

PARAVION TECHNOLOGY, INC.  
2001 AIRWAY AVENUE  
FT. COLLINS, COLORADO 80524

**INSTRUCTIONS FOR CONTINUED AIRWORTHINESS  
C182IR INFRARED CAMERA SYSTEM**

**CESSNA MODEL 182 AIRPLANES\***

\*Approved for Models 182Q, 182R, 182S, 182T, R182, T182T

Cover  
PR-C1821R-120M  
Rev. 0, 02/10/2009

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**RECORD OF REVISIONS**

REVISION NO.	ISSUE DATE	DATE INSERTED	BY
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**REVISION CONTROL PROCEDURE**

Revisions to this document are mailed to owner of record. Before inserting a change, ensure this manual is correct. Check the existing List of Effective Pages in this manual to ensure that all prior revisions are inserted. **Do not insert this revision if prior revisions are not inserted.**

**LIST OF EFFECTIVE PAGES**

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**AIRWORTHINESS LIMITATIONS**

The Airworthiness Limitations Section is FAA approved and specifies inspections and other maintenance required under §§ 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

No airworthiness limitation associated with this type design change.

This system has no life-limited components.

REVISION	DATE	APPROVED
0	2/17/09	Melissa Padon

## 1.0 SYSTEM DESCRIPTION (Infrared Camera System)

The camera system incorporated in this installation includes “Infrared” imaging, which may be referred to as “thermal” or “Forward Looking Infrared (FLIR)”, and visible light (Color Daylight) capability. The features and functions of the imaging system are fully described by the product data. Please refer to current edition of “Airborne Thermal Imaging System” manual.

### 1.1 The Imaging System installation includes the following major components:

- 1.1.1 Mount Assembly Installation, extending through the baggage compartment door at F.S. 98.5. (Fig. 1 and Fig. 2)
- 1.1.2 Gimbal Adapter Assembly, (Figs. 3A, 3B, 3C) necessary in order to add a support plate, which fits into channels in the Mount Assembly Installation. (Fig. 2)
- 1.1.3 Gimbal Assembly (Ref.) shown in Figs. 3A, 3B, 3C.
- 1.1.4 Electronic Control Unit. (Fig. 4)
- 1.1.5 An Equipment Cabinet Installation and mounting hardware for Electronic Equipment. (Fig. 5)
- 1.1.6 A handheld control unit for the Imaging Gimbal functions (Figs. 6A, 6B, 6C)
- 1.1.7 A Monitor and Monitor installation. (Fig. 5)

\*The Imaging unit (Gimbal), Electronic Control Unit, Hand Held Control Unit and Monitor are Line Replaceable Units. The appearance and electrical interface of these units may vary. Maintenance in the field is limited to removal and replacement of the units only. Maintenance personnel are advised to contact the system manufacturer for current information on these items.

- 1.1.8 Permanently installed electrical wiring to operate the imaging system (Ref. Fig 6A, 6B, 6C as applicable). This electrical system includes appropriate size wire from the Avionics Buss to the breaker panel to the system power switch (recommended location in Lighting Panel), and to a power connector.
- 1.1.9 System electrical cabling. This cabling is unique to the particular imaging system installed in the aircraft. Paravion Technology, Inc. will arrange for direct contact to the system manufacturer when necessary.

## 2.0 INSPECTION AND MAINTENANCE

It is the objective of this inspection and maintenance procedure to ensure that component installations are secure and that the electrical system is airworthy.

Table I, TROUBLESHOOTING PROCEDURE (Infrared Camera System), refers to the most likely problems that may be encountered, and outlines the appropriate corrective actions. Torque all loose and/or replaced fasteners per standardized torque values as shown in AC43-13.1, as revised.

Please refer to the applicable troubleshooting chapter in the latest revision of the manufacturer’s manual referenced above for any system troubleshooting procedures.



### 3.0 COMPONENT REMOVAL AND REPLACEMENT

**NOTE:** When mounting components are removed, and replaced, follow torque recommendations given in APPENDIX A of this document. System operation must be tested before return to service when new or repaired components are installed, or repairs to the onboard electrical installation are made.

#### 3.1 Gimbal Installation

3.1.1 Reference Figure 2, unscrew the Locking Knob located at the open end of the mount assembly. Slide the Support Plate fully into the mount assembly rails.

3.1.2 Reinstall the Locking Knob and hand-tighten.

3.1.3 Assure that the aircraft Battery switch is OFF. Install Power Supply/Control cables to their proper receptacles.

**NOTE:** Cable connector ends are normally matched to mating receptacles. Refer to the camera system manufacturers technical data to insure proper cables installation.

#### 3.2 Gimbal Removal

3.2.1 Assure that the aircraft battery switch is OFF, before removing electrical cables from the gimbal installation.

3.2.2 Unscrew the Locking Knob located at the open end of the mount assembly, and slide the support plate out of the mount assembly rails.

3.2.3 Remove and stow connecting cables.

#### 3.3 Hand Held Control Unit Installation

3.3.1 Assure that the aircraft battery switch is OFF.

3.3.2 Connect Control Cable to proper Electronics Unit receptacle.

#### 3.4 Hand Held Control Unit Removal

3.4.1 Assure that the aircraft battery switch is OFF.

3.4.2 Remove and stow the control and connecting cables.

3.5 When aircraft mission requirements are revised, or to facilitate inspection, it may be necessary also to remove the Electronic Control Unit (ECU), the Equipment Cabinet/Monitor Installation, and the (Gimbal/ECU) Mount assembly. The order in which these units should be removed is not defined.

3.5.1 Refer to FIGURE 4 Electronic Control Unit Installation when removing or installing the ECU. Cables must be stowed or removed when not in use.

3.5.2 Further refer to FIGURE 2 Mount Assembly Installation when removing or installing the mount assembly.

3.5.3 Refer to Figure 5 Equipment Cabinet/Monitor Installation when removing or installing the Equipment Cabinet and/or Monitor.

3.5.4 Refer to Figure 3A, 3B, or 3C when disassembling or assembling the Gimbal Adapter Unit.

3.6 Components Service

\*System functional testing should be conducted only in low light intensity areas. Do not view high intensity light such as direct sunlight.

Repairs are limited to removal and replacement of the Infrared Camera system components and wiring harness with the exception of repairs to the aircraft wiring from the aircraft power source to the receptacle. Adjust the aircraft Weight and Balance accordingly reference Table II when operating the aircraft with equipment removed

**TABLE I**

<b>TROUBLESHOOTING PROCEDURE</b>		
<b>PROBLEM</b>	<b>POSSIBLE CAUSE</b>	<b>CORRECTIVE ACTION</b>
IMAGING GIMBAL FAILURE	Electrical Power Supply	Inspect Electrical System Wiring. Repair as necessary.
	Control Box	Refer to Camera System Mfr's Instructions. Remove and replace as necessary.
GIMBAL CONTROL MONITOR FAILURE	Control Circuits	Refer to Camera System Mfr's Instructions. Remove and replace imaging system components as necessary
	Electrical Power Supply	Inspect Electrical Power Supply wiring installation
	Signal Loss	Refer to Camera System Mfr's Instructions. Remove and replace imaging system components as necessary.
	Monitor Failure	Remove and Replace Unit

