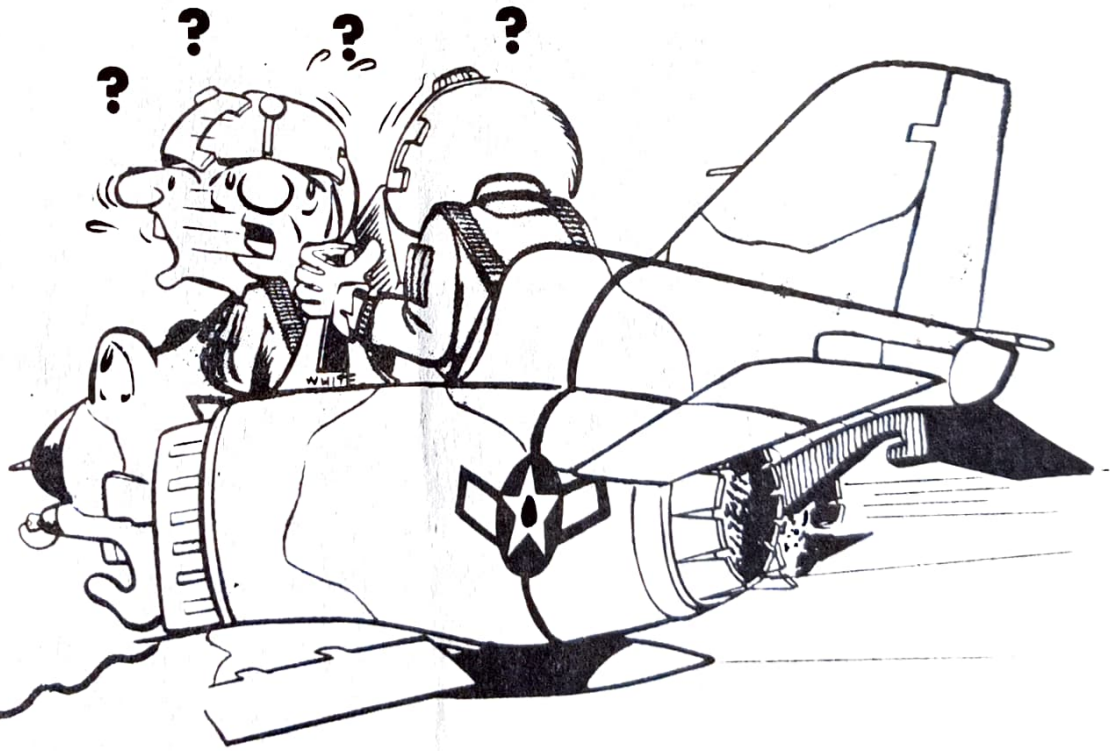
347 TFW
DOW

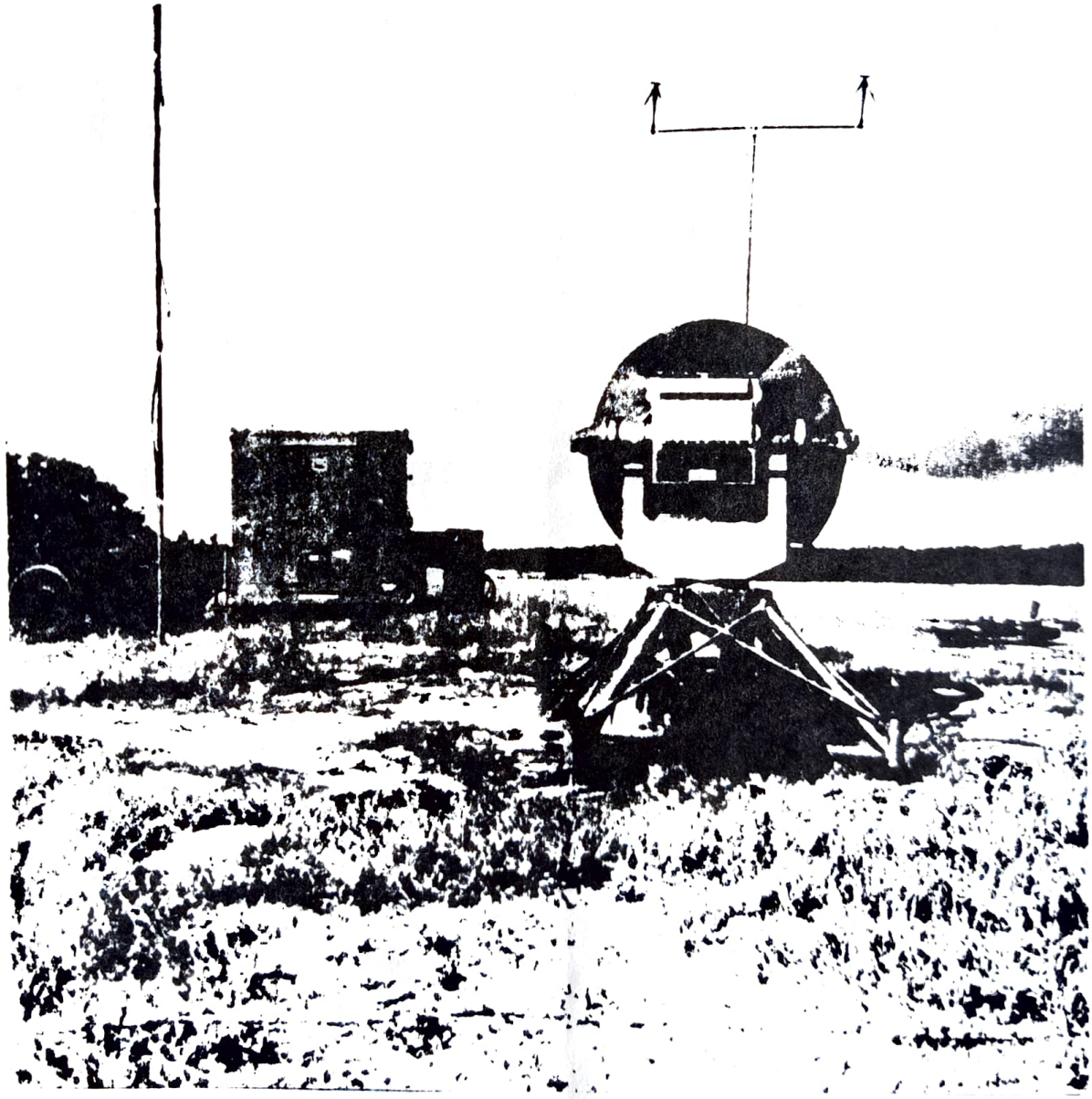
NEW INFORMATION PAMPHLET #13
AIR SUPPORT RADAR TEAM
(ASRT)

BONG -BONG-BONG-tic-tic-Beeeeeeeeeeep



ASRT Background

The Air Support Radar Team (ASRT) uses the AN/TPB-1B Radar Bomb Directing Set (see picture). This provides all-weather day-and-night air support for tactical targets. The set is a highly mobile radar site that can deploy with the ground units. In its current configuration, the ASRT is capable of operating in a low to medium threat environment (emphasis on LOW). So, don't set your hair on fire over being straight and level and predictable in a high threat environment. It is NOT, repeat NOT a high threat environment system.



The set is a Seek Point System. Basic functions performed by the Seek Point System are:

Automatically searches a selected sector of space to acquire, track, and direct beacon equipped aircraft at ranges of up to approximately 120 nautical miles.

Automatically computes guidance commands and transmits these commands, aurally and visually, to the aircrew.

Automatically calculates the ballistic trajectory for the type of ordnance carried; generates and transmits to the aircrew the release point for the ordnance.

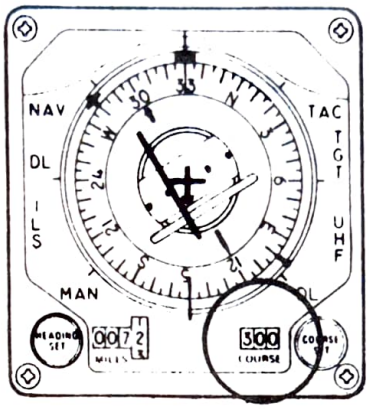
Testing is taking place on the TPB-1C at this time which is looking at further modifications that will allow more aircraft maneuverability and use in a limited communications environment. Follow on uses of this system will include delivery of stand-off type weapons.

This NIP is designed to better prepare you for your first ASRT Flight. Suggest you keep a copy because you never know when those wiley schedulers might grab you for an ASRT sortie.

