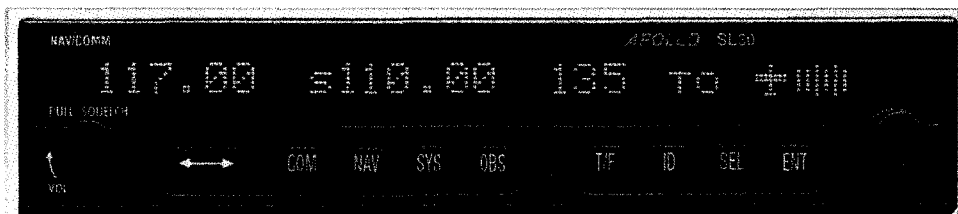


SECTION 9

Airplane Flight Manual Supplement AVE 16

NAV/COM Transceiver GARMIN SL 30

If the GARMIN SL30 NAV/COM Transceiver is installed into the AQUILA AT01, this AFM-Supplement is applicable and must be inserted into Section 9 of the Airplane Flight Manual. The Information in this AFM-Supplement adds or replaces information of the basic Airplane Flight Manual.



The technical content of this Airplane Flight Manual Supplement is approved under the authority of DOA No. EASA.21J.025.

Schönhagen, 17/12/2007


D. Krappel Office of Airworthiness

EASA-Approval: EASA.A.A. 01748
EASA, Certification Directorate

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0.1 LIST OF REVISIONS AND AMENDMENTS

Revision	Reason for Amendment/Revision	Affected Pages	Date of Issue
A.11	Publication of AVE 16 to 21 (minor change AT01-00245)	all	30/11/2007

0.2 LIST OF EFFECTIVE PAGES

Page	Revision	Date
AVE16-1 to AVE16-12	A.11	30/11/2007

Page	Revision	Date

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1. GENERAL

This Airplane Flight Manual Supplement provides a general description of the NAV/COM Transceiver GARMIN SL30, its basic operation and its integration into the AQUILA AT01. For a more detailed description of the GARMIN SL30 and full operating instructions, refer to the effective issue of the SL30 Pilot's Guide, P/N 560-0403-01.

The information contained within this Supplement is to be used in conjunction with the complete Airplane Flight Manual. Furthermore, the "Quick-Reference-Card" of the SL30 furnished by the manufacturer, which contains a summary of the basic operating functions, has always to be carried on board of the aircraft. It is recommended to carry also the SL30 Pilot's Guide on board of the aircraft during flight.

2. OPERATING LIMITATIONS

The GARMIN SL30 NAV/COM Transceiver is installed as optional equipment whose failure is uncritical under all operational conditions. The operating limitations of the basic Airplane Flight Manual apply without any changes or restrictions.

3. EMERGENCY PROCEDURES

The present section defines standard procedures which have to be observed in the case of a failure of the NAV/COM Transceiver as well as for the transmission of radio messages on the international emergency frequency. All emergency procedures defined in the basic Airplane Flight Manual continue to remain valid without any restrictions and are only supplemented by the following defined emergency procedures. Particularly in the case of fire in electrical systems or cable burnings, the relevant emergency procedures defined in the basic Airplane Flight Manual have to be observed.

FAILURE OF THE COM TRANSCEIVER UNIT

In the case of a failure of the COM Transceiver Unit of the SL30, proceed in accordance with the standard emergency procedure defined in the basic Airplane Flight Manual using Transponder Code **7600** and the corresponding flight practices.

FAILURE OF THE NAV RECEIVER UNIT

In the case of a failure of the SL30 NAV Receiver Unit, the remaining operative NAV-Equipment has to be used as required or visual navigation has to be conducted.

TRANSMITTING ON THE INTERNATIONAL EMERGENCY FREQUENCY 121.5 MHZ

In the case of an emergency during flight, a radio message may be transmitted on the international emergency frequency 121.5 MHz. This standard emergency channel is

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stored in the COM memory of the SL30 and may be selected in different ways:

MANUAL SELECTION (121.5 MHZ):

- Switch over to the COM Operating mode, if you aren't in the COM mode already.
- Manually tune in the emergency frequency using the Frequency Selector knobs.
- Press the **Frequency Flip/Flop** button to activate the emergency frequency.
- Transmit radio messages as required/desired.

