

CVW-14 INITIAL TRAINING

Week 5: A2G-1 - BOMBS





OVERVIEW



- Welcome to Week 5!
- Tonight we will discuss:
 - **AIR TO GROUND FUNDAMENTALS** – Putting warheads on foreheads and trying to not kill yourself, friendlies or innocent bystanders in the process.
 - **A2G PROCEDURES** – What to do around the range & how to not sound like an asshole
 - **THE TARGETING POD** – When the Mk1 eyeball just won't cut it.
 - **BOMBS** – "Drop the bomb, man!"
- Any pressing questions?

TOPIC 5.1 – A2G FUNDAMENTALS

"How do we employ the F/A-18 against ground targets?"

"How do we communicate over the radio during A2G operations?"





A2G 101



- Shooting down MiGs is fun (and necessary!) but the majority of the work we do in the F/A-18 is ***air-to-ground***.
 - We did rebrand to VFA, so...
- Several different types of air-to-ground missions, including but not necessarily limited to:
 - ***Strike*** – "That factory offends me. Remove it."
 - ***Interdiction*** – Killing the truck drivers bringing the bad guys to the front lines or the ones bringing supplies to the bad guys, or destroying bridges, or whatever
 - ***Close Air Support (CAS)*** – the guys on the ground are getting shot at and need our help
 - ***Suppression/Destruction of Enemy Air Defenses (SEAD/DEAD)*** – Getting the SAMs to turn off long enough to accomplish a mission, or actually going in and blowing them up



STORES PAGE

- The **STORES** page lets you select & program weapons
 - Wingform display corresponds to weapon location on the jet
 - Allows for weapon configuration
- Different options in **AA** vs **AG** master modes
- Displayed options depend on selected weapons