How To Do It

This system depends on the crew being able to:

1. Use heading readout information.

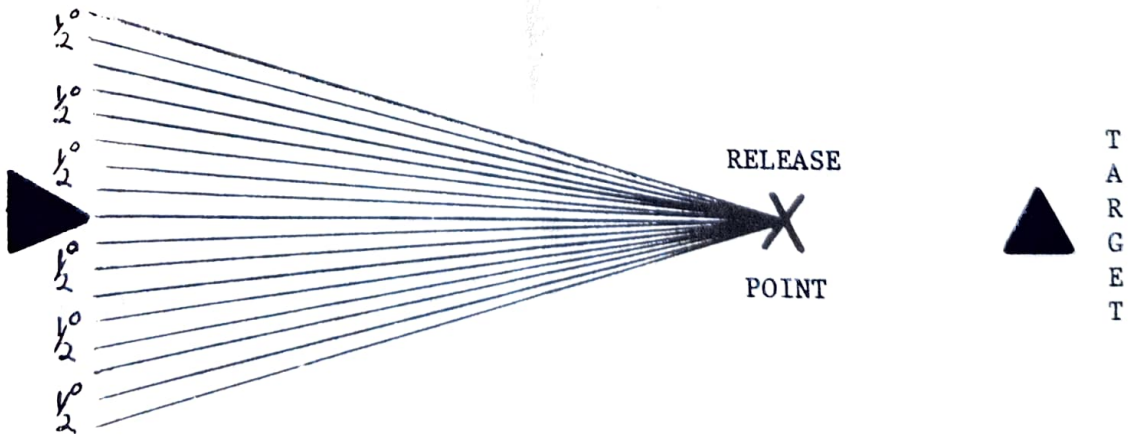


2. Recognize heading correction information transmitted by Aural Tone.

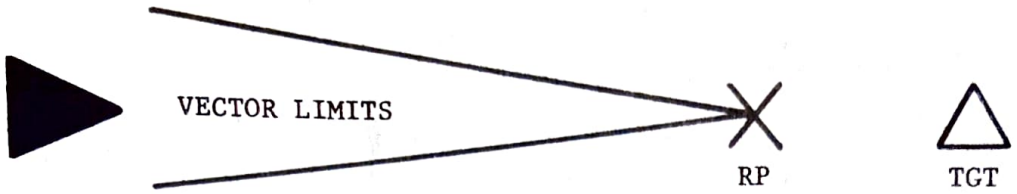
Correct left ● ●

Correct right ● —

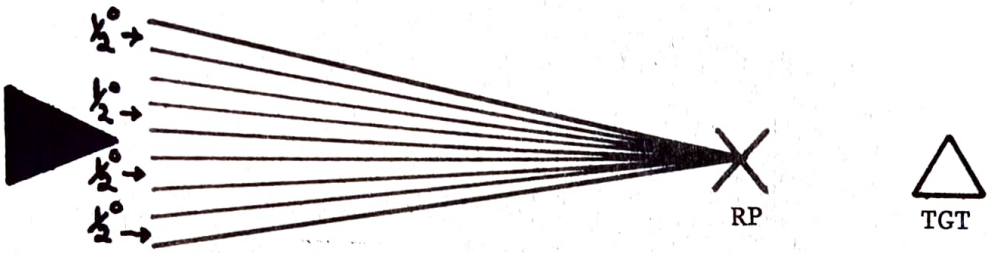
3. Fly strictly defined heading limits.



Imagine, if you will, extending from the release point a flat one dimensional cone. This area constitutes precision approach limits.



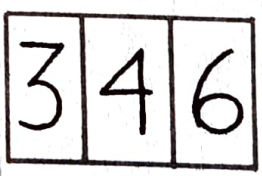
The vector limits are separated into 1/2 degree tolerances. Think about it. If you deviate 1/2 degree you will have to correct.



Well, it isn't as bad as it sounds. You just have to be more precise about your corrections ("That's easy for you to say!")

There are two items that will make these corrections much easier. They are:

The HSI course window.



The aural tones.

