



US Department
of Transportation
Federal Aviation
Administration

MAJOR REPAIR AND ALTERATION
(Airframe, Powerplant, Propeller, or Appliance)

Form Approved
OMB No. 2120-0020
2/28/2011

Electronic Tracking Number

For FAA Use Only

INSTRUCTIONS: Print or type all entries. See Title 14 CFR §43.9, Part 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. §44701). Failure to report can result in a civil penalty for each such violation. (49 U.S.C. §46301(a))

1. Aircraft	Nationality and Registration Mark N267RH	Serial No. 18282208
	Make Cessna	Model 182T
2. Owner	Name (As shown on registration certificate) PXW Services	Address (As shown on registration certificate) Address PO Box 802 City Bristow State VA Zip 20136-0802 Country USA

3. For FAA Use Only

4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial No.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	AIRFRAME	_____	(As described in Item 1 above)	_____
<input type="checkbox"/>	<input type="checkbox"/>	POWERPLANT	_____	_____	_____
<input type="checkbox"/>	<input type="checkbox"/>	PROPELLER	_____	_____	_____
<input type="checkbox"/>	<input type="checkbox"/>	APPLIANCE	Type _____ Manufacturer _____	_____	_____

6. Conformity Statement

A. Agency's Name and Address		B. Kind of Agency	
Name Philip Glasgow	Address 2533 Dallas Creek Court City Fort Collins State Co Zip 80528 Country USA	<input checked="" type="checkbox"/> U. S. Certified Mechanic	Manufacturer
		<input type="checkbox"/> Foreign Certified Mechanic	C. Certificate No.
		<input type="checkbox"/> Certified Repair Station	A&P 3292572 IA
		<input type="checkbox"/> Certified Maintenance Organization	

D. I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B <input type="checkbox"/>	Signature/Date of Authorized Individual Philip Glasgow 9/5/2012
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7. Approval for Return to Service

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ Approved ☐ Rejected

BY	FAA Fit. Standards Inspector	Manufacturer	Maintenance Organization	Persons Approved by Canadian Department of Transport
	FAA Designee	Repair Station	<input checked="" type="checkbox"/> Inspection Authorization	

Certificate or Designation No. A&P 3292572 IA	Signature/Date of Authorized Individual Philip Glasgow 9/5/2012
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NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished

(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

N267RH

Nationality and Registration Mark

9/5/2012

Date

Installed Gomolzig Flugzeug-und Maschinebau GmbH Muffler IAW STC SA01096W1.

Updated weight & balance records.

-----END-----

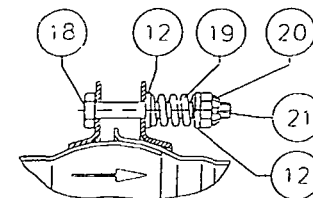
☒ Additional Sheets Are Attached

1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388</
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Inlet cold-air heat-exchanger

Z 1:2

X 1:1



Exhaust gas flow

GOMOL 240 Flugzeug- und Maschinenbau GmbH
Entwicklungsabteilung FASA 211.274

Freigegeben durch M.P.L.

Freigegeben am 01.05.2001

Freigegeben durch

Ministerium M.P.L.

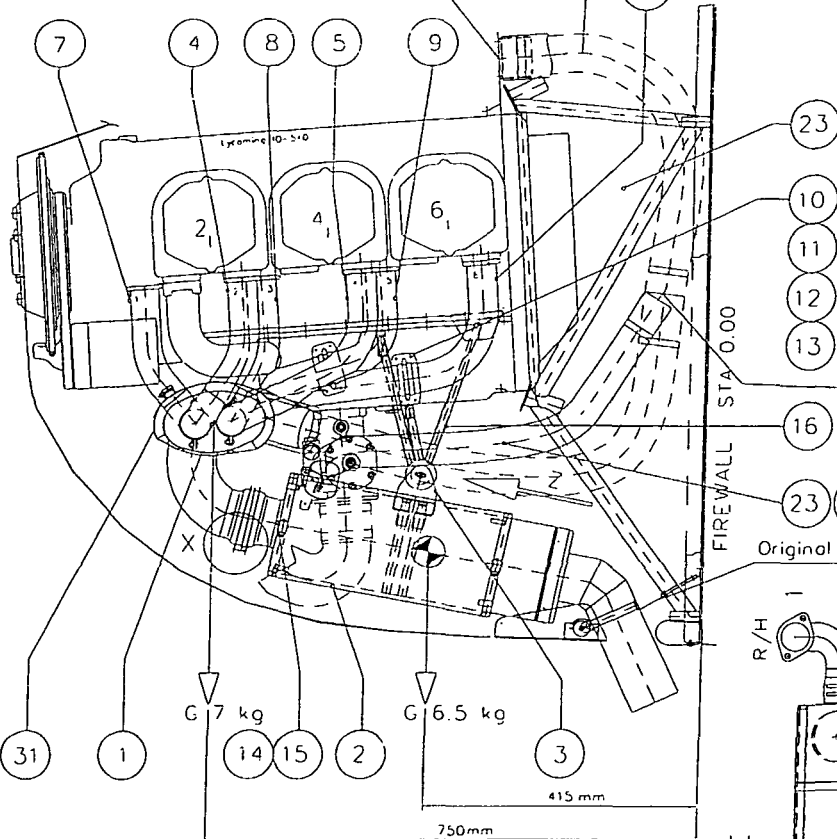
32	93111111	1	Bolt	UNC 1/2" x 1 1/2"	
37	60000760	1	Washer	MS35333-40	- 1/4" lock internal teeth
36	11111111	1	Screw		- 1/4" (1 25/32")
35	210431	2	Nut	MS21043	
34	940416	6	Washer	MS940	- #16
33	111616	1	Washer	MS940	- #17
37	606516	1	Bushing	GO-606516	
31	18756576	1	Shroud	(187-606560	(PA 18756576
28	19000013	2	Clamp	Original Extra Part	S1891-405
29	606519	2	Cover	GO-606519	
26	606570	2	Shockmount	GO-606570	
27	87001330	1	Av. tube 1/4"	SC(11-17	- #3" - 1000 mm long
25	19000013	1	Av. tube 1/4"	SC(11-10	- #2.5" - 1000 mm long
23	3381080	2	Clamp	Extra	S1891-405
22	19000019	1	Cooling air heat exchanger	SC(11-6	- #2" - 1000 mm lg
27	18756900	1	T-tube	(187-606580.00	(PA 18756900
21	21665101	3	Castor pin	MS21665	- #10
20	31033	3	Castor nut	MS3103	- #3
19	10303	3	Spring	MS103	- #3
12	111311	3	Screw	MS111	- #10
17	11111111	1	Screw	MS111	- #10
16	18756400	1	Flange bracket	(187-606580.00	(PA 18756400
15	209915	1	Safety wire	MS20991	- #10
14	103178	3	Clamp	MS10317	- #10 - 178 mm
13	210431	2	Nut	MS21043	- #3
12	940416	30	Washer	MS940	- #16
11	341	2	Screw	MS341	- #10
10	75015176	12	Clamp (nut)	GO-606517.1	- #10 mm / 1 1/2"
8	18756303	1	Tube 1/4" - Cp.2	(187-606563.02	(PA 18756303
6	18756302	1	Tube 1/4" - Cp.3	(187-606563.02	(PA 18756302
7	18756301	1	Tube 1/4" - Cp.1	(187-606563.01	(PA 18756301
2	18756703	1	Tube 1/4" - Cp.6	(187-606567.03	(PA 18756703
5	18756702	1	Tube 1/4" - Cp.5	(187-606567.02	(PA 18756702
4	18756701	1	Tube 1/4" - Cp.4	(187-606567.01	(PA 18756701
3	1750041	1	Attachment	(175-606570	
2	187565	1	Support	(187-606565	(PA 187565
1	18756112	1	Mounting	(187-606512	(PA 18756112

For Part No.: Qty. Description. Norm. / Drawing No.: Weight / Dimension

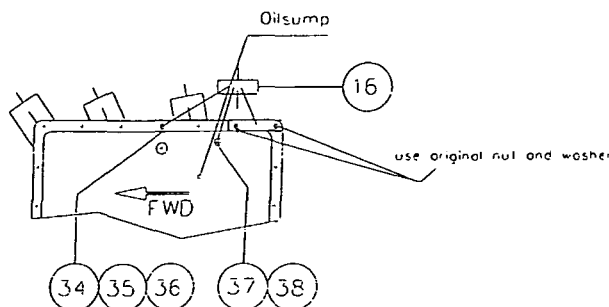
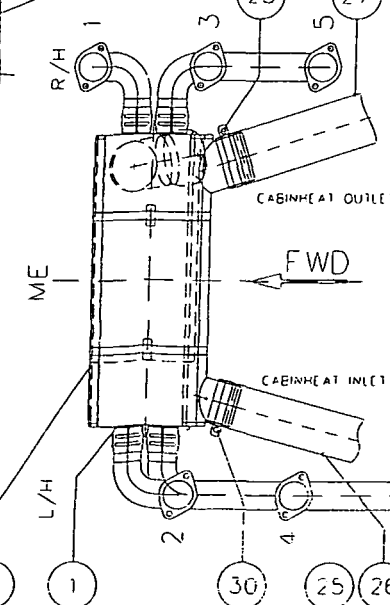
1	13.5 kg	
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Tolerance limits
ISO 2768
fine medium coarse
C182 Exhaust System
Installation Drawing

C182-606580.00



Original parts





US Department
of Transportation
Federal Aviation
Administration

MAJOR REPAIR AND ALTERATION
(Airframe, Powerplant, Propeller, or Appliance)

Form Approved
OMB No. 2120-0020
2/28/2011

Electronic Tracking Number

For FAA Use Only

INSTRUCTIONS: Print or type all entries. See Title 14 CFR §43.9, Part 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. §44701). Failure to report can result in a civil penalty for each such violation. (49 U.S.C. §46301(a))

1. Aircraft	Nationality and Registration Mark N267RH	Serial No. 18282208	
	Make Cessna	Model 182T	Series
2. Owner	Name (As shown on registration certificate) PXW Services	Address (As shown on registration certificate) Address PO Box 802 City Bristow State VA Zip 20136-0802 Country USA	

3. For FAA Use Only

The technical data identified herein has been found to comply with the applicable airworthiness requirements and is hereby approved for use only on the above described aircraft, subject to conformity inspection by a person authorized in CFR title 14, Part 43, section 43.7.
Approving Inspector: Juliet Sumner Date: 9/7/02
Denver FSDO, NM-03

4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial No.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	AIRFRAME		(As described in Item 1 above)	
<input type="checkbox"/>	<input type="checkbox"/>	POWERPLANT			
<input type="checkbox"/>	<input type="checkbox"/>	PROPELLER			
<input type="checkbox"/>	<input type="checkbox"/>	APPLIANCE	Type Manufacturer		

6. Conformity Statement

A. Agency's Name and Address		B. Kind of Agency	
Name Philip Glasgow	Address 2533 Dallas Creek Court City Fort Collins State CO Zip 80528 Country USA	<input checked="" type="checkbox"/> U. S. Certificated Mechanic	Manufacturer
		<input type="checkbox"/> Foreign Certificated Mechanic	C. Certificate No.
		<input type="checkbox"/> Certificated Repair Station	
		<input type="checkbox"/> Certificated Maintenance Organization	A&P 3292572 IA

D. I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B <input type="checkbox"/>	Signature/Date of Authorized Individual Philip Glasgow <u>9-10-17</u>
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7. Approval for Return to Service

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ Approved ☐ Rejected

BY	FAA Flt. Standards Inspector	Manufacturer	Maintenance Organization	Persons Approved by Canadian Department of Transport
	FAA Designee	Repair Station	<input checked="" type="checkbox"/> Inspection Authorization	Other (Specify)

Certificate or Designation No. A&P 3292572 IA	Signature/Date of Authorized Individual Philip Glasgow <u>9-10-17</u>
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NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished

(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

N267RH

Nationality and Registration Mark

9-10-12

Date

Installed Equipment.

Installed Paravion Technology C182-100 Infrared Camera provisions IAW STC SA00294DE.

Ref Paravion Engineering Report ER-C182ELP-2 Rev N/C.

-Installed a Paravion Technology Augmented Reality System (ARS) IAW Paravion Installation Drawings ARS 303 & 213. The ARS is powered from the Avionics Buss and is protected using a 15 AMP Klixon C/B switch P/N 7270-1-15 labeled "ARS". The ARS is interfaced to FLIR Camera system IAW the above mentioned Paravion Installation Dwgs ARS 303 & 213.

-The ARS ECU is mounted in the baggage compartment at station 130".

-The ARS is secured to the rear baggage compartment shelf using two quick disconnect controller mount rails. Ref attached Paravion Technology Inc drawing ARS 4130 sheet 3 for fabrication of controller rails. Attached the controller mount rails to two existing structures in the aircraft using 4X Screws P/N MS27019-1-10, 7 X washers P/N NAS1149F0332P & 3 X nuts P/N MS21042-L3.

-Fabricated a new cover plate for the ARS. Ref Paravion Technology Dwg # ARS 4130 sheet 2. Attached fabricated cover with 8 X Screws P/N MS35206-231. Instructions for continued airworthiness for the augmented Reality System are contained in Paravion Document PR-ARS-120M. Ref 8110-3 dated 3/30/11 and Paravion report ARS-4004-901 for structural mounting.

-Mounted the Inertial Navigation Unit (IMU) on top of the fabricated cover plate and secured with 4 X IR-620 spacers, 4 X MS35207-265 screws & 4 X MS21042L3 nuts. The IMU is powered from the above ARS ECU and is protected using a 2 amp internal fuse to the ARS ECU.

-Mounted the INS RS232 control box to the fabricated cover plate using a plate with is attached to the above mentioned cover plate using 4 X MS35206-226 screws. Ref Paravion Technology Dwg 4130 Sheet 4 item -12 for full fabrication details. Attached the INS RS232 control box to the above mentioned plate using 4 X MS35206-226 screws.

-Mounted The GMS Downlink Control ECU to the above mentioned cover plate using 6 X MS35206-226 screws. Installed the GMS Down link IAW manufacturers Dwgs 100-W0062X1. System is protected using a Klixon C/B switch P/N 7270-1-10 and is labeled "Down Link". Mounted two antennas on the bottom of the aircraft. Mounted the first antenna at station 145.0" on the bottom of the aircraft to the R/H side of the aircraft center line. Fabricated a doubler from 6061 T6 aluminium 4" X 5". Attached the antenna to the aircraft using 4 X P/N MS51987-48 screws, 4 X P/N AN960C8 washers & 4 X P/N MS21042-L08 nuts. Mounted the second antenna to the bottom of the aircraft at station 125.0" to the L/H side of the center line. Fabricated a doubler from 6061 T6 aluminium 4" X 5". Attached the antenna to the aircraft using 4 X P/N MS51987-48 screws, 4 X AN960C8 P/N washers & 4 X P/N P/N MS21042-L08 screws. Mounted the control head to the center console using 4 X P/N MS35206-215 screws, 4 X MS21042L04 nuts & 4 X AN960JD3 Washers.

-Installed 2 X Video Accessory Corporation Video Distribution Amplifiers P/N 11-524-104 Ref Paravion Technology Inc Dwg # C182 ARS-1000 item -14 for fabrication details of the supporting bracket. Attached the Video Distribution Amplifiers support brackets to the shelf using 2 X MS27039-0807 screws, 2 X MS21042-L08 nuts & 4 X NAS1149FN832P washers. Attached the distribution Amplifiers to the brackets using 4 X MS24693S27 screws. Power is supplied from the avionics buss and the amplifiers are protected using a 1 Amp Klixon C/B P/N 7277-2-1 C/B Labeled "Video Dstrb".

☒ Additional Sheets Are Attached

NOTICE

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8. Description of Work Accomplished

(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

N267RH

9-10-17

Nationality and Registration Mark

Date

Installed 2 X Video Accessory Corporation Video switches P/N 17-511-112. Power is supplied from the avionics buss and is protected using a 1 Amp Klaxon C/B P/N 727721-1. Controlling the 2 X Video switches by installing 2 X Rotary switches one labeled "Downlink Video & ARS or FLIR". The second switch is labeled "MFD Video & PRI or SEC" They are collectively labeled "Video switching". These switches are located in the upper center overhead panel. Fabricated a switch panel is secured to the overhead interior panel using 4 X 632 clip nuts & 4 X MS35206-228 screws. Located the FLIR control switch, Laser Interlock control switch & the FLIR Anti Ice switch to the above mentioned overhead panel.

The monitor is mounted to the instrument panel on the R/H side using 3X MS24693-363 screws. Attached 3X MS21049-L3 nut plates to the instrument panel using 6 X MS21426-3-4 counter sunk rivets. The primary display is provided power from the avionics buss and is protected using a 3 Amp C/B P/N 7277-2-3. And is label "Monitor Power".

