

MGL Avionics

VHF Airband Transceiver
Model V6



User & Installation Manual

VERSION 1.1 - 10/2011

General

Please read this manual before operating the V6 Transceiver
Please include this manual if ownership of the V6 Transceiver changes

Operational limitations, conditions and restrictions

Do not operate this unit outside of its specified temperature range – this may result in malfunction or damage to the unit.

Observe the installation wiring diagrams. Incorrect wiring may damage this unit.

Never operate this unit outside of its specified voltage range. Doing so may cause serious damage to this unit. At all times ensure that no reverse polarity power is applied to this unit. **Reverse polarity will destroy this unit.**

This Transceiver is designed to withstand the possible power surges that may occur in a correctly wired power supply system of a typical aircraft. For this reason the Transceiver may be left switched on when engines are started. Please note that the supply voltage may drop below minimum operating voltage during engine cranking. During this time operation of the radio will not be possible.

Do not operate the transmitter of this unit without connecting a correctly adjusted antenna. Doing so may result in damage to the unit.

The V6 Transceiver is not FAA type certified. This unit may only be used in aircraft where such a unit is permitted under local rules. Typically these rules permit operation in non-type certified aircraft such as home built and experimental or sport category aircraft. Limitations may exist on maximum altitudes above which a non-certified airband Transceiver may not be operated. Please check local rules with the relevant authorities.

Use of this radio may be subject to a radio station license. Please contact the local radio frequency spectrum governing body (such as the FCC) to inquire as to the procedures required to obtain a radio station license.

Operation of this Transceiver may only be allowed by persons holding a valid radio license (restricted or full).

Please do not operate this Transceiver illegally.

Please do not operate this Transceiver in an environment or in conditions where its transmissions may cause interference to other electronic equipment or systems.

Never operate an airband radio without the required qualifications to do so.

Never cause a nuisance to aircraft on the ground or in the air by misuse of this Transceiver in any way.

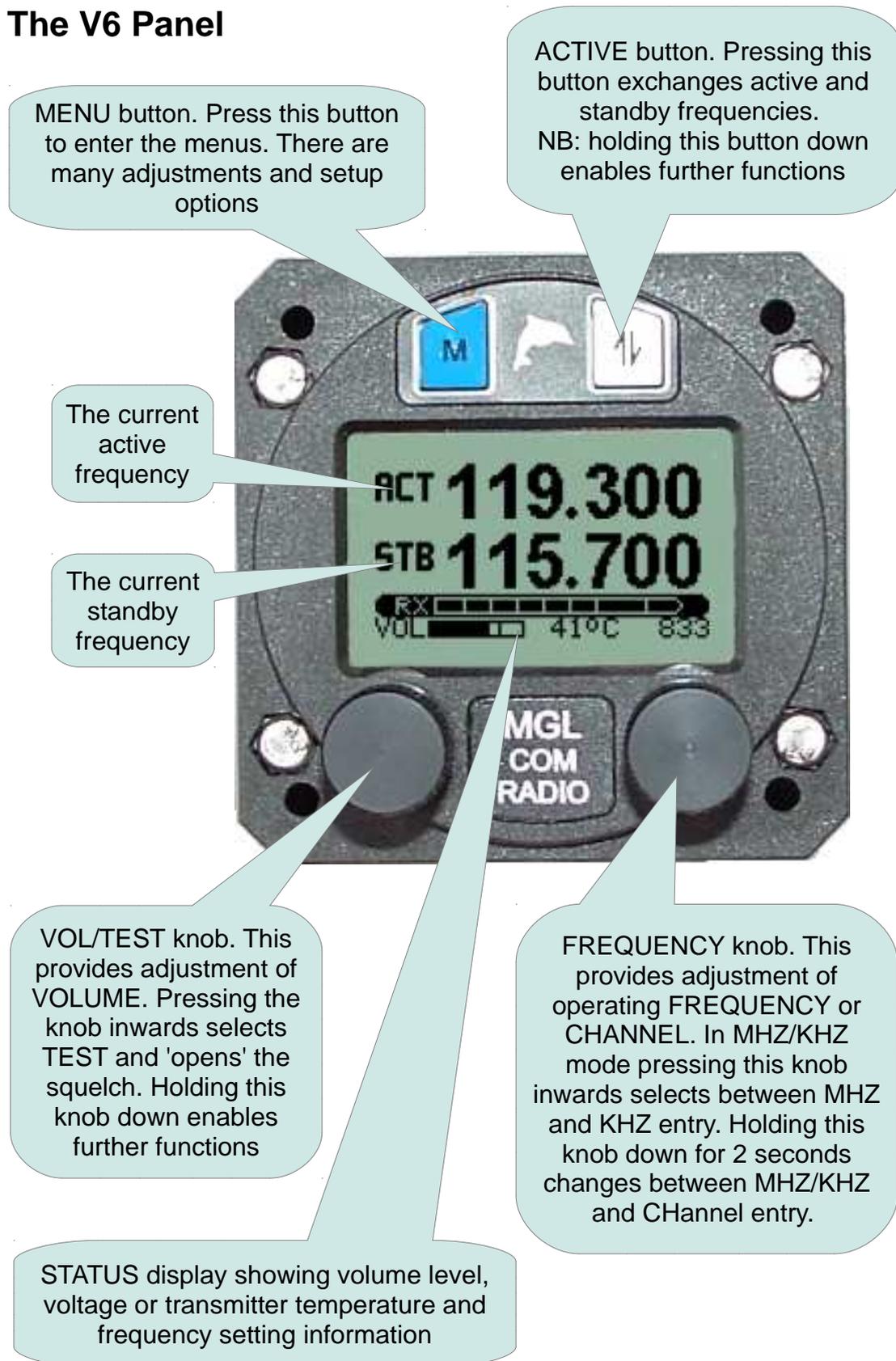
Never compromise the safety of other aircraft with lengthy transmissions. Keep transmissions short and to the point following established air to air and air to ground rules and procedures.

Table of Contents

General.....	2
Operational limitations, conditions and restrictions.....	2
The V6 Panel.....	5
The V6 controls.....	6
The 'VOL/TEST' knob.....	6
The 'ACTIVE' button.....	7
The 'FREQUENCY' knob.....	7
Setting frequencies.....	8
Changing channels.....	8
The STATUS display.....	9
RX/TX bargraph.....	9
Annunciators.....	10
The 'MENU' button.....	11
Menu structure.....	11
First Level Menu.....	13
Ambient noise suppression.....	13
Squelch adjustment.....	13
Program channels.....	14
Contrast.....	14
Microphone level.....	15
Music level.....	16
Auxiliary input levels.....	16
Microphone bandpass filter.....	16
Scanning state at power up.....	17
Frequency lists.....	17
Setup	17
Second Level Menu.....	18
TX MIC VOX / HOT.....	18
TX LOCK ON / OFF.....	18
P-scan ON / OFF.....	19
PTT Configuration.....	19
Flip-Flop FS / Direct FS.....	19
MIC Levels.....	19
Pilot Isolate configuration.....	19
Auxiliary input configuration.....	20
Audio output configuration.....	20
Sidetone configuration.....	20
CHANNEL spacing.....	20
RESET.....	20
Installation.....	21
General installation notes.....	21
Planning.....	22
DB-25 connector pin out.....	23
Typical wiring diagrams.....	24
Transceiver installation.....	25
Specifications – Subject to change without notification.....	26
Physical.....	26
Transmitter.....	26
Receiver.....	26
Other.....	27

Power.....	27
FCC Statement.....	27
REFERENCE.....	28

The V6 Panel



This shows the V6 Transceiver in a Factory Default configuration with 'Flip-Flop' frequency selection. The V6 Transceiver can be operated in other modes depending on setup and installation.

