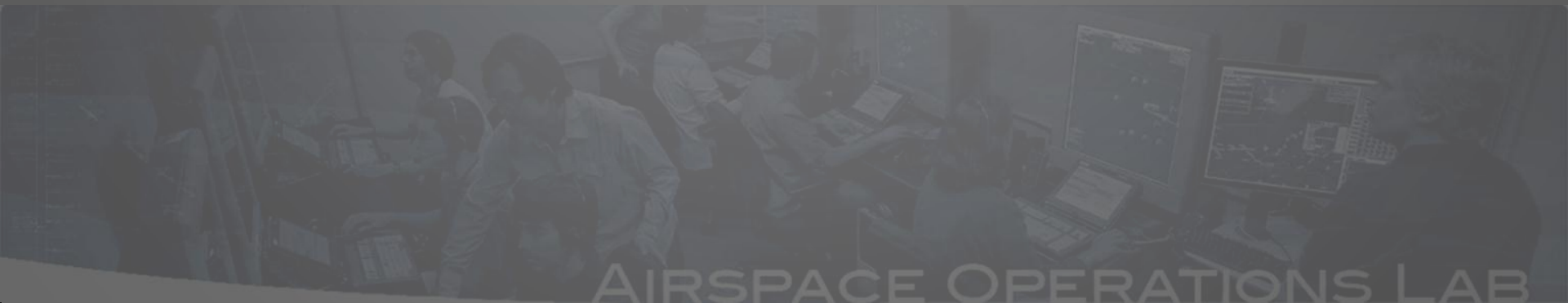


Getting Started with MACS: Installation, directory overview, launching

Chris Cabrall



Outline

- System requirements
- Installation
 - Stand-alone application on a single computer
 - Networked simulation platform across multiple computers
 - ADRS
- MACS files and folders overview
 - Organization
 - Principle files (some of the major players)
- How to start and run MACS
 - .bat file shortcuts

System Requirements

- Minimal (depending on what you ask it do single pilot vs. MSP)
 - number of processes, aircraft, displays, etc.
 - data collection requirements (calculations/computations per X secs)

Guidelines

- Any off-the-shelf mid-range or high-end computer with capable graphics and processing power (e.g. 2008 or newer)
- 4 GB of minimum system memory is recommended
- 120 MB of minimum available disk space

- Recent version of java (www.java.com)
- It can be either the 32 bit or 64 bit version



Installation (stand-alone)

On a single computer

- Useful for off-line testing and development, with no connections needed to anything else

1) Create a new folder called “Experiments” on the top level of your local hard drive, e.g. C:\Experiments\

2) Copy and paste the “Example_ZKC_ZID” and the “Example_ZLA” folders

from:

D:\MACS_Install_Stand_Alone\



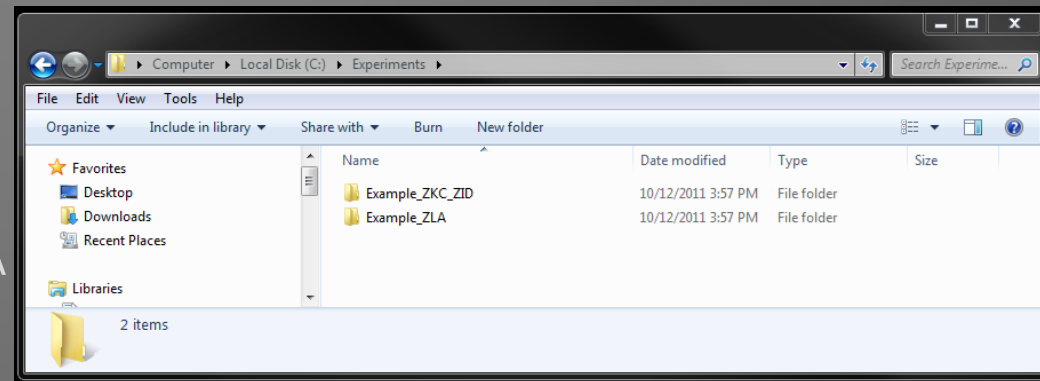
into:

C:\Experiments\

result:

C:\Experiments\Example_ZKC_ZID\

C:\Experiments\Example_ZLA\



Installation (networked)

On a network “share drive” server

- To be distributed and accessed (via SHORTCUTS) from multiple computers simultaneously for real-time human-in-the-loop simulations.
- Only Java needs to be on each separate networked workstation

- 1) Create a new folder called “Experiments” on the top level of your “share drive” server, e.g. Z:\Experiments\
- 2) Copy and paste the “Example_ZKC_ZID” and the “Example_ZLA” folders

from:

D:\MACS_Install_Networked\

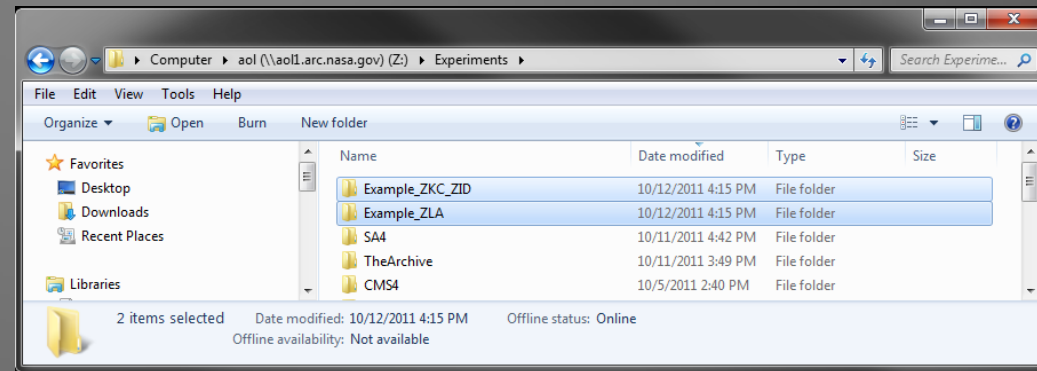
into:

Z:\Experiments\

result:

Z:\Experiments\Example_ZKC_ZID\

Z:\Experiments\Example_ZLA\

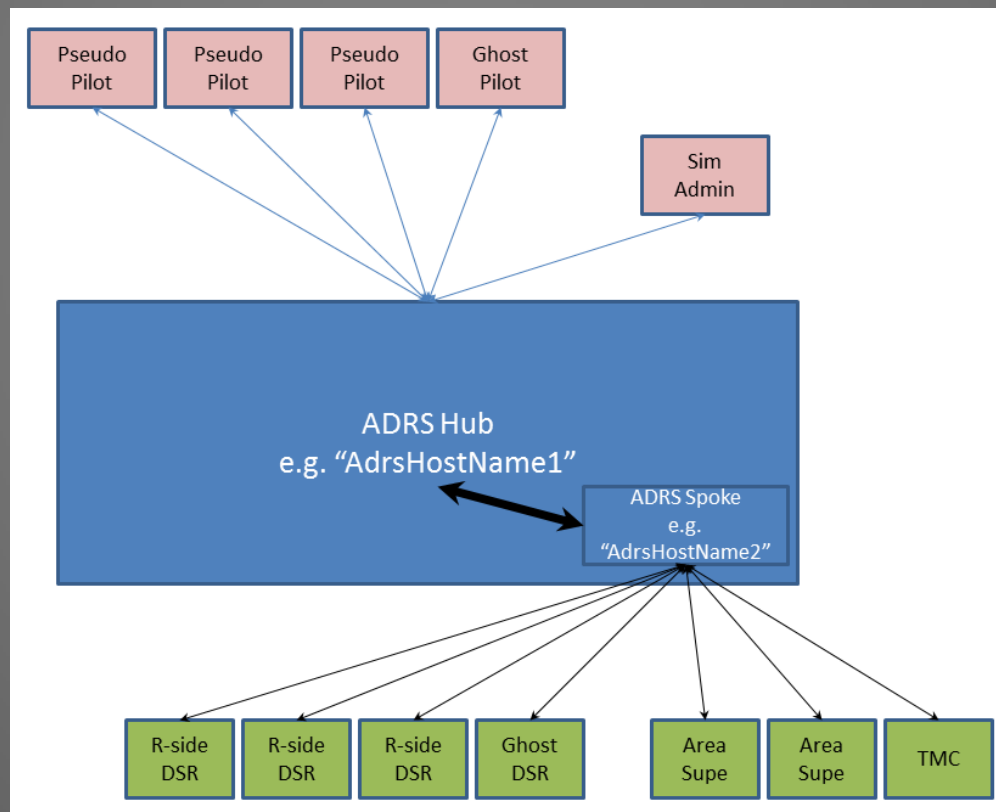


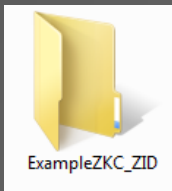
Installation (networked)

- For distributed simulations, you will need the ADRS
- What is the ADRS?
 - Aeronautical Datalink and Radar Simulator
 - The communication bridge between networked MACS workstations (the way MACS stations talk to each other)
 - Simulates various types of surveillance source data (radar, ads-b, etc.)
 - Communicates data link messages between macs stations
 - NOTE: the ADRS has its own database (similar to MACS' MACSAirspace directory)
- How to install ADRS? (vaibhav.kelkar@nasa.gov)
 - We recommend using the ADRS on a linux machine...
 - Installation will vary based on your linux environment
- How to launch the ADRS?
 - `>: cd [your_adrs_home_directory]\aero_dlnk_radar_str\realtime_procs\
... \realtime_procs\ >: adrs -data [main ADRS airspace adaptation]`
 - EXAMPLE `... \realtime_procs\ >: adrs -data ZID_SDF`