Fabricated a center console and installed in the aircraft. Ref Paravion Technology drawing FBI Console for details and ref attached conformity reports for material used. Ref Paravion Technology Drawing ARS182-1000 sheet 3 for fabrication details of the attaching brackets for the above mentioned console. Attached the brackets to the floor using MS20426AD3-3.5 Rivets X 24.

Installed 2 X Aux Foot switches on the floor at station location 20.00". Fabricated foot switch holder form the same material as mentioned above for the center console and installed a 2 X switches P/N M8805/55-001 X 2. Attached the Foot switch housing Using 2 x MS35206-228 screws and 2 X AN960JD6L washers. to the floor using 3 X Nut plates P/ N MS21075L06 & 1 X MS21069L06 nut plate. Attached the nut plates to the floor using 8 X MS20426AD3-3.5 Rivets.

Installed two USB connectors on the fwd slopping face which is integrated to the ARS unit.

Mounted an existing Motorola radio on the above mentioned center console on the aft end using a doubler fabricated from 6061 T6 aluminum 2" X 4" .063". Used 1 X AN3-3A bolt and 1 X NAS1149F0332P washers to attach to the console.

Wire gauge selection was done in accordance with AC43-13-1B Chapter 11, Aircraft Electrical System, section 5 (wiring rating) paragraphs 11-66, 11-67 section 6 (Aircraft Electrical Wire section) paragraphs 11-76, 11-77.

An electrical load does not exceed limitations of AC43-13-1b Chapter 11, paragraphs 424 (Electrical load limits), 425 (generator) and 428 (determination of electrical load).

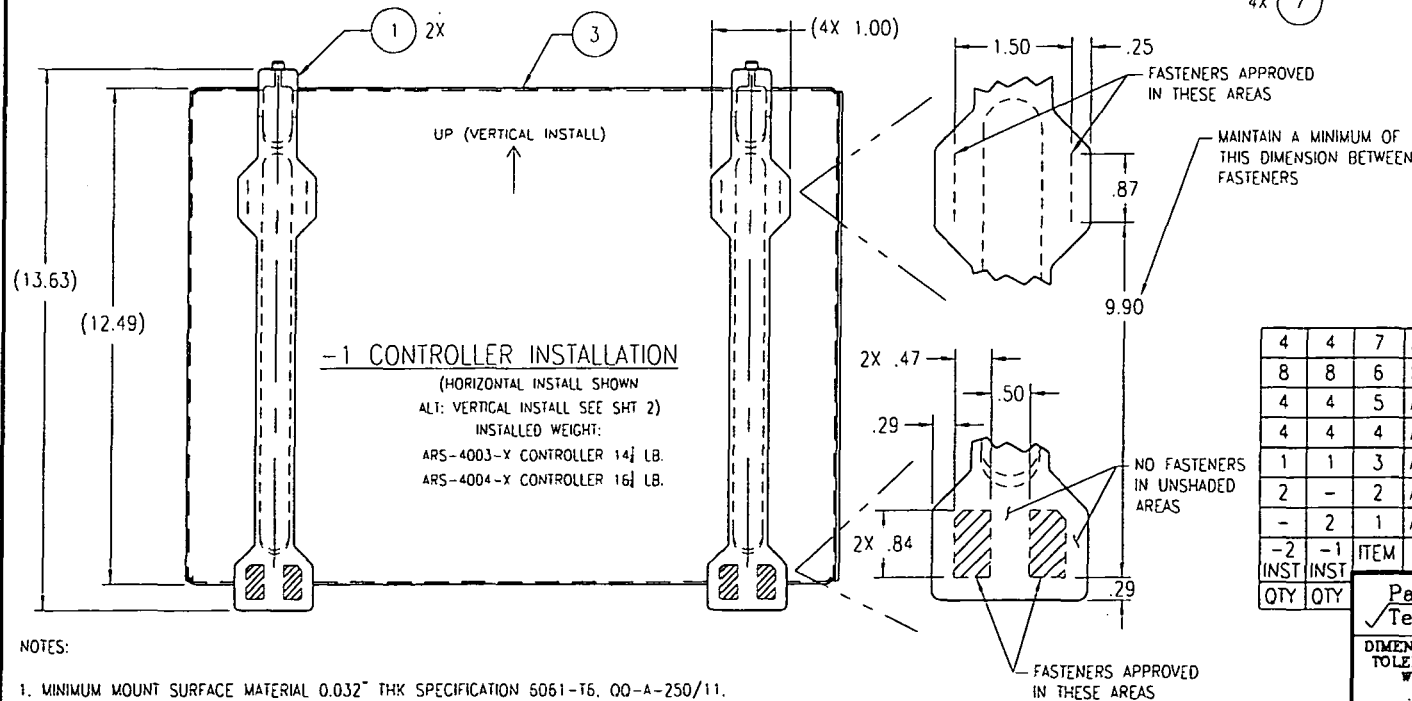
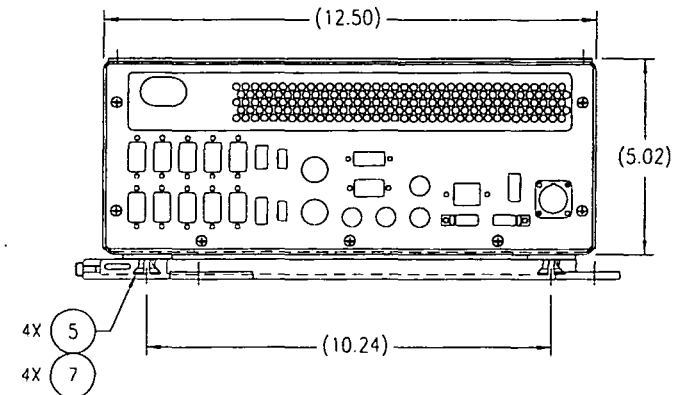
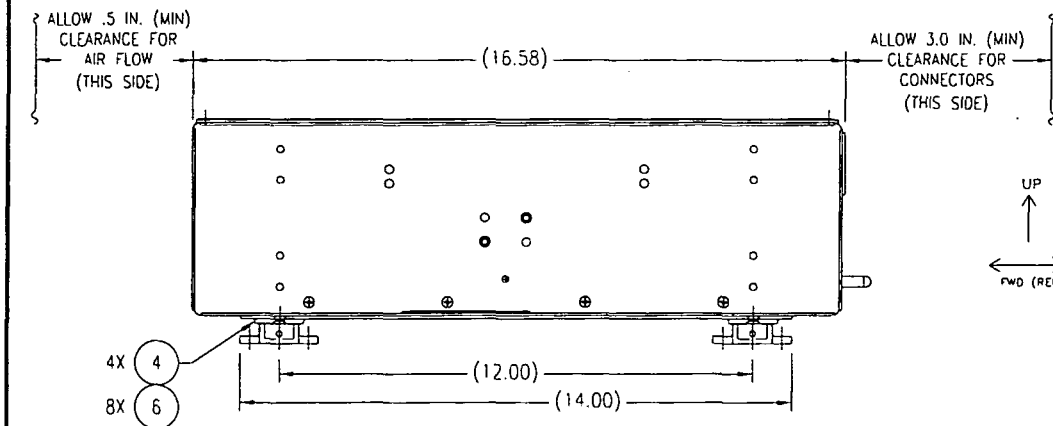
The Instructions for Continued Airworthiness (ICA) contained in the Flight Standards Handbook Bulletin for Airworthiness (HBAW-8900.1) are not applicable as these components are not field repairable and are "Remove and Replace" items only.

Aircraft weight & balance and equipment list amended as required.

----- Nothing follows -----

☒ Additional Sheets Are Attached

SHEET	REV	DATE	DESCRIPTION	BY	APR	CHK
1,2	A	5/24/11	REVISED -1 INSTALL: ADDED -2 INSTALL	TN	REB	LS
1,2	B	7/28/2011	ADDED WEIGHTS, -1/ -2 INSTN: ARS4003/4004	REB	REB	LS



-1 CONTROLLER INSTALLATION

(HORIZONTAL INSTALL SHOWN)
 ALT: VERTICAL INSTALL SEE SHT 2)
 INSTALLED WEIGHT:
 ARS-4003-X CONTROLLER 14 LB.
 ARS-4004-X CONTROLLER 16 LB.

NOTES:

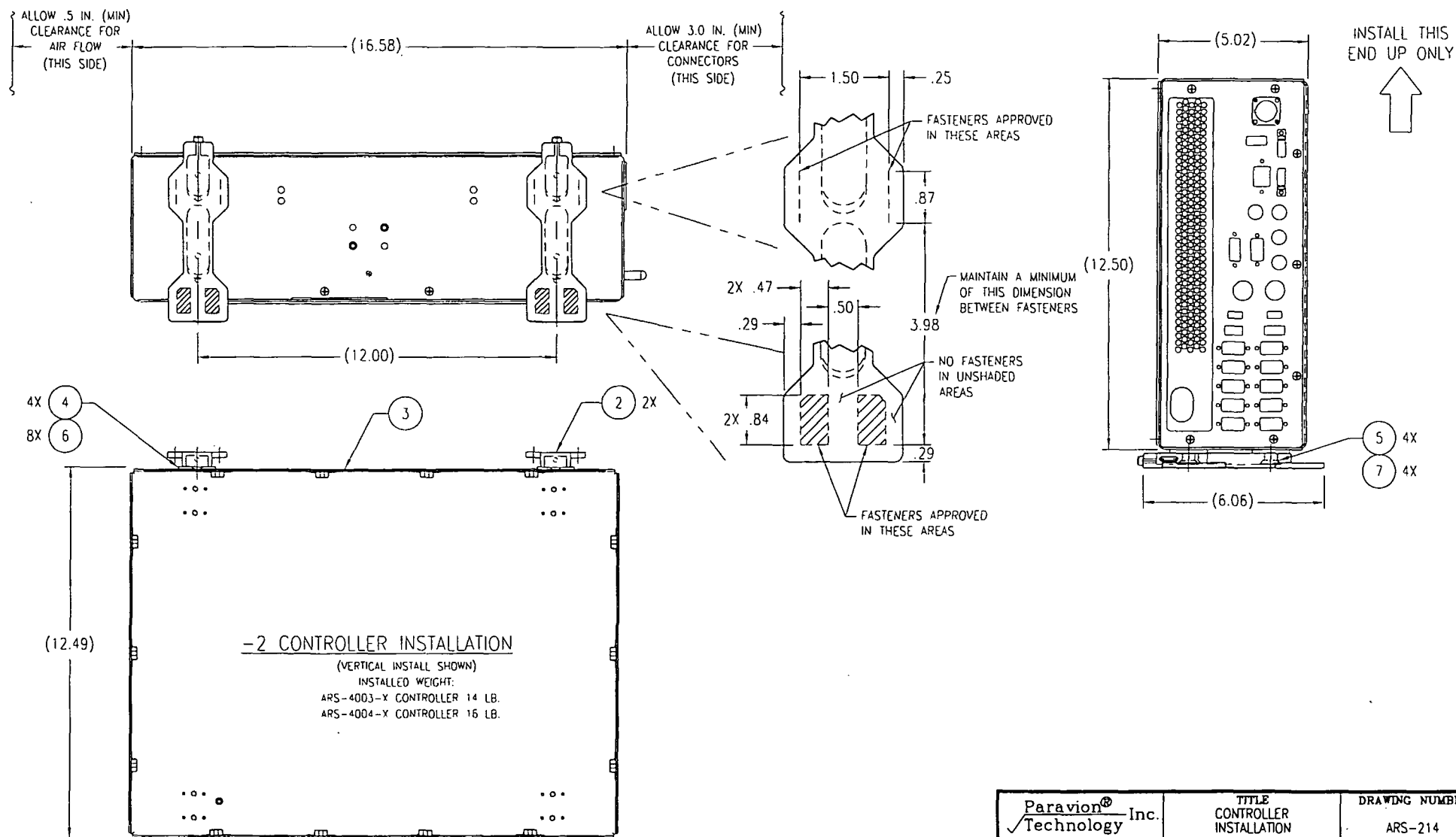
1. MINIMUM MOUNT SURFACE MATERIAL 0.032" THK SPECIFICATION 5061-T6, 00-A-250/11. MOUNTING SURFACE RATING MUST BE GREATER THAN 61 LBS. PER SQ. FT.
2. USE A MINIMUM OF (4) #8 MS35206 OR EQUIVALENT STRENGTH FASTENERS OF APPROPRIATE LENGTH PER RAIL (ARS-4130-X) IN THE LARGEST RECTANGULAR PATTERN POSSIBLE.

4	4	7	MS24693-69	SCREW
8	8	6	MS24693-50	SCREW
4	4	5	ARS-4130-14	FOOT
4	4	4	ARS-4130-13	PLATE
1	1	3	ARS-400(X)-(X)	CONTROLLER ASSEMBLY (REF.)
2	-	2	ARS-4130-2	CONTROLLER MOUNT ASSEMBLY
-	2	1	ARS-4130-1	CONTROLLER MOUNT ASSEMBLY
QTY	INST	QTY	ITEM	DESCRIPTION

Paravion® Inc.		TITLE CONTROLLER INSTALLATION		DRAWING NUMBER ARS-214	
DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED: .X = ±.1 .XX = ±.05 .XXX = ±.010 ANGLES = ± 1°	DRAWN BY TN	CHK'D BY LS	APRVD. BY REB	DATE 5/23/11	REV B
THREADS: INTERNAL: CLASS 2B EXTERNAL: CLASS 2A	3RD ANGLE PROJECTION	DO NOT SCALE DRAWING		SHEET 1 OF 2	

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PROTO

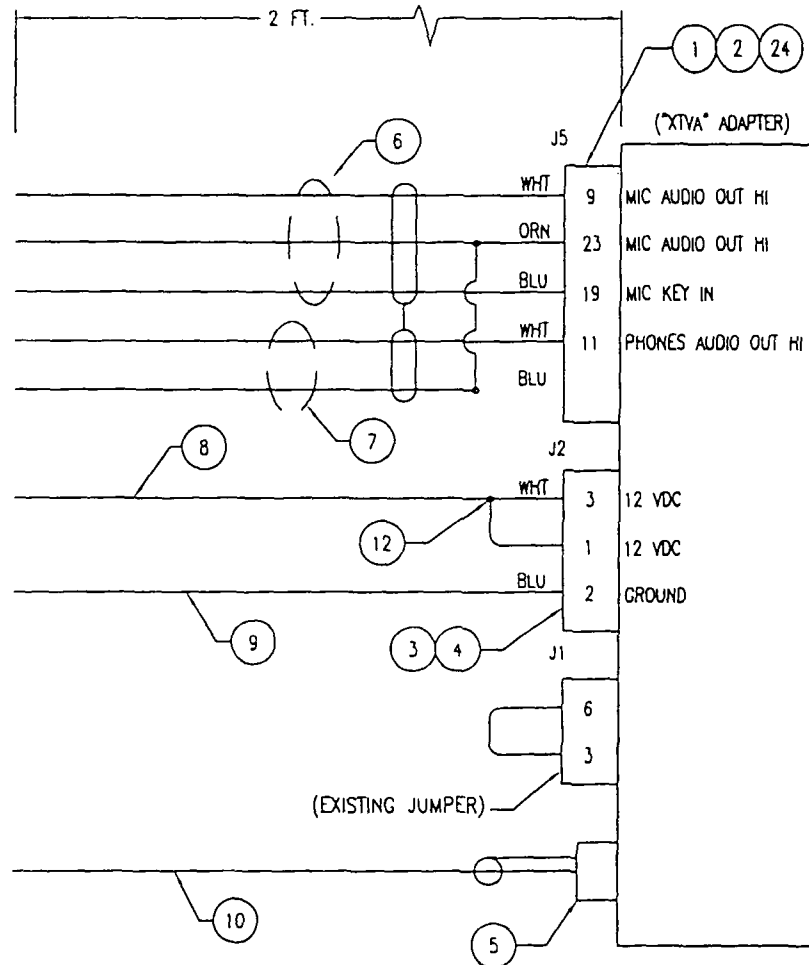


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PROTO
-

Paravion® Technology Inc.		TITLE CONTROLLER INSTALLATION				DRAWING NUMBER	
DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED: .X = ±.1 .XX = ±.05 .XXX = ±.010 ANGLES = ± 1°		DRAWN BY	CHK'D BY	APRVD. BY	DATE	REV	ECO
THREADS: INTERNAL: CLASS 2B EXTERNAL: CLASS 2A		TN	LS	REB	5/23/11	8	-
3RD ANGLE PROJECTION		DO NOT SCALE DRAWING				SHEET	
		©2009 PARAVION TECH. INC. PARAVION IS A TRADEMARK OF PARAVION TECHNOLOGY INC.				2 OF 2	

SHEET	REV	DATE	DESCRIPTION	BY	APR	CHK
1,2	A	05/11/2012	REMOVE NANO FLASH, REVISE USB CONFIGURATION	REB	REB	LS



WIRE LABEL LEGEND	
ITEM	WIRE LABEL
7	AEX027B22
8	AEX0032PWR16
9	AEX0032GND16
6	AEX025B22
10	AEX026B22

NOTE:

1. LABEL WIRES AS INDICATED.

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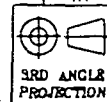
PROTO

ITEM	QTY	PART NUMBER	DESCRIPTION
38"	26	22TG1T14	WIRE
10ft.	25	M22759/16-20	WIRE, AWG 20
2	24	5205980-1	FASTENER KIT
1	23	190712	MALE BNC CONNECTOR
15"	22	V73263	CABLE
1	21	110249	90' BNC CONNECTOR
4	20	M39029/63-368	CONTACT
1	19	205203-8	D-SUB CONNECTOR 9-PIN
1	18	ES50264-2F	CONNECTOR
1	17	P1011-036	FEMALE USB CABLE
1	16	17-200161 (REF.)	FEMALE BAYONET USB
1	15	PAN-AM-AS-BK	CONNECTOR
38"	14	USB2422	USB WIRE
1	13	206039-1	PLUG
1	12	M83519/1-2	SOLDER SLEEVE
1	11	206070-1	CLAMP
24"	10	RG-400	CABLE, COAX 50 OHM
24"	9	M22759/16-16-9	WIRE, AWG 16
24"	8	M22759/16-16-9	WIRE, AWG 16
24"	7	M27500-22TG2T14	WIRE
62"	6	M27500-22TG3T14	WIRE
1	5	81-115N-1000	CONNECTOR
3	4	45750-1212	CONTACT
1	3	39-01-2040	MOLEX PLUG
32	2	M39029/64-369	MALE CONTACT
1	1	5205208-1	25 PIN MALE SUB-D CONNECTOR
ITEM	QTY	PART NUMBER	DESCRIPTION
		Paravion® Inc.	TITLE C182 CONSOLE WIRING SCHEMATIC
			DRAWING NUMBER C182IRC-3000
		DRAWN BY TN	CHK'D BY BY
		APRVD. BY BY	DATE 8/16/2011
		REV A	ECO -
		DO NOT SCALE DRAWING	SHEET 1 OF 2
		© 2009 PARAVION TECH. INC. PARAVION IS A TRADEMARK OF PARAVION TECHNOLOGY INC.	

