BFDG Embraer A-29 Super Tucano for X-Plane 11
- Addons: Better Cockpit, Weapon Usage and Manual   - New April 29, 2020, updated May 11 -

Contents: Cockpit Basics | Weapons | Quick Nav Guide | More Nav | My Mods | Problems. Q & A | Links. Refs. |

BFDG - Chuck Amaral and others - have made a very nice X-Plane 11 model of Super Tucano.

Some cockpit settings in the model seem not to have got their final form. I have made adjustments that make it easier to use weapons, and to navigate with "waypoints". Plus many improvements in cockpit: more functions, brighter colours, somewhat improved HUD.

You can buy the basic model at • X-Plane.org, 28$ ⧉.
Simple installation: copy file directory "BFDG A29B" into "../X-Plane 11/Aircrafts/my_added/"

Warning! Do not visit website **www.xplanebrasil.org** it has been hacked, and redirects to a dangerous site.

My addons, zip-file 20 MB:
● **XP11_Super_Tucano_Addon_BoJu_20200510.zip**

Installation of addons
From zip-file copy files
  emb314.acf,
  emb314_cockpit_INN.obj,
  sidepanels.png
to "../X-Plane 11/Aircraft/my_added/BFDG A29B/"

Copy the following files to indicated sub-directories:
  panel.png   --> /cockpit_3d/-panels-/
  S-TEC_55.png   --> /cockpit_3d/autopilot/
  gen_text*.png   --> /cockpit_3d/generic/
  outgen_LED*.png --> /cockpit_3d/generic/
  el_xxxx-1.png   -->
      /cockpit_3d/EFIS/EFIS elements primary/

BFDG Super Tucano - Menu for outer changes.

- Click for larger images! -

Cockpit Basics

Cockpit description
EFIS - Electronic Flight-Information Systems with
HUD - Head-Up Display
UFCP - Up-Front Control Panel (or **ICP**)
with DED Data Entry Display (here only displays)

MFD - Multi-Function Display - left+right, with
- PFD Primary Flight Displa
- ENG Engine and Fuel
- MAP Navigation map, symbols only.
- WPN Weapons loaded, display
- NAV=FMC not functional.

MFD-PFD and **MFD-ENG**
Left: **PFD:**
- Attitude gyro
- Speed(left) and Altitude(right)
- HSI with compass, HDG-bug(magenta),
  OBS-Course(green).
- VVI Vertical Velosity Ind.(right)

Right: **ENG**
Turbine data, Oil, Fuel tanks, Trim,...

First flight!
Flight setup: At end of some Rwy. Engines running.
Electricity and Fuel pumps - Set all ON. (down-right)

Keep brakes on (key B down) and increase throttle 50%.

Low down: Radios, AP Autopilot, Transponder.

Release brakes, max throttle.

Use some right rudder to keep aircraft straight.
It has a powerful engine with strong torque!

Remark: Brazilian real version has special setting to reduce torque via autopilt, for beginners.
Question: R/P-button on their AP???
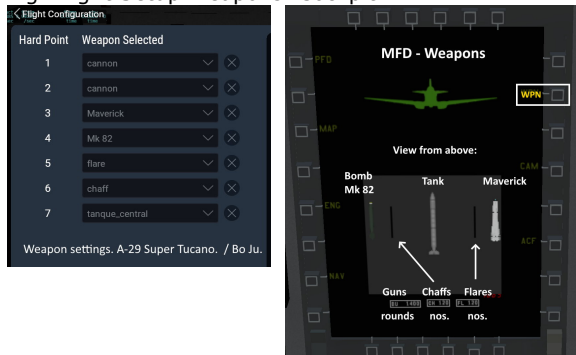
Weapons

Weapons
BFDG default: 2 cannons, 4 MK_8x bombs, central tank.

Change i Flight-Setup Weight/Fuel-Weapon to :
- cannon, cannon (in wings)
- Mk 82 bomb, Maverick air-tio-ground missile.
- flares, chaffs (small metal strips)
- tanque_central (droppable)

Fig. Flight Setup Weapons. Cockpit MFD-2 WPN.