SELECTION FROM COM FREQUENCY MEMORY:

- Switch over to the COM Operating mode, if you aren't in the COM mode already.
- Press **SEL** button.
- Turn the large Frequency Selector knob to select the menu item *EMERG. CHANNEL*, one position counter-clockwise will reach it faster.
- Press the **Frequency Flip/Flop** button to directly activate the emergency frequency.
- Transmit radio messages as required/desired.

MALFUNCTIONS OF THE SL30 NAV/COM TRANSCEIVER

In the case of malfunctions of the SL30 NAV/COM Transceiver, refer to the SL30 Pilot's Guide, P/N 560-0403-01, for trouble-shooting and corrective actions. Possibly necessary maintenance activities or repairs have to be conducted and certified by an authorised maintenance/repair organisation or the manufacturer of the equipment.

4. NORMAL PROCEDURES

No change to the basic Airplane Flight Manual. A short description regarding the operation of the SL30 NAV/COM transceiver is contained in section 7 of this supplement.

5. PERFORMANCE

No change to the basic Airplane Flight Manual.

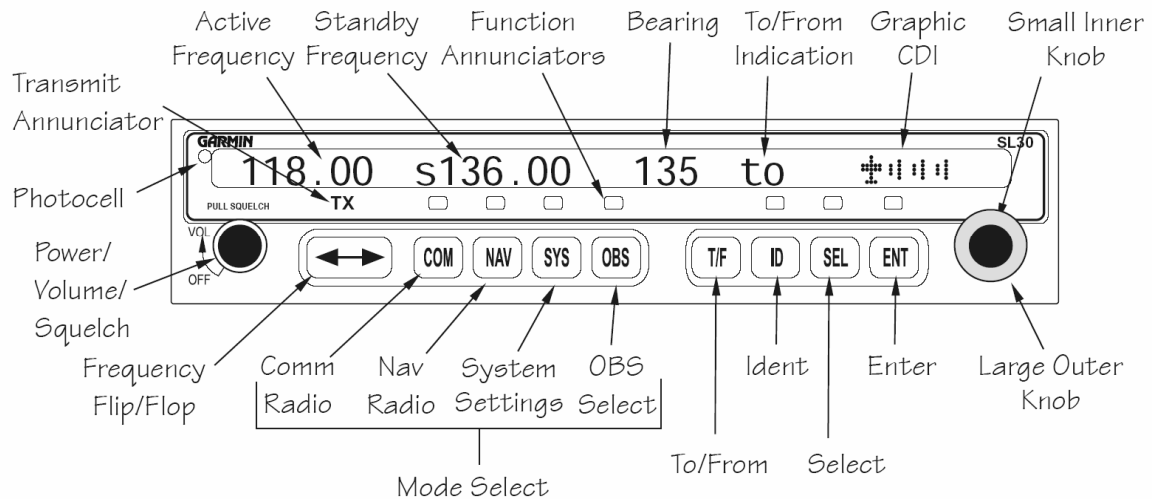
6. WEIGHT AND BALANCE

The change of the empty weight and corresponding centre of gravity after the installation or removal of the GARMIN SL30 has to be determined and recorded in accordance with section 6 of the basic Airplane Flight Manual.

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7. SYSTEMS DESCRIPTION

GARMIN SL 30 FRONT VIEW



GENERAL DESCRIPTION

The GARMIN SL30 NAV/COM Transceiver combines a powerful 760 channel VHF communications transceiver with a 200 channel VOR, Localizer and Glideslope receiver. Besides traditional NAV/COM features, the SL30 also incorporates workload-reducing functions such as automatic decoding of the Morse code station identifier for VOR and LOC ground stations, most-used frequency storage in miscellaneous frequency memory lists, built-in course deviation indicator integrated into the display of the SL30, and more. In addition to the communications transceiver and navigation receiver units, the GARMIN SL30 includes also an independent voice-activated INTERCOM system.

