NAVIGATION AND FORMATION FLYING

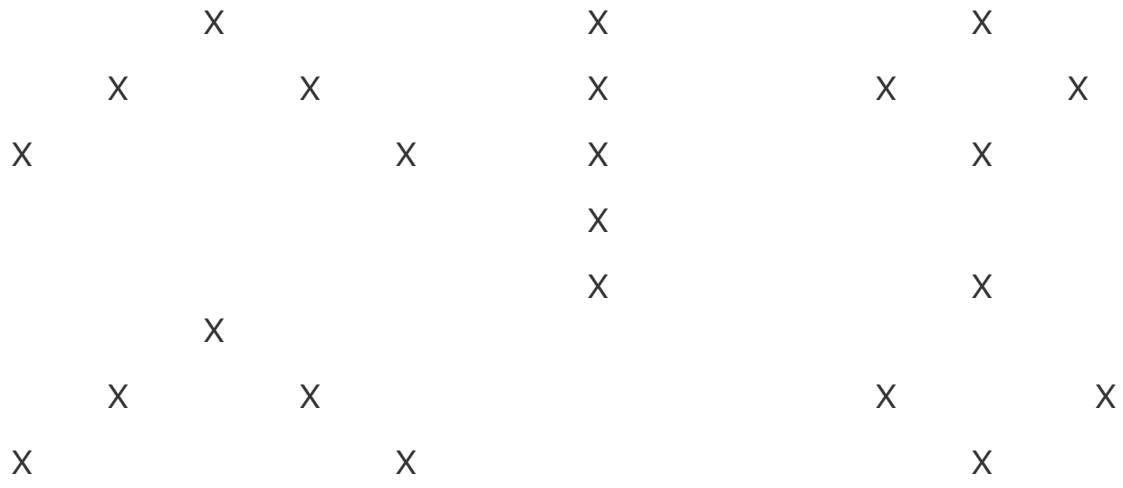
Today we'll take a look at formation flying in the Huey and an introduction to some basic radio navigation with the radios that are installed in the Huey.

The mission for the day will be a combination of formation flying and radio navigation. We'll form into three ship formations and practice inflight formation flying while using the VOR to track a radial to a station and then change course as we pass over the station. This all will be very basic for all the experienced pilots, but hopefully will be fun for all.

Formation flying

Formation flying in helicopters is used to airlift troops into landing zones. It is demanding and requires attention and concentration. The landing area would be prepared by artillery fire, bombers, fighter aircraft and other means to ensure a relatively safe landing by the helicopters.

The typical formation is the V with left and right echelon, a trail, or a larger formation consisting of several smaller formations.



The distance between aircraft is about two rotor discs or about 100 feet. If you look toward the aircraft in front of you and place that aircraft rotor disc on the horizon and keep the proper distance you will be fine. To keep the angle from the wingman in front of you, a good rule of thumb is this; If you

are in the right echelon, look at the wingman ahead and to your left and align his right rear crosstube with the left front crosstube.

That will make an X that will give you about a 45 degree angle. If you are in a left echelon, look at the wingman ahead and to your right, align his left rear crosstube with the right front crosstube. The Huey had a two pilot crew with one person flying and the other pilot monitoring instruments, handling the radios and monitoring the route.

The mission must be thoroughly briefed and understood for safety and mission accomplishment. Everyone must know which way to go and what to do in the event of an emergency or inadvertent weather conditions.

The lead aircraft makes all radio calls and informs the controller they are a flight of helicopters and the number in the flight. The lead aircraft should squawk the assigned transponder code and the other members of that flight will squawk standby.

The lead aircraft announces to the flight all intentions and makes all turns slow and gradual.

The landing of a formation of helicopters can be a challenge. As you approach the ground there will be a lot of rotor wash and turbulence generated by the aircraft in front of you. This will require additional power. The approach must not be too fast or too steep. If an excessive rate of closure and descent are used in an aircraft that is loaded heavy, there is a possibility of getting into a vortex ring state i.e. settling with power.

We will discuss this in our session on Saturday.

Radio navigation

The Huey did not have all the great avionics that are found in today's aircraft. The primary radios used were a VOR and ADF. The Huey did not have distance measuring equipment (DME) even though the airway system combined the distance capabilities of TACAN with a VOR and that was the named VORTAC.