BIG VOICE COMMS

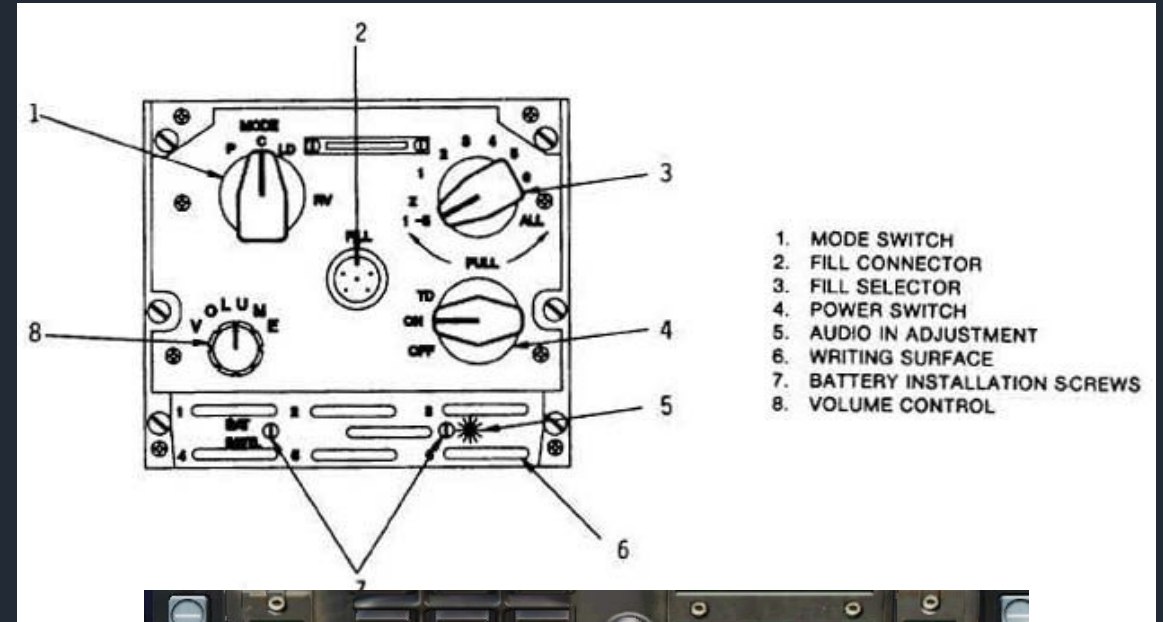


- “Jesus, is this asshole going to talk about radios again?”
 - Yes he is!
- “**Big voice**” freq
 - The freq that all packages, C2, and leadership monitor to gain SA on the overall fight
 - Standard calls on Big Voice would be:
 - **Check-Ins** – “Sting 1-1 checking in, mission number 6969, flight of 4 F/A-18s, loaded as fragged...”
 - **Attack Callouts** – “Sting 1-1 in hot on the east range ”
 - **Weapons Release** – “Sting 2-1, pickle times-one GBU-38 north range, off to the east”
 - **Kills/BDA** – “Sting 2-4, shack, target destroyed.”
 - **Threat Information** – “Sting 3-1, Mud 6, North.”
 - **Defensive Calls** – “SAM, SAM, SAM!”
 - Things you would not put out on BV:
 - Coord with flight members about flight specific stuff.
 - Things that would not be pertinent to everyone in the theater as SA building comm.
 - Dinner plans for after you get back to the boat



