



ESPE

UNIVERSIDAD DE LAS FUERZAS ARMADAS
INNOVACIÓN PARA LA EXCELENCIA

DEPARTAMENTO DE CIENCIAS ESPACIALES CARRERA DE MECÁNICA AERONÁUTICA MENCIÓN AVIONES

MONOGRAFÍA PREVIO A LA OBTENCIÓN DEL TÍTULO DE TECNÓLOGO EN MECÁNICA AERONÁUTICA MENCIÓN AVIONES

TEMA: “INSPECCIÓN VISUAL POR HUNDIMIENTO Y RAJADURAS EN LA PIEL DE LAS ALAS DE LA AERONAVE FAIRCHILD FH-227, MEDIANTE LA IMPLEMENTACIÓN DE UN SISTEMA FPV (VIDEO EN TIEMPO REAL), EN EL CUADRICÓPTERO CFLM PARA LA UGT-ESPE”

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DIRECTOR: ING. COELLO TAPIA, LUIS ANGEL

LATACUNGA

2020





Introducción



Generalidades



Sistema FPV DJI Lightbridge 2



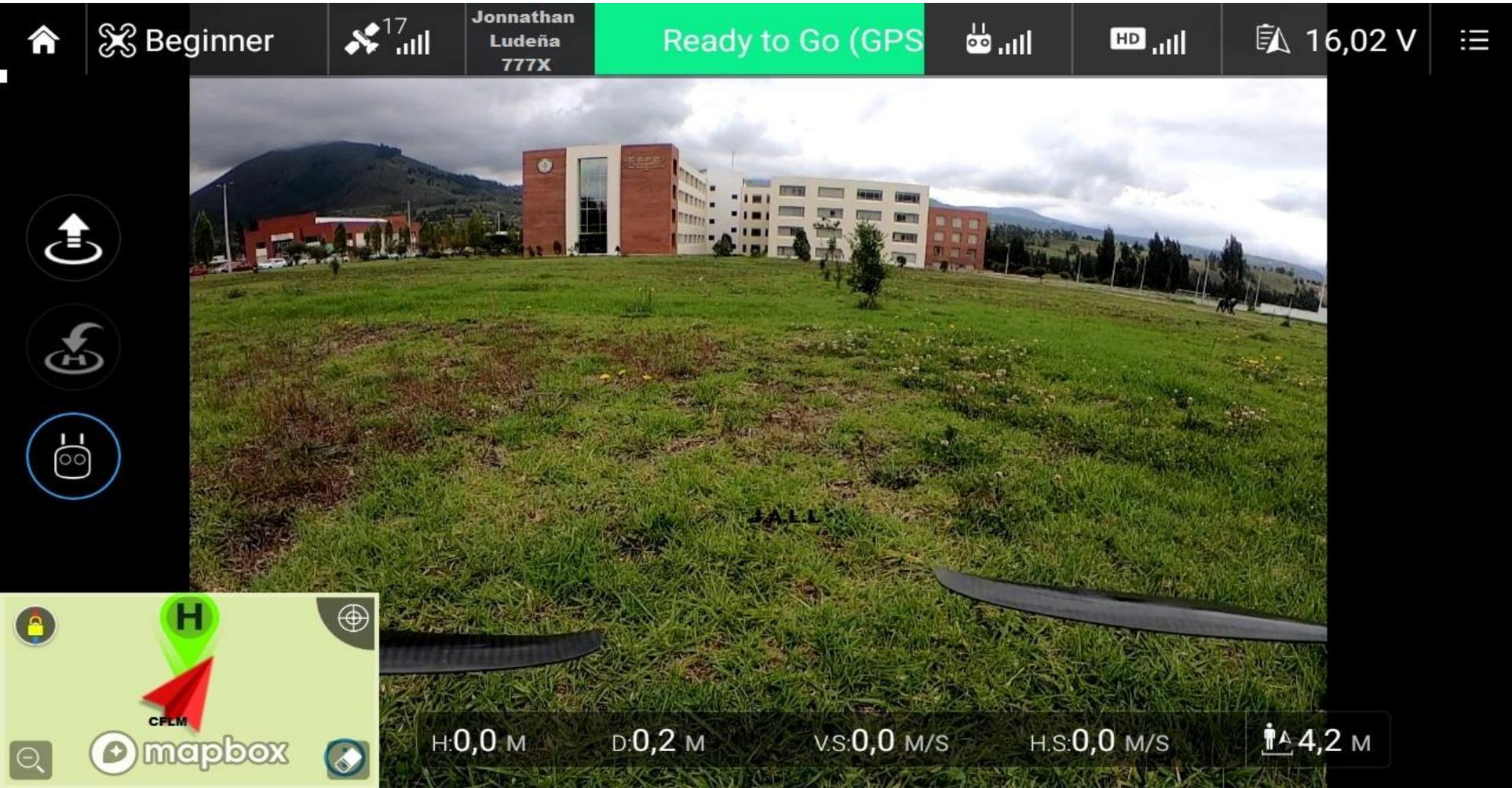
Inspección visual por hundimiento y rajaduras en las alas del avión Fairchild FH-227



Conclusiones

9/1/2020

INTRODUCCIÓN



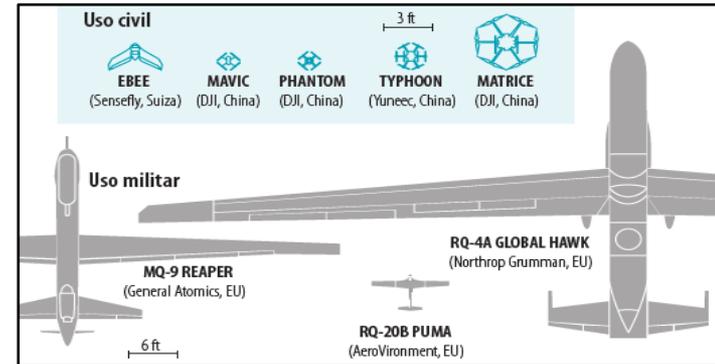
INTRODUCCIÓN



DRONES



USO DE LOS DRONES PROFESIONALES



CLASIFICACIÓN DE LOS DRONES

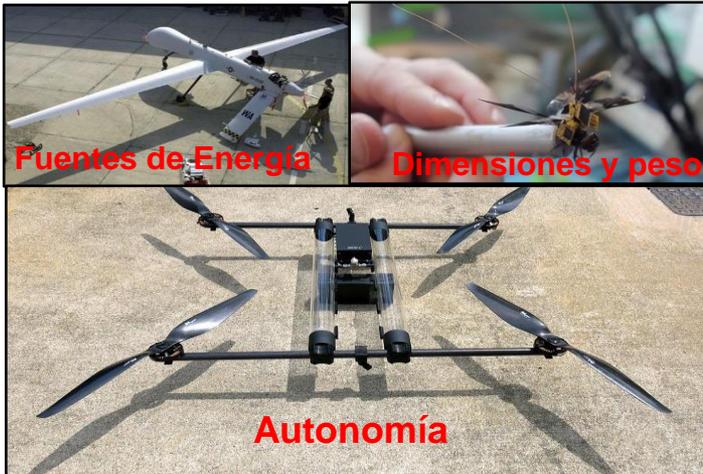


PARTES BÁSICAS DE UN DRONE



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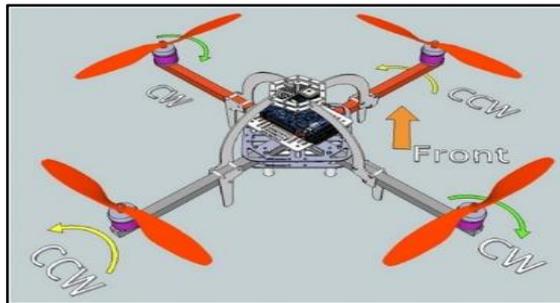
GENERALIDADES



CARACTERÍSTICAS DE LOS CUADRICÓPTEROS



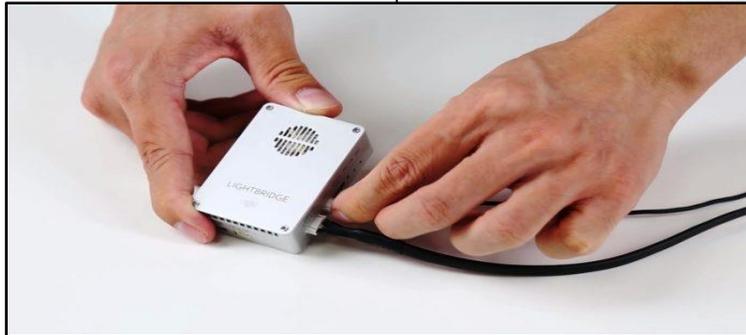
NORMATIVA DE OPERACIÓN DE DRONES EN ECUADOR



