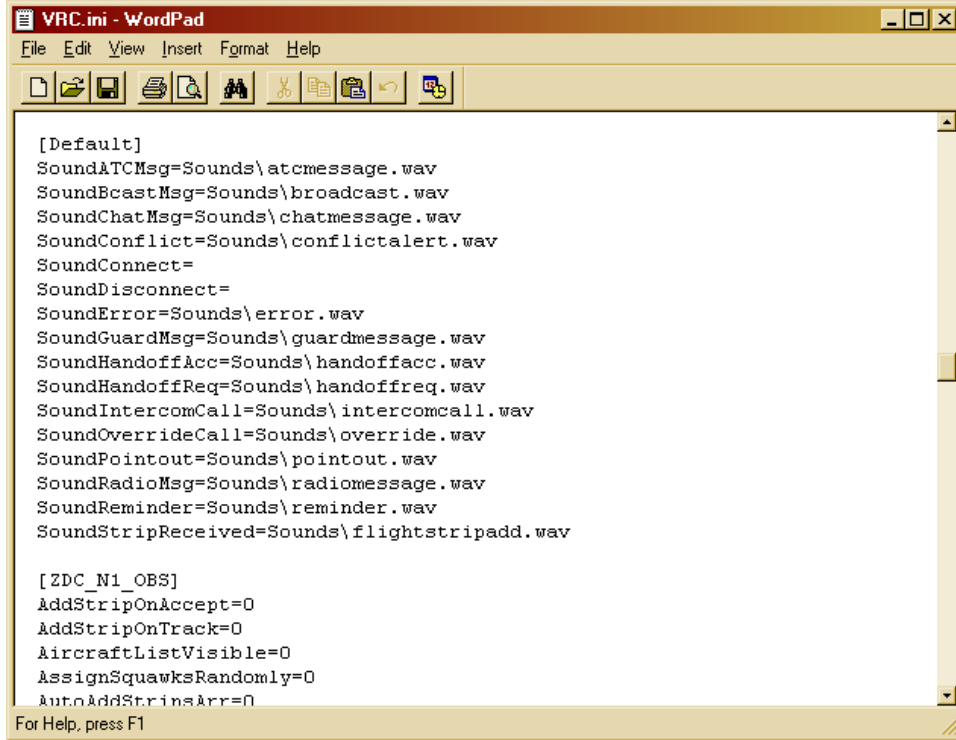
[ :CP:Default]
ColorOceanicTracksWest=8421376
ColorOceanicTracksEast=8404992
ColorARTCCBound=3223857
ColorAirport=7168
ColorAnchorLines=32896
ColorBackground=0
ColorCenterlines=16448
ColorCoasting=255
ColorConflict=255
ColorEmergency=255
ColorFiltered=16384
ColorFix=11051
ColorHandoff=16711680
ColorHighAirway=7253
ColorHighBound=16384
ColorHistoryTrail=16384
ColorLDB=32768
ColorLowAirway=11051
ColorLowBound=128
ColorNDB=98

For Help, press F1
```

The top portion of the file contains information related to Color Profiles. Scroll further down until you see (or search for) a line that says “[Default]”. This is the beginning of the information which characterizes your Default profile. It should not contain very much information. Underneath the Default profile section, you should find a line that says “[ZDC\_N1\_OBS]”. This is the beginning of the information which characterizes the “ZDC\_N1\_OBS” profile that you’ve been working with. The figure below shows what the “VRC.ini” file should look like at this point in the file:

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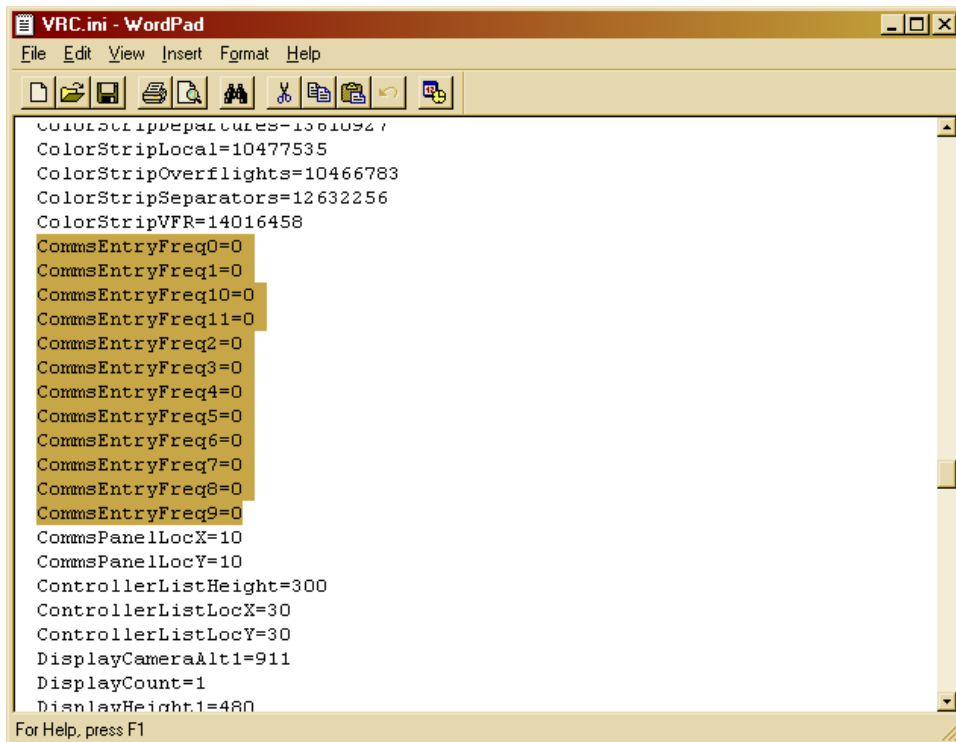
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```
[Default]
SoundATCMsg=Sounds\atcmessage.wav
SoundBcastMsg=Sounds\broadcast.wav
SoundChatMsg=Sounds\chatmessage.wav
SoundConflict=Sounds\conflictaert.wav
SoundConnect=
SoundDisconnect=
SoundError=Sounds\error.wav
SoundGuardMsg=Sounds\guardmessage.wav
SoundHandoffAcc=Sounds\handoffacc.wav
SoundHandoffReq=Sounds\handoffreq.wav
SoundIntercomCall=Sounds\intercomcall.wav
SoundOverrideCall=Sounds\override.wav
SoundPointout=Sounds\pointout.wav
SoundRadioMsg=Sounds\radiomessage.wav
SoundReminder=Sounds\reminder.wav
SoundStripReceived=Sounds\flightstripadd.wav

[ZDC_N1_OBS]
AddStripOnAccept=0
AddStripOnTrack=0
AircraftListVisible=0
AssignSquawksRandomly=0
AutoAddStripsArr=0
```

Scroll a bit further down until you find a set of twelve parameters that each begin with the text “CommsEntryFreq” (or you can search for that string of characters to find it as well. The figure below shows the parameters highlighted:



```
ColorStripParameters=10610967
ColorStripLocal=10477535
ColorStripOverflights=10466783
ColorStripSeparators=12632256
ColorStripVFR=14016458
CommsEntryFreq0=0
CommsEntryFreq1=0
CommsEntryFreq10=0
CommsEntryFreq11=0
CommsEntryFreq2=0
CommsEntryFreq3=0
CommsEntryFreq4=0
CommsEntryFreq5=0
CommsEntryFreq6=0
CommsEntryFreq7=0
CommsEntryFreq8=0
CommsEntryFreq9=0
CommsPanelLocX=10
CommsPanelLocY=10
ControllerListHeight=300
ControllerListLocX=30
ControllerListLocY=30
DisplayCameraAlt=911
DisplayCount=1
DisplayHeight=480
```