DIMENSIONS IN INCHES
TOLERANCES EXCEPT
WHERE NOTED:

.X = ±.1
.XX = ±.06
.XXX = ±.010
ANGLES = ± 1°

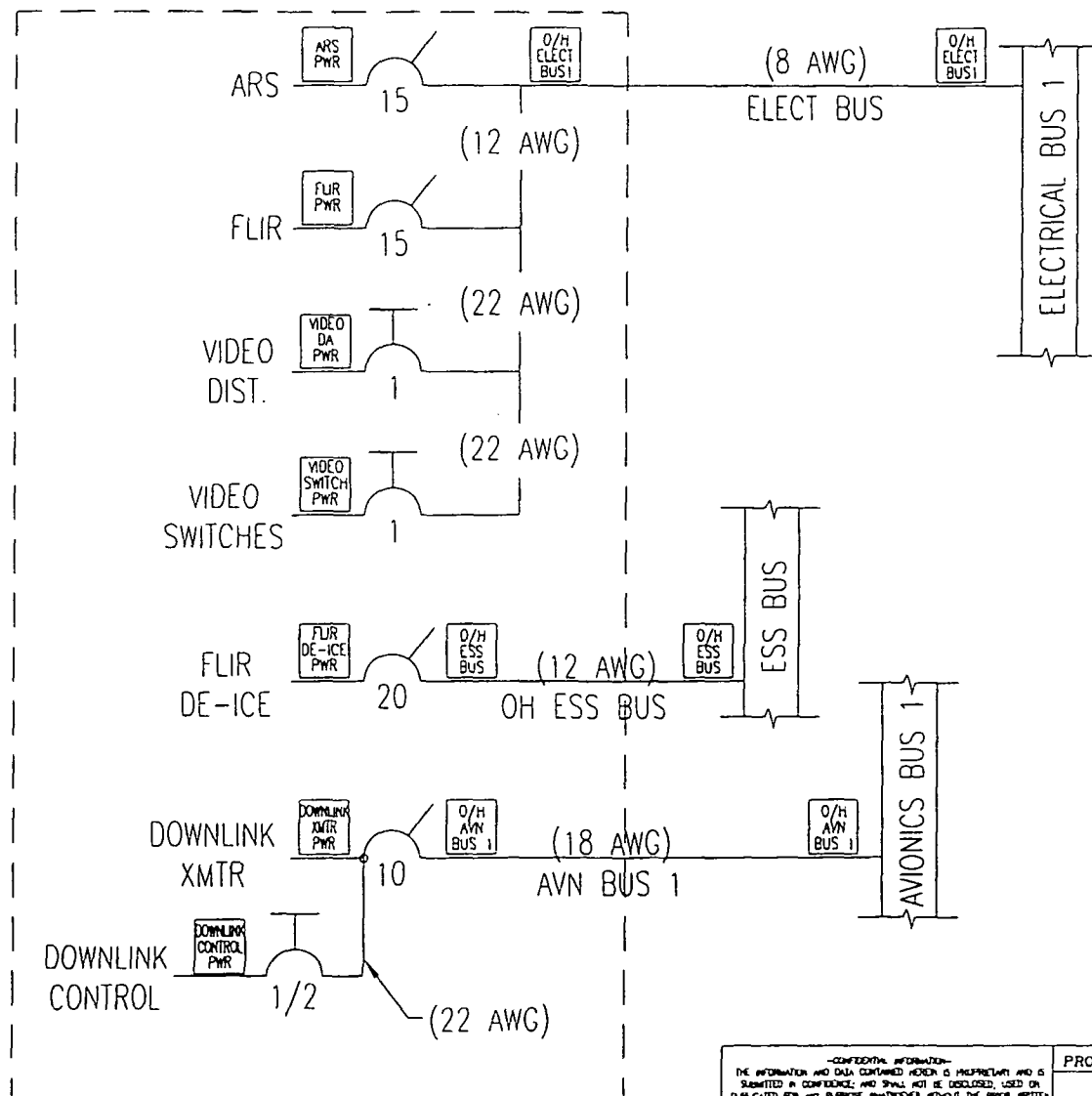
THREADS:
INTERNAL: CLASS 2B
EXTERNAL: CLASS 2A



3RD ANGLE
PROJECTION

SHEET	REV	DATE	DESCRIPTION	BY	APR	CHK
3,10,11	A	04/26/2012	REMOVED NANOFASH, ADDED USB3. ADDED "VIDEO" TO SWITCH LABELS	REB		

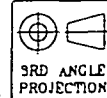
OVERHEAD BRAKER PANEL



Paravion® Inc.		TITLE POWER BUS FBI C182 HAWK OWL PROJECT		DRAWING NUMBER MASTER ELECTRICAL	
DRAWN BY	CHK'D BY	APRVD. BY	DATE	REV	ECO
IN			4/13/2012	A	-
DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED: .X = ±.1 .XX = ±.05 .XXX = ±.010 ANGLES = ± 1°			DO NOT SCALE DRAWING		
THREADS: INTERNAL: CLASS 2B EXTERNAL: CLASS 2A			SHEET 1 OF 16		

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PROTO
-

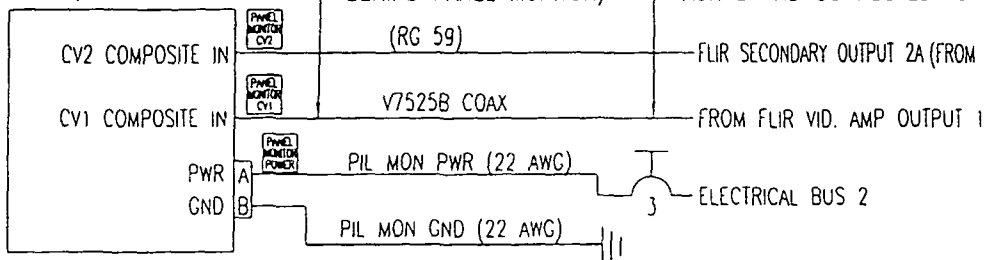


3RD ANGLE
PROJECTION

PANEL MONITOR
P/N: AB-08

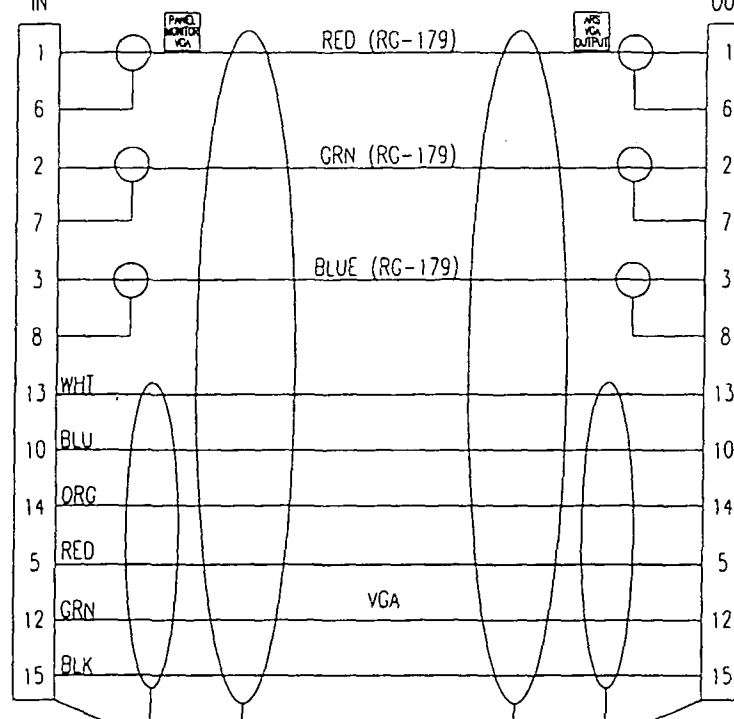
(EXISTING COAX STOWED
BEHIND PANEL MONITOR)

(EXISTING COAX REMOVED FROM AFT VIDEO PANEL
AUX 2 AND CONNECTED TO FLIR VID AMP OUTPUT 1)



