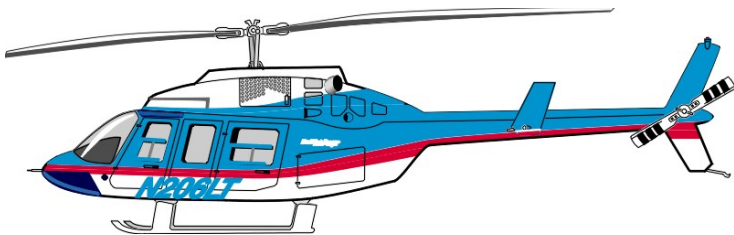


THIS MANUAL CONTAINS HELPFUL HINTS ON:

Installation of DynaFlight 3 System

DynaFlight Aerial Application Guidance and
Management system



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DynaNav Installation Manual

Overview of System

The DynaFlight-3™ system is a GPS based electronic guidance and data management system specifically designed as a tool for the pilot to fly Parallel Swath Guidance, Free Form Navigation and Live Moving Map for the application of seeds, fertilizer and chemicals for farm and forestry applications. It also gives unlimited navigation points including automatic Last Sprayed Point to return back to continue his application after refill. The system automatically senses spray on and spray off for recording and displaying the real time map of the application and displays this to the pilot in his Heads-Up Display. Note: we have the DynaViz graphical display that we refer to as a Mini-HUD but you do not see through it, however, it has a low profile, no different than a lightbar, to not block the outside view. We are now releasing a true Heads Up Display that you see through the Combiner lens and the image is projected way out in front of the display. Keep your eye out for this – pun intended.

Mounting

GPS Antenna

Overview

As the GPS antenna has to view the full constellation of orbiting satellites and as such the antenna should have as much visibility of the full sky as possible.

Placement – IMPORTANT!! Make sure that the GPS Antenna is bonded to the Airframe.

The GPS antenna should be mounted on top (not the bottom) of the aircraft/helicopter and should take into consideration the following. See figures 1, & 2:

- On helicopters, mount the antenna as far forward on the top as possible. This is to keep it away from the rotor mast as much as possible as well as lead the pilot to the spot.
- The antenna should be mounted high enough to see as much of the sky above and around so as the fuselage does not block the signal and as far forward as possible.
- Mounting on the tail should only be done if Laser Gyro option is installed in the DynaFlight to correct the position.
- Keep as far away from transmitting antennas as possible (at least 12 inches) If this is not possible, please contact DynaNav for recommendations.
- For fixed wing aircraft, if the antenna can be mounted as far forward as possible without being on the engine cowls, and of course on the centerline of the aircraft.



FIGURE 2

Touchscreen Processor Display

Overview

The DynaFlight 3 processor display has all the electronics of the system in the touchscreen display . It should be mounted to the aluminum panel for heat transfer using 4 mounting screws to attach.

Placement

The Touchscreen should be mounted as close to the center and as high as possible for the pilot to access during flight with ease.



DynaViz Mini-HUD Pilot Display

Overview

The pilot display is intended to be a “heads-up” type of display to be mounted in the field of view of the normal operation of the pilot. As such this *DynaViz™* display has multiple functions including the following:

- Guidance display to guide pilot on his parallel swaths or live moving map.
- Pilot display for selecting CUSTOMER, JOB, and SWATH WIDTH.

Placement

DISPLAY





- The display should be mounted to best suit the requirements of both the pilot and the specific aircraft/helicopter. This should take into consideration the following:
- It should be in the direct view of the pilot, so as not to obstruct his view outside the aircraft.
- The sun shroud (used on the EL type display) should be positioned for full screen visibility for the pilot while occluding direct sunlight on the screen. As the bottom mount can be tilted from 0 to 25 degrees to adjust for individual pilot needs, be sure the bottom plate is mounted to allow for individual pilot needs (tall or short).
- The front of the screen should be oriented to front of helicopter/aircraft to give guidance information that relates to helicopter/aircraft flight direction.

Product features

- As the display represents the ground view, the display should be mounted as horizontal as possible so as the pilot can see the complete screen. The EL display can be viewed at quite extreme angles and can use either the tunnel sun shroud or the angled sun shroud.
- The connector plug is a LEMO connector that is simply pushed on (align red dots first) and simply pulled off to remove. DO NOT TWIST!

Control Grip or Switches

Overview

The control grip contains three primary switches that control the entire system. On our supplied DynaGrip™, two of these switches are contained in the single 5 way Top Hat switch and the other on a push button switch. It is the intention of the system for the pilot to have access to these switches on his grip, cyclic or his collective or a combination of both. Other than these switches, the DynaFlight system is wired to the IO ControlBox interface to sense spray on/off or other actions.