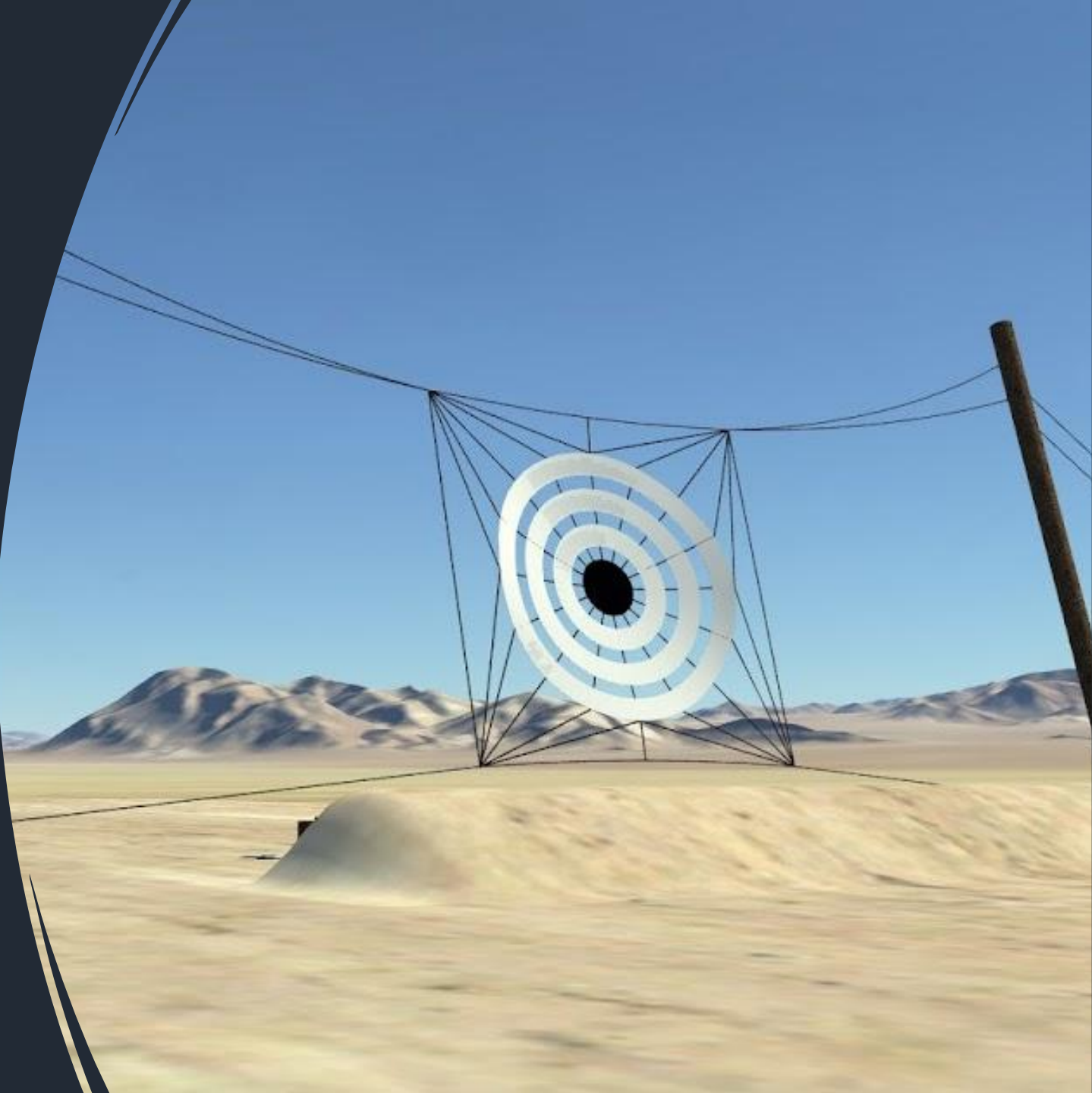
ENCRYPTION

- KY-58 Secure Voice Module
 - Can secure both Radio 1 or 2 – VID switch below UFC
 - 1) Power On 2) Mode switch to “C” 3) Select briefed channel 1-6 (Fill)
- **HUD video switch** controls encryption of PRI or AUX (DCS is weird)
 - SRS Overlay is very helpful to confirm you have the right one selected...
- **“Big Voice” frequency is encrypted – you may need to switch the KY on and off as you switch freqs!**



TOPIC 5.2 – A2G PROCEDURES

"What are some of the standard procedures we use both in the jet & on the radio around the range?"





FENCE CHECKS

- Before you reach the target, lead will have you “**Fence In**” – items you need to make sure you’ve got handled before you go into combat!
 - **F – Firepower:** Weapons system configured, SAFE until you’re ready to actually employ weapons!
 - **E – Electronic Warfare:** Countermeasures/Jamming set
 - **N – Navigation:** Waypoints/Bullseye/Displays configured
 - **C – Communications:** Radio frequencies as briefed
 - **E – Emitters:** Lights off! EMCON as appropriate for the environment
- When you’re all done, let lead know + your fuel state – “**2’s in, 8.5**”



AROUND THE RANGE

- **HOLD POINT** – the position your flight holds before beginning the run into the target
- **INITIAL POINT (IP)** – a designated point, offset from the target area, that serves as the beginning of the final approach to a target
- **TARGET** – where you're trying to, y'know, drop the bomb

- When you arrive on the range, you'll generally be directed to hold at a point, then commence the run on the target via the IP.
- At the hold, the FL will usually direct the flight to stack up at 1000 foot increments for deconfliction; don't stray from this!
 - Generally the way these blocks work is you have FROM YOUR ASSIGNED ALTITUDE up to X+999 feet; if I'm in the Angels 24 block, I can work from 24000 to 24999



RANGE COMMS

- In combat we'll frequently be working with JTACs, but we won't go into those comms this week
- In general, *Who The Fuck Are You, Where The Fuck Are You, What The Fuck Are You Doing?*
- Some basic things we'd like to see:
 - Attack Calls – “Sting 1-1 IP Inbound East Range, 1x GBU-38”
 - Weapon Drops – “Sting 2-4, pickle 1x GBU-12 on the North Range, off west”
 - BDA – “Sting 4-1, shack”

TOPIC 5.3 – ATFLIR 101

"What are the capabilities of the ATFLIR targeting pod?"