**TABLE II**

**C182IR-100 Weight and Balance Data**

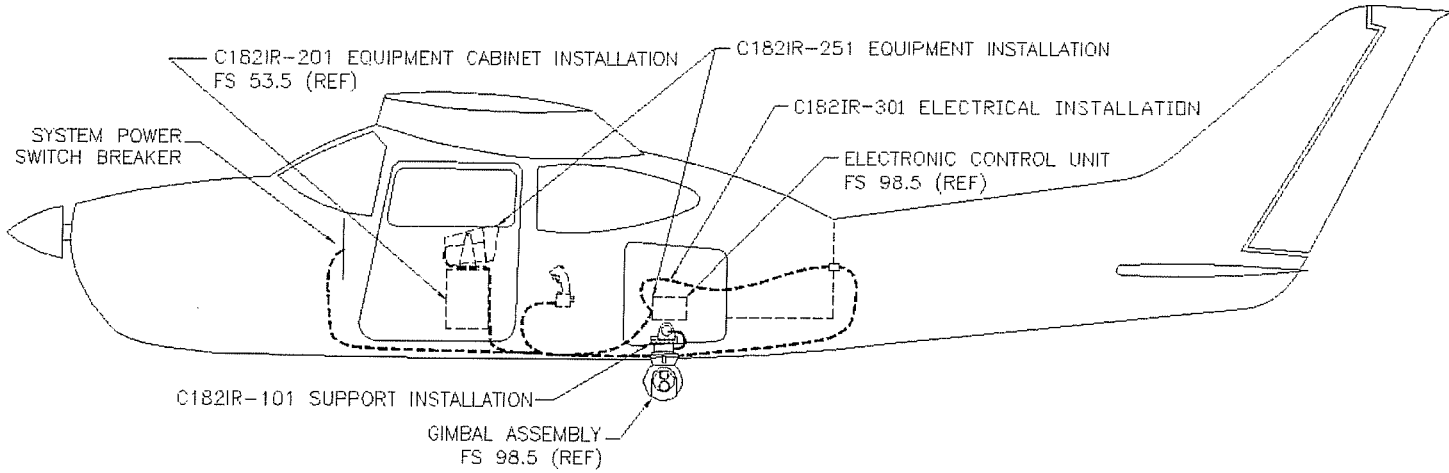
Item	Longitudinal		Lateral	
	Weight	F.S.	B.L.	Moment
	(lb)	(in)	(in)	(in-lbs)
Standard Gimbal Adapter	4.0	98.5	-24.9	394
Isolated Gimbal Adapter	8.2	98.5	-24.9	807
MK-I or MK-II Gimbal	27.9	98.5	-24.9	2748
U7000 Gimbal	26.0	98.5	-24.9	2561
U7500 Gimbal	26.4	98.5	-24.9	2600
U8000 or U8500 Gimbal	29.0	98.5	-24.9	2856
POP 200 Gimbal	36.4	98.5	-24.9	3585
MK-I or MK-II ECU	11.0	98.5	-2.8	1084
U7000 or U7500 ECU	9.1	98.5	-2.8	896
U8000 ECU	14.9	98.5	-2.8	1468
U8500 ECU	15.5	98.5	-2.8	1527
Equipment Cabinet Inst'n	(7.7)*	(48)**		(370)**

\*Carbon Fiber Cabinet P/N C182IR-2010-2

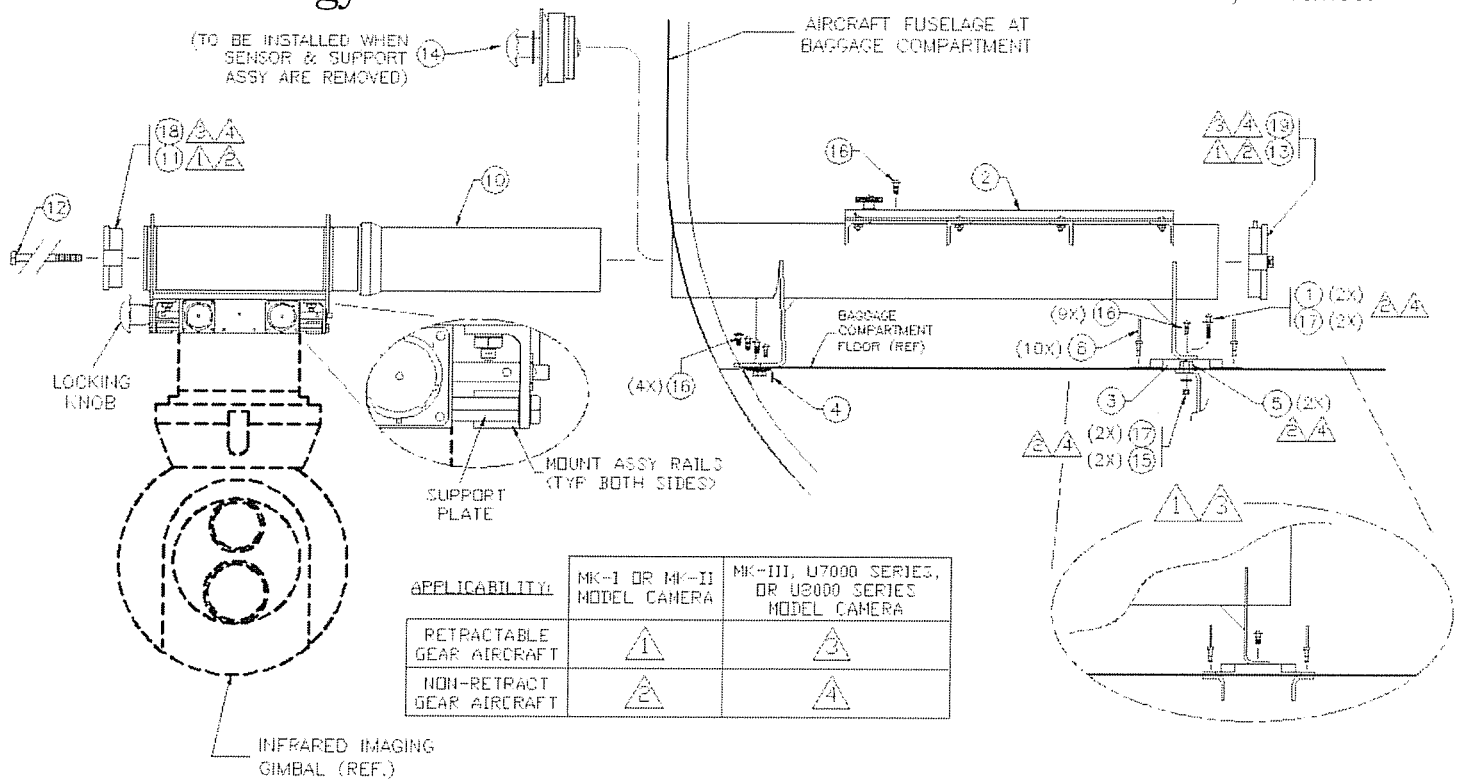
15 lb. If P/N C182IR-2010-1 Aluminum Cabinet is installed.

\*\*Fuselage Station may vary. Moment must be calculated for actual weight and c.g. location.

## FIGURES



**Figure 1: Infrared Imaging System Configuration**



VIEW LOOKING FORWARD  
AT F.S. 98.5 (REF.)

