AIR Control Display 57

Pilot's Manual

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IMPORTANT

Please carefully read this manual before using the ACD-57 in flight. Take special care in reading and understanding the limitations of the device. If you are unsure, please contact with AIR Avionics product support for clarification.

This manual is an essential resource. It should be stored within the aircraft's operating documentation so that it is available to any flight crew operating the aircraft.

Covered Articles

Article Name	*Product P/N*	*SW Version*
AIR Control Display	ACD-57	46

From software version **46**, the ACD-57 introduces a dynamic and updated menu. In this manual, only the latest **Version 46** menu structure is referenced.

Recommendation: If your ACD-57 runs an older software version, it is strongly recommended to update your ACD-57 software to the latest version.

Product Support

If you have questions, our product support team will be happy to help you. Contact us via support@air-avionics.com or by phone. Please find details about our hotlines and availability online at *https://www.air-avionics.com*

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Getting Started 1

1.1 Introduction

The AIR Avionics ACD-57 is a compact multi-function display unit that integrates altimeter, VHF COMM radio control, and Mode-S/ADS-B transponder control into a single, panel-mounted device.

It provides large, clear altitude readouts and outputs encoded pressure altitude for transponders to use. The system supports interfacing with a wide range of remote-mounted radios and transponders.

Multiple ACD-57 units and peripherals can be synchronized across cockpit positions. ACD-57 can be controlled by third-party systems such as EFIS for COMM, XPDR, and altimeter settings.

The device supports databases for position-based listing of "NEAREST" COMM stations and a station name display.

A color display with ambient-light-controlled backlighting ensures optimal readability, and user interaction is streamlined through a concentric push-turn knob, and four push button softkeys.

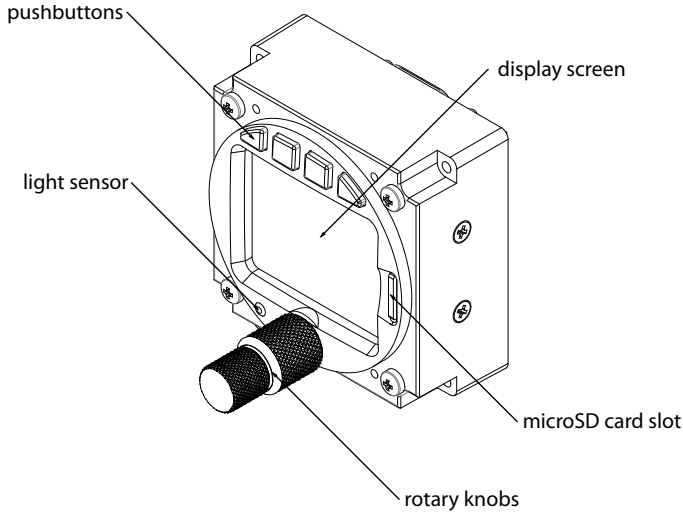


Figure 1.1.: ACD-57 front panel overview

1.2 Limitations and Safety Instructions

1.2.1 Safety

Using the ACD-57 shall never distract from general practices of safe airmanship. Using the ACD-57 may impose a significant workload on the flight crew if they are not adequately familiar with the ACD-57 and trained on its operation. To use ACD-57 effectively, being familiar with the unit is essential.

We recommend thoroughly studying this manual and extensively familiarizing yourself with the ACD-57 on the ground before your first flight with it.

Do not fly with ACD-57 if you are unfamiliar with its operation and limitations

Installations where ACD-57 units are used can be complex. Familiarization of specific installation conditions in an aircraft, for example, the number, type, and configuration of connected systems is essential before using ACD-57.

ACD-57 installation requires several forms, such as checkout forms and configuration logs, to be filled out by the installation personnel. These documents are stored in the aircraft's documentation and are a viable resource for pilots who wish to study the installation specifics of an ACD-57 in an aircraft.

1.2.2 Regulatory Requirements

It is the responsibility of those using ACD-57 to determine that the installation and working conditions are within required standards and conform to applicable regulations.

Independent of FAA-TSO / ETSO authorizations, depending on aircraft type and certification base, ACD-57 may not be suitable as a primary altimeter, COMM control, or XPDR control unit in an aircraft.

1.2.3 Screenshots

All screenshots used in this document are current at the time of publication.

Screenshots are intended to provide visual reference only. All information depicted in screenshots, including software file names, versions, and part numbers, are subject to change and may not be up-to-date.

1.2.4 Database Functions

ACD-57 provides optional database-driven functions like station identification and the nearest station list.

A database can be obtained from AIR Avionics and loaded onto a microSD card that is inserted into the unit's microSD card reader. These databases have an expiry date. An error message indicates if a database has expired.

We recommend to update the database file frequently. The flight crew is ultimately

responsible for selecting the right channels/frequencies. The station database is used for reference only.

The station database may contain errors.

> We request that the flight crew report any observed discrepancies related to database information. These discrepancies could come in the form of an incorrect channel, incorrectly identified station, or any other displayed item used for communication in the air or on the ground.

1.2.5 Add-On Functions

Certain functions are subject to a software licensing model. These functions have been unlocked during the installation of the ACD-57. For details on Add-Ons, please consult the ACD installation manual [1].

1.2.6 Liability

IN NO EVENT WILL AIR AVIONICS BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM THE USE, MISUSE OR INABILITY TO USE THE PRODUCT OR FROM DEFECTS IN THE PRODUCT.

1.2.7 Limitations

1. Using the alticoder of ACD-57 is limited to 40,000ft (FL400).
2. Using the altimeter of ACD-57 is limited to 40,000ft (FL400).
3. Use of the device is limited to class II aircraft (MRE, MTE and STE), which includes class I aircraft (SRE), both with MTOW of 6000 pounds or less as per definition of AC23.1309-1E.
4. Use of ACD-57 as primary and only altitude measurement device of the aircraft is excluded, if loss of functions or misleading information is assessed higher than Minor.
5. The operator must verify that the installation meets the airspace requirements where the flights are intended.
6. The device does not provide static error correction. Therefore installation is limited to aircraft where static error correction is not required.

1.2.8 Low Temperature Operations

If the temperature is below –10°C (14°F), the ACD-57 must be powered on at least 5 minutes before flight, to warm up the display.

2.1 Pilot Controls

ACD-57 has a dual concentric push-turn knob. Inner and outer knobs have 16 detents per revolution and can be rotated clockwise and counter-clockwise. The inner knob has a pushbutton. Four softkey pushbuttons are located on the bezel along the top of the display screen.

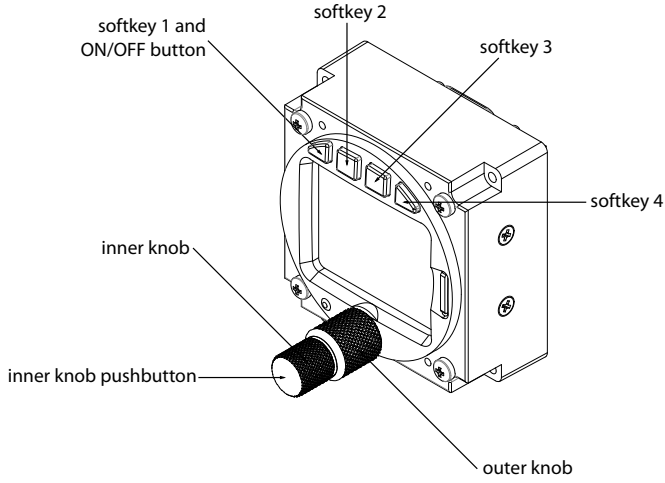


Figure 2.1.: ACD-57 pilot controls

The functions of the controls vary depending on the context and the installation. Below is a comprehensive list of all possible functions of all control elements. We recommend to study the operation based on your installation and coming back to this section later for reference.

2.1.1 Inner Knob Functions

- In the menu, the inner knob controls the position of the menu focus.
- On the main page, if a VHF transceiver is controlled, the inner knob opens the volume control or channel selection page.
- If only a Mode-S transponder system is controlled (and no VHF transceiver), on the main page, the inner knob opens the XPDR page.

- If only altimeter functions are used (and no VHF transceiver or XPDR is controlled), on the main page, the inner knob opens the barometric reference selection page.
- On the COMM channel selection page, the inner knob adjusts kHz in the smallest increments[1]. To move in 25 kHz steps, push and turn the inner knob.
- On the volume control page, the inner knob controls the ACTIVE channel volume.
- On text input pages, the inner knob controls the text character.

2.1.2 Inner Knob Pushbutton Functions

- On the main page, the inner knob pushbutton is used to toggle ACTIVE and STANDBY channels of a connected COMM unit (short push) and for opening the menu (long push).
- In the Menu, the inner knob pushbutton is used for menu item execution/ENTER (short push), for toggling ON/OFF setting menu items (short push), or for closing the menu (long push).

2.1.3 Combined Inner Knob and Inner Knob Pushbutton Functions

By simultaneously pushing/holding the inner knob pushbutton and rotating the inner knob, special functions are controlled.

- On the COMM channel memory page, stored channels can be sorted.
- On the COMM channel selection page, frequencies are changed in 25 kHz steps. If the channel spacing is set to *25kHz and 8.3kHz*, channels are changed in 25 kHz steps.

2.1.4 Outer Knob Functions

- In the menu, the outer knob controls the position of the menu focus.
- On the main page, if a VHF transceiver is controlled, the outer knob opens the volume control or channel selection page.
- If only a Mode-S transponder system is controlled (and no VHF transceiver), on the main page, the outer knob opens the XPDR page.
- If only altimeter functions are used (and no VHF transceiver or XPDR is controlled), on the main page, the outer knob opens the barometric reference selection page.
- On the volume control page, the outer knob controls the STANDBY channel volume.
- On the COMM channel tuning page, the outer knob controls the channel (MHz).
- On text input pages, the outer knob controls the input position (cursor).

[1] Depending on the airspace rules, the steps can be setup to *8.33 kHz channels and 25 kHz frequencies* or *25 kHz* only

2.2 Softkeys

Four “softkey” pushbuttons are located on the top of the front bezel of the device. The softkey designators on top of the display screen show the softkey’s current function. Softkey functions change depending on menu level and context.