Together with the active frequency, the tuned-in STANDBY frequency is also displayed on the alphanumeric front display of the SL30. Furthermore, the SL30 offers the opportunity to monitor the tuned-in STANDBY frequency in the background. To activate the tuned-in STANDBY frequency, the **Frequency Flip/Flop** button has to be pressed. When pressing the **NAV** button on the key panel, the pilot switches over to the NAV operating mode and the tuned-in active as well as the STANDBY frequency of the NAV mode appears on the display. When the NAV operating mode is activated, the annunciator (LED) above the button will light. By pressing the **COM** button, the SL30 switches back to the COM operating mode and the LED annunciator above the button will light. A photocell is located in the top left corner of the front panel display which automatically adapts the light intensity of the display LEDs to the current light conditions.

The transmission and reception range of the SL30 VHF COM Transceiver unit extends to the frequency band between 118 and 136.975 MHz with 760 channels, i.e. the COM

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frequencies can be selected in 25 kHz increments. The SL30 VHF NAV Receiver unit operates on the frequency range between 108 and 117.95 MHz with 200 channels (50 kHz distance between two adjacent channels) decoding both the VOR and Localizer navigation signals. The built-in Glideslope receiver will automatically tune the corresponding glideslope paired frequencies (328.6 to 335.4 MHz) when the associated Localizer frequency is tuned in and received.

OPERATING MODES

COM OPERATING MODE

The COM operating mode is selected by pressing the **COM** button which activates the operating functions of the SL30 VHF COM transceiver unit. In the COM operating mode, the VHF communication channels can be selected, monitored, or the memory functions of the communications unit may be used. If the COM operating mode is selected, the LED annunciator located on the display directly above the **COM** button will light.

When the **COM** button is pressed a second time, the FREQUENCY MONITORING function is activated which enables the monitoring of the STANDBY frequency for activity while listening to the active frequency. A small “m” (“monitoring”) appears on the display in front of the STANDBY frequency in place of the small “s” (“stand-by”) after activating the FREQUENCY MONITORING function. The small “m” indicates that the FREQUENCY MONITORING function is active. During normal operation when the FREQUENCY MONITORING function is inactive, the small “s” identifies the STANDBY frequency.

The FREQUENCY MONITORING function is immediately deactivated and the unit will switch automatically to the active frequency as soon as a signal is received on the active frequency. For a manual deactivation of the FREQUENCY MONITORING function, the **COM** button has to be pressed once again or the **Frequency Flip/Flop** button has to be selected. After the deactivation of the FREQUENCY MONITORING function, the small “s” appears in front of the STANDBY frequency again.

NAV OPERATING MODE

The NAV operating mode is selected by pressing the **NAV** button which activates the operating functions of the SL30 VHF NAV receiver unit. In the NAV operating mode, the VHF navigation channels can be selected, monitored, or the memory functions of the navigation unit may be used. If the NAV operating mode is selected, the LED annunciator located on the display directly above the **NAV** button will light.

The NAV operating mode provides a MONITORING function for the STANDBY frequency similar to the COM operating mode. When the **NAV** button is pressed a second time, the FREQUENCY MONITORING function is activated. A small “m” (“monitoring”) appears on the display in front of the STANDBY frequency in place of the

