Becker SAR DF 517 Training

Introduction



- *Task:* Become better acquainted with the Becker DF
- *Conditions:* Given checklist and classroom environment with handouts
- *Standards:* Implement proper DF techniques utilizing Becker DF
- *Background:* Currently all new CAP aircraft from the factory will come equipped with the Becker, and over 1/5th of the national fleet already have them

Becker SAR DF 517 System Components

Two Primary components

Control-Display Unit (CDU)





Antenna-Receiver Unit (ARU)

Becker SAR DF-517

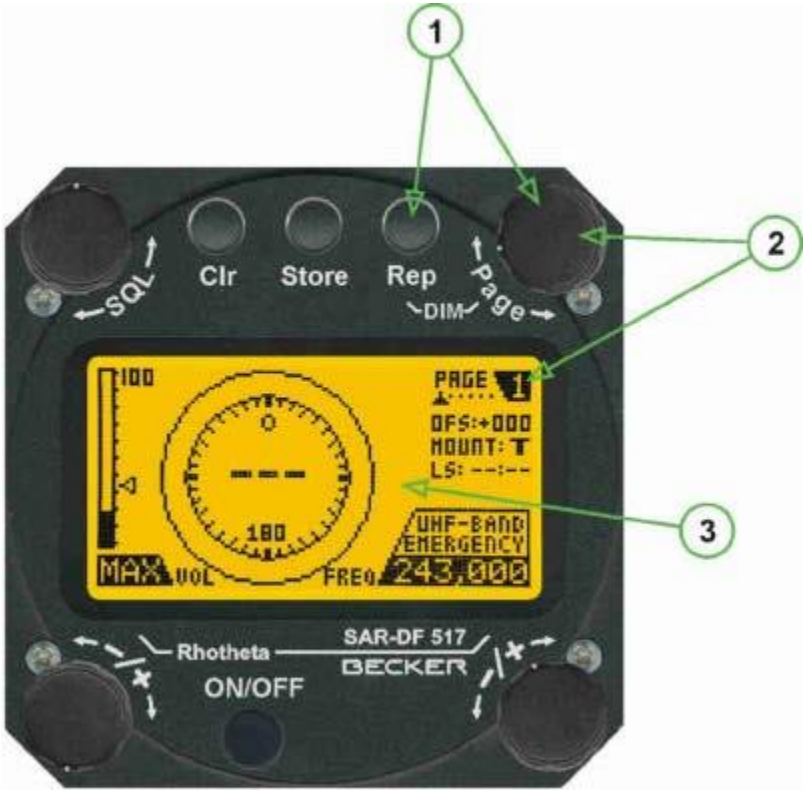
- The Becker SAR DF-517 is an automatic direction finder. It supports 121.5, 243 and 406 MHz frequencies
- The DF unit will display a bearing relative to the nose of the aircraft for signals received
- There are two sets of frequencies that may be selected. These are Emergency Mode or Training Mode frequencies
- The Emergency Mode or Training Mode can only be selected at power up

Power Up



- If your aircraft is equipped with Mission Master it must be on for DF to operate
- On power up (1), verify Emergency or Training mode. To change the setting, turn the page dial (2) and select the appropriate mode (3). Note: this option is only available for the first 10 seconds of power up – then the system automatically cycles into the function selected

Initial Setup



- The Page dial (2) is used to switch the DF-517 between the different pages
- By holding the Rep button and rotating the page dial (1) the brightness can be adjusted

DF-517 DFing



- Select the desired frequency to DF by using the bottom right rotary dial (1) to select the desired preprogrammed frequency
- Use the volume (2) rotary dial to set the volume level
- Once the desired frequency is selected, use the SQL (3) dial to select the squelch level

DF-517 DFing cont.

- According to the manufacturer DF signal can be heard by selecting the ADF monitor toggle on the audio panel
  - This of course begs the question…"What if your aircraft is not equipped with ADF?"
- DFing is done using Page 1 or Page 2
- Page 1 displays a full circle with the signal and bearing in 360^{o}
- Page 2 displays a 90^{o} window with the relative bearing and signal

DF-517 DFing cont.