Placement

If the grip, cyclic or collective have a spare Top Hat switch, it can be wired directly to the connector on the Dual Relay box along with two other push buttons for the “accept” and the “window” operation. This Dual Relay box should always be used as it contains the transient spike protection circuitry. If the DynaGrip™-Collective switch box is used, it should be attached to the collective such as to not interfere with the normal operation and so the top hat can be operated with the thumb. For Fixed Wing aircraft, the supplied DynaGrip™ is to replace the existing control grip on the flight control stick.





Collective Switch

FIGURE 3

Product features

With the grip or collective switch box in the pilots hands, the pilot will be able to change job functions while observing the display to keep his field of view outside the helicopter/aircraft, not inside the cockpit.

IO ControlBox

Overview

The IO ControlBox has multiple functions to interface the aircraft and the pilot to the DynaFlight system. These functions are as follows:

- To interface to sense the spray on/off of the aircraft system.
- To protect the DynaFlight from the electrical spikes generated by any relay action
- To protect the DynaFlight system from static discharge on the control switches.
- To interface multiple styles of control switch assemblies or to the DynaGrip™ control grip.

Placement

The IO ControlBox does not need to be hard mounted, however for vibration isolation, it would be best to secure it to the aircraft surface.

Wiring

The IO ControlBox has Red and Black wires that are respectively required to connect to power and ground. The Green wire is for Marking the GPS Spray on/off. This requires power supplied to it to be Spray On. For Pressure switches on the Spray Boom, make sure the pressure is well within the range of the normal boom pressure for spraying. If you have a DynaNav DynaFlow.

The IO ControlBox is connected directly to the **DynaFlight 3** interface harness, by connecting the 3 pin male and female CanBus connectors coming from each of the DynaFlight 3 and the IO ControlBox.

Wiring Harness Diagrams

Overview

The diagrams attached to appendix are for the interconnect wiring of the DynaNav system. All wires on the harnesses supplied (except the control grip/box)

Supplied Parts List

Basic DynaFlight 3™ airborne system contains:

| Part Number | Description |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| 1) DynaFlight HMI | DynaFlight 3 Processor/GPS Touchscreen |
| 2) DynaViz III | DynaViz III™ Electro-luminescent display unit |
| 3) DB-3-Display Cable | DynaViz III Cable 3-foot Display cable |
| 4) 5BO16A-XT-1 | GPS, GLONASS, L Band Antenna |
| 5) DB-AntCable14-E | Antenna Cable 14' TNC to SMA |
| 6) DB-3-Power Cable | Power with Laser and Com (for flow control, etc.) connectors |
| 7) DynaGrip™/ Switch kit ... | Military spec 5-way Top Hat control switch as well as other switches with 8 foot cable assembly. (for Helicopters, switches provided) |
| 8) DB-3-ControlBox | Relay box for sensing of spray on/off and control switch input |
| 9) DB-3-Control Cable | Spray on/off 9 ft. wire and CanBus interface connector |
| 10) DB-3-Aux Cable | DynaFlight 3 Cable for USB, CanBus and Relay out (AutoSpray) . |
| 11) Dual Lock | 1 feet peel and stick locking fastener |

Specifications:

- Windows 10 operating system with DynaFlight-III version 1.0 software template.
- **DynaViz™** Display Unit EL flat panel display showing position, moving-map, guidance and operating buttons, for a safe operation.
- **DynaFlight-III processor touchscreen** - rugged environmentally resistant enclosure with Lemo connectors, with Installation kit and cables
- Includes WIFI, Bluetooth, SkyNet transceivers for connectivity to ground and other aircraft.
- Rugged **DynaGrip™** hand grip for fixed wing or Collective Switch Kit for helicopters, for intuitive operator input
- GPS is a GNSS Engine is less than 0.1 second latency and presented at sixteen position solutions per second or better.

| Specifications Environmental: Unit | Physical: | DynaFlight-III™ Processor | DynaViz™ Display |
|---------------------------------------|-----------|---------------------------|------------------|
|---------------------------------------|-----------|---------------------------|------------------|

| | | | | |
|------------------------|---------------------------|----------------|-----------------|------------------|
| <i>Operating Temp:</i> | -30 to +50 degrees C. | <i>Width:</i> | 7.1 ins (18 cm) | 6.25 ins (16 cm) |
| <i>Storage Temp:</i> | -40 to +70 degrees C. | <i>Height:</i> | 5.2 ins (13 cm) | 5.25 ins (13 cm) |
| <i>Humidity:</i> | 5 to 95%, non-condensing. | <i>Depth:</i> | 2 ins (5 cm) | 6.5 ins (16 cm) |
| <i>EMI/RFI:</i> | DOC, FCC | <i>Weight:</i> | 2.2 lbs (1 kg) | 1.6 lbs (.6 kg) |

Installation kit including DynaGrip™ and antenna weights are dependent on installation, typically less than 3 lbs. (1.2kg)

12 – 40 VDC, negative ground (system requires less than 14 watts) Note: Specifications subject to change without notice.