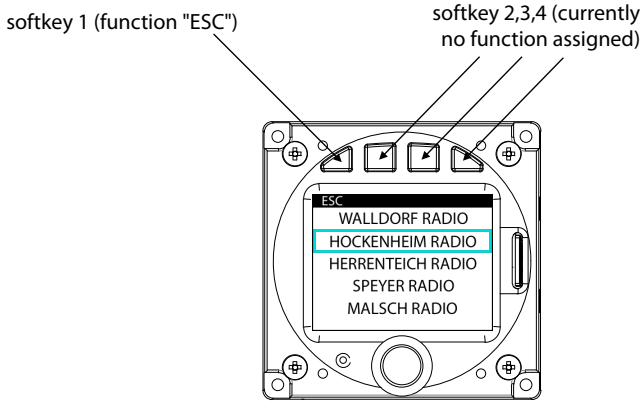


Figure 2.2.: Text input page. The leftmost softkey has a function (ESC)

The ACD-57 system software is configurable and can be adapted to the requirements of an individual installation. For example it is capable of interfacing and controlling different COMM and transponder systems from various manufacturers and optionally displaying altitude functions. Hence, the user interface, softkey structure, and configuration menu are flexible and dynamic.

This manual covers the operation of COMM control, XPDR control, and altimeter separately. Yet these functions can be combined. Chapter **??** shows user interfaces for all combinations possible.

Appendix 11 holds a diagram of all available softkeys.

2.3 Display Color Coding

All functions the outer knob controls are kept in the color *magenta*, all functions the inner knob controls are kept in the color *cyan*.

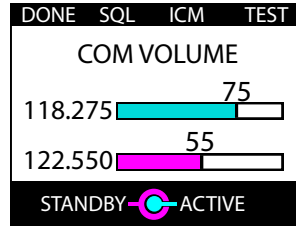


Figure 2.3.: COMM volume control page. The inner knob always controls the cyan-colored elements, outer knob the magenta-colored elements.

2.4 Inactivity Timeout

The user interface consists of several different screens (pages). If on any page (other than the main page or the configuration menu) no user input occurred for more than 10 seconds, the ACD-57 automatically switches back to the main page.

2.5 Light Sensor

A sensor detecting ambient lighting conditions is placed on the left side of the concentric rotary knobs. The display backlight and keyboard illumination, can be automatically adjusted using information from the light sensor. This function has to be activated by setting a configuration parameter during installation.

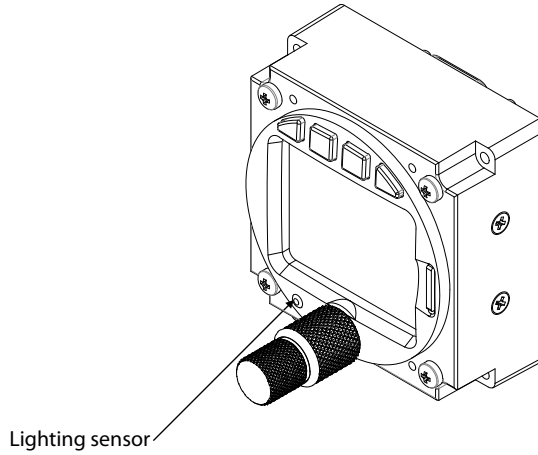


Figure 2.4.: Light Sensor Position

A filter is used to slow down changes in the user interface illumination. This prevents the illumination level from changing too quickly, for example when shadowing the sensor with your hands during operation of the knobs.

> If the user interface illumination is controlled by the aircraft's lighting bus, the ACD-57 uses the light sensor for plausibility checks to prevent blinding the flight crew at night. If the light sensor detects low ambient lighting conditions, but the lighting bus is set to a high brightness, the ACD-57 issues a warning and switches into manual illumination override mode. Details on the illumination override mode can be found in the section "BACKLIGHT OVERRIDE" on page 34.

2.6 Switching On and Off

2.6.1 Power On

By default the ACD-57 switches on automatically if a sufficient power supply is present. ACD-57 switches on at 9V DC.

To switch ACD-57 on manually, the *Auto Boot* parameter can be deactivated during installation. For details, please consult the ACD-57 Installation Manual [1]. If *Auto Boot* is deactivated and if the ACD-57 has been manually switched off before, ACD-57 is powered on by pushing softkey 1 for at least 0.5 seconds.

The boot phase of ACD-57 takes less than one second. No special boot screen is shown.

When turned on, ACD-57 powers up all connected avionics systems (such as COMM or XPDR) if they have not been powered up already.

2.6.2 Power Off

If *Auto Boot* is active (default), ACD-57 is switched off by taking away power. ACD-57 switches off if the supply voltage drops below 8V DC. With *Auto Boot* active, ACD-57 can not be switched off manually using softkey 1 .

If *Auto Boot* is deactivated, push softkey 1 longer than 4 seconds to switch ACD-57 off.

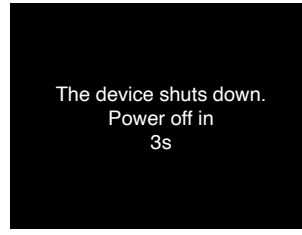


Figure 2.5.: Power off screen. The countdown timer on the right (here 3 seconds counts down until the unit is switched off.

3 Connected Radios and Transponders

3.1 Limitations of Connected Devices

Please be aware that not all functions supported by the ACD-57 may be supported by the connected COMM/XPDR devices. Carefully observe the limitations and functions of the connected COMM devices to assess system limitations that apply to your aircraft. The following table gives an overview of functions not supported by all connectable COMM systems and other limitations thereof:

Function	*AIR COM (AC-1) VHF Transceiver*	*Becker 620X VHF Transceiver*	*Dittel/TQ KRT2 VHF Transceiver*	*TRIG TY91/TY92 VHF Transceiver*	*F.U.N.K.E ATR-833 VHF Transceiver*
Say Again Function	●	–	–	–	–
Standby COMM channel independent volume level possible	●	–	–	–	–
VHF transceiver system configuration during installation	●	●	–	●	–
Interface speed from ACD-57 to VHF transceiver	fast (nearly in real time)	normal (delays are recognizable)	slow (up to half a second delay)	normal (delays are recognizable)	normal (delays are recognizeable)

3.2 Connected Devices Parameter Changes

Whenever a parameter in an external system such as a COMM or XPDR device is changed, ACD-57 TRANSMITS a change request to the device through a data interface. The information is only updated on the ACD-57 display screen if the changes have been acknowledged by the COMM or XPDR device.

Therefore, a delay (normally less than half a second) can be visible, depending on the type of the connected device, the data interface, and the changed parameters.

Some elements of the user interface, for example on the volume control page, present both, the intended target value and the currently active value in the connected system.

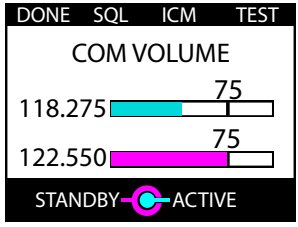


Figure 3.1.: Volume control page. The cyan colored bar indicates the value currently active in the connected COMM unit, the little black pointer and numerical value show the value currently set in ACD-57. Normally this discrepancy disappears within half a second.

3.3 Connected Devices Startup Time

Some connected devices may need a significantly longer time than ACD-57 to power up. For example, a connected TQ KRT-2 COMM unit needs up to 20 seconds before it starts to send data to the ACD-57. While the ACD-57 is not yet receiving data from a connected system, the connected system's status is not known and, therefore, red crosses are shown on the parts of the display referring to the connected system.

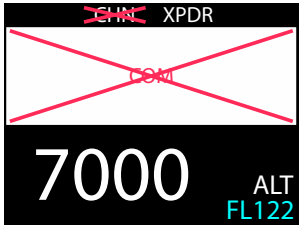


Figure 3.2.: No data from connected COMM system after power up. This condition may last up to 30 seconds after power up.

4 COMM Operation

4.1 Introduction

ACD-57 can control a connected VHF transceiver (COMM) including COMM unit setup, channel selection, and audio control.

Multiple ACD-57 can be installed on one COMM unit and control the COMM unit simultaneously, for example in aircraft with large cockpits or in tandem seating configurations.

4.1.1 COMM User Interface

ACTIVE and STANDBY channels are shown on the main page.

If a database is used, channel names may be displayed on the main page. Station names are shown for stations within a distance of approx. 20 miles from the aircraft's current position.

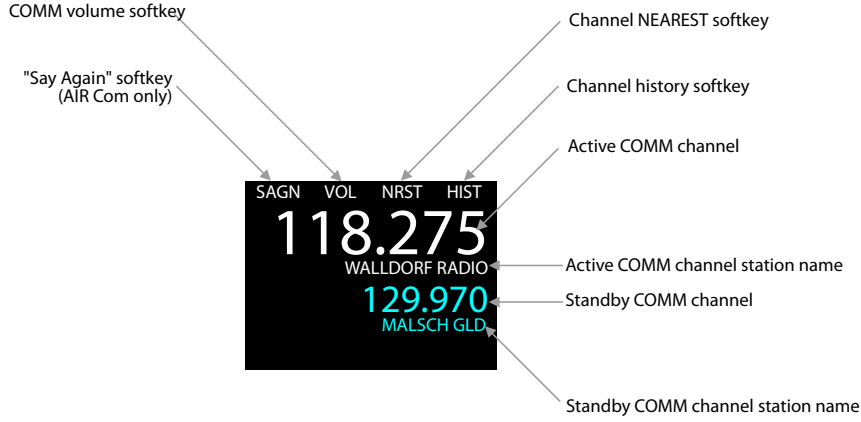


Figure 4.1.: COMM user interface on the main page explained.

The display of station names in the ACD-57 requires position data from an external source that needs to be connected and configured during installation. Furthermore, a valid station database (microSD card) is required. If no position data or no station database is available, the functions can not be used.

The "Say Again" replay function is only available if an AIR Avionics AIR COM (AC-1) radio is controlled. Other VHF radios do not support this function.