MONITOR VGA
IN

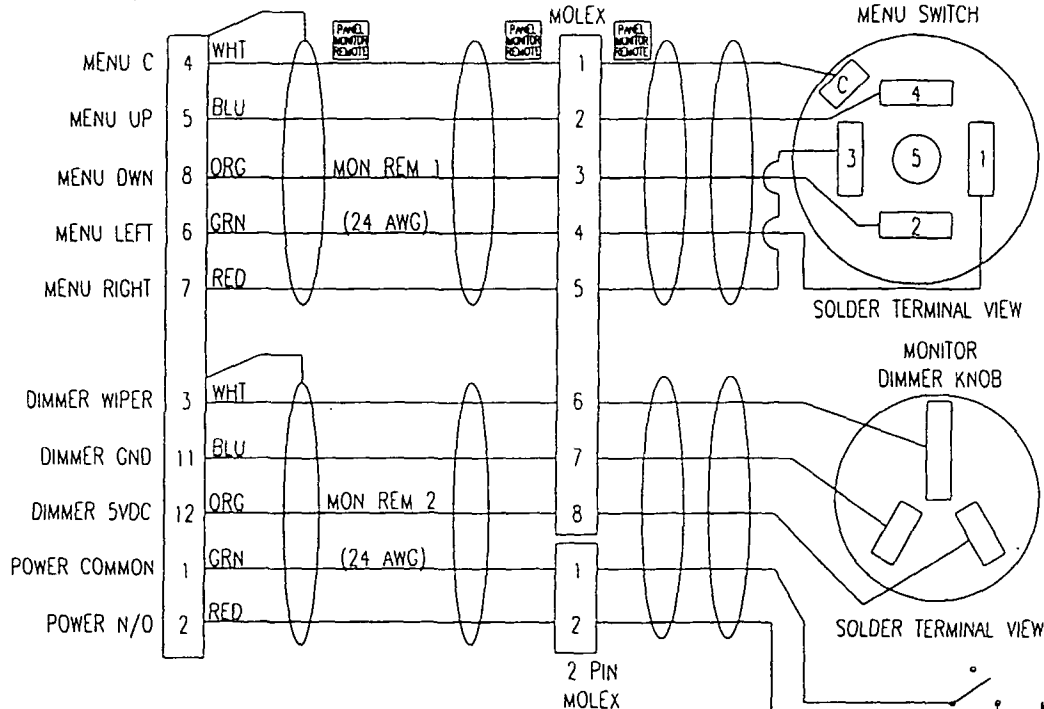
ARS VGA
OUT



MONITOR
REMOTE CONTROL

9 PIN
MOLEX

MONITOR
MENU SWITCH



SOLDER TERMINAL VIEW

MONITOR
DIMMER KNOB

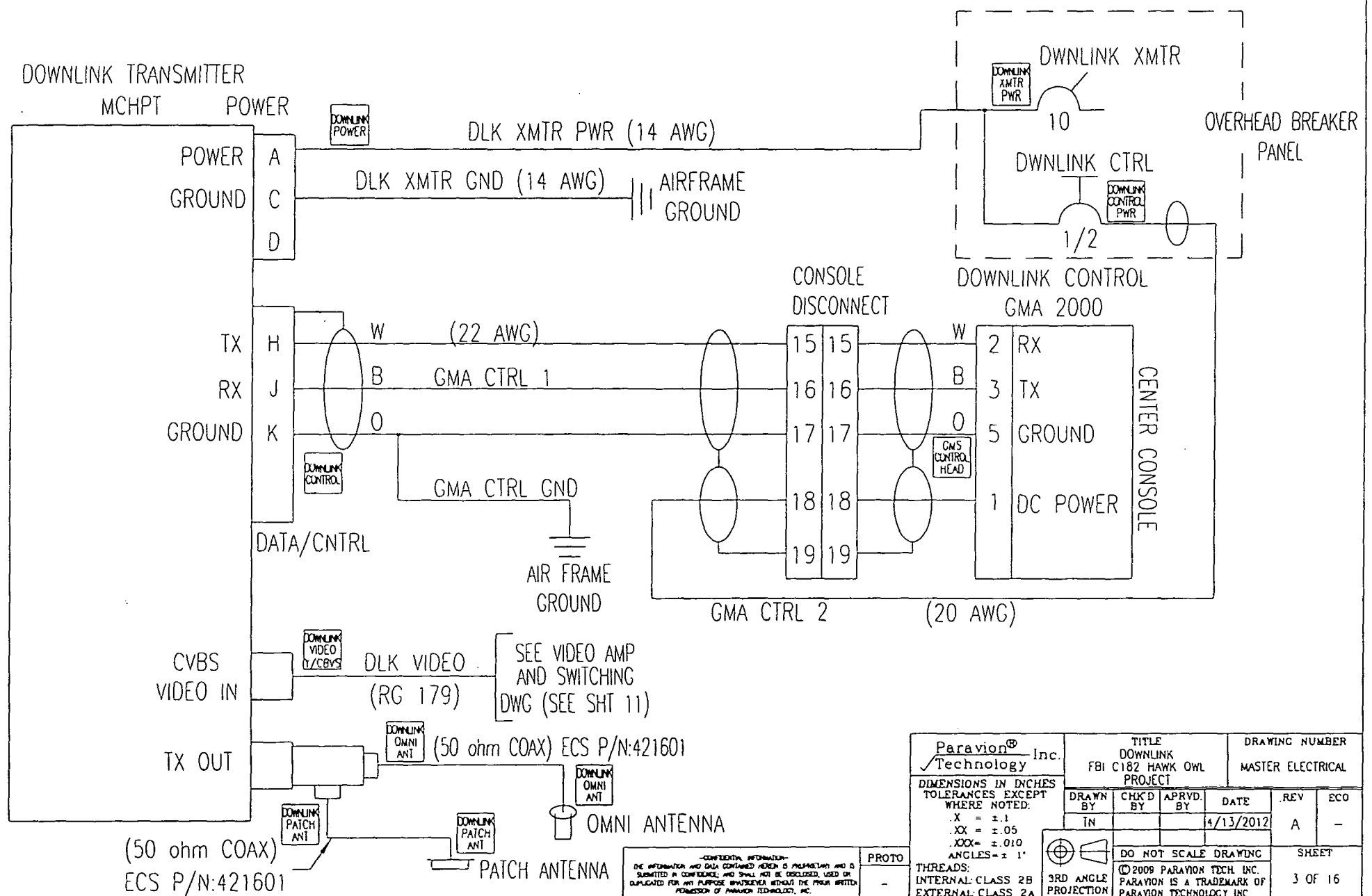
SOLDER TERMINAL VIEW

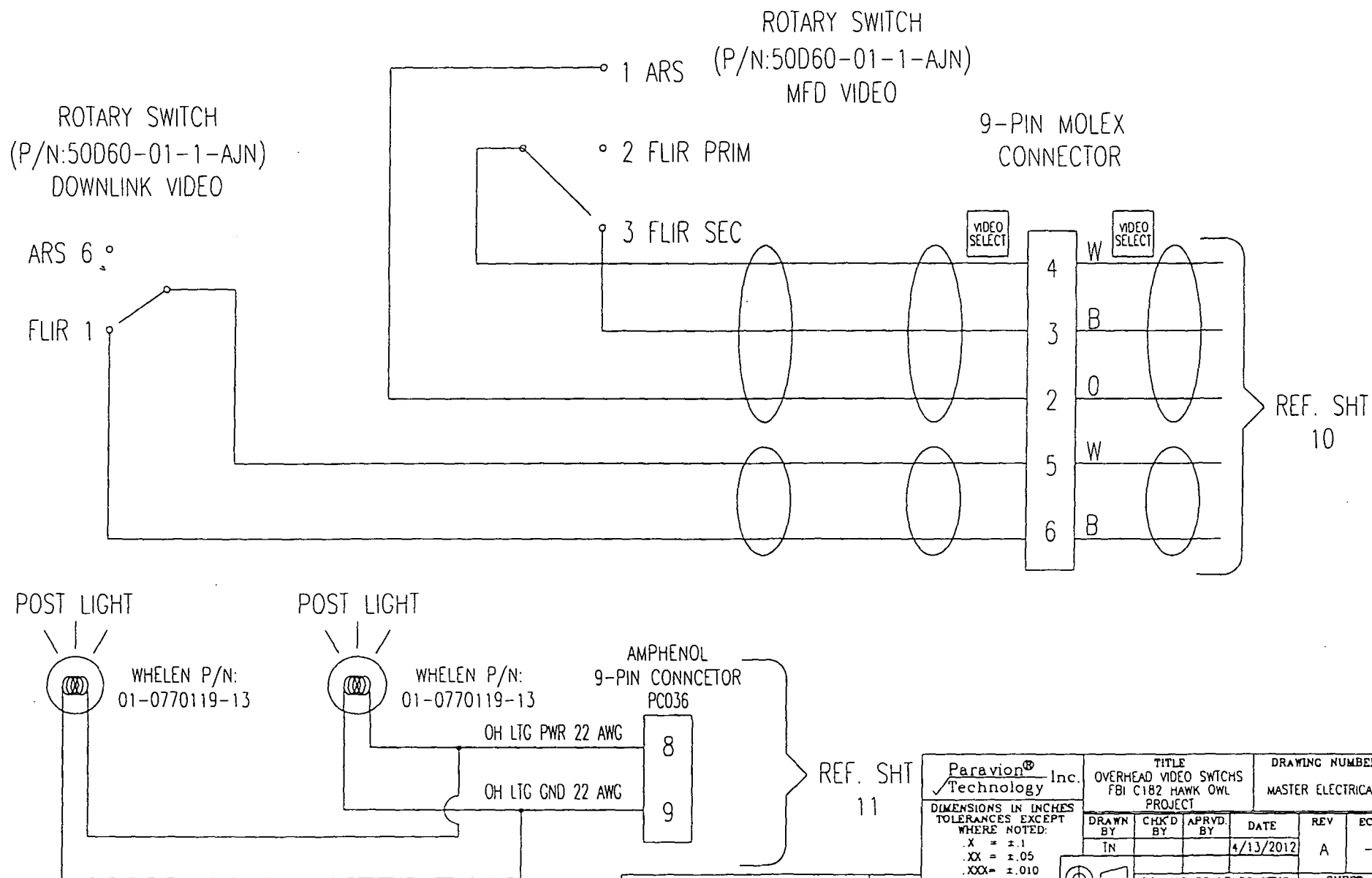
MONITOR
POWER SWITCH

Paravion® Inc.		TITLE OPERATOR MONITOR FBI C182 HAWK OWL PROJECT		DRAWING NUMBER MASTER ELECTRICAL	
DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED:	DRAWN BY TN	CHK'D BY	APRVD. BY	DATE 4/13/2012	REV A
.X = ±.1 .XX = ±.05 .XXX = ±.010 ANGLES = ± 1°	DO NOT SCALE DRAWING			SHEET 2 OF 16	
THREADS: INTERNAL: CLASS 2B EXTERNAL: CLASS 2A	3RD ANGLE PROJECTION			© 2008 PARAVION TECH INC. PARAVION IS A TRADEMARK OF PARAVION TECHNOLOGY INC.	

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PROTO
-



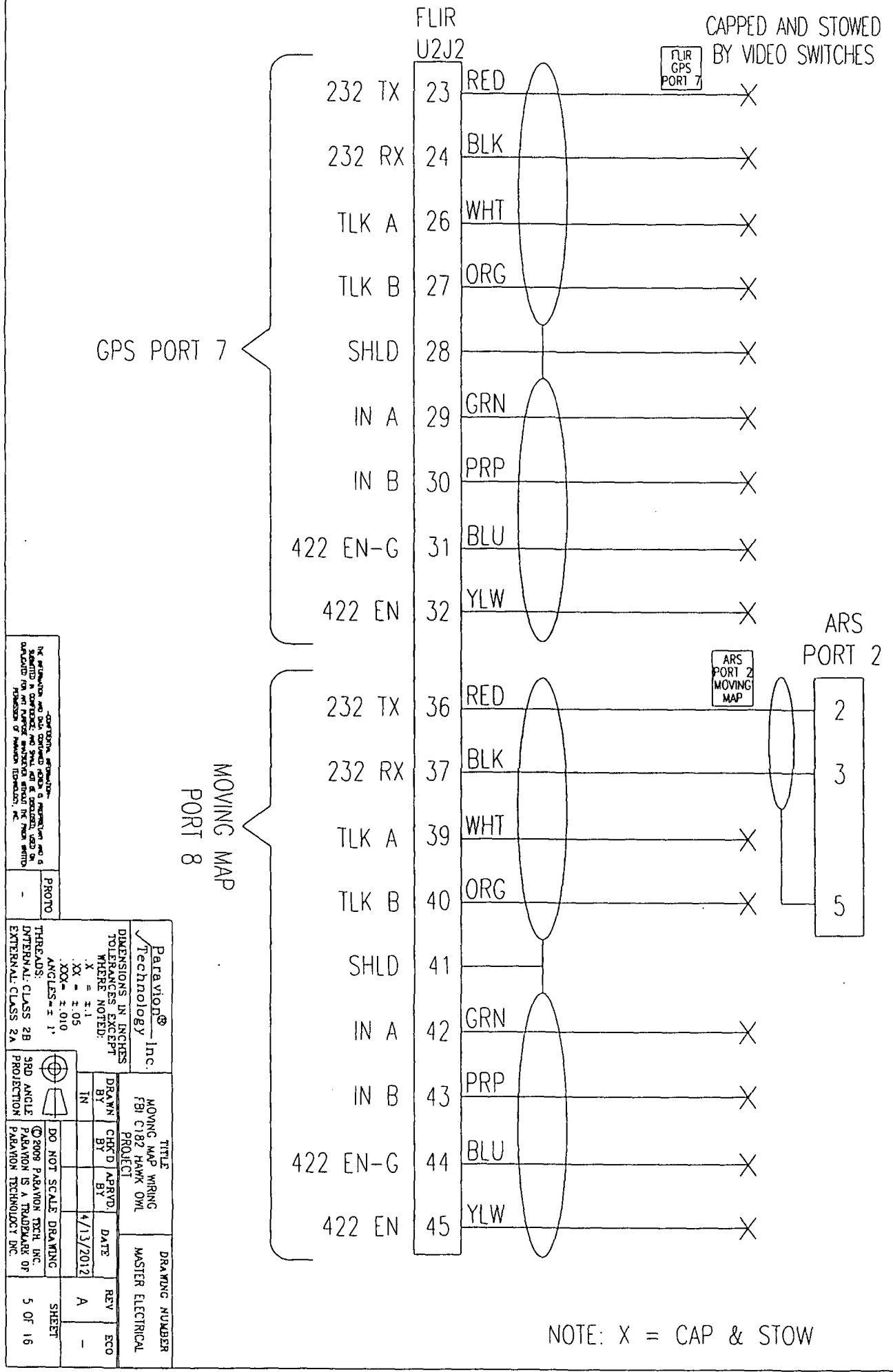


NOTE: ALL WIRES 22 AWG

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PROTO

Paravion® Technology Inc.		TITLE OVERHEAD VIDEO SWITCHES FBI C182 HAWK OWL PROJECT				DRAWING NUMBER MASTER ELECTRICAL	
DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED:		DRAWN BY	CHK'D BY	APRVD. BY	DATE	REV	ECO
.X = ±.1		TN			4/13/2012	A	-
.XX = ±.05							
.XXX = ±.010							
ANGLES = ± 1°							
THREADS: INTERNAL: CLASS 2B EXTERNAL: CLASS 2A		DO NOT SCALE DRAWING				SHEET	
		3RD ANGLE PROJECTION				4 OF 16	
		© 2009 PARAVION TECH. INC. PARAVION IS A TRADEMARK OF PARAVION TECHNOLOGY INC.					

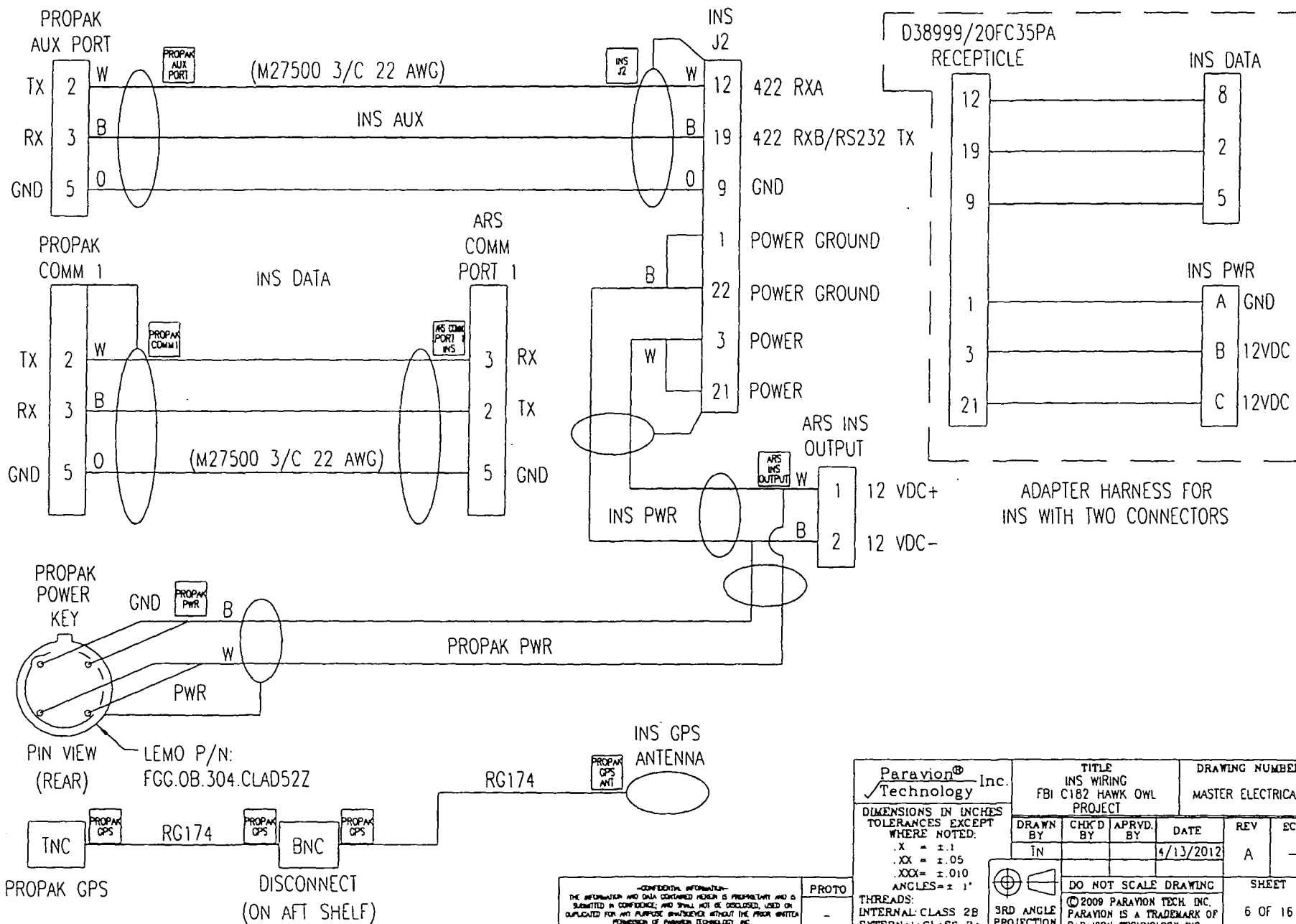


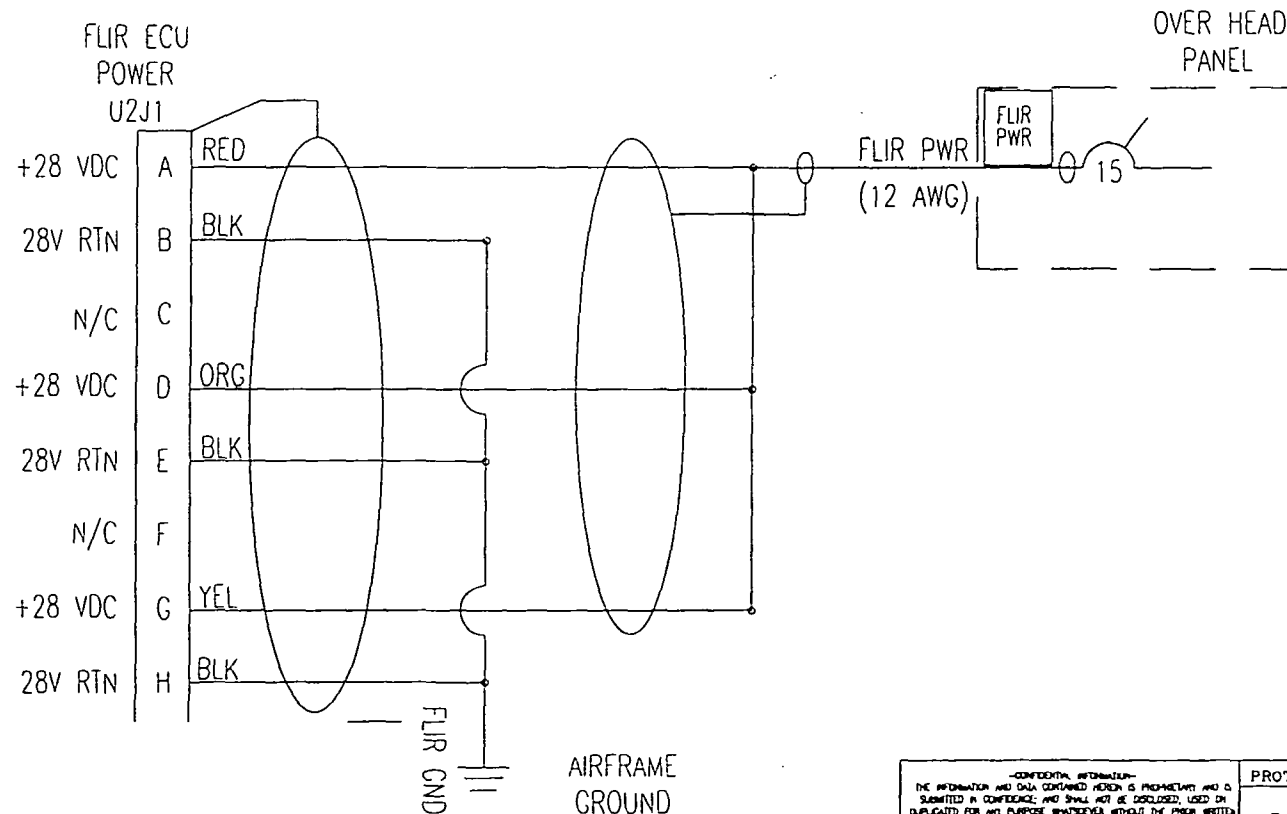
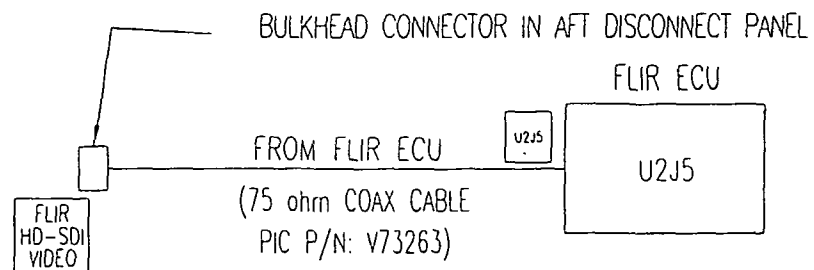
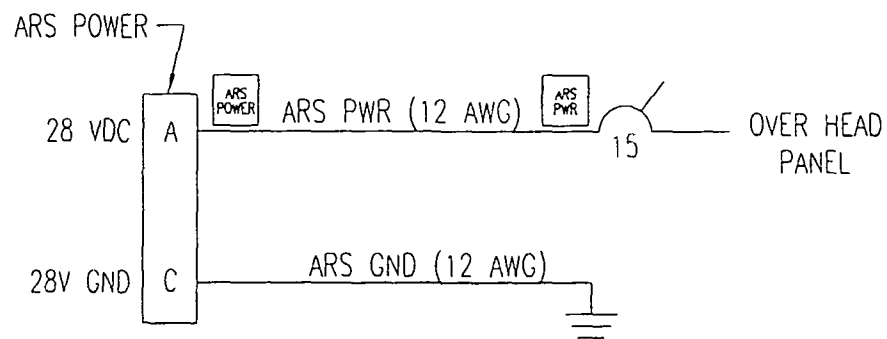
TITLE MOVING MAP WIRING FBI C182 HAWK OML		DRAWING NUMBER MASTER ELECTRICAL	
PROJECT DRAWN BY: [] CHECKED BY: [] DATE: 4/13/2012		REV ECO A -	
DO NOT SCALE DRAWING PARAYON IS A TRADEMARK OF PARAYON TECHNOLOGY INC.		SHEET 5 OF 16	