- Click for larger images! -

Arm buttons
MASS - in my mod set to "guns_armed"
  (MASS = Master Armament Safety Switch)
LATE ARM under red cap - in mod set to "bombs_armed".

You can try firing Guns when on ground. OK!
But, avoid to fire Maverick or Bombs there.
- Well, if you do, then a flight-restart will repair!

HUD-btns for Navigation, A/G or A/A aim sights.

Setup firing buttons
In XP11 Settings, set Joystick:
- Trigger button - "fire guns"
- Left Js-button - "fire_bombs"
- Some button - "deploy flares"
- Some button - "deploy chaffs"

Test guns, flares, chaffs on ground.
Use backward-outer-view to see flares, chaffs.

Maverick fired:

X-Plane 11 is not a war game like *Digital Combat Simulator DCS*, or *War Thunder*. You will see explosions, but very little destruction (only on AI-aircrafts).

- You can add AI-aircrafts, e.g. helis, and hit them:

Quick Navigation Guide - Use Waypoints from Home Base to Goal

Navigation via Waypoints
Military - sets up waypoints to target: Lat, Long, WP-Name. Here emulated with WP = VOR or DME, Name=ID

Make a simple two-leg mission
Prepare!
1. Put your aircraft on your "Home Base".
2. Open map ('M'). Find a Goal and a WP in between.
3. Click on Goal-VOR,DME and set freq to Nav1.- WP2!

4. Flip freq to Nav1-Standby: Ctrl+9
5. Click on WP in between, your WP1. Set freq to Nav1.
6. Note Hdg1 to WP1, and set HDG-bug to Hdg1 -
   - use UFCP-TIP and drag HDG-knob.
7. Click TIP Off, and FIX On.

Take off!
8. Take off and turn to Hdg1, see DTK Desired Track!
9. Time to WP1 is ETE minutes (Expected Time Enroute).
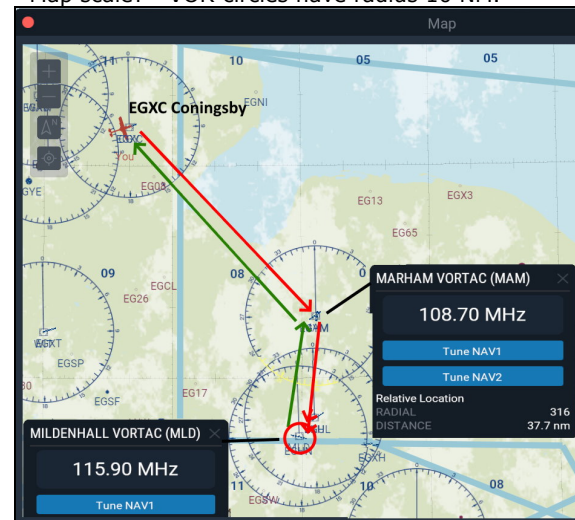10. At WP1 flip Nav1-standby, WP2! Turn to Hdg2.

Attack!
11. When nearing Goal "arm_bombs" (Maverick, Mk 82).
    - Use chaffs to disturb radar.
12. Dive and fire bombs x2.
    - Use flares to disturb IR-missiles.

Fly Home!
13. Flip Nav1 to reactivate WP1 and turn to it.
14. When at WP1, set Nav1-freq to Home Base VOR.

Planning - Map with: Home Base, WP1, WP2=Goal.
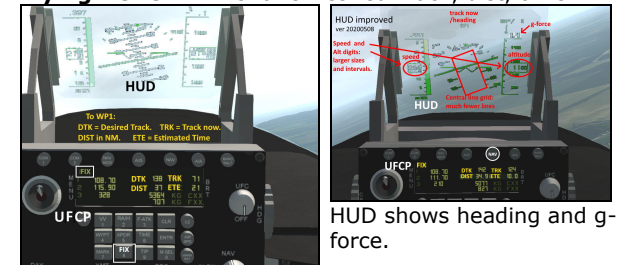Map scale? - VOR-circles have radius 10 NM.

