



Zipgun's War College (185th VFS Confidential)

Markpoints for Dummies (and Geniuses)

Lead: "Whoa, movers at my 2 o'clock, flight cleared hot!!!"

Two: "I've got nothing, and where the **** are you?"

Lead: Get your head out [mumble] ...and look at my 2 o'clock, you worthless piece of goat dung!!!"

Two: "Let's see, Mickey's big hand is on the eight and his little hand ..."

Ok stop it right there – this isn't going to end well, except for the enemy. What should have happened?

Lead: "Sending data, moving column, cleared hot!" Two: "Data sweet, targets captured, in hot!"

Gee Mister Wizard, nice feature, how can I do that?? Let's talk about markpoints.

The F-16 can mark GPS positions in-flight and, even neater, it can send them to any or all aircraft in the package. First, we will need a markpoint, they are generated by hitting ICP 7 -MARK (go figure). What happens before selecting 7 is important; it determines what mode will be displayed in the MARK subpage.

First, let's start with a reading from Red Dog's BMS 4.32 Dash-1 (p 64):

The Mark page is used to create markpoints. Own ship markpoints are stored in steerpoints bank 26-30. Mark points can be made from 4 different systems. OFLY (Overfly), FCR (Fire Control Radar), HUD (Heads Up Display) or TGP (Targeting Pod). There are thus 4 sub modes in the MARK page. To toggle between the sub modes, use DCS SEQ. The system defaults to a specific subpage according to master mode and sensor of interest and may make automatic markpoint recording.

1. If the master mode is NAV or AG mode, and the FCR is Sensor of Interest & designating:
=> entering the Mark page will default to FCR Mark. The first markpoint will remain blank until TMS is moved up. At that point, the markpoint is created.
2. If the master mode is NAV or AG mode, and the TGP is Sensor of Interest & ground stabilized:
=> entering the Mark page will default to TGP Mark. As with FCR, the markpoint needs to be manually done with TMS up.
3. If the master mode is NAV or AG mode, and the FCR or TGP are not in use (or not SOI and not designating or not ground stabilized) :
=> entering the Mark page will default to HUD Mark. No automatic markpoint is created.

```
MARK *FCR * 1
MKPT 26
LAT N 41° 25.029'
LNG E 128° 37.945'
ELEV 7133FT
```

```
MARK *TGP * 1
MKPT 26
LAT N 41° 25.029'
LNG E 128° 37.945'
ELEV 7133FT
```

```
MARK *HUD * 1
MKPT 26
LAT N 41° 25.029'
LNG E 128° 37.945'
ELEV 7133FT
```

```
MARK *OFLY * 1
MKPT 26
LAT N 41° 25.029'
LNG E 128° 37.945'
ELEV 7133FT
```

Markpoint must be done manually by moving the HUD mark cue (HMC – a small slewable circle appearing near the FPM in pre-designate) with the cursor (HUD SOI) and moving TMS up. The first press of TMS UP will ground stabilize the HMC and the second TMS-up will save the Markpoint. HMC must be on the ground for correct implementation, pointing at the sky will not work obviously.

4. If the master mode is AA mode
=> entering the Mark page will default to OFLY Mark and an automatic markpoint will be created.

“Blah blah blah ... You lost me – I can read it myself, I just don’t understand what it is saying!”

OK let’s break it down –

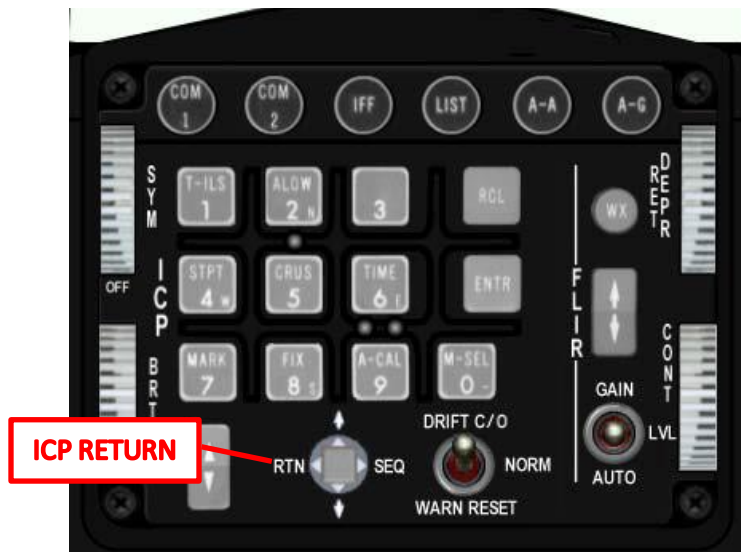
If you are in AA mode and hit ICP 7, the jet assumes you want to mark your current position (Overfly or OFLY) and it will store it IMMEDIATELY upon hitting ICP 7. This is the last scenario mentioned above (4). Not used very often, because everyone should be able to see you in their HSD. But, what if you see a juicy column below and you’re Winchester? Mark it and write down the coordinates for your next flight. Another scenario might be, you are FAC for incoming flights ... this is a good way to get the coordinates and verbally relay them to non-package flights.