ATFLIR OVERVIEW



- **AN/ASQ-228 ATFLIR** – "Advanced Targeting Forward Looking Infrared" slewable IR TGP
 - Unlike the LITENING pod, ATFLIR is certified for carrier operation
- Capabilities include:
 - Target Designation
 - Laser Designation
 - Ranging
 - Video/IR imaging
 - Various track modes incl. moving target track
 - A2A and A2G functionality





ATFLIR SETUP

1. Ensure aircraft is in AG master mode
2. Set FLIR sensor switch to **STBY**
 - I. Located on the right hip
3. Box **FLIR** on one of the screens
 - I. Note that AMPCD will display in grayscale, DDIs will be green
4. Monitor warmup progress
 - I. Process takes about 2min
5. When ready for use, pod status will switch from **NOT TIMED OUT** to **STBY**
6. Pressing undesignate twice rapidly will select Velocity Vector Slaved Mode + uncage the camera.





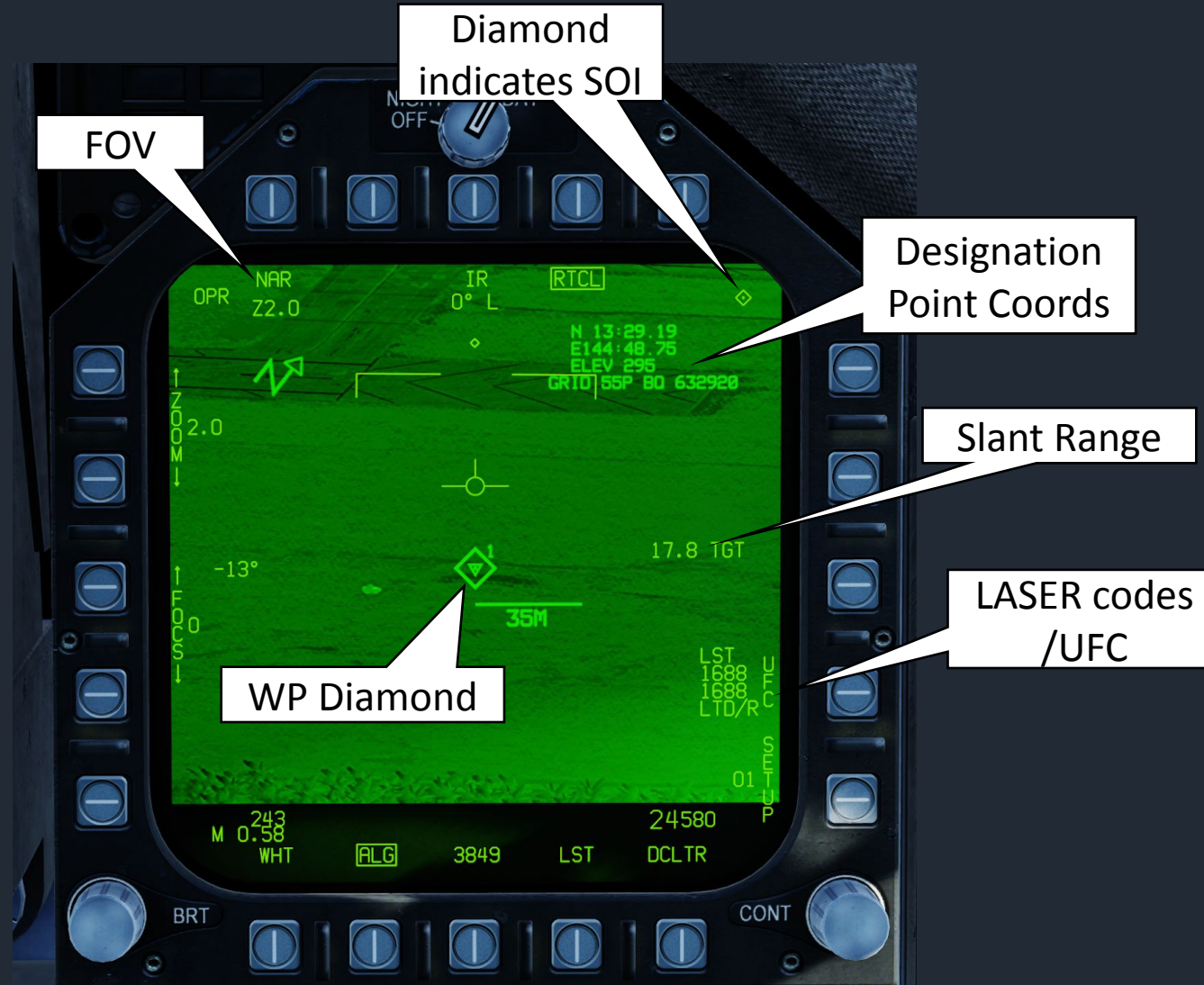
CONTROLLING THE ATFLIR POD



- To control the pod, FLIR must be set as **SOI** – sensor of interest
 - Castle switch in the direction of whatever screen has the FLIR up
 - Diamond in the upper right of the screen confirms SOI
- The **Throttle Designator Controller (TDC)** slews the pod
 - **Antenna Elevation** controls zoom & FOV levels
- Pressing **WPDSG** on the HSI/SA page will slave the pod to the selected waypoint
- The **JHMCS** can also be used to slew the pod
 - Undesignate, castle up to select the HUD, look at target, TDC depress



ATFLIR SYMBOLOGY



Drop De Bomb, Man!

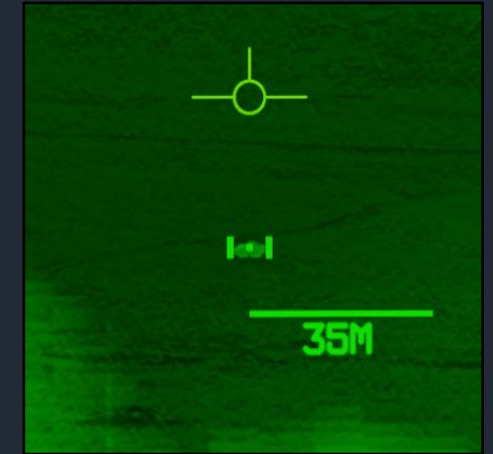


TRACK MODES

- The pod can track targets in a few different ways. The two that are often most useful are **Scene Track** & **Auto Track**.
 - **Scene Track** – Tracks a specific area, generally best for stationary targets
 - **Auto Track** – Tracks a specific moving point, best used for moving targets.
- Castling towards the DDI that's currently displaying the FLIR swaps track modes