4.2 Audio Control

4.2.1 Volume Control

To enter the volume control page, press the VOL softkey. If the VOL softkey is not shown[1], rotate the inner knob or the outer knob on the main page.

On the volume control page, you can use the inner knob to adjust the ACTIVE channel volume. Use the outer knob to adjust STANDBY channel volume.

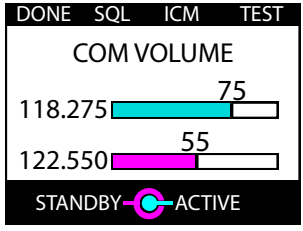


Figure 4.2.: Volume control page

If the connected COMM unit does not support individual volumes for ACTIVE and STANDBY channel, outer knob switches DUAL/SCAN mode on or off.

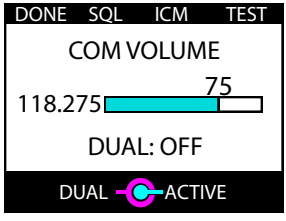


Figure 4.3.: Volume control page for TQ KRT2 COMM unit. outer knob switches DUAL mode on or off.

On the volume control page, the TEST softkey will open the squelch for some seconds in order to test the audio output. Testing the audio output before each flight is recommended.

4.2.2 Monitoring the STANDBY COMM Channel

The STANDBY COMM channel monitoring function (also known as "DUAL WATCH" or "SCAN") is always active, when the STANDBY channel volume is set to a value above zero. If set to zero, the STANDBY COMM channel monitoring is deactivated.

[1] If the *KNOB USE* parameter in the configuration is set to *CHANNEL* (default), rotating the knobs changes channels and a VOL softkey is shown. if it is set to *VOLUME*, the VOL softkey is not shown and the volume is adjusted by directly rotating the inner or outer knob. Details on the *KNOB USE* parameter can be found in the section "Knob Use" on page 23.

Only an AIR Avionics AIR Com (AC-1) supports individual values for the volume of the standby COMM channel. If a different COMM unit is used, the volume value for the standby COMM channel the same as the active COMM channel. In this case, rotating the outer knob only activates or deactivates the standby COMM channel monitoring function.

4.2.3 Squelch Level Control

The squelch page is accessed by pushing the SQL softkey on the volume control page. It is recommended to keep the squelch level at the lowest value required for filtering white noise.

If the connected COMM system doesn't completely open the squelch at the "zero" setting (e.g. Becker radios), the squelch can be turned on and off with the softkey 4 on the squelch page.

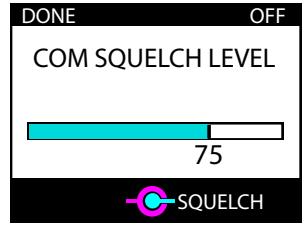


Figure 4.4.: Squelch control page

4.2.4 Intercom Control

The volume of the intercom function and the intercom VOX level can be individually configured for both intercom inputs. Intercom volume is the audio volume of the intercom audio output. Intercom VOX level (also known as "intercom squelch") is the sound level at which the intercom function is engaged / opened.

The intercom page can be accessed by pushing the ICM softkey on the volume control page. Use the inner knob to adjust the intercom volume for input 1 and the outer knob to adjust the intercom volume for input 2.

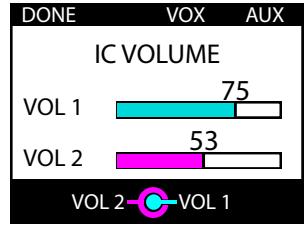


Figure 4.5.: Intercom page

The intercom VOX level page can be accessed by pushing the VOX softkey on the intercom control page. Use the inner knob to adjust the VOX level for input 1 and the outer knob to adjust the VOX level for input 2.

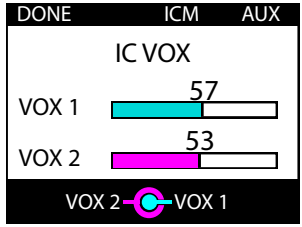


Figure 4.6.: VOX level page

4.2.5 AUX Volume Control

A maximum of two AUX volumes can be individually adjusted. The aux inputs can, for example, be used to connect an audio player, mobile phone, or external avionics system to the connected COMM unit. The number and logic behind the AUX inputs depends on the connected COMM system. Please familiarize yourself with the installation conditions before using the AUX inputs.

The aux inout level page can be accessed by pushing the AUX softkey on the intercom control page.

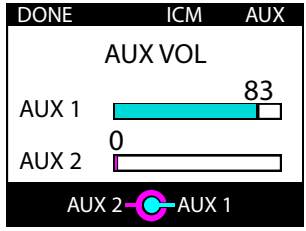


Figure 4.7.: Aux input level page

4.3 Selecting a COMM Channel

The channel/frequency selection always selects the STANDBY channel. To change the ACTIVE channel, the STANDBY and ACTIVE channel must be toggled (flip flop).

4.3.1 Toggling STANDBY and ACTIVE Channel (flip flop)

To switch between ACTIVE and STANDBY COMM channels (toggle / flip flop), push the inner knob pushbutton on the main page.

4.3.2 Manual Channel/Frequency Selection

To open the channel selection page, rotate the inner knob or the outer knob, or, if present, push the CHN softkey [2].

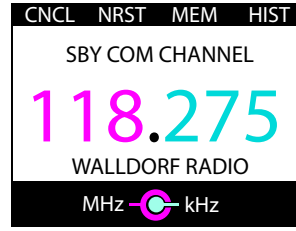


Figure 4.8.: Channel Selection Page

1. rotate the inner knob or the outer knob, or, if present, push the CHN softkey
2. To select a channel, use the inner knob for kHz selection and the outer knob for MHz selection. For a quicker channel selection if channel spacing is set to 25 kHz AND 8.33 kHz) you can push the inner knob pushbutton and simultaneously turn the inner knob for 25 kHz increments.
3. Push the inner knob pushbutton to execute the channel selection and to exit the channel selection page to the main page.

You can always exit the selection process, discard the selection, and return to the main page by pushing the CNCL softkey.

4.4 Nearest and History Functions

4.4.1 Nearest Station Selection

> The database may contain errors. Always cross-check the correctness of station names and channels. The selection of nearest stations in ACD-57 requires position data and a database. If not available, the function will not work.

The nearest station list can be opened by pushing the NRST softkey. The NRST softkey is available on the channel selection page. In COMM-only configurations, the NRST softkey is also available on the main page.

1. To open the channel selection page, rotate the inner knob or the outer knob, or, if present, push the CHN softkey.
2. To access the NEAREST station list, push the NRST softkey.
3. Use the inner knob to select a station.

[2] If the *KNOB USE* parameter was set to *VOLUME* during installation, you can access the channel selection page by pushing the CHN softkey. Details on this parameter can be found in the section "Knob Use" on page 23.

4. Push the inner knob pushbutton to select the channel of the selected station and to exit the channel selection page to the main page.

Figure 4.9.: NEAREST station list

You can always exit the selection process, discard the selection, and return to the last page by pushing the ESC softkey.

4.4.2 Channel History

ACD-57 stores a history of selected channels in a channel history list. Channels can be selected from this list.

The channel history list can be opened by pushing the HIST softkey. The HIST softkey is always available on the channel selection page. In COMM-only configuration, the HIST softkey is also available on the main page.

1. To open the channel selection page, rotate the inner knob or the outer knob, or, if present, push the CHN softkey.
2. To access the history list, push the HIST softkey.
3. Use the inner knob to select a channel from the recently-selected-channels list.
4. Push the inner knob pushbutton to execute the channel selection and to exit the channel selection page to the main page.

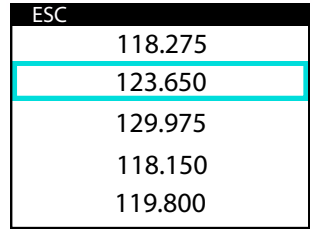


Figure 4.10.: Channel History List

You can always exit the selection process, discard the selection, and return to the last page by pushing the ESC softkey.

4.5 Channel Memory

ACD-57 features a user-configurable channel memory. Fifteen COMM user channels can be saved including an optional text name/identifier.

4.5.1 Select a Channel from Memory

The channel memory list can be opened by pushing the MEM softkey. The MEM softkey is available on the channel selection page.

1. To open the channel selection page, rotate the inner knob or the outer knob, or, if present, push the CHN softkey.
2. To access the memory list, push the MEM softkey on the channel selection page.
3. Use the inner knob to select a position / identifier from the memory list.
4. Push the inner knob pushbutton to execute the selection and to exit to the main page.

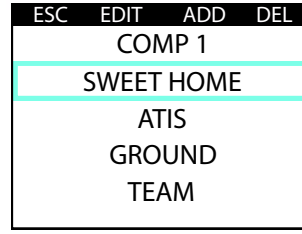


Figure 4.11.: Channel memory list

You can always exit the selection process, discard the selection, and return to the last page by pushing the ESC softkey.

4.5.2 Store a Channel in the Memory

1. To store a channel, enter the channel memory list and push the ADD softkey.
2. Select the desired channel using the inner knob (kHz) and outer knob (MHz). Push the inner knob pushbutton to execute the channel selection and to get to a text input page where you can enter an identifier for the stored channel.
3. Use the outer knob to select a position in the text and the inner knob to select a character. Push the inner knob pushbutton to execute the identifier text input and to store the channel to the memory list.

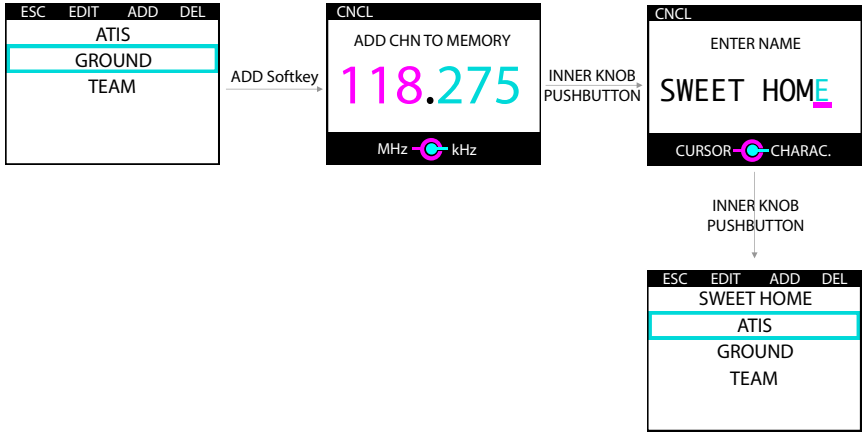


Figure 4.12.: Channel storing process in channel memory list

You can undo the storing process and return to the last page by pushing the CNCL softkey.