Correct left ● ●
Correct right ● —

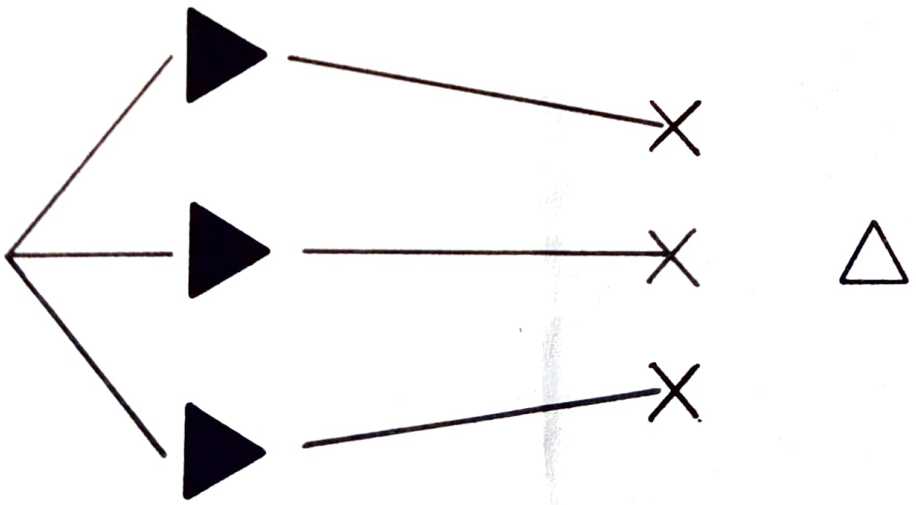
Let's look at the system again. Assume the release point is transmitting a signal to the aircraft.

As soon as the aircraft strays 1/2 degree from the center beam, a different tone is transmitted to the aircraft, a CORRECTION TONE. Remember the correction limits are 1/2 degree apart. So it doesn't take much of a deviation to get a correction tone.

The secret is to stay on line with the target. Then you keep a steady tone. Not until you deviate will you get a correction tone.

There is another element to this system. It is essential to make it all work. It is the RELEASE POINT.

One thing to always remember is that the RELEASE POINT is variable. Once the computer initially picks you up, it computes a release point. Then every time you are required to correct your heading the computer recomputes your release point. All heading information is then predicated upon the new or latest release point. So you don't ever try to get back on the original course. There really is no original course because you get a new course each time the computer recomps. (See figure, page 12.)

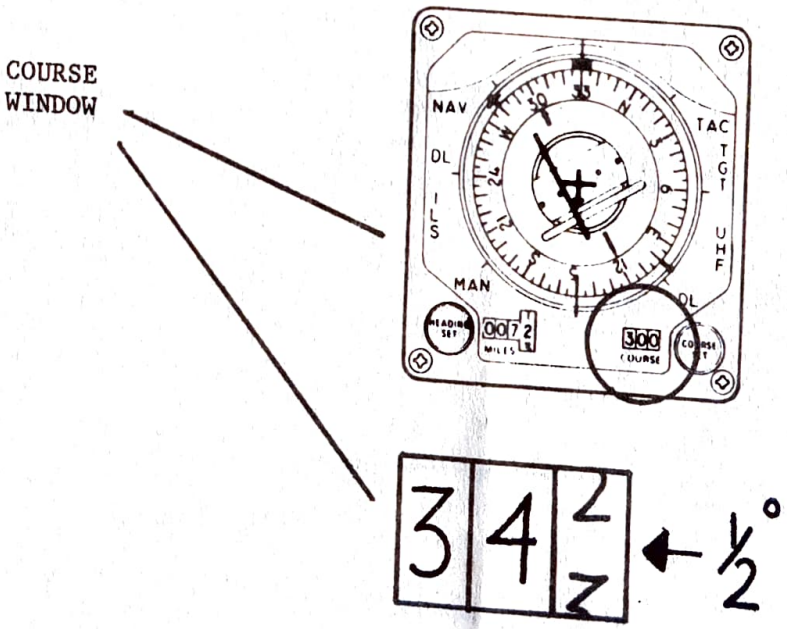


1. Release points are variable.
2. Aircraft direction/heading is variable.
3. Only the TARGET remains stationary.

Therefore as your heading changes your release point will also change. With each correction that you make, normally 1/4 and 1/2 degree, the course to the target is recomputed. (See figure, page 11.)

The ASRT will transmit correction information and recompute your release point. This does take time however. You must learn to condition yourself to wait 5 seconds, <u>that's 5 seconds</u>, before you can expect ASRT to transmit correct heading information. Your aircraft slides for approximately 3 seconds before it accepts the new heading plus the tones come every 2 seconds, for a total of 5 seconds. Approximately 5 seconds passes before you get accurate feedback from the change in heading.

OK! Now let's talk about actual corrections. The course parameters are finite. When you are directed to make a course correction, you have a 1/4 to 1/2 degree tolerance. That's right 1/4 to 1/2 degree! So needless to say you must make minor corrections i.e., "just breathe on the stick".