DF-517 Page 1 Display



- (1) The signal and relative bearing
- (3) Signal Strength
- (4) Squelch level
- Tracking frequency 406.025 in Emergency mode
- Note that to DF a signal, the squelch level must be below the maximum signal strength

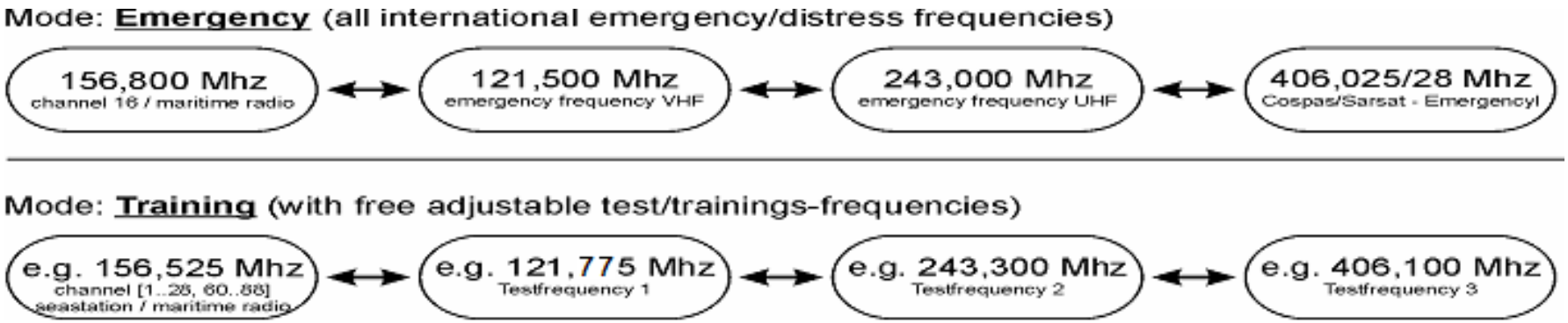
DF-517 DFing cont.

DF-517 Page 2 Display

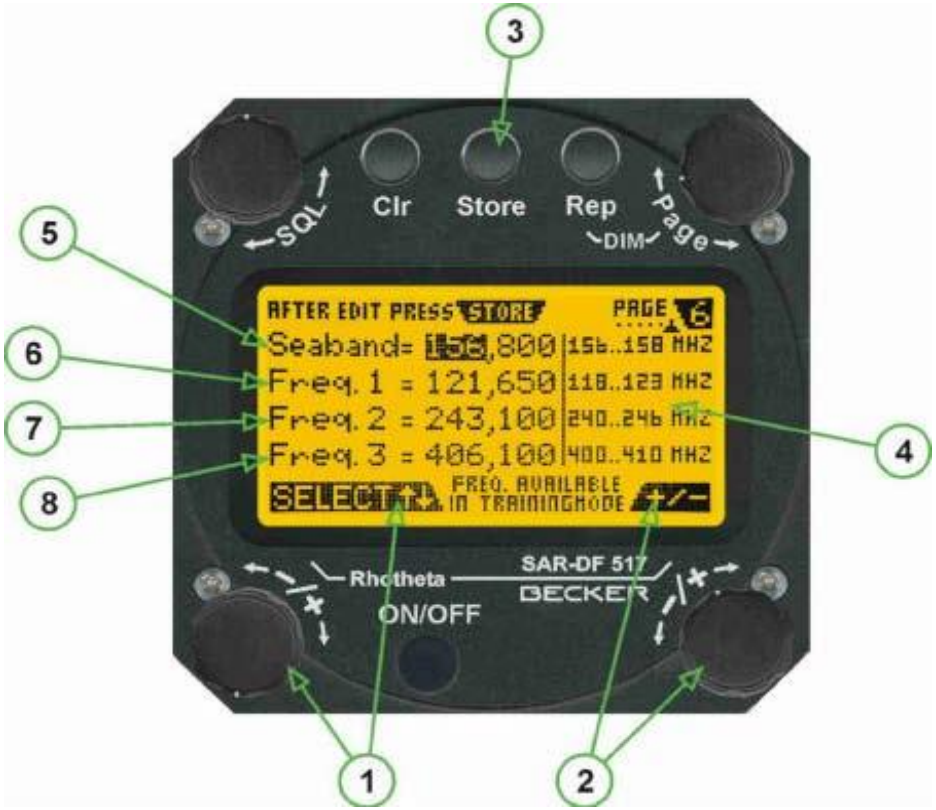


- (1) Signal level and relative bearing
- (2) Position error
- Tracking Freq. 121.775 in Training Mode for CAP (not .650 as was default with original systems)