PARAYON® Inc.
 DIMENSIONS IN INCHES
 TOLERANCES EXCEPT
 WHERE NOTED:
 .XX = ±.05
 .XXX = ±.010
 ANGLES = ± 1°
 THREADS:
 INTERNAL CLASS 2B
 EXTERNAL CLASS 2A

3RD ANGLE
 PROJECTION

PROTO
 -CONTINUED, REVERSE-
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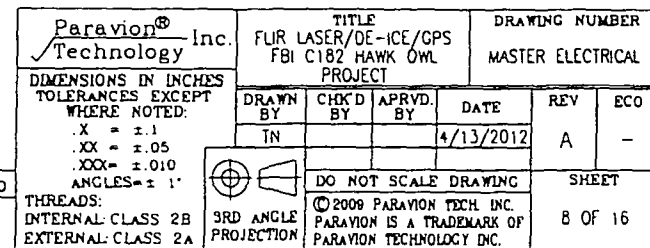




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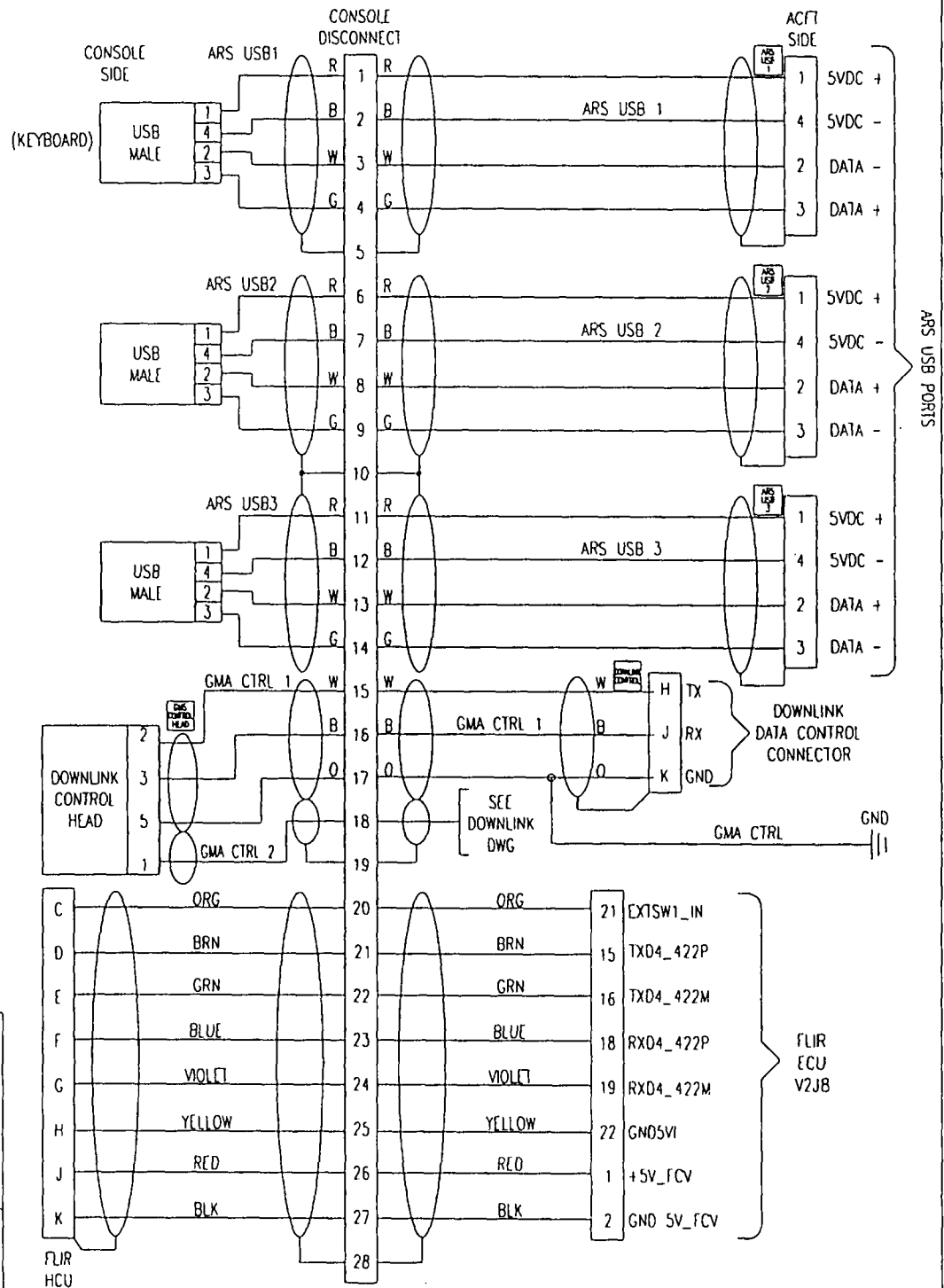
PROTO
-

Paravion® Technology Inc.		TITLE POWERS FBI C182 HAWK OWL PROJECT		DRAWING NUMBER MASTER ELECTRICAL	
DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED: .X = ±.1 .XX = ±.05 .XXX = ±.010 ANGLES = ± 1°		DRAWN BY TN	CHK'D BY	APRVD. BY	DATE 4/13/2012
THREADS: INTERNAL: CLASS 2B EXTERNAL: CLASS 2A		DO NOT SCALE DRAWING		SHEET 7 OF 16	
3RD ANGLE PROJECTION		©2009 PARAVION TECH. INC. PARAVION IS A TRADEMARK OF PARAVION TECHNOLOGY INC.			



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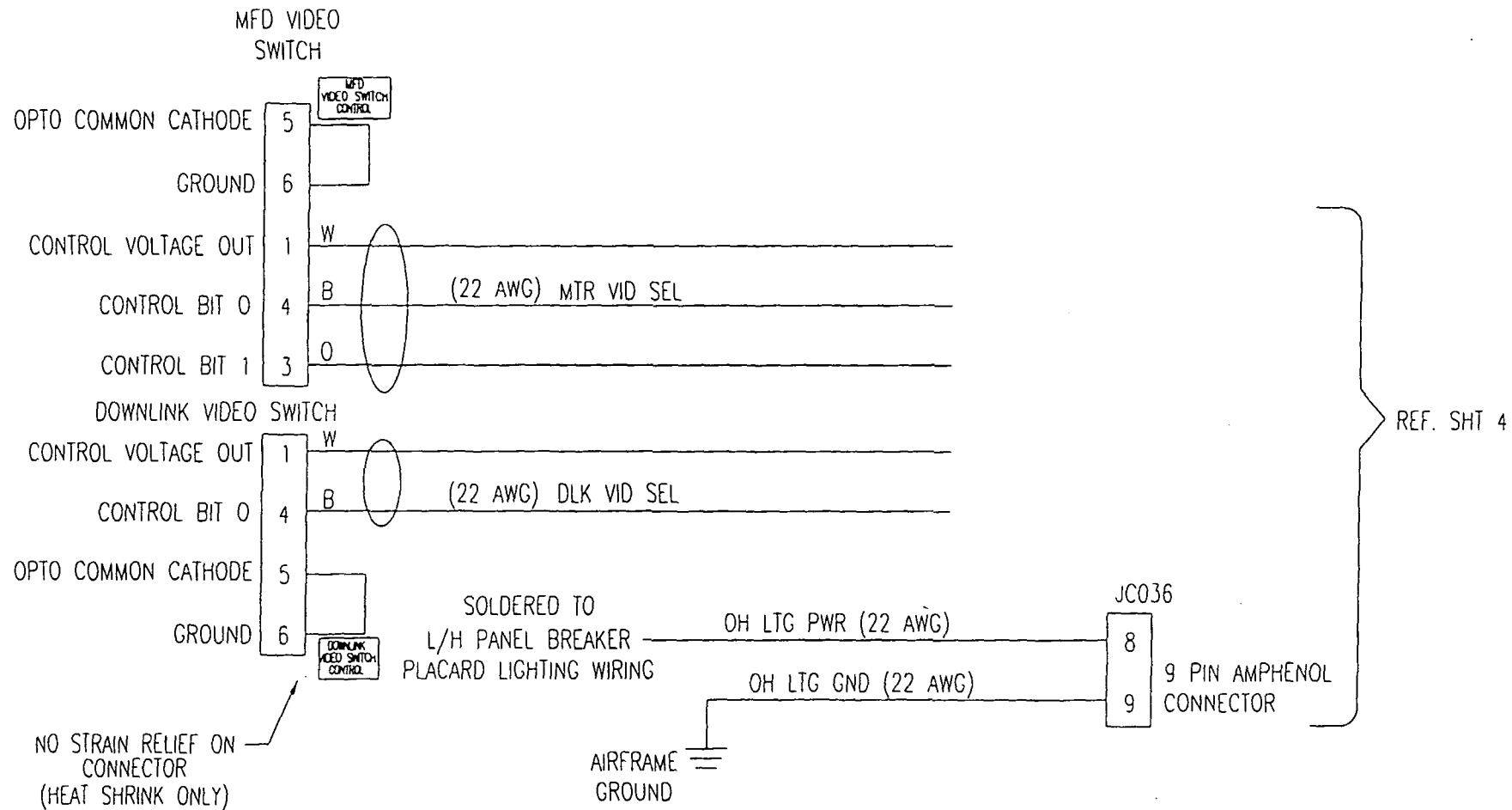
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 INVESTIGATION OF LAW ENFORCEMENT, INC.

PROTO

Paravision® Inc. Technology DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED: .XX = ±.1 .XXX = ±.010 ANGLES = ± 1° THREADS: INTERNAL: CLASS 2B EXTERNAL: CLASS 2A		TITLE OVERHEAD VIDEO SWITCH FBI C182 HAWK OWL PROJECT		DRAWING NUMBER MASTER ELECTRICAL	
DRAWN	CHK'D	APRD.	DATE	REV	ECO
BT	BT	BT	4/13/2012	A	-
DO NOT SCALE DRAWING ©2008 PARAVISION TECH. INC. PARAVISION IS A TRADEMARK OF PARAVISION TECHNOLOGY INC.			SHEET 9 OF 16		

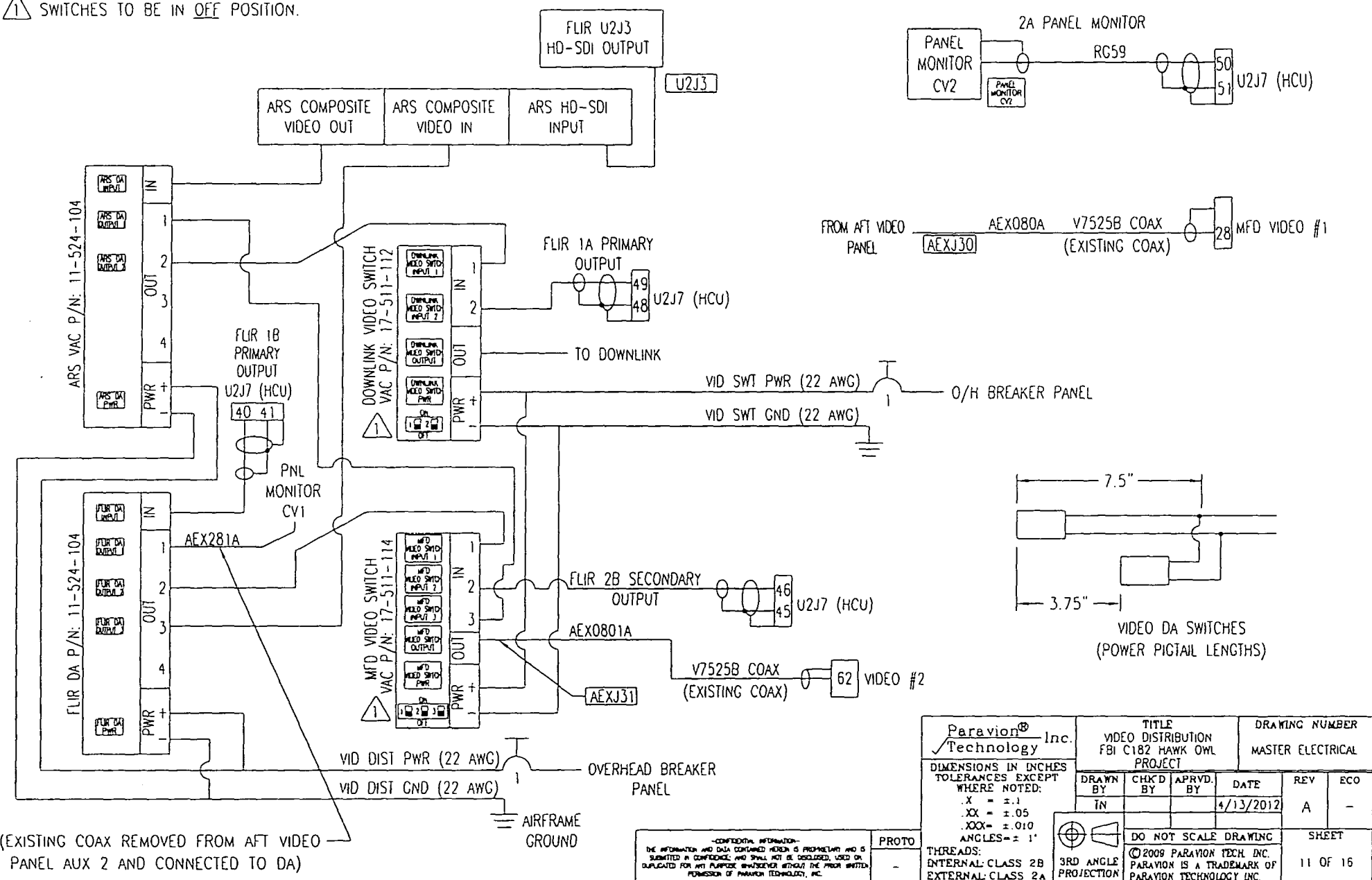


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PROTO
-

Paravion® Technology Inc.		TITLE VIDEO DISTRIBUTION FBI C182 HAWK OWL PROJECT			DRAWING NUMBER MASTER ELECTRICAL		
DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED:		DRAWN BY	CHK'D BY	APRVD. BY	DATE	REV	ECO
.X = ±.1 .XX = ±.05 .XXX = ±.010 ANGLES = ± 1°		IN			4/13/2012	A	-
THREADS: INTERNAL: CLASS 2B EXTERNAL: CLASS 2A		DO NOT SCALE DRAWING				SHEET	
3RD ANGLE PROJECTION		© 2008 PARAVION TECH. INC. PARAVION IS A TRADEMARK OF PARAVION TECHNOLOGY INC.				10 OF 16	

1 SWITCHES TO BE IN OFF POSITION.



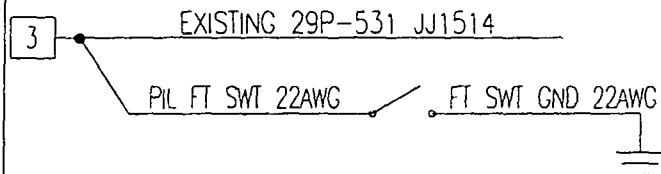
Paravion® Inc.		TITLE VIDEO DISTRIBUTION FBI C182 HAWK OWL PROJECT		DRAWING NUMBER MASTER ELECTRICAL	
DRAWN BY	CHK'D BY	APRVD. BY	DATE	REV	ECO
IN			4/13/2012	A	-
DO NOT SCALE DRAWING			SHEET		
© 2009 PARAVION TECH. INC. PARAVION IS A TRADEMARK OF PARAVION TECHNOLOGY INC.			11 OF 16		

