Middle East
Carrier Operations
(MECOPS)
for
Microsoft Flight Simulator X SP1/2
Version 1.1

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Credits:

Special thanks to **Bob Familton** who spent, since the beginning of this project, countless hours on initial testing, documentation review and evaluation.
Thanks to **Terry Bryson** for beta testing of the scenery and mainly for testing the carrier related functions like catapult starts and carrier landings under various aspects. Thanks to **Wayne Knowles** for his comprehensive documentation review.
A great thanks to **Javier Fernandez,** the author of the absolutely fantastic carrier models in this scenery, and his permission to include the model as part of this scenery.
Many thanks to **Richard Hogan**, the creator of the Arrcab program and his permission to include this great program as part of this scenery package.
Many thanks also to **Rob Barendregt**, the creator of the RCBCO gauge and his permission to include his excellent gauge as part of this scenery package.
Thanks to **Rok Dolenec** for his KC-135 Stratotanker model.

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1.   Overview

This scenery has been developed for FSX Flight Simulator SP1 or SP2. It has also been tested with Microsoft Acceleration , but compatibility is not guaranteed by the author.
This is not a load and fly package. Please take your time to read the included documentation carefully before installing and using this software.
The scenery set up for the Gulf region is shown below.

Below are the parts and objects of the scenery in more detail. The main units are the two carrier groups :

1. The first carrier group, CVN68, is located in the north of the Gulf with 4 escort ships. Three AI F18s are flying from the Airport (AP) in Kuwait to/from the CVN68.

2. The second carrier group, CVN69, is located in the south of the Gulf with 2 escort ships. Three AI F18s are flying from the AP in Doha to/from the CVN 69.

3. Two AI KC-135 tanker aircraft traveling on a fixed 4 hours schedule from Doha to Kuwait and from Kuwait to Doha. Therefore, the aircraft from CVN69 and CVN68 have the opportunity to perform an A2A re-fueling.

 4. There are a Navy destroyer and a Navy Cruiser traveling from Doha to a position in the Gulf which is close to the CVN69 and back to Al Khawr which is in the North direction of Doha.

5. The magenta line represents the route of a mission flight as described in Appendix D .

6. The complete scenery addon includes the following :

> a. The two models of the CVN68 and CVN69 carriers.
>
> b. A pre-configured F18A aircraft for the test flights.
>
> c. The AI F-18 models for the AI traffic.
>
> d. The AI KC-135 model for the AI traffic.
>
> e. A number of Oil Platforms.
>
> f. Additional Navy Ships like a Destroyer and a Cruiser.
>
> g. The Arrcab program for the arrester and catapult functions.
>
> h. The RCBCO gauge for the arrester and catapult functions as an option to the Arrcab program.
>
> j. The ARS4 radar gauge provides target displays for aircraft and ships, an auto tracking function for an A2A re-fueling procedure, and an auto landing function for the carrier.

2. Carrier Definitions

2.1 Carrier CVN68 Nimitz

Airport Name and Definitions

Airport ident=**"C680"**
region=""
country=**"World"**
state=**"Gulf Persian**"
city=**"US-Navy"**
name=**"USS Carrier Nimitz"**
lat=" 28.628301"
lon=" 49.759303"

Runway
lat="28.6282211526949"
lon="49.7598055053677"
alt=**"72.178F"**
length=**"790.0F"**
width=**"90.0F"**
heading=**"260.00"**

ILS
lat="28.6280298304258"
lon="49.7585803525716"
alt="72.172F"
heading=**"260"**
frequency=**"110.900"**
range=**"27.03N"**
ident=**"CVN68"**
width="20"

GlideSlope
lat="28.6282353848219"
lon="49.7598910331726"
alt="72.172F"
pitch="3"
range=**"27.03N"**

Com
frequency=**"135.9000"**
type=**"TOWER"**
name=**"NMTZ"**

Com
frequency=**"134.9000"**
type=**"APPROACH"**
name=**"NMTZ"**

Com
frequency=**"133.9000"**
type=**"DEPARTURE"**
name=**"NMTZ"**

Ndb ADF
lat="28.628040613"
lon="49.758585943"
alt="72.178F"
type="H"
frequency=**"368.0"**
range="60.00N"
region="CV"
ident=**"C68"**
name="ADF"

VOR DME
lat="28.628564806"
lon="49.7600926953897"
alt="104.987F"
frequency=**"108.20"**
region=**"CV"**
ident=**"C68"**
name=**"CV68 VOR**
range=**"48.0 nm"**

## 2.	Carrier Definitions

### 2.2	Carrier CVN69 Eisenhower

Airport Name and Definitions

Airport ident=**"C690"**
region=""
country=**"World"**
state=**"Gulf Persian**"
city=**"US-Navy"**
name=**"USS Carrier Eisenhower"**
lat="26.070073"
lon="52.665586"

Runway
lat="26.0705105742313"
lon="52.6655832194896"
alt=**"72.178F"**
length=**"790.0F"**
width=**"90.0F"**
heading=**"160.00"**

ILS
lat="26.0694615482895"
lon="52.666008331039"
alt="72.172F"
heading=**"160"**
frequency=**"110.800"**
range=**"27.03N"**
ident=**"CVN69"**
width="20"

GlideSlope
lat="26.0705972089677"
lon="52.6655499904489"
alt="72.172F"
pitch="3"
range=**"27.03N"**

Com
frequency=**"136.9000"**
type=**"TOWER"**
name=**"IKE"**

Com
frequency=**"133.9000"**
type=**"APPROACH"**
name=**"IKE"**

Com
frequency=**"132.9000"**
type=**"DEPARTURE"**
name=**"IKE"**

Ndb ADF
lat="26.06950574"
lon="52.66599176"
alt="72.178F"
type="H"
frequency=**"369.0"**
range="60.00N"
region="CV"
ident=**"C69"**
name="ADF"

VOR DME
lat="26.070584438"
lon="52.665154156"
alt="104.987F"
frequency=**"109.20"**
region=**"CV"**
ident=**"C69"**
name=**"CV69 VOR**
range=**"48.0 nm"**

3.   Oil Platforms

Five oil rigs are located about 200 miles SW (HDG 130 °) from the carrier CVN68. A large fire is on one of the platforms.

The center oil rig platform has an ADF and a VOR DME navaid.