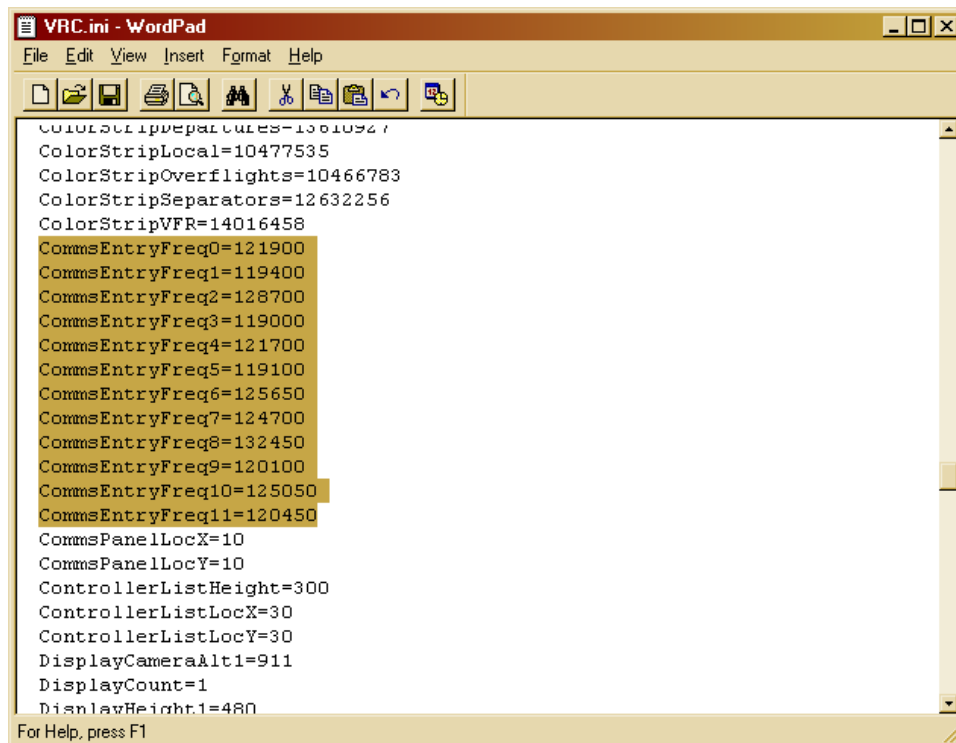
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These parameters control the frequency of each of your channels in your Comms Panel. Note that they are currently blank. Highlight this portion of the text (be sure not to highlight the “CommsPanelLocX” and “CommsPanelLocY” parameters, as these dictate the position of the Comms Panel when you open VRC. Delete all twelve “CommsEntryFreq” parameters, and then replace them with the text below:

```
CommsEntryFreq0=121900
CommsEntryFreq1=119400
CommsEntryFreq2=128700
CommsEntryFreq3=119000
CommsEntryFreq4=121700
CommsEntryFreq5=119100
CommsEntryFreq6=125650
CommsEntryFreq7=119850
CommsEntryFreq8=132450
CommsEntryFreq9=120100
CommsEntryFreq10=125050
CommsEntryFreq11=120450
```

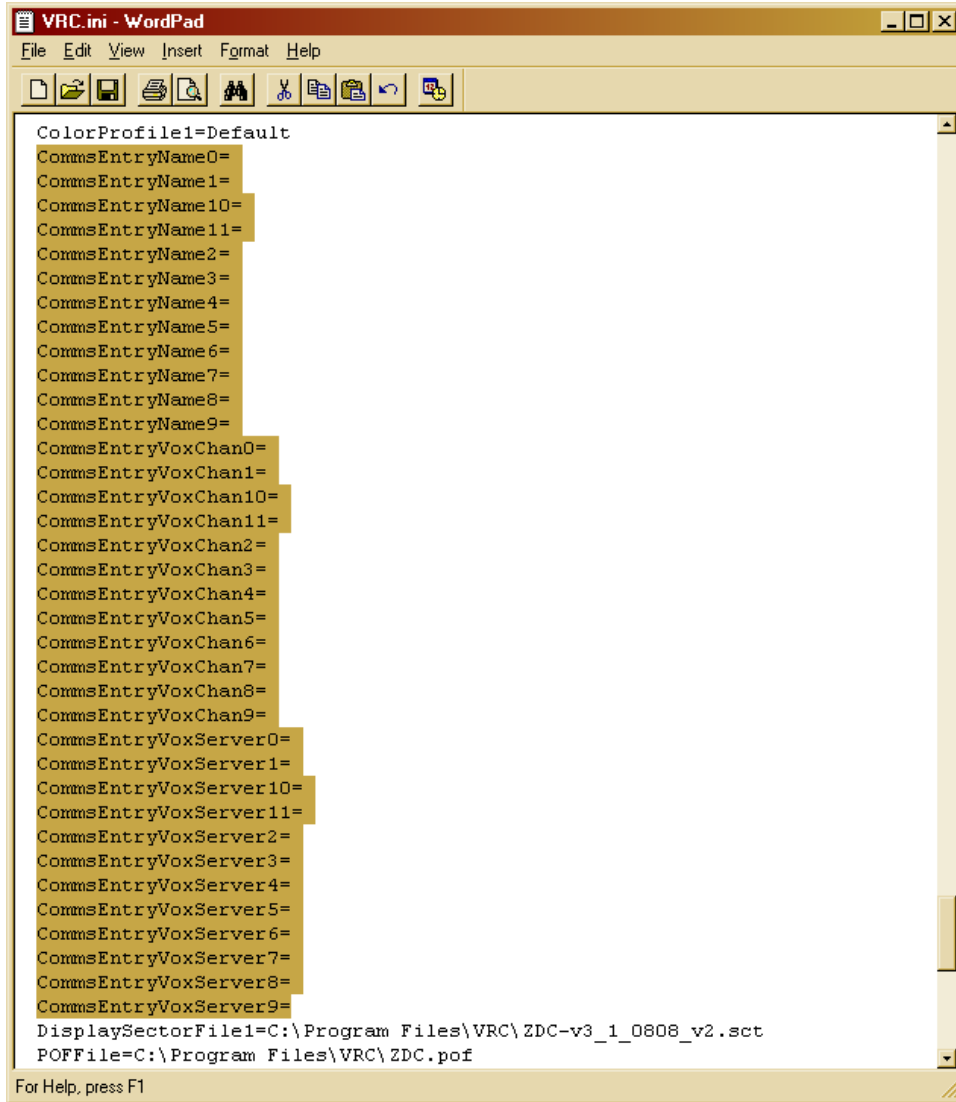
These new parameters will assign all of the channels in your Comms Panel with the frequencies needed to control in various airports and positions within ZDC. Your “VRC.ini” file should now resemble the figure below:



We have one more change to make to this file. Scroll down a bit further until you find a set of 36 parameters that begin with the text “CommsEntryName”,

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“CommsEntryVoxChan”, or “CommsEntryVoxServer” (or you can search for one of those three strings of characters to find this area of the file as well. The figure below shows the parameters highlighted:



The screenshot shows a WordPad window titled "VRC.ini - WordPad". The window contains the following text, with several lines highlighted in yellow:

```
ColorProfile1=Default
CommsEntryName0=
CommsEntryName1=
CommsEntryName10=
CommsEntryName11=
CommsEntryName2=
CommsEntryName3=
CommsEntryName4=
CommsEntryName5=
CommsEntryName6=
CommsEntryName7=
CommsEntryName8=
CommsEntryName9=
CommsEntryVoxChan0=
CommsEntryVoxChan1=
CommsEntryVoxChan10=
CommsEntryVoxChan11=
CommsEntryVoxChan2=
CommsEntryVoxChan3=
CommsEntryVoxChan4=
CommsEntryVoxChan5=
CommsEntryVoxChan6=
CommsEntryVoxChan7=
CommsEntryVoxChan8=
CommsEntryVoxChan9=
CommsEntryVoxServer0=
CommsEntryVoxServer1=
CommsEntryVoxServer10=
CommsEntryVoxServer11=
CommsEntryVoxServer2=
CommsEntryVoxServer3=
CommsEntryVoxServer4=
CommsEntryVoxServer5=
CommsEntryVoxServer6=
CommsEntryVoxServer7=
CommsEntryVoxServer8=
CommsEntryVoxServer9=
DisplaySectorFile1=C:\Program Files\VRC\ZDC-v3_1_0808_v2.sct
POFFile=C:\Program Files\VRC\ZDC.pof
```

At the bottom of the window, it says "For Help, press F1".