Installation (networked)

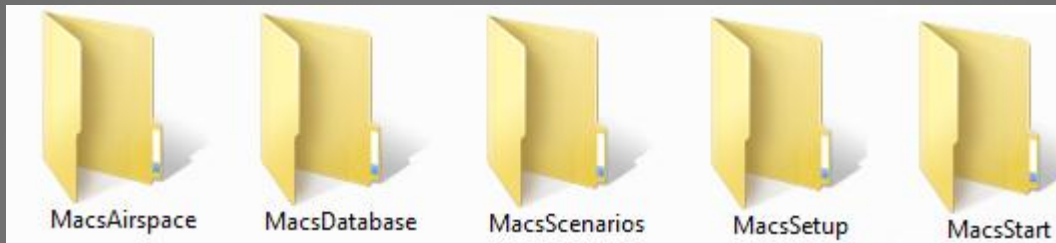
- Hub (pilot stations, simulation admin) and Spoke (ATC stations)
- How to launch the spoke ADRS?
 - `..\realtime_procs\ >: adrs -data [main ADRS airspace adaptation] -add_adrs [hostname of hub adrs]`
 - EXAMPLE `..\realtime_procs\ >: adrs -data ZID_SDF -add_adrs AdrsHostName1`



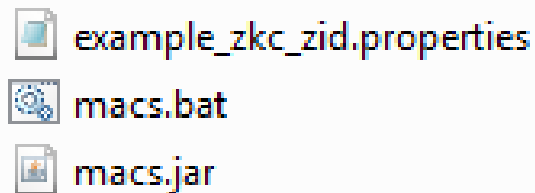


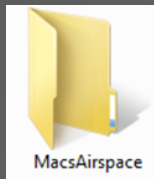
MACS Files and Folders

- At the top level within C:\Experiments\Example_ZKC_ZID\
 - 5 major directory folders



- High level and central MACS files





MACS_Airspace

Contains the files for defining a particular airspace adaptation of interest:

- Airports
- Waypoints
- Sector boundaries
- Airways/jet-routes

Etc.

Organized into:

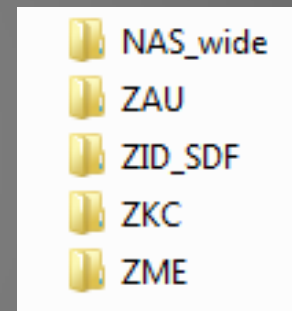
-NAS_Wide (self-explanatory)

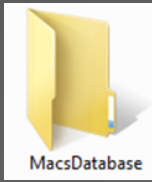
-Airspaces

Primary airspace – required (e.g. ZID_SDF)

Secondary airspace(s) – optional (e.g. ZAU, ZKC, ZME)

- NAVDB\
• CUSTOM\
• VIDEO MAPS\

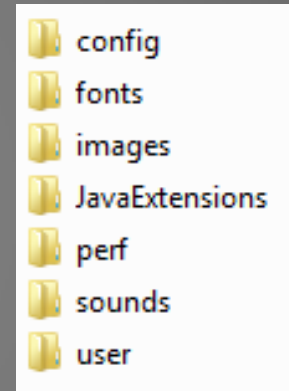


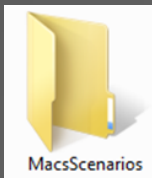


MACS_Database

Contains pilot configuration and various MACS “system” files

- Config\ – pilot configuration files for determining which planes a pilot station will have ownership of/access to (e.g. zkc90)
- Fonts\, Images\, Sounds\ – self explanatory
- JavaExtensions\ – for add-on functionality, e.g. speech synthesis , some scripting, etc.
- Perf\ – aircraft performance specifications
- User\ – screen layouts/sizes, which windows where on which tabs



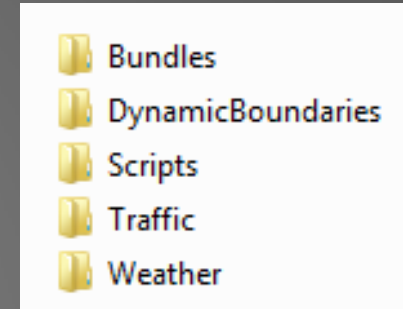
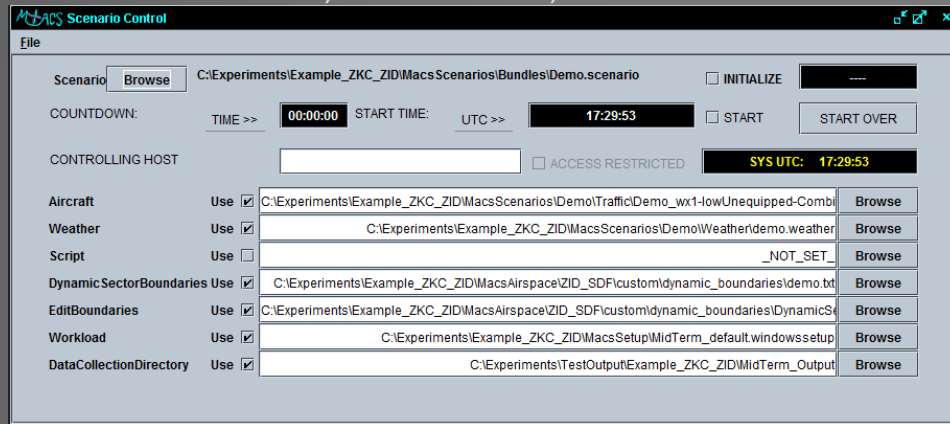


MACS_Scenarios

Contains the files related to experimental setup for different conditions\runs

Bundles\

-run1.scenario, run2.scenario, etc.



Dynamic Boundaries\

-EditOptions\, ScriptedBoundaries\, rcas\

Scripts\

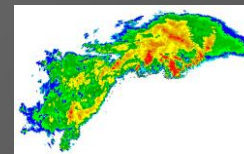
Traffic\

Weather\

.weather = what kind of weather (winds only, winds + convective, etc.)

WxImageFolder = .gif images of convective weather

.xml = displays the weather images and moves them over time within a run





MACS_Setup

Contains the files for display types and various setup panels in MACS

Major display types:

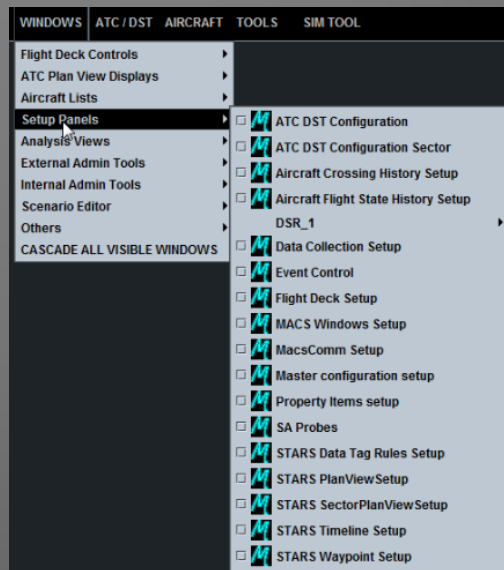
- ATOP, TSD, DSR, STARS
- Scenario Editor
- each has:

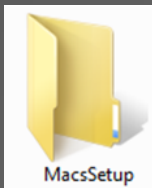
- planviews
- datatag rules
- waypoints, etc.



Setup panels:

- example 1: DSR_1_dtr
- example 2: ATC_DST





MACS_Setup

Contains the files for display types and various setup panels in MACS

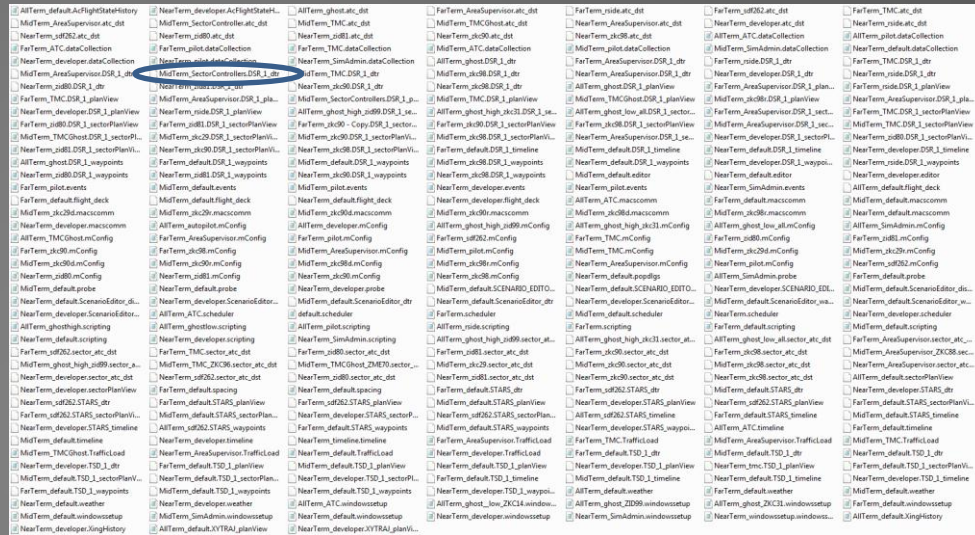
Major display types:

- ATOP, TSD, **DSR**, STARS
- Scenario Editor
- each has:

- planviews

- datatag rules

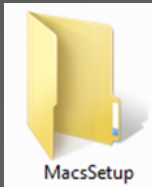
- waypoints, etc.