**Figure 2: Mount Assembly Installation**

ITEM NO.	PN	DESCRIPTION	QTY	TYP
1	AN525-10R14	SCREW	2	EA
2	C182IR-1010-1	SUPPORT ASSY (App'l notes 1 & 2)	1	EA
	C182IR-1010-2	SUPPORT ASSY (App'l notes 3 & 4)	1	EA
3	C182IR-2000-1	MOUNT PLATE ASSY	1	EA
4	C182IR-2000-2	MOUNT PLATE ASSY	1	EA
5	C182IR-2100-1	SPACER	2	EA
8	CR3213-4-3	RIVET	10	EA
10	IR-1040-1	SUPPORT ASSY (App'l notes 1 & 2)	1	EA
	IR-1040-2	SUPPORT ASSY (App'l notes 3 & 4)	1	EA
11	IR-1050-1	CAP	1	EA
12	IR-1060-1	BOLT	1	EA
13	IR-1070-1	CAP ASSY	1	EA
14	IR-3000-1	EXPANSION PLUG	1	EA
15	MS21042L3	NUT	2	EA
16	MS35207-264	SCREW	9	EA
17	NAS1149D0363J	WASHER	4	EA
18	IR-1050-2	CAP	1	EA
19	IR-1070-2	CAP ASSY	1	EA

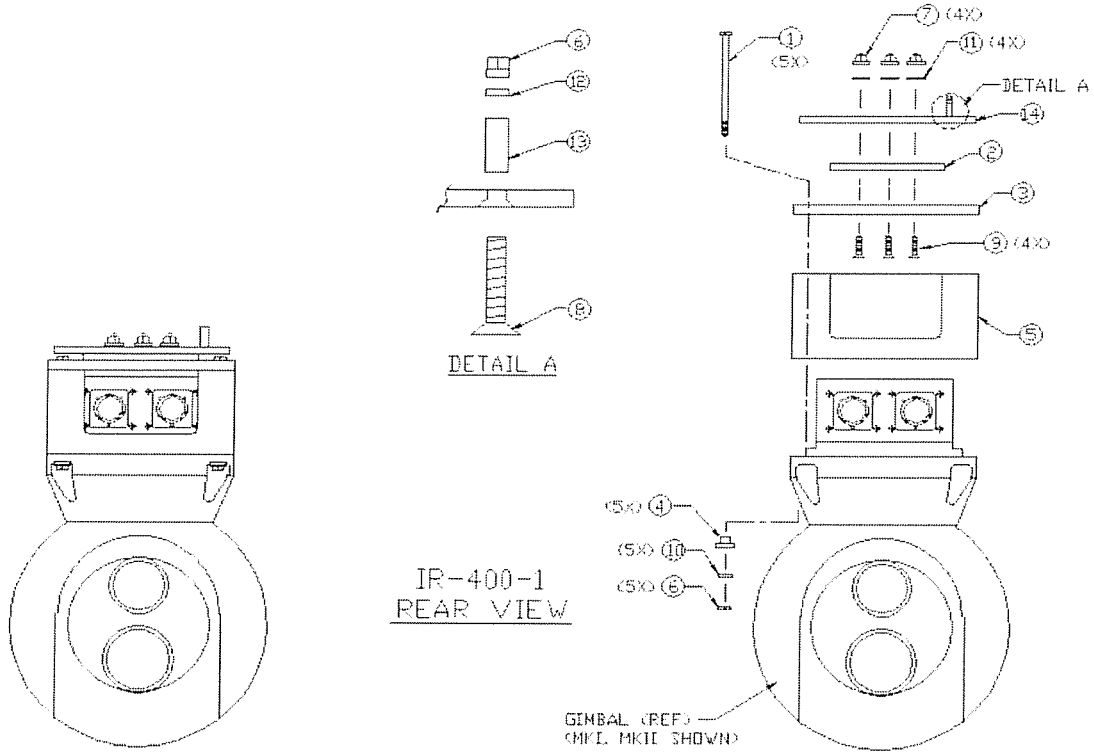


Figure 3A: IR-400-1 Gimbal Adapter Assembly

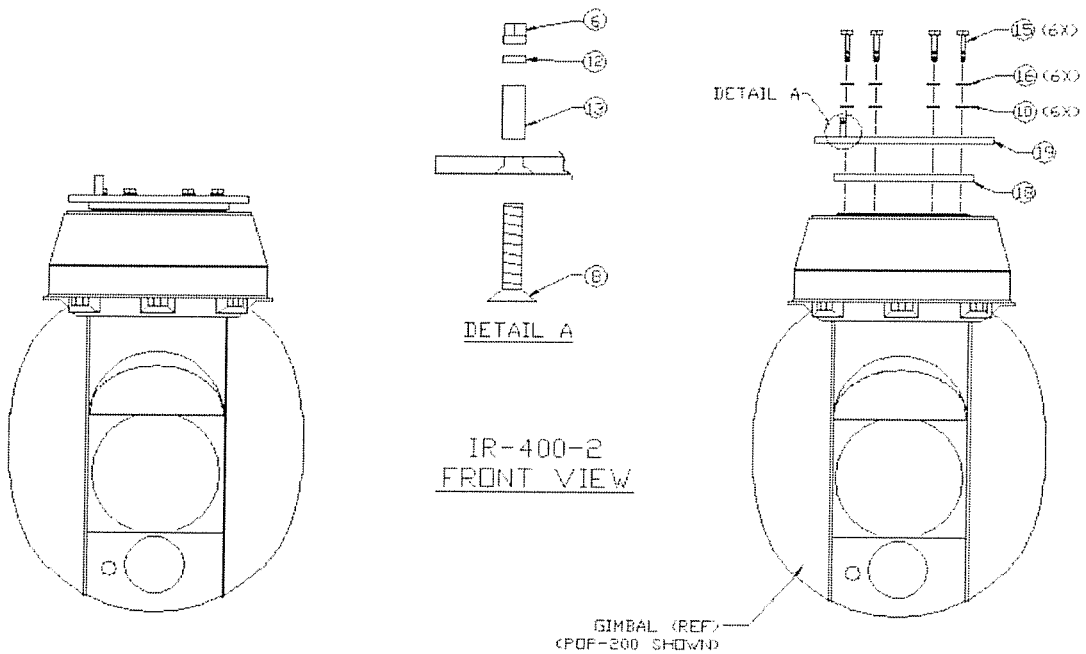
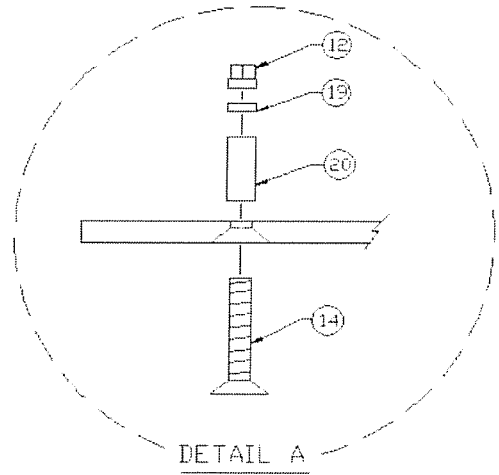
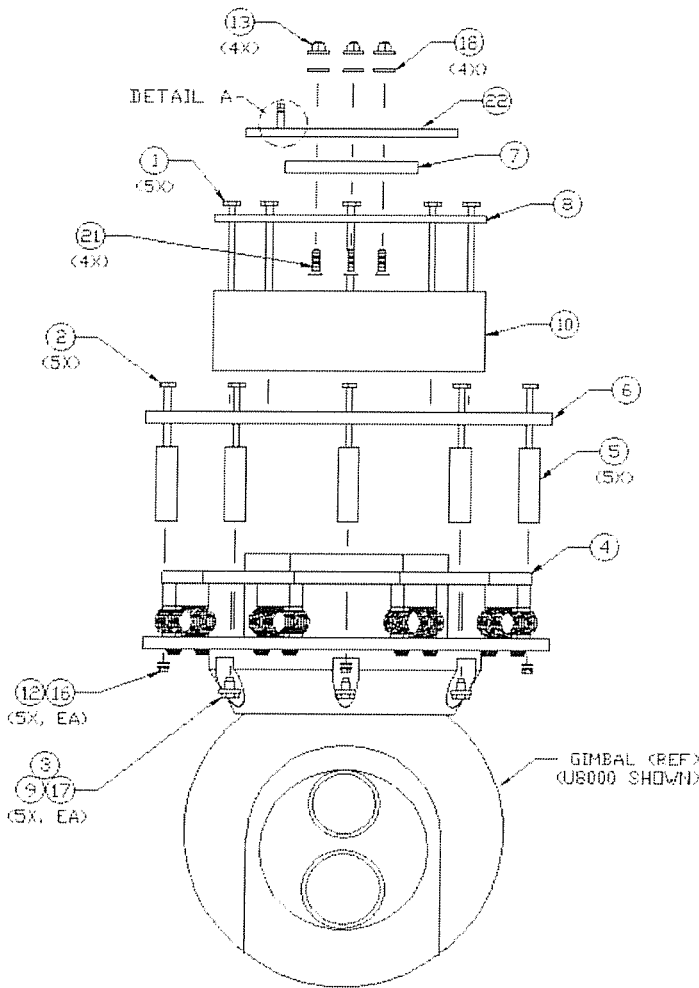


