

PART 2 PROCEDURES.

Read the progress report below together with the Scenario as a demonstration of basic plotting and classification techniques in manual sonar using the visual aid kit and progress chart.

INTRODUCTION.

The procedure outlined below will demonstrate:-

1.PROGRESS CHART.

Use of the Progress Chart to log contacts, show action taken, classify and filter.

- a). In a dense contact environment we must be able to select and focus only on that which is essential to our purpose. We filter all contacts sidelining all that is not relevant. Pan for gold. What is relevant is mission (or ROE) specific; for example in this scenario we are tasked to find a Russian submarine.
- b). In addition to this prime objective as we must assess any neutral or friendly platform which could be at risk if we have to engage the sub.
That is also very relevant.

Our aim is to build-up a picture and transfer the relevant information to the NAV map.

2.VISUAL AID PLOTTER.

We shall demonstrate the conversion of the SW linear display to an Akula-like one.

You will rank pins on the plotter to :-

- a). Establish SPH and TA contacts. Attempt classification.
- b). Merging - merge above, where able, to form a Master contact = truth.
- c). Stabilize - establish the real TA contact eliminate the ghost.
- d). NOBB - Track, monitor, classify and ultimately assign BB tracker.
- e). Classify neutrals, and relevant Targets and Civilians/Friendlies at risk

3. POINTERS.

- a). Watch out for platform with lower frequency NB lines that match those of subs., like fishing boats (Civilian Mini-sub., Trafalgar UK, Harushio Japan etc.)
- b). Examine closely NB freq. lines. Do they mask something below or behind ?

4. SIMPLIFICATIONS

and assumptions made to aid instruction :-

- a). The Seawolf is the platform of choice here because the TA is its prime sonar tool and the use of it is not intuitive.
- b). You are fully familiar with the location, purpose and procedures of all sonar stations. That all auto assistance except TMA is off and Truth is off.
- c). We shall use the Demon only, in this scenario, as an aid to classification.

Cont.

KIT SPECIFIC TERMS

CHART - Make an entry on the Progress Chart.

PIN - Place a pin on the bearing radius of the Plotter.

RANK - Add further pin/s to the radius of the Plotter.*

NOBB - A contact in NB which has no matching BB contact (Yet!)

BAT - Bind Area Tracker – A turn calculator showing the baffles at current heading

BOOMERANG - Marks the current baffled areas – a reminder to check after turning.

SCENARIO – SVAK (Sonar Visual Aid Kit Dive.)

PREPARATION.

If you have not already, set your monitor display properties so that you can clearly see the NB contact in the ' Monitor Check' display (A bmp. Attached to the Tacman download docs) See SubGuru.

BRIEFING.

You are allocated a Seawolf on an ASW mission.

You must locate and track a Russian submarine transiting the area

39-45N 012-21E and 39-06N 013-16E. ROE. - You must not initiate any preliminary launch procedures nor utilize a UUV - all of which may be interpreted as hostile intent. (Stay out of Fire Control)

START the simulation. (Note my reported bearings are from a test run - yours will be close and remember that over time bearings drift - so you must approximate)

NAV - Center on your SW and zoom in. Check surrounding depths ensuring safe depth under keel will persist.

CONTROL -Stream the Starboard TA. Charge your air.

NAV - Plot the search area. Note your position is at the southernmost reaches of the search area, so will filter here before looking more northerly.

SONAR- Check SSP PC it and the layer. Launch probe to check (Return later)

NB - SPH indicates 2 contacts PC: - Bearing 112 Class Oiler Bearing. 291 Class Freighter.

Cont.

BB - SPH Both contacts present - assign trackers Both have WAA ranges so RL.
CHART – Tracker/Reference no./Bearing./WAA/ Tick RL box. Finally enter the platform details under Classify.
PIN - Place blue markers for both SPH brgs. RANK Green Class. pins

BB - Switch to TA - both contacts show on the same SPH brgs. - allocate trackers.
Chart: - Under Merge enter new TA Refs.
PIN - Place 'Merged'
NOTE - a new contact/s has shown in BB TA (baffled by SPH) Brg 203 or 154
Go to NB – its a Cruise Ship. But which is the real contact and which ghost -
a turn will clarify establishing the STABLE, but meantime -

CHART- 203/154 Cruise Ship Put a ? in 'STABLE' (If it helps PIN TA brgs)
Remember in other scenarios you may come under fire - at any point when you lift-off you should be able to regain situational control asap.

PLAN TURN

Purpose- a). Check TA baffled area (Blind area) b). Stabilize(as above)
c).Improve TMA (not here) d). Throw hostiles TMA.

Pre-Turn a.) Pin 'Boomerangs' to Plotter showing SPH & TA baffled areas.
b). Check you wont baffle any contacts - Use the BAT. My preference is for a 60 deg. initial turn to fully checkout the TA baffle.
c) Select a speed of 12 knots (avoiding washout here) When speed achieved -

EXECUTE TURN - Dial-in 060 (Timing - the bearing will be reached in mins. 1-20s
But the TA will take until 3 mins. to straighten. An increase to 19 kn would reduce time to turn by 34% without loss of data) You will have plenty of time to go to -

NAV -Enter in your classifications of the Oiler and Freighter. Then go to Sonar -

BB -Wait for the TA to start turning and watch 203/154 - 205 stays put - its STABLE.
When TA straight - assign tracker and note WAA. And RL. (Rapid Locator)
CHART- Enter all details. Tracker, Contact ref. WAA range and Tick RL.
PINS - Yellow STABLE and a green CLASS.

