

ARK-15 ADF in the YAK52

The ADF system in the YAK52 is a little awkward to get your head around. You need to first understand the philosophy. The YAK52 is a short ranged aircraft (180nm max). It was designed to fly in a limited area of operation. Russian practice is to place NDB/Markers along the approach path of the main runway. The furthest one out being the “Outer marker” and the closest in being the “Inner marker”. These typically support an ILS as well to provide a distance reference to those on the ILS. It was also Russian practice that both runway directions each had a set of markers and were on the same Freq though only one runway direction in use at a time.

Understanding this adds some sense to the YAK52 ADF setup. A total of 8 NDB's can be selected in the YAK52. The tuning of the desired frequency is a maintenance task (In the sim in the Mission Editor) and is done before flight on a control unit located in the fuselage behind the rear seat. So once configured that is all the pilot can tune. Using the Channel Selector with 4 positions.

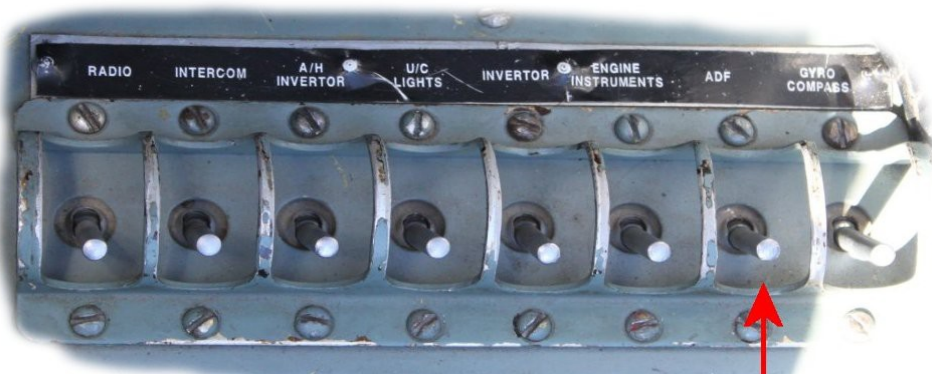


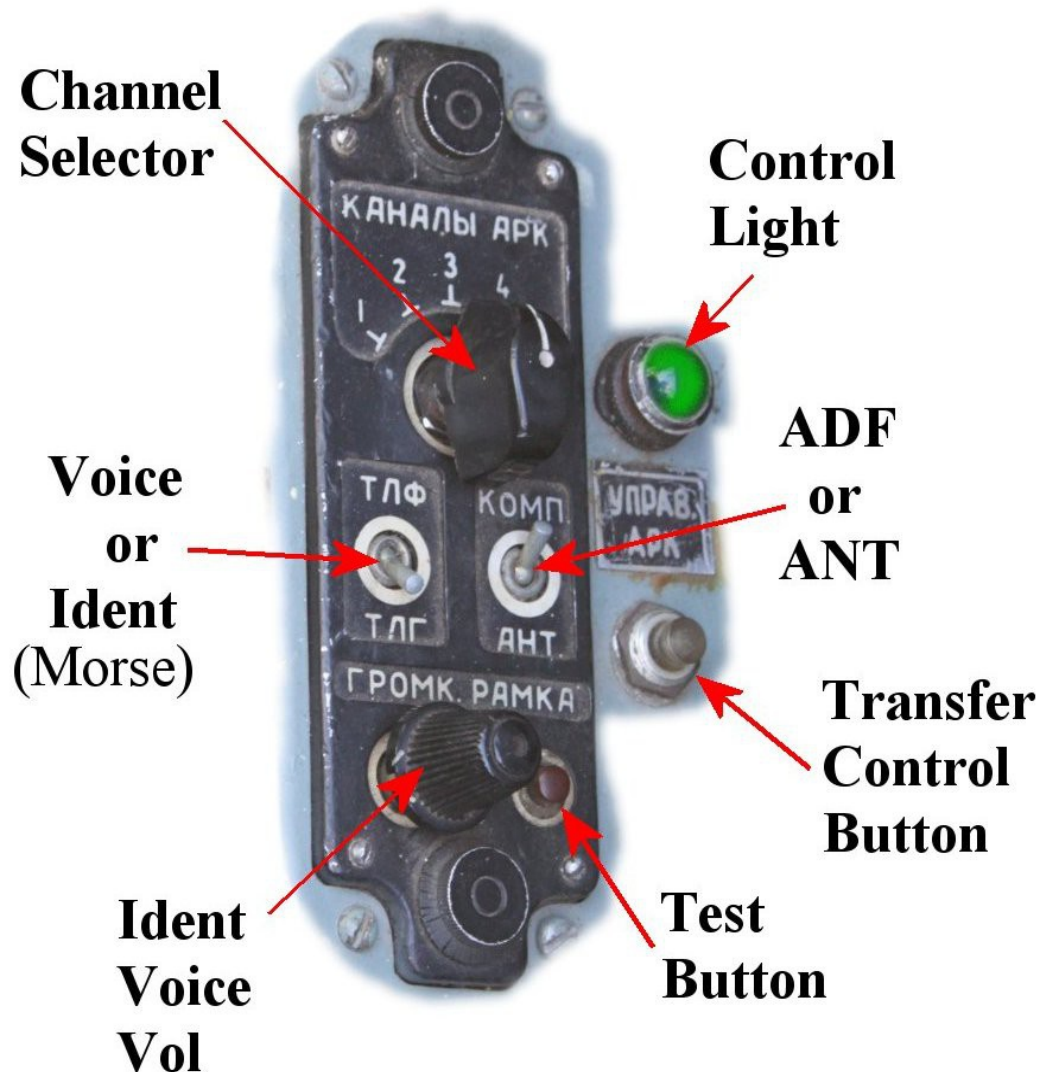
Recall the concept of Outer and Inner. With this in mind Each Channel has 2 Frequencies assigned to it. The pilot selects the desired Channel with the ADF control unit, then uses the switch on the coaming to select either the “outer” or the “inner” station.