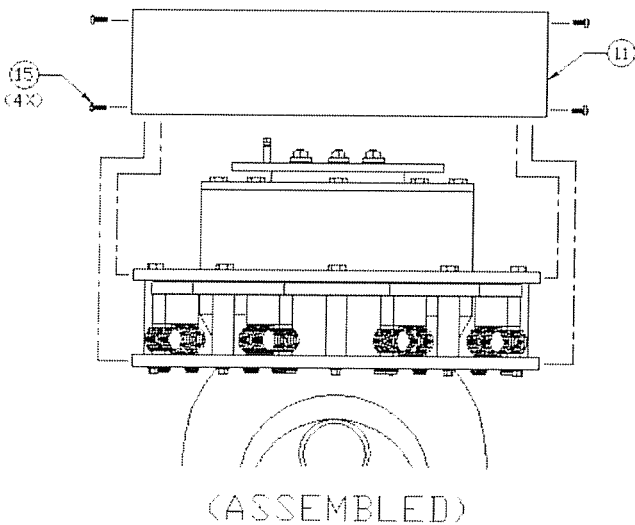
Figure 3B: IR-400-2 Gimbal Adapter Assembly

**Parts List**  
**Figure 3A: IR-400-1**  
**Figure 3B: IR-400-2**

ITEM NO.	PN	DESCRIPTION	QUANTITY		TYP
			IR-400-1	IR-400-2	
1	AN3-40A	BOLT	5	-	EA
2	IR-607-1	SPACER	1	-	EA
3	IR-610-1	MOUNT PLATE	1	-	EA
4	IR-620-1	BUSHING	5	-	EA
5	IR-630-1	SPACER	1	-	EA
6	MS21042L3	NUT	6	1	EA
7	MS21042L4	NUT	4	-	EA
8	MS24693S277	SCREW	1	1	EA
9	MS24693S300	SCREW	4	-	EA
10	NAS1149D0363J	WASHER	5	6	EA
11	NAS1149D0463J	WASHER	4	-	EA
12	NAS1149F0332P	WASHER	1	1	EA
13	NAS43DD3-32	SPACER	1	1	EA
14	SX5-606-1	SUPPORT PLATE	1	-	EA
15	AN3-10A	BOLT	-	6	EA
16	MS35333-39	LOCKWASHER	-	6	EA
18	IR-650-1	PLATE ASSEMBLY	-	1	EA
19	SX6-606-1	SUPPORT PLATE	-	1	EA



IR-420-2  
 FRONT VIEW



\*ISOLATOR, SPACER, AND SCREW  
 MUST BE MATCHED AS FOLLOWS\*

ES93000 ISOLATOR	IR-5010 SPACER	MS24693 SCREW
-1	-15	-S60
-2	-16	-S60
-3	-17	-S58
-4	-18	-S58
-5	-19	-S56
-6	-20	-S55

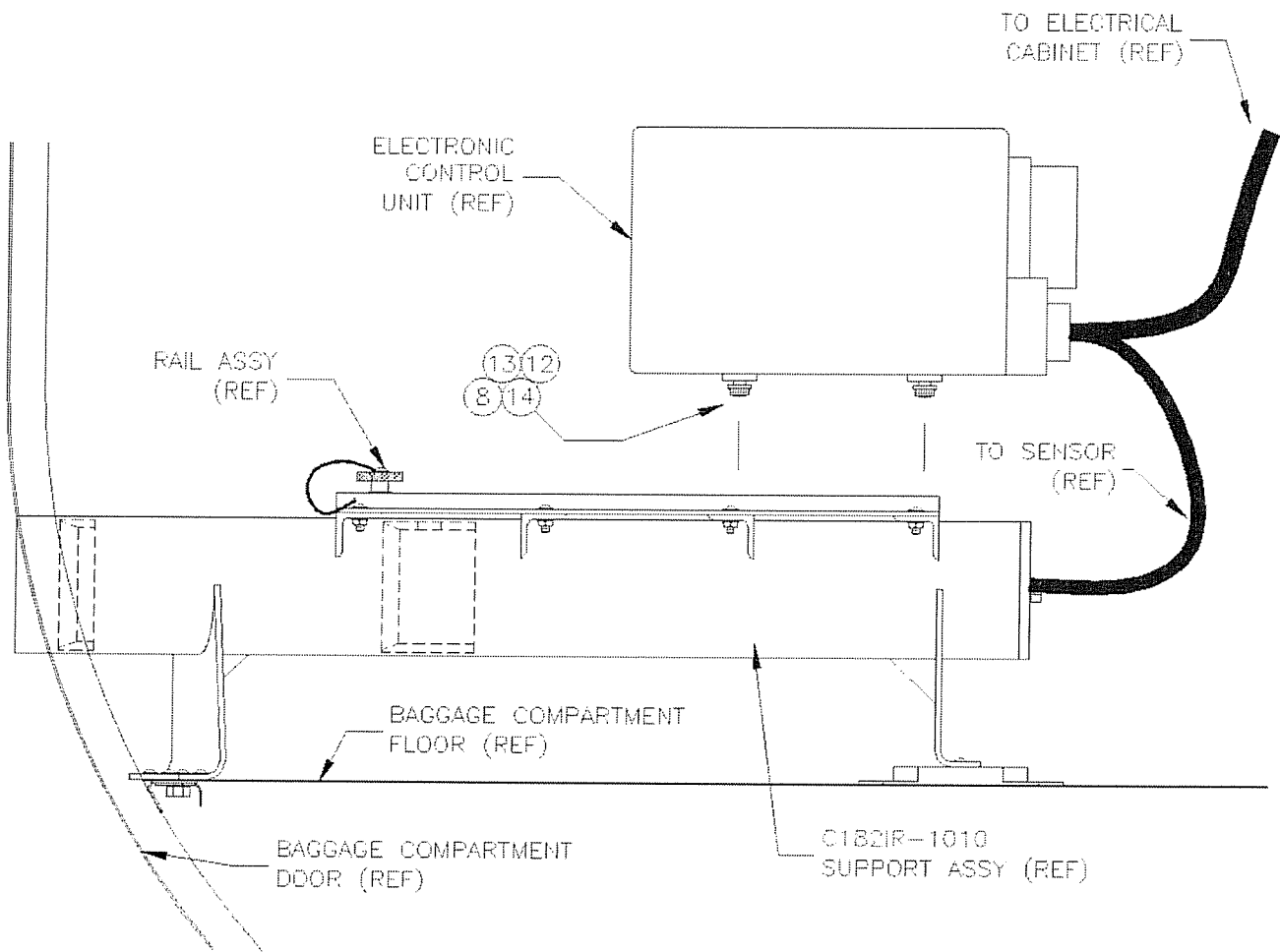
Figure 3C: IR-420-2 Gimbal Adapter Assembly