Ndb ADF
lat="26.59545420"
lon="52.00527185"
frequency=**"377.0"**
range=**"120.00nm"**
magvar="0.0"
region=**"GF"**
ident=**"ORIG"**
name=**"ADF">**

VOR DME
lat="26.59545420"
lon="52.00527185"
frequency="108.80"
region=**"GF"**
ident=**"RIG"**
name=**"RIG VOR"**
Dme
lat="26.59545420"
lon="52.00527185"
alt="100.178F"
range=**"60.0 nm**

The following pic show the arrangement and locations of the platforms :
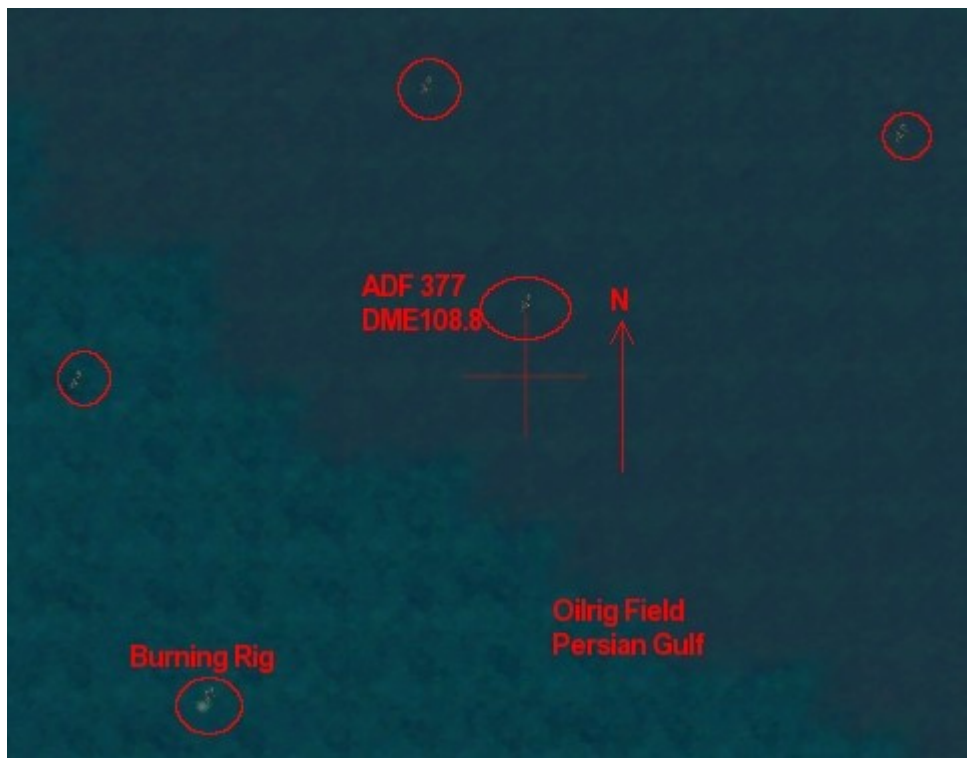
A burning platform on the pic above is marked with a circle.

There are more scenery effects that you can see on the Island of Khark about 50 miles north from the carrier CVN68. Here you can see numerous burning oil tanks.

Very impressive effect !!

4.   AI Traffic

4.1   AI traffic for the KC-135

There are two KC-135 air tankers traveling between Kuwait and Doha. Each
tanker has a unique ATC ID in order to identify them on the radar screen. One
has the **ID N-K135** and the other **ID N-K136.** The route for the AI traffic for both
tankers is from Doha to Kuwait and from Kuwait to Doha at preset times.

Description:
The speed of each tanker is 200 kt.
The flight level Depends on the direction between 8,000 ft and 11,000 ft. All
times are **GMT (UTC) Time** !!

It is a four hour cycle between Doha and Kuwait and between Kuwait and
Doha. One plane starts at Doha every 4 hours beginning at 00:00 . Within this
4 hours the flight goes to Kuwait and back to Doha.
A second plane starts at Kuwait every 4 hours beginning at 01:00 . Within this
4 hours the flight goes to Doha and back to Kuwait.
Two planes are always on the way to their destination in each on a 4 hour cycle.

Example:
08:00   Start in Doha (The steps before are : Preflight, Pushback,Taxi,
Take Off) So, at about 08:07 we have take off.
09:40   Arriving in Kuwait (The steps before are: Landing, Taxi, Standdown)
09:52   Taxi out in Kuwait and fly back to Doha.
11:32   Back in Doha. Standdown until 12:00
12:00   Start next cycle Doha to Kuwait.

Times of 08:00 to 12:00 is the four hour cycle for plane 1 and 09:00 to 13:00 for
plane 2. there will always be a plane in the air.
If you start in Doha with your aircraft at about 08:07 and try to follow the
AI KC-135 you will meet the second KC-135 in the air at about 09:20, not far
away from Kuwait. Both planes are in the air and enroute to their
respective destinations.

Cycles Summary Doha to Kuwait:	Cycles Summary Kuwait to Doha:
In 24 hours plane 1:	In 24 hours plane 2:
00:00 to 04:00	01:00 to 05:00
04:00 to 08:00	05:00 to 09:00
08:00 to 12:00	09:00 to 13:00
12:00 to 16:00	13:00 to 17:00
16:00 to 20:00	17:00 to 21:00
20:00 to 00:00	21:00 to 01:00 next day.

5.   Scenery Support Programs

5.1   General

In connection with this MECOPS scenery, and the use of military aircraft for carrier operations, the packages Arrcab or RCBCO are required to provide the catapult and cable arrester functions. FSUIPC 4.4 or later is also required and must be be installed on your system (unregistered is OK).

Note: If you are running FSX SP1 Accelleration be aware, that the key commands for carrier operations are not supported with this scenery. This is why one of the two support programs RCBCO or Arrcab are required .

A) RCBCO from Rob Barendregt is available at AVSIM. Search the library for **rcbco-30.zip**. With permission from Rob, the package is also provided within the MECOPS scenery package.

B) Arrcab26 from Richard Hogan is available at AVSIM. Search the library for **arrcab26.zip**. With permission from Richard the MECOPS package includes a subset of the program (English version only) to provide the cat/arrest function for the carriers. Please download the full version from AVSIM.

5.2   RCBCO Cab/Arrest gauge

When using this program install it as described in the install chapter of this document. Read the documentation carefully before deciding. During various tests, sometimes the aircraft did not stop on the carrier deck even though the arrester sound indicated the cable catch. This may be an overall system issue in terms of performance, and should be checked out.

5.3   Arrcab26 Cab/Arrest Program

Arrcab is a well known program developed by Richard Hogan. It is "stand alone" software and connects to FSX as soon as FSX is active.
Read the corresponding documentation for the package carefully. It includes a number of attractive additional features which are easy to install. No extra entries are required in the panel.cfg or aircraft.cfg. During various tests the software worked perfectly. When using this program install it as described in the install chapter of this document.