Setup panels:

example 1: **DSR_1_dtr**

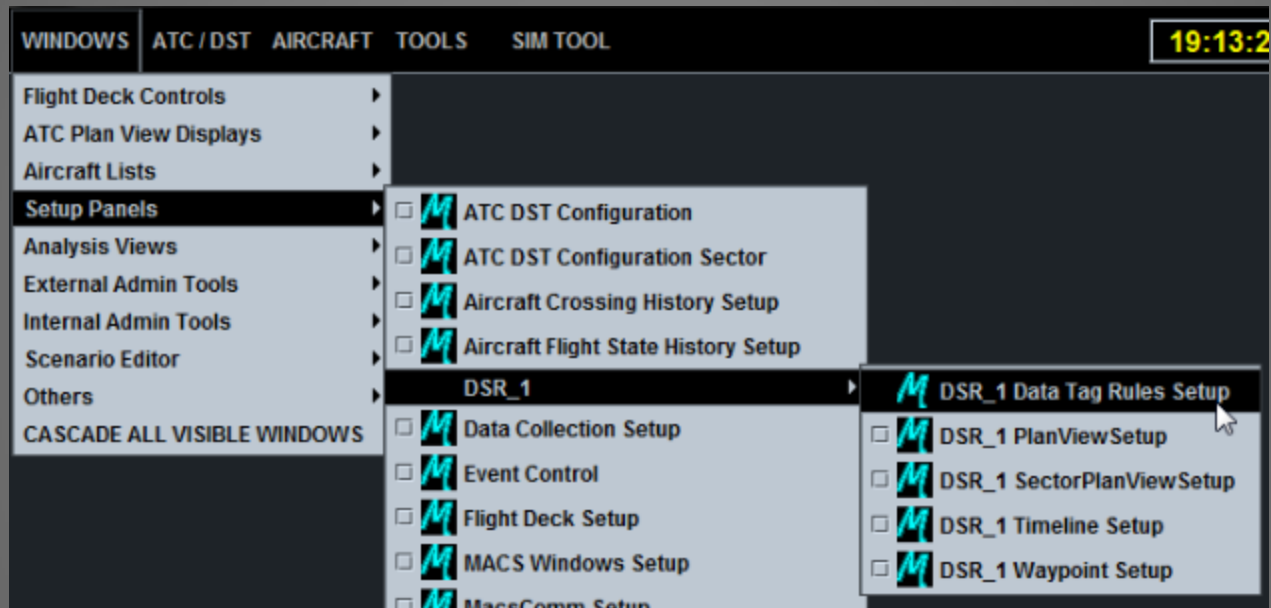
example 2: ATC_DST



Example 1: DSR_1_dtr

MidTerm_SectorControllers.DSR_1_dtr

Menu Selection





Example 1: DSR_1_dtr

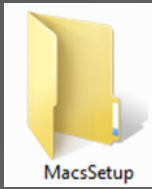
MidTerm_SectorControllers.DSR_1_dtr

Setup Panel in MACS

MACS DSR_1 Data Tag Rules Setup

File Edit Address C:\Experiments\Example_ZKC_ZID\MacsSetup\MidTerm_SectorControllers.DSR_1_dtr

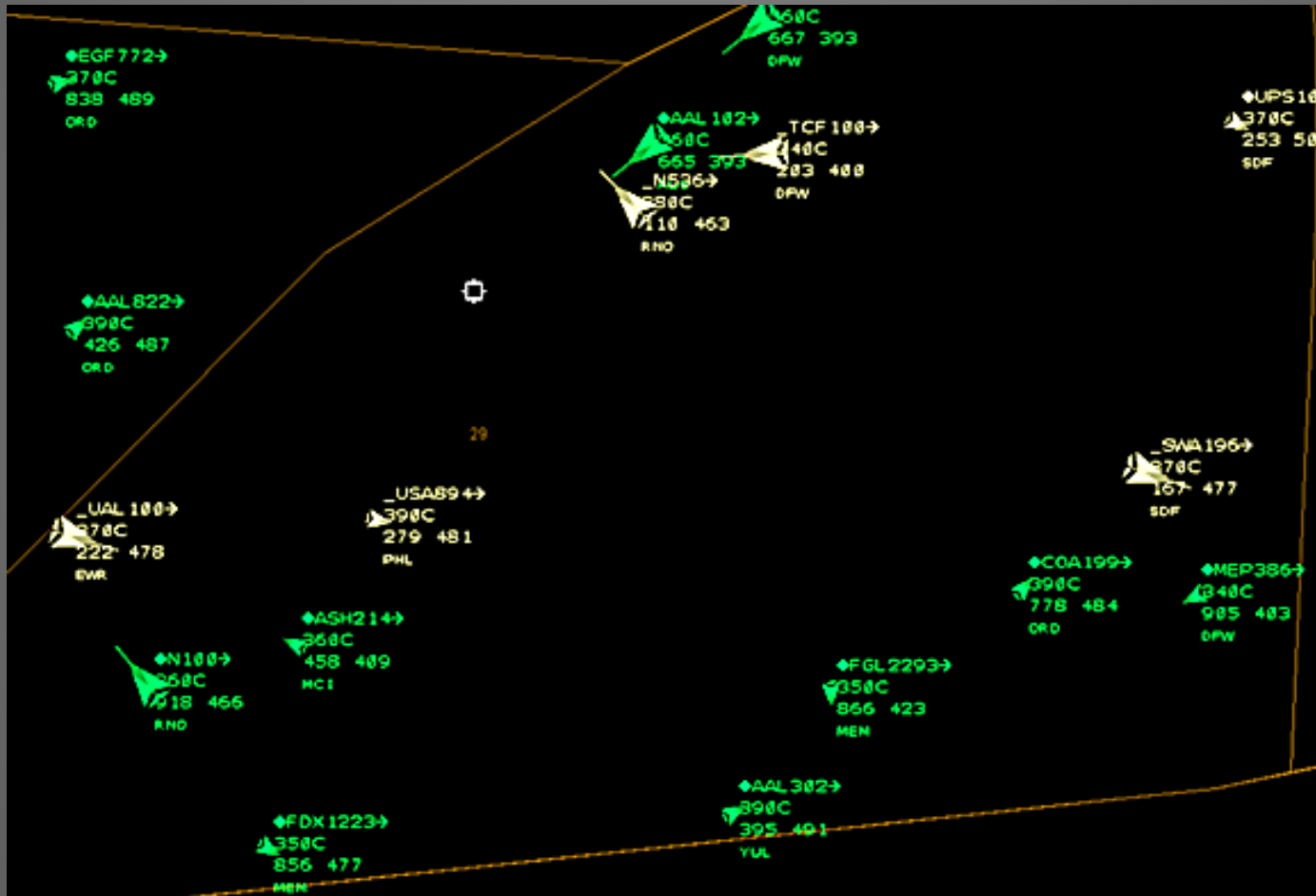
Name	Filter	TagRules	TagLayout	TagColor	TagAppearance	TagItemColor	TagItemAppearance	AdPositionTag	Symbol	History	SymbolColor	SymbolFlash	LeaderLine	TimelineColors
default		default	default		default	default	default	default	*	default		default	default	default
owned_on														
owned_off														
unowned_on														
unowned_off														
selected					custom									
foreground_...	custom						custom	custom						
foreground_...	custom						custom							
background														
IFR														
TFR														



Example 1: DSR_1_dtr

MidTerm_SectorControllers.DSR_1_dtr

Result





MACS_Setup

Contains the files for display types and various setup panels in MACS

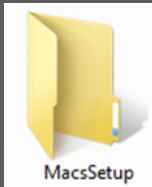
Major display types:

- ATOP, TSD, DSR, STARS
- each has:
 - planviews
 - datatag rules
 - waypoints, etc.

Setup panels:

- example 1: DSR_1_dtr
- example 2: ATC_DST

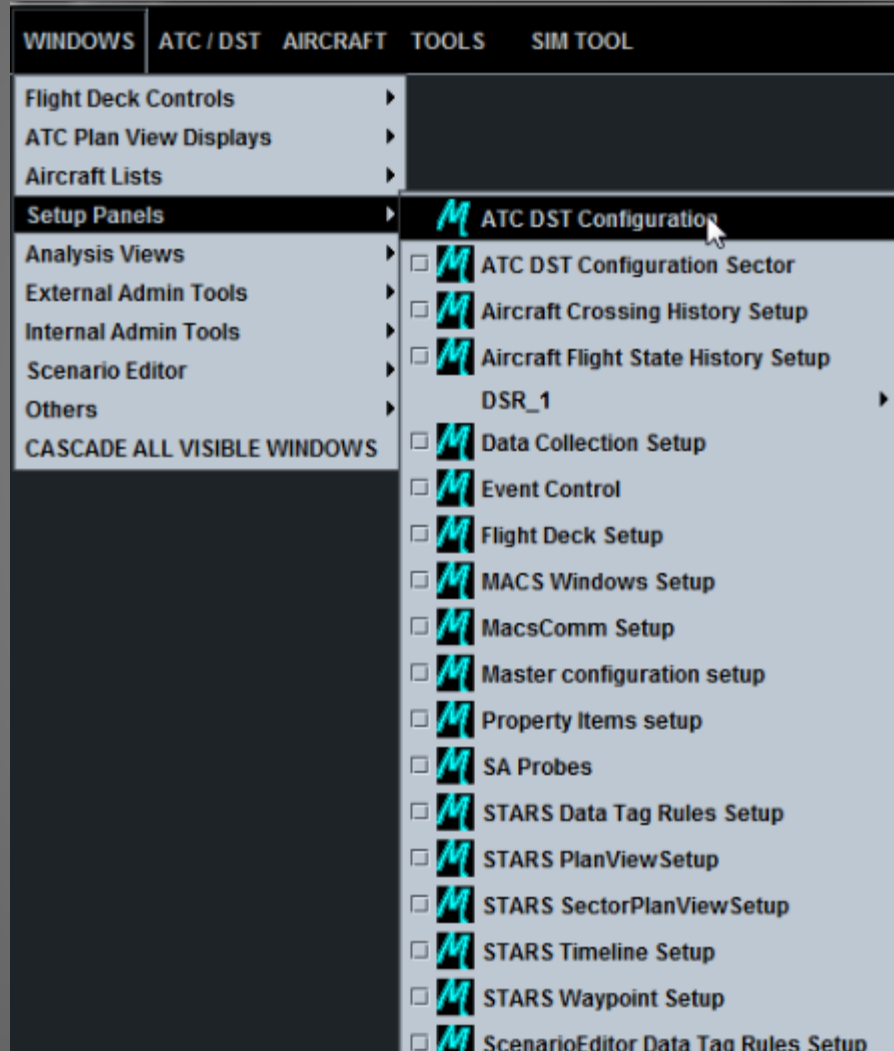
AllTem_default.AirFlightDataHistory	NearTem_developer.AirFlightDataH...	AllTem_ghost_atc_dtr	FarTem_AreaSupervisor_atc_dtr	FarTem_atc_dtr	FarTem_atc2_dtr	FarTem_TMC_atc_dtr
MidTem_AreaSupervisor_atc_dtr	MidTem_SectorController_atc_dtr	MidTem_TMC_atc_dtr	MidTem_TMCGhost_atc_dtr	NearTem_developer_atc_dtr	NearTem_developer_atc_dtr	NearTem_atc2_dtr
NearTem_atc2_atc_dtr	NearTem_atc_dtr	NearTem_atc90_atc_dtr	NearTem_ATC_dataCollection	MidTem_pilot_dataCollection	MidTem_pilot_dataCollection	MidTem_pilot_dataCollection
FarTem_ATC_dataCollection	FarTem_pilot_dataCollection	FarTem_pilot_dataCollection	MidTem_ATC_dataCollection	MidTem_pilot_dataCollection	MidTem_pilot_dataCollection	MidTem_pilot_dataCollection
NearTem_developer_dataCollection	NearTem_pilot_dataCollection	NearTem_SimAdmin_dataCollection	AllTem_ghost_DSR_1_dtr	FarTem_AreaSupervisor_DSR_1_dtr	FarTem_atc_DSR_1_dtr	FarTem_TMC_DSR_1_dtr
MidTem_AreaSupervisor_DSR_1_dtr	MidTem_SectorController_DSR_1_dtr	MidTem_TMC_DSR_1_dtr	MidTem_TMC_DSR_1_dtr	NearTem_AreaSupervisor_DSR_1_dtr	NearTem_developer_DSR_1_dtr	NearTem_atc2_DSR_1_dtr
NearTem_atc2_DSR_1_dtr	NearTem_atc_DSR_1_dtr	NearTem_atc90_DSR_1_dtr	NearTem_ghost_DSR_1_dtr	FarTem_AreaSupervisor_DSR_1_dtr	FarTem_atc_DSR_1_dtr	FarTem_TMC_DSR_1_dtr
FarTem_TMC_DSR_1_planView	MidTem_AreaSupervisor_DSR_1_p...	MidTem_SectorController_DSR_1_p...	MidTem_TMC_DSR_1_planView	MidTem_TMCGhost_DSR_1_planView	FarTem_AreaSupervisor_DSR_1_p...	FarTem_atc_DSR_1_planView
NearTem_developer_DSR_1_planView	NearTem_atc_DSR_1_planView	NearTem_atc90_DSR_1_planView	AllTem_ghost_high_atc2_DSR_1_se...	AllTem_ghost_high_atc2_DSR_1_se...	AllTem_ghost_high_atc2_DSR_1_se...	AllTem_ghost_high_atc2_DSR_1_se...
FarTem_atc2_DSR_1_sectorPlanView	FarTem_atc_DSR_1_sectorPlanView	FarTem_atc90_DSR_1_sectorPlanView	FarTem_atc90_Copy_DSR_1_sector...	FarTem_atc90_DSR_1_sectorPlanView	FarTem_AreaSupervisor_DSR_1_se...	FarTem_developer_DSR_1_sectorPL...
MidTem_TMCghost_DSR_1_sectorPlanV...	MidTem_ghost_DSR_1_sectorPlanV...	MidTem_atc90_DSR_1_sectorPlanV...	NearTem_default_DSR_1_timeline	NearTem_default_DSR_1_timeline	NearTem_developer_DSR_1_timeline	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_atc2_DSR_1_sectorPlanV...	NearTem_atc_DSR_1_sectorPlanV...	NearTem_atc90_DSR_1_sectorPlanV...	MidTem_default_DSR_1_waypoints	MidTem_default_DSR_1_waypoints	NearTem_developer_DSR_1_waypoi...	NearTem_TMC_DSR_1_sectorPlanView
AllTem_ghost_DSR_1_waypoints	FarTem_default_DSR_1_waypoints	NearTem_atc_DSR_1_waypoints	NearTem_atc90_DSR_1_waypoints	NearTem_developer_events	NearTem_pilot_events	NearTem_TMC_DSR_1_sectorPlanView
NearTem_atc90_DSR_1_waypoints	MidTem_default_events	MidTem_pilot_events	NearTem_developer_events	FarTem_pilot_events	NearTem_SimAdmin_events	MidTem_TMC_DSR_1_sectorPlanView
FarTem_pilot_events	MidTem_default_flight_deck	NearTem_default_flight_deck	NearTem_developer_flight_deck	ATCTem_maccscomm	FarTem_default_maccscomm	NearTem_atc2_DSR_1_sectorPlanV...
FarTem_default_flight_deck	MidTem_atc29_maccscomm	MidTem_atc90_maccscomm	MidTem_atc90_maccscomm	ATCTem_maccscomm	FarTem_default_maccscomm	NearTem_atc2_DSR_1_sectorPlanV...
MidTem_atc29_maccscomm	ATCTem_maccscomm	AllTem_developer_mConfig	AllTem_developer_mConfig	AllTem_ghost_high_atc31_mConfig	AllTem_ghost_high_atc31_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_developer_maccscomm	AllTem_autopilot_mConfig	FarTem_pilot_mConfig	FarTem_pilot_mConfig	FarTem_atc29_mConfig	FarTem_atc29_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
AllTem_TMCghost_mConfig	FarTem_atc90_mConfig	MidTem_AreaSupervisor_mConfig	MidTem_pilot_mConfig	MidTem_TMC_mConfig	MidTem_atc29_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
FarTem_atc90_mConfig	MidTem_atc90_mConfig	MidTem_ghost_mConfig	MidTem_ghost_mConfig	MidTem_TMC_mConfig	MidTem_atc29_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
MidTem_atc90_mConfig	MidTem_atc90_mConfig	NearTem_AreaSupervisor_mConfig	NearTem_pilot_mConfig	NearTem_AreaSupervisor_mConfig	NearTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_atc90_mConfig	NearTem_atc90_mConfig	NearTem_developer_probe	MidTem_default_probe	NearTem_developer_probe	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
MidTem_default_probe	NearTem_developer_probe	MidTem_default_SCENARIO_EDITOR...	NearTem_developer_SCENARIO_EDITOR...	NearTem_developer_SCENARIO_EDITOR...	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_developer_probe	NearTem_developer_SCENARIO_EDITOR...	MidTem_default_scheduler	NearTem_default_scheduler	NearTem_developer_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_developer_SCENARIO_EDITOR...	MidTem_default_scheduler	FarTem_scheduler	FarTem_scheduler	NearTem_developer_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_developer_scheduler	AllTem_ATC_scheduler	AllTem_sids_scripting	AllTem_sids_scripting	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
AllTem_ATC_scheduler	AllTem_ghostlow_scripting	NearTem_pilot_scripting	NearTem_pilot_scripting	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
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AllTem_ghostlow_scripting	FarTem_atc29_sector_atc_dtr	MidTem_TMC_2XCR6_sector_atc_dtr	MidTem_TMC_2XCR6_sector_atc_dtr	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
FarTem_atc29_sector_atc_dtr	MidTem_TMC_2XCR6_sector_atc_dtr	NearTem_atc29_sector_atc_dtr	NearTem_atc29_sector_atc_dtr	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
FarTem_atc29_sector_atc_dtr	NearTem_atc29_sector_atc_dtr	NearTem_atc90_sector_atc_dtr	NearTem_atc90_sector_atc_dtr	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_atc90_sector_atc_dtr	NearTem_atc90_sector_atc_dtr	FarTem_default_STARS_dtr	FarTem_default_STARS_dtr	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_developer_sectorPlanView	FarTem_default_STARS_dtr	MidTem_default_STARS_planView	MidTem_default_STARS_planView	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_atc2_DSR_1_dtr	FarTem_default_STARS_planView	MidTem_developer_STARS_planView	MidTem_developer_STARS_planView	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_atc2_DSR_1_dtr	MidTem_developer_STARS_planView	NearTem_developer_STARS_sectorPL...	NearTem_developer_STARS_sectorPL...	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_atc2_DSR_1_dtr	NearTem_developer_STARS_sectorPL...	NearTem_developer_STARS_waypoints	NearTem_developer_STARS_waypoints	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_atc2_DSR_1_dtr	NearTem_developer_STARS_waypoints	FarTem_atc29_STARS_timeline	FarTem_atc29_STARS_timeline	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_atc2_DSR_1_dtr	FarTem_atc29_STARS_timeline	NearTem_developer_STARS_timeline	NearTem_developer_STARS_timeline	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
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NearTem_atc2_DSR_1_dtr	MidTem_trafficLoad	NearTem_trafficLoad	NearTem_trafficLoad	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_atc2_DSR_1_dtr	NearTem_trafficLoad	FarTem_trafficLoad	FarTem_trafficLoad	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_atc2_DSR_1_dtr	FarTem_trafficLoad	NearTem_trafficLoad_planView	NearTem_trafficLoad_planView	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_atc2_DSR_1_dtr	NearTem_trafficLoad_planView	NearTem_TSD_1_planView	NearTem_TSD_1_planView	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_atc2_DSR_1_dtr	NearTem_TSD_1_planView	NearTem_developer_TSD_1_planView	NearTem_developer_TSD_1_planView	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_atc2_DSR_1_dtr	NearTem_developer_TSD_1_planView	MidTem_TSD_1_planView	MidTem_TSD_1_planView	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_atc2_DSR_1_dtr	MidTem_TSD_1_planView	NearTem_TSD_1_timeline	NearTem_TSD_1_timeline	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_atc2_DSR_1_dtr	NearTem_TSD_1_timeline	FarTem_TSD_1_timeline	FarTem_TSD_1_timeline	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_atc2_DSR_1_dtr	FarTem_TSD_1_timeline	NearTem_weather	NearTem_weather	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_atc2_DSR_1_dtr	NearTem_weather	AllTem_ATC_windowsetup	AllTem_ATC_windowsetup	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_atc2_DSR_1_dtr	AllTem_ATC_windowsetup	AllTem_low_2XCR4_window...	AllTem_low_2XCR4_window...	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_atc2_DSR_1_dtr	AllTem_low_2XCR4_window...	NearTem_windowsetup	NearTem_windowsetup	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_atc2_DSR_1_dtr	NearTem_windowsetup	NearTem_SimAdmin_windowsetup	NearTem_SimAdmin_windowsetup	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_atc2_DSR_1_dtr	NearTem_SimAdmin_windowsetup	NearTem_XYTRAI_planView	NearTem_XYTRAI_planView	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...
NearTem_atc2_DSR_1_dtr	NearTem_XYTRAI_planView	AllTem_XYTRAI_planView	AllTem_XYTRAI_planView	FarTem_scheduler	FarTem_pilot_mConfig	NearTem_atc2_DSR_1_sectorPlanV...