## Parts List

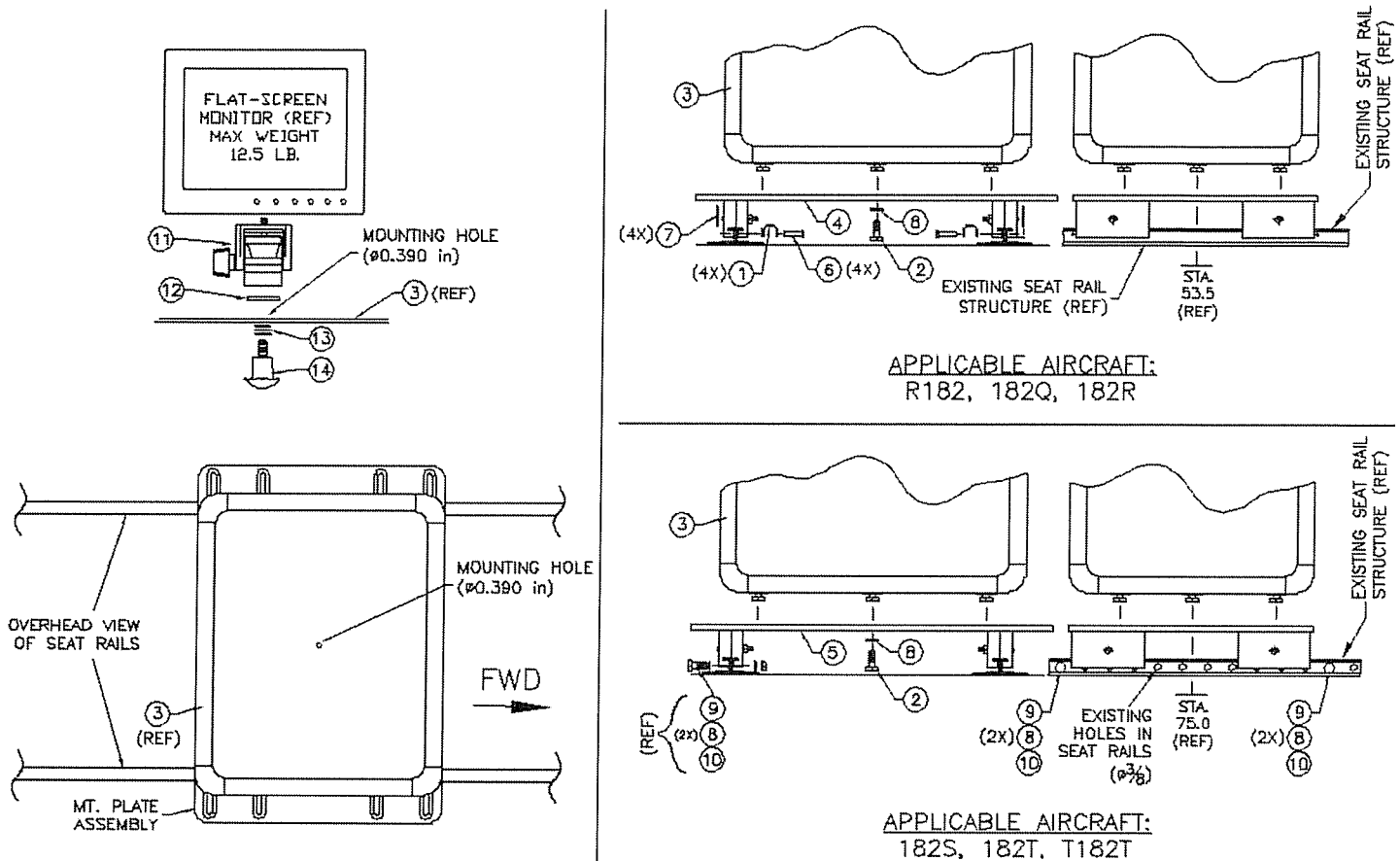
Figure 3C: IR-420-2

ITEM NO.	PN	DESCRIPTION	QTY	TYP
1	AN3-30A	BOLT	5	EA
2	AN3-32	BOLT	5	EA
3	AN3-6A	BOLT	5	EA
4	IR-5010-2	ISOLATOR ASSEMBLY	1	EA
5	IR-5011-10	SPACER	5	EA
6	IR-5012—2	PLATE ASSEMBLY	1	EA
7	IR-607-1	SPACER	1	EA
8	IR-610-1	PLATE	1	EA
9	IR-620-1	SPACER	5	EA
10	IR-630-3	SPACER	1	EA
11	IR-640-2	COVER	1	EA
12	MS21042L3	NUT	6	EA
13	MS21042L4	NUT	4	EA
14	MS24693S277	SCREW	1	EA
15	MS35206-228	SCREW	4	EA
16	NAS1149D0316J	WASHER	5	EA
18	NAS1149D0463J	WASHER	4	EA
19	NAS1149F0332P	WASHER	1	EA
20	NAS43DD3-32	SPACER	1	EA
21	MS24693S300	SCREW	4	EA
22	SX5-606-1	PLATE	1	EA