5.4   ARS4 Radar Gauge

The gauge is part of the package. The cab file is in the folder ARS4.
Read the ARS4 doc if you want to install the gauge into an aircraft of your choice. If you use the F18A aircraft included in the scenery package (MSF18AModel.zip file) the ARS4 cab file is part of it. The ARS4 gauge is mandatory in order to perform auto landing on the carrier and to perform auto tracking for the A2A fuel procedure.

6.   Installation

In order to install this package some basic knowledge of handling files
and folders in FSX/Windows, and on how to edit existing .cfg and .ini files with a
text editor are required.
Note: ALWAYS BACKUP A FILE BEFORE EDITIING

6.1 Step by Step Installation Process

1. Unzip the MECOPS.zip file in a folder of your choice.

2. Open the MECOPS_V1 folder, the MECOPS Doc folder and read the
documentation first before doing any installation.
Secondly, spend some time to reading the ARS4 documentation carefully.
In order to understand the carrier auto landing functionality and the A2A fueling
process, it is extremely important to understand how the ARS4 gauge works..

6.1.1 Installation of the Scenery Files

1. Copy the "Middle_East_Carrier_Ops_CV68" folder into the FSX Addon
scenery folder.

2. Copy the "Middle_East_Carrier_Ops_CV69" folder into the FSX Addon
scenery folder.

3. Copy the contents of the "Effects" folder into your main FSX effects folder.
Overwrite existing effect files.

4. Copy the contents of the "Sounds" folder into your main FSX sound folder.
Overwrite existing .wav files.

5. Copy the contents of the "AI Traffic" folder into your
 FSX ...Scenery\World\Scenery folder.

6. Add/activate the scenery "Middle_East_Carrier_Ops_CV68" and
"Middle_East_Carrier_Ops_CV69" in your FSX Addon Scenery.

6.1.2 AI Aircraft Files

1. Open the "AI F18 Aircraft" folder, unzip the "AIF18.zip" file into a folder of
your choice, and copy/paste the included "AI F-18" folder into the FSX
....\SimObjects\Airplanes folder.

2. Open the "AI K-135 Tanker" folder, unzip the "KC135TAI.zip" file into a folder
of your choice, and copy/paste the included "KC-135T_AI" folder into the
FSX….\SimObjects\Airplanes folder.

Note: If you do not want to see the AI aircraft on the FSX "Select Aircraft" window you should set the panel entry to panel=off in the aircraft.cfg.

6.1.3 F18A Aircraft Files

For initial testing the F18A standard MS model should be used.
This aircraft is part of the package and uses the standard Lear45 panel. The ARS4 radar gauge is included in the panel folder and a pre-configured panel.cfg is also included.

1. Open the "F-18A Test Aircraft" folder. Unzip the MSF18Model.zip file into a folder of your choice, and copy/paste the included "MS_F-18A_Model" folder into the FSX….\SimObjects\Airplanes folder.

6.1.4 Flight Plan Files

1. Copy the contents of the "TestFlightFiles" folder into the FSX folder, where your "Flight Simulator X Files" are located.

6.1.5 Arrcab26 Program

If you have decided to use this program for the carrier catapult/cable functionality:

1. Copy the ARRCAB folder into the main FSX folder. The ARRCAB folder contains the absolute minimum of internal files in order to support this scenery. The dat file includes the coordinates for the arrester zone positions for the CVN68 and the CVN69 for the Gulf scenery. Set the options in the Arrcab control panel as shown below:
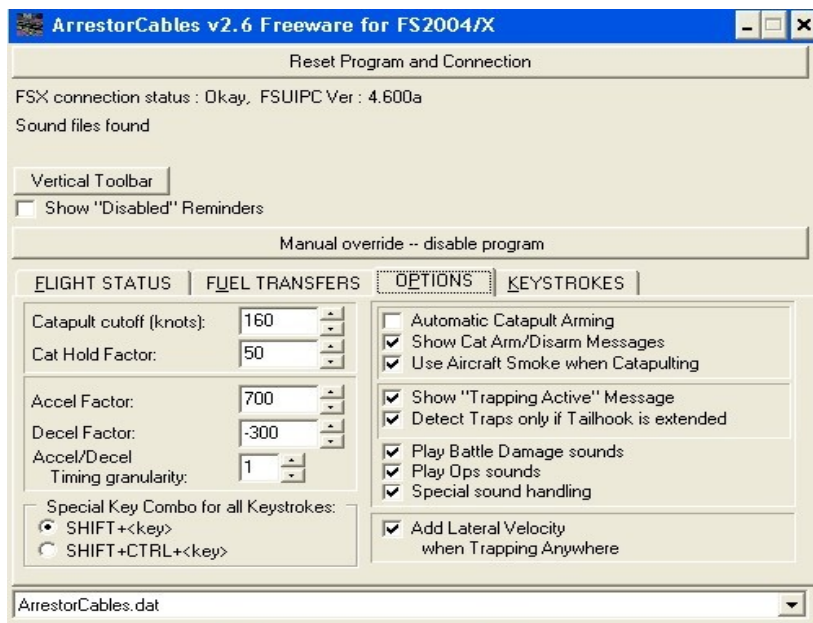
Note: You may increase the Decel Factor to -600 or to -900 if the aircraft does not stop soon enough.

Make a shortcut on your desk top to start the Arrcab program. This is necessary as FSX must be loaded prior to starting this program.
The cable catch zone for Arrcab is shown below:

6.1.6 RCBCO Gauge

If using this gauge, for the carrier catapult/cable functionality,   open the RCBCO folder for which contains the folder MECOP.

1. Copy the MECOP folder into your main FSX gauge folder. If you have a COP3 folder already in your FSX main gauge folder, you may delete it, if it is not being used for any other of your aircraft. The MECOP folder includes the pre-configured ini file. The cat/arrester option is set to GLOBAL.
With the global option set in the RCBCO ini file, an arrester zone is not relevant.   The plane will arrested as soon as the aircraft contacts the deck. Same is true for the CAT positions. In GLOBAL mode the plane can perform a catapult start from any position of the carrier deck.

2. If you decide to use the much more challenging carrier approach, where the hook of your aircraft needs to exactly contact the cable catch zone first of the carrier, you must copy the two ini files dsd_arrester_zones.ini and the dsd_catapult_zones.ini into the main gauge folder of FSX, and set the first parameter in the F18Config.ini file from Value_00=1, to Value_00=0.
Now the catapult zones and the arrester zone becomes relevant.
All 4 catapult zones of the carrier can be used. The arrester zone is the same as being defined for the Arrcab program (see above).