- Nose Wheel Steering button will undesignate a tracked target



Scene Track



AUTO Track



LASER



To set up the laser designator:

1. Set the **LTD/R** switch to ARM
2. Press the OSB next to **UFC** to enter desired laser code
3. Press the button on the UFC next to **LTDC**
4. Enter laser code on the keypad, press **ENT**
 1. Generally this will be 1 followed by your board number, i.e. 1637
5. Confirm **L ARM** is displayed on FLIR page
6. Once a weapon is dropped, **LTD/R** indicates the laser is firing
 - Pressing the **TRIG** OSB will allow manually lasing with the trigger
 - **Also note that the laser will need to be rearmed after each drop!**



TOPIC 5.4 – BOMBING IN THE HORNET

"How do I employ JDAMs?"

"How do I employ laser guided bombs?"





BOMBING 101



- Bombing is a very broad topic, and there's no way we can cover it all in one week.
- We're going to talk about some overall concepts quickly and then dive into some of the weapons that we use in the Hornet.
- Questions before we get started?



BOMBING 101



- **CCIP vs. AUTO (CCRP)**
 - Continuously Computed Impact Point (CCIP) is designating your impact point visually and placing the pipper on the target. Press the button, drop the bomb, even if you're off target.
 - **AUTO**, or Continuously Computed Release Point, is "consent to release." The jet knows where the bomb needs to go and tells you when you're in that position. You consent by pressing the button.
- **Quantity vs. Multiples**
 - **Quantity** – the overall number of weapons you want to release
 - **Multiples** – How many sets of bombs dropped simultaneously
 - Ex. Select CCRP, Quantity 4, Multiple 2, 500 ft dist: Upon pressing the weapons release button, this setting will drop a pair of bombs immediately and then another pair of bombs with the second pair released so that it impacts 500 ft beyond the first pair.