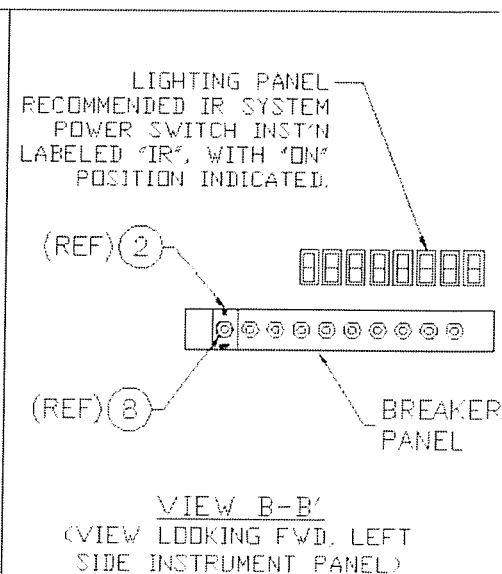
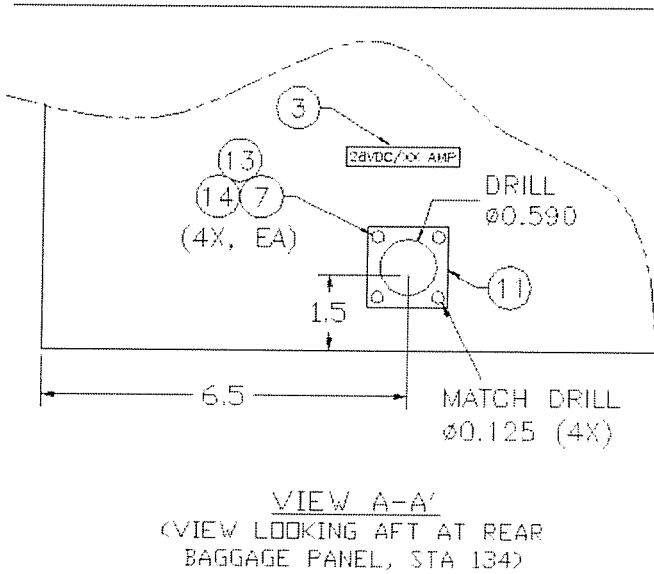
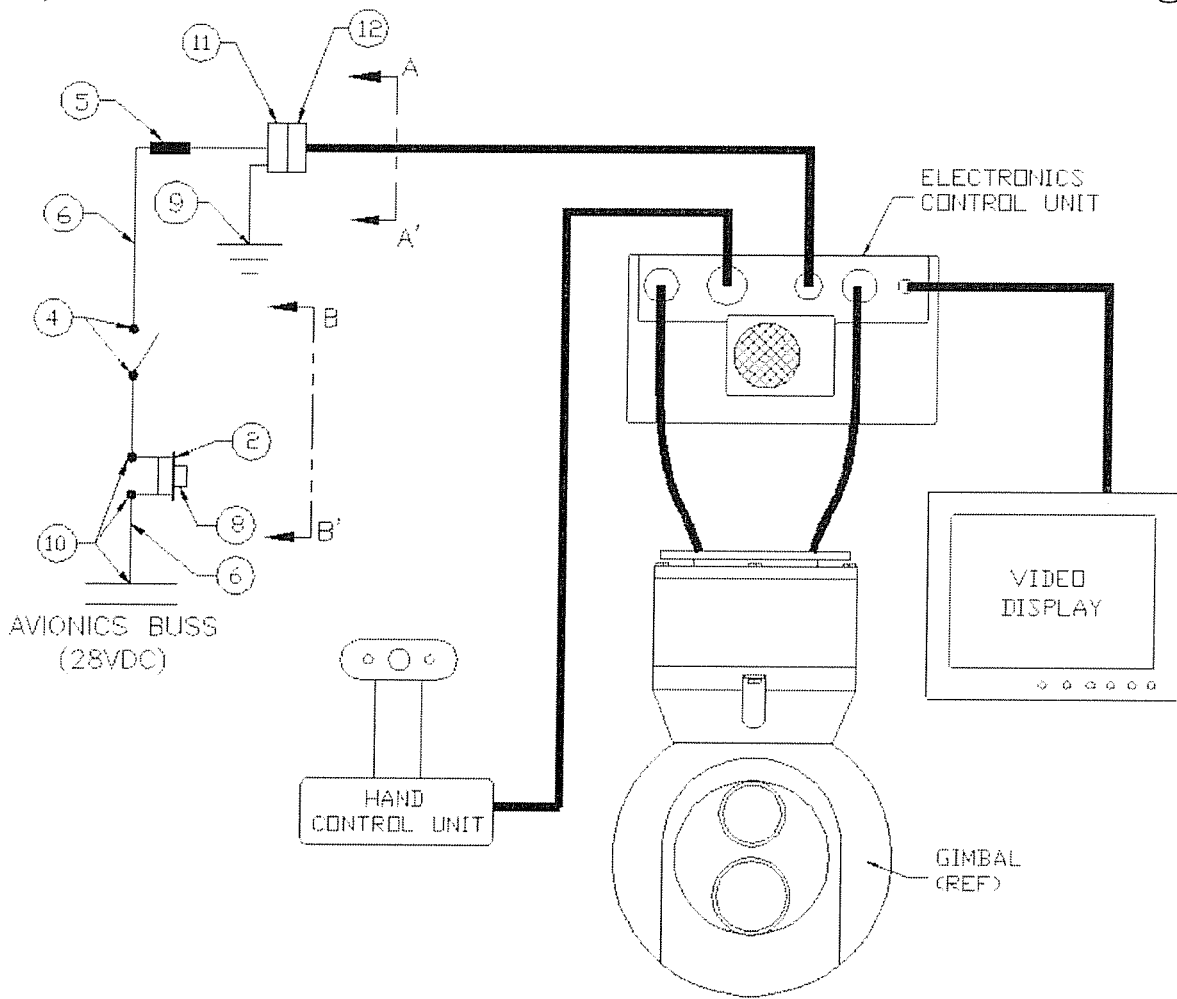
**Figure 4: Electronic Control Unit Installation**

ITEM NO.	PN	DESCRIPTION	QTY	TYP
8	IR-2000-1	BUTTON	4	EA
12	MS35206-247	SCREW	4	EA
13	MS35333-38	STAR WASHER	4	EA
14	NAS1149DN816J	WASHER	4	EA



**Figure 5: Equipment Cabinet/Monitor Installation  
(Using Flat Screen Monitor)**

ITEM NO.	PN	DESCRIPTION	R182/182Q/182R	182S/182T/T182T	TYP
1	0713074-1	CLIP	4	-	EA
2	AN4-10A	BOLT	1	1	EA
3	C182IR-2010-2	EQUIPMENT CABINET ASSY	1	1	EA
4	C182IR-2500-1	MOUNT PLATE	1	-	EA
5	C182IR-2500-2	MOUNT PLATE	-	1	EA
6	MS20392-1C21	PIN	4	-	EA
7	MS24665-151	PIN	4	-	EA
8	NAS1149F0463P	WASHER	1	5	EA
9	AN4-6A	BOLT	-	2	EA
10	MS20365-428	NUT	-	2	EA
11	MM-1600-2	SWIVEL ASSEMBLY	1	1	EA
12	MM-304-1	RUBBER WASHER	1	1	EA
13	NAS1149F0632P	WASHER	As Req'd	As Req'd	EA
14	MM-303-1	KNOB ASSEMBLY	1	1	EA