Important: When using the RCBCO gauge, select the panel.cfg from the
 F-18A test aircraft accordingly (Name: RCBCO_panel.cfg) . Just rename it to panel.cfg and the cfg will support the RCBCO gauge.

7.   Recommendations and Considerations

When using the scenery the first time, ensure that in FSX your traffic
slider for "Airline traffic density" and "Ships and ferries" are set at 50 % or more.
In Options/General set "Setting-Realism" to "Ignore crashes and
damage".

In order to enjoy the full scenery and the carrier operations, in terms of landing
and take, off please perform all the prepared test flights first.
Before using your own F-xxx carrier proven aircraft, use the standard F18A
MS model which is part of this scenery package. The standard Lear45 panel will
be used and the ARS4 radar gauge is already built-in. The default panel.cfg is
based on the usage of the Arrcab program for catapult and arrester function.
A copy of a panel.cfg using the RCBCO gauge is included.

If you have successfully performed all the test flight and the mission flights,
use other FSX settings e.g. weather, realism, traffic etc. in order to see how
things all work together. Time to experiment with more or less realistic FSX
settings.

Appendix A

Checkout the Scenery Installation
After you have completed the installation process according to the documentation regarding the scenery, AI aircraft, Effects etc.. you should now checkout whether all the pieces of the scenery are correctly installed integrated and functional on your system. Please follow the steps below:

1. Start FSX and check whether the two carriers are defined and available in FSX. The airport ID are C680 and C690. Verify the 2 carriers are registered in FSX:

Search results: (24492 airports found)

Name	ID	City	State / Province	Country / Region
Kendallville Mun	C62	Kendallville	Indiana	United States
Plymouth Mun	C65	Plymouth	Indiana	United States
Monmouth Mun	C66	Monmouth	Illinois	United States
USS Carrier Nimitz	C680	US-Navy	Gulf Persian	World
USS Carrier Eisenhower	C690	US-Navy	Gulf Persian	World
Crosby Mun	C71	Crosby	Mississippi	United States
Cross Winds	C72	Clayton	Washington	United States
Dixon Mun-Walgreen	C73	Dixon	Illinois	United States

2. On the initial FSX screen click on Load and select the saved flight **"Carrier68Gulf Carrier Start"**.
Your F-18A Blue Angels should be shown on the deck of the CVN68 at a catapult position.

a. UN-PAUSE the SIM (press the **P** Key).
b. The ARS4 panel is open.
c. Power ON the ARS4, set 40 miles range and you should see a F-18/US-Navy target.
d. Check Traffic Explorer. You should see both the F18 , and the K135 as the USAF airline.
e. Click on the Air button to turn off the Air display and switch to **Ships** display on the radar panel. You should see the escort boat targets (switch to 5 miles range to see more details).
f. Check out Arrcab. Start Arrcab. Check the Arrcab settings. Check Arrcab status (Shift+F8)
g. Set FSX Time and Date to NIGHT time. Verify that the RWY lights on the carrier deck are on. If so, the test is OK. Switch back to DAY time.
h. Check the catapult start. Check that your parking brake is set. If the Arrcab status is OK, press Shift+F9.You should hear the voice from the deck personal ? If so, select outside view. Set throttle full and parking brake OFF at about 80-90 % eng. power. Verify   catapult steam is being displayed. If so, the test is OK.

3. Load the saved flight **"Carrier69Gulf Carrier Start"**.
Your F-18A Blue Angels should be shown on the CVN69 on a catapult position.

a.   UN-PAUSE the SIM (press the **P** Key).

b.   The ARS4 panel is open.

c.   Power ON the ARS4, set 40 miles range and you should see a F-18/US-Navy target.

d.   Check Traffic Explorer. You should see the F18.
Uncheck the "Aircraft only" box to see the ships. You will see Navy Cruiser and Destroyer.

e.   Click on the Air button to turn off the Air display and switch to **Ships** display on the radar panel. You should see a number of boat targets.

f.   Check out Arrcab. Start Arrcab. Check the Arrcab settings as shown above. Check Arrcab status (Shift+F8)

g.   Set FSX Time and Date to NIGHT time. Do you see the RWY lights on the carrier deck ? If so, the test is OK. Switch back to DAY time.

h.   Before catapult start. Check parking brake set. Press Shift+F9. You should hear a Arrcab sound/voice from the deck personal ? If so, select outside view. Set throttle to full (or press F4) and parking brake OFF at about 80-90 % engine power. The catapult will launch you off the deck. Check if you see there is catapult steam. If so, the test is OK.

Appendix B

The following description explains the auto landing and take off operations on a carrier with the MECOPS scenery.
Note once more: The ARS 4 gauge works only if the ARS 4 window is activated <u>and shown on your panel!!</u> If you switch to a outside view, the gauge will not function !!!!!!!!!! You may go to View-View Mode and set it to Outside Locked Spot, undock the window and set it's position and size so you can watch the airplane on takeoff and landing.
How Auto Landing on a Carrier Works

Please read in the ARS4 documentation chapter "IV ARS4 Operational Instructions Ships/Boats" first, before reading the following.
The ARS4 gauge provides a full functional auto landing on the two carriers (CVN68 and CVN69) in the MECOPS scenery. The function has been tested with the standard F-18A model from the FSX Acceleration and the F-18E model from the team KBT. This auto landing function has nothing to do with an ILS approach on the carrier based on the ILS frequencies. However, do not use an ILS approach if you selected auto landing with ARS4.
The carrier will be represented by a magenta dot with a magenta RWY pointer on the screen. See below:

The length of the RWY pointer corresponds to the range selected for the radar screen. If a radius of 40 nm is selected, the pointer represents a length of 40 miles too. So, the pointer gives a good impression of how far you are always away from the carrier.
The glide slope function works according to the function below:
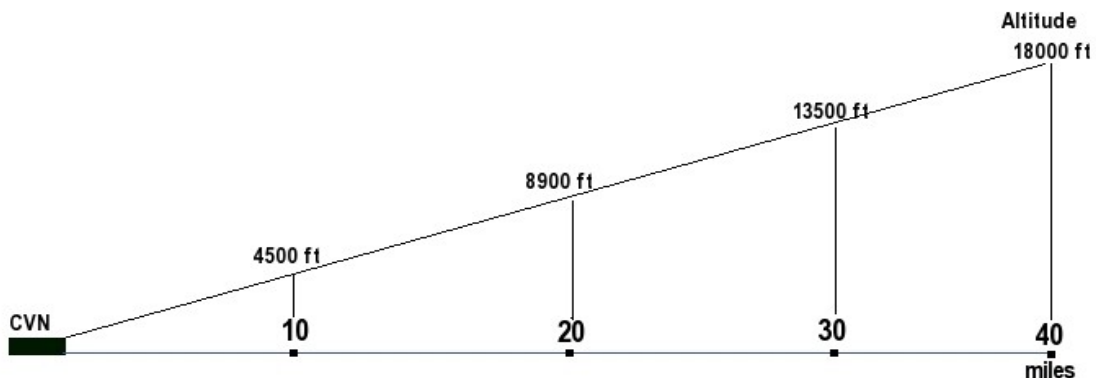
The graphic shows the ratio between the distance and the altitude to be on a perfect glide slope. If you try to approach the carrier with an altitude setting of 8,900 ft, the GS pointer will be centered if your distance to the carrier is 20 nm

In order to achieve the best approach position regardless of the runway direction (corresponds to the localizer on a ILS approach) you should t steer your aircraft into a position relative to the carrier as shown below and marked as " Position to start auto landing":
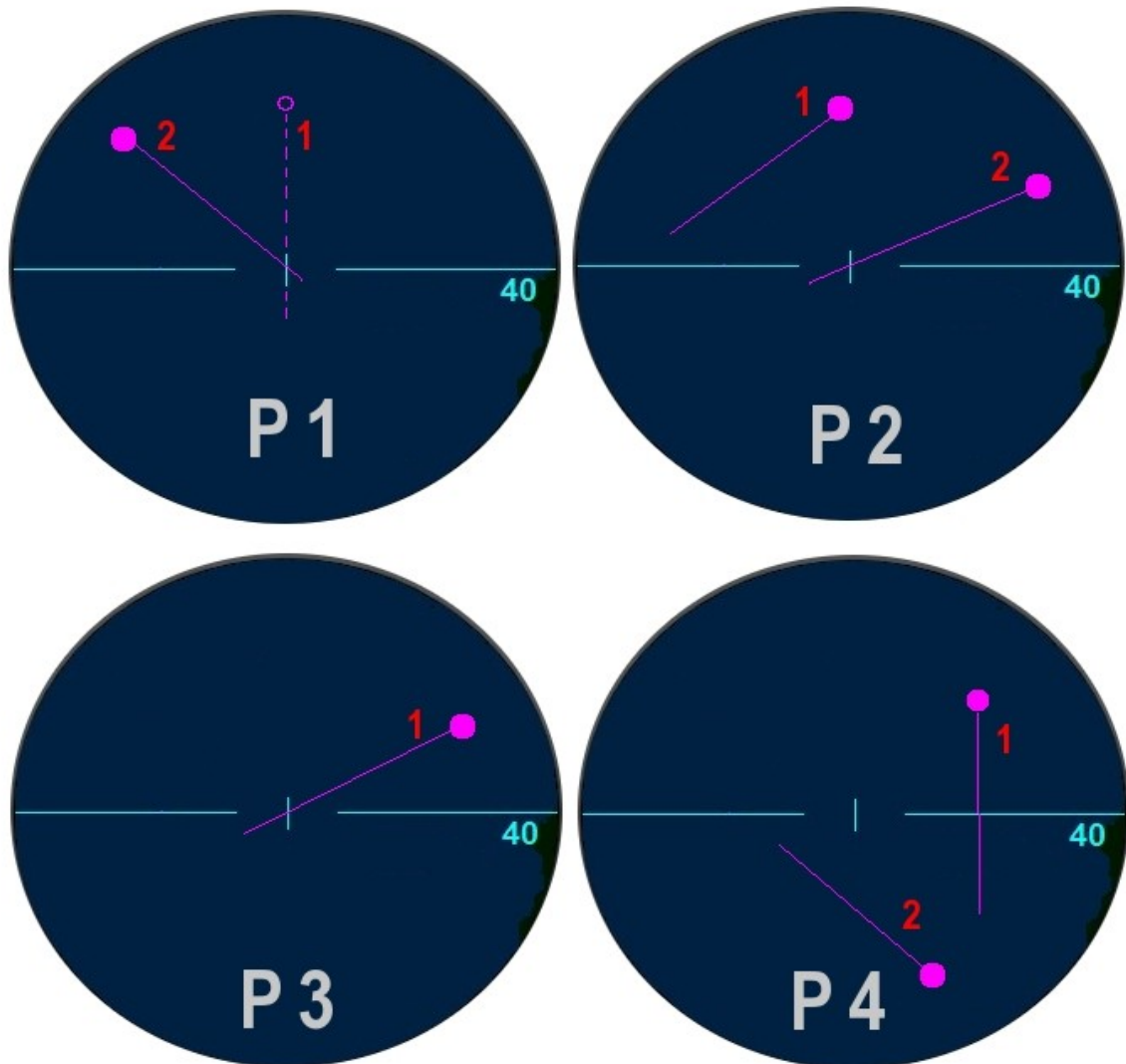
Position where to start auto landing as shown in:

Picture **P1 Nbr.2,** Picture **P2 Nbr.2,** Picture **P3 Nbr.1.**

The dotted symbol in P1 shows, that the plane has lined up 100% with the carrier RWY. The key criteria to trigger the auto landing function successfully is, that the magenta RWY pointer MUST cross the center of the screen. On the pics above the selected range is 40 miles, so the pointer crosses the center at a distance of about 35 miles. This is a very good position to turn on auto landing.

Position where you must correct your course before you can start auto landing is shown in:

Picture **P2 Nbr.1** requires to steer left until the RWY pointer crosses the center. Picture **P4 Nbr.1** and **Nbr.2** are very bad positions. You must turn your course around 180° to bring you in a reasonable position for the **Nbr.2** carrier, and for **Nbr.1** you may be to close to bring you in a good position.
The whole procedure looks like the navigation following a ADF pointer where you do not know up front in which position you will arrive the carrier.
Another important info is the position of the arrester zone on the carrier.
The touch down of your aircraft must be within the zone as shown below:

The ARS4 auto landing function will take care of it.

Carrier Landing and Take OFF Test

Time for a test flight.

Note: For this test set your FSX Realism Settings to
 "Ignore crashes and damage".

The flight is based on a pre-defined saved flight which is part of the
scenery package. The aircraft is the standard MS ACC F18A Blue Angel
model using the Lear panel (model and panel are provided in the
MECOPS scenery pack). The Arrcab26 program for catapult start and
cable arrester is part of the scenery package also and should be
installed on your system. The prepared flight is part of the pack too and
should be installed on your system as well.
No flight plan is involved, no ATC is required.