DF-517 frequencies



DF-517
Adjusting Frequencies



- Page 6 enables you to adjust the training frequencies
- **(1)** >±**Select**< rotary switch selecting the trainings-frequency (MHz/kHz)
- **(2)** >±< rotary switch changing the frequency. Confirm the changed value by pressing pushbutton >STORE<
- **(3)** >**STORE**< Pushbutton to confirm changed values

DF-517

- The backlight is controlled by adjusting the top panel light adjustment and setting the annunciator panel switch in the “Night” position
- Additional information on the Becker DF-517 can be found in the manual
- Link at: http://www.becker-avionics.de/666571_C_Images/ImgProductsUSA/ProductsUSAPDF/ACF564.pdf

Operation

Power-On and operation modes emergency or training



(1) ON/OFF

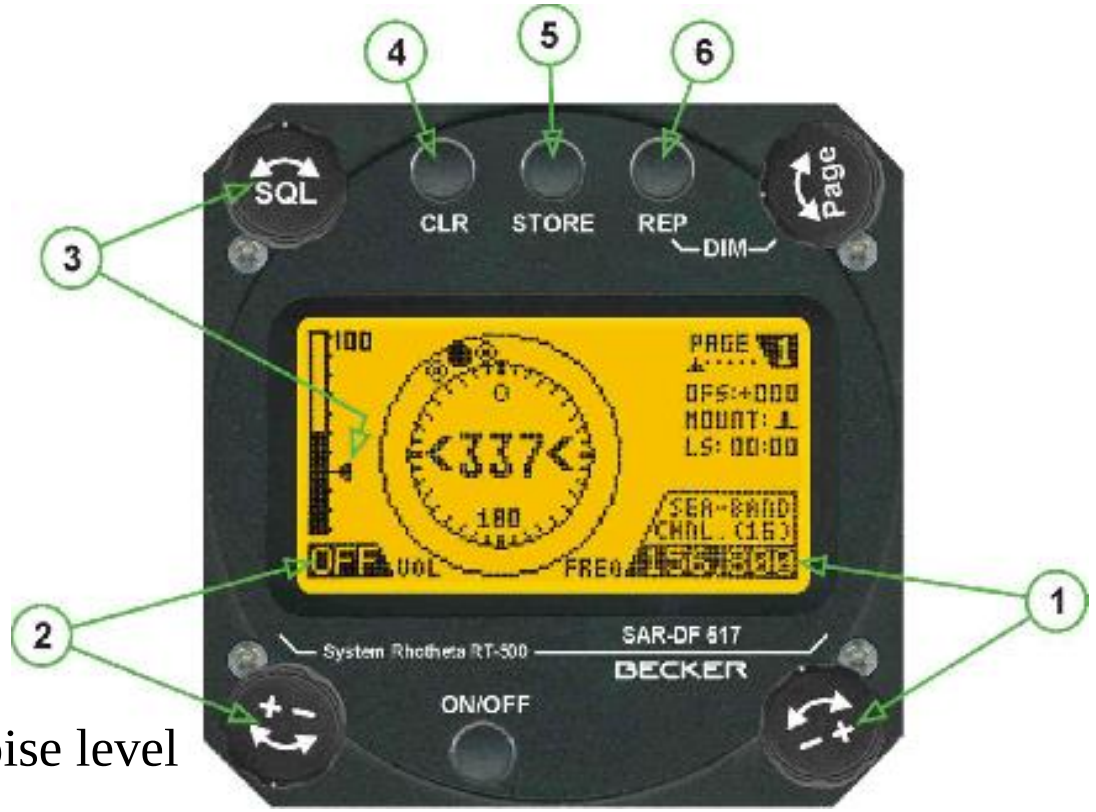
(2) PAGE

(3) MODE Indication of the actual operation mode

(4) ARU Version Software version and serial number of antenna-receiver Unit

(5) CDU Version Software version and serial number of control-display Unit

Bearing mode (pages 1 to 3)