Even though you are familiar with the course window, you need to know what a special part it plays in the ASRT run. Remember when we talked about that 1/4 and 1/2 degree correction. Well this is the indicator that you will use to determine those small corrections.

Since the outboard most idgit is in whole number increments it really isn't designed to be used for less than whole number heading changes. But we can hack it. It's a simple task of recognition to use the window for fractional heading changes.

Well you've heard a lot about these tones, now let's discuss them at length. First of all there are two types of tones.

CORRECTION TONES

RELEASE TONES

The correction tones provide guidance for LEFT CORRECTIONS (• •) and RIGHT CORRECTIONS (• —) and come in two second intervals. There is also a STEADY TONE, but it will be easy to recognize. It means you're on target.

You might be wondering how you can tell how far you really are from the STEADY TONE. Well, not to worry. ASRT thought of that too. The farther you are to the left or right of center, the HIGHER THE PITCH of the tones. So needless to say the closer you are the LOWER THE PITCH of the tones. After you have heard these CORRECTION TONES a few times you will be able to distinguish between pitch changes and then make applicable corrections. A point worth emphasizing is that "turn" as it is used here is not in the classical sense. You really don't turn when you change heading by a 1/4 to 1/2 degree.

Remember if you hear a STEADY TONE ———, hold your heading. Keep it to within 1/4 to 1/2 degree. Once the computer catches up with where you are (approximately 5 seconds) you might get a correction, but remember 1/4 to 1/2 degree, no more.

So much for correction tones, now let's talk about RELEASE TONES. When you get to 5 seconds from the release point, the release tones begin. They are:

BONG-BONG-BONG-TIC-TIC-Beeeeeeeeep

Don't laugh! These are for real. There are a couple of cautions associated with these release tones.

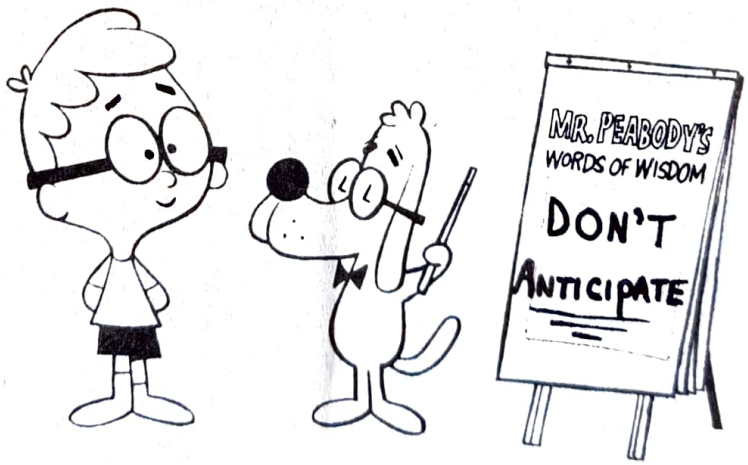
DON'T anticipate them.

DON'T get anxious when you hear them begin.

DO wait for the Beeeeeeeeeep.

Once you hear the release tones the first time you probably won't have any trouble recognizing them the next time you hear them. The BONG-BONG-BONG is really a preparatory command. The tic-tic- may or may not be recognizable. The Beeeeeeeeeep is the command of execution. When you hear the beginning of the Beeeeeeeeeep-----PICKLE. NOT BEFORE. The system is designed to compensate for the time it takes you to HEAR, RECOGNIZE, DETERMINE what to do and then DO IT.

SO DON'T ANTICIPATE



OPERATIONAL INFORMATION

TONE SHIFT OR SKIP: The system, such as it is, can cause some confusing phenomena. The first of which is called, "the tone shift or skip". If you have a cross track (tones changing pitch) going, you can go directly from right corrections to left corrections without, semingly, passing through the center (steady) tone. What happens is a recomputation that shifts the release point (figures, pages 12 and 13) and therefore the tone pattern. This skipping is most noticable when over-corrections (more than 1/2 degree) are made or the 5 second waiting time between corrections is not being observed.

MASKING: Antenna masking can cause the system to breaklock. In the F-4 the antenna is in the door 19 area behind the WSO and slightly right of the center spine. If the ASRT is off the left wing and you turn right, the beacon is blanked out (masked). The computer does compensate by holding on for 8 seconds before breaking lock. If it does lose your beacon for 8 seconds you will have to be relocated. The system takes time to relocate you after a break lock. If it happened at one minute to go, you would probably be back in operation at 30 seconds to go. It is pretty tough to get settled down with that short of time to go. The secret is to know when you will MASK the beacon, and don't leave your wing up for more than 6 seconds.