Next, it gets a little tricky ... we are in AG mode and now I have 3 options available to me:

FCR – (1) I’ve locked a target in GM or GMT and the FCR is frozen on that point. Hitting ICP 7 brings up the display in the first bullet above (#1). Nothing happens, yet ... YOU MUST HIT TMS UP to store the markpoint.

IMPORTANT: MARK mode “captures” the TMS button until you hit ICP RTN. If you forget to do this, you cannot use TMS to designate a target! Every time you hit TMS UP, you store another markpoint, and another, and another ... Here’s how it sounds on the radio:

“Hey Lead, I stored a markpoint for this sweet column, switched SOI to my Mav’s and now I can’t do anything!! I can’t lock the damn thing on a target!!! Crap, resetting...”

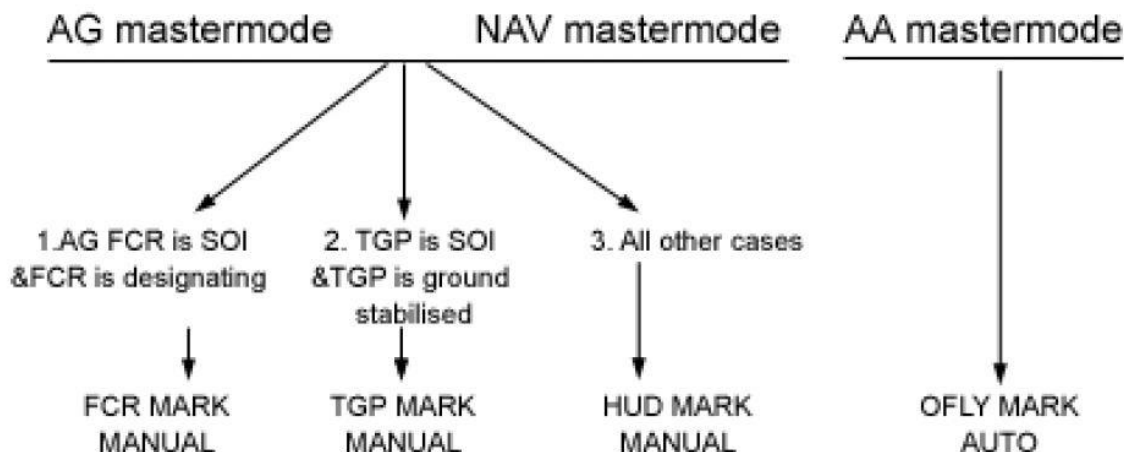


TGP – (2) You’re equipped with fine TGP and you’ve found and ground stabilized a target. Maybe you are out of weapons and you see an SA-9 that needs to be smoked by your #2, or you are FAC for other flights. Lock it in IR Area mode and hit ICP 7 – you now see the display in #2 above. TMS UP!!!! Hit return!!!

HUD – (3) I’m in AG or NAV mode and have not locked a target, if I hit ICP 7 – it puts me in HUD mode. I hear your gears grinding: “what a useless feature, I’ll never use that..” Hold your horses, Frank ... try this:

I have HARMs or Shrikes and a HAD. I lock an emitter (an itsy bisty SA-3) and my #2 has Mavericks. Look in the HUD, there is a circle over the emitter. Mentally note the location, TMS down to release the lock, hit ICP 7, move the HUD circle over the spot, TMS UP, and Bob’s your Uncle. Oh did I mention to hit ICP RTN afterwards????

Here is a recap from the Dash-1:



BIG TIP: after hitting TMS UP (and before hitting ICP RTN) hit ICP 0 (M-SEL) to instantly change to the new markpoint! You’ll love this feature.