The V6 controls

The 'VOL/TEST' knob

Rotating this control knob will adjust headphone volume. The Transceiver defaults to volume adjustment. While adjusting the volume, the display will change to a large bargraph and number indicating volume level setting.



Pressing the knob inwards will disable the squelch on the Receiver and allow a quick receiver TEST. Squelch setting may be changed in the First Level Menu.



Holding the VOL/TEST knob down and rotating counter-clockwise reduces the volume level of the Radio only. This allows easy conversation over the Intercom in the presence of heavy radio traffic. The reduced volume level is adjustable downwards, but may not be switched off. While the Radio is 'MUTED' the screen flashes every five seconds.

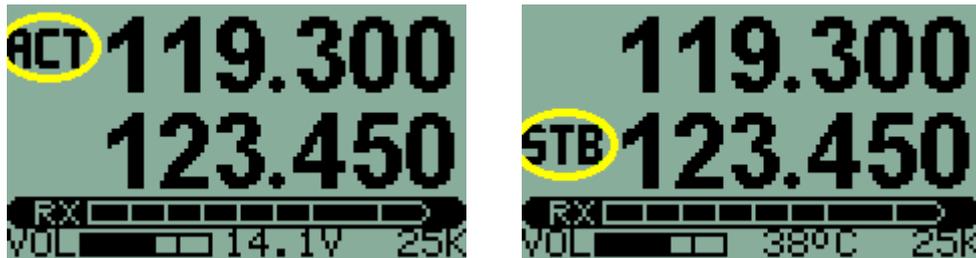


Radio volume is restored by holding the VOL/TEST knob down and rotating clockwise. Also, volume is automatically returned to normal by using the transmitter (pressing a PTT).

The 'ACTIVE' button

With a Factory Default setup, the display shows two frequencies – active and standby. When the ACTIVE button is pressed, the standby frequency becomes the active frequency and the active frequency becomes the standby frequency.

Holding down the ACTIVE button for 1 second will enable or disable scanning (the Receiver 'scans' rapidly between active and standby frequencies to check for incoming transmissions). Scanning is indicated by alternate flashing of the ACTIVE and STANDBY annunciators on the display.



A short burst of beeps in the headphones gives an audible indication as scanning is enabled or disabled so that it is not necessary to look at the display. Three beeps indicate scanning has been enabled and two beeps that it has been disabled.

If a transmission is detected, scanning stops and it is possible to listen to the received signal. Scanning continues when the transmission ends. The transmission may be on either the active or standby frequency.

NB: Holding down this button for three seconds will automatically set the active frequency to the emergency channel on 121.500 MHz.

It is possible for the Transceiver to operate with direct frequency entry. This configuration may be selected in the second level of the Menu system. Only a single frequency is shown on the display - the active frequency. This frequency is changed directly. There is no standby frequency and no scanning is possible.

The 'FREQUENCY' knob

This control is used to set the operating frequency of the Transceiver. The setting acts on the standby frequency (or the active frequency if direct frequency entry is being used).

A frequency is set on the V6 Transceiver either by entering MHZ/KHZ or by selecting a memory Channel. Holding the FREQUENCY knob down for two seconds changes from one to the other.

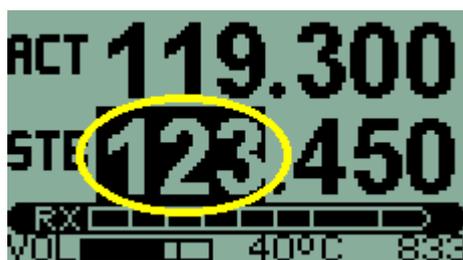
An indication of whether the Transceiver operating frequency is to be set by MHZ/KHZ or CHannel selection is shown on the display as indicated.



The spacing between frequencies may be in steps of 25KHz or 8.33KHz. This may be set in the Second Level Menu. A 'speed-up' function is provided for the FREQUENCY knob so that a new frequency or channel may be set up quickly and easily.

Setting frequencies

With the method of frequency entry set to MHZ/KHZ a frequency is set by pressing the FREQUENCY knob inwards momentarily until the desired part of the frequency entry is highlighted on the display. The graphic below shows 'MHZ' entry, with that part of the display highlighted (with a dark background).



While the desired part of the entry is highlighted, the setting may be changed by rotating the knob.

NB: KHZ rolls over without changing the MHZ value. Thus for example, increasing KHZ will change from a frequency display of 124.975 to 124.000. Likewise, decreasing KHZ from 124.000 will change the setting to 124.975. This makes KHZ selection easier.

Pressing the FREQUENCY knob briefly switches between MHZ and KHZ entry.

Changing channels

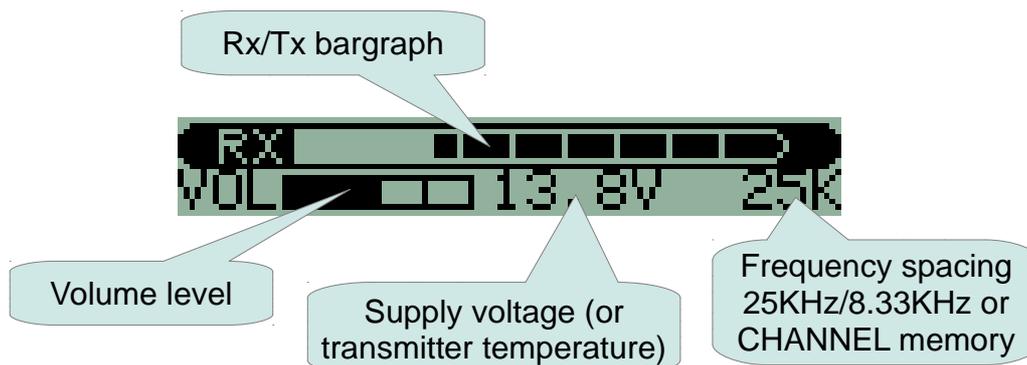
To switch to memory CHannel entry hold down the FREQUENCY knob for two seconds. Memory Channels may then be selected by rotating the knob.

NB: Channel selection rolls over from 99 to 1 or from 1 to 99.

NB: If a frequency list has been uploaded from a compatible EFIS or GPS and activated by menu function (in the First Level Menu), only 20 channels will be available. The list size is determined by the SL30 and SL40 communications protocol and may have from 1 up to a maximum of 20 entries.