Later models of the Huey were equipped with DME and DME hold which was a huge improvement in navigation and instrument approach capabilities.

As a quick review of the VOR, we must keep in mind that a VOR uses radials from the station, so when you are told to intercept or track a course. It will be <u>from</u> that VOR station.

For our exercise we will form three ship formations from which you can practice a V formation, trail, or an echelon left or right and can alternate positions within the formation.

We will start by tuning and identify the VORTAC at McCarran International Airport. The frequency is 116.9. Then verifying the radial with the large needle on the radio magnetic indicator (RMI), and finally centering the course needle on the omni bearing selector.

We'll depart Nellis and track to the VORTAC at McCarran, cross the station and track an assigned radial from the station.

We may even have a couple of surprises from air traffic control!

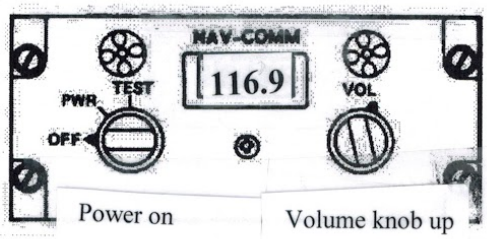
We will discuss all of this in our workshop and walk you through the tuning, identifying, and tracking a VOR signal.We will discuss the relationship between the needles on the RMI and OBS.

This will be a great introduction to VOR navigation and I look forward to a great discussion. There are a lot of very experienced pilots in the group and I know everyone will jump in and help make this a fun and informative workshop.

I have added a page with some images of the radios and instruments we will be using.

Looking forward to great day

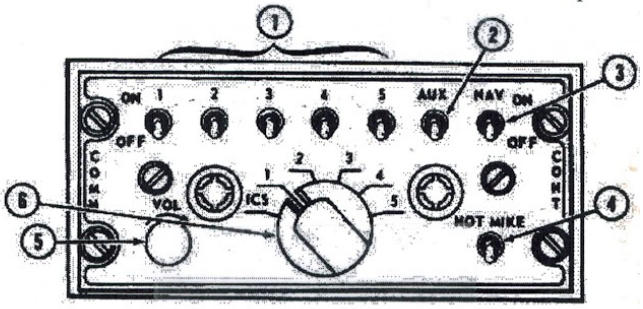
Tom Hotstart

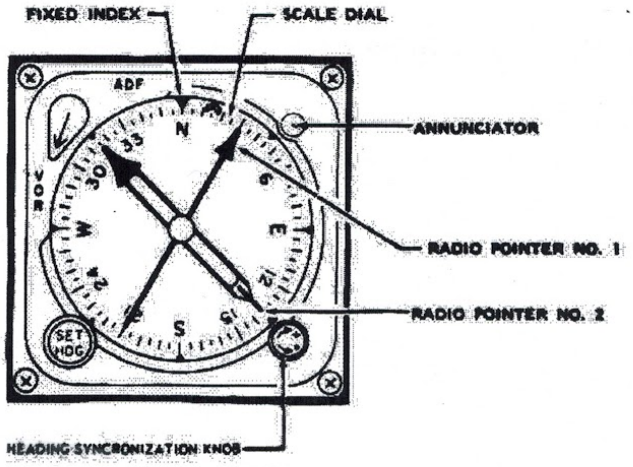


Power on

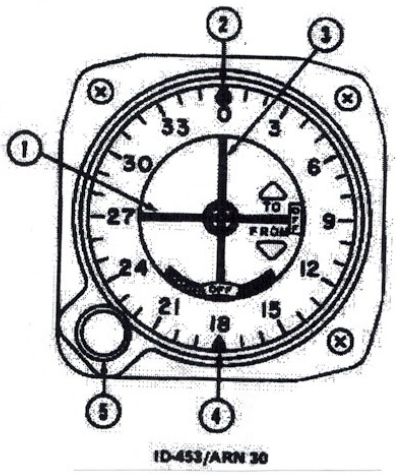
Volume knob up

Nav switch up





Radio pointer points to VORTAC



Center vertical needle with to/from flag indicating TO