Use Up-Front Control Panel (UFCP)
TIP to set HDG   and   **WYPT** shows ID (in air)

OBS! Click Btn-Off, before click next Btn-On. - Bug!

Flying - **UFCP-FIX** shows Desired Track, dist, time!

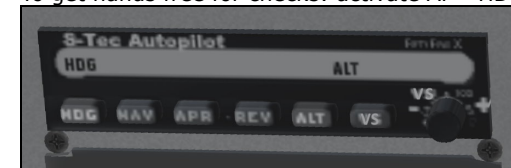HUD shows heading and g-force.

I have made some improvements to HUD:
- larger digits, fewer central grid lines.
The images above show HUD before and after!

Autopilot, AP, from S-Tec
To get hands free for checks: activate AP - HDG+ALT.

HDG - AP turns to your chosen HDG-direction.
ALT - AP holds present altitude.

When at WP1, turn HDG-bug to Hdg2.
When near goal - turn AP OFF (click AP-HDG,ALT again)
- or have a button for AP-Off - better!

Joystick and key settings
Often used keys (default):
B, V - Brake normal, max

Views:
W - Cockpit, forward
Shift+8 - Outside, follow, chase

G - Gear in, out

1 - Flaps Up
2 - Flaps Down

[- Trim nose Dn
] - Trim nose Up
  (for non-US keyboard, assign other keys/btns!)

Zoom - mouse roll button

Radio:
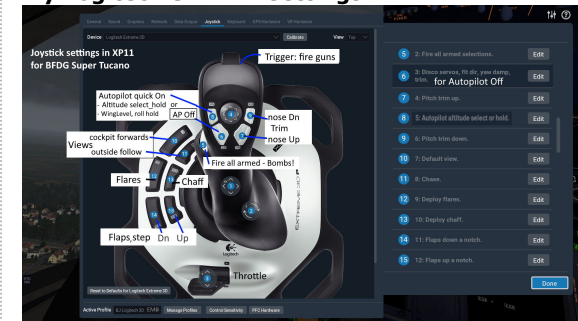**Ctrl+9** - Swap Nav1 to Standby freq.

Sim control:
P - Pause
M - Map, show/hide
Yoke hide: use red cockpit btn "Salvo"

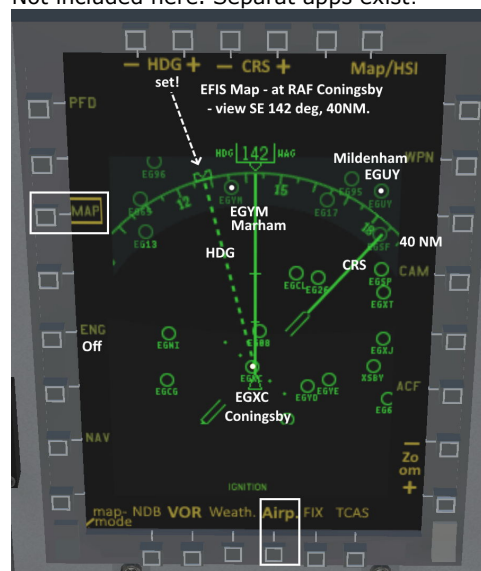**Shift + ';'** - Drop all tanks.

My Logitech 3D EMB settings

More about Navigation

Nav Map
Only a very simplified IFR-navigation map.
Military aircrafts use moving topographic maps.
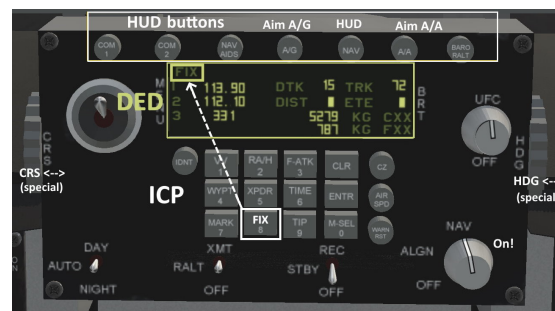Not included here. Separat apps exist!

MAP with VORs

MAP with HSI

click for larger!