FÍSICA DE UN CUADRICÓPTERO



SISTEMA FPV DJI LIGHTBRIDGE 2



SUBSISTEMA DE AIRE

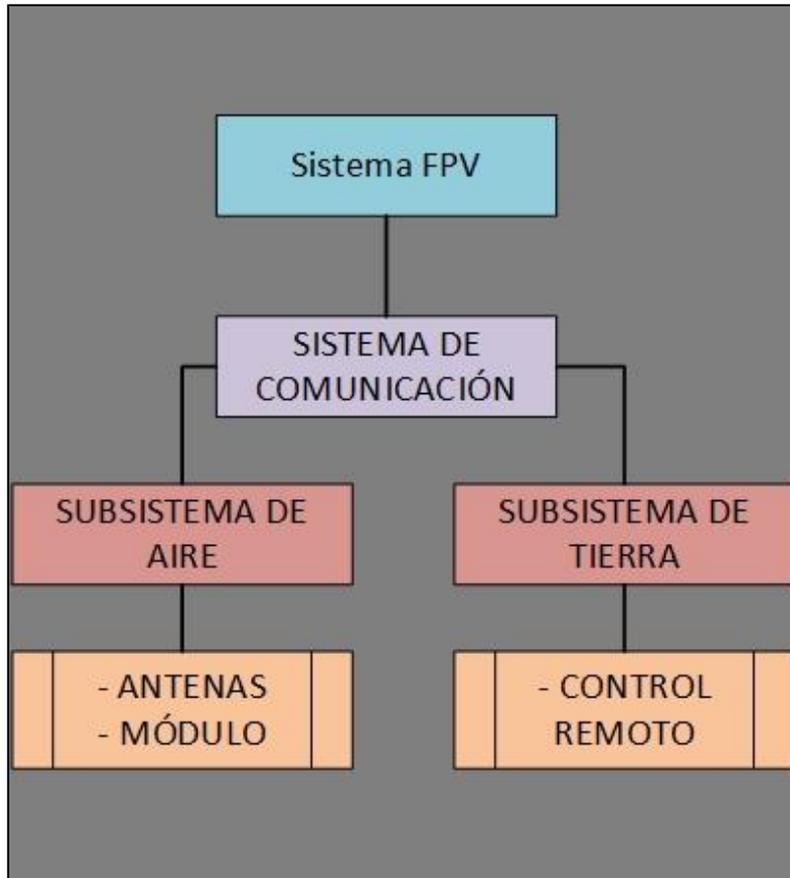


SUBSISTEMA DE TIERRA

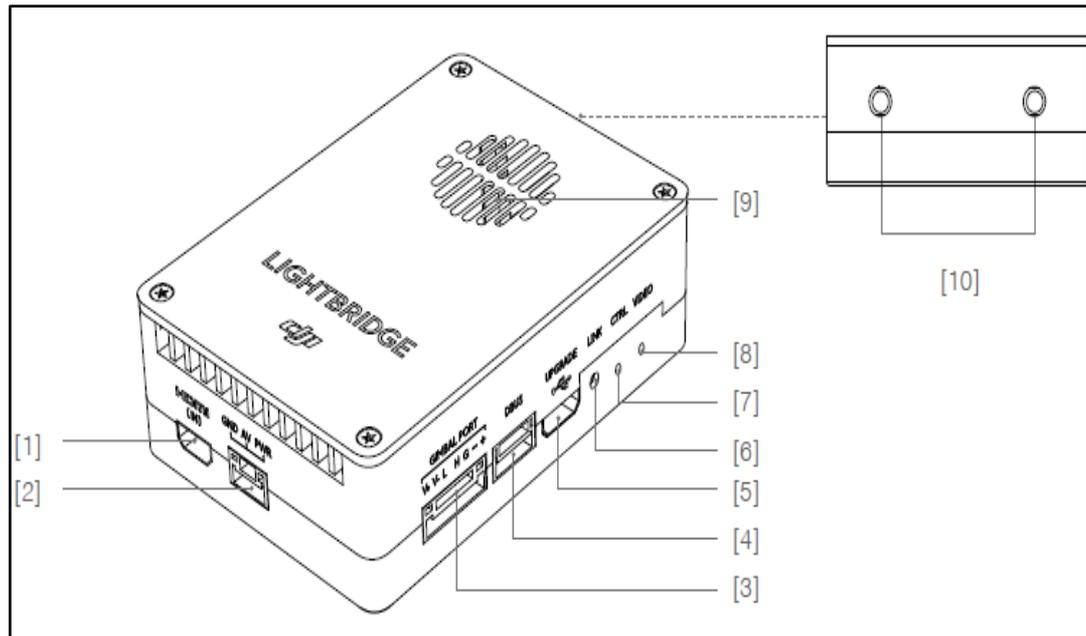


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SISTEMA DE COMUNICACIÓN DJI LIGHTBRIDGE 2