Appendix Follows:

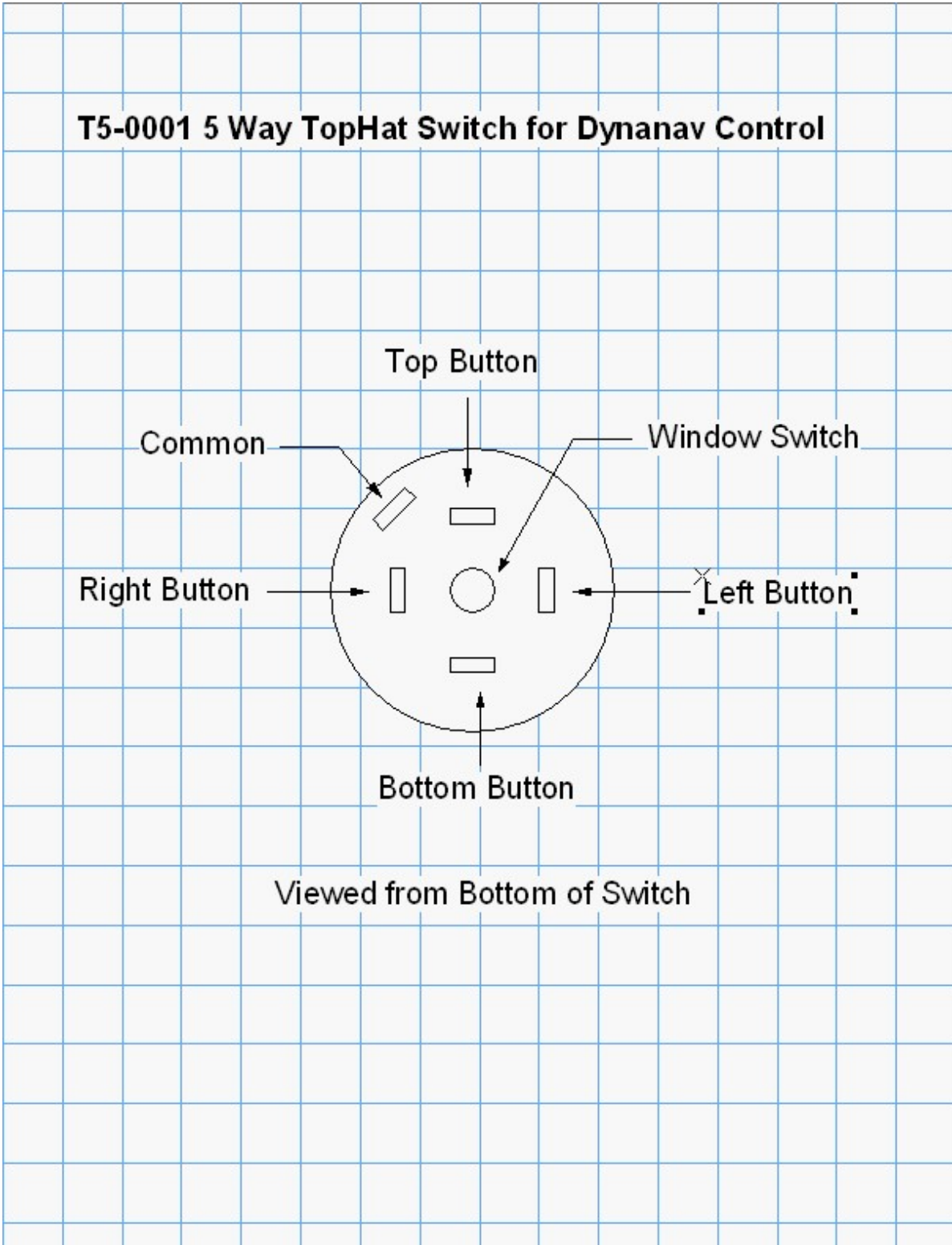
DynaFlight 3 Unit Pictures



Cable Pictures



TopHat Switch Layout



DynaFlight 3 Diagram