MACS_Setup

FarTerm_rside.atc_dst

Menu Selection



The screenshot shows a software menu with the following structure:

- WINDOWS** (selected)
- ATC / DST
- AIRCRAFT
- TOOLS
- SIM TOOL

Under the **WINDOWS** menu, the following items are listed:

- Flight Deck Controls
- ATC Plan View Displays
- Aircraft Lists
- Setup Panels** (highlighted)
- Analysis Views
- External Admin Tools
- Internal Admin Tools
- Scenario Editor
- Others
- CASCADE ALL VISIBLE WINDOWS

The **Setup Panels** sub-menu is expanded, showing the following options:

- ATC DST Configuration** (highlighted with a mouse cursor)
- ATC DST Configuration Sector
- Aircraft Crossing History Setup
- Aircraft Flight State History Setup
- DSR_1
- Data Collection Setup
- Event Control
- Flight Deck Setup
- MACS Windows Setup
- MacsComm Setup
- Master configuration setup
- Property Items setup
- SA Probes
- STARS Data Tag Rules Setup
- STARS PlanViewSetup
- STARS SectorPlanViewSetup
- STARS Timeline Setup
- STARS Waypoint Setup
- ScenarioEditor Data Tag Rules Setup



MACS_Setup

FarTerm_rside.atc_dst

Setup Panel in MACS

MACS ATC DST Configuration

File Address C:\Experiments\Example_ZKC_ZID\MacsSetup\FarTerm_rside.atc_dst

Airline Filter Traffic Load Conflict Probe Data Link **Sta Freeze** Advisories Weather Probe Dynamic Sector Altitude definitions Corridors

General Settings InActive Ac Participation Combined sectors State Source Traj Filters Handoff H/O Autonomous Conflict Alert

Enable conflict probe Enable Manual Trial Planning Enable conflict resolution (AAC) Enable TSAFE resolution
 External conflict probe (CTAS) External Trial Planner (CTAS) External conflict resolver (CTAS) Use Auto Resolver for TSAFE

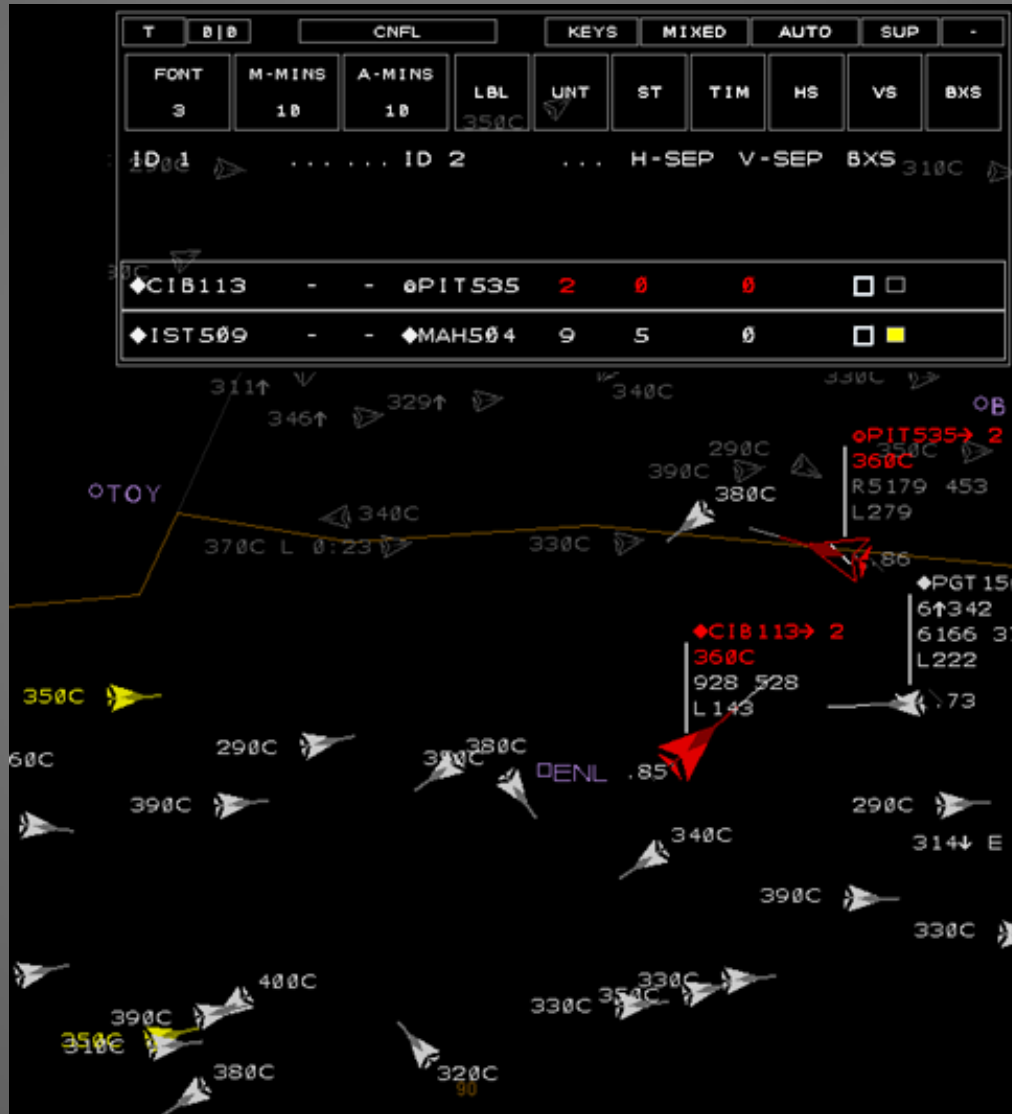
Managed/Managed	Trial plan/Managed	Managed/Autonomous	Autonomous/Autonomous
Probe Enabled <input checked="" type="checkbox"/>	Probe Enabled <input checked="" type="checkbox"/>	Probe Enabled <input checked="" type="checkbox"/>	Probe Enabled <input checked="" type="checkbox"/>
Automatic Resolutions <input type="checkbox"/>	Automatic Resolutions <input type="checkbox"/>	Automatic Resolutions <input type="checkbox"/>	Automatic Resolutions <input checked="" type="checkbox"/>
Earliest time for auto-res (sec to LOS) 480	Earliest time for auto-res (sec to LOS) 480	Earliest time for auto-res (sec to LOS) 480	Earliest time for auto-res (sec to LOS) 600
Latest time for auto-res (sec to LOS) 210	Latest time for auto-res (sec to LOS) 210	Latest time for auto-res (sec to LOS) 210	Latest time for auto-res (sec to LOS) 210
AutoResolution Uplink <input type="checkbox"/>	AutoResolution Uplink <input type="checkbox"/>	AutoResolution Uplink <input type="checkbox"/>	AutoResolution Uplink <input checked="" type="checkbox"/>
Use AutoExecution Limits <input type="checkbox"/>	Use AutoExecution Limits <input type="checkbox"/>	Use AutoExecution Limits <input type="checkbox"/>	Use AutoExecution Limits <input checked="" type="checkbox"/>
AutoExec: Maximum Delay (sec) 60	AutoExec: Maximum Delay (sec) 60	AutoExec: Maximum Delay (sec) 60	AutoExec: Maximum Delay (sec) 90
AutoExec: Maximum Heading Change 31.0	AutoExec: Maximum Heading Change 31.0	AutoExec: Maximum Heading Change 31.0	AutoExec: Maximum Heading Change 61.0
AutoExec: Maximum Altitude Change 2200.0	AutoExec: Maximum Altitude Change 2200.0	AutoExec: Maximum Altitude Change 2200.0	AutoExec: Maximum Altitude Change 2200.0
AutoExec: Maximum Speed Change 50.0	AutoExec: Maximum Speed Change 50.0	AutoExec: Maximum Speed Change 50.0	AutoExec: Maximum Speed Change 50.0
AutoResolution Graphics <input checked="" type="checkbox"/>	AutoResolution Graphics <input checked="" type="checkbox"/>	AutoResolution Graphics <input checked="" type="checkbox"/>	AutoResolution Graphics <input type="checkbox"/>
AutoApprove requests <input type="checkbox"/>	AutoApprove requests <input type="checkbox"/>	AutoApprove requests <input type="checkbox"/>	AutoApprove requests <input type="checkbox"/>
TSAFE Resolutions <input checked="" type="checkbox"/>	TSAFE Resolutions <input type="checkbox"/>	TSAFE Resolutions <input checked="" type="checkbox"/>	TSAFE Resolutions <input checked="" type="checkbox"/>
Start time for TSAFE res (sec to LOS) 180	Start time for TSAFE res (sec to LOS) 180	Start time for TSAFE res (sec to LOS) 180	Start time for TSAFE res (sec to LOS) 180
Auto TSAFE Uplink <input type="checkbox"/>	Auto TSAFE Uplink <input type="checkbox"/>	Auto TSAFE Uplink <input type="checkbox"/>	Auto TSAFE Uplink <input checked="" type="checkbox"/>
Uplink time for TSAFE res (sec to LOS) 120	Uplink time for TSAFE res (sec to LOS) 120	Uplink time for TSAFE res (sec to LOS) 120	Uplink time for TSAFE res (sec to LOS) 120
Auto TSAFE Return to Flight Plan <input type="checkbox"/>	Auto TSAFE Return to Flight Plan <input type="checkbox"/>	Auto TSAFE Return to Flight Plan <input type="checkbox"/>	Auto TSAFE Return to Flight Plan <input type="checkbox"/>
Auto TSAFE Return Owned Only <input type="checkbox"/>	Auto TSAFE Return Owned Only <input checked="" type="checkbox"/>	Auto TSAFE Return Owned Only <input type="checkbox"/>	Auto TSAFE Return Owned Only <input type="checkbox"/>
Show if in my sector or if I own one aircraft <input type="checkbox"/>	Show if in my sector or if I own one aircraft <input checked="" type="checkbox"/>	Show if in my sector or if I own one aircraft <input type="checkbox"/>	Show if in my sector or if I own one aircraft <input type="checkbox"/>