Bottom buttons to turn symbols Off/On:
  NDB – VOR – WEATHER – AIRPORTS – FIX - TCAS
  I recommend to have only **on**e active: VOR or Airports.

Zoom Click + / - .
  2, 5, 10, 20, 40, 80, 160 NM. Default 10NM.

HUD and **UFCP** are important in military aircrafts.

In the BFDG-sim-model one cannot enter values, only show values.

Autopilot, Radios, Transponder:

UFCP-buttons --> display in DED

All show frequencies for: Nav1, Nav2, ADF.
And weights: Total and Fuel.

VV   - VV, ALT- Vertical_Velocity, Altitude
RA/H - ALT, RALT - Altitude (baro), Radar-alt.
F/ACK - HDG, IAS - present heading, indicated airspeed

WYPT - FIX, DIST - Waypoint ID, Dist NM - nav1!
XPDR - XPDR, MODE - Transponder Nr, Mode (on/off)
TIME - T MIN, T MIN - to waypoint,mins to nav1,nav2

MARK - LAT, LONG - for plane now
FIX   - DTK, TRK / DIST, ETE / to nav1.
   DTK = Desired_Track, TRK = current_Track,
   ETE = Estimated_Time_Enroute, minutes
TIP   - HDG-now, JUSTUS-MOD added CRS + HDG-bug

CLR, ENTR, M-SEL - shows nothing, no fcn here.
  In real world used to Enter values with digit-buttons.
  (M-SEL resets closed display).

CZ - CRUISE: HDG, ALT, IAS
AIR/SPD - IAS, TAS - Indicated_Air_Speed, True (rel.ground)
WRN/RST - shows nothing, no function.

Note: These buttons are On/Off-btns with higher priority
for higher numbers. Not swap or flip!

Avoid pressing: X-On,...Y-On,...Z-On,...
Instaed: X-On,...X-off,Y-On,...Y-off,Z-On,...

map_mode - click for changes, and if HSI not shown.

TCAS - Other aircrafts, only if you have added AI-aircrafts, or have *Traffic Global* or similar.

Same for MFD-btns: prio PFD-MAP-ENG-WPN (highest)

Autopilot, AP, från S-TEC

HDG - AP turns to your chosen HDG-direction.
ALT - AP holds present altitude.
VS - Change Alt by increasing or decreasing
   Vertical Speed with the rotary button.

NAV - AP turns to CRS-Course set for NAV1-VOR.
   To fly **From** a VOR, set HDG eqaul to Course.

APR - Approach to ILS.
REV - Reversed ILS approach.

Auttopilot Manual: see your XP11-directory
"/X-Plane 11/Instructions"

Use UFCP-TIP when you set HDG or CRS
Complex systems!
It is easier to set HDG-desired, with UFCP-TIP active!

Remark: to use these knobs for CRS,HDG is a very special usage done in BFDG-XP11-model! Ususally done with rotary knobs.

To PAUSE or fly LIVE - that is the Question
One can use 'P'-key to pause simulation, and still change radio frequencies, HDG-value etc.

In real flying, pilots use autopilot to get a "pause" from steering, and then change freqs, HDG etc.

Quickest AP activation is "Wings level + Keep attitude".
You can program keys on your joystick fot this.
- Wings level, keep roll
  or Altitude hold.
- AP Off: Disco servos, engage,..

Routes with many Waypoints?
You may try some addon, e.g. TonyVier's
"Extended Radio and Nav Stacks", at X-Plane.org.

My Modifications

List of my Mods to emb314.acf

"P acf/_is_military 1" - 1!
"P acf/_name A29B Super Tucano" - B!

UFCP/ICP Errors in DATAREF: replaced "gps_" by "nav1_"

UFCP-TIP - added display of Course and Heading.
   Use when changing CRS,HDG by "dragging" big HUD-knobs left-right.