OK, I've got all these marks, where are they and what can I do with them? Red Dog to the rescue again – a snip from his Avionics Checklist:

STPT	Assignment
1 – 24	Target Steerpoints (Preplanned Flight route)
25	Default Bullseye
26 – 30	Available for 5 Ownship mark points (Small yellow x)
31 – 50	LINES steerpoints (4 groups of 5 stpts)
51 – 55	Open
56 – 70	Preplanned threats
71 – 80	Available for DataLinked steerpoints (Large yellow X)
81 – 99	Open

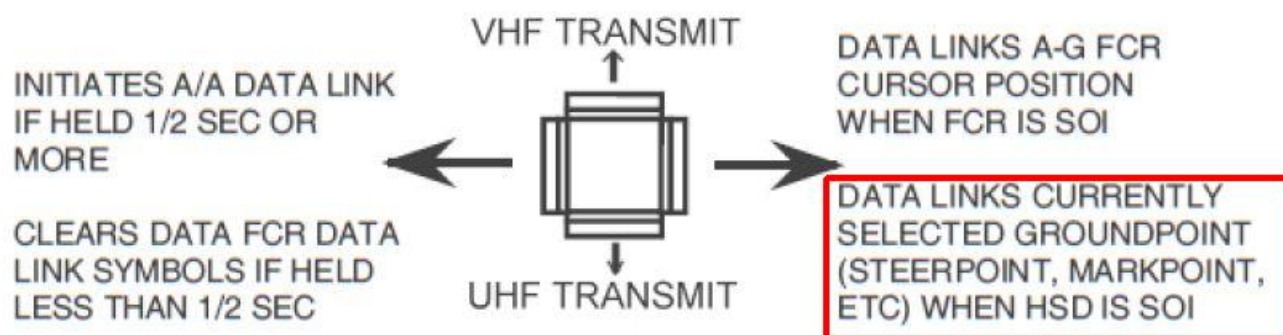
Your markpoints are stored in STPs 26-30 and are displayed as small X's on the HSD. Storing more than 5 points wraps back and starts to overwrite number 26, 27, etc. The tip mentioned above will select the STP number of the markpoint you just stored (makes multiple passes on targets easier to find as you reset).

So I've got these targets stored, let's pass them around.

Most people know that they can transmit a "bugged" target by holding the comms switch to the right (see below – you may have a keystroke or callback defined for this function). This is OK for SA on air targets, but, because it goes away in a few seconds, it is less effective for ground targets. Markpoints can be sent to package members and are stored in 10 spaces from 71-80. They also show up as large X's on the HSD. Much better!!

Here's how:

Scenario one: Mark a fresh juicy target, hit ICP 0, ICP RTN. My STP display says 26 in the HUD and DED. Switch SOI to the HSD, and hit Comms Right ... you've just transmitted the markpoint to everyone in your package. They see DATA and a new big X on their HSD. Let's go get 'em!!



Datalink Switch Summary

Scenario two: I've got a mark point (or three) and I want the 2nd flight in our package to rain fire on them. Hmmm... how's that going to happen?

Reference Red Dog's Dash-1, pg 68:

1.3.16.11 A-G DLINK page



The Data Link pages are used to set your in-flight data-link settings. There are only two selectable options in the Air to Ground page: the transmit address and the FILL option.

The transmit address is your ownship IDM address.

The Fill option determines whether the system stores (ALL) or ignores (NONE) all received data-link steerpoints. When the option is set to FILL, the received steerpoints are stored in the steerpoints databank between #71-#80. When more than 10 IDM steerpoints are received, position #71 is overwritten.

When option NONE is selected, the system doesn't store received markpoints and the pilot gets no HUD and no VMS message.

Hit ICP LIST and then ENTER ... In the DED display, XMT defaults to x0, which is a broadcast to all aircraft in your flight (x is your flight's IDM number). What if you want to transmit the markpoint to Lead in the 2nd flight and not confuse others in your package? Set XMT to 21, switch SOI to HSD, Comms Right, and the message will be sent only to that aircraft. Setting it to 20 sends the message to everyone in the 2nd flight. It's like the difference between a specific email and broadcast to a group alias. Flight 1 is 10, #2 in flight 1 is 12, etc., check the OWN field to see your "local" address. I've found in testing that, unfortunately, the "all package" address of 00 is not functional in 4.3.2.

Still with me? Let's pass along few more tips about the HSD as SOI:

If you set the cursor over a steerpoint and press TMS UP, it will change to that steerpoint.

Aww crap, now he's giving us useless stuff. OK -- what if you were supposed to attack the SA-2 to the left of STP4 .. But then Lead says the SA-2 is out and you should put a Maverick on the SA-3 to the right. "oooo Gosh, I wish I paid attention during the briefing and had written down the PPT numbers for all the threats. Hmmm, was it 56, 59, ..."

Put the cursor over the SA-3 and hit TMS UP, the STP will change to the stored PPT number. While you're at it, put the cursor over the SA-2 and hit TMS DOWN, and the threat ring will go away .. an easy way to sort active threats around the target.

Until next time ...