These parameters control the name, Vox Channel, and Vox Server for each of your channels in your Comms Panel. Note that they are currently blank. Highlight these parameters in your “VRC.ini” file and delete them, and then replace them with the text below:

## ZDC Training

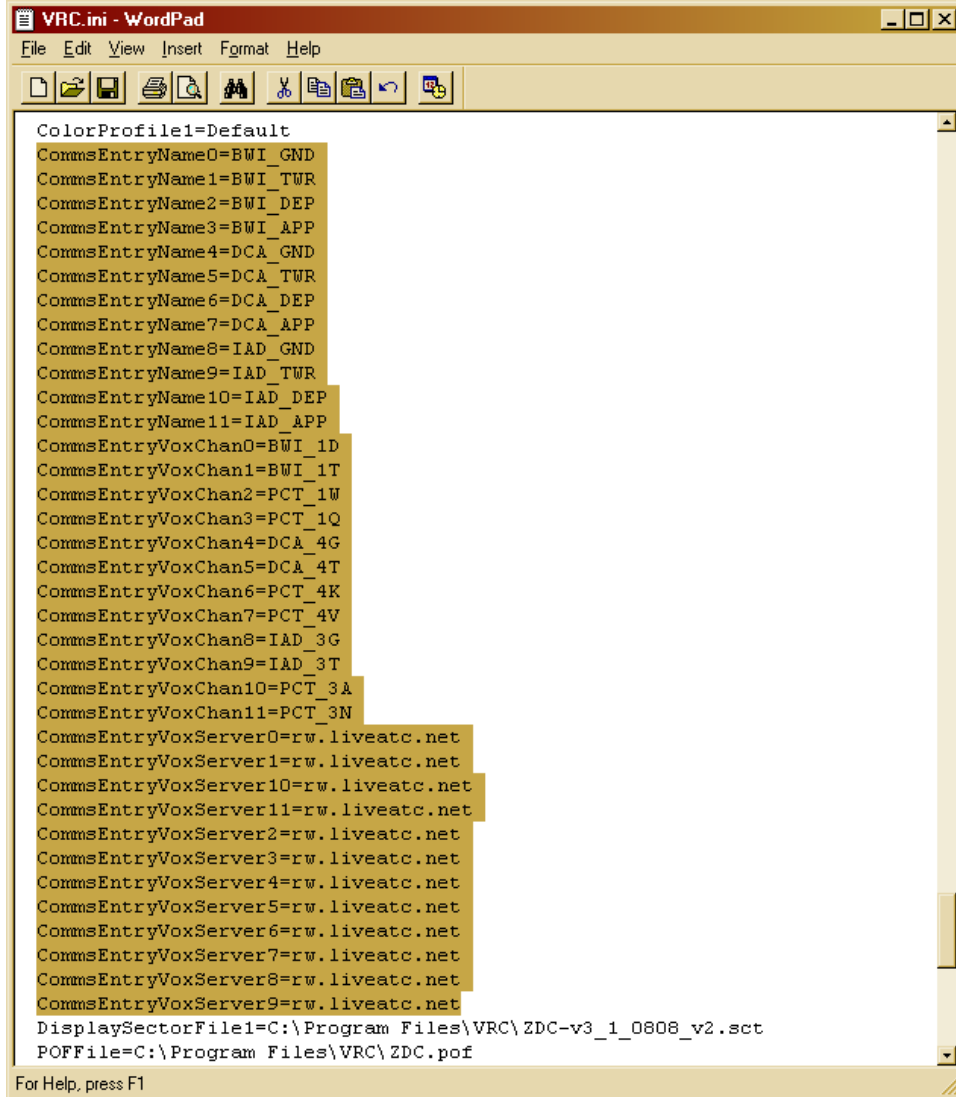
### Volume 1: Basic Information and Radar Client Setup

```
CommsEntryName0=BWI_GND
CommsEntryName1=BWI_TWR
CommsEntryName2=BWI_DEP
CommsEntryName3=BWI_APP
CommsEntryName4=DCA_GND
CommsEntryName5=DCA_TWR
CommsEntryName6=DCA_DEP
CommsEntryName7=DCA_APP
CommsEntryName8=IAD_GND
CommsEntryName9=IAD_TWR
CommsEntryName10=IAD_DEP
CommsEntryName11=IAD_APP
CommsEntryVoxChan0=BWI_1D
CommsEntryVoxChan1=BWI_1T
CommsEntryVoxChan2=PCT_1W
CommsEntryVoxChan3=PCT_1Q
CommsEntryVoxChan4=DCA_4G
CommsEntryVoxChan5=DCA_4T
CommsEntryVoxChan6=PCT_4K
CommsEntryVoxChan7=PCT_4J
CommsEntryVoxChan8=IAD_3G
CommsEntryVoxChan9=IAD_3T
CommsEntryVoxChan10=PCT_3A
CommsEntryVoxChan11=PCT_3N
CommsEntryVoxServer0=rw.liveatc.net
CommsEntryVoxServer1=rw.liveatc.net
CommsEntryVoxServer10=rw.liveatc.net
CommsEntryVoxServer11=rw.liveatc.net
CommsEntryVoxServer2=rw.liveatc.net
CommsEntryVoxServer3=rw.liveatc.net
CommsEntryVoxServer4=rw.liveatc.net
CommsEntryVoxServer5=rw.liveatc.net
CommsEntryVoxServer6=rw.liveatc.net
CommsEntryVoxServer7=rw.liveatc.net
CommsEntryVoxServer8=rw.liveatc.net
CommsEntryVoxServer9=rw.liveatc.net
```

These new parameters will assign all of the channels in your Comms Panel with the channel names, Vox Channel names, and Vox Server names needed to control in various airports and positions within ZDC. Your “VRC.ini” file should now resemble the figure below:

# ZDC Training

## Volume 1: Basic Information and Radar Client Setup

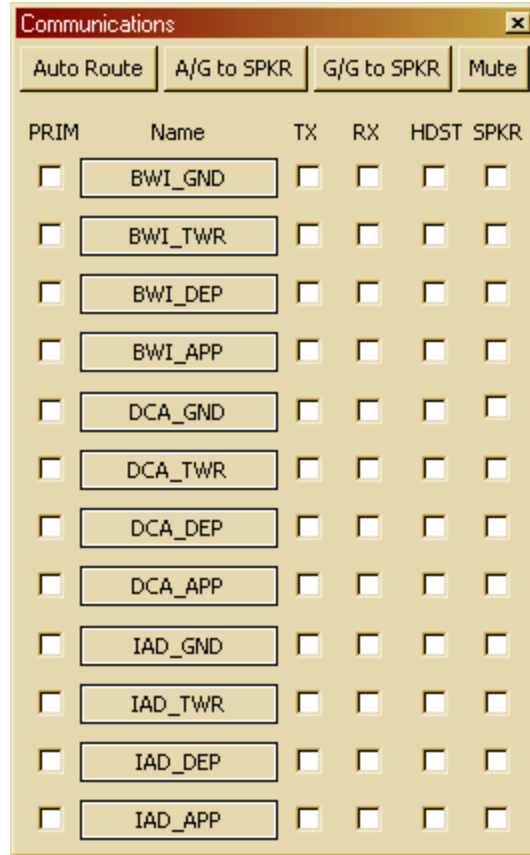


```
ColorProfile1=Default
CommsEntryName0=BWI_GND
CommsEntryName1=BWI_TWR
CommsEntryName2=BWI_DEP
CommsEntryName3=BWI_APP
CommsEntryName4=DCA_GND
CommsEntryName5=DCA_TWR
CommsEntryName6=DCA_DEP
CommsEntryName7=DCA_APP
CommsEntryName8=IAD_GND
CommsEntryName9=IAD_TWR
CommsEntryName10=IAD_DEP
CommsEntryName11=IAD_APP
CommsEntryVoxChan0=BWI_1D
CommsEntryVoxChan1=BWI_1T
CommsEntryVoxChan2=PCT_1W
CommsEntryVoxChan3=PCT_1Q
CommsEntryVoxChan4=DCA_4G
CommsEntryVoxChan5=DCA_4T
CommsEntryVoxChan6=PCT_4K
CommsEntryVoxChan7=PCT_4V
CommsEntryVoxChan8=IAD_3G
CommsEntryVoxChan9=IAD_3T
CommsEntryVoxChan10=PCT_3A
CommsEntryVoxChan11=PCT_3N
CommsEntryVoxServer0=rw.liveatc.net
CommsEntryVoxServer1=rw.liveatc.net
CommsEntryVoxServer10=rw.liveatc.net
CommsEntryVoxServer11=rw.liveatc.net
CommsEntryVoxServer2=rw.liveatc.net
CommsEntryVoxServer3=rw.liveatc.net
CommsEntryVoxServer4=rw.liveatc.net
CommsEntryVoxServer5=rw.liveatc.net
CommsEntryVoxServer6=rw.liveatc.net
CommsEntryVoxServer7=rw.liveatc.net
CommsEntryVoxServer8=rw.liveatc.net
CommsEntryVoxServer9=rw.liveatc.net
DisplaySectorFile1=C:\Program Files\VRC\VRC-v3_1_0808_v2.sct
POFFile=C:\Program Files\VRC\VRC.pof
```

For Help, press F1

Save your “VRC.ini” file, and then close it. Start VRC. If all of the previous steps were performed correctly, VRC will start without issue, and your new Comms Panel will resemble the figure below:

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If your Comms Panel looks like the figure above, then save your profile. If you can not start VRC, or if your Comms Panel does not look like the figure above, then close VRC. Restore your original, unaltered file by deleting the file called "VRC.ini", and then renaming your "BackupVRC.ini" file to "VRC.ini". This should revert all of the manual changes you've made in this portion of the setup. Go through the process of manually editing the "VRC.ini" file again, making sure to create a backup file as you did before. If your second attempt still does not produce a Comms Panel that looks like the figure above, then restore your original, unaltered file once more, and we will make the changes through the GUI as described below.