WINDS AND DRIFT: Winds at altitude will cause your start and finish heading to be different. Flying "heading only" will cause you to home toward the target. Flying a ground track can be used but the recomputation and moving Release Point will probably cause confusion. Knowing your drift and applying it to the final vectors, prior to concentrating on heading, can get you started smoother (less initial correction). Let the system do the wind work for you.

TYPICAL MISSION

(Narrative)

1. PREBRIEF: 24 hours prior with controller, to pass and receive mission information, range, IP, altitudes, freqs., etc.

2. RANGE ENTRY: Turn on beacon approaching the range to get it warmed up.

3. RADIO CONTACT: Controller is the range officer.

4. IP VECTORS: Navigate on your own to the IP if you are not "locked up" yet. If locked, the controller can direct you verbally or via the TACAN needle. ASRT will use TACAN CH 64.

5. FINAL TURN: Verbal vectors or TACAN needle to final heading.

6. ARMING: Prebriefed procedures will be followed.

7. FINAL CORRECTIONS: The controller will give verbal vectors until approximately 60 seconds remaining. (You should be within two degrees of final heading.) You will fly guidance tones for that last 60 seconds.

8. WEAPONS RELEASE: At 5 seconds to release, the guidance tones are replaced with the "release tones". Pickle your weapon(s) on the release signal.

9. SWITCHES SAFE: Prebriefed procedure.

10. REPOSITION: Turn as directed to the next target.

11. DEBRIEF: Call your controller for mission debrief after landing.

SPECIAL CONSIDERATIONS

1. The training usually takes place on controlled or tactical ranges. Presently, range C-62 is used for HOT profiles and water ranges W-1 and W-2 are used for DRY profiles. (See page 14.) Airspace may be a problem, 60 degree bank turns are recommended for repositioning from one run to the next. This reduces the airspace used, fuel consumption, and range time utilized.

2. After entry to the range using the established procedures, the ASRT controller is the range officer. A ground range officer, if required, must clear you prior to tones (60 seconds). You may not be able to hear him through the tones.

3. To stop the tones, in the event of an emergency, just turn off the beacon, the tones will stop in 8-10 seconds.

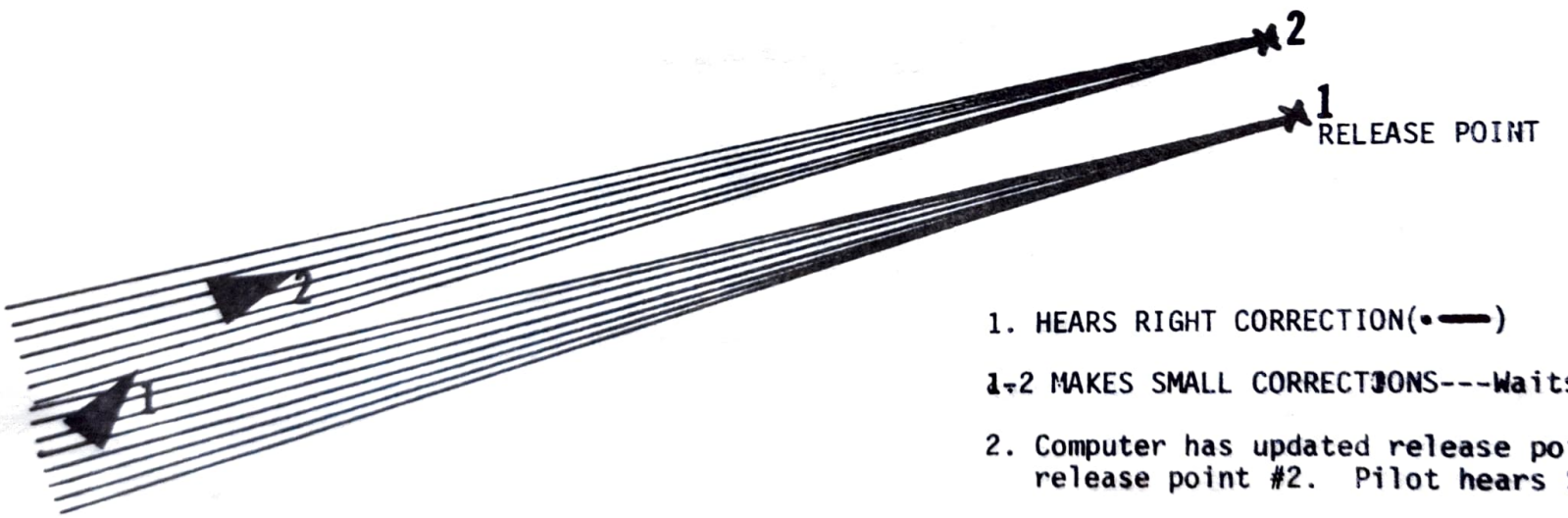
4. If the range is EW capable, the mission lends itself to using the time during and between ASRT runs for ECM training.