**Figure 6A: Electrical Installation, MKI, MKII, MKIII, & U7000 Series**

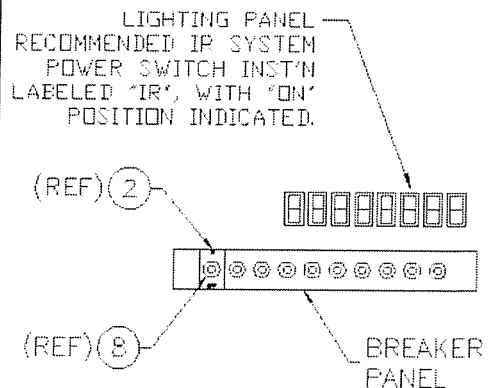
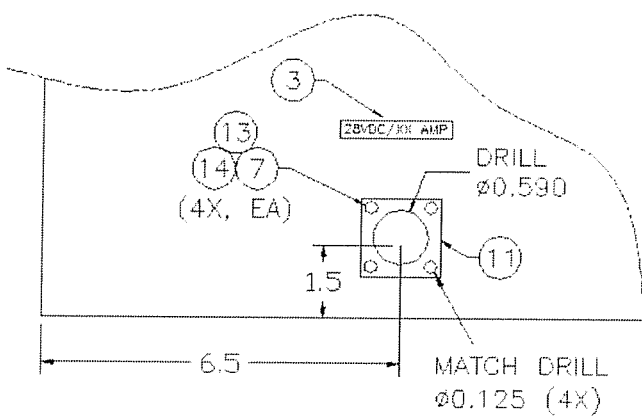
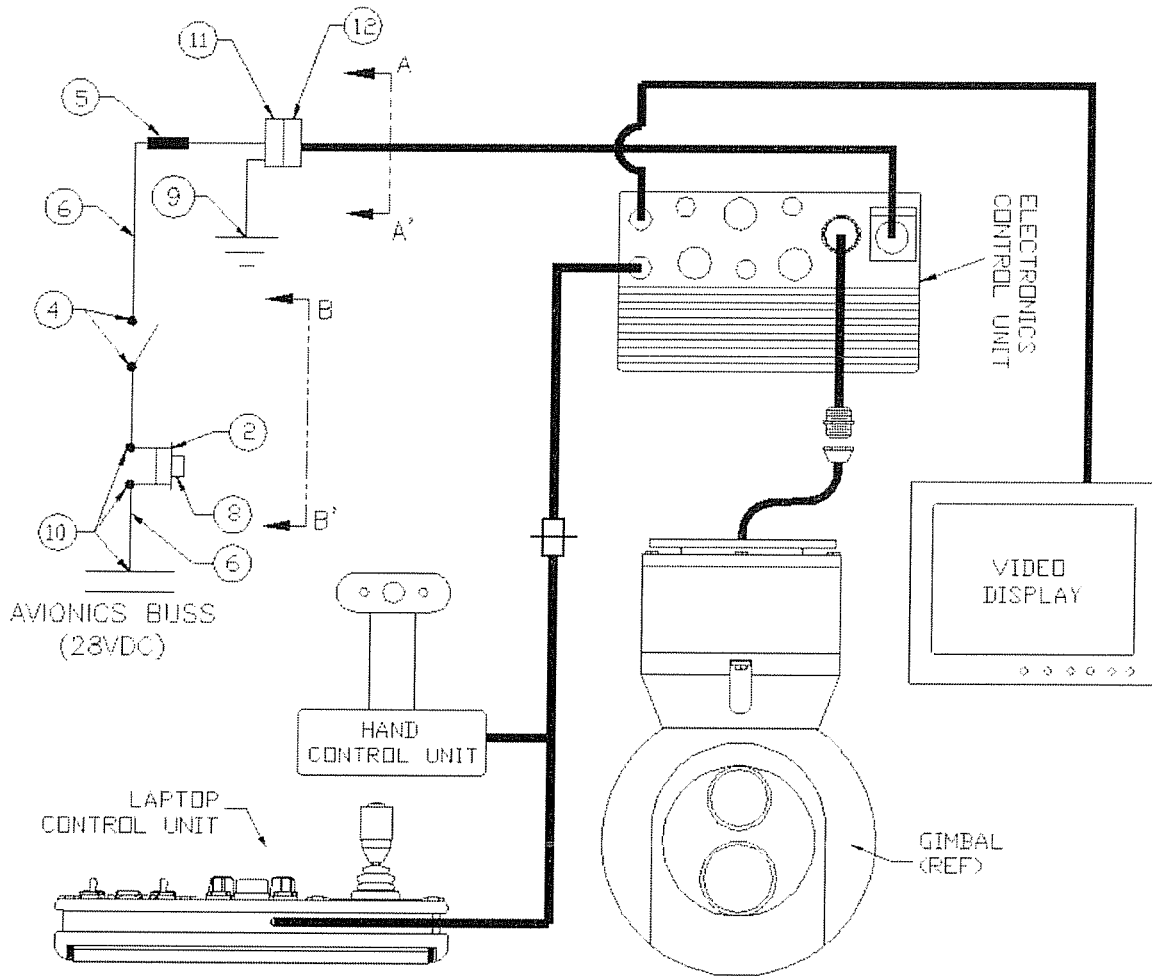


Figure 6B: Electrical Installation, U8000 Series

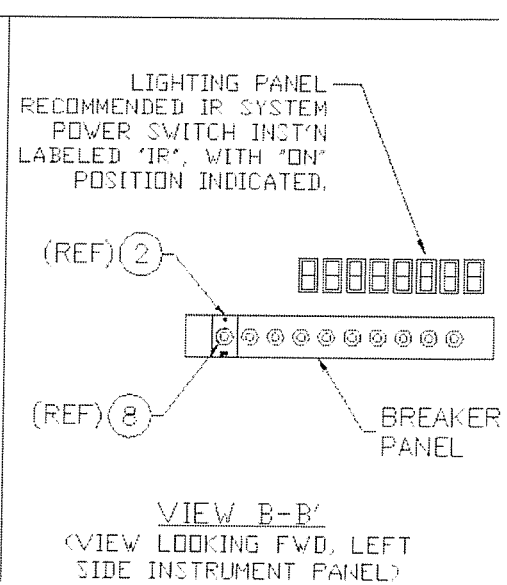
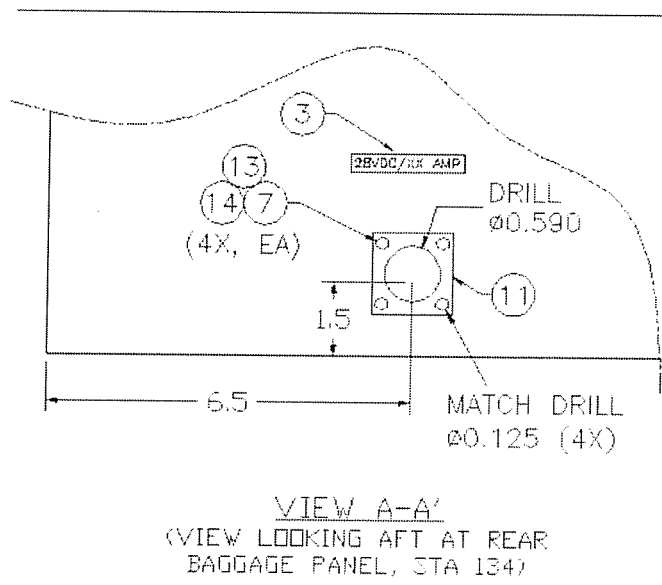
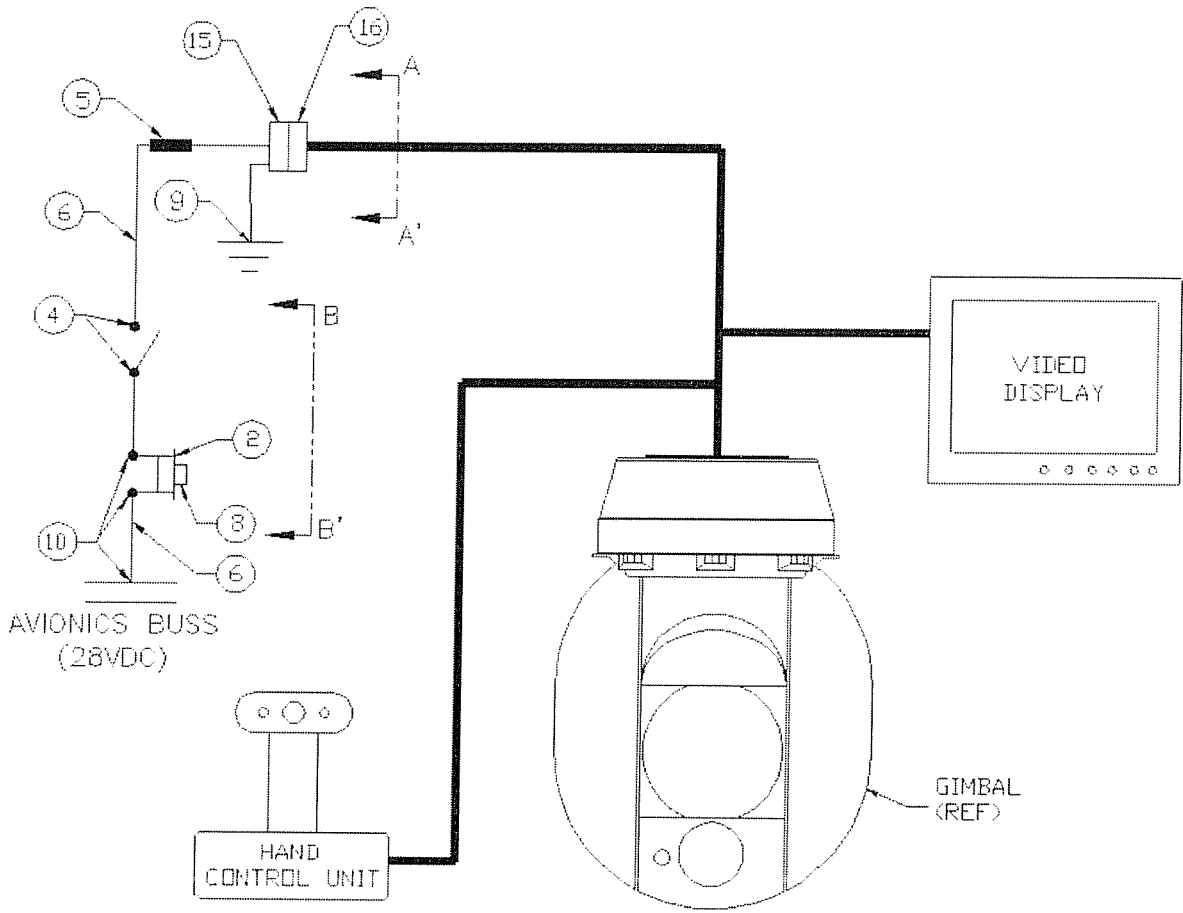