If you click on any of the "Name" boxes (such as "BWI\_GND"), a panel at the bottom of the window will appear which shows the settings for that channel. The window will look like the figure below:

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PRIM	Name	TX	RX	HDST	SPKR
<input type="checkbox"/>	BWI_GND	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	BWI_TWR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	BWI_DEP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	BWI_APP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	DCA_GND	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	DCA_TWR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	DCA_DEP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	DCA_APP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	IAD_GND	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	IAD_TWR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	IAD_DEP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	IAD_APP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Position Name:

Frequency:

Vox Server:

Vox Channel:

Note that there are four items associated with the channel. The “Position Name”, “Frequency”, “Vox Server”, and “Vox Channel”. If your Comms Panel is still blank due to not being able to successfully edit the “VRC.ini” file, you can enter this information in manually using this interface. There are a total of twelve channels available. Populate all of the channels with the information given below. Ensure that the Frequencies are entered using three digits after the decimal point – the GUI will not accept any other format. Note that all Vox Server entries are identical – they should all be set to “rw.liveatc.net”.

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Position Name	Frequency	Vox Server	Vox Channel
BWI_GND	121.900	rw.liveatc.net	BWI_1D
BWI_TWR	119.400	rw.liveatc.net	BWI_1T
BWI_DEP	128.700	rw.liveatc.net	PCT_1W
BWI_APP	119.000	rw.liveatc.net	PCT_1Q
DCA_GND	121.700	rw.liveatc.net	DCA_4G
DCA_TWR	119.100	rw.liveatc.net	DCA_4T
DCA_DEP	125.650	rw.liveatc.net	PCT_4K
DCA_APP	124.700	rw.liveatc.net	PCT_4V
IAD_GND	132.450	rw.liveatc.net	IAD_3G
IAD_TWR	120.100	rw.liveatc.net	IAD_3T
IAD_DEP	125.050	rw.liveatc.net	PCT_3A
IAD_APP	120.450	rw.liveatc.net	PCT_3N

Once again, when you are done with your work, save your profile. You will note that each channel has five radio buttons associated with it – “PRIM”, “TX”, “RX”, “HDST”, and “SPKR”. We will review the functionality of each of these radio buttons, as they are of prime importance when you are logged onto the VATSIM network.

“PRIM” sets your primary frequency. When you check this box, all users within your visibility range can see your Callsign and the frequency associated with the channel for which you checked “PRIM”. As a pilot, when you see DC\_CTR in your list of controllers with a frequency of 123.85, that is because a controller has pressed “PRIM” on that channel in their VRC Comms Panel. You do NOT want to press “PRIM” on any channel while connected to the VATSIM network unless you have authority to do so. With a rating of “Observer” (OBS), you are not allowed to press “PRIM” on any frequency at all. Your instructor will tell you when you have the proper certification and the rating (S1 or higher, depending on the position) to check this box on a particular frequency. For the moment, do not check this box at any time when connected to the VATSIM network.

“TX” lets you transmit on the frequency associated with the channel for which you checked “TX”. If you transmit (by pushing your PTT key and speaking into your microphone), you will be broadcasting on the frequency. The only difference between this and “PRIM” is that you will not be visible in the controller list of pilots within your visibility range. Using this function is also prohibited until you possess the proper certification and the rating (S1 or higher, depending on the position) to do so. For the moment, do not check this box at any time when connected to the VATSIM network.

“RX” lets you receive transmissions on the frequency associated with the channel for which you checked “RX”. You are encouraged to press this button at any time, and on any channel, as you are only listening to transmissions on the channel, and any observer is permitted to do this at any time when connected to the VATSIM network. This will be a great tool for learning how ATC functions are performed. There is only one catch – when you check “RX”, you still have not instructed VRC on how you want to hear the transmissions. This is the function of the next two boxes.

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“HDST” commands VRC to direct the received transmissions on the particular frequency to your Headset Device, as defined in the Audio Device settings. Normally the “HDST” button is checked for the frequency on which you are actively controlling.

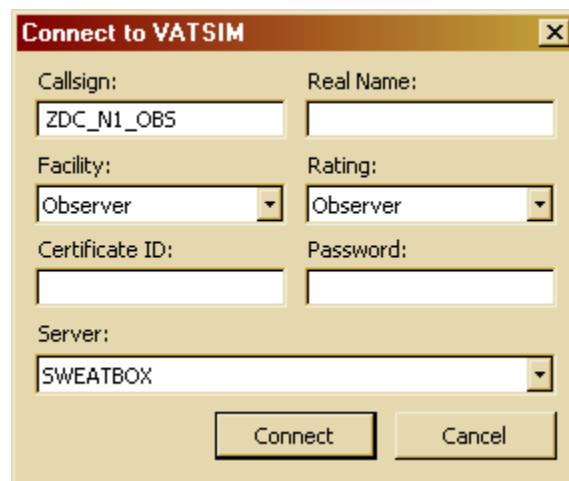
“SPKR” commands VRC to direct the received transmissions on the particular frequency to your Speaker Device, as defined in the Audio Device settings. Normally the “SPKR” button is checked for the frequency (or frequencies) which you are monitoring, but not controlling.

If you wish to monitor more than one channel, you are free to do so by checking both “RX” and “SPKR” for each channel you want to listen to. Just make sure not to press “TX” or “PRIM” at any point while connected to the VATSIM network. You will need to have achieved a rating promotion to Student (S1) and the local certification to do so from your ZDC MTR or INS.

We will make one last modification to files within the VRC installation directory. Go to the VRC installation directory (this should be “C:\Program Files\VRC\”), and then open WordPad or any other text editor. Copy and paste the following text into the empty file:

```
sweatbox.vatsim.net SWEATBOX
```

Go to “File->Save As...” and name the file “myservers.txt”. Ensure that this file is in the VRC installation directory. There should also be a file called “servers.txt” in the same directory. The file you just created will enable you to connect to the “SWEATBOX” server. This server will be listed among the list of servers to choose from when you connect to the VATSIM network. When you connect, you should be able to choose “SWEATBOX” from the “Server” drop-down menu, as shown in the figure below:



This server is unique, and is isolated from the “live” VATSIM servers. Its purpose is to provide a training ground for students, and to allow live collaboration with MTR and INS staff in a simulated environment (even more simulated than VATSIM because you are not connected to the actual VATSIM servers where the pilots fly). This is where you will most likely log on to have your training sessions with your mentors and instructors.

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Also, you will be granted the rights to log on with a “Facility” other than “Observer” on the Sweatbox server (commonly referred to as the “SB server”, or just “SB”). This enables you to be able to manipulate data tag information for aircraft, and other actions necessary for a comprehensive training forum. The aircraft that you encounter on the SB server will be automated, and controlled by your MTR or INS, not pilots flying on VATSIM. The purpose of the SB server is to let your training commence with some “simulated” aircraft before you are permitted to log on to the VATSIM network and control “live” traffic.

To review, at this point you are not permitted to log on to the VATSIM network (using any server like USA-W, USA-SE, EUROPE-E2, OCEANIA, etc.) with any Facility other than “Observer” and with any Rating other than “Observer”. You are not permitted to press “PRIM” or “TX” on any channel on the VATSIM servers.

When you finish executing this guide and pass the ZDC Basic Examination and the ZDC Potomac Ground Examination on the VATUSA Certification Center, you can request a training session in the Training Requests section of the ZDC Forum. You will most likely meet your MTR or INS on the “live” VATUSA servers (where you will log in as an Observer), and then chat with them a bit, and then re-connect to the SB server (where you will log on with a Facility that represents the position you are training for – Delivery, Ground, etc.). Your trainer may ask to meet you directly on the SB server at a particular time as well. In any case, know that you can (and should) log on to the SB server with a Facility higher than “Observer”, because if you log on as an Observer in SB, you will not be able to manipulate aircraft data tags and perform other necessary functions required for training.