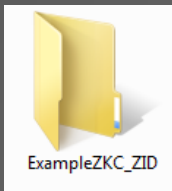


MACS_Setup

FarTerm_rside.atc_dst

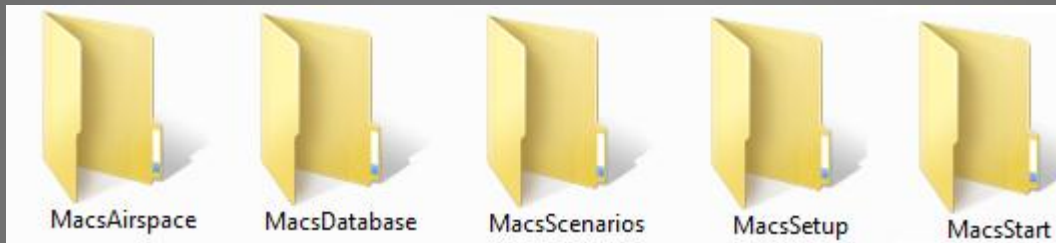
Result








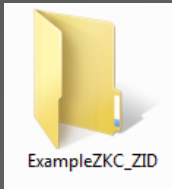
MACS Files and Folders

- At the top level within C:\Experiments\Example_ZKC_ZID\
 - 5 major directory folders




- High level and central MACS files

 example_zkc_zid.properties
 macs.bat
 macs.jar



MACS Files and Folders

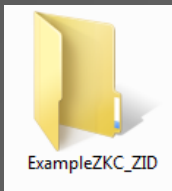


example_zkc_zid.properties
macs.bat
macs.jar

- .exe




- Requires specification of certain parameters

- Achieved in our examples folder through layers of .bat files



MACS Files and Folders

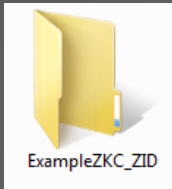


-  example_zkc_zid.properties
-  macs.bat
-  macs.jar

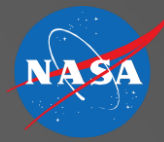
- .properties file specifies locations of files/folders
- 1) Airspace directory (primary and secondaries)
 - 2) Setup directory

```
example_zkc_zid.properties - Notepad
File Edit Format View Help
# Property file [Partial set of property items (as of 5)]
# c:\Experiments\Example_ZKC_ZID\example_zkc_zid.properties
# Property items that can appear in command line and/or property file
UseMultiScreen = true
adrs = adrs_host.arc.nasa.gov
asdi = false
asdiHost = offline
asdiId = onlyyouknow
asdiMode = false
asdiPassword = onlyyouknow
asdiPort = 2010
audioText = false
CFmsForceModRteDispatch = false
CFmsMode = false
CFmsPort = 7803
cdti = false
cdtiHost = offline
config = view
cruise = false
crzAltTrajMode = false
geometry = maximized
master = default.mConfig
```

```
metronEnabled = false
nogUI = false
numDsrDisplays = 1
numTsdsDisplays = 1
operator = Analyst
password = onlyyouknow
sessionMode = default
smartSkies = false
user = guest
# Property items that appear only in property file
AirportLetterCodesDirectory = custom/
AirportLetterCodesFilename = airport_letter_codes
AirportsDirectory = ../NAS_wide/
AirportsFilename = airports
AirspaceDirectory = C:/Experiments/Example_ZKC_ZID/MacsAirspace/
CenterBoundariesDirectory = navdb/
```

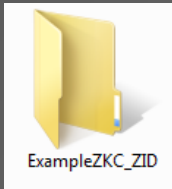


MACS Files and Folders







example_zkc_zid.properties
macs.bat
macs.jar

- cd "C:\Experiments\Example_ZKC_ZID"
- java
- Xms2048m - Xmx2048m
- XX:+UseConcMarkSweepGC
- classpath macs.jar
- MacsDatabase\JavaExtensions\log4j-1.2.13.jar
- MacsDatabase\JavaExtensions\jython.jar
- Macs

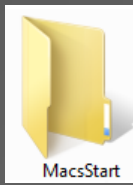


MACS Files and Folders



 example_zkc_zid.properties
 macs.bat
 macs.jar

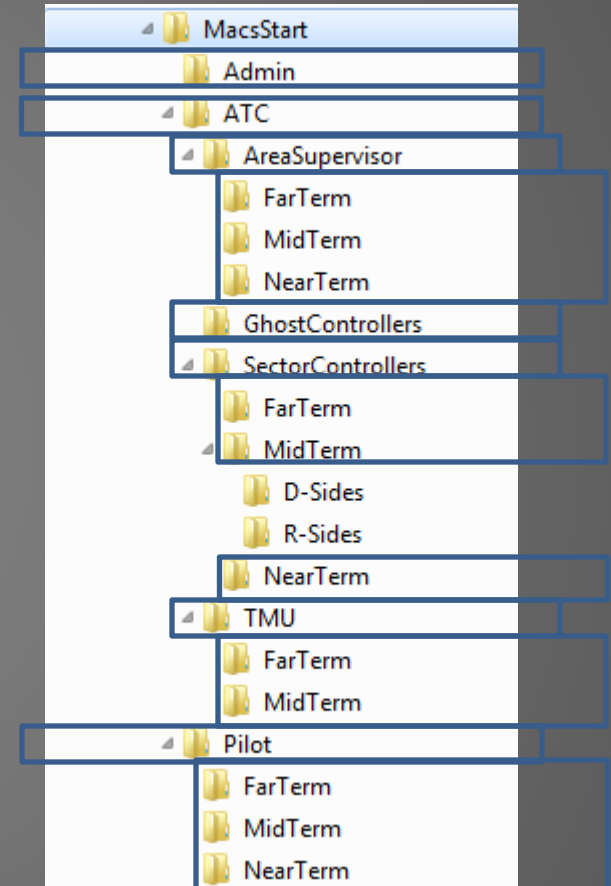
- properties=example_zkc_zid.properties
- adrs=%1.arc.nasa.gov
- operator=%2
- master=%3
- %1, %2, %3, etc. are place holder variables that are passed arguments from other .bat files

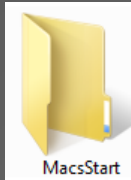


MACS_Start

For launching different kinds of MACS stations under different pre-set configurations

