ICG360 PC INTERFACE

INTRODUCTION

The ICG360 gyro is equipped with a 'computer' port that allows the internal settings of the gyro to be adjusted to the users' requirements. Although for many users the default settings of the ICG360 (with which it is supplied pre-loaded) will be satisfactory, with careful experimentation, it may be possible to tailor the operation of the gyro to match more closely the particular model, radio equipment, and flying style of the pilot. Should you be unsuccessful in finding a better set-up, the PC software includes a facility for returning the gyro back to the factory default settings.

INSTALLING THE INTERFACE SOFTWARE ON YOUR PC

The installation program may be run under DOS or windows. The following description is for DOS. To install the gyro interface software onto a hard drive, insert the distribution disk in drive A (or B) and at the DOS prompt type:-

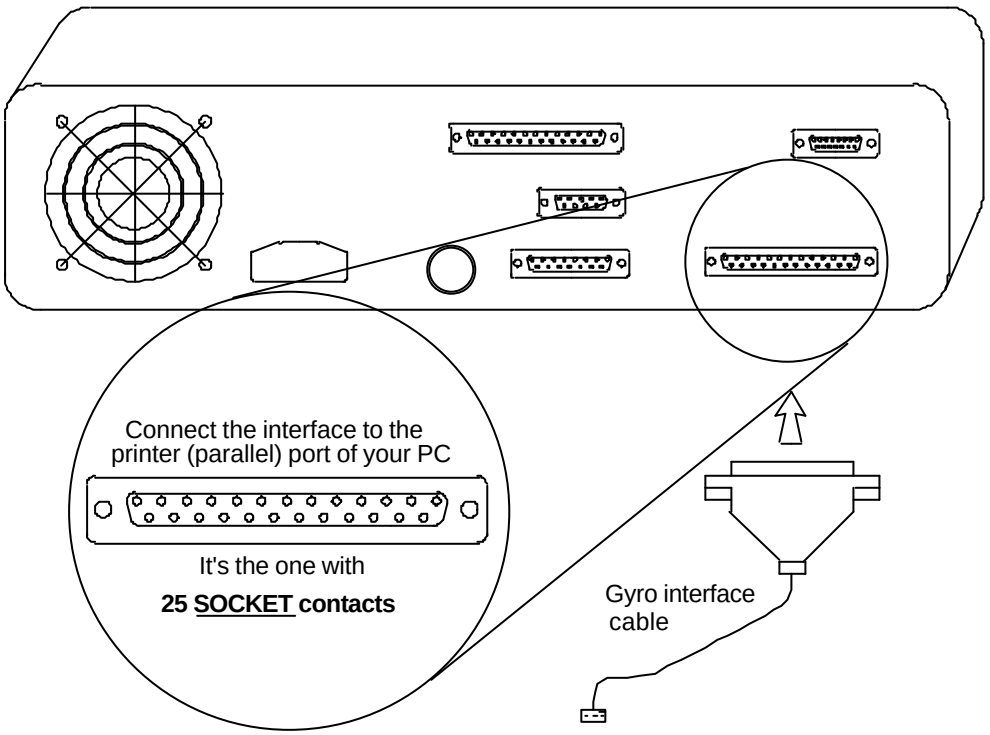
A: (Enter) {or B: if appropriate}
INSTALL (Enter)

You will be asked which hard drive you want the software installed onto (e.g. "C"), and the floppy drive from which the software will be installed ("A" or "B"). Once the selection of drives has been confirmed, a directory called **'ICG360'** will then be created on the appropriate drive, and the required files transferred. If the install program finds a previously installed version it will ask if you wish to overwrite it.

RUNNING THE INTERFACE SOFTWARE

Once the software has been installed on your PC follow the following steps to connect to your gyro.

1. CONNECT THE GYRO INTERFACE CABLE TO YOUR PC



Locate the Parallel (Printer) port of your PC. This is a 25 pin 'D' connector with **socket contacts.** If you have a printer attached to your PC it may already be connected to the desired port. If so, disconnect it and connect the gyro interface cable in its place. If your PC has multiple parallel ports you can install the interface on LPT1, LPT2 or LPT3. You will be able to select the port in use when running the interface program.

! DO NOT CONNECT YOUR PC TO THE GYRO YET !

2. START THE INTERFACE SOFTWARE
Do this by typing at the DOS prompt:-

GYRO (Enter)

3. SELECT THE LPT PORT IN USE
At the first menu screen select the printer (LPT) port to which you have the gyro interface cable connected. If you are unsure of your LPT port's address you will need to try each option in turn until a successful connection to the gyro is achieved.

4. SELECT THE RC SYSTEM IN USE
At the next menu select the type of radio system you are using with the gyro. It is important to specify this correctly as some of the gyro internal variables are calculated based on the characteristics of the system in use.

5. TURN OFF TRANSMITTER (if present)
The gyro will only enter the PC interface mode if, during its turn on checks, it finds no servo pulses from the receiver. In order for this to happen your transmitter must be OFF.

6. TURN RECEIVER ON.
This will power up the gyro. After a short delay the gyro will start to flash its "SET" LED to indicate that it is in PC interfacing mode.

7. CONNECT INTERFACE LEAD TO "COMPUTER" PORT OF GYRO
This lead is easily identified as the only white/red/black ribbon cable emerging from the gyro.