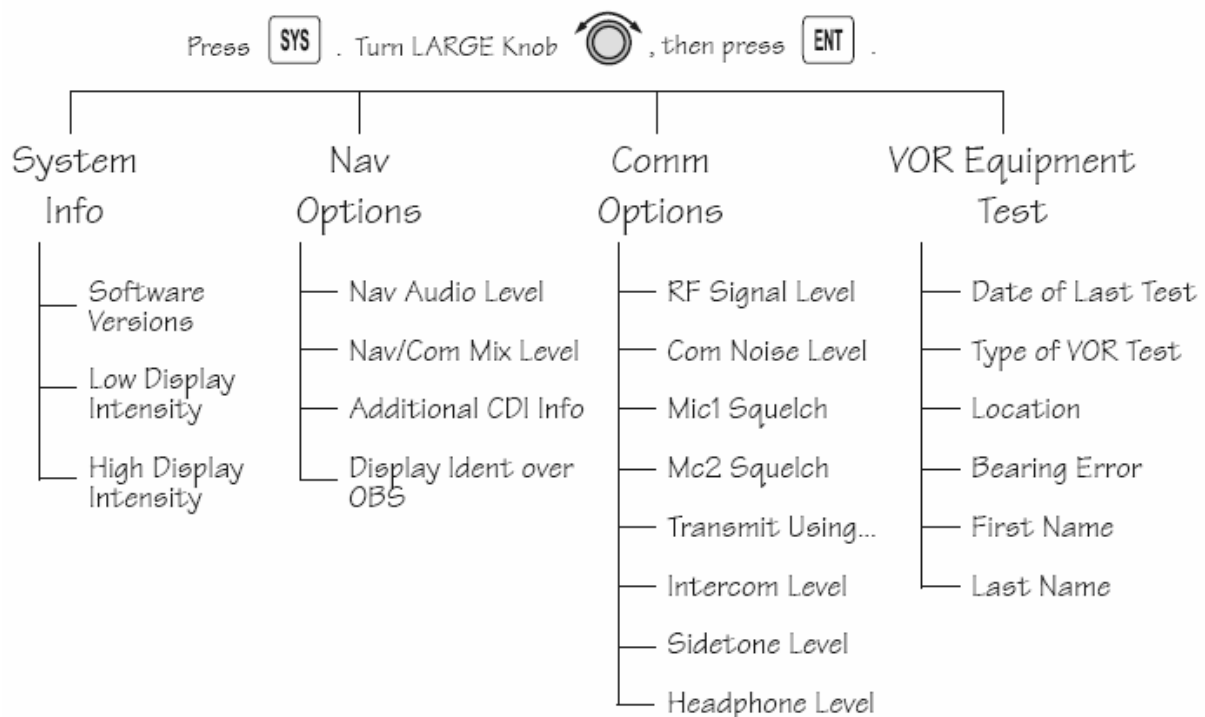
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small “s” (“stand-by”) after the activation of this function. The FROM radial for the VOR ground station whose frequency is tuned in the STANDBY channel is shown in parentheses on the display replacing the station identifier, OBS course, VOR/LOC indicator, or the Course Deviation Indicator. The FROM radial of the STANDBY VOR ground station is shown in addition to the radial (TO or FROM, depending on the selection) of the active VOR station enabling the cross bearing to two different VOR stations without the need of a second NAV receiver.

The FREQUENCY MONITORING function is deactivated when the **NAV** button is pressed once again, a frequency is recalled from the memory, or the **Frequency Flip/Flop** button is pressed.

SYSTEM OPERATING MODE

In order to make configuration adjustments for the SL30, the pilot has to switch over to the SYSTEM operating mode by pressing the **SYS** button. After pressing the **SYS** button, the LED annunciator in the display directly above the **SYS** button will light. In the SYSTEM operating mode, general configuration or system information may be recalled, NAV/COM options changed, or information with regard to the last equipment test called up. The following illustration shows the general structure of the available menus. For more detailed information with regard to each menu and possible configuration options, refer to the effective issue of the SL30 Pilot’s Guide, P/N 560-0403-01.



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OBS OPERATING MODE

The OBS operating mode of the SL30 is selected by pressing the **OBS** button which activates the horizontal CDI graphic display in the form of a course deviation scale. The desired OBS course to which the deviation of the current track is to be indicated can be selected with the large and small Frequency Selector knob only in this operating mode. The large Frequency Selector knob adjusts the course by tens (00-35 in higher digits), the small Frequency Selector knob adjusts single degrees. When the OBS operating mode is active, the LED annunciator in the display directly above the **OBS** button will light.