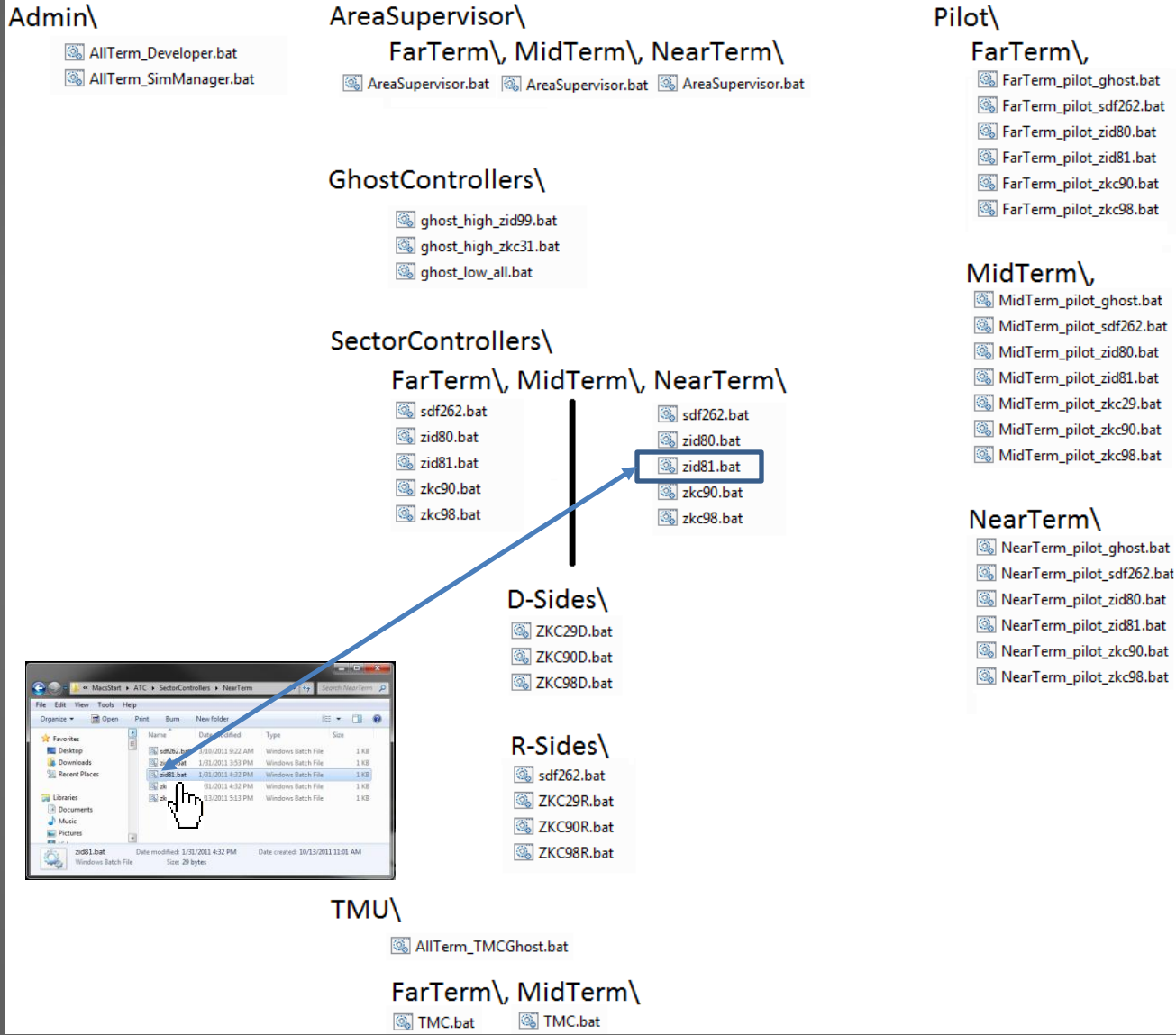
- Admin, ATC, Pilot
- ATC
 - Area Supervisor
 - FarTerm
 - MidTerm
 - NearTerm
 - Ghost Controllers
 - Sector Controllers
 - FarTerm
 - MidTerm
 - D-Sides
 - R-Sides
 - NearTerm
 - TMU
 - FarTerm
 - MidTerm
- FarTerm, MidTerm, NearTerm





MACS_Start

EXAMPLE_ZKC_ZID





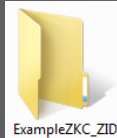
MACS_Start

Layered Batch Files

Computer > aol (\aol1.arc.nasa.gov) (Z:) > Experiments > Example_ZKC_ZID

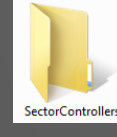
Name	Date modified	Type	Size
MacsAirspace	5/1/2011 9:03 AM	File folder	
MacsDatabase	5/1/2011 9:03 AM	File folder	
MacsScenarios	8/29/2011 4:03 PM	File folder	
MacsSetup	8/29/2011 10:28 AM	File folder	
MacsStart	5/16/2011 4:32 PM	File folder	
example_zkc_zid.properties	3/10/2011 10:00 AM	PROPERTIES File	5 KB
log4j.properties	1/27/2011 11:03 AM	PROPERTIES File	1 KB
macs.bat	1/26/2011 4:25 PM	Windows Batch File	1 KB
macs.jar	6/6/2011 7:00 PM	Executable Jar File	7,824 KB

macs.jar Date modified: 6/6/2011 7:00 PM Date created: 5/1/2011 9:03 AM Offline status: Online
 Executable Jar File Size: 7.63 MB Offline availability: Not available

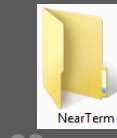


```
cd "z:\Experiments\Example_ZKC_ZID"

java -Xms2048m -Xmx2048m -XX:+UseConcMarkSweepGC -classpath macs.jar MacsDatabase\JavaExtensions\log4j-1.2.13.jar;MacsDatabase\JavaExtensions\jython.jar
macs -properties example_zkc_zid.properties -addr %1 arc.nasa.gov -operator %2 -master %3 %4 %5 %6 %7 %8
echo "done"
```



```
rem ADDR Operator master
cd "z:\Experiments\Example_ZKC_ZID" macs.bat "bahrain" "center-controller" %1 "user=guest" "-useMultiScreen=false"
```

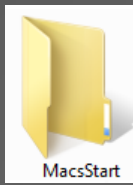


```
.. \rside.bat "NearTerm_zid81"
```

MacStart > ATC > SectorControllers > NearTerm

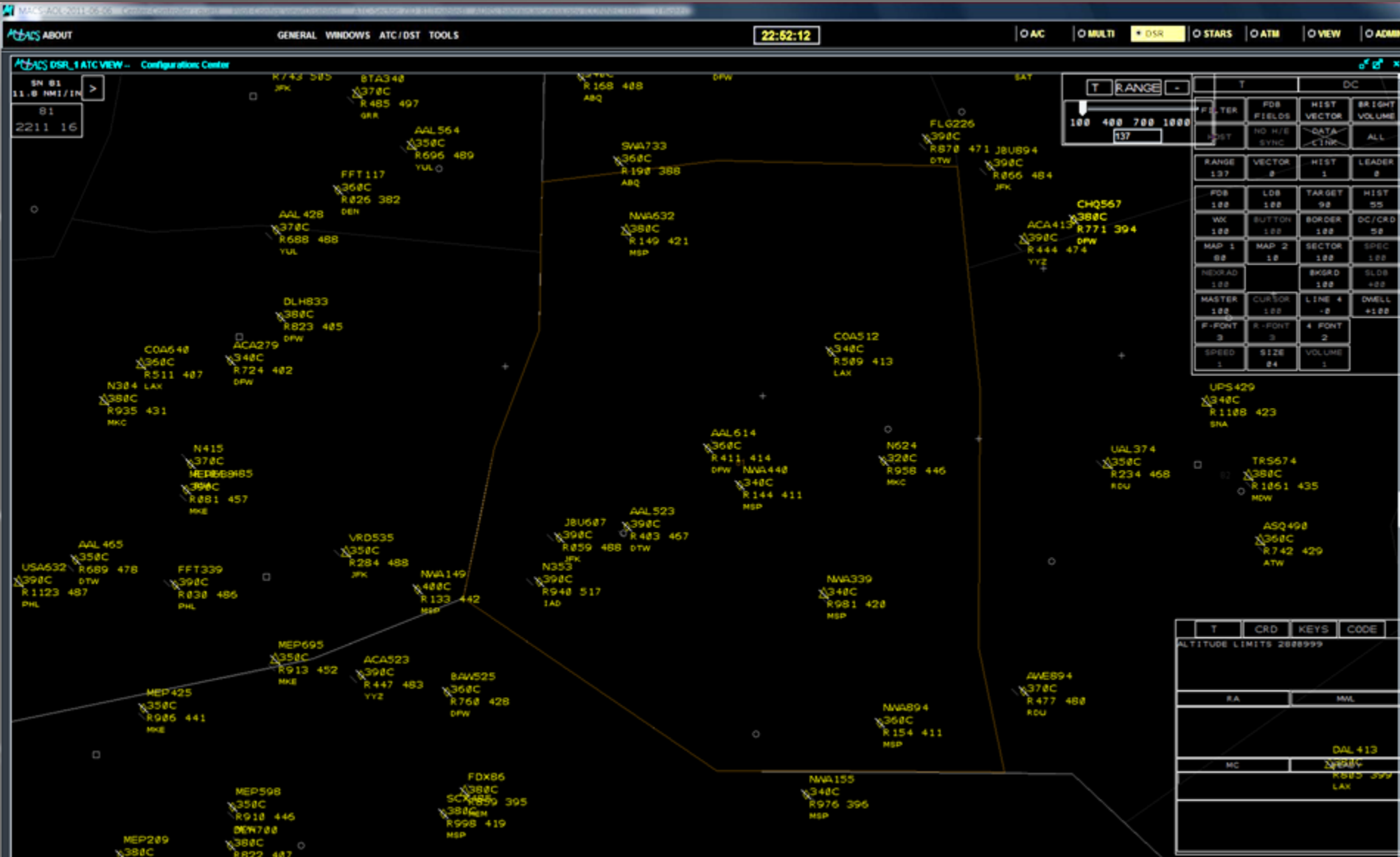
Name	Date modified	Type	Size
zid81.bat	3/30/2011 9:22 AM	Windows Batch File	1 KB
zid82.bat	3/30/2011 3:53 PM	Windows Batch File	1 KB
zid83.bat	3/30/2011 4:03 PM	Windows Batch File	1 KB
zid84.bat	3/31/2011 4:32 PM	Windows Batch File	1 KB
zid85.bat	3/31/2011 5:13 PM	Windows Batch File	1 KB

zid81.bat Date modified: 3/30/2011 4:32 PM Date created: 10/13/2011 11:05 AM
 Size: 20 bytes