The STATUS display

The STATUS display provides an Rx/Tx bargraph, and annunciators for volume level, supply voltage or transmitter temperature and frequency spacing.



RX/TX bargraph

The V6 Transceiver display includes a bargraph showing the strength of a received signal during RX or modulation level of the transmitter during TX.

Due to good receiver sensitivity, signals of medium strength will fill the bargraph.



Receiving transmission of moderate strength

During TX the bargraph shows modulation of the actual transmit carrier. This is a visual form of side tone making it possible to judge how well the signal from the microphone is modulating the transmitter. Note that this bargraph does not show the level from the microphone – this shows directly the modulation of the signal being transmitted.

Good modulation will cause the bargraph to just touch the right hand side of the display for the loudest parts of transmission. Often this is achieved with click “T” or “SHH” sounds. Average level of speech during transmission should be between 50% and 75% on the bargraph.

The modulator for V6 transmitter is under direct microprocessor control. The audio signal to be transmitted is processed using digital signal processing algorithms before being sent to the modulator.

Software control of the modulator allows precise control of modulation under varying power supply and temperature conditions. It also allows wide range control of the audio signal amplitude at the modulator. This prevents over-modulation while still allowing deep and rich modulation of the carrier. This

results in excellent audio quality of the transmitted signal and extends the effective range of the transmitter.

Correct microphone level adjustment is required for optimum modulation level. If a headset is changed to another type, microphone level should be checked before use. The microphone level adjustment function (in the First Level Menu) has a convenient bargraph readout, making adjustment simple and accurate.

Annunciators

The bottom line of the display provides three annunciators.

On the left-hand side, a small bargraph indicates the setting of the volume control.

In the center is a display of nominal supply voltage at the power terminals of the connector on the rear of the case. This periodically changes to indicate the temperature of the transmitter. The temperature is in Centigrade and may rise as high as 95°C for high ambient temperatures and during periods of intense use of the transmitter. Output power is reduced automatically at high temperatures to limit the possibility of damage to the transmitter.

On the right-hand side is an indicator of the frequency method or spacing used for setting the operating frequency. When using Channel memories, this shows 'CHL'. For entering frequencies, either in Flip-flop or Direct modes, this shows the frequency spacing. '25K' indicates that the frequency may be set in steps of 25KHz while 833 indicates that frequencies are available in steps of 8.33KHz. Frequency setting and readout on the display is according to ICAO standards for both spacings.

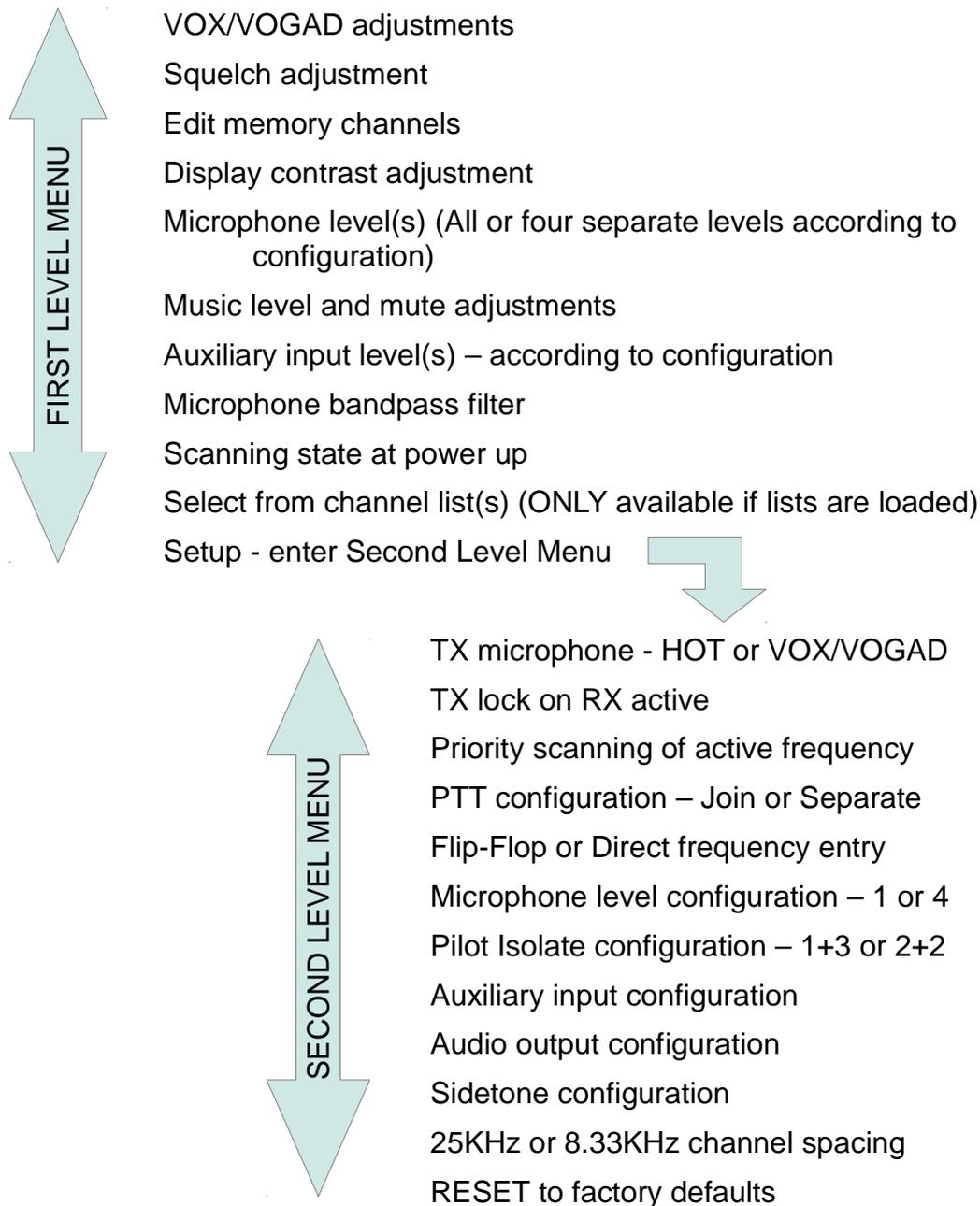
Visit www.MGLAvionics.co.za to download the latest version of this User and Installation Manual.