Outer logically being selected with the switch to the Left ... pointing “outside” the cockpit, and the “inner” with the switch pointing “inside” the cockpit. There is nothing to stop you simply presetting up to 8 NDB's as you wish. You just need to know what Channel and what switch is required for each NDB. Remember each Channel can have 2 NDB's assigned to it.

In the cockpit

The ADF is controlled by the ADF power switch on the left console and the ADF control unit on the right console. When the Power switch is turned on the Green light on the ADF panel is illuminated. This light directly indicates which controller is operating the ADF front or Back. The small button behind the light transfer control to the other cockpit. On initial turn on the front cockpit control panel should be initially in control. (Bug in sim at present *Sim Bug1)





The Channel selector labelled 1-4 selects the required channel to be used. Remember up to 2 NDB's can be assigned to each channel.

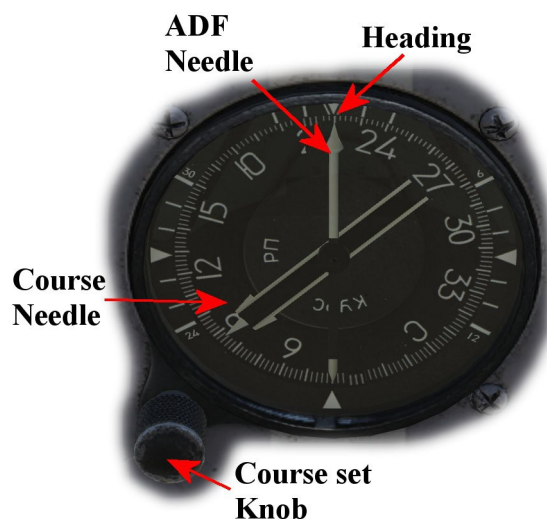
The two Switches behind the the Channel selector Control Interphone input from the ADF and operating mode. The Left switch determines what you hear from the ADF. In the rear position you will hear the NDB morse ident. In the forward position you will hear voice modulation if it is being used. The Volume rheostat controls this voice or Ident volume. (Bugged at present #Sim Bug2)

The outer switch selects Between ADF mode or Loop mode. The usual mode is ADF with the switch in the forward position. In this mode the ADF single needle will point to the NDB on the main Compass/RMI. This is how it is normally used. The Rear position is the loop mode in this position the ADF single needle will show the current direction of the ADF antenna.

The Test button causes the ADF needle to rapidly move to the 160 deg position on the compass/RMI. When released it will return to its previous position.