The CDI graphic is shown in the right section of the SL30 display consisting of an aircraft symbol, which points up- or downwards depending on TO or FROM selection, and a bar graph of up to five pairs of short and tall bars right or left of the aircraft symbol depending on the aircraft position with regard to the selected OBS course. Each short and tall bar pair indicates two degrees of deviation. When no VOR signal is received, the CDI graphic on the display is dashed and marked "flagged". The CDI function is not available for LOCALIZER ground stations.

The OBS operating mode provides also a function to navigate direct-to a VOR. This function is activated by pressing the OBS button a second time. The CDI will now centre immediately in the TO condition.

An external Course Deviation Indicator such as the GARMIN GI 106A may be optionally installed on the instrument panel of the aircraft.

OPERATION OF THE SL30

In order to activate the SL30 NAV/COM Transceiver, both the **ALT/BAT**-Master Switch and the Avionics Master Switch have to be in the "ON"-Position.

ACTIVATION / DEACTIVATION OF THE SL30

The SL30 NAV/COM Transceiver is turned on by rotating the Power/Volume knob clockwise past the detent. The continuing rotation of this knob towards the right increases speaker and headphone amplifier volume level. Rotate the knob to the left to reduce the volume level. After activation, the SL30 will go through a short initialization routine and then briefly display the last VOR check date. The SL30 is operative when the last selected frequency is displayed.

The SL30 is turned off by rotating the Power/Volume knob counter-clockwise until the detent engages in the end position.

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FREQUENCY SELECTION (COM AND NAV OPERATING MODE)

New frequencies are first selected as a STANDBY frequency and then toggled to the active side when desired. The desired STANDBY frequency can be selected by means of the large and small Frequency Selector knobs located near the right edge of the SL30 front panel. The large Frequency Selector knob has to be used to change the frequency in 1 MHz increments. The small Frequency Selector knob has to be used to change the frequency in 25 kHz increments between 000 and 975 kHz in the COM operating mode and in 50 kHz increments in the NAV operating mode. The STANDBY frequency is toggled to the active frequency by pressing the **Frequency Flip/Flop** button. Only the STANDBY frequencies can be changed with the Frequency Selector knobs, not the active frequencies.

RECALLING STORED FREQUENCIES

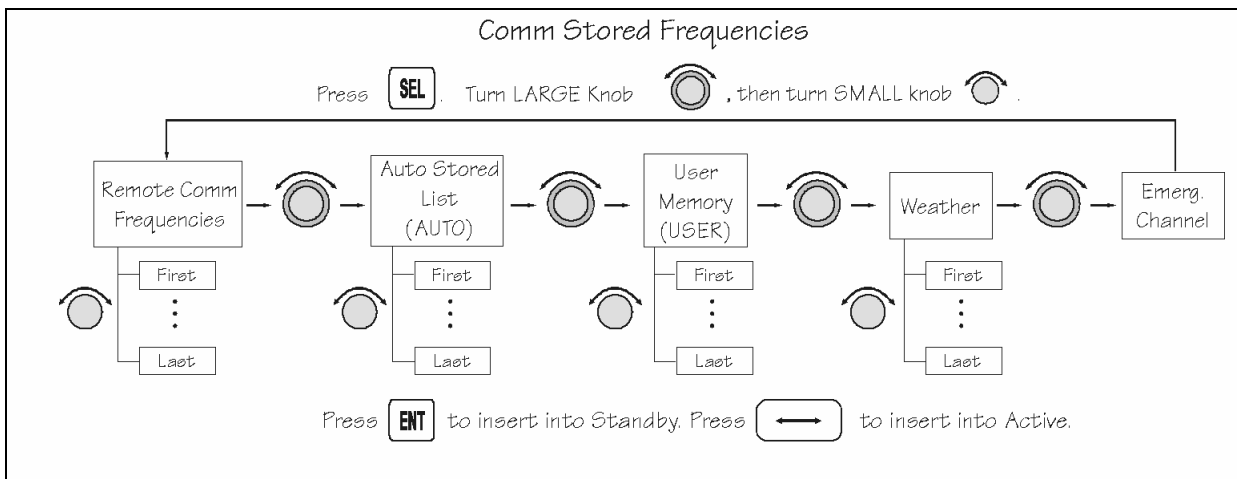
The following description is valid for the COM as well as the NAV operating mode.