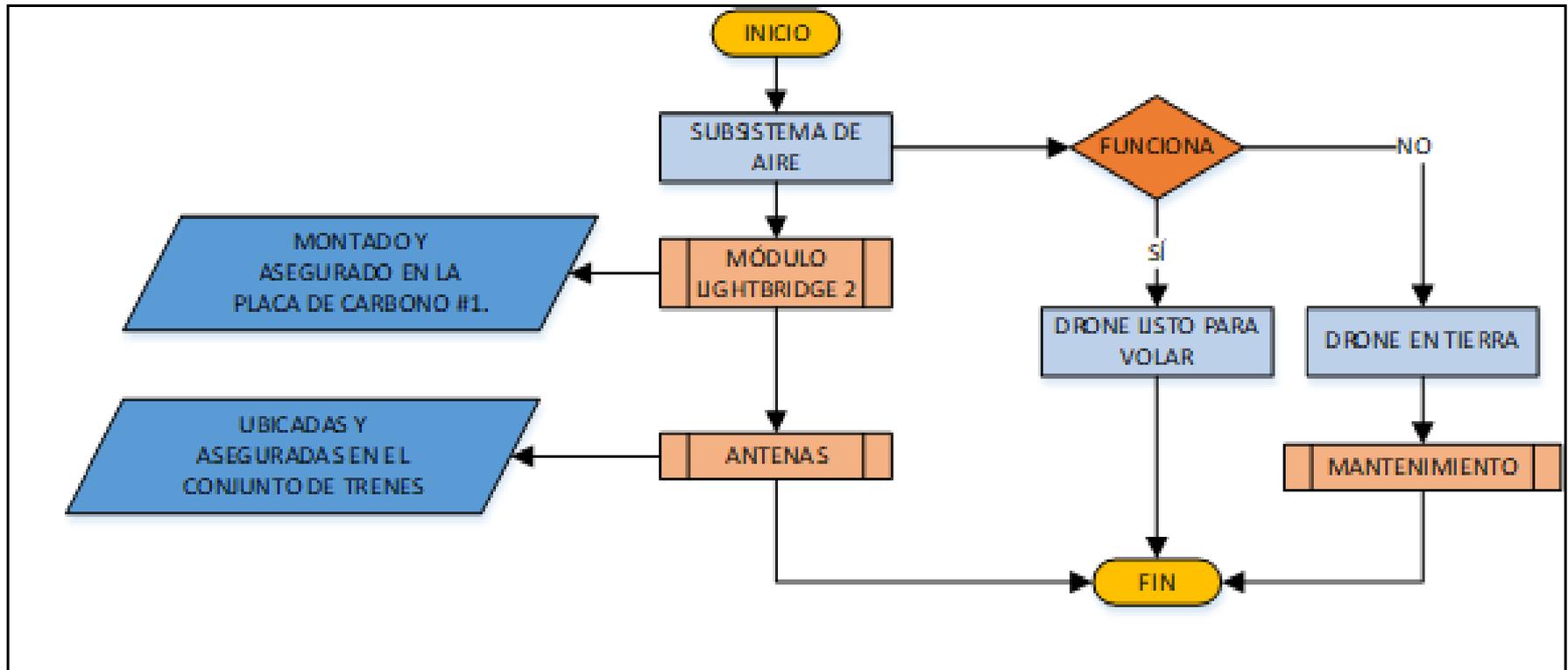
COMPONENTES DEL SUBSISTEMA DE AIRE



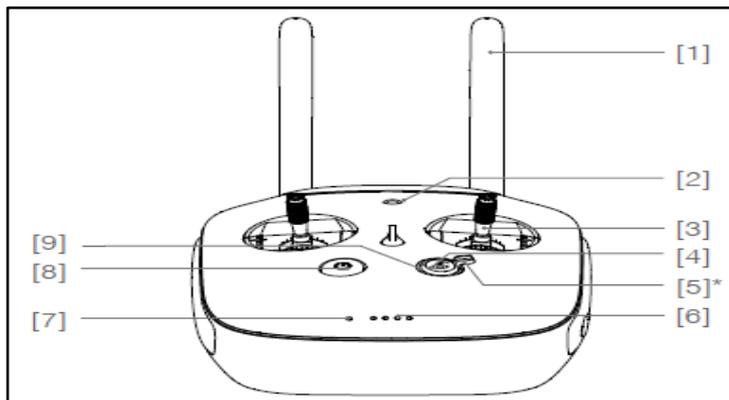
MÓDULO DJI LIGHTBRIDGE 2



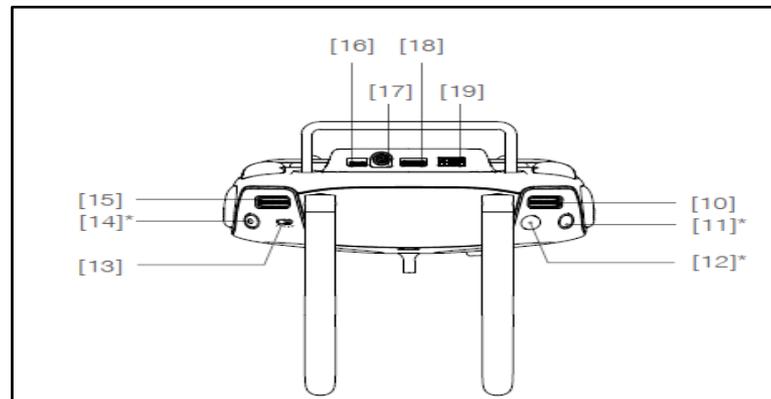
OPERACIÓN DEL SUBSISTEMA DE AIRE



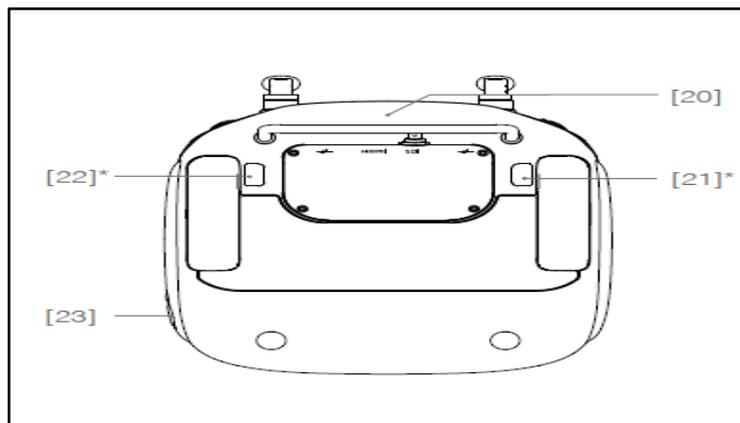
COMPONENTES DEL SUBSISTEMA DE TIERRA



COMPONENTES SUPERIORES

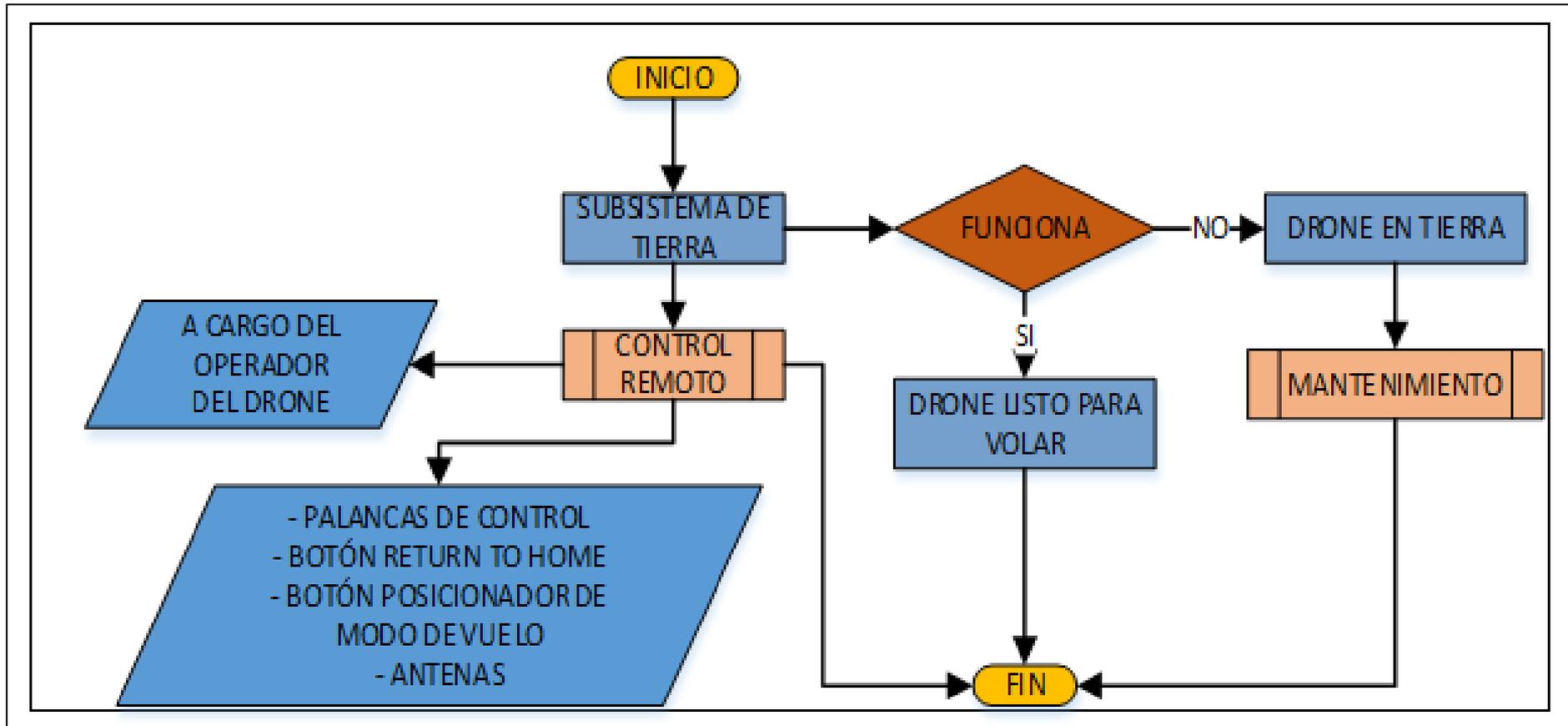


COMPONENTES POSTERIORES

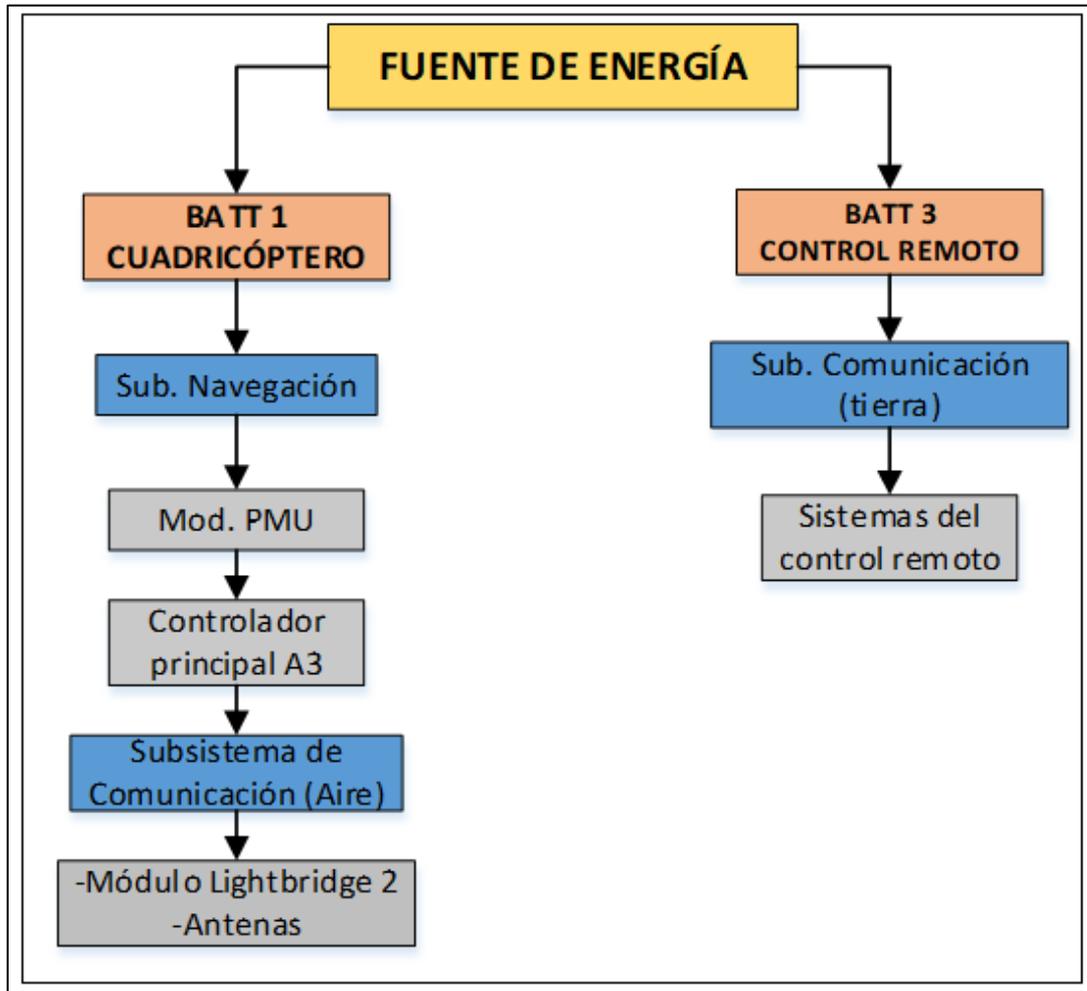