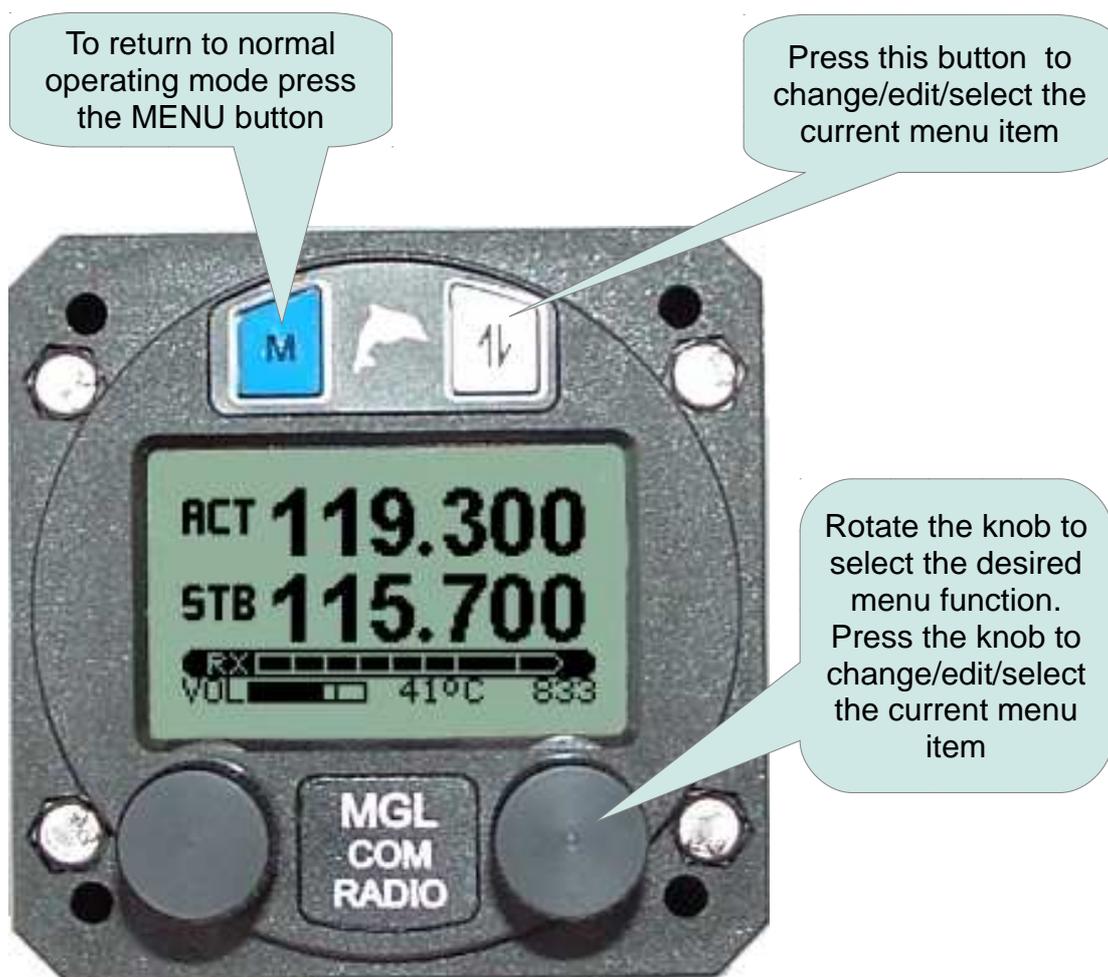
The 'MENU' button

The MENU button allows entry to the two level menu system at any time. The menus provide access to options and adjustments such as setting intercom, VOX, and audio levels, and many others.

Menu structure

The V6 Transceiver provides setup options and adjustments on two menu levels. The First Level Menu is accessed by pressing the "MENU" button. The Second Level Menu with options that are usually only used during installation, is accessed via the "Setup" function in the First Level Menu.





Once a menu function has been selected, the display will change according to available functionality. Pressing of the ACTIVE button and the FREQUENCY knob are interchangeable except where indicated. Pressing the MENU key as required will return the unit to the normal operating screen – either Frequency display or Channel display. Also, any menu function will default to the normal operating screen after 60 seconds.

As an example, this is the display for the ambient noise suppression system function allowing selection of the type of system to be used and adjustment of the level/'strength' of the selected system.



First Level Menu

Ambient noise suppression

Factory Default: **VOGAD MED 2**

The V6 Transceiver provides four different ambient noise suppression systems. Pressing the FREQUENCY knob (or the ACTIVE button) cycles through the four types. Rotating the knob adjusts the level or 'strength' for the selected type.



- **VOGAD (three types)**

This is a proprietary VOGAD system developed by MGL Avionics. It uses gain shaping with digital processing of the audio signal from the microphone. The voice signal envelope is detected and used to modulate microphone gain. Three types are provided – LOW, MED(ium) and HIGH. The type should be selected depending on noise level in the aircraft. Most general aviation aircraft will use a medium setting. Each VOGAD type has up to 8 levels. As the level is increased, gain falls more sharply below a threshold as set by the VOGAD type.

It is important not to set the microphone level too high. This must be correctly matched to the selected type. If the microphone level is too high ambient noise may exceed the threshold for that type.

With the VOGAD system set up correctly, the microphone will seem to be highly directional so that it must be placed directly in front of the mouth.

A suggested starting point is VOGAD MED(ium) level 2.

- **VOX**

This type simply switches off the microphone if sound is below a preset threshold. Switching is done in a digitally controlled "soft" manner so no sharp clicks are audible. Adjust the level so that ambient noise is just below that required to switch on the microphone. If the level is set too high, part of the first syllable may be 'lost'.

Squelch adjustment

Factory Default: **0**

The display provides a large bargraph and number for reference when setting the squelch level. Pressing the FREQUENCY knob (or the ACTIVE button) activates the Squelch adjustment function. This is indicated by the reference number flashing. Rotating the FREQUENCY knob adjusts the level between limits of -16 and +15. Adjust the squelch level so that static noise from the receiver is just 'squelched' out. Too high a level may result in weak transmissions not being received. Too low a level may result in noise breaking through. A setting is accepted by pressing the FREQUENCY knob.



Program channels

This function supports memory channel programming.

Memory channels may be programmed using this function or they may be downloaded from a PC via an RS232 connection using software available from www.MGLAvionics.co.za



The V6 provides 99 memory channels for user programmed frequencies. Each channel has an associated frequency, 'Name' for the frequency (for example airport name or code), and 'Type' for the frequency (for example "ATIS").

Rotating the VOL/TEST knob moves the highlight (the line with a dark background) to select a line for editing.



Channel selected:

Rotate the FREQUENCY knob to select the number of the channel to be edited.

Frequency selected:

Press the FREQUENCY knob to select between the MHZ or KHZ part of the frequency setting (the MHz or KHz part will flash to indicate which is selected).

Rotate the FREQUENCY knob to change the setting.

Name or Type selected:

Press the FREQUENCY knob to cycle through the character positions to edit. A flashing 'underline' or character indicates the position to be edited. Rotate the FREQUENCY knob to change the character. Up to six characters are available.

When finished with editing channels, press the 'MENU' button to return to the First Level Menu.

Contrast

Factory Default: **40**

This function is for adjusting display contrast as required. A value between 30 and 40 is suitable for most environments. A lower value results in a lighter display while a higher value results in a darker display. Adjust the contrast so that dark areas are fully saturated while light areas do not show any darkening.