In order to recall and select stored frequencies from the memory, the following steps have to be carried out:

- Select the desired operating mode (COM or NAV)
- Press the **SEL** button to go to the frequency databases
- The different items of the basic menu (frequency memory lists, refer to the illustration on the next page) may be selected by turning the large Frequency Selector knob.
To recall a manually saved frequency, select the frequency memory list (menu item) *USER MEMORY* with the large Frequency Selector knob.
- The different available sub-items of the selected frequency memory list may be selected by rotating the small Frequency Selector knob. To recall a manually saved frequency, scroll through the saved frequency channels with the small Frequency Selector knob until the desired channel is selected.
- Press the **ENT** button to put the displayed channel into the STANDBY frequency position. Pressing the **Frequency Flip/Flop** button toggles the selected STANDBY frequency to the active frequency or directly puts the displayed channel of the frequency memory list into the active frequency position.
- The basic menu of the frequency memory lists may be left or the selection cancelled by pressing the **SEL** button again

The following illustration shows the menu structure of the available frequency memory lists in the COM operating mode.

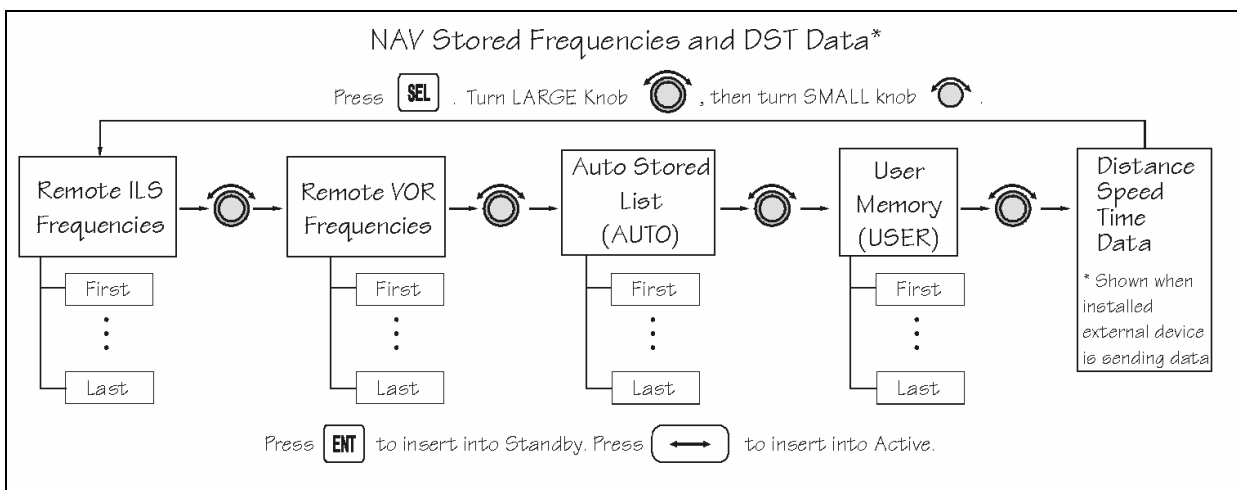
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Menu Structure of the Frequency Memory Lists (COM Operating Mode)

The frequency memory list *AUTO STORED LIST* contains the last ten used active frequencies in chronological order. Each individual frequency may be selected by rotating the small Frequency Selector knob. All manually saved channels are stored in the *USER MEMORY* list (up to 250 COM and NAV frequency channels). The international emergency frequency (121.5 MHz) is stored in the menu item *EMERG. CHANNEL*. The emergency channel is put into the *STANDBY* frequency position by pressing the **ENT** button. The subsequent pressing of the **Frequency Flip/Flop** button activates the emergency channel.