1: Start FSX, select the flight: **"Carrier68GulfAutolanding"** , start FSX.
   The system comes up in panel view mode and the ARS4 window open,
   and the SIM in PAUSE mode. Your autopilot is already setup.

2: Start Arrcab, now go into FSX in full screen mode , press Shift+F8
   and check the the status of Arrcab.

3: Click on the ARS4 panel Power ON, select **Ship by clicking on the
AIR button if necessary**, click **C1**, click the **SEL** button, set the **CPL**
switch to ON, and click the **ATR** button to on.
Leave the **ALT** button to OFF, set range to 40 nm. See pic below:

You should see the carrier on your screen at a distance of 34 nm

4: Check settings on your A/P: A/P is ON, HDG hold ON, ALT hold ON
   and set to 9,000 ft, speed hold ON and set to 130 kt, FD ON, gear
   down, flaps full and HOOK UP.
   You are now ready to start your auto landing test.

5: Ready? Key-in **P** and start the SIM. Watch the GS pointer on the
   radar screen. The pointer will move downwards at a distance
   of 20 nm. As soon as the pointer moves click the **ALT** button on the
   radar panel. Now set the HOOK down !!! Use Shift-F8 and Arrcab
   should show a message that the Hook is Enabled.

6: At about 15 miles distance to the carrier you should see this display:
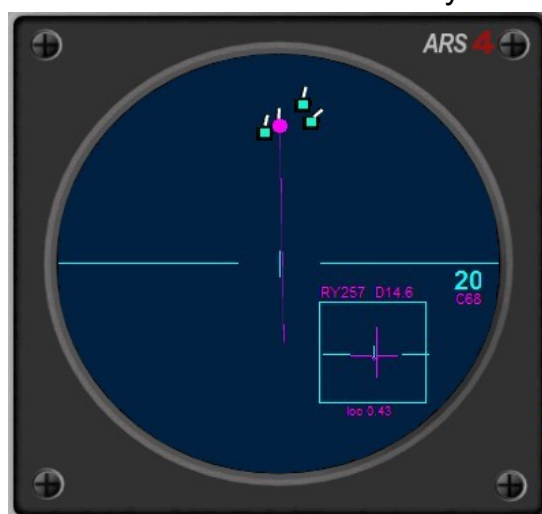
You are perfect lined up with the runway. Check Arrcab status!

7: At about 2.5 miles in distance from the carrier you will get an Arrcab
   message, that trapping is active. Just stay cool and let the ARS4 do
   the job. Set your range selector down to 5 miles if you are less than 5
   miles away from the carrier (this is optional, you also can stay on
   40 miles).

8: Be prepared for touch down.
   Right before you contact the deck, turn speed hold OFF (can be at
   a distance of 0.2 miles or less) and **A/P OFF.** As soon as you are
   arrested activate **Throttle Cut** !!! (Press F1 Key, or quickly run the
   throttle slider up and down to idle).
   It is important to note that engines under full power will try to move
   you around on deck.

9: Arrested? Throttle Cut? OK. Parking brake to ON, HOOK UP,
   ARS4 CPL switch to OFF. Landing completed !!!

Note: As soon as your aircraft has touched the carrier deck, and the
arrester sound is being played, ARS4 is no longer in function
regardless how the switches are set on the radar panel. At this
point it is the job of Arrcab in connection with FSX to perform the
arrest and stop your aircraft.
To approach the carrier with the speed of around 130 kt is another
important parameter in order to hit the cable catch zone within
range. A speed above will cause a touch down beyond the zone
and a speed below may result in a crash with the stern of the carrier.

Take OFF Test

This is just a simple test. To take off from the carrier you just landed on.
First check status of Arrcab. Hook should be UP and CAT not be in the
armed position. Taxi to the any free catapult position on the deck.
Position flaps full down. Set trim to +6 .
Press Shift+F9 in order to arm the catapult. You will hear the
conversation with the deck personnel.
Set throttle to FULL, parking brake OFF, you will hear the cat sound, and
you are in the air.

Note: During the catapult take off sit back, but don't touch the flight stick.
The right trim setting is essential (here +6) and the flaps setting too,
for a perfect cat take off. Immediately after takeoff, your aircraft automatically
rotates to capture about 12° pitch angle. Once you're at a safe altitude, retract
the landing gear, take control of the aircraft's flight stick. When you gain
sufficient altitude, set the flaps up, and you may now turn on your A/P.

Appendix C

The following description explains the Air to Air refueling operations with a KC-135 aircraft tanker using the MECOPS scenery. It is important to read and understand the ARS4 documentation first, before starting this test flight. The two prepared test flight files "A2AFuelTestFlight.FTL" and the "A2AFuelTestFlight.WX" must be available in your corresponding FSX folder. Check that your file "GKC135_traffic.bgl" file is available in your FSX Scenery/World/Scenery folder too, and the KC-135T aircraft installed on your system.

Note once more: The ARS 4 gauge works only if the ARS 4 window is activated <u>and shown on your panel!!</u> If you switch to a outside view, the gauge will not function !!!!!!!!!! You may go to View-View Mode and set it to Outside Locked Spot, undock the window and set it's position and size so you can watch the airplane on landing.

Air to Air Refuel Operations Step by Step

With the prepared flight loaded all the required settings for your aircraft and FSX are ready to perform this test flight. No flight plan is involved. Leave ATC OFF !

1:       Open FSX, Load flight **"A2AFuelTestFlight"** and start FSX.
          The SIM starts in panel view and in PAUSE mode.
          Check: A/P is ON, HDG hold is ON, Speed Hold is ON, altitude
          hold is ON, flight director is ON, GPS/NAV is set to NAV, gear
          is UP, flaps UP, Fuel about 40 % (600 gallons).
          Check your traffic slider in FSX. The setting should be > 30 %.

2:          Open the ARS4 window. Click PWR switch to ON, set range to 40 nm. Two targets should be displayed. Click the Select button **>** and on the target in front of you will identify it as our K-135 tanker. Click on the **AA** field and the little A2A window will pop-up. The window will provide you the information as seen in this figure

Click the **SEL** button now and the window will present you the more detailed information about the selected tanker. in

Set the **CPL** switch to ON, click the **ATR** button, click the **ASP** button. Verify panel setting must be as displayed here:

The test flight is ready. Press the **P** key to begin.

At this point the radar controls your autopilot. HDG hold,
Speed hold, and ALTITUDE hold will be controlled by the radar.
The speed hold is automatically set to 435 kt in order to
catch up the tanker.
Now let the auto tracking do the job and wait until we are
close to less then 3 miles from the tanker. Select your range
setting accordingly.