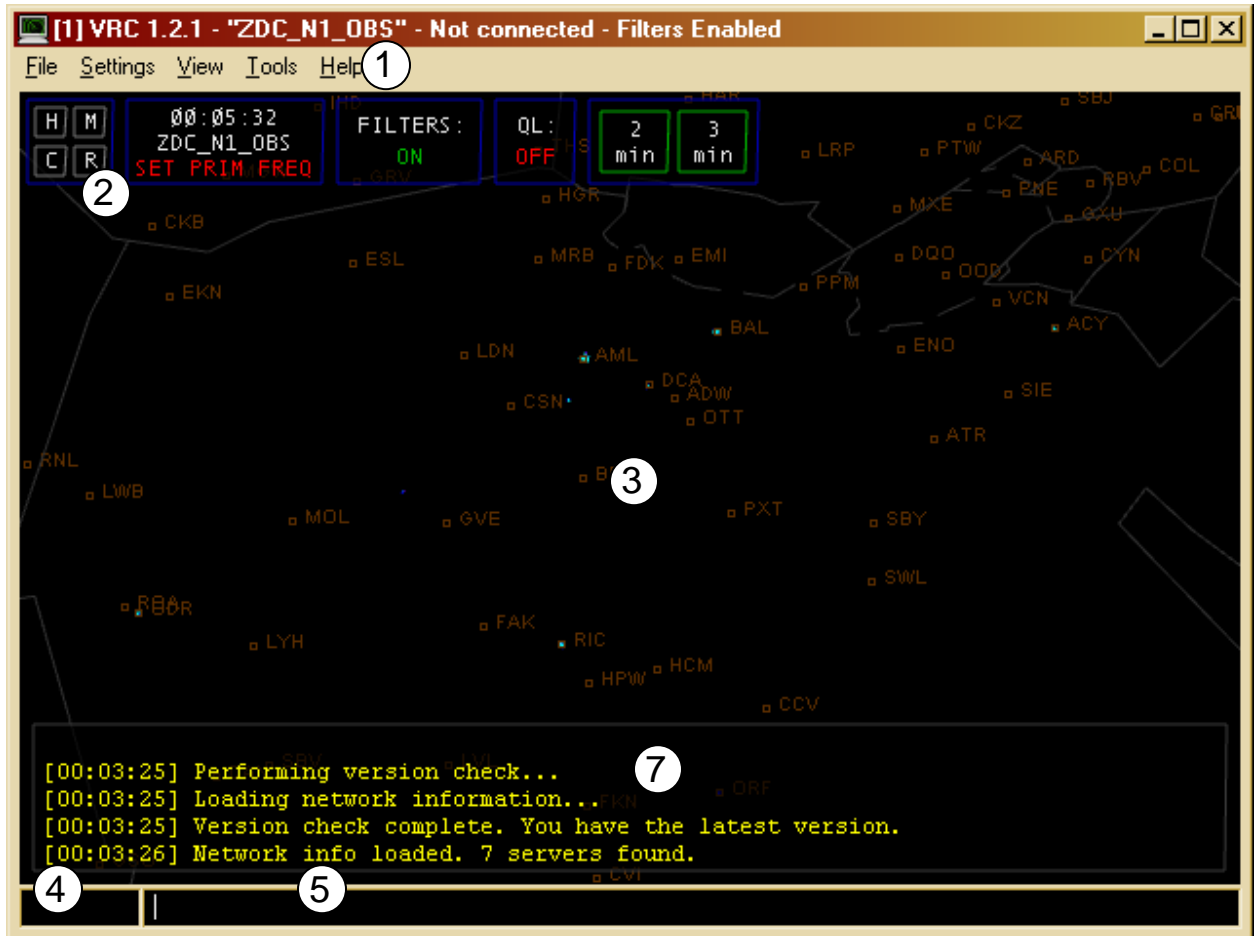
- **How to Use VRC**

Now that you have VRC completely configured, you can connect to the VATSIM network and observe traffic, and monitor frequencies while you progress through your training. Monitoring other controllers is an excellent way to learn how to perform the same functions yourself. It is no excuse for study, but it is an excellent addition to the process. We will begin learning to provide ATC services by going through a tour of all the VRC functions and capabilities.

## Tour of VRC

- **The Main Window**

There are several parts of the VRC Main Window that you will use each and every time you control. We will take a look at all of these items below. Also, remember that VRC has considerable documentation on all of its functions – simply follow this link: [http://www.metacraft.com/VRC/docs/single\\_page.html](http://www.metacraft.com/VRC/docs/single_page.html)



1. The Menu Bar – This is a standard Windows menu bar. You can make alterations to your window configuration using the items in the menus.
2. The Button Bar – This consists of a number of items that are designed to help give the controller situational awareness. The top left contains a set of four reminder lights.
  - a. H – an aircraft is being handed off to you (radar controllers only)
  - b. M – your microphone is muted
  - c. C – a message from a controller is unread in the chat window

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d. R – you have aircraft on your reminder list

The Button Bar also includes a box that shows the current Zulu time, along with your callsign and your primary frequency (if one is set). There are also alert displays that tell you whether your filters are on, and there are two timers that are available for use – a two minute and a three minute timer. These are useful for Tower operations where separation between aircraft must be timed. To the right of those items, weather information can be displayed, and this will be covered below.

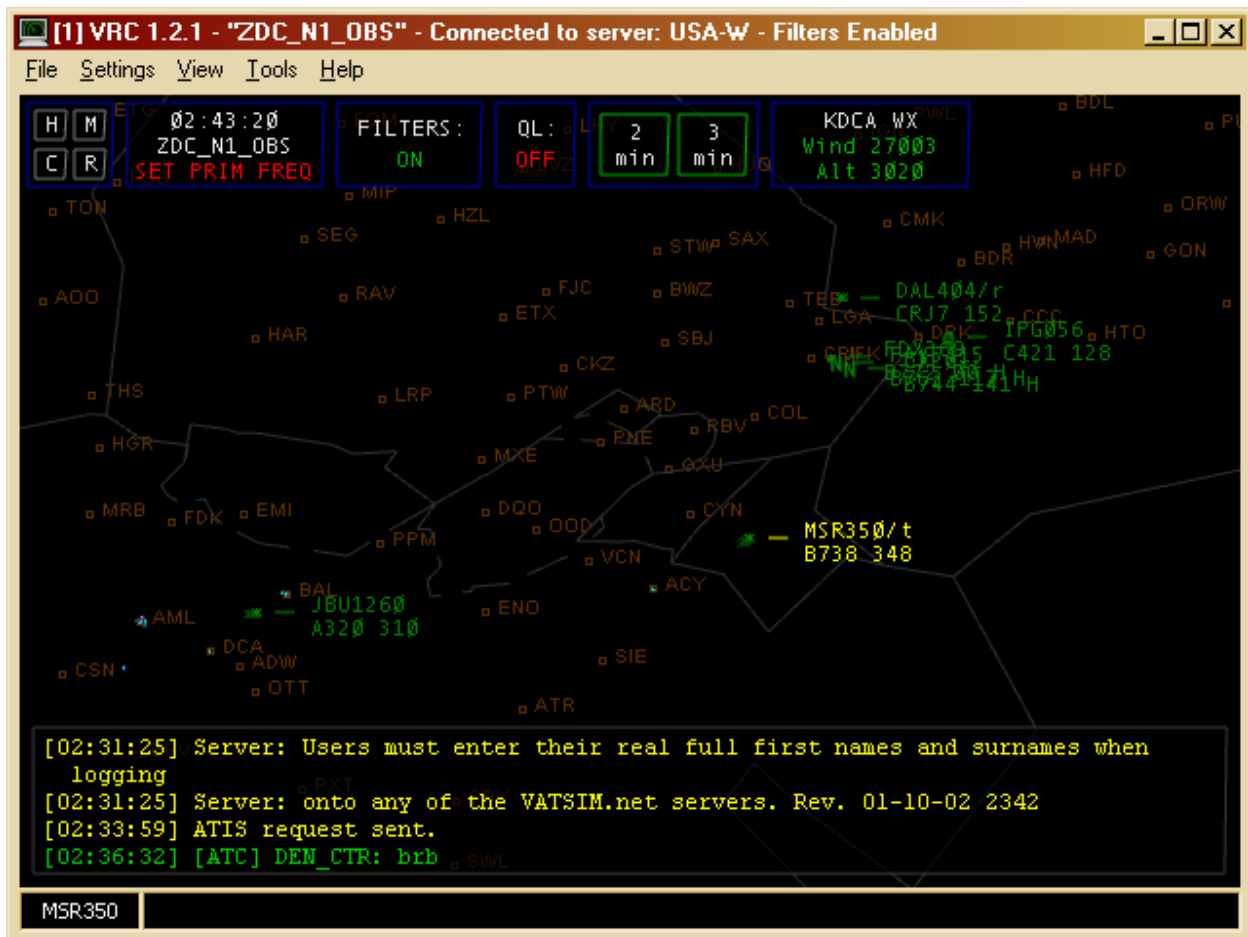
3. The Main Radar Screen – This is your main radar display. Secondary radar display can be opened by pressing File->New Window. This will open another radar display, but it will not have all of the options that the Main Radar Screen has, as it controls the application on a global basis.
4. The Selected Aircraft – In the bottom left hand corner is a box that will display your selected aircraft, if any are selected. If the box is blank (is it is in the picture above), then no aircraft has been selected. In order to communicate directly to a particular aircraft using text, you will need to have it selected (click on the aircraft using the left mouse button and you will see the aircraft callsign appear in this box).
5. The Command Line – This is where you can type text messages to selected aircraft, and also execute “dot” commands”. To type a text message to a particular aircraft, select the aircraft by using the left mouse button, and then type a message here and press “Enter”. The message will be sent to the selected aircraft with an audible tone so that the receiver knows the message was sent specifically to them, although all other aircraft on your frequency will also see the message. If you would like to broadcast to all aircraft on your frequency, first you must de-select an aircraft if there is one currently selected by pressing “Esc”, and the box should then be empty. Now you can type a text message and press “Enter” – your message will be broadcast to all aircraft on your frequency, and an audible tone will be heard by all aircraft receiving the message. The other use for the command line is to execute “dot” commands. These are commands that are prefixed with a period “.”, and they execute functions rather than broadcast text, although some may execute a function which broadcasts text. A simple example is the command “.showstats”. Type “.showstats” at the command line and press enter. You will see a summary of statistics appear in the command history box (explained in item 6, below). There are built-in commands, and there are the commands defined in your alias file. To see a list of the built-in commands, go to Help->Command Reference. We will address the functions of the alias file dot commands in the “Alias File” section below. Another use of the Command Line is to send messages to other ATC – this is done by prefixing your text with the forward-slash character, “/”. Typing “/online” in the Command Line will broadcast to all ATC in your area the message “online”, and your callsign will be identified directly to the left of the message, so that everyone knows who sent it. This is useful for telling other ATC when you are logging on or off, but the use of this ATC channel to carry on conversations is strictly prohibited. Only use this function when necessary.