Microphone level

Factory Default: **0**

This function allows adjustment of microphone level. A bargraph is provided to assist in adjustment to the correct level. The level is correct when the bargraph remains between about $\frac{1}{2}$ and $\frac{3}{4}$ of the full range while speaking normally into the microphone, with excursions all the way to the right only during the loudest parts of speech.



NB: For a single microphone, the level shown by the bargraph is for the Pilot microphone input ONLY. No level is shown for the passenger microphone. The adjustment affects all microphones equally.

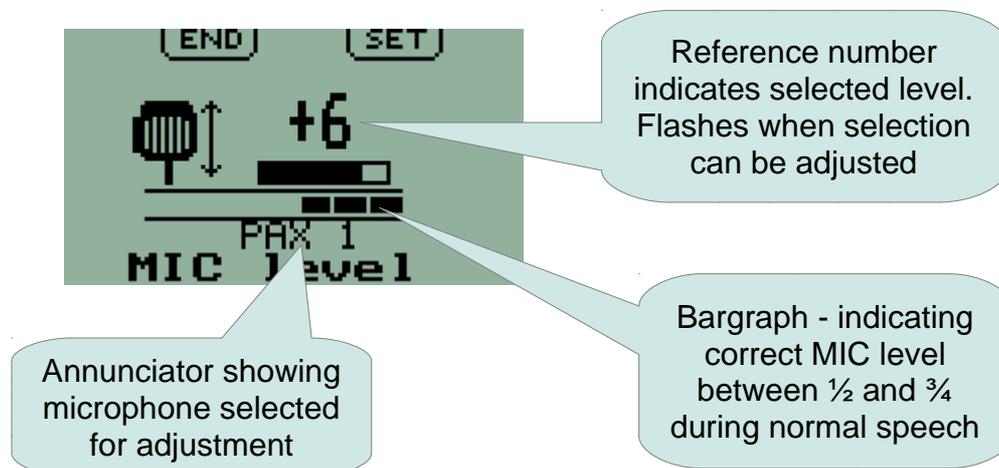
Correct adjustment of this level is important. It affects operation of the ambient noise suppression system and the modulation level of the transmitter.

NB: By design the transmitter cannot be over-modulated if levels are set too high. However, sound quality of the transmitted signal may suffer.

Using independent level settings for pilot and passenger microphone circuits:

A function is available in the Second Level Menu to enable independent adjustments for all four microphone circuits.

If enabled, each microphone has a separate screen for level adjustment.



Music level

Factory Default: Open: 0
 Mute: Off

A stereo music source such as an MP3 player may be connected to the stereo music input.

Two adjustable levels are provided for this input.

Open: This level applies if there is no audio from the intercom, the radio or the auxiliary inputs.

Mute: This level applies if there is audio from any other source.

In particular, with the Mute level set lower than the Open level the music input is reduced to the lower level when there is audio from any of the intercom, radio or auxiliary inputs and returns to the higher level when that input ceases.



Auxiliary input levels

Factory Default: Primary Open: 0
 Mute: Off
 Secondary Open: 0
 Mute: Off

Two Auxiliary inputs are available – Primary and Secondary. These may be configured in the Second Level Menu either 'ON' or 'OFF' according to requirements. When 'ON', the level for each input is independently adjustable with each having its own screen. The Primary input has priority over the Secondary input.

EFIS voice alerts or other audio sources may be connected to the auxiliary inputs. Two adjustable levels are provided for each input.

'Open': This level applies if no audio is received from the microphones or radio.

'Mute': This level applies if audio is received on any of the microphone circuits or the radio.

In particular, with the 'Mute' level set lower than the 'Open' level an auxiliary input is reduced to a lower level when the intercom or radio is in use and returns when that input ceases. With a 'Mute' level set to 'OFF', that auxiliary input is muted by radio reception or during use of the intercom.



Microphone bandpass filter

Factory Default: Off

For operation in high ambient noise levels an additional voice bandpass filter can be added for the microphone circuits.



This can help reduce the effects of unwanted noise, in particular at low and high frequencies. This filter has a sharp cutoff for frequencies below 500 Hz and above 2.4KHz.

Scanning state at power up

Factory Default: **Off**

This function sets scanning 'ON' or 'OFF' when the V6 Transceiver is switched on.

Scanning only applies for active/standby (Flip-Flop) frequency setting and is always disabled for direct frequency entry.

Scanning continuously checks for reception on both active and standby frequencies.



Frequency lists

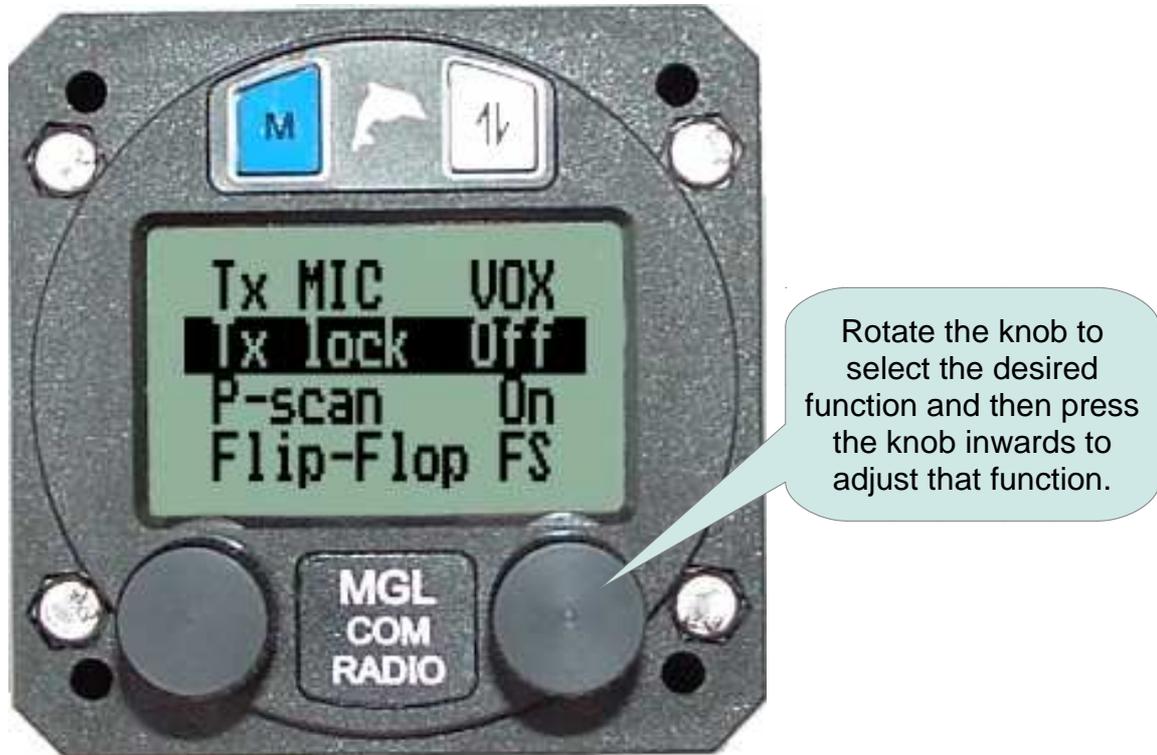
Setup

This is the entry point to the Second Level Menu for options and settings relating to installation of a V6 Transceiver.