3:    Turn the fuel arming ON on the A2A window !!! Click on the
gray bar close to the ARM label. A blinking MSG will be shown,
indicating , that Airfuel is Armed.
If you are at a distance of 2.5 nm and the radar has reduced
your speed now down to 311 kt. Continue in the auto mode!! At
a distance of about two miles you should see the tanker.

*Note: You can move your A2A window up to a position on your
panel where it can be watched it at it"s best.*

The pic below shows the information on the radar and
on the A2A window. The little light green altitude pointer on
the A2A window is already perfect positioned in the white box
of the window.

4:          You are very close for a successful air-to-air refueling.
            Stay cool !!
            You have this view:
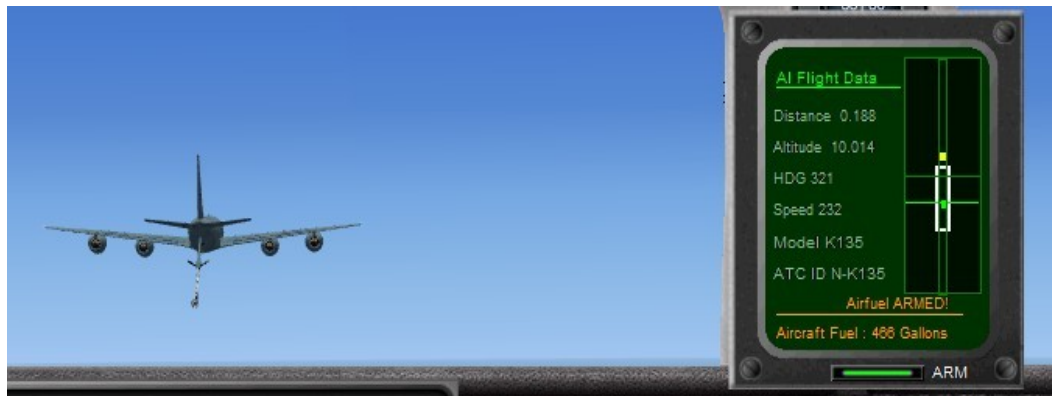
Keep auto mode ON. Watch the yellow direction pointer on
the A2A window. As long as he moves straight into the white
box, do nothing. If not, turn HDG hold off and use your stick
careful to line up your aircraft with the tanker.
Watch the distance. You must come down to a distance under
0.05 miles. Your speed is 15 kt higher than the speed of the
tanker. Keep speed hold ON. At a distance of 0.1 you can turn
off HDG hold. As long as the little yellow dot is in range and
moves into the white box, do not touch the stick.
Turn HDG hold off so as to be prepared to immediately move
away from the tanker, as soon as the refuel is performed.
As soon as you below 0.05 miles the refuel happens.
(Note the green bar and that your total fuel has been increased)
Your cockpit view should look like this:

You will be close to the tanker drogue but not completely
engaged. You do not have to have the F-18 probe extended for
a successful refuel. Take your stick and move immediately
away from your tanker

A2A refueling is now successfully completed !!!
Turn off A2A **ARM,** close the A2A window.
Really easy, right ??

5:        Tanker bye, bye and good luck !

Option: Another option can be to turn off HDG hold and speed hold on
the A/P about 2 miles before meeting the tanker, but leave altitude hold
ON It is now up to you to keep the HDG with your stick and control the
speed with your throttle control.
Or turn off speed hold only on your A/P, and adjust the distance with your
throttle slider. By controlling the speed you may keep your plane for a
while in the re-fuel zone.
Always keep altitude hold ON.

Note: In case you are far out of range for HDG, distance and
altitude the pointers are not shown. The distance pointer will show up
if you are less than 1 nm in range of the AI. The altitude pointer will show up if
you are about 100 ft above or below the AI altitude.

For a successful A2A re-fueling you must get your aircraft
within the parameters below:
Distance relative to the AI: < 0.05 nm
**Altitude : max. 100 feed below the AI and max. 10 feet above the flight
level of the AI.**

Appendix D

Performing the GULF Mission Flight

Mission Overview:

1:          Carrier takes off from CVN69

2:          Flys an initial HDG 324°

3:          Fly to meet a KC-135 tanker and perform an A2A re-fueling

4:          After the re-fueling fly in the direction of CVN68, passing
           the carrier group and flying to the Khark Island to observe the
           burning oil tanks.

5:          Return and land on the CVN68 carrier.

6:          Take off from CVN68, return to CVN69 and landing
           at night time.

Mission Flight Step by Step

No flight plan is involved. Leave ATC OFF !

1: Carrier take off from CVN69 at time **08:12 GMT** (any day)
        a. Start the prepared flight **"GulfMissionFlight".**
        The flight will come up with SIM in PAUSE mode.

                Check:
                - Fuel weight 50 %
                - Flaps down
                - parking brake ON
                - Trim +5
                - HDG set to 324 °
                - Speed hold set to 350 kt
                - Altitude hold to 10,000 ft

                Check Auto Pilot (A/P).
                - ALT is ON
                - HDG is ON
                - FD is on
                - GPS/NAV switch, NAV is ON

    b. Unpause the SIM (P key) .
    .
    c. Start Arrcab

    d: Check Arrcab status (Shift+F8)

    e: Press Shift+F9. Deck personnel will arm your catapult. You
        are now ready for take off.

    f: Set throttle to full. When your aircraft has reached about 90%
        power, release your park brake and you are in the air.

    Note: During the cat takeoff sit back, but don't touch the flight
    stick unless an emergency occurs. Immediately after takeoff,
    your aircraft automatically rotates to capture about 12° pitch
    angle. Once you're at a safe altitude, retract the landing gear,
    take control of the aircraft's flight stick. When you gain sufficient
    altitude, set the flaps up, and turn on your A/P You're now
    ready to tackle the mission objectives.

2: Turn A/P ON, turn speed hold ON, fly a HDG 324 ° in order to meet
  the air tanker. Your aircraft follows HDG of 324°, climbs to 10,000 ft and
  will keep the speed of 350 kt.

      a. Open your ARS4 window now. Verify the **Air** screen (should
         be ON by default) , click on the **AA** button of the control
         panel and the little A2A window will pop up.
         Close the ARS4 window and leave the A2A
         window open and watch it.

      b. After about 3 to 5 minutes on flying in the direction of 324 °
         the information on the A2A window will pop up, displaying
         your KC-135 tanker position.