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- The Command History – This is the area in which you can review the incoming and outgoing text messages you have sent and received. You can use the “Page Up” and “Page Down” buttons to scroll through the messages, and you can hold down “CTRL” and press “Up Arrow” or “Down Arrow” in order to increase or decrease the height of the Command History window, respectively. This window will not only show messages exchanged between aircraft, but also messages broadcast over the ATC channel.

There are several other features of the Main Window that can be addressed at this time, one of which is the METAR Weather Display. This is located to the far right of the Button Bar, but is empty by default. In order to display a METAR box, press “F2” and then type an airport identifier, such as “KDCA”, and press “Enter”. This will bring up a small box that shows the winds and the altimeter at KDCA, as shown below:



If you click on the METAR box itself, a full METAR line will appear beneath it – this is useful for finding out the visibility and the ceiling at the designated airport. You can populate this area with as many METAR boxes as you like, by continuing to enter airports like we did for KDCA. Just press “F2” and then type an airport designator and press “Enter”, and another METAR box will appear to the right of the first one. To

## ZDC Training

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remove them from the screen, type the same command, and the appropriate METAR box will disappear from the screen.

Another item to note in the figure above is the highlighted aircraft. Note that MSR350 is highlighted as opposed to all the other aircraft in the screen. Also note that the Selected Aircraft box in the bottom left hand corner of the Main Window reads "MSR350", affirming that this is indeed the currently selected aircraft. As mentioned above, any text typed into the Command Line that is not preceded by a dot will be transmitted to the selected aircraft, along with an audible tone.

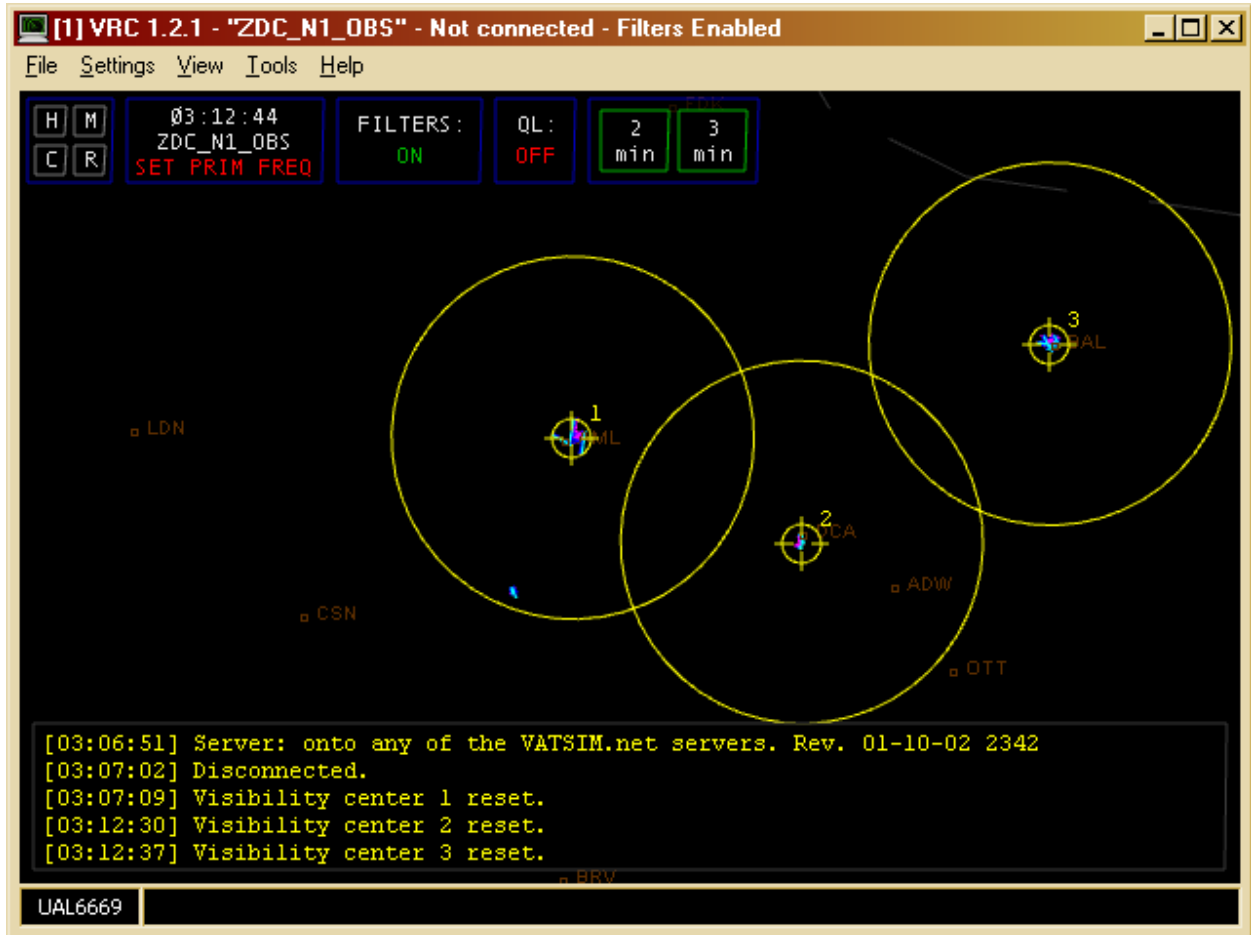
Your Visibility Center controls the area around which your Visibility Range is centered, as defined in the General Settings. You can assign up to four separate visibility centers using the commands ".vis1", ".vis2", ".vis3", and ".vis4", each corresponding to a separate visibility center. If you wish to set a visibility center at Dulles, type the command ".vis1 kiad" into the command line, and press "Enter". You will then see the following diagram for a brief time:



Note the circle centered at KAIID. You can set visibility centers using airport, VORs, and fixes. The circle disappears after a few seconds, but if you would like to see your visibility centers, type the command ".showvis" into the command line and press

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“Enter”. After defining KDCA and KBWI as two additional visibility centers, and then typing “.showvis”, the following diagram is seen:



Each of the circles depicted above has a range of 15 nautical miles, and we will now be able to see controllers that are at any of these three airports, as well as aircraft that are within the boundaries of the visibility centers. Again, remember to restrict your Visibility Range through the General Settings in accordance with the position you are assuming. See the Section “Setting Up VRC” for more details on Visibility Range settings.

- **The Flight Strip Bay**

The Flight Strip Bay accommodates all of your Flight Strips. Note that in the figure below, there are only two flight strips in the screen, as there are only two aircraft that were either departing or arriving at one of the Potomac airfields. Also note that the flight strip for MSR350 is highlighted – again reaffirming that this is our selected aircraft at the time.

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Flight Strip Bay									
JBU1260	0000	KIAD	CAPITAL5 GOLDA BROSS STIKY OOD DAVYS						
A320/Q	310	KBOS	BRAND RBV LAURN JFK ORW3						
804 I	310	KJFK	/V/						
MSR350	2122	KDCA	PALEO V44 DONIL V229 PANZE V44 CAMRN						
B738	250	KJFK							
461 I	250	KJFK	Noobie request ILS RUNWAY WHEN LAND /T/						

We will briefly tour all the elements of the last flight strip listed in the figure above, keeping in mind that much more detailed information can be found in many of the resources mentioned in the first few sections of this guide.

