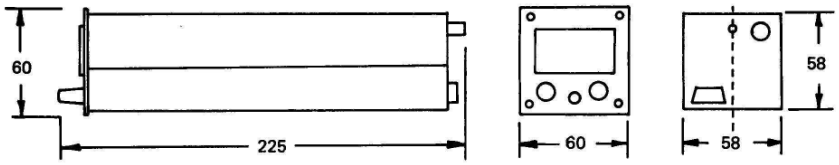
AVcomm 720 Channel Radio

- Simple installation
- Full 720 channel operation
- Small size 2¼" instrument mounting
- Low current consumption for long battery life
- Accepts both electromagnetic or carbon microphones
- Preset channel and extended band models also available
- Automatic circuitry always ensures maximum transmitter modulation

THE **GL72a** IS A 720 CHANNEL TRANSMITTER – RECEIVER COVERING THE 118 – 136 MHz AIRCRAFT COMMUNICATION BAND

AVcomm 720 Channel Radio

Specification



all dimensions in mm

GENERAL

Overall Size:	225 x 60 x 60mm
Weight:	540gm
Operating Temperature:	−15°C to +50°C
Shock:	15G in any direction

ELECTRICAL

Frequency Range:	118 – 136 MHz (117 – 137 MHz options)
Tuning:	Push Button Switched Synthesizer
Channel Spacing:	25 KHz
Power Supply:	10 – 15 V 750 mA Transmit (200 mA Receive)
Antenna:	BNC Socket
Transmitter Output Pwr:	2 watts PEP min.
Receiver Audio Output:	3 watts into 3 ohm Speaker
Receiver Sensitivity:	Less than 3μV for 20dB Sig/Noise

C.A.A. APPROVED LA327 class 1 (Gliders and Balloons. Cert. No. G55–b.)

The above figures are typical only and do not form the basis of a contractual specification. They are subject to change without notice.

PO Box 54, Rickmansworth, Herts.

Available from...

SPECIALIST SYSTEMS

TYPICAL PERFORMANCE DATA

General

Frequency range: 118 to 135.95 (options to 117 and 137.95 MHz)

Channel separation: 25 KHz

Number of channels: 720

Power supply: 10.5 to 15 volts (down to 10v operation on 121.5 MHz)

Temperature range: -15 to +50 °C

Size: 60mm x 60mm x225mm

Weight: *540 Gms*

Transmitter

RF output:2.5. watts peak

Modulation:>85% with automatic speech compression

Carrier stability: better than ±3Oppm

Power consumption: 750mA under fully modulated conditions

Spurious outputs: all <25µW

Receiver

Sensitivity: <.1µV for 10db S/N

Selectivity: -60dB at ±25KHz

Spurious responses: better than -40dB

Audio output: > 2 watts into 3 ohms (speaker) 20mW into ‘phones

Power consumption: <200mA approx.

Spurious radiation: <2nW

Section 1 INTRODUCTION

1. This handbook describes the operation and maintenance of the AVcomm GL72A/B aircraft transceiver unit. The unit is intended for installation in gliders arid microlites and has frequency coverage; both on transmit and receive, of 118-136 MHz in 25 KHz steps. The output power of the transmitter is 2 watts peak, which is sufficient for a line of' sight communication range of up to 50 miles.

   The radio comes initially in two versions; A and B, the difference being that the B version has the option of 10 pre-programmed channels additionally available by selection from the front panel. The units are externally physically identical and A version can be upgraded to B at a later stage without difficulty.

   The unit is complete with an intercom facility, and either carbon or electromagnetic microphones can be used without external circuitry. Automatic modulation compression is used to maintain maximum modulation depth and intelligible over a wide range of microphone types and voice characteristics. It is extremely small (6 X 6 X 20 cm) and weighs only 540 gins. The fitting can be either, direct front panel mounting to a standard 2¼" instrument aperture or, tray mounted with rear fixing.

   ~~A companion navigation unit the GL32P VOR is also available and a matching escutcheon panel for the GL72A/B can be supplied if the two units are to be mounted side by side in a standard 6¼ inch tray.~~

   Careful design and extensive use of large-scale integrated circuitry has enabled the unit to be produced in a small size whilst maintaining a specification comparable with light aircraft standards.

SECTION 3 OPERATION

The operation of the transceiver will be described for the 'full-fit' installation of a GL72B version, as covered in Section 4 and on Drawing No GL72A403. References will be made in paragraphs that do not apply to simpler 'fits' and the GL72A model.