COMPONENTES INFERIORES

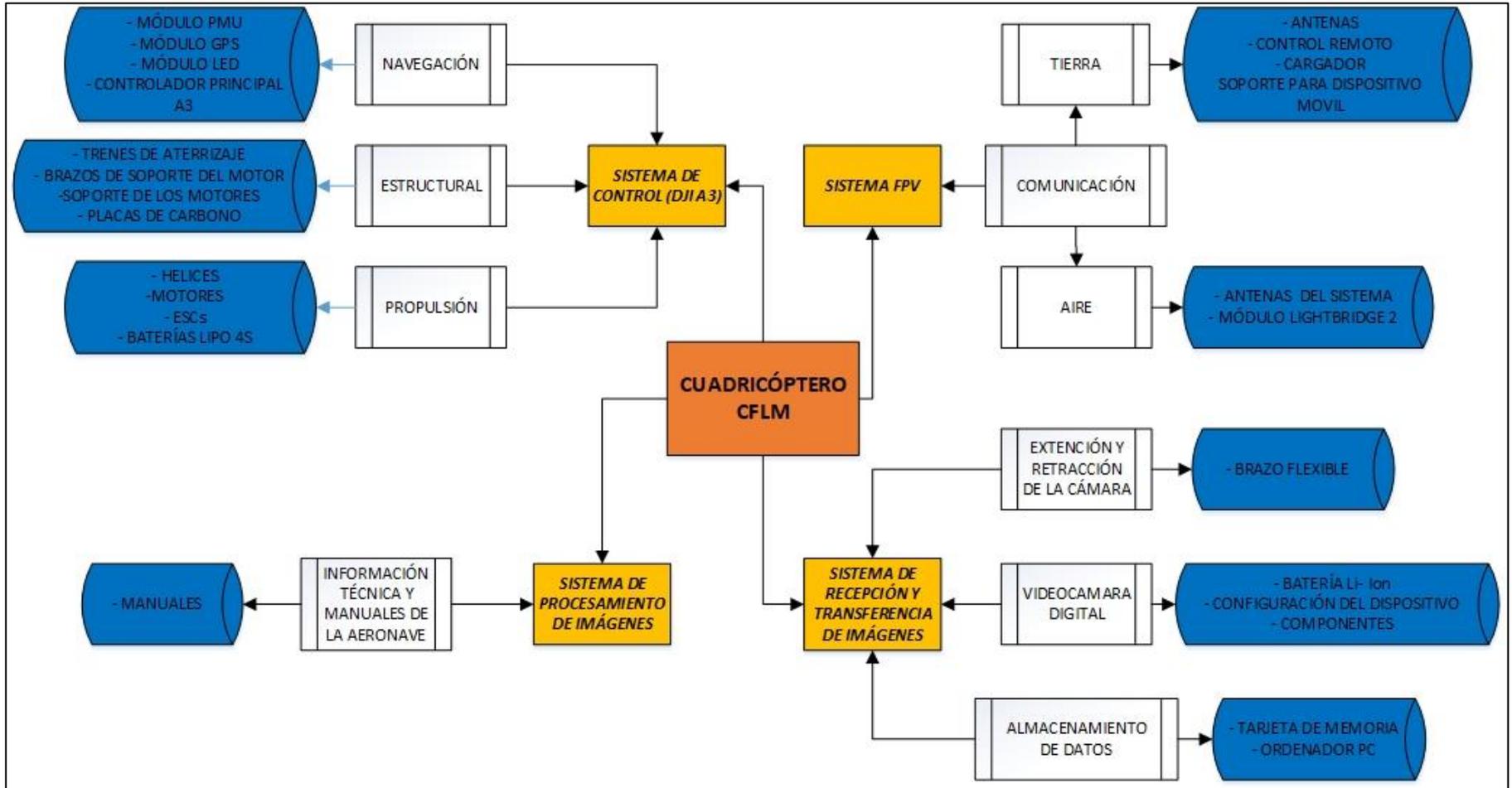
OPERACIÓN DEL SUBSISTEMA DE TIERRA



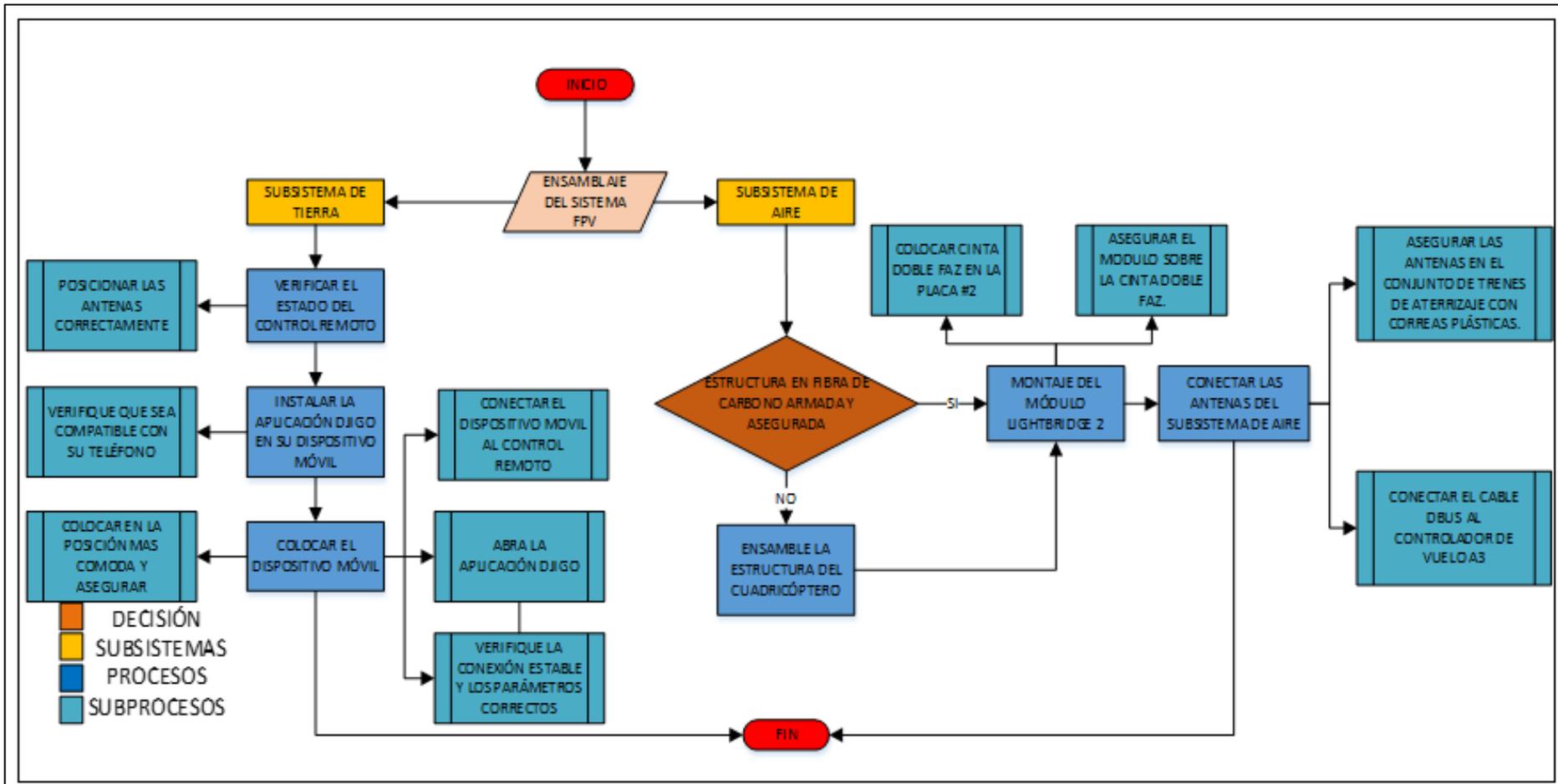
FUENTE DE ENERGÍA DEL SISTEMA FPV



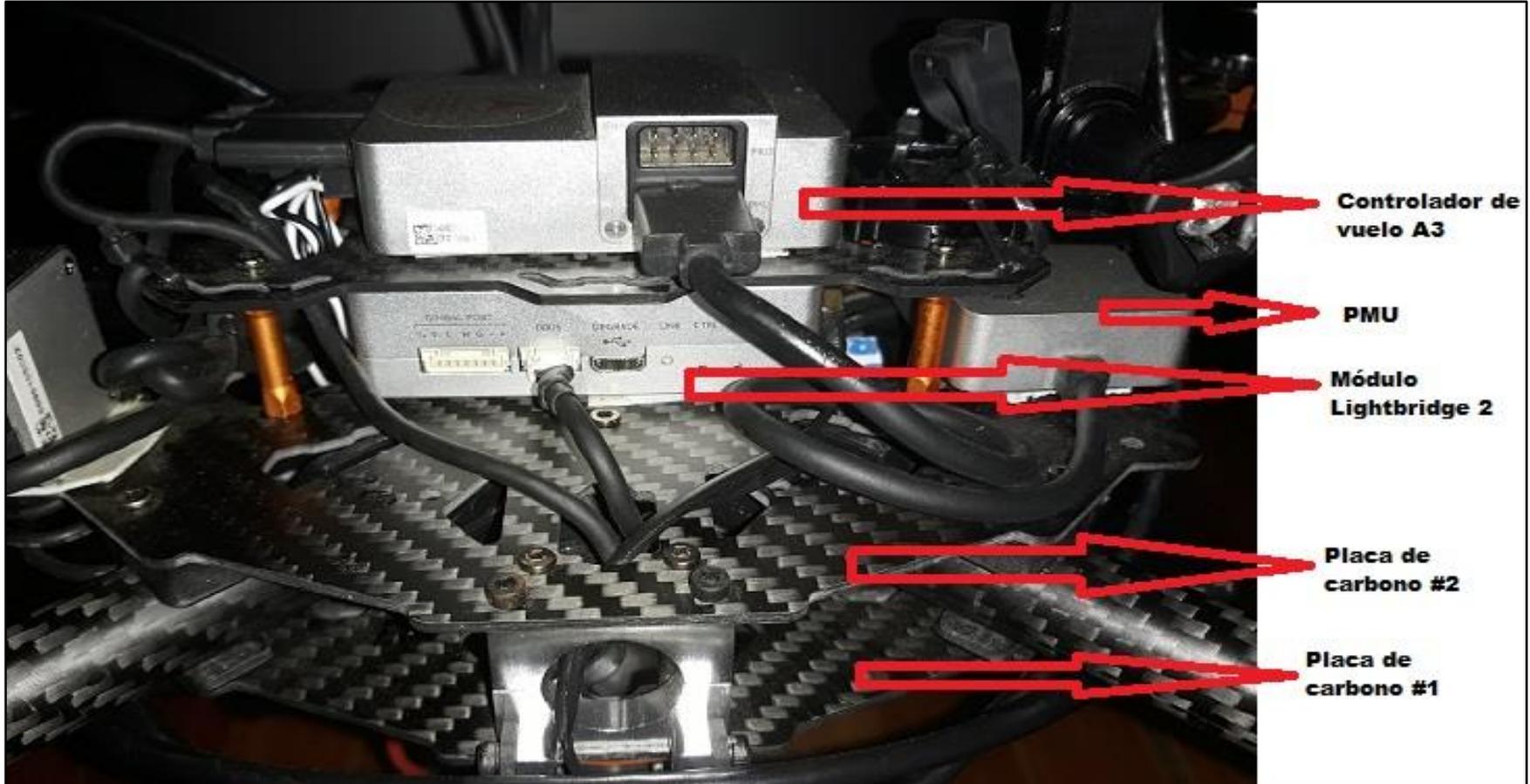
INTERACCIÓN DE LOS SISTEMAS EN EL CUADRICÓPTERO CFLM



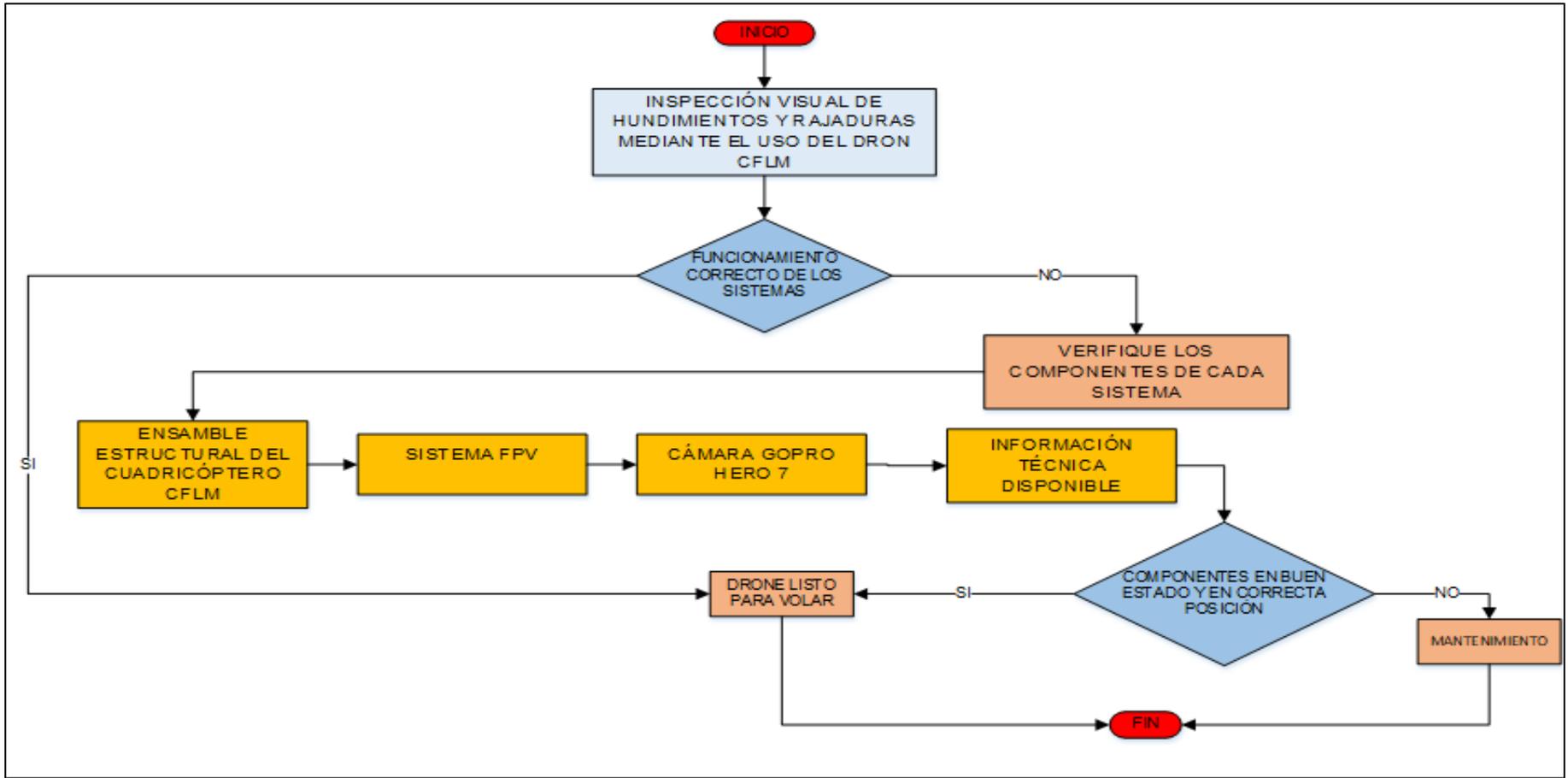
ENSAMBLAJE DEL SISTEMA FPV



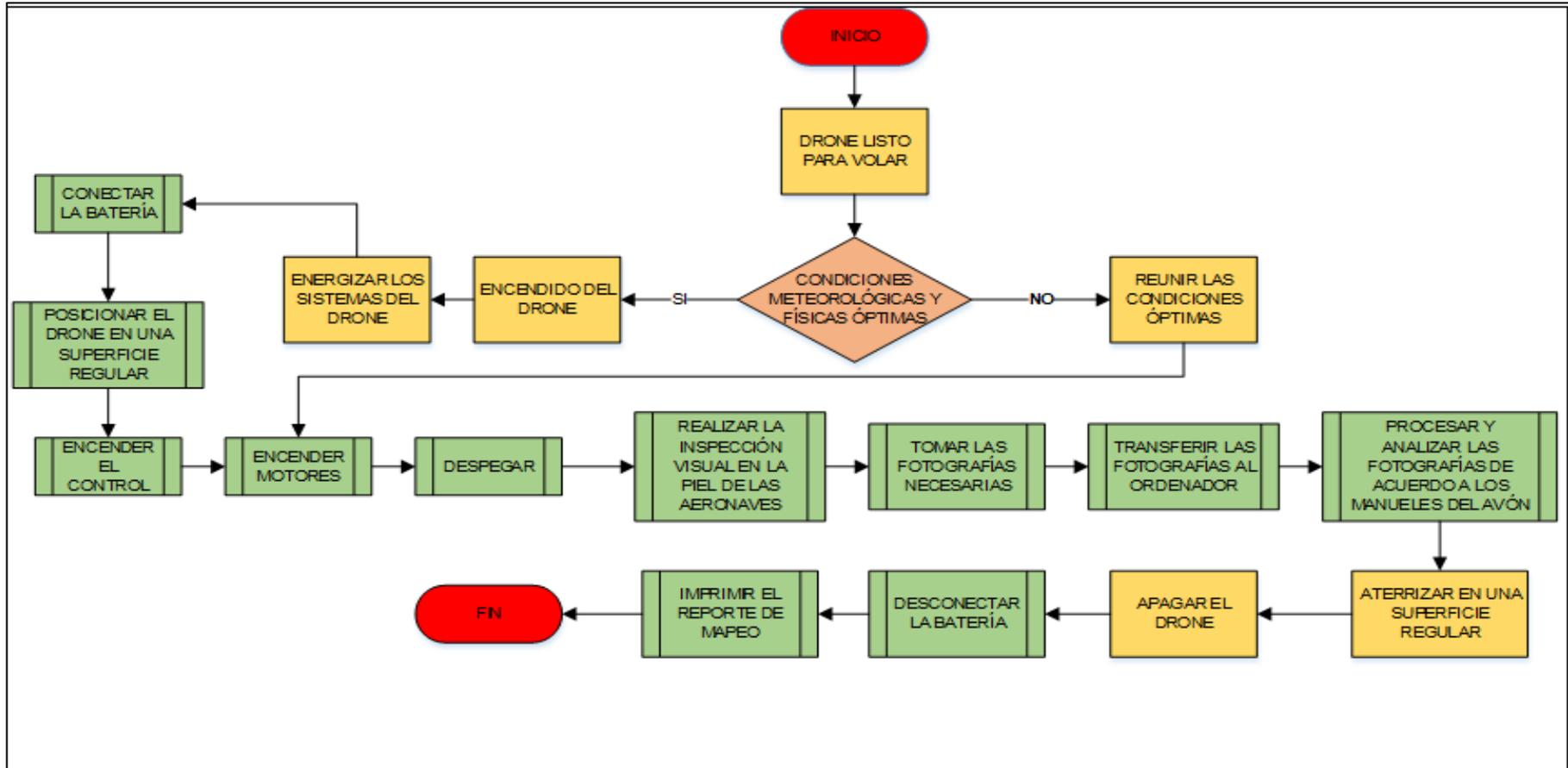
MONTAJE DEL SUBSISTEMA DE AIRE EN CUADRICÓPTERO CFLM