4.5.3 Editing a Stored Channel

1. To edit a stored channel, enter the channel memory list, use the inner knob to select a position/identifier, and push the EDIT softkey to edit the selected position/identifier.
2. Select the desired channel by using the inner knob (kHz) and outer knob (MHz). Push the inner knob pushbutton to execute the channel selection and to get to a text input page where you can edit the name for the stored channel.
3. Use the outer knob to select a position in the name and the inner knob to select a character. Push the inner knob pushbutton to execute the name selection and to store the channel in the memory list.

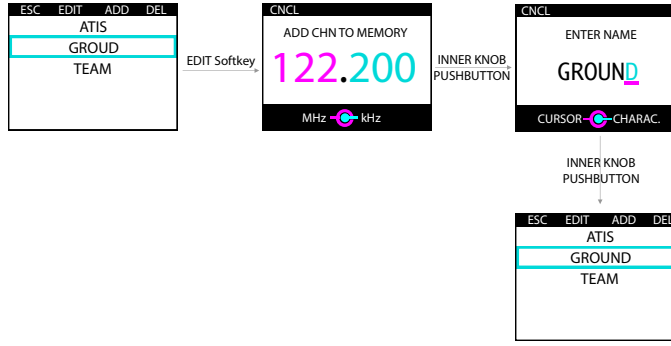


Figure 4.13.: Channel editing process in channel memory list

You can undo the selection/editing process and return to the main page by pushing the CNCL softkey.

4.5.4 Sorting the Channel Memory List

1. To sort the channel memory list, enter the channel memory list, use the inner knob to select a position/identifier that shall be repositioned in the list.
2. Push the inner knob pushbutton, hold and simultaneously rotate inner knob to move the position/identifier within the list.
3. Release the inner knob pushbutton as soon as the position/identifier is in the desired place in the list.

4.5.5 Deleting a Stored Channel

1. To delete a stored channel, enter the channel memory list, use the inner knob to select a position, and push the DEL softkey to delete the selected position.

> The position is instantly deleted, there is no way to undo the process.

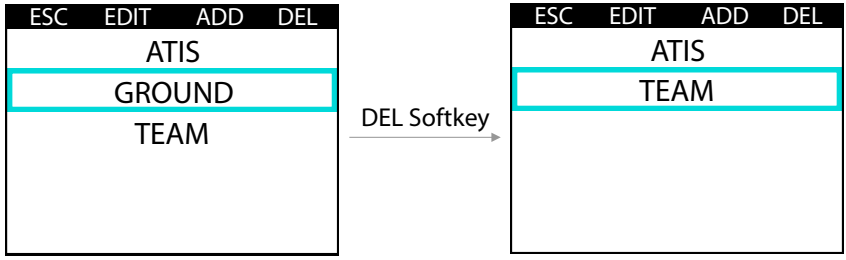


Figure 4.14.: Channel deletion process in channel memory list

4.6 RX/TX Indication and Stuck PTT Function

4.6.1 RX/TX Indication

The current receiver/transmitter status is shown on the main page. If radio messages are transmitted or received, a little indicator is shown.

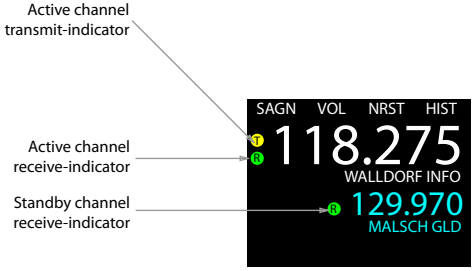


Figure 4.15.: RX and TX indicators explained

4.6.2 Last RX Indication

To indicate the channel on which the last transmission was received, an indicator is shown next to that channel for a duration of 50 seconds after the end of the last incoming transmission or until another transmission is received.

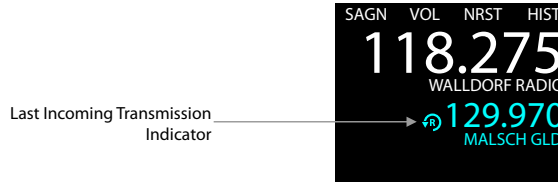


Figure 4.16.: Last RX indicator

4.6.3 Stuck PTT Indication

If the connected COMM unit features a “stuck PTT detection” or a “stuck PTT timeout”, the status of a “stuck PTT” being detected is indicated on the main page by a crossed-out transmitter symbol or by a COMM error message (depending on the type of the connected COMM device).

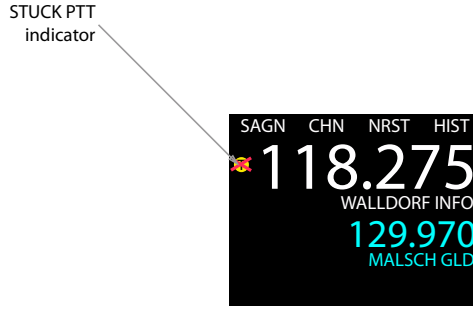


Figure 4.17.: Stuck PTT indicator

4.7 Say Again Function

If the connected COMM unit features a recording or “say again”-function, the function is accessed through the SAGN softkey on the main page.

If the SAGN softkey on the main page is pushed (short push), the last recorded transmission is replayed. A replay indicator appears on the main page while the replay is active.

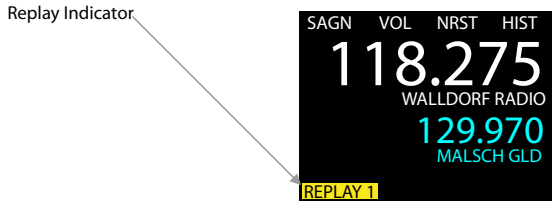


Figure 4.18.: SAGN softkey has been pushed, replay function is active

> The replay can be interrupted by a received transmission. Actual transmissions have priority. This however depends on the setup of the connected COMM system. Please inform yourself on the ground about the configuration and behavior of the connected COMM system before using the function in flight.

ACD-57 supports replay of several transmissions (depends on capacity of connected COMM system). By pushing the SAGN softkey again, you can replay earlier transmissions. The number on the replay indicator shows the current position.

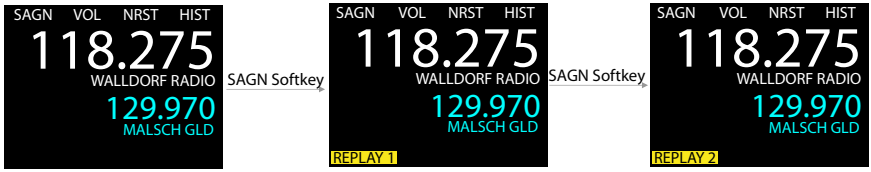


Figure 4.19.: SAGN softkey has been pushed, replay function is active and SAGN softkey is pushed again to replay an earlier transmission.

4.8 Knob Use

The primary use of the inner knob and outer knob on the main page can be changed during installation in the *configuration menu*. The inner knob pushbutton function remains unaffected of this setting (always flip flops active/standby channels). The default setting for this parameter is *CHANNEL*.

It can be set to *VOLUME* to open the volume control page when turning the inner knob or the outer knob. In this case softkey 2 will have the function to open the channel selection page. If set to *CHANNEL* (default) to open the channel selection page when turning the inner knob or the outer knob. In this case softkey 2 will have the function to open the volume control page.

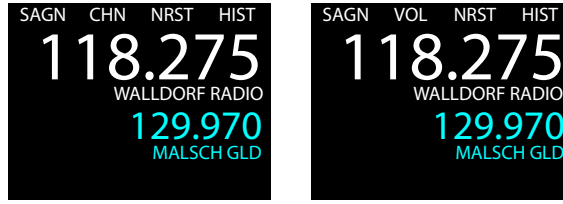


Figure 4.20.: COMM main page with *KNOB USE* parameter set to *VOLUME* on the left and to *CHANNEL* on the right.

If you wish to change this parameter, please consult the ACD-57 Installation Manual [1].

5.1 Introduction

ACD-57 can control connected XPDR units including XPDR unit setup, squawk code selection and mode control. Multiple ACD-57 can be installed to control one XPDR unit.

> A thorough familiarization of specific installation conditions in an aircraft, e.g. number of connected devices and topology is essential before using ACD-57.

5.1.1 XPDR User Interface

Squawk code[1], XPDR mode, and transmitted altitude (i.e. the altitude sent out by the connected XPDR system when replying) are displayed on the main page. Additionally a reply indicator shows if the transponder is currently transmitting a reply to an interrogation.

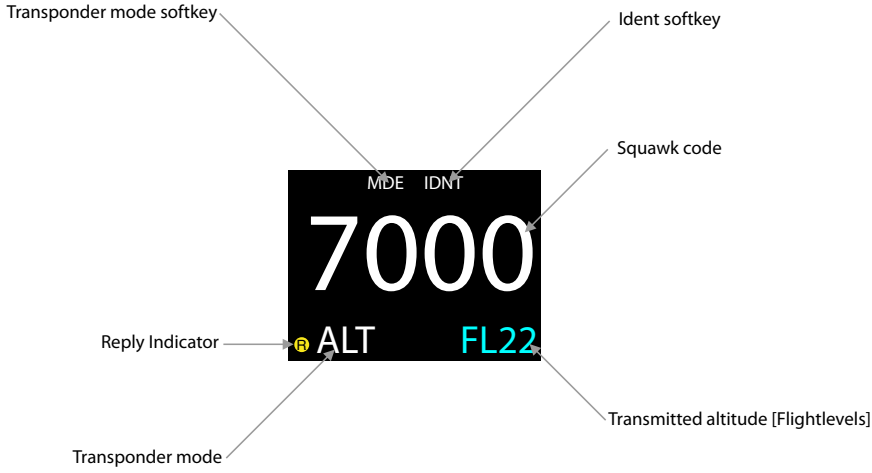


Figure 5.1.: XPDR user interface on the main page

[1] "Squawk Code" here refers to the ATCRBS 4096 reply code. Details on the terminus "squawk" can be found here: *https://en.wikipedia.org/wiki/Transponder_(aeronautics)*

5.2 Selecting a Squawk Code

To enter the XPDR page, rotate the inner knob or the outer knob on the main page (in XPDR-only configuration) or push the XPDR softkey (in a configuration with VHF transceiver and XPDR).