Figure 6C: Electrical Installation, POP-200

## Parts List

Figure 6A: MKI, MKII, MKIII, & U7000 Series

Figure 6B: U8000 Series

Figure 6C: POP-200

ITEM NO.	PN	DESCRIPTION	QUANTITIES				TYP
			(Fig 6A) MKI, MKII	(Fig 6A) MKIII, U7000	(Fig 6B) U8000	(Fig 6C) POP-200	
1	CAM-6275-11	PLACARD	1	1	1	1	EA
2	IR-310-2	PLACARD	1	1	1	1	EA
3	IR-310-3	PLACARD	1	-	-	-	EA
	IR-310-4	PLACARD	-	1	-	-	EA
	IR-310-5	PLACARD	-	-	1		EA
	IR-310-6	PLACARD	-	-	-	1	EA
4	KTN-54	CONNECTOR	2	2	2	2	EA
5	M7928/5-3	BUTT SPLICE	1	-	-	1	EA
	M7928/5-4	BUTT SPLICE	-	1	1	-	EA
6	MIL-W-22759/16-18	WIRE	15	-	-	15	FT
	MIL-W-22759/16-16	WIRE	-	15	-	-	FT
	MIL-W-22759/16-14	WIRE	-	-	15	-	FT
7	MS20364-440	NUT	4	4	4	4	FT
8	MS24509-10	BREAKER	1	-	-	-	EA
	MS24509-A15	BREAKER	-	1	-	-	EA
	7270-1-20	BREAKER	-	-	1	-	EA
	MS24509-7.5	BREAKER	-	-	-	1	EA
9	MS25036-103	TERMINAL	1	-	-	1	EA
	MS25036-108	TERMINAL	-	1	1	-	EA
10	MS25036-149	TERMINAL	3	-	-	3	EA
	MS25036-153	TERMINAL	-	3	3	-	EA
11	MS3122E12-3S	RECEPTACLE	1	1	-	-	EA
	MS3100F16-10S	RECEPTACLE	-	-	1	-	EA
12	MS3126E12-3P	PLUG	1	1	-	-	EA
	MS3106F16-10P	PLUG	-	-	1	-	EA
13	MS35206-216	SCREW	4	4	4	4	EA
14	NAS1149FN432P	WASHER	4	4	4	4	EA
15	MS3100F10SL-3S	RECEPTACLE	-	-	-	1	EA
16	MS3106F10SL-3P	PLUG	-	-	-	1	EA

**APPENDIX A**

**STANDARD TORQUE VALUE CHART**



## Appendix A

<b>RECOMMENDED TORQUE VALUES (inch-pounds)</b>				
<b>CAUTION</b>				
<b>THE FOLLOWING TORQUE VALUES ARE DERIVED FROM OIL FREE CADMIUM PLATED THREADS.</b>				
	TORQUE LIMITS RECOMMENDED FOR INSTALLATION (BOLTS LOADED PRIMARILY IN SHEAR)		MAXIMUM ALLOWABLE TIGHTENING TORQUE LIMITS	
Thread Size	Tension type nuts: MS20365, MS21042, MS17825, AN310 (40,000 psi in bolts)	Shear type nuts: MS20364, MS21245, MS17826, AN320 (24,000 psi in bolts)	Nuts: MS20365, MS21042, MS17825, AN310 (90,000 psi in bolts)	Nuts: MS20364, MS21245, MS17826, AN320 (54,000 psi in bolts)
<b>FINE THREAD SERIES</b>				
10-32	20-25	12-15	40	25
1/4-28	50-70	30-40	100	60
<b>COARSE THREAD SERIES</b>				
4-40	-	1.5-2	-	-
6-32	-	4-5	-	-
8-32	12-15	7-9	20	12
The above torque values may be used for all cadmium-plated steel nuts of the fine or coarse thread series which have approximately equal number of threads and equal face bearing areas. * Estimated corresponding values.				
This table includes standard nut and bolt combinations, currently used in aviation maintenance. For further identification of hardware, see AC 43.13-1B, Chapter 7.				

## APPENDIX B

### ANNUAL/100 HOUR INSPECTION CHECKLIST

## Appendix B

### Annual/100 Hour Inspection Checklist

INSPECTION (Infrared Camera System)	COMMENTS	INITIALS
1. Check for Mount fasteners security. Inspect Mount Assembly and adjacent aircraft structure for condition. Replace damaged and/or corroded components and fasteners as needed. <b>Fig. 2</b>		
2. Visually check Gimbal Adapter Assembly for condition, security of components. Replace damaged/ corroded components and fasteners as needed. <b>Fig. 3A, 3B, 3C</b>		
3. Visually check Gimbal Assembly for condition, security of components. Refer to IR system manufacturer's data for component use limits. <b>Fig. 3A, 3B, 3C</b>		
4. Check Electronics Unit Installation security. Tighten or replace loose or corroded fasteners as needed. <b>Fig. 4</b>		
5. Check Monitor Assembly and installation for condition, security of components. Inspect Equipment Cabinet, installation to seat rails, and affected cabin floor. Replace or repair damaged or corroded components and fasteners as needed. <b>Fig. 5</b>		
6. Inspect electrical cabling, Circuit Breaker installation, Switch installation, imaging system power supply connector for security, insulation damage and function. Evaluate cable routing to avoid heat and movement. Any sign of arcing must be addressed, by cable or system component replacement or repair. <b>Fig. 6A, 6B, 6C</b>		
7. <b>Torque all fasteners in accordance with Appendix A.</b>		