(1) FREQUENCY Selected

(2) VOLUME

(3) SQL Should be above the noise level

(4) CLR For erasing the stored bearing value

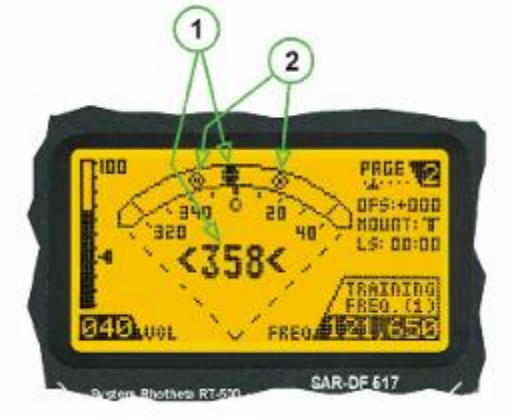
(5) STORE While bearing an AM signal a 3 kHz sound is superimposed to the audio signal for technical reasons

(6) REPEAT Displays the last valid bearing value with the corresponding receive level

Display Readings



Page 1: 360°bearing



Page 2: expanded 90°



Page 3: bearing text

(1) Bearing value

(2) Spread Maximum deviation of unaveraged bearing. Good bearing results even with a spread of 45°as a result of the averaging procedure

(3) Receive level Field strength

(4) Squelch level Squelch level must be above the noise level without a received signal

(5) Offset Corrects for antenna alignment (adjusted in the edit-menu)

(6) Mounting TOP mounted or BOTTOM mounted antenna

(7) LS: ---:--- Internal timer (LS meaning last signal) indicating the time since the last signal was received, displayed in min /sec

Using the SCAN mode while bearing COSPAS/SARSAT signals

The COSPAS/SARSAT signal on 406,025 MHz is only transmitted every 50 sec (Pulse length of 400ms)

The scanning mode is possible with frequencies 406,025MHz or 121,500/243,000MHz or the matching training frequencies

The **LS: ---:---** timer (LS meaning last signal) always displays the time since last COSPAS/SARSAT signal was received in 406.025 MHz



Frequency displayed in scanning mode

Becker Antenna

- Antenna mounted on bottom of aircraft
- Solid one piece unit
- This DF does not use wing null method



Techniques

- Audio Panel Tip: **Hard to track what you can't hear.** The bar on the left side of the display is a visual Squelch indicator, which **MUST BE SET BELOW THE AMBIENT NOISE LEVEL** for the unit to work. You can see this when the little triangle turns solid

- During regular operations, you can set the squelch above the ambient noise. (Which would alert you if you happen across an ELT, but otherwise not bug you with static noise)

Techniques

- To hear the ELT access your ADF monitoring on the Comm panel
- Turn the squelch ALL the way down when actively searching
- COSPAS/SARSAT page will display ELT Lat/Long if it is a 406 ELT
- MO can enter Lat/Long in to GPS as waypoint
- When overflying the target, the marble will do a little wiggle, and then rapidly jump down to the bottom of the (360^{o} View) display
- If the Observer recommends a sudden and steep turn to either direction, it's *a good bet* that the wing would be pointing *right at* the target in the turn.

Techniques

- Becker DF range is not as far as L-Tronics
- Utilize Aircraft comm radios to acquire the ELT signal – remember to have squelch pulled
- Conduct Wing Null – to get general location
- Proceed to Lat/Long of intersection of two Wing Nulls
- Once the Becker acquires the signal the Mission Observer will advise Pilot on course correction so that the bearing on the DCU is 0^{o} or 360^{o}
- Avoid minor corrections
- Once bearing drops off to 180^{o} you just flew over the ELT
- Mark location with GPS

QUESTIONS?