1. on the main page, rotate the inner knob or push the XPDR softkey to enter the XPDR page.
2. Use the outer knob to select a position in the squawk code and use the inner knob to adjust the selected position's value.
3. Push the inner knob pushbutton to execute the selected squawk code and to exit to the main page.

Alternatively, you can use the softkey 2 to toggle between the preset VFR squawk code and the last non-VFR squawk code. Then push the inner knob pushbutton to confirm the squawk code.

> You can always undo the squawk code selection and return to the main page by pushing the CNCL softkey

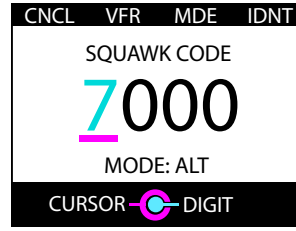


Figure 5.2.: XPDR page: Squawk code selection and other options for the transponder

5.3 Using the Ident Function

Push the IDNT softkey to initiate the ident function. This also confirms the currently selected squawk code. The IDNT softkey is always available on the XPDR page. In XPDR-only configuration, the IDNT softkey is also available on the main page.

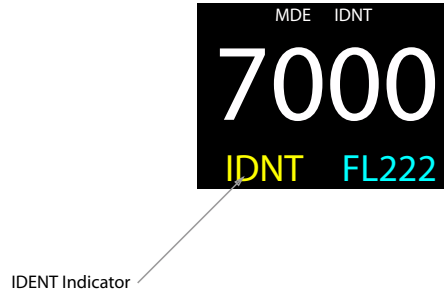


Figure 5.3.: Ident function is active. *IDNT* is shown instead of the normal mode indication as long as the ident feature is active.

5.4 Changing XPDR Mode

ACD-57 supports selection of the following XPDR Modes by the flight crew:

- SBY – Transponder is inactive.
- ALT – Active Mode, also called "Altitude Mode". This is the normal mode in flight at which altitude, Mode-A/C and Mode-S replies, and ADS-B aquitters are transmitted.
- ON – Alt Inhibit Mode, no altitude data is transmitted.

5.4.1 Normal Mode Selection

A short push on the MDE softkey switches between SBY (Standby Mode) and ALT (Active Mode). It also confirms the currently selected squawk code. The MDE softkey is always available on the XPDR page. In XPDR-only configuration, the MDE softkey is also available on the main page.

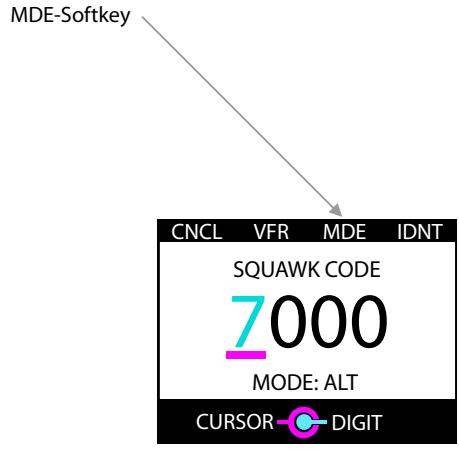


Figure 5.4.: MDE softkey on the XPDR page

5.4.2 Altitude Inhibit Mode

A long push on the MDE softkey switches to ON (ALT Inhibit Mode). In this mode, no altitude information is transmitted.

> The use of this mode is only recommended if requested by air traffic control.

Another long push on the MDE softkey switches from ON (ALT Inhibit Mode) to SBY (Standby).

5.4.3 GND Mode

GND mode (all-call inhibit mode) is an optional, special XPDR mode that is automatically engaged if the aircraft is on the ground. The installation and correct configuration of an On-Ground-Switch is required. To indicate this mode, a special GND flag is shown.

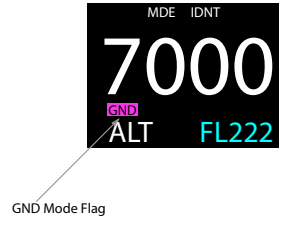


Figure 5.5.: GND mode flag. On-Ground-Switch is required. Due to regulatory requirements, GND mode can not be selected manually.

ACD-57 is capable of determining and displaying a precise pressure altitude and can be used as an altimeter.

6.1 Altimeter User Interface

The current altitude is displayed numerically and with a tape-style indicator, or trend indicator. Depending on the device configuration and other display content, the size of the altitude display varies.

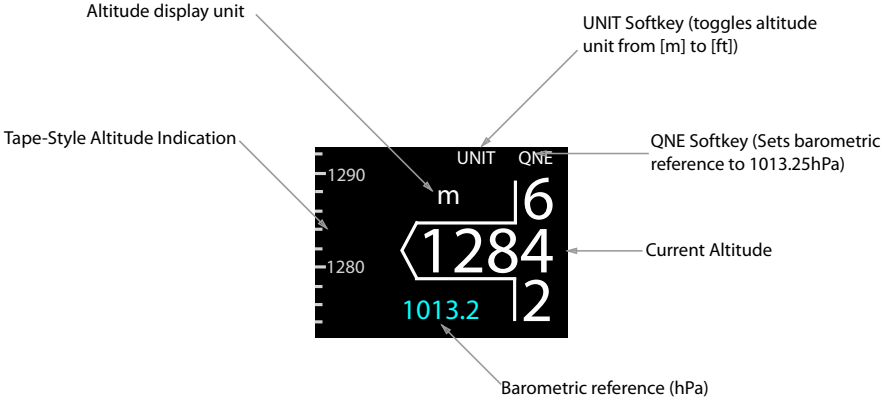


Figure 6.1.: Altimeter user interface

Units to display altitude and barometric pressure are user-configurable. Altitude can be displayed in feet or meters, barometric pressure can be displayed in inches mercury or hectopascals (which equals millibars).

6.2 Adjusting the Altimeter Setting

To enter the altimeter setting page, rotate the inner knob or the outer knob on the main page (In altimeter-only configuration) or push the BARO softkey (if additionally a VHF transceiver and/or a XPDR is controlled).

1. on the main page, rotate the inner knob or push the BARO softkey to enter the altimeter setting page.

2. Use the inner knob and outer knob to adjust the current barometric reference (altimeter setting).
3. Push the inner knob pushbutton to save the setting and to exit to the main page.

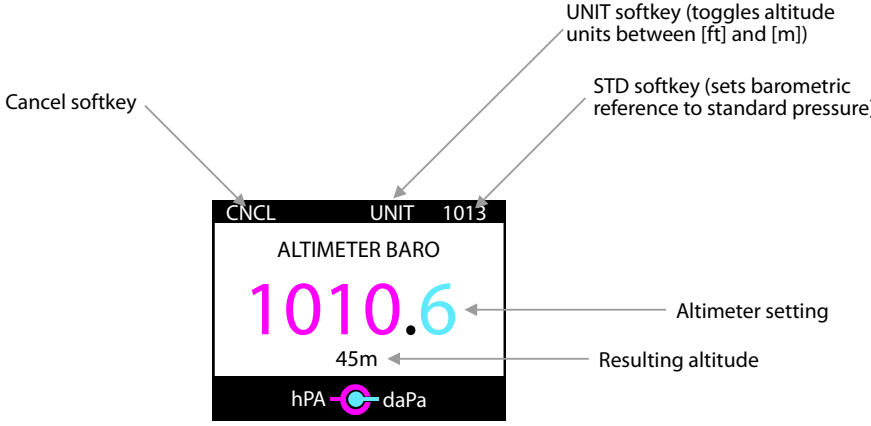


Figure 6.2.: Altimeter setting page

The 1013 softkey or 29.92 softkey can be used to set the barometric reference to standard pressure (1013.25 hPa or 29.92 inHg). If the altimeter is already set to standard pressure, the softkey 4 will instead show the last non-standard altimeter setting, so that the pilot can quickly toggle between standard pressure and another setting.

6.3 Altitude Units

With the UNIT softkey it is possible to toggle quickly between feet and meters as the unit the altitude is expressed in.

ACD-57 can be used to control a COMM VHF transceiver and a transponder at the same time. Additionally it can display altitude. Any combination of these three functions is possible and depends on the configuration during installation and on connected subsystems.

7.1 COMM, Transponder, and Altimeter Combined

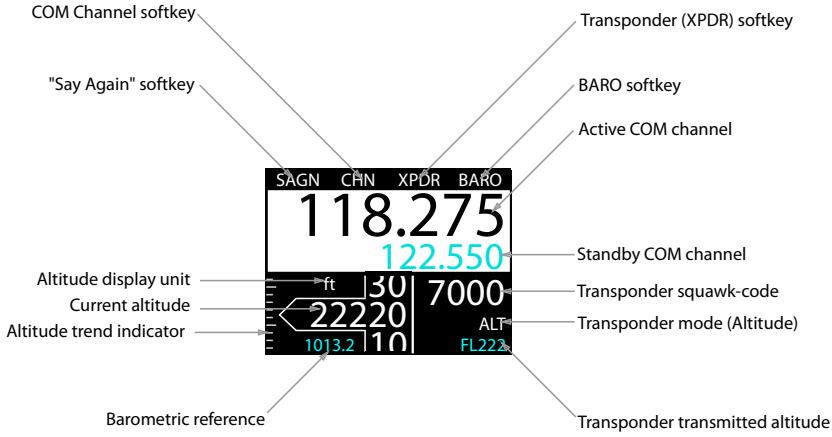


Figure 7.1.: User interface with COMM, transponder, and altimeter functions combined.