In the leftmost box of the flight strip, you can find the aircraft callsign (MSR350), followed by the aircraft type (B738). The integer underneath the aircraft type is a unique identifier that needs no attention, and the “I” next to that indicates the flight is filed as an IFR flight.

In the next column, there are three boxes – the top most indicates the assigned squawk code (2112), and underneath that is the assigned temporary altitude (250), and at the bottom is the assigned cruise altitude (250).

The next column contains four spaces for entry – the top most indicates the departure airport (KDCA), while the next one down indicates the arrival airport (KJFK). The next one down indicates an alternate field (KJFK), and underneath that is an empty space that is called the “scratchpad”. You will learn to use this to keep certain notes that will appear on the aircraft data tag in the Main Window.

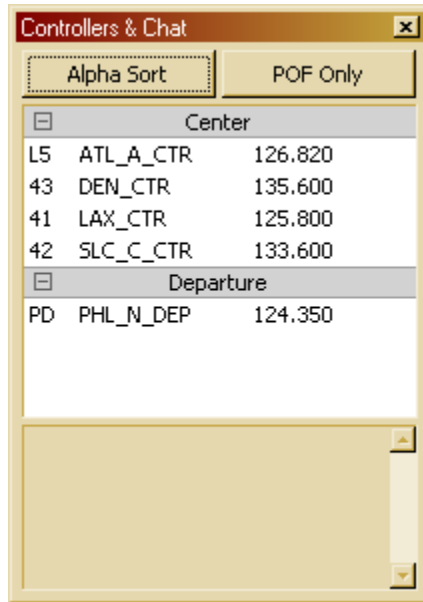
The next column is the body of the flight strip, and it contains the full flight plan for the aircraft. The bottom line contains remarks, which can be very helpful. In this case the pilot is alerting controllers that he is a new controller, and is requesting an ILS approach into KJFK.

The nine boxes at the right end of the flight strip are places for you to place notes of any kind. Normally these are used to hold runway assignments, initial headings, and the like.

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- **The Controllers and Chat Window**

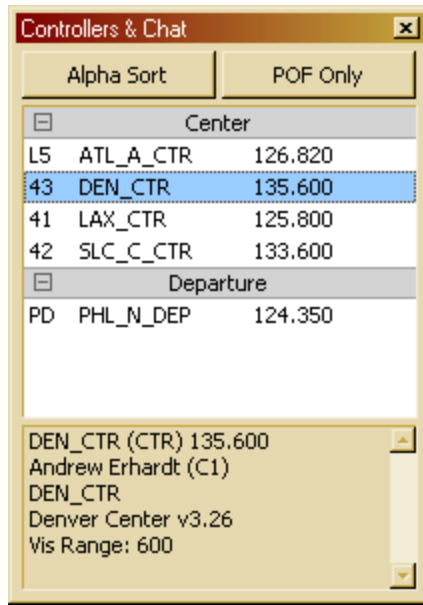
This is accessed by selecting Tools->Controller List. This window shows a list of controllers that are within your visibility range, along with their primary frequency. The window is sorted by controller position by default.



If one of the controllers in this window sends you a text message, the controller's callsign will become highlighted as shown below, and the "C" box in the Button Bar of the Main Window will blink as well, indicating that you have a message. Double-click the controller callsign to bring up a chat window in which you can text message the controller.

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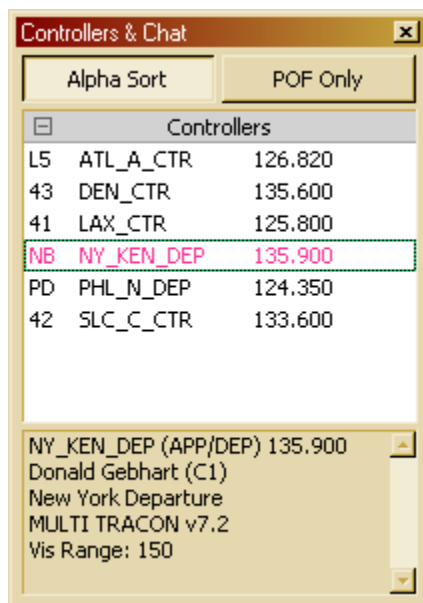
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Once you click on one of the controllers, the bottom part of the window shows information for that controller as well, including their visibility range, and the Sector File they are using, as seen in the figure above.

You can click "Alpha Sort" to sort all controllers alphabetically rather than by position as seen above. If you click "POF Sort", only controllers that are identified in your Position File will appear in the list. This can reduce clutter in situations where many controllers are online.

A controller's callsign will also change color when they have designated that they will be logging off shortly. The figure below shows that NY\_KEN\_DEP is about to log off.



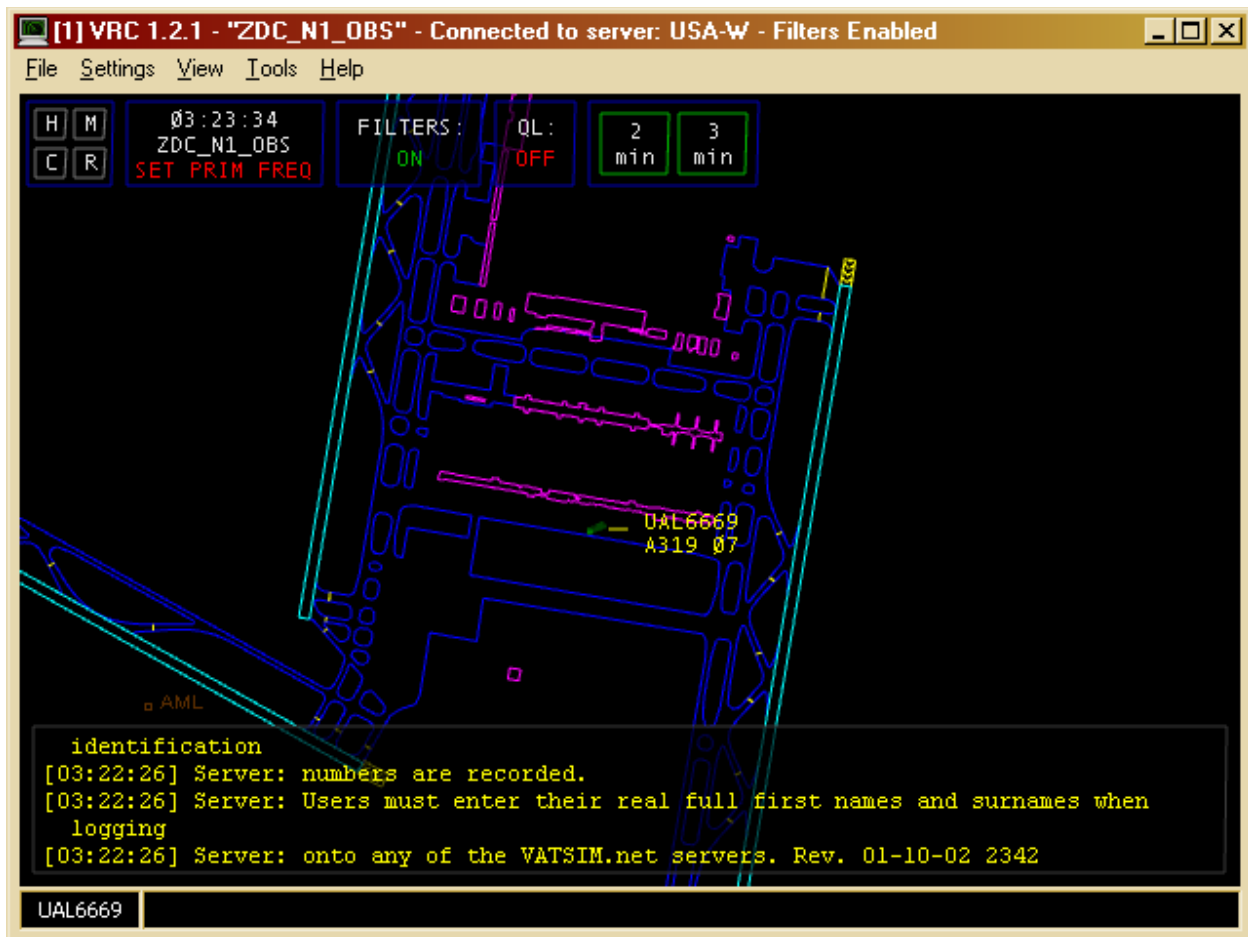
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The controller performs this operation by typing the dot command “.break” into the command line (note the dot before the word break). This changes their color in the Controllers and Chat Window and alerts adjoining controllers that they will not be online very much longer. ZDC Policy requires that controllers use this function before logging off, among other actions, fully described here:

[http://www.zdcartcc.org/policies/policies\\_logonoff.php](http://www.zdcartcc.org/policies/policies_logonoff.php)

- **Data Tags**

Data tags are the information displayed alongside an aircraft that give the controller information that must be readily available about the aircraft. The data contained in the data tags depends on the Radar Mode chosen within VRC. In the figure below, VRC is set to “Ground” Radar Mode, and the information in the data tag is limited to the aircraft callsign, the aircraft type, and the ground speed in knots.