BOMB TYPES



- **GP Bomb** – General Purpose Bomb
 - "Dumb" bomb. Not terribly accurate, but quick to employ.
 - 500, 1000, 2000lbs
- **LGB** – Laser Guided Bomb; same bomb, but with laser guidance kit on nose and steerable tail fins. Precise and hits movers.
- **JDAM** – again, same bomb, but has GPS guidance kit fitted for precision strike. Useless on moving targets.
- **Blast frag vs. Penetrator**
 - Blast fragmentation is the warhead we see on TV. Big Bada-boom.
 - Penetrator (I hardly know her!) – hardened bomb casing with delay fuzing to go BOOM under things.
- **Cluster munition** (Rockeye, CBU's)
 - Warcrime, warcrime!
 - Lots of little bomblets in a single delivery casing.
 - Used to destroy things in a large area and/or area denial
 - Variable coverage and density based on deployment release height which is adjustable by the pilot
 - Can be soft or hard target weapons



JDAM



- **Joint Direct Attack Munitions (JDAMs)** are some of the most common smart weapons used in the Hornet
 - Nothing more than General Purpose bombs (Mk82, Mk84, etc.) with GPS guidance packages
- Two main modes
 - **Preplanned (PP)** – Plug known coordinates into the bomb
 - **Target of Opportunity (TOO)** – Use the FLIR to find targets



JDAM SETUP



- JDAMS are set up via STORES page
 - OSB next to **J-82** selects JDAMs
 - Once selected, JDAMs need about 3min for alignment
 - 10 UNSTABLE > 06 MARGINAL > 01 GOOD
 - Once alignment is complete, TIMING indicator will disappear from the page
 - OSB next to **MODE PP** cycles between PP and TOO mode
 - Click **EFUZ** to set up fuzing
 - Generally set to **INST** (Instantaneous)



PRE-PLANNED MODE



PP Mode requires
coords in
***Degrees-Minutes-
Seconds-Decimal
Seconds***
format.

Pre-Planned Points (Deg Min Sec.Decimal-Seconds)			
Target Point	Latitude	Longitude	Elevation (ft)
TGT1 STA2 / PP1	30 17 15.33 N	56 57 49.29 E	5745
TGT2 STA3 / PP1	30 17 15.83 N	56 57 45.54 E	5745
TGT3 STA8 / PP1	30 17 18.49 N	56 57 47.61 E	5745
TGT4 STA7 / PP1	30 17 18.71 N	56 57 43.93 E	5745



PP MODE SETUP

1. Verify bomb is in PP MODE on STORES page
2. Enter MSN page
3. Select TGT UFC
 - I. On the UFC, click POSN
 - II. Select LAT and enter coordinates
 - A. Before entering coords, press 2 for N or 8 for S
 - B. Enter Degrees, Minutes, Seconds, then press ENT
 - C. Enter Decimal-Seconds and press ENT
 - III. Repeat process for LONG
 - I. Use 4 for W, 6 for E





ENTERING PP MODE COORDINATES



4. Press TGT UFC twice to return to main UFC menu
5. Select ELEV on the UFC
6. Select FEET, enter TGT elevation, press ENT





TOO MODE SETUP

1. Verify bomb is in **TOO Mode** on STORES page
2. Enter **MSN** Page
3. Slew ATFLIR to target, TDC depress
 - I. Coords will automatically populate on the MSN page
4. Make attack run just like you would in PP mode, symbology will be exactly the same





LASER GUIDED BOMBS

- ***Laser Guided Bombs (LGBs)*** are the other main precision bombs available in the F/A-18
 - Modified GP bombs with laser guidance packages
 - Various sizes available
- Dropped using an AUTO release
 - Fly towards the vertical line, wait for the release cue, hold the pickle button
- Requires laser for terminal guidance – make sure you don't mask the pod!
 - Useful against moving targets!
- ***Make sure you set up your bomb laser codes through the rearmament menu before you taxi!***