7.2 COMM and XPDR Combined

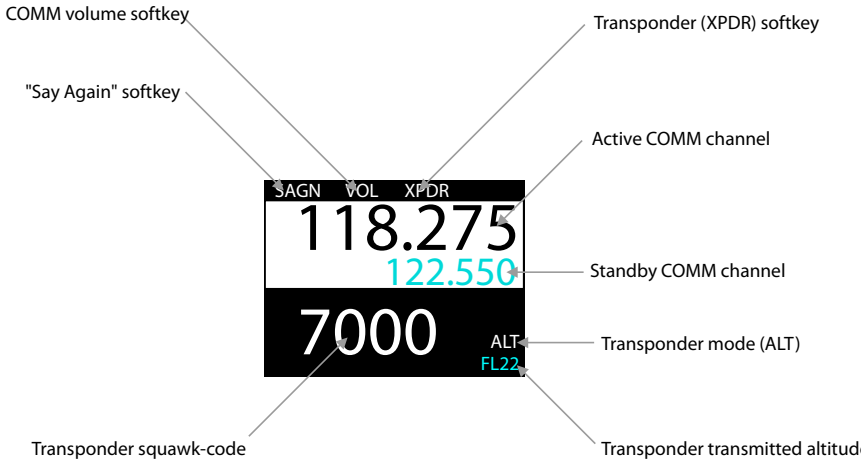


Figure 7.2.: User interface with COMM and transponder functions combined.

7.3 COMM and Altimeter Combined

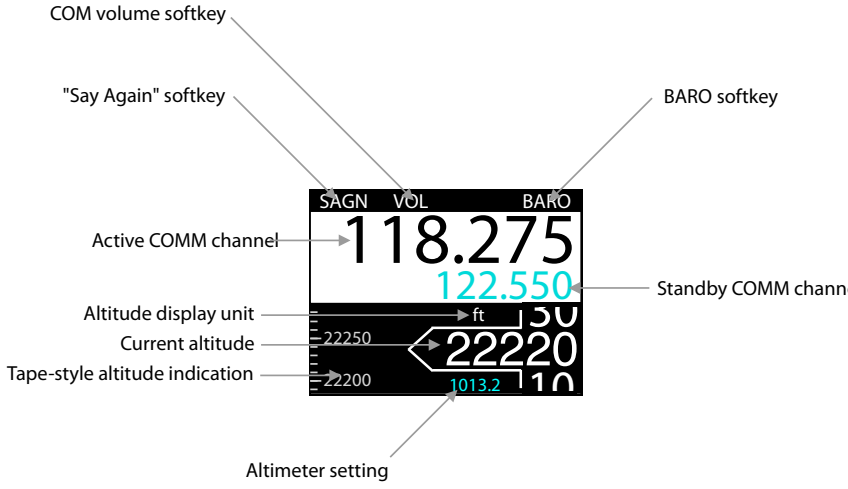


Figure 7.3.: User interface with CMOM and altimeter functions combined.

7.4 XPDR and Altimeter Combined

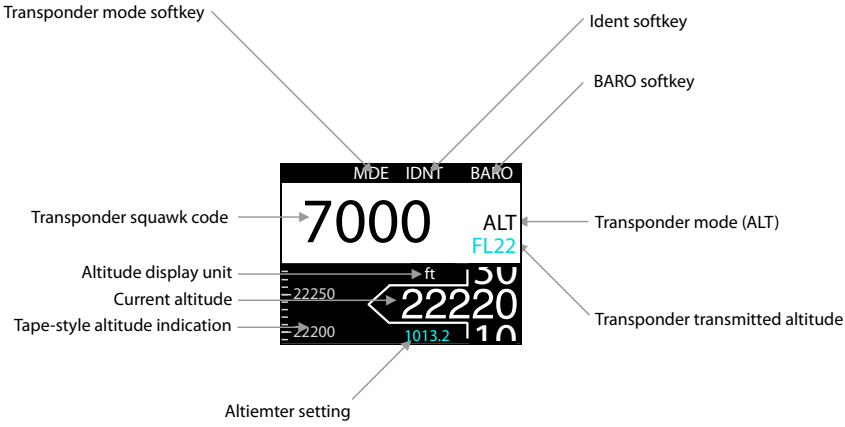


Figure 7.4.: User interface with transponder and altimeter functions combined.

8 Configuration Menu

To enter the configuration menu, push the inner knob pushbutton for at least 2 seconds (long push). The menu contains several configuration options and status information about ACD-57 as well as connected systems.

8.1 ACD System Menu

In the configuration menu, *ACD SYSTEM* contains status information about the ACD-57.

8.1.1 ABOUT

In the *ACD SYSTEM* menu, *ABOUT* contains specific information about the ACD-57 such as hardware and software version information.

STATUS

STATUS holds information about the status of the power supply and the position and pressure data sources.

DATABASES

DATABASES holds information about databases, if they are used.

8.1.2 BACKLIGHT OVERRIDE

In the *ACD System* menu, *BACKLIGHT OVERRIDE* the current display and knob illumination settings can be manually overridden in flight, for example, when the light sensor fails and a wrong backlight intensity is applied.

Until the next restart of the ACD-57, this setting overrides the current backlight configuration. After a restart, the backlight configuration is restored.

To reset the override and get back to the illumination configuration entered during installation, push the RESET softkey.

8.1.3 Control Interface Override

In the *ACD SYSTEM* menu, *CTRL IF OVERRIDE* the external control interface, where COMM and XPDR functions can be controlled by external devices like EFIS systems, is disconnected.

Until the next restart of the ACD-57, this setting overrides the inputs from an external control interface, for example, in case of a fault in the external control system software. After a restart, the control interface configuration that has been entered during the installation is restored.

To reset the override and get back to the control interface configuration entered during the installation, repeat the process to switch the override OFF.

8.1.4 ACD SYSTEM SETUP

This menu is only accessible after a code has been entered to unlock the setup. Here, the hardware-specific settings of the ACD-57 are made. For details, please consult the ACD-57 Installation Manual [1].

9 Software and Station Database Updates

9.1 Version Identification

- The software version can be reviewed in *CONFIGURATION MENU* → *ACD SYSTEM* → *ABOUT*.
- The database version can be reviewed in *CONFIGURATION MENU* → *ACD SYSTEM* → *ABOUT* → *DATABASES*.

9.2 microSD Card

Software upgrades and station databases are updated using the integrated microSD card slot and a microSD memory card.

While the software is actually loaded onto the device, the station database remains on the microSD card. Therefore, database information is only accessible if the microSD card remains inserted.

> If the microSD card is not installed, not all functions will be available.

> Never remove the microSD card while the device is in operation. If the microSD card is removed from the device during runtime, the device's software may stop working. In this case a system restart would be required.

The microSD card slot is located on the right side of the unit's front panel. A microSD memory card can be inserted and removed from the device.

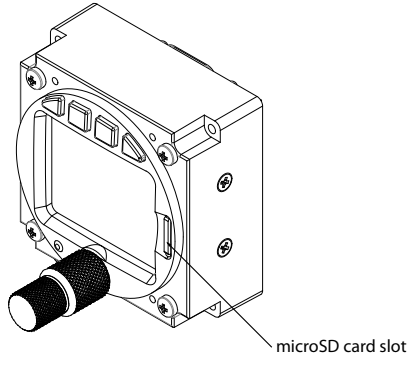


Figure 9.1.: microSD Card Slot

To insert a microSD card, insert the card into the slot, print facing to the display, little nose facing upwards and gently push the card until it clicks in.

> Inserting the microSD card in the wrong orientation may damage the slot.

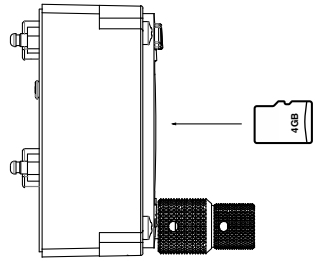


Figure 9.2.: microSD card in correct orientation

To remove an inserted microSD card, use your fingernail to gently push on the card until a click is audible. The card will be released following the click. Use your fingernail to remove the card.

> Be careful. Application of too much force may damage the slot.

ACD-57 is compatible with FAT or FAT32 formatted microSD cards. It has been successfully tested with microSD cards with a storage size of 2 to 64 gigabytes.

9.3 Database Loading

9.3.1 Using a Database

To use a database, please carry out the following steps:

1. Download a valid station database file from *https://www.air-avionics.com*
2. Load the station database file onto a microSD card.
3. Insert the microSD card into the ACD-57.
4. Power the unit on.
5. Open the menu with a long push on the inner knob pushbutton.
6. Use the inner knob to navigate to *CONFIGURATION MENU* → *ACD SYSTEM* → *ABOUT* → *DATABASES*.
7. Verify correct installation in the databases list.
8. Push the ESC softkey to leave the menu.

For safety reasons, databases expire one year after the download. When the database expires, the database can no longer be used and database functions are no longer available.

The station database and related functions are only available while the microSD card holding the station database file is inserted. If the microSD card is removed, the database and all related functions are unavailable.

9.3.2 Loading Software to ACD-57

For details on loading new software onto ACD-57, please consult the ACD-57 Installation Manual [1].

ACD-57 features a range of built-in self test features that continuously monitor the system state and the state of connected systems to detect failures.

10.1 Failures

The detection of a failure is annunciated to the flight crew on the display.

Depending on detected failures and failure severities, the system may seize to function or functionality may be reduced. Failure messages either close automatically, can be closed by the flight crew, or can not be closed at all depending on failure severity.

Figure 10.1.: Major internal failure annunciation

10.2 Insufficient Data Failure Modes

10.2.1 No data from connected systems or internal systems

ACD-57 continuously monitors data from connected systems or its own internal hardware and software systems. If data is not regularly updated, it is no longer displayed. Instead the corresponding value is “crossed out” by a red cross (in case of entire systems that fail to respond) or yellow crosses (if single datasets in the menu expire).

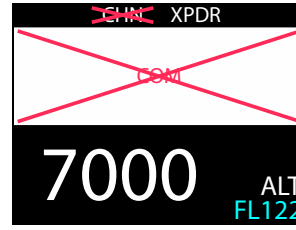


Figure 10.2.: No data/communication with connected COMM system.