NB - Now lets examine closely the TAs baffled area (Boomeranged) 330 - 030 deg
Three contacts show (at present) 05/115 is the Oiler but you have 2 new contacts -
350/129 - Freqs. 50khz, 125 khz You get a Preliminary.'Class'. - Fishing Boat ?
17/104 -'Class' Car Carrier (Harpers Ferry shows ?) Baseline 60 khz.) Not Russian !

Cont.

BB- There is a contact here only for 17/104 There is none for 350/129 - it is a NOBB !
Did you notice the SNR reading go from 0 to 1 ? You need a turn to Stabilize 17/104
CHART - Both contacts information and highlight the 'NOBB' section.(? in Red ink)
(Pin all if you need a memory jogger)

PLAN TURN

Use the BAT to pick a course aiming also to close distance North - Is it a fishing boat?
TURN - Order 300 deg.to close (Baffling Freighter which is no problem as it is heading NW) Boomerang the baffled areas.

NAV - Bring all up to date.

NB – During the turn you need to monitor the NOBB for the Stable contact -
(see TimmyG00's Tacman for the technique) and keep an eye on 17/104.
Result - 347 and 17 are the stable contacts.

BB - Assign tracker to 17 (No WAA shown – a range clue !)
CHART - Enter all under Classes.(rub out 104 and 129) Tick 'Stable'
Enter the 17 Frequencies and a place a FB (Fishing Boat) ? Under 'Class'
PIN -17- Blue pin NOBB and RANK a yellow 'Stable' pin Also place a green
Class pin for the apparent Harpers Ferry (Car Carrier)
347 – Place a white TA pin and RANK a yellow Stable pin
(Do not Class - as you're not sure – is it a FB (?)

NB - You have been continuously monitoring all bearings of NB haven't you ? (LOL)
Well now is your chance ! You are looking for a Russian sub so let's set a low frequency line at 50 khz . Choose the 300 range as it's quicker/easier to set.
Now take your time to scan very slowly. Can you find it ?
At 23/217 fighting the 60 khz CarC./ HF line is a very faint 50 khz contact.

BB - Check it out - no BB contact shows - NOBB So now you have two POSSUBS !!
Look for a SNR twitch from 0 to 1 – this might be your first indicator !
CHART - NOBB the 50 freq. Contact Highlight 'NOBB.' Place a ? in CLASS. (FB?)

TURN

Use BAT to assess. Set a 60 degree course (Need to close and avoid baffling)
Boomerang.(Monitor NB see below) -

AND DIVE

If either of these contacts are subs - are they on the same side of the layer ?
Set a dive level of 60 ft below layer. (Result - no change)

NB - Monitor 23/217 for Stable - and its 23. CHART – Result .
PIN – A white TA pin Rank blue NOBB and yellow Stable pins.

Cont

FILTER

You now have 2 Possubs at 23 and 347 (FB ?) Also a 'Relevant' Harpers (Car Carrier) that may be vulnerable. (RELEVANT !)

BB - As you close keep trying to assign trackers to the NOBBs. With 15 -there is no joy but soon 347 assigns. Eureka ! There is still no sound in the headphones ?

BUT NOW WE HAVE DEMON.

USNI - Fishing boat 4 blades- TPK 25. Russian subs. Have 6 or 7 blades TPKs 7 or 10

DEMON-Select the ref for 023 and select a Freq. Setting of 120. Demon shows 4 blades with bright strong returns offset well from the left margin of the display. A TPK of 25 gives a speed of 4 knots. You are looking for fainter sub returns closer spaced and nearer the left margin – possibly the full 6 or 7 but more likely, at higher distances, less. Lets check the TPK – Russian sub. TPKs of 7 or 10 they give speeds of 15 and 18 knots. You can conclude that this is a fishing boat.

CHART- Place a ? in WAA. Classify as FB. Remove NOBB. Put a ? in Target.

PIN - Place/rank a Classification pin on the plotter (green)

Now you have a rank for this target of white, blue, yellow and green pins -

PIN HISTORY – (See Photo 7)

(Photo of cumulative pin position at this point in time)

FOCUS

Only one NOBB at 023 deg remains a POSSUB - is this our target ?

The only way we can find out is to close. Now I leave you to do this -

- a). Increase speed and choose a heading carefully with BAT
- b). Slow now and again to update your sonar/TMA and monitor ITA for Possub turns.
- c). Calculate the distance before you turn to clear the TA baffle.(Is he closing too ?)
- c). TIP - You may need to get within 9 nm to classify this contact. Are there others ?

CONCLUSION

I hope that this scenario and the progress and plotting techniques help you to grasp an overall picture of what you are trying to achieve in manual sonar.

Bellman.

5.7.05.

Acknowledgement.- I am most grateful to Molon Labe for vetting these procedures

Cont

APPENDIX.

PIN KEY

White	- TA
Blue Card	- Sphere
White on Blue	- Merged
Yellow	- Stable
Blue	- NOBB (NB with no BB)
Green	- Classified
Red	- Target

KIT TERMS

CHART - Make an entry on the Progress Chart.

PIN - Place a pin on the bearing radius of the Plotter.

RANK - Add further pin/s to the contacts bearing radius on the Plotter.

NOBB - A contact in NB which has no matching BB contact (Yet!)

BAT - Bind Area Tracker – A turn calculator showing the baffles at current heading

BOOMERANG - Marks the current baffled areas – a reminder to check after turning.

SIMULATION TERMS

SPH - Spherical Array.

TA - Towed Array.

WAA - Wide Aperture Arrays Range.

RL - Rapid Localization, (Send range to TMA only if tracker assigned)

NB - Narrowband Sonar station.

BB - Broadband Sonar station.

ITA - Intermediate Timed average.

SNR - Signal to Noise Ratio.