5. Bomb scoring may or may not be available. Air scoring may be necessary--check for time of flight for your delivery altitude and maneuver appropriately to observe the impact.

6. Because the ASRT system may use your TACAN system for guidance, plan on other methods for range navigation.

7. Abort criteria for individual runs will be handled by the computer or the controller. A window or gate is set in the computer that establishes the maximum allowable lateral miss distance at ten seconds to release. If not within the gate, the tones just stop. The controller can abort you anytime in the run down to one second. The aircrew will be able to turn off the beacon or just "not pickle" if they don't feel right about the run.

RECOMPUTATION



1. HEARS RIGHT CORRECTION(•——)

1-2 MAKES SMALL CORRECTIONS---Waits

2. Computer has updated release point #1 to release point #2. Pilot hears Steady Tone.

fig. 1

TARGET/RELEASE POINT/AIRCRAFT RELATIONSHIP

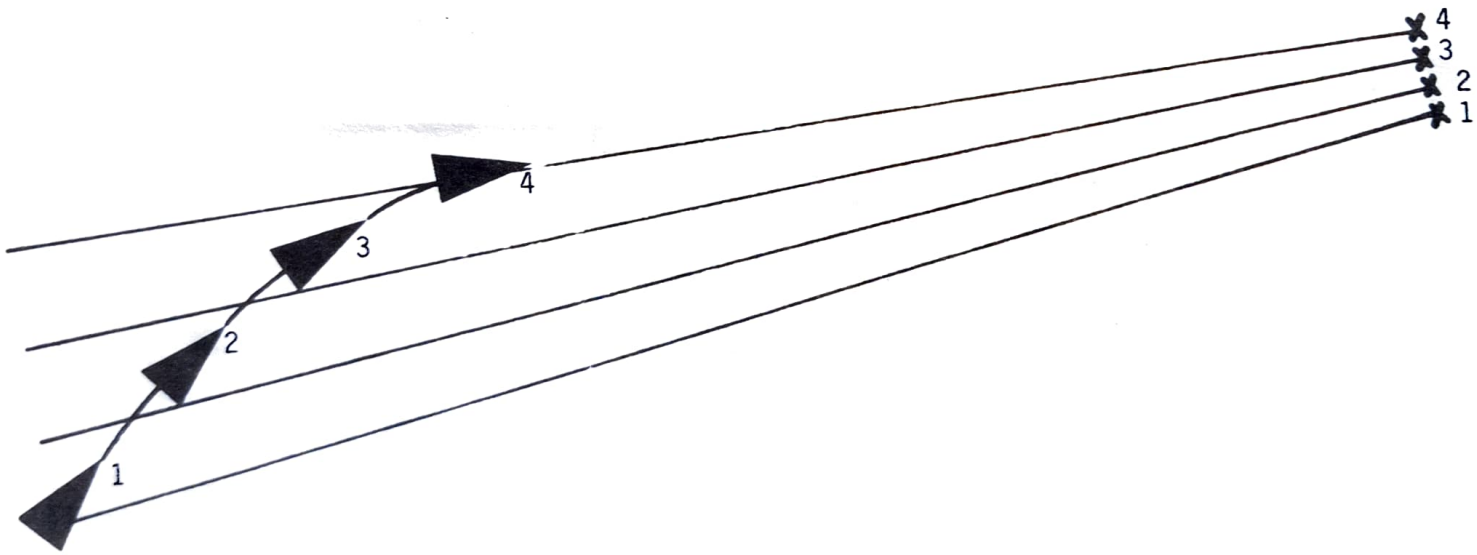


fig. 2

Eglin Local Flying Area