      Note: Be aware, that the tanker started at Doha at 08:00 in
       order to meet you on his flight from Doha to Kuwait.

      c. Now you know where your tanker's position. Set your HDG
         according to the bearing info display on the A2A window.
         You may loose the tanker info if FSX traffic engine drops the
         K135 from his schedule because of other traffic events. Do
         not worry, our tanker will show up again. Just keep the latest
         HDG in this case.

3:        Flying to meet a KC-135 tanker and perform a A2A fuel

    a. Adjust your HDG hold always according to the bearing
       information. Be aware, that your position is permanently
       changing and the position from the tanker too. So, the bearing
       information will be changing as well.
       In case you have lost the tanker info on your A2A window, it
       will show up again. If so, update your HDG setting according
       to the bearing information.
       Fly with 350 kt and follow the tanker until the distance is
       below 40 nm.

    b. You will see that the distance to the tanker decreases as you
       fly in it's direction. If the distance is less than 40 nm turn on
       your ARS4 screen and locate the K-135 as a target
       on the screen. Select the tanker using the **< >** keys on the
       ARS4 panel. Here the pic you should see:

    The tanker is on an ideal position in front of you and 38 nm
    away.

The A2A window will now update and looks like this.
Remember, as soon as you select the target on the radar,
the A2A window will display the full information regarding
your selected tanker.

c. Now is the ideal time to start the auto tracking function on the
   ARS4 radar. Click on the **ATR** and on the **ASP** button on the
   radar control panel. You panel setting must be look like this:

At this point the radar controls your autopilot. HDG hold,
Speed hold and Altitude hold will be controlled by the radar.
The Speed hold jumps up to around 431 kt in
order to catch up to the tanker.
Continue to let the auto tracking do the job wait until we are
less about 3 miles from the tanker.

d. **Turn now on fuel arming on the A2A window !!!** Click on
   the bar close to the ARM label. A blinking MSG will be
   shown, telling you, that Airfuel is Armed.

e. Perform the A2A fuel procedure the way you have learned it
   during the **"A2AFuelTestFlight"**.

4:          After the re-fueling fly in the direction of the CVN68, passing
             the carrier group and fly to the Khark Island to observe the
             burning oil tanks.

    a. You are ready for the next mission stage.
       Close the A2A window. Turn on the Ship display on the
       radar control panel, Select **C1** in order to get the bearing and
       distance display for the CVN68 carrier.

    b: Set the HDG to the value according to the bearing info
        (should be around 345°). Set altitude hold to 1,000 ft and
        speed hold to 300 kt.
       We want to cross the carrier group on a low altitude.
        Setup speed and altitude as required to meet your friends
        on the CVN68. Go down to 500 ft and speed 140 kt with
        flaps full to say hello to the CVN68 staff.
        Keep your ARS4 screen open at 40 nm range. If your
        distance is below 40 nm, the carrier symbol will show up on
        the screen. No action required from your side. Just keep the
        HDG direction in order to cross the carrier. Here you cross
        the carrier at 600 ft and speed 150 kt.:

c. Next step is to fly to the Khark Island to observe the burning oil tanks.
Set your ADF frequency to 325 Khz.
As soon as you cross the CVN68 set 1,000 ft for Altitude hold, set Speed hold to 300 kt. and set HDG according to the ADF pointer.
You can close the ARS4 window. At a distance of about 15 nm from KHG reduce your speed to about 180 kt and at about 10 nm you will see the burning fields in front of you.
Here a pic at about 3 nm distance:

It's now time to return to the carrier and here it will be the CVN68.

5:        Return and landing on the carrier CVN68.

      a: Turn on your ARS4 screen. Select C1 carrier, set altitude
         hold to 9,000 ft, speed hold to 300 kt and HDG according to
         the bearing info on your ARS4 screen.

      b: If you are below 40 nm in distance the carrier symbol will be
         displayed on the screen. Set Speed hold to 200 Kt. Press
         the **SEL** button on the radar panel. You should see this:

Navigate with your HDG until the carrier magenta RWY
pointer crosses the center of the screen and perform a auto
landing the way you performed it during the
"Carrier68Gulf Autolanding" test flight.

Check Arrcab status , do not forget the HOOK, FLAPS and
GEAR down. !!!

c: After the successful landing, taxi your plane to a cat position and set your parking brake.

d: You aircraft needs to checked and re-fueled for your flight back to CVN69 which will be night flight.

6: Take off from CVN68, return to CVN69 and landing on CVN69 at night time.

   a. Set Time to 15:20 GMT. Refuel your aircraft 100 %.

   b. Set trim to +6, set speed hold to 300 kt, set altitude hold to 9,000 ft, set HDG hold to 265°, check parking brake ON, check the Arrcab status (Shift+F8) , press Shif+F9. And you will get the MSG "Cat Armed and Set" from Arrcab OK ? Throttle to full, 90 % power, parking brake OFF, take off !

   c. Gear up, flaps up, A/P to ON.
      Open ARS4, select **C2** carrier, check distance and bearing, set HDG hold according to the bearing info and follow it. CVN69 is about 225 nm away from you at about 132°. Keep ARS4 open and update your HDG always according to the bearing display.

d. In preparation of your landing on CVN69 set your frequencies NAV1 to 110.8, NAV2 to 109.2 and ADF to 369.
You can use the ILS indicator in order monitor your landing approach controlled by ARS4. However, do not use the ILS approach for landing !!

e. Now plenty of time. Set Speed Hold to 400 kt and at about 15:50 GMT you will see the CVN69 on your radar at a distance of about 38 nm.
Set your Speed hold down to 200 kt, click **SEL** on the radar panel. This is the display on your screen.

 Once more, navigate with your HDG until the carrier magenta RWY pointer crosses the center of the screen and perform a auto landing the way you performed it during the
  "Carrier68Gulf Autolanding" test flight.

Check status of Arrcab with Shift-F8, do not forget the HOOK, FLAPS and GEAR !!!

All is now in the dark and you must 100% rely on the correct functionality of the radar. Turn ON lights as required.

OK !! Landed and arrested !!

!!!Congratulation Mission Accomplished !!!

Remarks related to boat traffic display:

In case you are using the option in FSX to speed up the sim rate to 4x it is very likely, that FSX drops some boat traffic. You may not see the carrier escort ships on the radar screen. This is not a radar issue !! You will not see the traffic in FSX Traffic Explorer either.
You can do a re-fresh of the traffic by just doing an update of the Time and Date function. You do not need to change any time or date, Just call the FSX Time and Date menu and click OK. FSX will now re-store the boat traffic and you will see it on the radar screen .

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