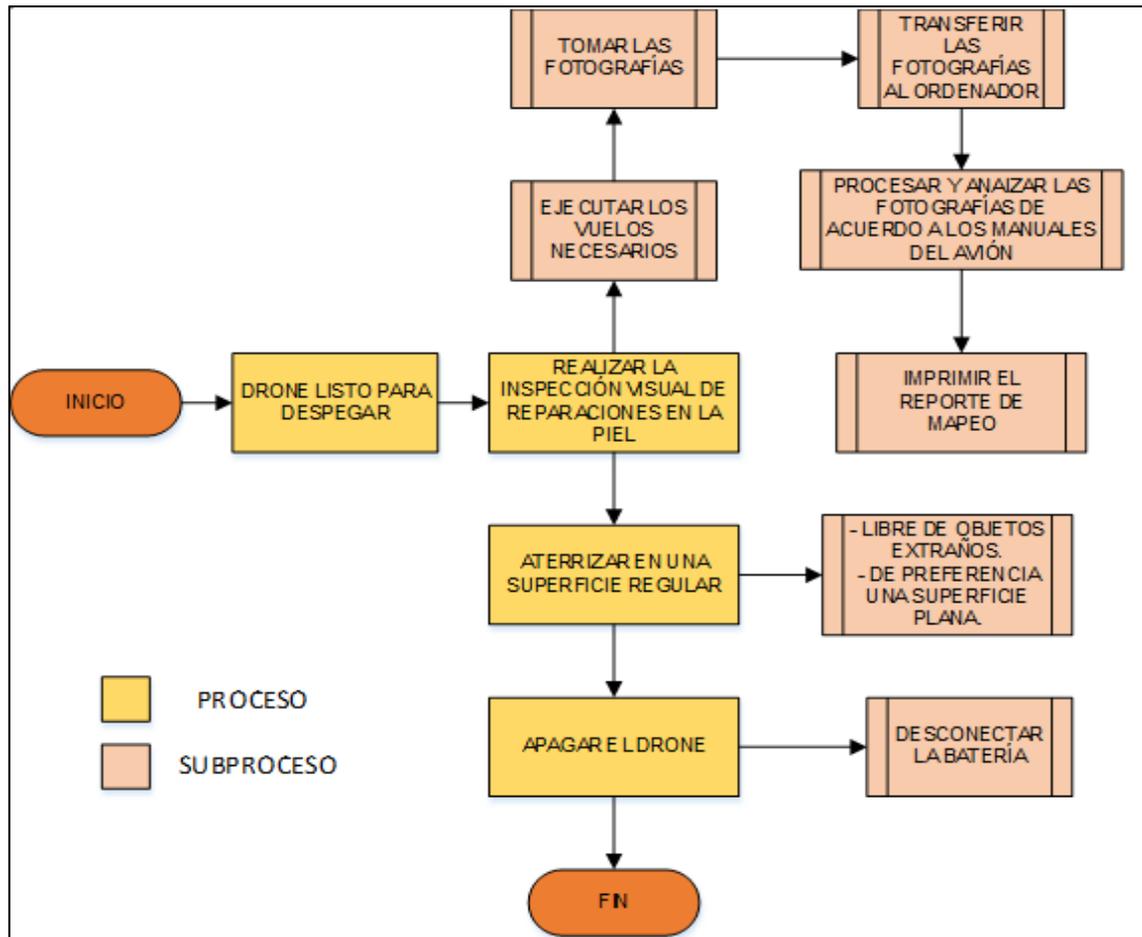
CALIBRACIÓN DEL CUADRICÓPTERO CFLM



DRONE LISTO PARA EJECUTAR INSPECCIONES VISUALES

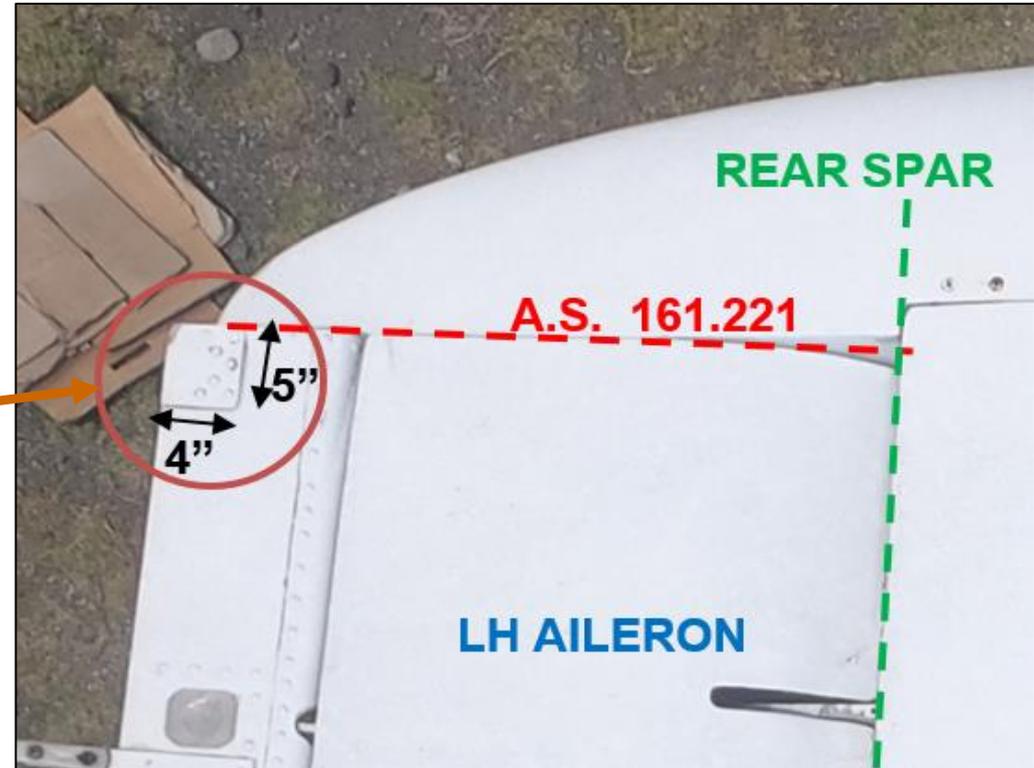
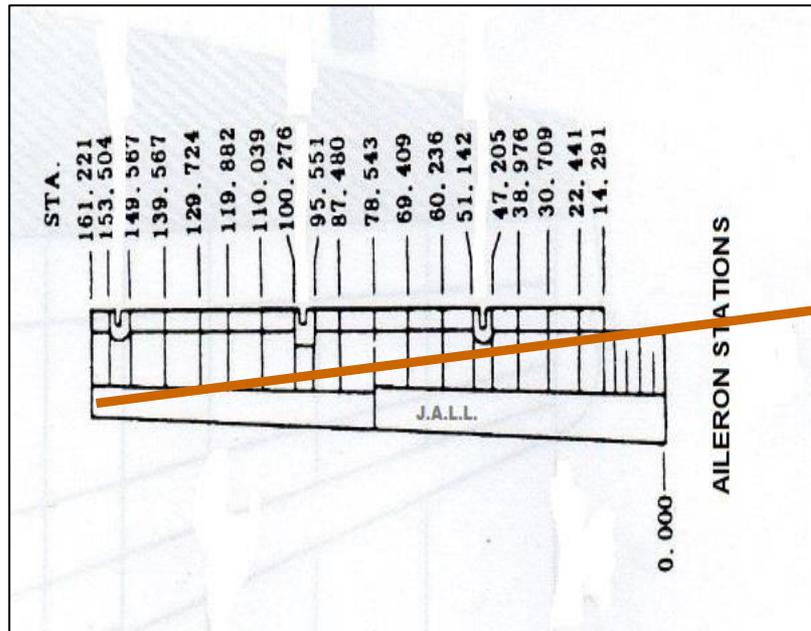


INSPECCIÓN VISUAL EN LA PIEL DE LAS ALAS DEL AVIÓN FAIRCHILD FH-227



ANÁLISIS DE RESULTADOS

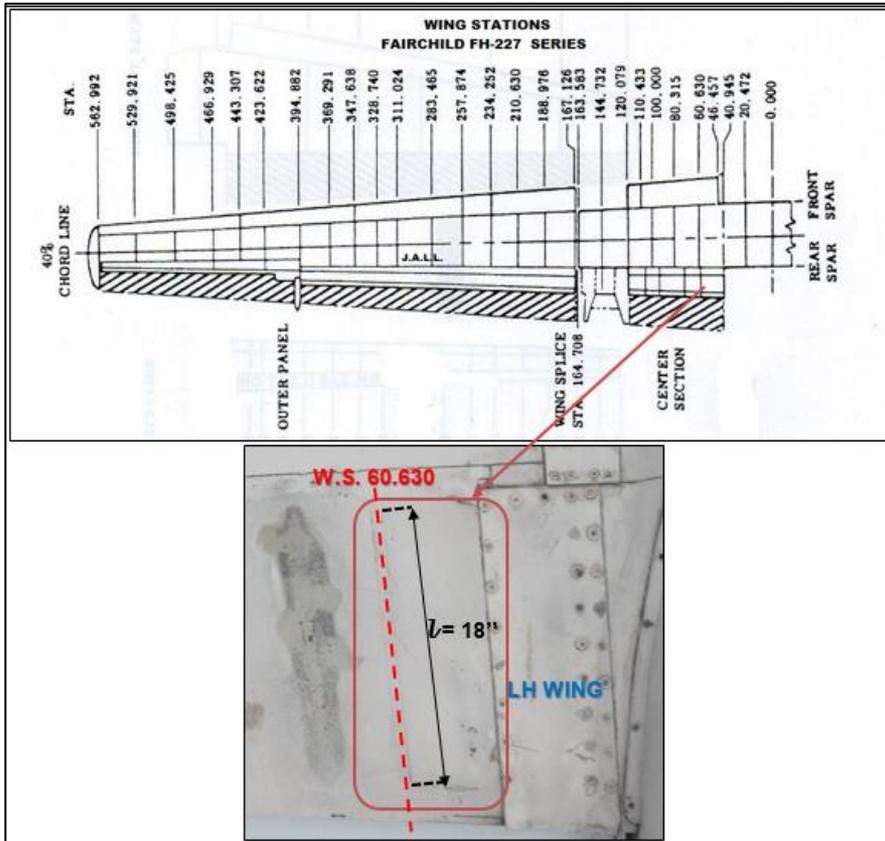
- REPARACIONES - RAJADURAS - HUNDIMIENTOS - DISCREPANCIAS ADICIONALES