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PROTO
-

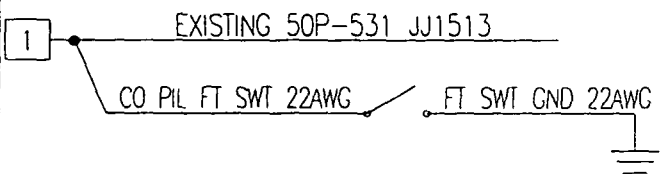
EXISTING MIC SWITCH TO YOKE

PILOT

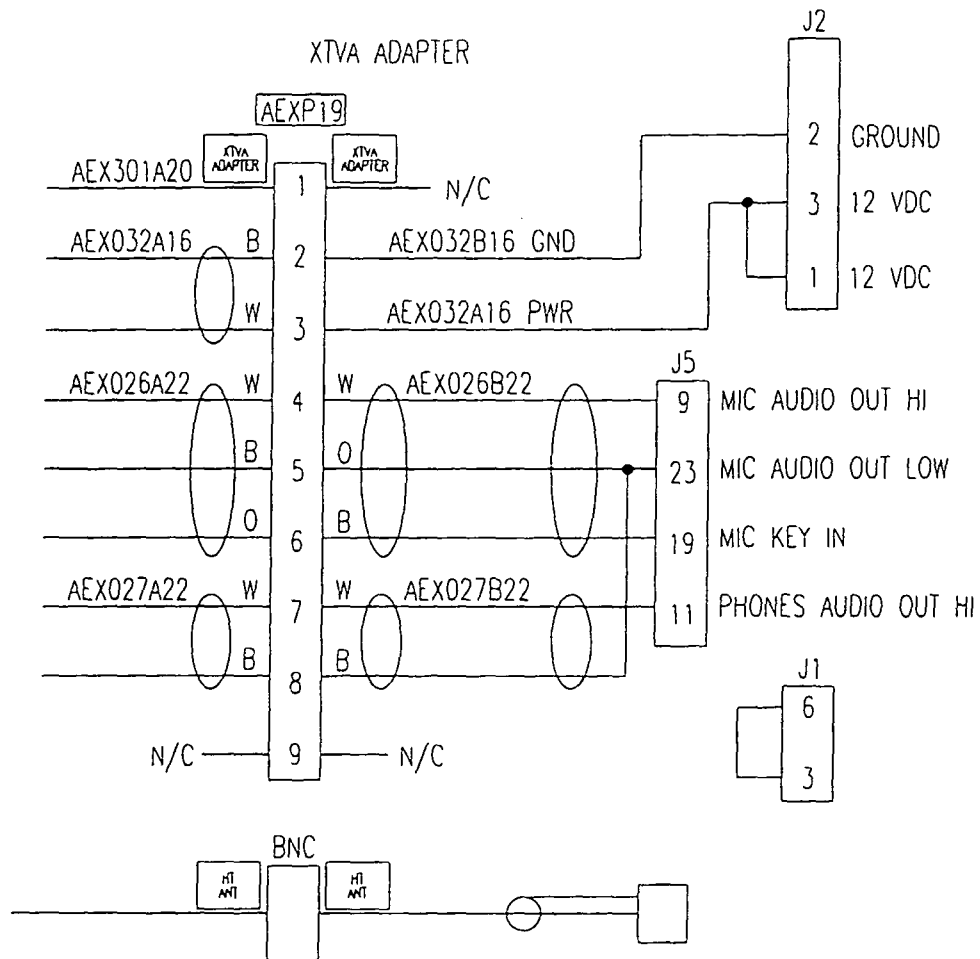


EXISTING MIC SWITCH TO YOKE

CO-PILOT



XTVA ADAPTER

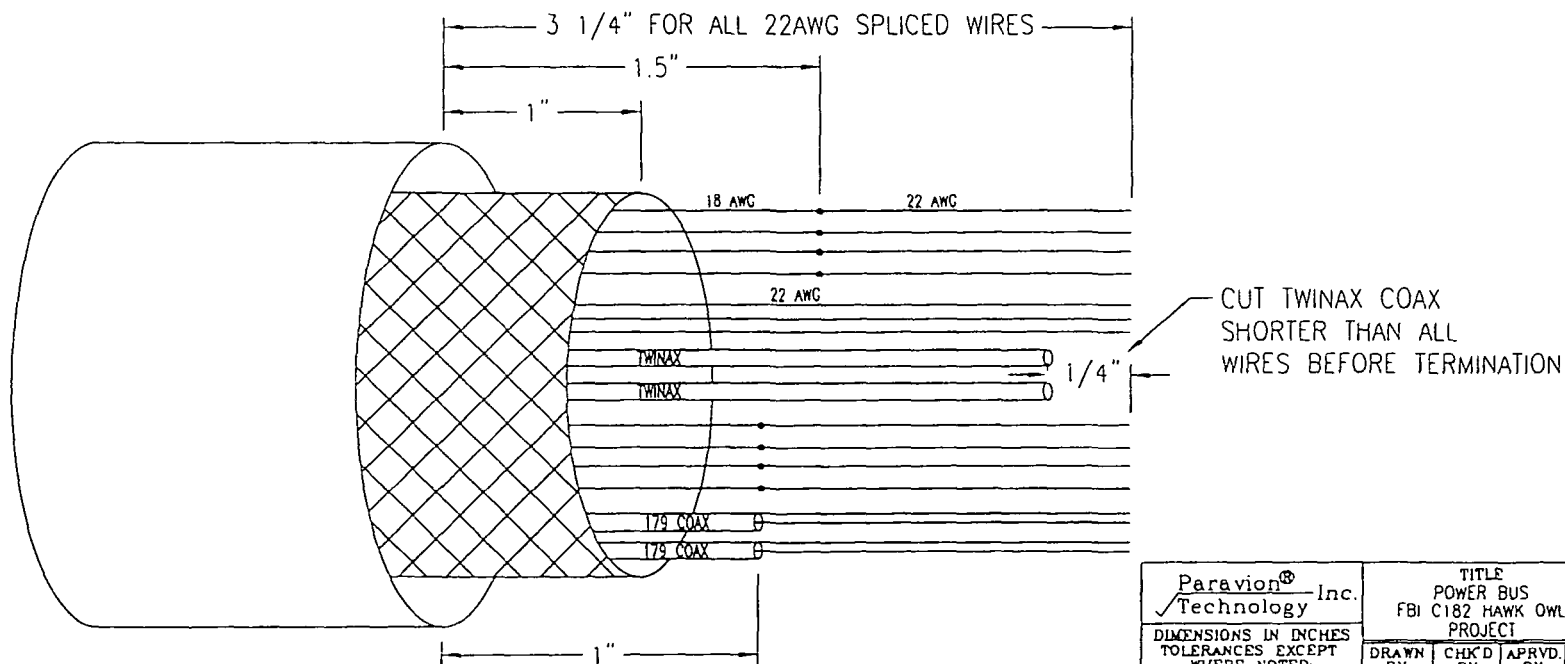
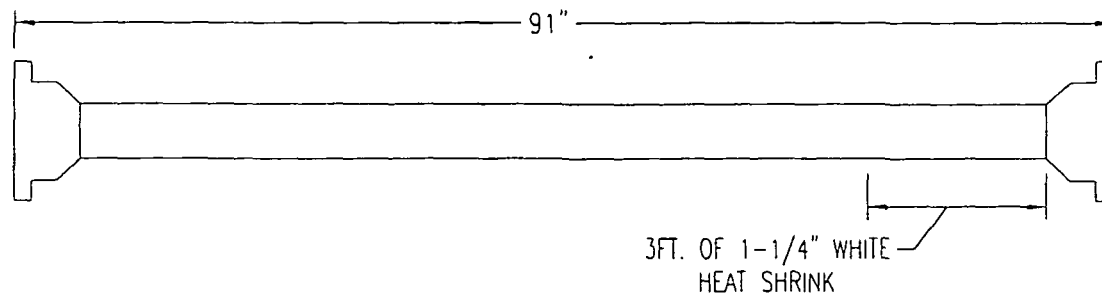


Paravion® Inc. Technology		TITLE XTVA ADAPTER/FOOT SWITCH FBI C182 HAWK OWL PROJECT		DRAWING NUMBER MASTER ELECTRICAL	
DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED: .X = ±.1 .XX = ±.05 .XXX = ±.010 ANGLES = ± 1°		DRAWN BY TN	CHK'D BY	APP'D BY	DATE 4/13/2012
THREADS: INTERNAL: CLASS 2B EXTERNAL: CLASS 2A		DO NOT SCALE DRAWING © 2009 PARAVION TECH. INC. PARAVION IS A TRADEMARK OF PARAVION TECHNOLOGY INC.		REV A	ECO -
3RD ANGLE PROJECTION		SHEET 12 OF 16			

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PROTO
 -

MAIN IMAGER FLIR GIMBAL CABLE



NOTES:

1. TWINAX SOCKET COME WITH CRIMP INSTRUCTIONS.
2. ALL OTHER SCOKETS ARE: M39029/56-348 (USE CRIMPER M22520/2-01 (BLUE CRIMPER) DIE K40).

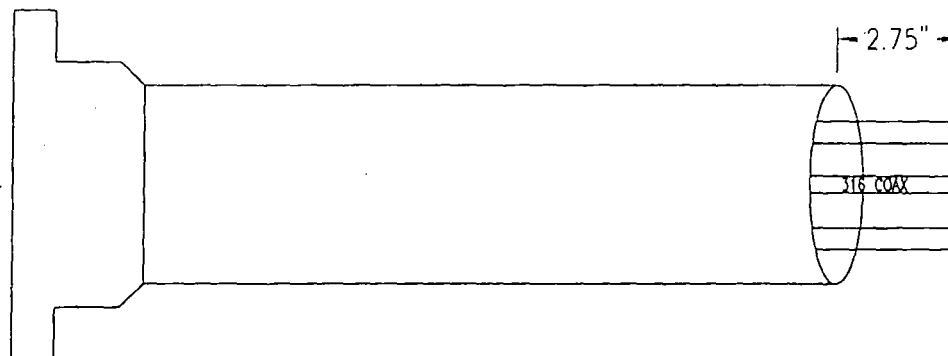
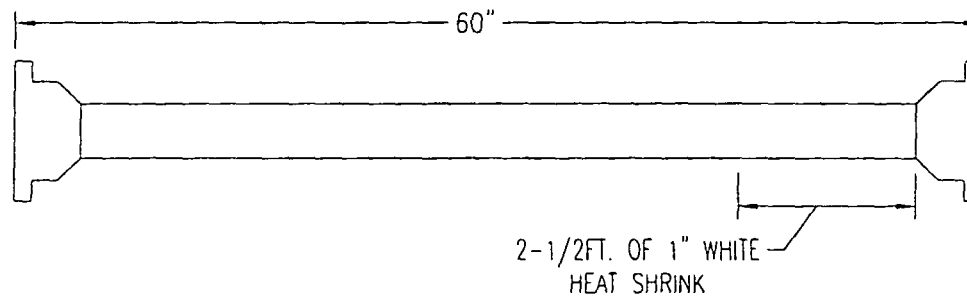
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PROTO

-

Paravion® Inc. Technology		TITLE POWER BUS FBI C182 HAWK OWL PROJECT			DRAWING NUMBER MASTER ELECTRICAL	
DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED: .X = ±.1 .XX = ±.05 .XXX = ±.010 ANGLES = ± 1°		DRAWN BY IN	CHK'D BY	APRVD. BY	DATE 4/13/2012	REV A
THREADS: INTERNAL CLASS 2B EXTERNAL CLASS 2A		DO NOT SCALE DRAWING				SHEET 13 OF 16
3RD ANGLE PROJECTION		© 2009 PARAVION TECH. INC. PARAVION IS A TRADEMARK OF PARAVION TECHNOLOGY INC.				

GIMBAL SIDE OF LASER/GPS/DE-ICE CABLE



NOTES:

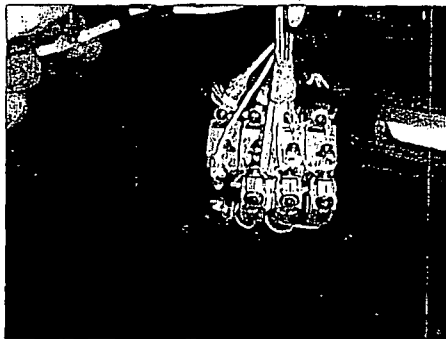
1. COAX SOCKET COMES WITH CRIMP INSTRUCTIONS.
2. ALL OTHER SCOKETS ARE: M39029/56-352 (USE CRIMPER M22520/1-01 DIE M22520/1-01).

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PROTO
-

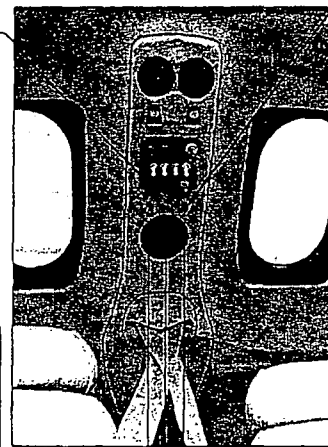
Paravion® Technology Inc.		TITLE POWER BUS FBI C182 HAWK OWL PROJECT		DRAWING NUMBER MASTER ELECTRICAL	
DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED:					
.X = ±.1					
.XX = ±.05					
.XXX = ±.010					
ANGLES = ± 1°					
THREADS: INTERNAL: CLASS 2B EXTERNAL: CLASS 2A		DRAWN BY IN	CHK'D BY	APRVD. BY	DATE 4/13/2012
3RD ANGLE PROJECTION		DO NOT SCALE DRAWING			SHEET 14 OF 16
©2008 PARAVION TECH INC. PARAVION IS A TRADEMARK OF PARAVION TECHNOLOGY INC.					

10" OF WIRE SLACK
FROM O/H OPENING
TO BREAKER PANEL



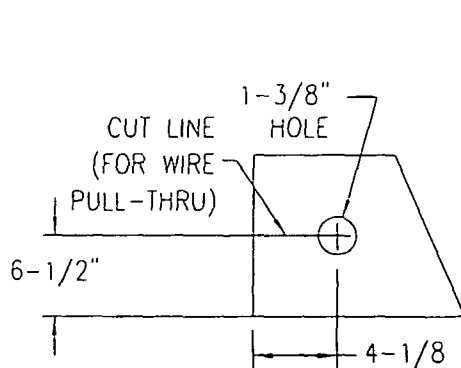
O/H VIDEO SWITCH BREAKER

#8 NUTPLATE

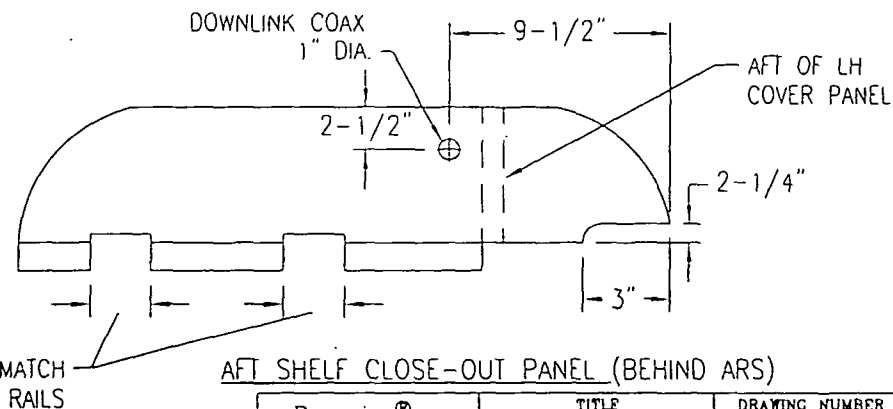
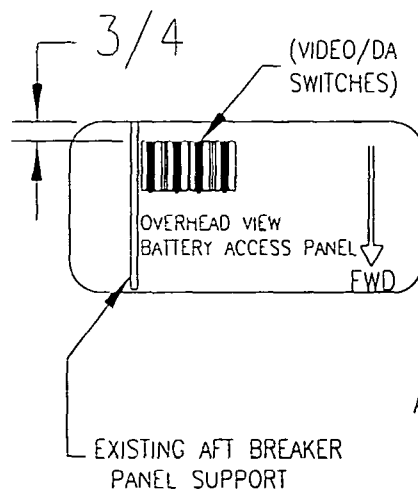


2X POST
LIGHTS (CLEARANCE
HOLES FOR POST LIGHTS
BEHIND PANEL ARE $\phi.625$)

O/H VIDEO SWITCH BREAKER



LH COVER PANEL
(FOR AFT CIRCUIT BREAKERS)

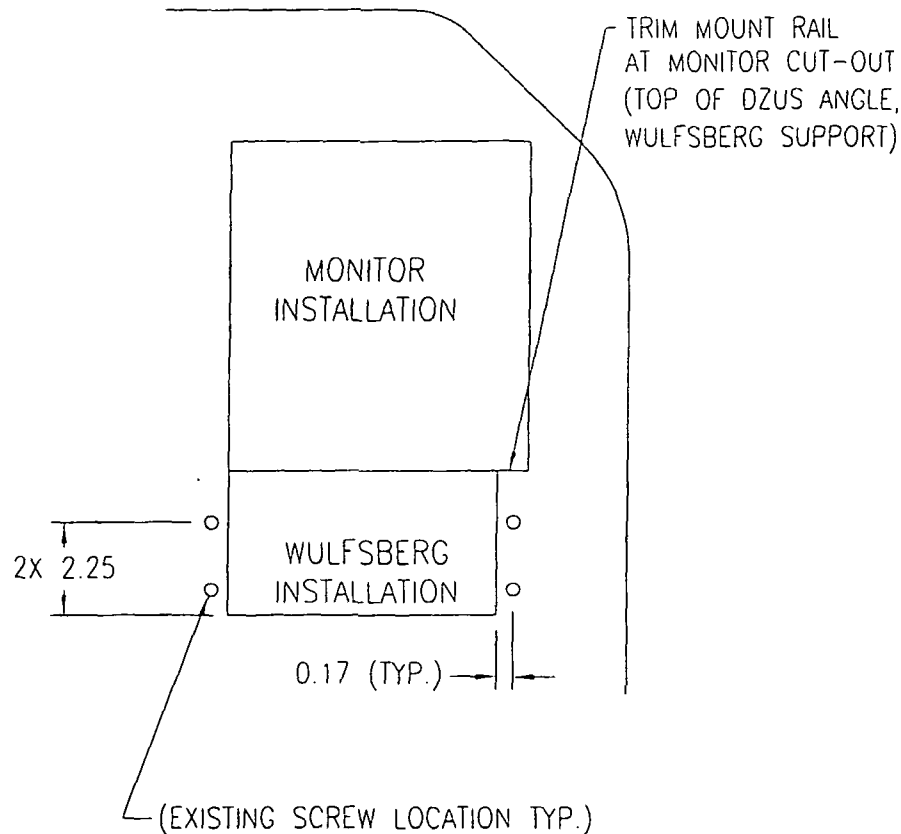


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DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED: .X = ±.1 .XX = ±.05 .XXX = ±.010 ANGLES = ± 1°		DRAWN BY TN	CHK'D BY	APRVD. BY	DATE 4/13/2012	REV A
THREADS: INTERNAL CLASS 2B EXTERNAL CLASS 2A		DO NOT SCALE DRAWING			SHEET 15 OF 16	
3RD ANGLE PROJECTION		©2009 PARAVION TECH. INC. PARAVION IS A TRADEMARK OF PARAVION TECHNOLOGY INC.				