Compass/Radio Magnetic Indicator (RMI)

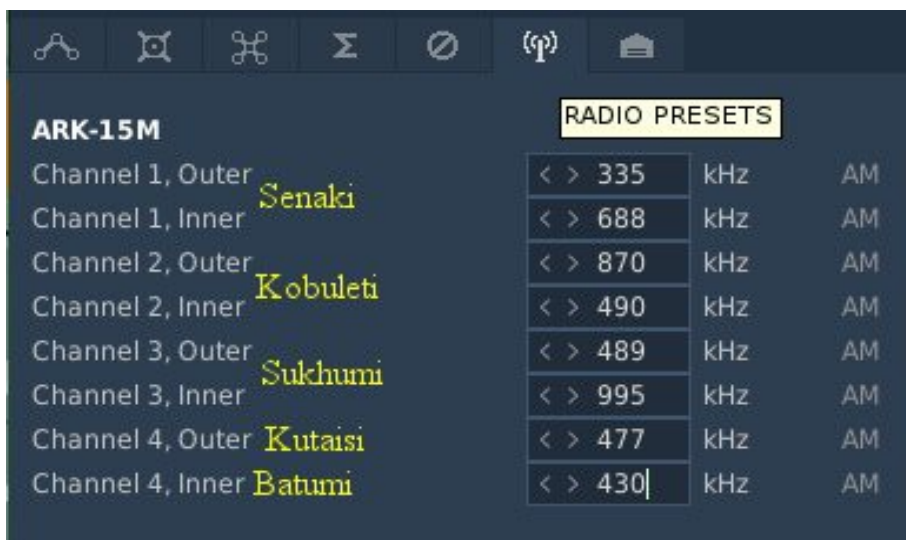
On the front panel displays either Gyro Magnetic heading or Straight Gyro heading as selected by the GMK-1A panel. Usually it always displays Gyro magnetic heading. Heading is read against the small triangle at the 12 P clock position. The dual needle is a pilot selectable Course needle. You set the desired course by rotating the knob near the RMI. Typically you would set the desired course into an NDB station ... like Runway heading.



The single needle will point to the tuned NDB. Get the NDB needle inside the Course needle and you tracking inbound into the NDB on the required course. Bugged at moment (%Sim Bug3)

Using the system

Lets say you are based at Senaki for training and will be operating in that area. Your Home airfield will usually be in Channel 1. Looking at the data Senaki uses an outer NDB freq of 335Khz and an Inner freq of 688khz. You enter these in the ME as shown.



The other airfields you may use are Kobuleti, Sukhumi, Kutaisi and Batumi. You decide to tune

Kobuleti to Ch 2 Outer 870Khz, Inner 490Khz

Sukhumi to Ch 3 Outer 489Khz, Inner 995Khz

Now Kutaisi and Batumi only have a single NDB so you can put One in Channel 4 outer and the other in Channel 4 Inner so you presetting

Kutaisi Ch 4 Outer 477Khz

Batumi Ch4 inner 430Khz

So you have preset the maximum of 8 NDB frequencies for use in your training area. Doing this in the Mission Editor simulates doing so in the aeroplane.

You would then have a data card either in the aeroplane or you kneeboard that might look something like this:

Channel	Station	Outer (Ident)	Inner (Ident)	QDM
1	Senaki	335 (BI)	688 (B)	085/265
2	Kobuleti	870 (KT)	490 (T)	064/244
3	Sukhumi	489 (AV)	995 (A)	290/110
4	Kutaisi	477 (TI0)	//////////	068/248
4	Batumi	//////////	430 (LV)	120/300

Flying

You are out in the training area and want to go home to Senaki. Weather is not super so elect to use the ADF system to get you home and fly a twin locator approach. The Duty runway is Rwy 09. So you want to get to the Outer NDB associated with Rwy 09 Senaki. You select CH 1 and the Outer/Inner switch to Outer. The ADF needle turns to point at Senaki outer NDB/Marker. You check the ident switch is set to Ident and turn up the vokume. You hear the Outer NDB morse ident it checks out so you are sure you are tuned to the Senaki Outer NDB Marker. To help your tracking you adjust the course pointer so it sits over the NDB needle. You track towards the NDB.

You know the runway course in Senaki is 089. As you approach the NDB you adjust the course switch to 089. Then depending on what you want to do you can position yourself to intercept the 089 course inbound to the outer NDB/Marker. As you fly over the outer the NDB needle will spin around, you simply flick the Outer/Inner switch to Inner and the inner marker is selected, the NDB needle spins around to point at the inner NDB/Marker.

Of course in reality you would have specific Altitudes and rats of descent to fly to get to a landable position by the inner marker.

*Sim Bug :1 To get ADF powered turn on ADF with Power switch in front seat Left Console. Jump in rear seat press ADF Transfer button ... Green ON light comes on. Jump in front seat press Transfer Button note Green light comes on. (Should default to this on turning main ADF switch power on)

#Sim Bug 2: KOMN/AHT switch and TN0 Tnt switch functions are swapped.

%Sim Bug 3: ADF needle is the thin onenot animated yet.

(All bugs reported 3 Aug 2018)