10.2.2 No position data and/or no database installed

Some functions require a database on an inserted microSD memory card and valid position data. These are:

- Display of station names on the main page or the channel selection page.
- Nearest station list functions

If no GPS position data or database is available, station names are not displayed on the main page or the channel selection page. If trying to access the nearest station list by pushing the NRST softkey, an information message appears indicating that this function is not available. The message can be acknowledged by pushing the inner knob pushbutton.

Figure 10.3.: Message indicating that database is not available

10.3 Backlight and Control Interface Overrides

> Familiarize yourself with the override functions. These are important safety features in case of malfunctions that could prevent you from using the ACD-57 properly in flight.

10.3.1 Backlight Override

If the display and knob illumination control malfunctions, the display may be too bright or too dark. It may blind the flight crew (during flights at night) or become so dark, that it is unreadable in sunlight.

You can override the current backlight regulation in the *CONFIGURATION MENU → ACD SYSTEM → BACKLIGHT OVERRIDE*. The override function allows to manually adjust the brightness. After a power cycle, the previous settings will be restored.

10.3.2 Control Interface Override

If the external control interface or the external device that controls the ACD malfunctions, the COMM and XPDR controls may be rendered unusable, for example, because of erroneous or intermittent channel or volume changes.

You can override the external control interface in the *CONFIGURATION MENU → ACD SYSTEM → CTRL IF OVERRIDE*. The override function disconnects the external device temporarily. After a power cycle, the previous settings will be restored.

10.4 ACD System Failures

10.4.1 Failure Condition Classification

Depending on the failure severity and its consequences for the operational state of the system, the ACD-57 distinguishes between two following failure classifications:

- Fatal Failure
- Reduced Function Failure

10.4.2 Fatal Failures

In case of a fatal failure, the failed system has seized operation. This can not be recovered during runtime, a reboot of the ACD-57 is required.

A fatal failure message is displayed in *red* color and will remain visible for the rest of the runtime of the system.

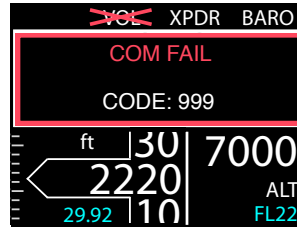


Figure 10.4.: Connected COMM system has detected a fatal failure, failure code is displayed. Unaffected systems remain functional.

10.4.3 Reduced Function Failures

In case of a reduced function failure, the failed system has an issue and functionality is limited/reduced. Some functions of the system may still be available.

A reduced function failure message is displayed in *amber* color and will disappear within 5 seconds. After that, the failed system will be enframed by an *amber* colored rectangle.

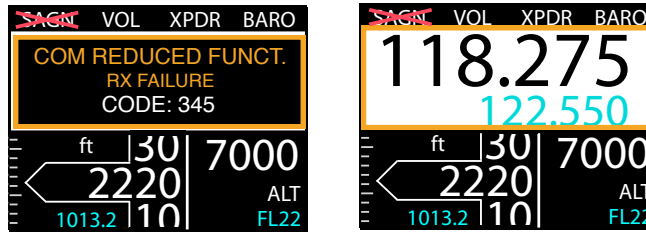


Figure 10.5.: Reduced function failure message (left) and system with reduced function after failure message has disappeared (right)

10.5 Failure Codes

Whenever available, failure codes of the ACD and all connected subsystems are shown. All current failure codes and the system state of the ACD and connected subsystems such as radios or transponders can be reviewed in *CONFIGURATION MENU* → *ACD SYSTEM* → *ABOUT* → *FAILURES*. The failure codes are not stored persistently. This means that after a powercycle/reboot of the ACD-57, the failure information will be lost.

> For failure code identification, please consult the manual of the affected systems.

Unable to tune in some 8.33 kHz or 25 kHz channels

In earlier software versions, it was possible to limit the available channels to 8.33 kHz channels only.

Newer software versions (46 and later) do not offer this parameter any longer. Please set the channel spacing parameter to *25 kHz AND 8.33 kHz* to resolve the issue.

An AIR Com (AC-1) radio or an AIR Transponder (AX-1) is not recognized

Only red crosses are visible, and no information is displayed on the part of the screen where the radio or transponder details should be shown.

This typically occurs when the data bus is not terminated. Please ensure that on every radio and transponder unit, pins 19 and 21 of the main D-SUB 26HD connectors are shorted. Please refer to the installation manuals for the radio or transponder units for detailed information.

The database has expired even though it is current

Database files expire one year after they are downloaded. Database download coupon codes allow for as many downloads as you like in their timeframe (usually two or five years). Please download a new database at least every year to keep it current. To download a database, enter your coupon code again on the respective website.

If the database expired message comes up even though the database is new, please check the following:

- Check if only the current database file is on the microSD card. More than one file may confuse the file algorithm.
- Check if your position source sends the correct date. Some position sources send wrong dates during power-up. Please power up your position source first, and after it has completely booted, power up the ACD. If the issue goes away, select a different position source or contact the support of your position source manufacturer for a fix.

A Bibliography

[1] AIR Avionics, *ACD-57: Installation Manual*, rev 3.0, June 2021.

Configuration Menu Diagram

This menu diagram only shows the basic parameters accessible to the flight crew. For a complete menu diagram including all code-protected parameters, please consult the ACD-57 Installation Manual [1].

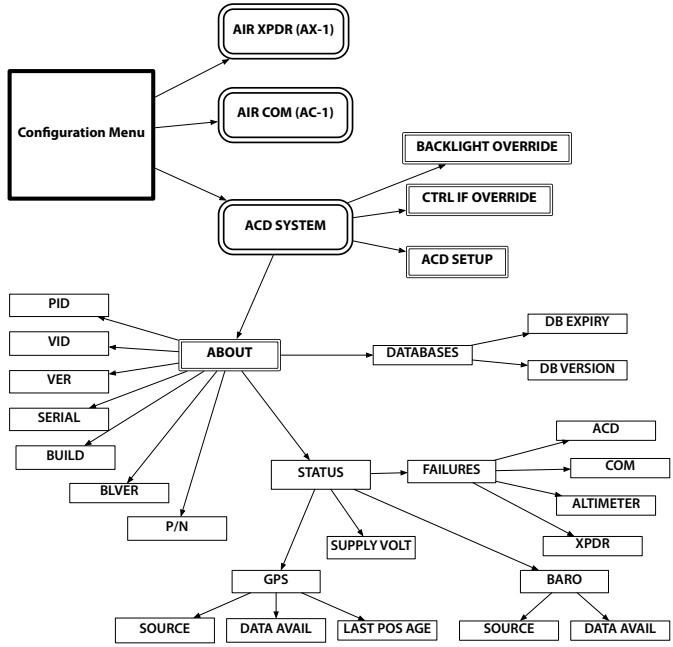
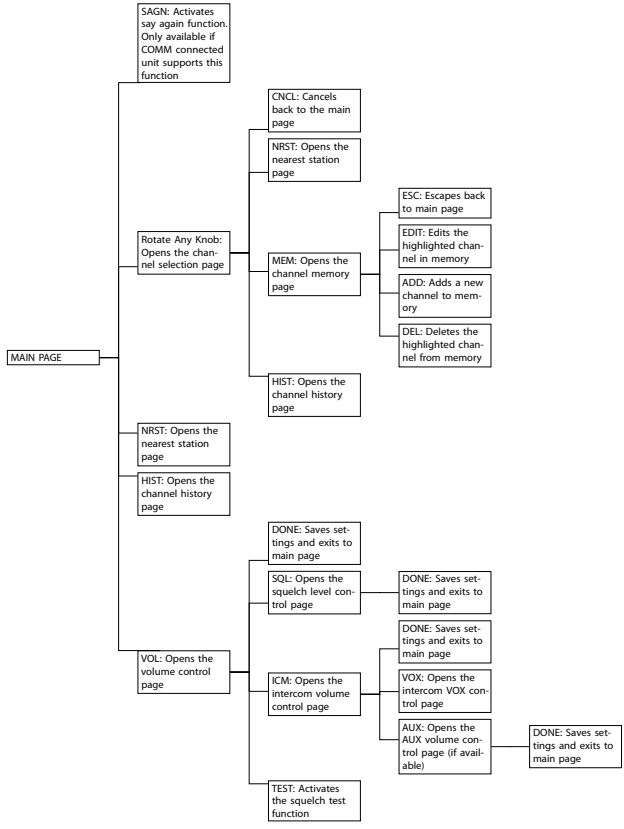


Figure A.1.: Configuration Menu Diagram.

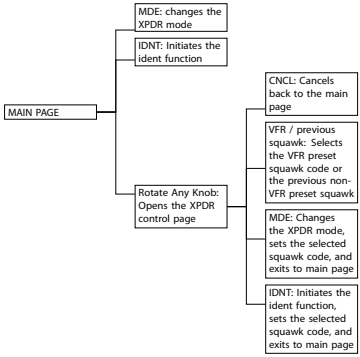
Softkey Menu Diagram

COMM Control Only Softkeys

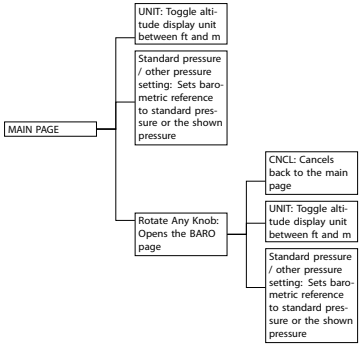


Please note that depending on the setup of the *KNOB USE* parameter, the VOL softkey on the main page may be replaced by a CHN softkey and rotation of inner knob or outer knob will open the volume control page.