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ANÁLISIS DE RESULTADOS

- REPARACIONES - RAJADURAS - HUNDIMIENTOS - DISCREPANCIAS ADICIONALES



WING CENTER SECTION

1. SKIN. (See Figure 1.)

A. Negligible Damage.

Skin surface scratches which do not penetrate the alclad coating may be classified as negligible when smoothed out by polishing or burnishing to a 63 file finish. Smooth dents that are free of nicks or cracks are also considered to be negligible if they can be tapped into shape. Holes and cracks that can be cleaned out with a 1/4 inch diameter drill, and then plugged with a soft rivet, are also classified as negligible damage.

B. Damage Repairable By Patching.

The affected area must be repaired by patching if any of the above limits are exceeded, or for any other type of damage not listed.

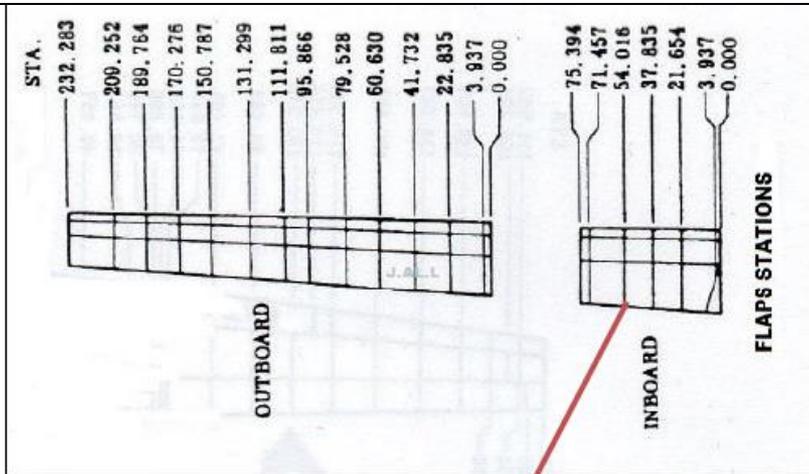
C. Damage Necessitating Replacement.