RECEIVER OPERATION

With the unit switched on at the main switch, all that is required to tune into a selected frequency, is to repeatedly press the buttons above or below the numerical displays until the desired frequency numbers appear in the appropriate windows. It will be noticed that the "5" digit is not available for the 25KHz spacing channels, and it is only necessary to set the last digit to 7 or 2 to achieve channel spacings of 75 or 25KHz. Mis-operation to other digits will only result in standard 25MHz spacings being obtained.

An attempt to set to a frequency outside the range 118.00 to 135.975[1] will result in an automatic selection of 118.00[1] MHz, irrespective of the error made.

To receive signals on the desired frequency, it will be necessary to advance both the squelch and volume controls clockwise until the station is heard at the correct level. In order to check the operation of the receiver in the absence of signals, it will be necessary to advance the squelch control fully clockwise, when idle channel noise will be heard if the volume control is veil advanced. To operate satisfactorily with the minimum received signal strengths, the squelch should be backed off (tuned anticlockwise) until the idle noise is just muted.

GL72B only

The version is fitted with 10 pre-set channels to the customers choice, which can be accessed by a single switch. In order to activate this mode of operation, all the frequency selection switches should be set to zero. The left hand switch (100 MHz) can then be used in its ten positions to access the pre-selected frequencies. Any combination of frequencies can be chosen when ordering the unit, the only stipulation being that at least two should be 100KHz channels. The programme of selections can be changed subsequently by returning the unit to the dealer**,** who will be able to supply a reprogrammed switch for the desired channels.

[1] Other ranges and frequencies available to comply with local Aviation Authority rulings

TRANSMIT

Earthing pin 9 will cause the unit to transmit at the selected frequency after a delay of a few tenths of a second to allow for stabilisation of the selected frequency**.**

The microphone connection can be made either to pin 3 or 4 depending on whether an electromagnetic or carbon microphone is used. Automatic speech compression and limiting takes place to ensure correct modulation under varying conditions.

Side-tone will be present in the earphones at a level dependent upon the setting of the receive volume control. If it is intended to utilise a speaker for reception then it is advisable that the side-tone should be mated, by applying an earth to pin 7 to avoid audio feedback.

INTERCOM FACILITY

If pin 8 is not earthed, signals from the microphone input will be heard together with the received audio through the earphone and speaker outputs. The intercom should therefore be muted if the use of a speaker is proposed.

Two microphones can be connected in parallel to each input, the automatic gain-adjusting device compensating for any level variations caused by microphone imbalance. For best results however, it is advisable to use matched microphones, or to utilise external matching resistors as shown on the installation diagram No GL72A403

SECTION 4 INSTALLATION

1. Electrical

Three typical schematics showing different installations are shown in Diagram No FL72A403, together with the pin connections for the rear plug. Microphone leads must be screened, particularly if an electromagnetic mike is used, and the earth return must be brought back to pin 1 and not to other metal parts. It is not necessary to provide bias for carbon microphones as this is done internally.

If more than one microphone of the same type is used it is advisable to match them or use external resistors of 100 ohms to avoid variations in sensitivity (see Operation Section).

The trans/rec switch should be of a type that requires reasonable pressure to operate and possesses a 'detent' in the transmit mode. This will ensure that accidental transmissions do not occur and intermittent operation is eradicated. Again the return earth path is returned to pin 1.

The input power should be taken to the rear socket through a fuse rated at 2 amps. The unit has reverse polarity and over-voltage protection **only if** this fuse is fitted. The absolute maximum voltage that can be applied is 15 volts, and the unit will continue to function down to a minimum of 11 volts.

Earphones should be of medium impedance (600 ohms) for best results and the speaker (it fitted) should be approximately 3 ohms for maximum volume.

Pin 8 also acts as an external audio input and nav audio can be injected at a suitable level at this point (see full fit schematic).

The antenna should be positioned away from the pilot's head to avoid radiation hazards and RF pickup by the microphone. The VSWR of the antenna installation should be less than 2:1 over the band 118-136 MHz for best results from the modulation, but the unit will not be damaged by operation Into mismatches as high as 3:1.

2. Mechanical

There are two main methods of mounting the transceiver, the simplest being front panel mounting to a standard 2¼ inch instrument aperture. The other method involves the use of a mounting tray for fitting a single unit, twin unit or side by side mounting with VOR Type GL32P. For best appearance it is recommended that the escutcheon panel be changed if tray mounting is used.

Drawing No GL62A404 shows details of the mounting tray dimensions together with fixing details for the mounting screws. Mounting screws must not penetrate the unit by more than $^{3}/_{8}$" otherwise internal damage will occur.

Drawing GL72A403