The menu structure of the available frequency memory lists in the *NAV* operating mode is similar to the *COM* operating mode and is shown in the following illustration.



Menu Structure of the Frequency Memory Lists (NAV Operating Mode)

For a detailed description of each frequency memory list and the procedure for the manual saving of channels in the *COM* as well as in the *NAV* operating mode, refer to the effective issue of the SL30 Pilot's Guide, P/N 560-0403-01.

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COM TRANSCEIVER (COM OPERATING MODE)**VOLUME AND SQUELCH**

The speaker and headphone amplifier volume level is adjusted by rotating the Power/Volume knob. In order to disable the automatic squelch, the Power/Volume knob has to be pulled. A general adjustment of the automatic squelch to the used headsets and the overall noise conditions has to be conducted in the SYSTEM operating mode under the menu item *COMM OPTIONS*.

TRANSMITTING

The transmitter mode of the SL30 COM Transceiver unit is activated by pressing the push-to-talk button on the control stick. The transmit annunciator (“**TX**”) located above the **Frequency Flip/Flop** button appears on the display while the COM radio is transmitting.

NAVIGATION RECEIVER (NAV OPERATING MODE)**NAV STATION IDENTIFICATION**

In order to listen to the audio signals (Morse Code Identifier of the VOR/LOC ground station), the **ID** button has to be pressed. After pressing the **ID** button once, the LED annunciator in the display directly above the **ID** button will light and “IDENT” will be displayed for 3 seconds. The Morse Code signal of the active NAV channel sent over by the VOR/LOC ground station on that frequency will be heard in the headsets. If the **ID** button is pressed a second time, “VOICE” will be displayed for 3 seconds. The Morse Code tone volume will be reduced so that possible voice transmissions on the COM channel can be heard more clearly. Pressing the **ID** button a third time will deactivate the ID mode and the LED annunciator above the button expires.

INTEGRATION OF THE SL30 NAV/COM TRANSCEIVER INTO THE AQUILA AT01

The GARMIN SL30 NAV/COM Transceiver is installed into the avionic rack in the midsection of the instrument panel among the other avionic equipment. The on-board electrical power supply of the SL30 occurs via the Avionic Bus which is connected to the Main Bus of the electrical power supply via the Avionics Master Switch (20 A protective rocker switch). To provide a functional separation between the NAV/COM transceiver unit and the thereof independent INTERCOM unit, the SL30 includes two different electrical circuits that are independent from each other with their own power supply and separately protected with their own circuit breaker. One electrical circuit supplies the NAV/COM Transceiver unit with electrical energy which is protected by a 5 A circuit

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breaker marked with the placard “**COM/NAV 1**” or “**COM/NAV 2**”, if the SL30 is installed as second NAV/COM Transceiver into the aircraft. The other electrical circuit supplies the independent INTERCOM unit of the SL30 with electrical energy which is protected by a 3 A circuit breaker marked with the placard “**INTERCOM**“. Both circuit breakers are installed in the right section of the instrument panel among the other circuit breakers. The SL30 NAV/COM Transceiver is connected to the VHF-COM antenna and the VOR antenna of the aircraft.

For further information and a detailed description of the integration of the SL30 NAV/COM Transceiver into the aircraft, its connection to the on-board electrical system and to other avionic equipment and instruments as well as the installation positions of the respective antennas, refer to the effective revision of the Maintenance Manual of the AQUILA AT01, document no. MM-AT01-1020-100.

8. HANDLING, SERVICE AND MAINTENANCE

In order to increase the service life of the GARMIN SL30 NAV/COM Transceiver, it should always be deactivated during engine start-up and shut-down since electrical surges during the start-up and shut-down process may cause damage to the unit.

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