LGB SETUP



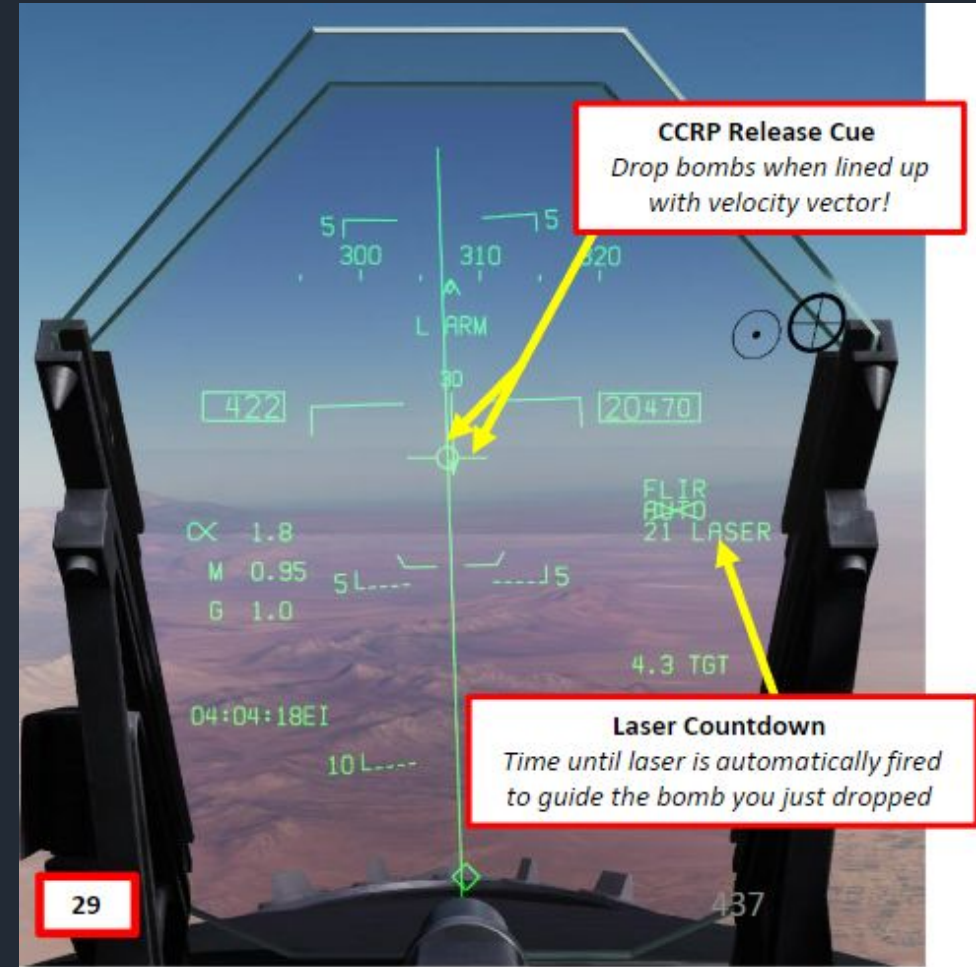
1. Select bomb in the **STORES** page
2. Set mode to **AUTO**
3. Select desired fuzing
4. Verify correct code for **LTDR** on the ATFLIR
5. "**RDY**" under bomb type indicates weapon and pod are correctly set
6. Confirm laser is armed!





LGB DELIVERY

1. Fly towards vertical **ASL** (Azimuth Steering Line) displayed on the HUD
2. Time to release will count down
3. Within 3 seconds of release timeout, hold the pickle button and watch for release cue line – weapon drops automatically
4. Laser automatically fires, indicated by **LTD/R** on the HUD
 - I. Remember not to mask the pod – lefthand orbit recommended if possible
 - II. Remember also that you'll need to rearm the laser before dropping further bombs





WHAT QUESTIONS DO WE HAVE?



Drop De Bomb, Man!