INSTRUMENT PANEL, RIGHT SIDE



EXISTING ACCESS PANEL

INSTRUMENT PEDESTAL

MATCH-DRILL TO EXISTING ACCESS PANEL SCREWS (4X) FOR INSTALLATION OF 2X C182ARS-1000-19.

1.25

3.81

(3-13/16, FIT TO CONSOLE)

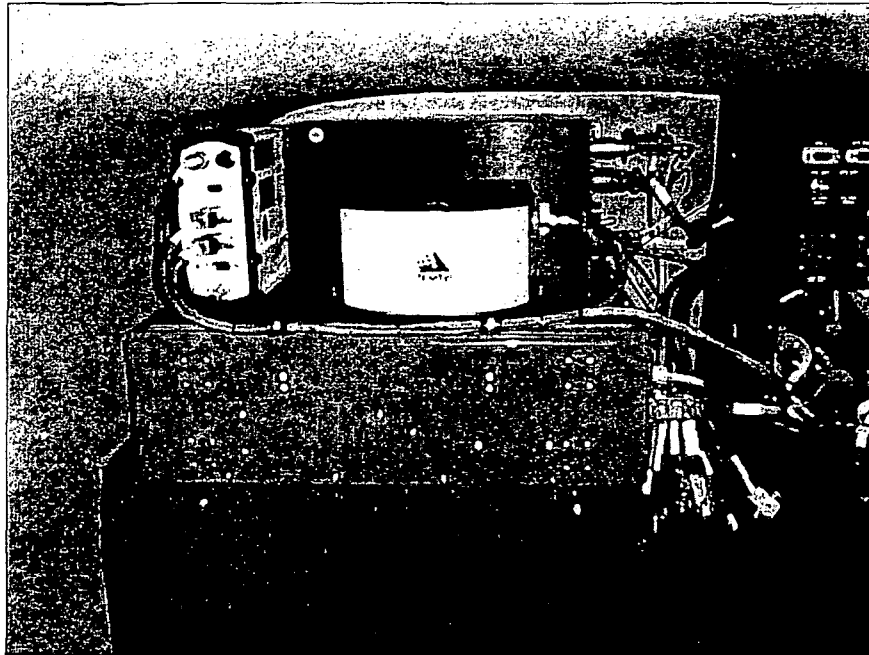
CONSOLE INSTALLATION

Paravion® Inc. Technology		TITLE RECORDER FBI C182 HAWK OWL PROJECT		DRAWING NUMBER MASTER ELECTRICAL	
DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED: .X = ±.1 .XX = ±.05 .XXX = ±.010 ANGLES = ± 1°		DRAWN BY IN	CHK'D BY	APRVD. BY	DATE 4/13/2012
THREADS: INTERNAL CLASS 2B EXTERNAL CLASS 2A		DO NOT SCALE DRAWING		REV A	ECO -
3RD ANGLE PROJECTION		©2009 PARAVION TECH. INC. PARAVION IS A TRADEMARK OF PARAVION TECHNOLOGY INC.		SHEET 16 OF 16	

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PROTO

SHEET	REV	DATE	DESCRIPTION	BY	APR	CHK
1	A	9/8/2011	ADDED -2 ASSY.	TN		



17 18
19 20

-2 ASSEMBLY
(PICTURE FOR REFERENCE ONLY
SEE SHT 2 FOR DETAILS)

10	-	20	MS3367-4-0	4" WIRE TIE
1	-	19	ARS-3610-3	CABLE ASSEMBLY
1	-	18	ARS-3610-2	CABLE ASSEMBLY
1	-	17	ARS-3610-1	CABLE ASSEMBLY
3	-	16	NAS1149DN632J	WASHER
3	-	15	25004	3/8 NYLON CLAMP
8	8	14	MS35206-231	SCREW
6	6	13	MS35206-226	SCREW
4	4	12	MS21042L3	NUT
4	4	11	NAS1149D0332J	WASHER
4	4	10	MS35207-265	SCREW
2	2	9	M4 X 8mm C.S. PH	SCREW ZINC PLATED OR S.S. (COMMERCIAL)
4	4	8	MS27039-08-05	SCREW
-	-	7	NOT USED	
4	4	6	IR-620-2	SPACER
1	1	5	ARS-4130-12	PLATE
1	1	4	ARS-4130-10	PLATE
1	1	3	MCHPTCBOS3N21	DOWNLINK BOX (COBHAM GAS PROD.) (CUSTOMER SUPPLIED)
1	1	2	HG1700-H58	IMU- LASER RING GYRO UNIT
1	1	1	PROPAK-V3-RT2I	GPS INTERFACE
-2	-1	ITEM	PART NUMBER	DESCRIPTION
QTY	QTY	ASSY	ASSY	

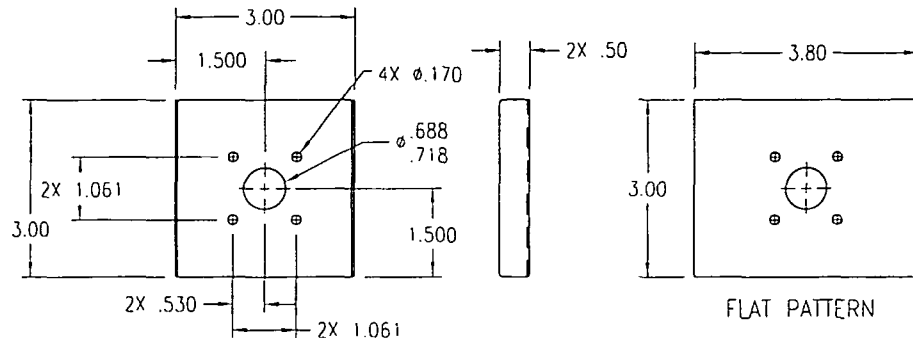
NOTES:

1 APPLY LOCTITE 640 (P/N:64031) THREAD LOCKING COMPOUND.

PROTO
-
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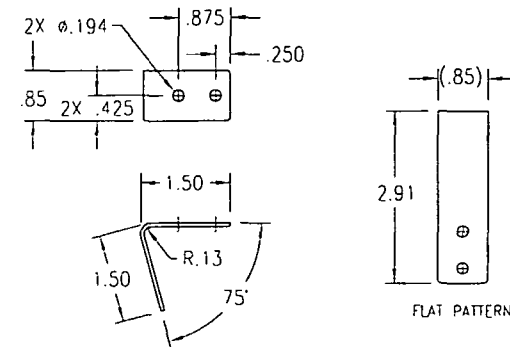
Paravion® Inc.		TITLE IMU, GPS, & DOWNLINK ASSEMBLY ARS CONTROLLER		DRAWING NUMBER ARS-232	
DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED: .X = ±.1 .XX = ±.05 .XXX = ±.010 ANGLES = ± 1°		DRAWN BY TN	CHK'D BY	APRVD. BY	DATE 3/15/11
THREADS: INTERNAL: CLASS 2B EXTERNAL: CLASS 2A		DO NOT SCALE DRAWING		REV A	ECO -
3RD ANGLE PROJECTION		© 2009 PARAVION TECH. INC. PARAVION IS A TRADEMARK OF PARAVION TECHNOLOGY INC.		SHEET 1 OF 2	

SHEET	REV	DATE	DESCRIPTION	BY	APR	CHK
	A	7/27/2011	UPDATE TO CURRENT CONFIG; MATERIALS, FIN.	TN		
7,12	B	8/16/2011	ADDED PART -30 & SHT 12; REMOVED Ø.159 HOLE FROM -24	TN		
1,2	C	9/9/2011	ADDED BLACK POWDER COAT FINISH TO -10,-11,-12,-13,-14	TN		



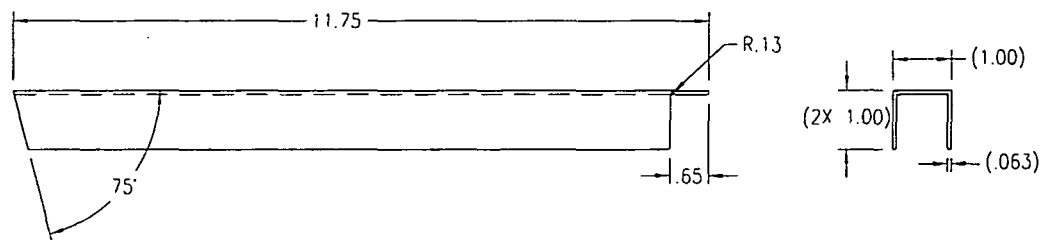
-10 BRACKET

MAT'L: .04" THK 6061-T6 ALUMINUM 00-A-250/11
 FINISH: BLACK POLYURETHANE POWDER COAT CARDINAL C241-BK303 OR
 EPOXY POLAMIDE PRIMER PER MIL-P-23377
 (BUILD 1)
 (DOWNLINK OMNI ANTENNA MOUNT)



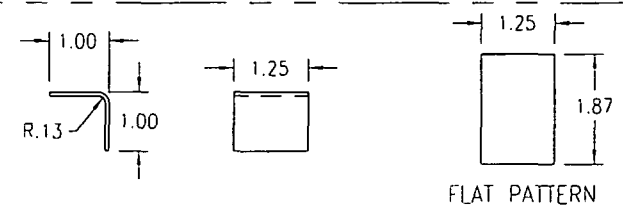
-12 BRACKET

MAT'L: .063" THK 6061-T6 ALUMINUM 00-A-250/11
 FINISH: BLACK POLYURETHANE POWDER COAT CARDINAL C241-BK303 OF
 EPOXY POLAMIDE PRIMER PER MIL-P-23377
 (BUILD 1)
 (SHELF SUPPORT MATES WITH 11)



-11 CHANNEL

MAT'L: 1" X 1" X .063" THK 6063-T52 ALUMINUM EXTRUSION
 FINISH: BLACK POLYURETHANE POWDER COAT CARDINAL C241-BK303 OR
 EPOXY POLAMIDE PRIMER PER MIL-P-23377
 (BUILD 1)
 (SHELF SUPPORT MATES WITH 12)



-13 BRACKET

MAT'L: .063" THK 6061-T6 ALUMINUM 00-A-250/11
 FINISH: BLACK POLYURETHANE POWDER COAT CARDINAL C241-BK303 OR
 EPOXY POLAMIDE PRIMER PER MIL-P-23377
 (BUILD 1)
 (LOWER SHELF SUPPORT MATES WITH 14)

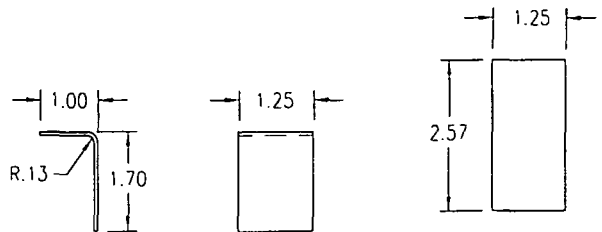
NOTES:

1. BREAK ALL SHARP EDGES.
2. ALL UNSPECIFIED RADII TO BE .13 MIN. O.N.O.

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PROTO

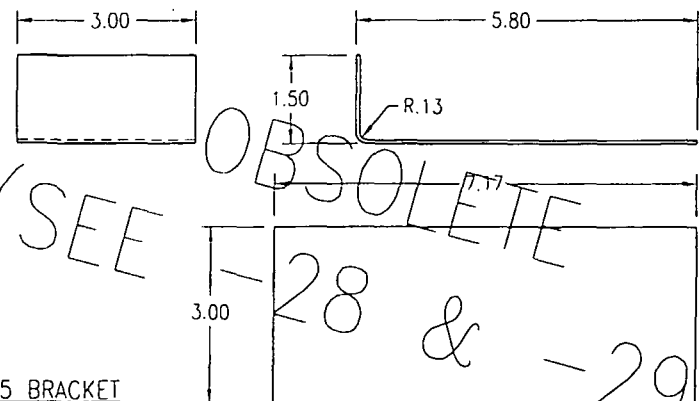
Paravion® Technology Inc.		TITLE MOUNT PARTS FBI HAWK OWL PROJECT		DRAWING NUMBER C182ARS-1000	
DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED: .X = ±.1 .XX = ±.05 .XXX = ±.010 ANGLES = ± 1°		DRAWN BY TN	CHK'D BY TN	APRVD. BY REB	DATE 1/17/11
THREADS: INTERNAL: CLASS 2B EXTERNAL: CLASS 2A		DO NOT SCALE DRAWING © 2009 PARAVION TECH. INC. PARAVION IS A TRADEMARK OF PARAVION TECHNOLOGY INC.		REV C	ECO -
3RD ANGLE PROJECTION		SHEET 1 OF 13			



FLAT PATTERN

-14 BRACKET

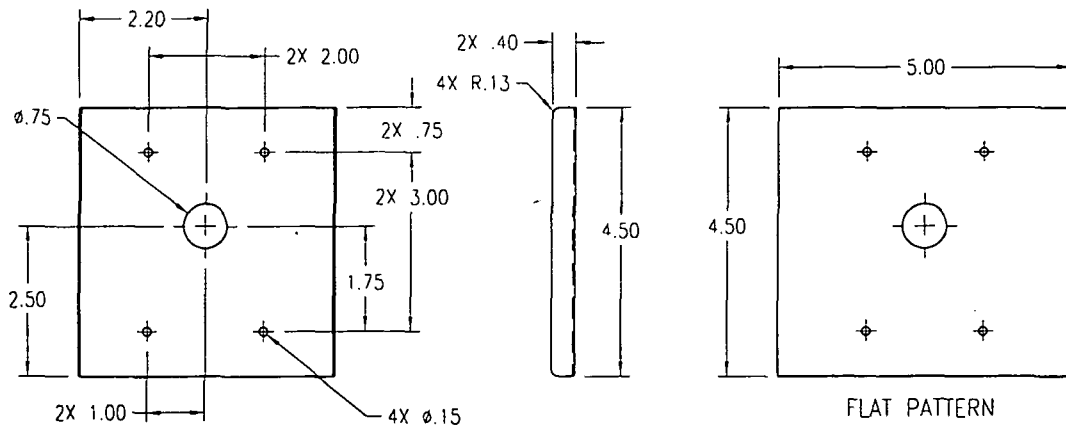
MAT'L: .063" THK 6061-T6 ALUMINUM QQ-A-250/11
 FINISH: BLACK POLYURETHANE POWDER COAT CARDINAL C241-BK303 OR
 EPOXY POLAMIDE PRIMER PER MIL-P-23377
 (BUILD 1)
 (LOWER SHELF SUPPORT MATES WITH 13)