8. PRESS ANY KEY TO INITIATE LINK-UP

TROUBLE SHOOTING
During the initial stages of the link up the integrity of the PC-gyro communications is checked and any problems will be reported. Failure to establish a link-up is usually due to the selection of the wrong LPT port address. As an aid the software automatically highlights your last port selection on being run.

NOTE FOR PPM (FM) RADIO USERS
You may find that, with the transmitter turned off, your PPM receiver picks up interference when close to your PC. This may cause problems in getting the gyro into PC interfacing mode and also cause unacceptable jitter of the servos (other than the tail servo) during PC link-up. If you have this problem proceed as follows:-
With your model well away from the PC turn on the receiver with the transmitter off. Observe the gyro "SET" LED and check that it is flashing. Now turn on your transmitter. Then bring the model close to your PC and complete the link-up as normal. The good signal from your transmitter will suppress the interference from the PC. Having finished with the PC link-up don't forget to turn off the transmitter. No such problems should arise with PCM receivers.

THE MAIN MENU

This offers the following options:-

Set up Flight Mode 0
Set up Flight Mode 1
Return Flight Modes to factory default settings

If you are familiar with using your ICG360 with its factory default settings then Flight Mode 0 is the so called 'Standard' mode while Flight Mode 1 is the 'Heading Lock' mode.
However, with the aid of this PC interface both Flight Modes are fully configurable and you could, if desired, set up both modes to have heading lock capability. This may be of particular interest for those using the ICG360 without the gyro gain input connected (and thus setting the gain of the gyro on the gain pot of the gyro). In this case only Flight Mode 0 is used. If desired, you can now set this mode to a Heading Lock mode. To do this simply copy the Factory Default values for Flight Mode 1 to Flight Mode 0.

The two Flight Mode setting sub-menus are identical and provide control over the following parameters:-

Conventional Gyro gain

This sets the degree of rate damping provided by the gyro, and is like the gain on an ordinary gyro.

Direct (Stick to servo) coupling
This provides the gain independent servo movement linked directly to the demanded yaw rate from the stick position. The setting of this parameter is discussed later.

Servo speed parameter
This relates to the speed of the servo travel and is in the units most commonly quoted by servo manufacturers (seconds for 60 degrees of servo travel). Remember, the smaller the number the faster the servo. The effect of this value may be affected by many things. Use the servo manufacturer's figure only as a starting point for your experimentation.

Heading-Lock gain
This sets the degree of resistance the gyro provides to unrequested heading changes. **If you want a 'standard' (non Heading Lock) mode set the Heading Lock Range to zero.**

Maximum yaw acceleration of helicopter
This parameter helps the gyro match its operation to the actual agility of the helicopter in yaw. The value relates to the maximum achievable (or desired) rate of acceleration and deceleration of the helicopter in yaw. Helicopters with large yaw inertia (i.e. those with scale bodies) will generally have lower yaw acceleration than, say pod-and-boom designs. Setting a value that is higher than the helicopter can achieve will mis-match the gyro to the helicopter and degrade the quality of the start/stop transients. For scale flying you can set this parameter to a value lower than the helicopter can achieve to deliberately slow the response of the model in yaw, making for a more scale-like performance.

Heading Lock Range
This limit sets the range of headings over which the heading lock gain applies. It can, if desired be used in conjunction with the Heading Lock Gain to limit the maximum power of the Heading lock. **Important: Set this parameter to zero for a 'standard' (non Heading Lock) mode.**

Servo travel limit
This provides a way of preventing over-travel of the tail control linkage.

General remarks
Given the number of variables within the gyro as well as the many aspects of the helicopter (tail blade size, engine performance, servo speed, etc.) that influence the characteristics of the helicopter in yaw it is not possible to give a simple recipe for optimising the gyro for you and your model. However, we strongly recommend you start by getting your model performing well with the factory default settings. You should then try making small adjustments to the default settings and observe their effects. You may, for example wish to experiment with reducing the servo travel limit while increasing the servo arm length and observing if you get an improvement in the crispness of the start and stop transients.
In arriving at the factory default settings we found it useful to set the two modes to nearly identical settings differing only in, say, the value of the servo speed parameter. By switching between the two modes we were able to see quite small changes and 'home in' on the optimum. Careful note-taking is vital to prevent confusion in this process! An observer taking notes on a clip board is very useful. Once you have used this technique to get one good mode (say a heading lock mode) you can then apply the same method to optimise your second flight mode.

As an example of the flexibility of the ICG360 system, a useful flight mode, especially for the beginner, is one with only a small amount of Heading Lock (say with a Heading Lock gain of between 5 to 10% and a Heading Lock range of between 10 and 20 degrees). This mode provides adequate heading lock to maintain trim in light cross-wind hovering while, in forward flight allowing the helicopter to weathercock should a turn not be well co-ordinated.

Adjustment of the Direct (stick to servo) Coupling can be left until other aspects of your Flight Modes have been set. The other parameters can be adjusted with the Direct Coupling set to the factory default value. Adjustment of the Direct Coupling is done by observing the effect of gyro gain changes on the maximum yaw rate. If you find that reducing the gyro gain causes the maximum yaw rate to decrease then more Direct Coupling is needed. Conversely, an increased maximum yaw rate at reduced gyro gain means that too much Direct Coupling is being used.

PARAMETER	DEFAULT	TEST 1	TEST 2	TEST 3
Conventional gain				
Direct Coupling				
Servo speed				
Heading Lock gain				
Max yaw acceleration				
Heading Lock range				
Servo travel limit				
Servo arm length				
Transmitter gain				