Second Level Menu

The Second Level Menu is accessed by selecting the 'Setup' function from the First Level Menu.



TX MIC VOX / HOT

Factory Default: **VOX**

While transmitting the ambient noise suppression system may remain active - 'VOX' - or the microphone may be continuously live during the time of transmission - 'HOT'.

TX LOCK ON / OFF

Factory Default: **Off**

Transmission may be prevented while a signal is being received on the active frequency.

With TX LOCK 'ON' the PTT is disabled while there is a signal being received (the squelch is 'open') on the active frequency.

P-scan ON / OFF

Factory Default: **Onf**

Enable or disable Priority scanning. Priority scanning only applies to systems set for Flip-Flop frequency selection.

With Priority scanning ON and scanning enabled, if reception is on the standby frequency, there is a brief interruption once every second while the radio checks the active frequency for a signal. If a strong enough signal is detected on the active frequency, reception switches to the active channel unconditionally. Once reception on the active channel ends, reception returns to the standby frequency or scanning resumes.

PTT Configuration

Factory Default: **Join**

The V6 Transceiver has two PTT inputs. These may be operated independently or together. PTT1 is associated with the PILOT microphone and PTT2 with the PAX1 microphone.

For 'Separate', only the microphone circuit associated with its own PTT is active during transmission – the other microphone is muted.

For 'Join', both microphone circuits are active during transmit and either PTT may be used.

Flip-Flop FS / Direct FS

Factory Default: **Flip-Flop**

Selects either 'Flip-Flop' (active/standby) Frequency Selection or 'Direct' Frequency Selection.

With Direct Frequency Selection only one frequency is displayed – that of the active channel. There is no standby channel and scanning is not possible.

MIC Levels

Factory Default: **1**

This may be configured for a single level to be used for all microphones or four levels providing independent control for each of the four microphones. Microphone level is set in the First Level Menu. Screens in the First Level Menu change according to this setup.

Pilot Isolate configuration

Factory Default: **1 + 3**

Two combinations of microphones with PILOT and PAX headphones are possible. When the 'Isolate' input is active, microphones are associated with headphone outputs according to the selected configuration. Receiver audio, sidetone (during transmit), and Auxiliary inputs are all available to both headphone outputs.

For '1+3' and 'Isolate' active, the PILOT microphone is associated with the PILOT headphones and all three PAX microphones are associated with the PAX headphones.

For '2+2' and 'Isolate' active, the PILOT and PAX1 microphones are associated with the PILOT headphones and the PAX2 and PAX3 microphones are associated with the PAX headphones.

Auxiliary input configuration

Factory Default: **Off**

The two Auxiliary inputs are designated Primary ('P') and Secondary ('S'). They may be configured to be 'ON' or 'OFF' in any combination. Pressing the FREQUENCY knob cycles through four possible arrangements. Auxiliary levels are set in the First Level Menu. Screens in the First Level Menu change according to this setup.

Audio output configuration

Factory Default: **IC & RX**

An Audio output is provided that can be connected, for example, to a Voice recorder or an external audio panel. The Receiver ('RX') and the Intercom ('IC') may be connected to this output. Pressing the FREQUENCY knob cycles through four possible arrangements.

Sidetone configuration

Factory Default: **ALL**

Sidetone is available from the Transmitter and the Intercom. Pressing the FREQUENCY knob cycles through three arrangements.

CHANNEL spacing

Factory Default: **25KHz**

This allows selection of either 25KHz or 8.33KHz steps for setting operating frequencies. The 8.33KHz setting allows operation in areas using these channel allocations. All frequency definitions are in accordance with ICAO standards (ref ICAO Annex 10 Vol 5 § 4.1.2.4)

RESET

This function allows the Transceiver to be reset to 'Factory Default' settings as listed for each function above. Memory channels and current active and standby frequencies are **NOT** affected by the RESET.

Installation

This chapter describes basic installation options for the V10 Transceiver.

Visit www.MGLAvionics.co.za to download the latest version of this User and Installation Manual.

General installation notes

Installation should be performed by a qualified aircraft electronics technician.

All wiring external to the V6 Transceiver to conform to relevant aircraft standards. Flame proof or flame retardant insulation to be used on all wiring.

Installations must conform to local regulations.

All soldering to use acceptable electronic fluxed solder wire. Solder joints are required to be of high quality to acceptable standards.

It is recommended that shielded cables are used for all audio signal connections and digital communications links. Using unshielded cables may result in interference or audio feedback.

Choose suitable power cable of sufficient diameter to carry the maximum expected current to the V6 Transceiver (1.5A maximum).

It is mandatory to install a 2.5A-5A slow blow fuse or equivalent circuit breaker in line to the supply of the V6 Transceiver.

Never share power to a Radio Frequency device with sensitive equipment such as GPS receivers and EFIS systems. Route separate grounds and power supply wiring to the V6 Transceiver.

Use good quality coaxial cable - RG400 or equivalent. Choose a low loss cable if the antenna mount far from the Radio.

Ensure that BNC connectors on the antenna cable are fitted correctly. In particular, ensure that there are no short circuits either inside the BNC connector or at the antenna end of the cable. An incorrectly fitted connector may result in poor performance and may also damage the transmitter.

Never route the antenna cable in a bundle with other wires. Never bend the antenna cable sharply as this degrades its function as a transmission line.

After installation verify proper operation of the V6 transmitter using a suitable RF power meter with SWR readout. Ensure that the antenna is well matched and is able to radiate the available RF power generated by the V6. Reflected power due to poor antenna match may enter the aircraft ground system and cause interference with other systems.

Before using the transmitter of the V6 Transceiver, ensure that microphones are working and levels have been set correctly (in the First Level Menu).

Planning

The V6 Transceiver is a complex combination of Radio and Intercom and may be installed with many possible combinations of features. Careful planning of the installation is necessary based on the configuration of the aircraft and personal operating preferences.

Choose a position on the instrument panel where the Radio may be clearly seen and easily reached to operate the controls. Where space behind the panel is limited, it may be necessary to use special arrangements or fittings for the connectors. A dimension as small as 150mm/6inches behind the panel is possible.

The antenna and its mounting are critical to getting the best performance from the Radio. Choose a suitable position to mount the antenna.