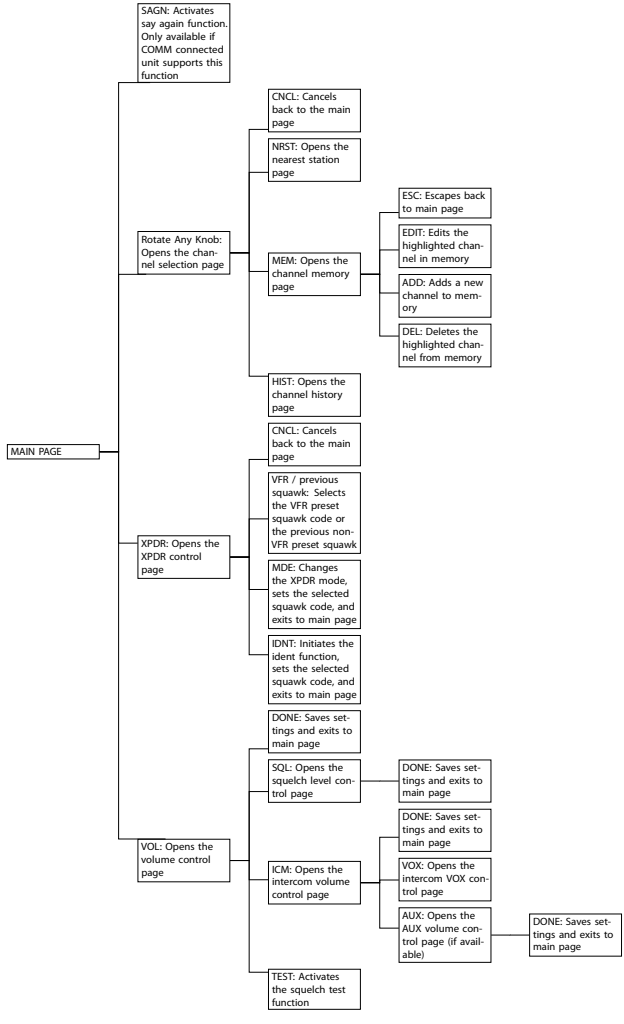
XPDR Control Only Softkeys



Altimeter Only Softkeys

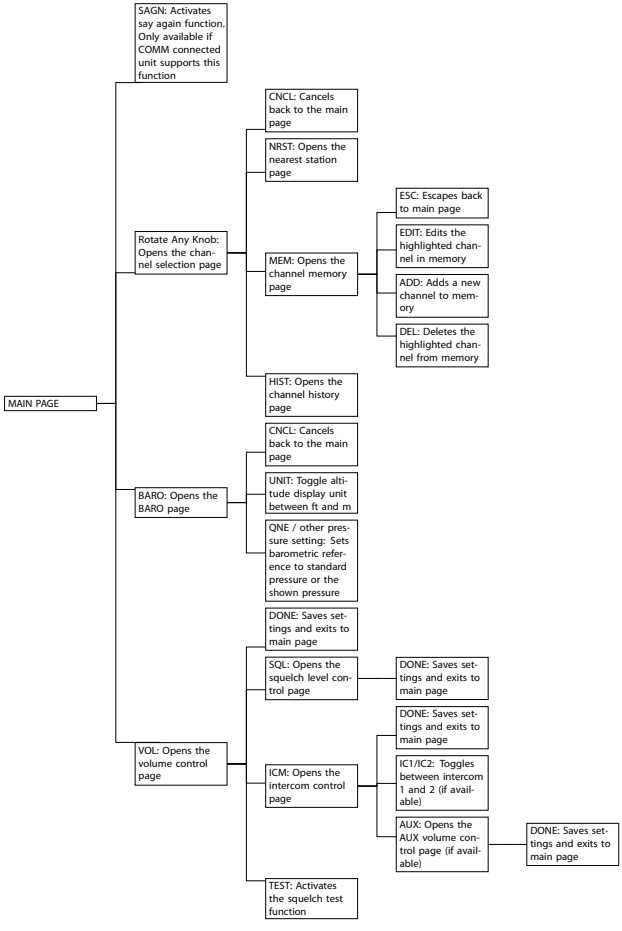


COMM and XPDR Control Softkeys



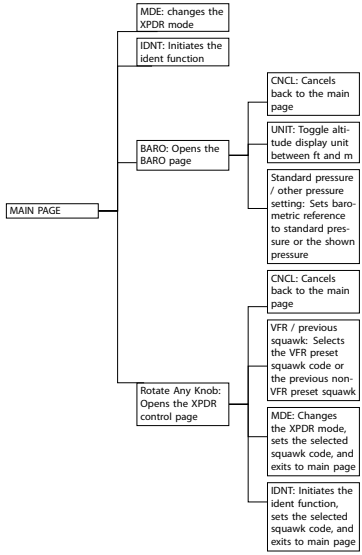
Please note that depending on the setup of the *KNOB USE* parameter, the VOL softkey on the main page may be replaced by a CHN softkey and rotation of inner knob or outer knob will open the volume control page.

COMM and Altimeter Control Softkeys

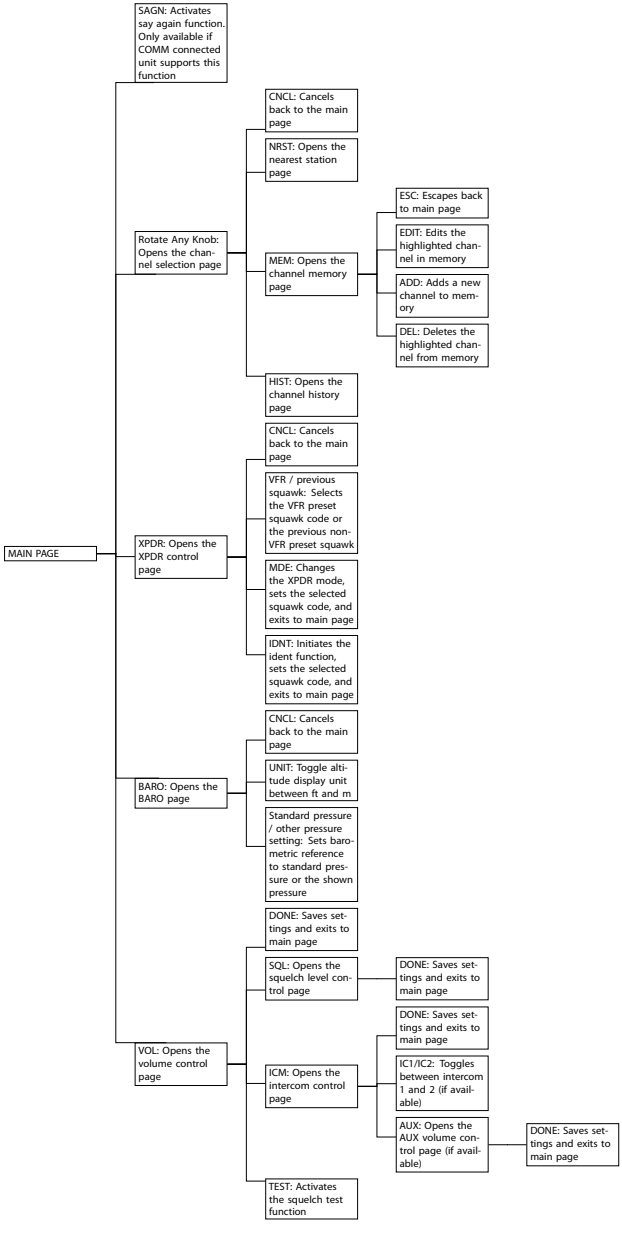


Please note that depending on the setup of the *KNOB USE* parameter, the VOL softkey on the main page may be replaced by a CHN softkey and rotation of inner knob or outer knob will open the volume control page.

XPDR Control and Altimeter Softkeys



COMM, XPDR Control, and Altimeter Softkeys



Please note that depending on the setup of the *KNOB USE* parameter, the VOL softkey on the

main page may be replaced by a CHN softkey and rotation of inner knob or outer knob will open the volume control page.

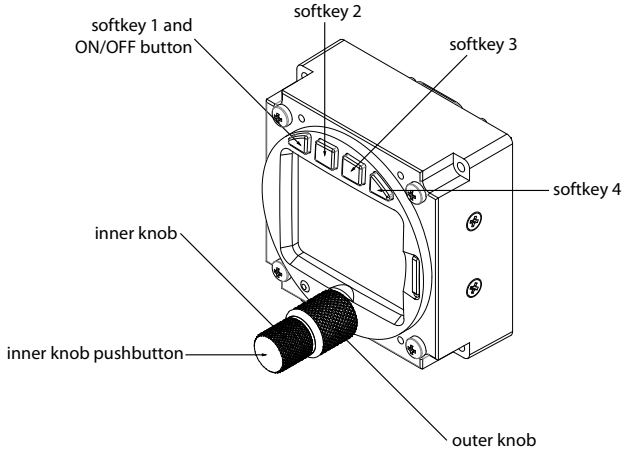


Figure A.2.: ACD-57 pilot controls

Switch On or Off

If not switching on automatically, push softkey 1 , the leftmost button on top of the display, to switch the unit on. To switch the unit off, push softkey 1 longer than 4 seconds.

COMM Operation

A.0.1 Volume Control

On the main page, the VOL softkey opens the volume control page. On the volume control page, the inner knob controls the ACTIVE channel volume, the outer knob controls the STANDBY channel volume.

A.0.2 Channel Selection

On the main page, rotating inner knob or outer knob opens the channel selection page. On the channel selection page, the inner knob controls the kHz, the outer knob controls the MHz.

> To quickly scroll through kHz channels, push, hold and turn the inner knob .

XPDR Operation

A.0.3 Squawk Code Entry

The squawk code is entered in the XPDR page. The XPDR page is opened by pushing the XPDR softkey on the main page. On the XPDR page, use the outer knob to select a position in the squawk code and use the inner knob to adjust the selected position's value. Push the inner knob pushbutton to confirm the squawk code.

A.0.4 XPDR Mode Change

To change the XPDR mode from SBY (Standby) to ALT (Active) or back, please push the MDE softkey on the XPDR page. This also confirms the currently selected squawk code.

A.0.5 XPDR Ident Function

To use the XPDR ident function, please push the IDNT softkey on the XPDR page. This also confirms the currently selected squawk code.

Altimeter Operation

To adjust the altimeter setting, push the BARO softkey on the main page. On the baro input page, use the outer knob and inner knob to adjust the altimeter setting. Push the 1013 softkey or 29.92 softkey to use standard pressure.

To toggle between feet and meters, use the UNIT softkey.