MACS_Start

End Result: from the MACS Batch Files





MACS_Start

End Result: Macs (green)

MACS-AOL-2011-06-06 Center Control Requested - 2011-06-06 22:52:12

MACS ABOUT GENERAL WINDOWS ATC/DST TOOLS 22:52:12 A/C MULTI DSR STARS ATM VIEW ADMIN

MACS DSR_1 ATC VIEW - Configuration: Center

SN 81 11.8 NMI/IN 2211 16

MACS-AOL-2011-06-06 Center Control Requested - 2011-06-06 22:52:12

MACS ABOUT GENERAL WINDOWS ATC/DST TOOLS 22:52:12 A/C MULTI DSR STARS ATM VIEW ADMIN

MACS-AOL-2011-06-06 Center Control Requested - 2011-06-06 22:52:12

MACS ABOUT GENERAL WINDOWS ATC/DST TOOLS 22:52:12 A/C MULTI DSR STARS ATM VIEW ADMIN

MACS DSR_1 ATC VIEW - Configuration: Center

SN 81 11.3 NMI/IN 2252 12

MACS-AOL-2011-06-06

MKE

USA632 390C R689 478 DTW R1123 487 PHL

VRD535 350C R284 488 JFK

FFT339 390C R030 PHL

MEP425 350C R906 441 MKE

MEP695 350C R913 452 MKE

ACA523 390C R447 483 YYZ

BAW525 360C R760 428 DFW

FDX86 380C R489 395 MEM R998 419 MSP

MEP598 350C R910 446 DFW R822 407

JBU607 390C R403 467 DTW R059 488 JFK N353 390C R040 517 IAD

MWA149 400C R133 442 MSP

MWA339 340C R981 420 MSP

MWA894 360C R154 411 MSP

MWA155 340C R976 396 MSP

ASQ490 360C R742 429 ATW

AME894 370C R477 480 RDU

DAL413 380C R805 399 LAX

Macs.jar



MACS_Start

End Result:

Operator Mode (orange), User (purple), Master Config (red) and ADRS (blue)

The screenshot displays the MACS (Mission Area Control System) interface. The main display area shows a map of flight paths with various aircraft icons and labels. The interface includes several panels and controls:

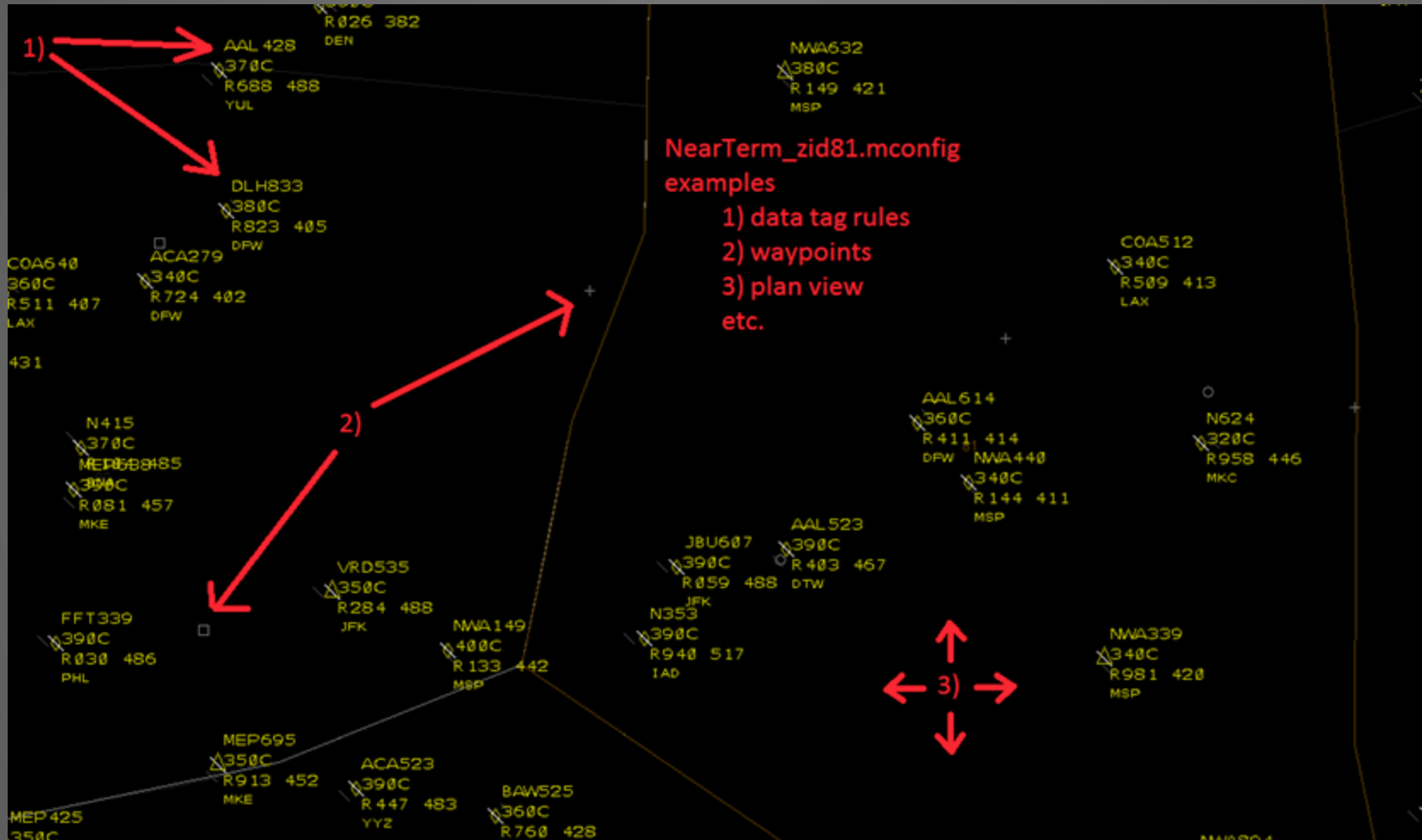
- Operator Mode (orange):** A yellow box highlights the 'Operator Mode' label, which is connected by lines to the 'Center - Controller: guest' and 'ATC-Sector: ZID-81' labels.
- User (purple):** A purple box highlights the 'User' label, which is connected by a line to the 'Center - Controller: guest' label.
- Master Config (red):** A red box highlights the 'Master Config' label, which is connected by a line to the 'Center - Controller: guest' label.
- ADRS (blue):** A blue box highlights the 'ADRS' label, which is connected by a line to the 'ADRS: bahrain.arc.nasa.gov' label.

The interface also shows various data fields, including 'GENERAL WINDOWS ATC/DST TOOLS', '22:52:12', and 'O AC O MULTI *DSR O STARS O ATM O VIEW O ADMIN'. The bottom left corner displays the number '31' and the bottom right corner displays 'MACS Workshop, 10/26/2011'.



MACS_Start

End Result: Master Config (red)



MACS_Start

End Result:

MultiScreen (gray) and .properties (black/white)

MultiScreen



MacsStart

.properties examples

- 1) MacsAirspace
- 2) Sector Boundaries

etc.

.properties

T	RANGE	DC
100	400	700
137		

FILTER	FDB	HIST	BRIGHT
HO/H/E	VECTOR	DATA	VOLUME
DTXC	CTNR	ALL	
RANGE	VECTOR	HIST	LEADER
137	8	1	8
FDB	LDB	TARGET	HIST
100	100	90	55
WX	BUTTON	BORDER	OC/CRO
100	100	100	50
MAP 1	MAP 2	SECTOR	SPDC
00	10	100	100
NEARAD		SKDAD	SLUB
100		100	700
MASTER	CURSOR	LINE #	DMELL
100	100	-8	4100
R-POINT	R-POINT	# POINT	
3	3	2	
SPEED	SIZE	VOLUME	
1	84	1	

T	CRD	KEYS	CODE
ALTITUDE LIMITS 2000000			
RA		MHL	
			DAL 413
MC		NEARAD	
		R-000	300
		LAX	

Questions?

Christopher.D.Cabrall@nasa.gov

- System requirements
- Installation
 - Stand-alone application on a single computer
 - Networked simulation platform across multiple computers
 - ADRS
- MACS files and folders overview
 - Organization
 - Principle files (some of the major players)
- How to start and run MACS
 - .bat file shortcuts