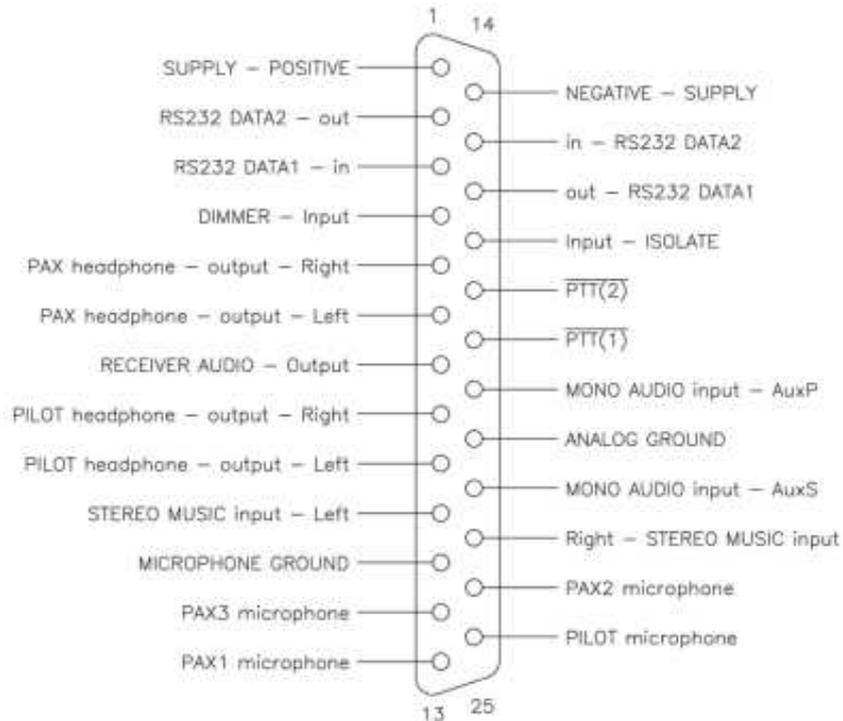
The V6 Transceiver has two PTT inputs. Some aircraft have two control yokes or sticks, so that two PTT switches may be installed, one for each position. With two switches installed and the PTT configuration in the Second Level Menu set to 'Separate', only the PILOT microphone will be 'live' when transmitting with PTT1 and similarly only the PAX1 microphone with PTT2. Wiring must be arranged accordingly. For this arrangement, the PILOT microphone has priority. This means that the PTT1/PILOT microphone will 'take over' transmission if PTT1 is activated, even if the PTT2/PAX1 microphone is transmitting. For an aircraft having a single stick and the PTT configuration set to 'Join', a single PTT switch may be connected to either PTT input and both the PILOT microphone and the PAX1 microphone will be 'live' when transmitting.

The Intercom of the V6 Transceiver is provided with a 'Pilot Isolate' facility. When activated, this allows the two stereo audio output circuits to be separated or 'Isolated'. When isolated, microphones are associated with headphone outputs according to the arrangement selected in the Second Level Menu. Thus the PAX1 microphone may be associated with either the PILOT headphones or PAX headphones depending on whether 'Mic 1+3' or 'Mic 2+2' is selected respectively. If it is required that the pilot is 'on his own' when 'Isolate' is activated then the headphones associated with the PAX1 microphone must be wired to the PAX headphone output and 'Mic 1+3' selected. With this arrangement and the PTT configuration set to 'Separate', when 'Isolate' is activated PTT2 does not affect the transmitter. Alternatively if the microphones are to be separated two and two, then the headphones for the PAX1 microphone are wired to PILOT headphone output and 'Mic 2+2' selected.

The V6 has two mono auxiliary audio inputs, shown as AuxP and AuxS on the connector pin-out below. These inputs are prioritized. Thus if an audio input on AuxS (Secondary) is being passed though to the headphone outputs and an input is applied to AuxP (Primary) input, this passes through instead and AuxS is muted completely. AuxP has priority over AuxS. Thus AuxP might be used for more important alarms or voice alerts (such as Terrain Warning) with others (such as Oil Pressure) relegated to AuxS.

DB-25 connector pin out

A 25 pin female SubD connector on the rear panel provides all low frequency signal and power connections to the V6 Transceiver. The wiring harness in the aircraft requires a male DB-25 connector.



A clean DC supply of 12V or 24V nominal is required. Internal protection will cause the Radio to be switched off if the DC voltage exceeds 32V. The negative supply lead to the Radio should be terminated at a separate connection point as close as possible to the negative terminal of the battery. This will help to reduce interference from other electrically noisy equipment in the aircraft.

A four microphone intercom circuit is provided with two stereo headphone circuits. One microphone (the 'PILOT' microphone) is intended for the pilot and the others for passengers. It is possible to connect several microphones in parallel at each input. In this case it is recommended that identical headsets be used.

A stereo music input is provided. A suitable jack, such as a 3.5mm stereo audio jack, should be provided if this input is to be used. An MP3 player may then easily be connected. For best results, the jack should be insulated from the airframe and its ground connected to the analog ground pin on the Radio.

Two mono auxiliary audio inputs are provided. These inputs can be used to connect alarms, EFIS voice alerts and the like.

Two stereo headphone outputs are provided. These are capable of driving 8 ohm speakers or multiple (up to 8) standard aviation headsets. The pilot's headset should be connected to the PILOT headphone output. The installation may be wired for mono headsets. In this case, headphone connections should use only one 'side' of the stereo outputs – all connected

to the same side. The corresponding 'side' of the stereo input can then be used for music.

Separate analog and microphone grounds are provided. They should not be connected to supply ground or the airframe as this may introduce audio interference. Insulating washers or an insulating panel should be used to mount headset and microphone jacks so that these may be connected back to the analog and microphone grounds respectively without connecting to the airframe. Screened cable should be used for microphone connections.

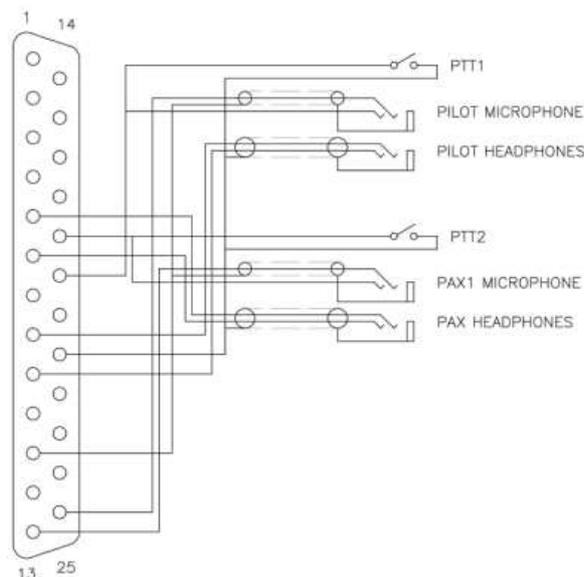
Two PTT inputs are provided. A PTT is activated by connecting the input to power supply ground or audio ground. Airframe ground may also be acceptable.

A Pilot Isolate input is provided. This feature may be activated by connecting the input to power supply ground or audio ground. Airframe ground may also be acceptable.