Replacement of an entire skin panel should be undertaken only when repairs would exceed one half of the area of the skin panel.



ANÁLISIS DE RESULTADOS

- REPARACIONES - RAJADURAS - HUNDIMEINTOS - DISCREPANCIAS ADICIONALES



FAIRCHILD F-27 SERIES STRUCTURAL REPAIR MANUAL

INBOARD FLAPS

1. SKIN. (See Figure 1.)

A. Negligible Damage.

Skin surface scratches which do not penetrate the alclad coating may be classified as negligible when smoothed out by polishing or burnishing to a 63 file finish. Smooth dents that are free of nicks or cracks are also considered to be negligible if they can be tapped into shape. Holes and cracks that can be cleaned out with a 1/4 inch diameter drill, and then plugged with a soft rivet, are also classified as negligible damage.

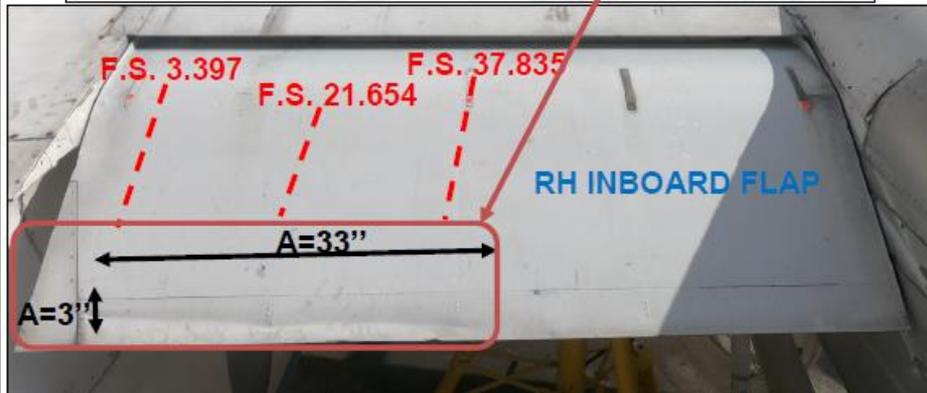
B. Damage Repairable By Patching.

The affected area must be repaired by patching if any of the above limits are exceeded, or for any other type of damage not listed.

C. Damage Necessitating Replacement.

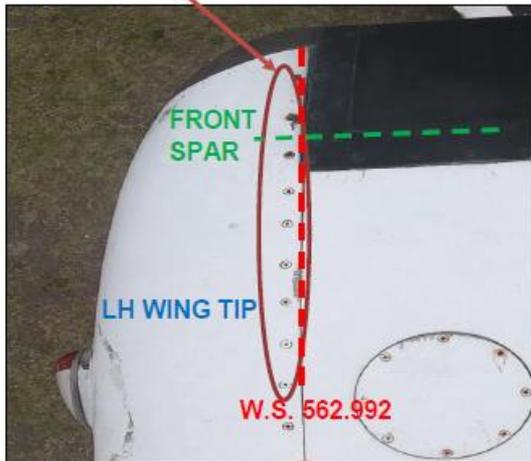
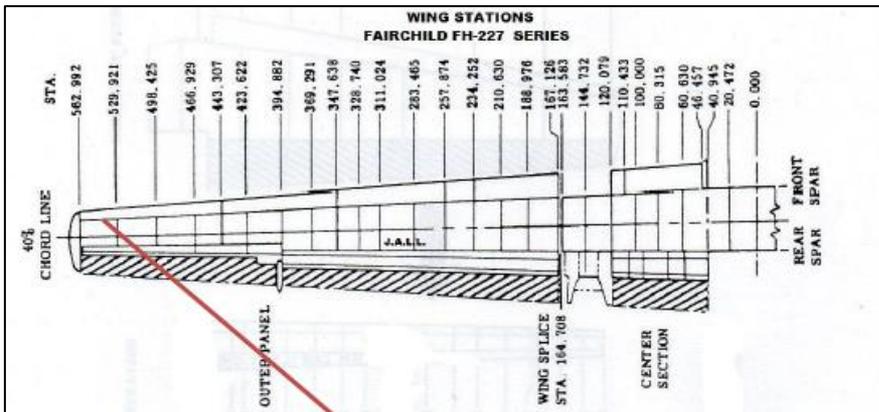
Replacement of an entire skin panel should be undertaken only when repairs would exceed one half of the area of the skin panel.

CAUTION: CONTROL SURFACE STRUCTURE MUST BE SUPPORTED TO MAINTAIN ALIGNMENT WHEN SKINS ARE REMOVED AND REPLACED.



ANÁLISIS DE RESULTADOS

- REPARACIONES - RAJADURAS - HUNDIMEINTOS - DISCREPANCIAS ADICIONALES

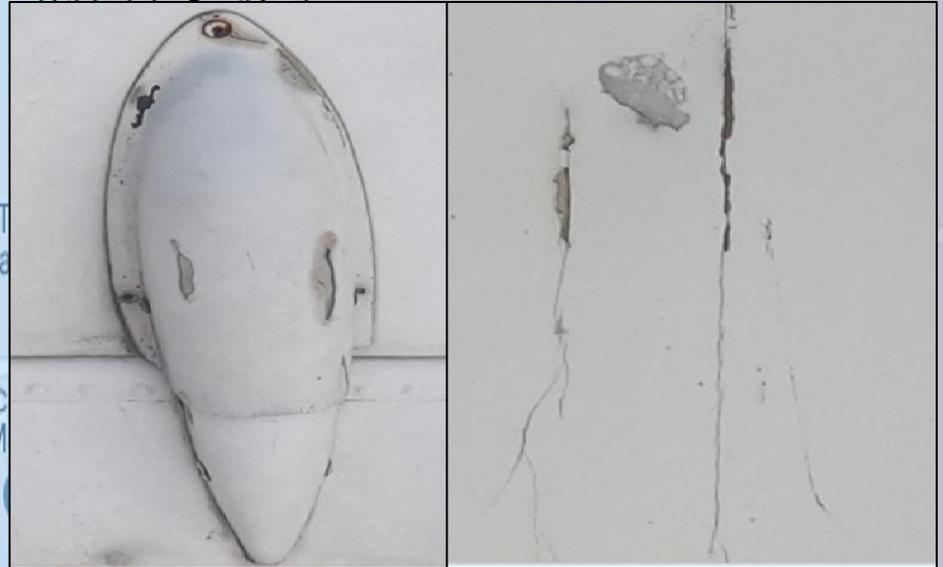


- 6.53 Corrosion Removal Around Countersunk Fasteners in Aluminum Alloy.** In aluminum alloys, intergranular corrosion often originates at countersunk areas where steel fasteners are used. Corrosion removal in a countersink is impossible with the fastener in place.
- 6.53.1** When corrosion is found around a fixed fastener head, remove the fastener to ensure corrosion removal, prevent further corrosion, and prevent loss of structural strength. To reduce the reoccurrence of corrosion, the panel should receive a chemical conversion coating, be primed, and have the fasteners installed wet with sealant.
- 6.53.2** Each time removable steel fasteners are removed from access panels, inspect them for material condition, including the condition of the plating. If mechanical or plating damage is evident, replace the fastener. Upon installation, follow one of the below fastener installation methods:
- 6.53.2.1** A preferred method is to brush a corrosion preventive compound on the substructure around and in the fastener hole, start the fastener, apply a bead of sealant to the fastener countersink, then set and torque the fastener within the working time of the sealant;
 - 6.53.2.2** Apply the corrosion preventive compound to the substructure and fastener, set and torque the fastener; or
 - 6.53.2.3** Apply a coating of primer to the fastener, and, while wet with primer, set and torque the fastener.



CONCLUSIONES

- INFORMACIÓN TÉCNICA DEL MANUAL DE REPARACIÓN ESTRUCTURAL (SÍ)
- INFORMACIÓN TÉCNICA DEL MANUAL DE MANTENIMIENTO (NO)
- FERRETERÍA DE USO CONVENCIONAL
- MATERIALES NO APROBADOS
- RAJADURAS, HUNDIMIENTOS, DAÑOS Y GOLPES
- DESGASTE DE SUS COMPONENTES Y PINTURA





Preguntas?



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!! GRACIAS POR SU ATENCIÓN !!