The symbol used to depict the aircraft also tells us that the aircraft is squawking Standby. To see a full list of all data tag information available in all VRC Radar modes, select Help->Documentation, and then click “The Various Radar Modes” in the center

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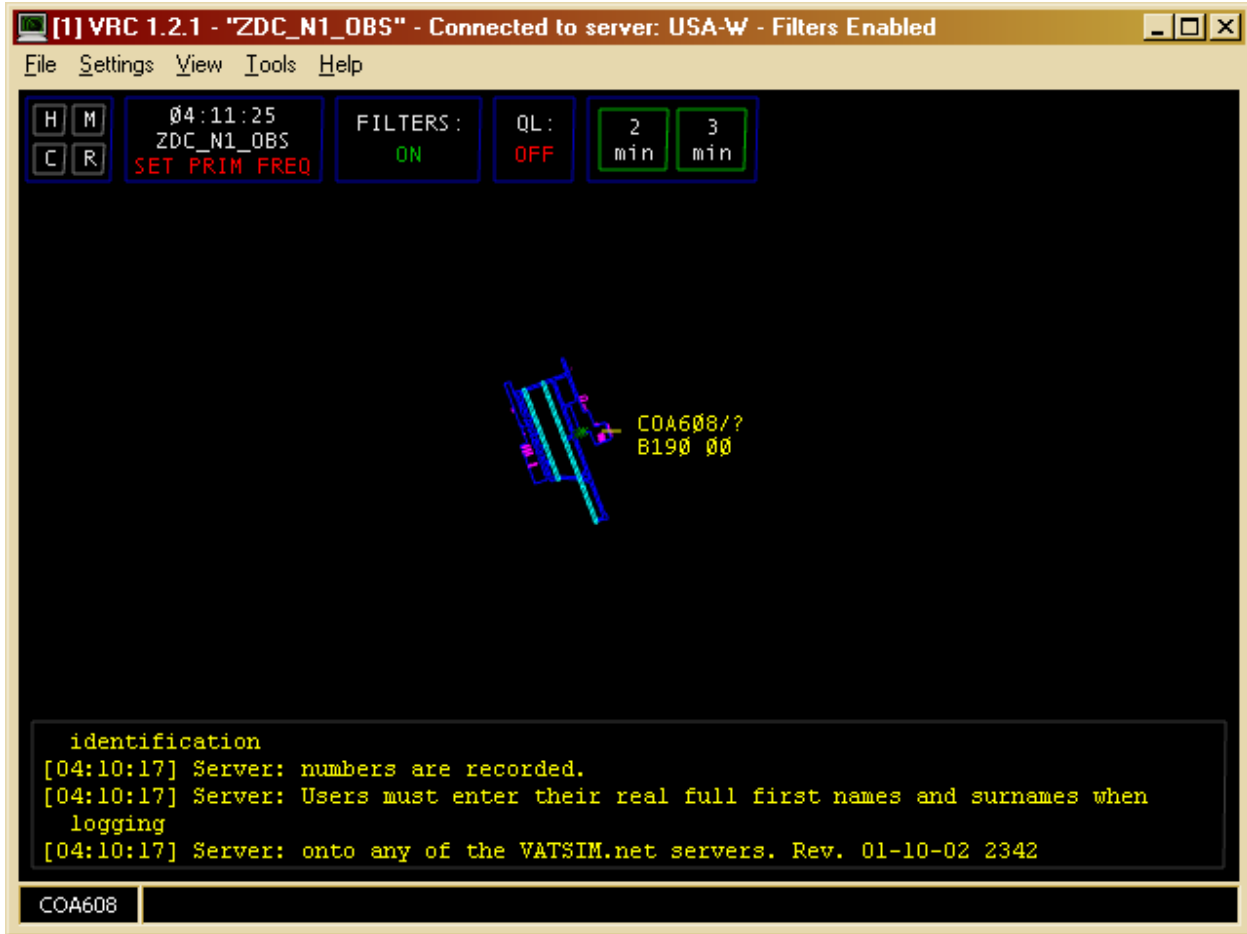
column of links. You can see that the VRC documentation is extensive, and you are encouraged to study it as much as possible in order to become familiar with all of the capabilities within VRC.

The “F9” key has a number of roles with regard to aircraft data tags and squawk codes. To see a full list of function keys and their capabilities, select Help->Command Reference. You will see that there are three entries for the F9 command, each ending with the term <asel>, which means “aircraft select”. The easiest way to select an aircraft is simply by left clicking on its symbol in the main window (not the data tag, but the marker which identifies the aircraft position).

Pressing “F9” and then selecting an aircraft will assign an automatic squawk code to the aircraft, which will be reflected immediately in its corresponding flight strip. If you wish to assign a particular squawk code to an aircraft (such as 1200, for some VFR flights), you would type “F9”, then type the code you wish to assign the aircraft, and then select the aircraft. Your selected code will appear in the corresponding flight strip.

The last feature of the F9 key is to assign a voice type tag for the aircraft. Aircraft are either text only, receive only, or fully voice capable. These situations are depicted on the data tag by appending “/t”, “/r”, or nothing at all to the right of the aircraft callsign. The aircraft in the figure above does not have a suffix after its callsign, so it is fully voice capable, meaning the pilot can transmit and receive voice (VOX). If the pilot informed you that they were text only, you would need to change the voice type tag for the aircraft by pressing “F9”, followed by typing “t”, and then selecting the aircraft. If the pilot were receive only (can receive VOX, but can not transmit VOX), you would type “F9”, followed by typing “r”, and then selecting the aircraft. In both cases you would see the aircraft data tag have “/t” or “/r” appended to the callsign. Aircraft that do not have a voice type tag assigned to them appear with “/?” next to the callsign, as shown in the figure below:

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Note also that this aircraft is squawking normal (or Mode C), because the symbol used to designate the aircraft position is an asterisk rather than a diamond (which would mean the aircraft is squawking standby). Again, all of the data tag functionalities for the different radar modes are available by selecting Help->Documentation, and then clicking "The Various Radar Modes" in the center column of links.

## **Getting Ready to Control**

- **Summary**

In working through this guide, you have learned what to expect from your career as a Virtual Air Traffic Controller, and the necessary steps you will need to take as you progress from a Ground Controller up to an En-Route Controller. You have registered with the ZDC Forum and understand its uses throughout the training process, and you have become familiar with the resources available through the ZDC, VATUSA, and VATSIM websites. You are familiar with the VATUSA Certification Center, and the ZDC Policies, SOPs, LOAs, MBIs, and other Training Materials that you will use throughout the training process.

You have set up a working instance of the Virtual Radar Client (VRC) software, and know how to log on to both the VATSIM network and the Sweatbox server for training purposes. You have configured VRC to begin your training as a Ground controller, and have saved profiles that enable quick access to all of the necessary settings for several different purposes. You have calibrated your microphone (if applicable), and have configured the Communications Panel to reflect the most common voice frequencies that you will be using during your training.

You have taken a brief tour of VRC, and have familiarized yourself with the basic workings of the software. You should take some time to review the VRC Documentation and familiarize yourself with as many of the software functions as you can – they will all become more familiar as you get practice using the software and gaining experience with live traffic.

Consult the checklist at the beginning of this document. Work your way through each of the items. Make sure to study all of the reference materials available during your training, but feel free to ask questions of the staff at any time. Use the ZDC forum to interact with your fellow controllers and the ZDC staff – this is a valuable resource.

Remember that this hobby is here for you to have fun and to learn at the same time. This Training Guide may seem daunting at first, but once you gain some experience you will see that the process not only gets easier and more familiar, but that there is much more to learn, and providing virtual ATC is very rewarding indeed. Most of the work needs to be done by you. The instructing staff are always available to help you through the very many difficult steps throughout your career, but you always have to do your homework – they are not there to hold your hand through the process, only to make sure that your progress is assured, and that you are learning correct procedures and phraseology. Experience is your most effective ally, and study is your most important tool to getting to where you want to be. Prepare well, put time in on the scopes, and you will soon be ZDC's newest Certified Professional Controller.