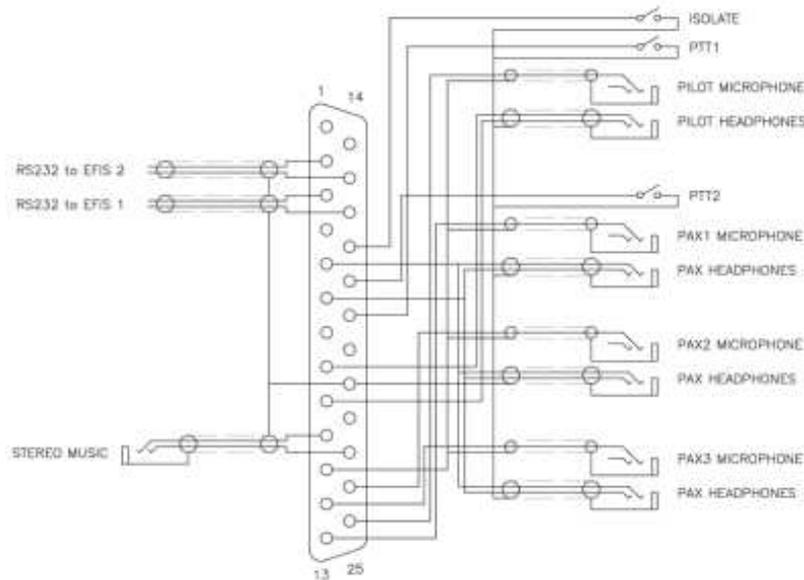
Two independent RS232 serial communications ports are provided. These may be used to connect to two independent EFIS systems for full remote control of the V6 Transceiver. These ports are equivalent and interchangeable. A specification for the communications protocol is available at www.MGLAvionics.co.za.

Typical wiring diagrams

Power supply wiring is not shown. A 2.5A – 5A circuit breaker or fuse must be installed. This is mandatory. Note the use of shielded audio cable and, in particular, the connections for the shielding of that cable.



This diagram shows a minimal two place installation with wiring for both external PTTs and headsets that provide built in PTT buttons.



This diagram shows a more complex four place installation in a '1+3' configuration including 'Pilot Isolate', a stereo music input and remote control by two EFISs. Note the shielded cables used for the RS232 connections to each EFIS and that the shields for those cables are only connected at one end.

Transceiver installation

A minimum installation requires the following:

- Power supply (typically 12VDC or 24VDC)
- Pilot headset - microphone and headphones
- Pilot PTT switch
- Antenna tuned to the VHF airband connected via RG400 or equivalent 50 ohm coaxial cable

These optional items may be connected:

- Up to three additional separate headsets
- One additional PTT switch
- Stereo music source
- One or two auxiliary audio sources
- One or two RS232 connections to EFIS systems (if used)

For more information visit www.MGLAvionics.co.za

Specifications – Subject to change without notification

General

Frequency range RX:	108.000-136.975MHz
Frequency range TX:	118.000-136.975MHz
Frequency control:	High resolution fully digital PLL (DPLL) with precision reference oscillator and micro-controller
CORTEX M3	
Tuning steps:	1MHz, 25KHz or 8.33KHz
Display: 20mm	Graphic LCD with green backlight – 36 x
Memories:	99 + 10 x 20 SL30/SL40 compatible frequency lists

Physical

Configuration:	Rear mount - standard Ø57mm / 2¼" cutout
Overall dimensions:	W61mm x H61mm x D140mm W2.3" x H2.3" x D5.5"
Installed depth:	120mm / 4.8" (excl. connectors and wiring)
Operating temperature range:	-20°C ... +55°C
Weight:	250 grams

Transmitter

Configuration:	LDMOS output stage with digital modulator
Output power TX: rating)	6.5W ±10% at 13.8V (specified power 5W at 12V (typical) 3.5W at 10V (typical - low voltage operation)
Frequency tolerance:	<5ppm (-20°C ... +55°C)
Modulation:	AM (6K00A3E)
Spurious output:	< -60 dBc
PTT timeout	35 secs (may be restarted)

Receiver

Configuration:	Double conversion super heterodyne 1 st IF 45MHz 2 nd IF 455KHz
Sensitivity:	< 2uV (-101dBm / 50Ω) for 6dB S+N/N (m=30% 1KHz)
Spurious response:	>10mV (-27dBm / 50Ω) – AGC method
Audio output power:	>0.5W into 8Ω, 600Ω compatible (up to 8 headsets)

Other

Microphone:	Electret
Microphone bias:	8.2V low noise / 1K Ω load
Audio subsystem:	Digital with 24bit CODEC, 12KS/s, and DSP
Intercom:	Four circuit with adjustable ambient noise suppression a) MGL Avionics propriety digital VOGAD b) Conventional VOX
Music & Auxiliary Inputs:	2Vp-p (max) / 5K Ω load
Serial communications: control	2 x RS232, Garmin SL30/SL40 compatible, MGL EFIS compatible, full remote

Power

Voltage:	Nominal 13.8VDC Negative ground
Voltage limits:	10.0 ... 32.0VDC (continuous operation, no damage)
Current RX: closed)	<250mA / 13.8VDC (no signal, squelch
Current TX:	<1.5A / 13.8VDC (50 Ω load)

RF Exposure

This Transceiver generates RF electromagnetic energy while transmitting. For compliance with RF exposure limits, the antenna gain should not exceed 0dBd (dipole antenna) and any persons should maintain a distance of at least 0.75m/2.5' during operation.

Do not operate this Transceiver in an explosive atmosphere

FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference,

This Transceiver has been tested for compliance with CFR 47 parts 2, 15, and 87 as applicable and is registered accordingly. Any changes or modifications not expressly approved may void the user's authority to operate the equipment.

FCC ID: **WSJV6** IC No:

REFERENCE

ADJUST VOLUME or TEST Receiver

Rotate the VOL/TEST knob to adjust volume. Press VOL/TEST knob to disable squelch for TEST. For Squelch setting enter the First Level Menu by pressing the MENU button. Press the MENU button again to exit the menu.

INTERCOM SETUP - Refer to First Level Menu

Suggested starting point: VOGAD MED level 2 or VOX level 7

Microphone level must be set correctly

Select PTT Join/Separate according to equipment installation

SWITCH ACTIVE AND STANDBY FREQUENCY

Press ACTIVE button.

FREQUENCY ENTRY

SET STANDBY FREQUENCY

Press FREQUENCY knob. Standby frequency selection changes between MHz and KHz. Rotate the knob to set frequency

SELECT 25KHZ OR 8.33KHZ TUNING STEPS

Second Level Menu function

CHANGE TO CHANNEL ENTRY

Press and hold FREQUENCY knob for two seconds

CHANNEL ENTRY

SELECT CHANNEL

Rotate FREQUENCY knob to set channel

CHANGE TO FREQUENCY ENTRY

Press and hold FREQUENCY knob for two seconds

SELECT SCANNING ON/OFF

Press and hold ACTIVE button for one second. Flashing 'ACT' and 'STB' annunciators indicate if scanning is 'ON'

NB: A 'priority scan' setup is available in the second level Menu

SET 121.5 MHz EMERGENCY CHANNEL

Press and hold ACTIVE button for three seconds. Active frequency will change to 121.500 MHz