UFCP all: DATAREF sim/flightmodel/weight/m_fuel_total
   from DIGITS 6 / DECIMALS 5 / PERIOD_WIDTH 0
   to   DIGITS 6 / DECIMALS 2 / PERIOD_WIDTH 1
   - yields fuel-kg with no decimals, e.g. 827
   (DIGITS 6 DECIMALS 0 PERIOD_WIDTH 0 - gave 8)
   (XP11-bug? values are e.g. 827.123456 kg)

List of my Mods to emb314_cockpit_INN.obj

Activated many functions which where "prepared".
They had dataref of type: com/e314/xyz

Trial and error using Notepad++, DataRefTool.

- MASS-switch - sets "guns_armed"
- LATE_ARM-switch (under red cap) - "bombs_armed"
   (armed = ready to use)

- MAPS - bottom right knob - map_range 1-4 for
  5, 10, 20, 40 NM (default 10NM)

- Zoom in map with buttons - map_range, 0-6
- Set HDG heading with btns -
- Set CRS with btns - obs-value
- map_type Wrap-button - down-left.

List of modifed/added png-images

sidepanel.png - brigheter background
- is in fact used for central panel, too.

panel.png - added text and symbols,
   esp. in subimages for MAP, WPN.

autopilot.png - brighter

gen_text.png - for blue ID-text in UFCP-WYPT.

outgen_LED, red digits used in UFCP-TIP

HUD-images: el_horizon-1.png, el_airspeed-1.png, el_altitude-1.png

- Added Tooltips for modified btns.
  and in .obj file comments:
JUSTUS-MOD changed function for....

Remark: Buttons around MFD have the same function,
irrespective of which panel that is shown.
"Active" btns are suggested with yellow color texts.

Figs. sidepanels.png and panel.png (jpg-copies)

Problems. Questions & Answers

Q. "I click on an MFD-button to get another display - no change!"
A. In this model, displays are on top of each other.
  - Click **Off** the one you not want to see!

Q. "I click on a UFCP-button to get a new display - no change!"
A. DED-displays are On or Off, larger numbers have higher priority.
  - Advice: Click **Off** present btn, before **On** new btn.

Q. "I try to fire flares and chaffs. Nothing happens."
A. Click MFD-WPN to see your weapons. - You can change in Flight Setup - Aircraft Weight - Weapons.
   And you must look backwards to see them fired.

Q. "MFD-NAV shows an FMC, Flight Management Computer, but nothing happens when I click on buttons?"
A. Correct - no functionality implemented. Very complex to program!

Q. "The Head-up-display, HUD, has very blurry digits."
A. This is a general XP11-error - too small png-images! A better HUD requires lots of programming!
  - I have modified some HUD-png-images, to get larger "small" digits, and fewer grid lines in center.

Q. "Up Front Control Panel, UFCP" repeats radio freqs and weights in all sub-panels. Is that so in real planes?"
A. I think freqs and weights only show up in a few real sub-panels.
   Question: Anyone who knows the real **UFCP?**, from Elbit comp.

Links, References

Flight Global - FLIGHT TEST: Embraer EMB-314 Super Tucano - Amazon warrior, 2002
- Recommended! Detailed description of real engine startup, take-off, waypoint nav. etc.

Manuals for BFDG X-Plane model, in folder "../BFDG A29B/Manual/"
- "BFDG A29 POH.pdf" - Pilot's Operating Handbook.
- "BFDG A29 CheckList.pdf"
  - Warning!Do not visit website **"www.xplanebrasil.org"**
     it has been hacked, and redirects to a dangerous site.

[BFDG - Developer's page, Chuck Amaral](#) ⤢ - very skilled!

X-Plane 10 Manual had info about "Weapons" and "Aircraft Carriers".
Those sections are not included in "X-Plane 11 Desktop Manual". Therefore reproduced here:
• [XP10 Manual - Secs. Simulating Combats, Performing Carrier Ops.](#) ⤢, pdf 4MB.

[Embraer EMB 314 Super Tucano, Wiki](#) ⤢

[Embraer Aircraft Company, Brazil](#) ⤢
• [Super Tucano](#) ⤢

[Flickr - Super Tucano, by Embraer North America](#) ⤢
• [GoogleMaps - Aeródromo de Embraer, NW Sao Paolo, Brazil](#) ⤢
   - where the cockpit photo was taken: S 21° 45.73 W 048° 24.03