FLAT PATTERN

-15 BRACKET

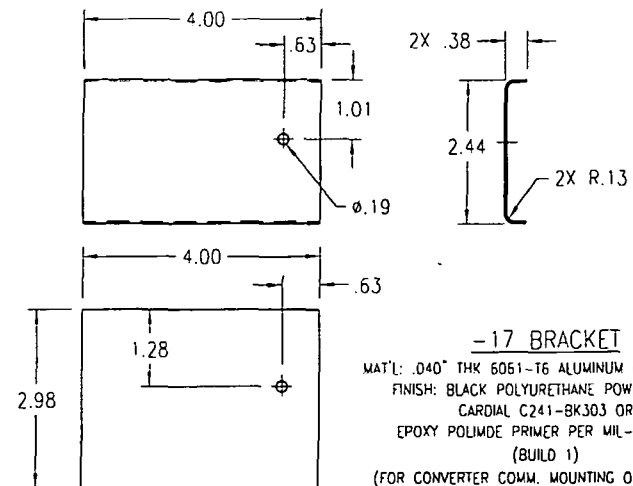
MAT'L: .063" THK 6061-T6 ALUMINUM QQ-A-250/11
 FINISH: POWDER COAT COLOR: FLAT BLACK
 (BUILD 4)
 (MOUNTS VIDEO SWITCHES)



FLAT PATTERN

-16 BRACKET

MAT'L: .040" THK 6061-T6 ALUMINUM QQ-A-250/11
 FINISH: BLACK POLYURETHANE POWDER COAT CARDINAL C241-BK303 OR
 EPOXY POLAMIDE PRIMER PER MIL-P-23377
 (BUILD 1)
 (FOR DOWNLINK ANTENNA MOUNTING)



-17 BRACKET

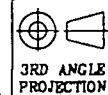
MAT'L: .040" THK 6061-T6 ALUMINUM QQ-A-250/11
 FINISH: BLACK POLYURETHANE POWDER COAT
 CARDINAL C241-BK303 OR
 EPOXY POLAMIDE PRIMER PER MIL-P-23377
 (BUILD 1)
 (FOR CONVERTER COMM. MOUNTING ON CONSOLE)

Paravion® Inc.		TITLE		DRAWING NUMBER	
Technology		MOUNT PARTS FBI HAWK OWL PROJECT		C182ARS-1000	
DRAWN BY	CHK'D BY	APRVD. BY	DATE	REV	ECO
TN	TN	REB	1/17/11	C	-
DO NOT SCALE DRAWING				SHEET	
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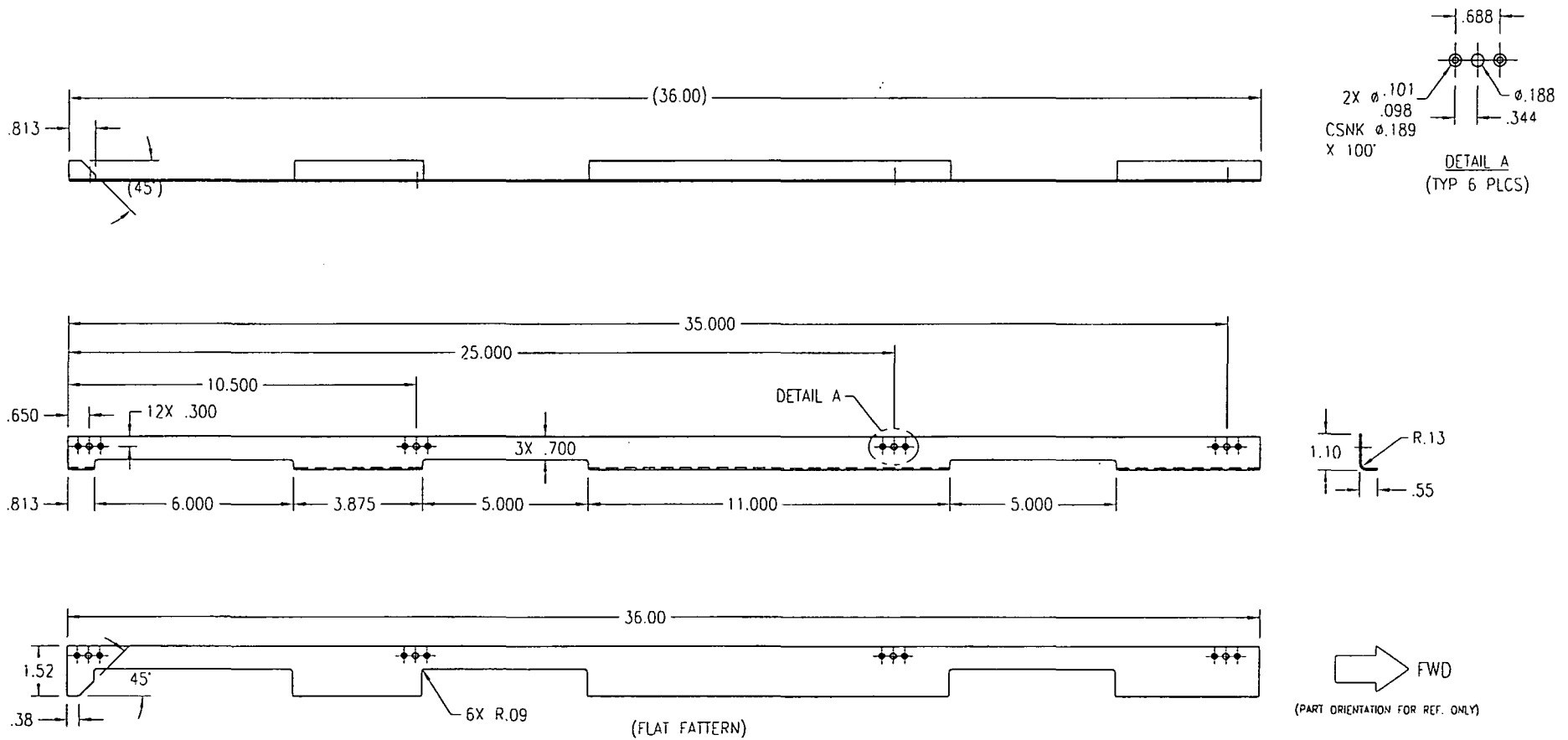
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PROTO

THREADS:
 INTERNAL CLASS 2B
 EXTERNAL CLASS 2A



3RD ANGLE
 PROJECTION

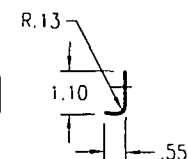
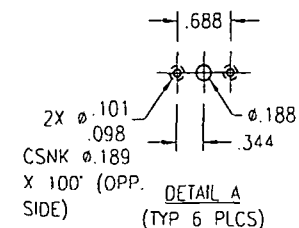
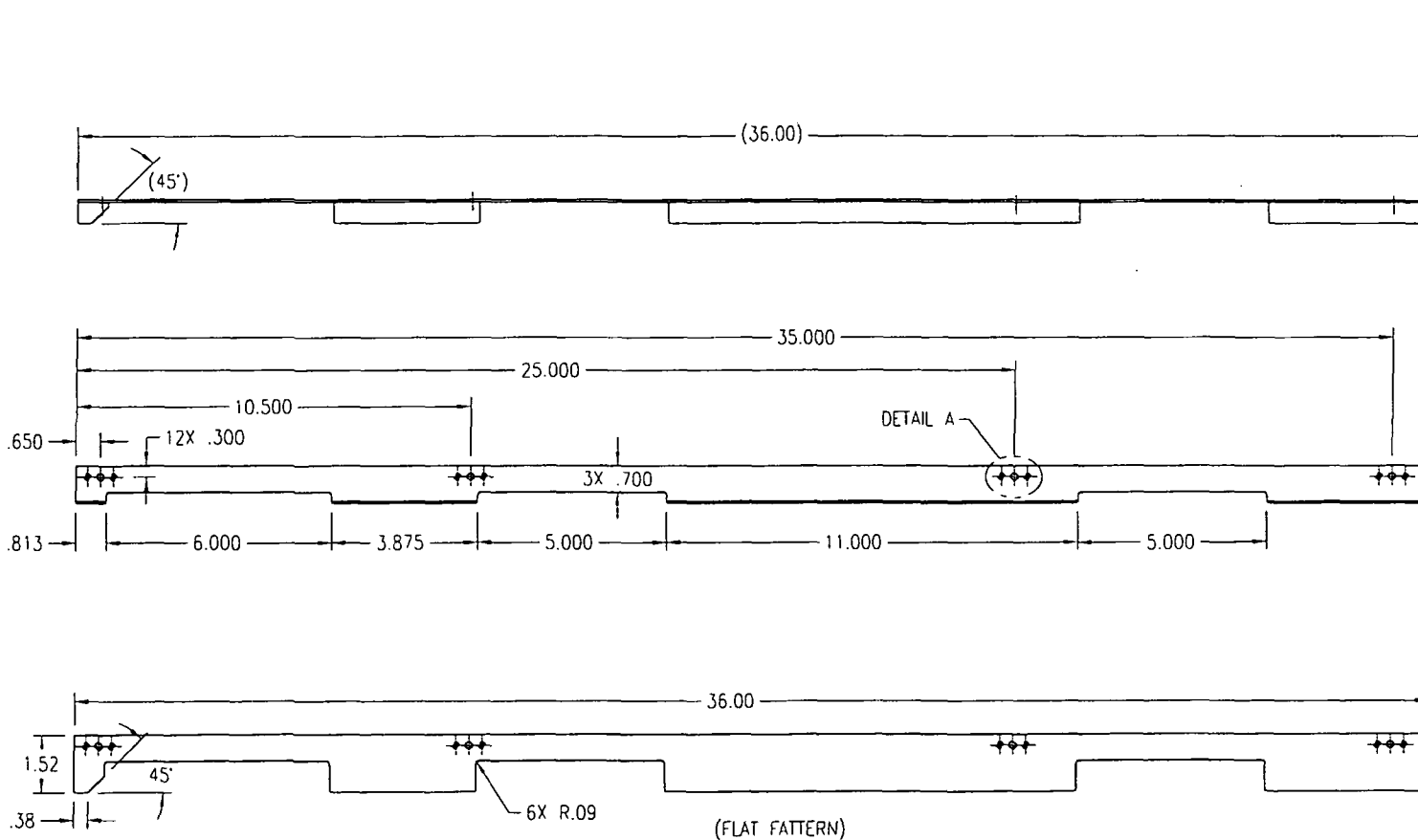


-18R R/H BRACKET
 MAT'L: .060" THK 6061-T5 ALUMINUM 00-A-250/11
 FINISH: BLACK POLYURETHANE POWDER COAT CARDINAL C241-BK303
 (MOUNTS CONSOLE TO FLOOR)

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Paravion® Inc.		TITLE MOUNT PARTS FBI HAWK OWL PROJECT				DRAWING NUMBER C182ARS-1000	
DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED: .X = ±.1 .XX = ±.05 .XXX = ±.010 ANGLES = ± 1°		DRAWN BY TN	CHK'D BY TN	APRVD. BY REB	DATE 1/17/11	REV C	ECO -
THREADS: INTERNAL: CLASS 2B EXTERNAL: CLASS 2A		DO NOT SCALE DRAWING © 2009 PARAVION TECH. INC. PARAVION IS A TRADEMARK OF PARAVION TECHNOLOGY INC.				SHEET 3 OF 13	



(PART ORIENTATION FOR REF. ONLY)

-18L L/H BRACKET
 MAT'L: .060" THK 6061-T6 ALUMINUM 00-A-250/11
 FINISH: BLACK POLYURETHANE POWDER COAT CARDINAL C241-BK303
 (MOUNTS CONSOLE TO FLOOR)

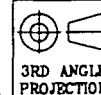
Paravion® Inc.		TITLE		DRAWING NUMBER	
Technology		MOUNT PARTS FBI HAWK OWL PROJECT		C182ARS-1000	
DRAWN BY	CHK'D BY	APRVD. BY	DATE	REV	ECO
TN	TN	REB	1/17/11	C	-
DO NOT SCALE DRAWING				SHEET	
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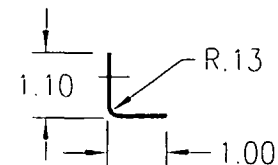
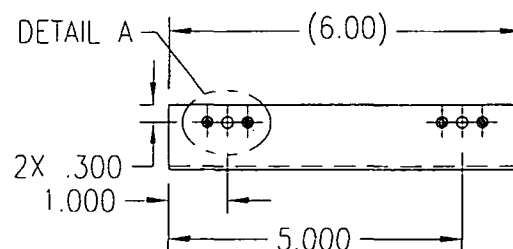
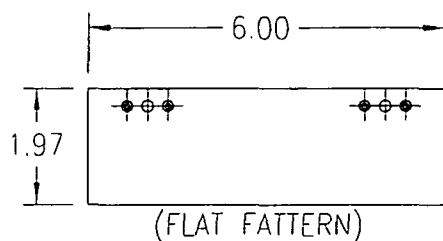
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PROTO

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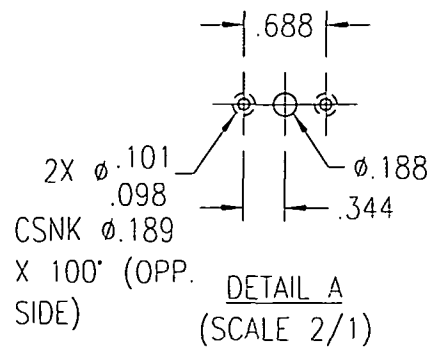
THREADS:
 INTERNAL: CLASS 2B
 EXTERNAL: CLASS 2A





-19 BRACKET

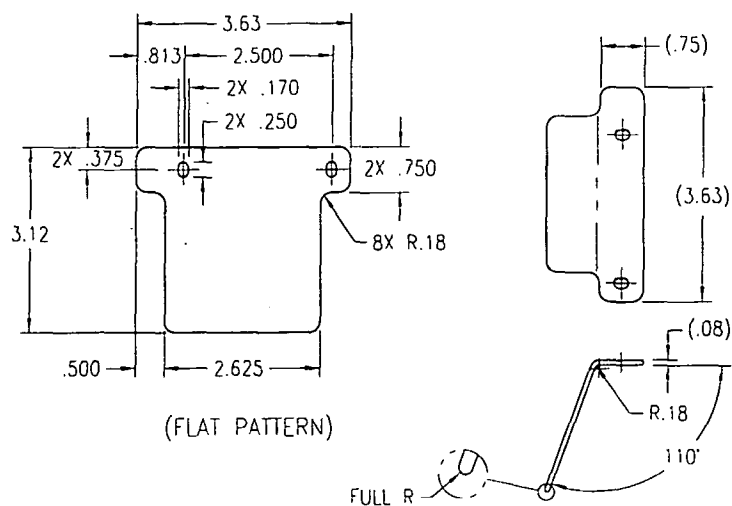
MAT'L: .063" THK 6061-T6 ALUMINUM 00-A-250/11
 FINISH: BLACK POLYURETHANE POWDER COAT CARDINAL C241-BK303
 (BUILD 2 PER AIRCRAFT)
 (MOUNTS CONSOLE TO FLOOR)



Paravion® Inc.		TITLE MOUNT PARTS FBI HAWK OWL PROJECT		DRAWING NUMBER C182ARS-1000	
DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED:		DRAWN BY	CHK'D BY	APRVD. BY	DATE
.X = ±.1		TN	TN	REB	1/17/11
.XX = ±.05					
.XXX = ±.010					
ANGLES = ± 1°					
THREADS: INTERNAL CLASS 2B EXTERNAL CLASS 2A		DO NOT SCALE DRAWING		SHEET	
3RD ANGLE PROJECTION		© 2009 PARAVION TECH. INC. PARAVION IS A TRADEMARK OF PARAVION TECHNOLOGY INC.		5 OF 13	

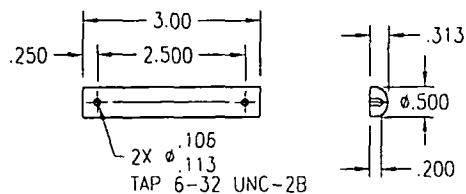
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PROTO



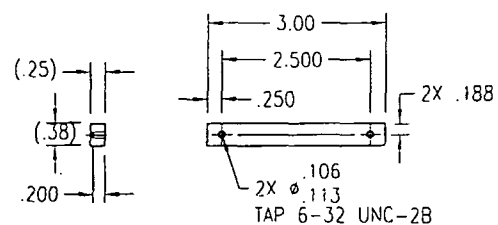
-20 BRACKET

SUGGESTED MAT'L: .08" THK 6061-T6 ALUMINUM 00-A-250/11
FINISH: BLACK POLYURETHANE POWDER COAT CARDINAL C241-BK303
(BUILD 1)



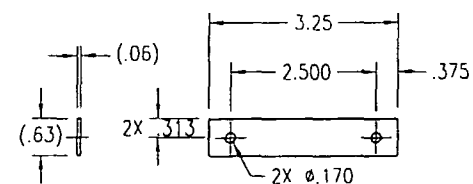
-21 BAR

SUGGESTED MAT'L: .50" 6061-T6 ALUMINUM 00-A-200/8
FINISH: BLACK POLYURETHANE POWDER COAT CARDINAL C241-BK303
(BUILD 1)



-22 BAR

SUGGESTED MAT'L: .38" X .25" 6061-T6 ALUMINUM 00-A-200/8
FINISH: BLACK POLYURETHANE POWDER COAT CARDINAL C241-BK303
(BUILD 1)



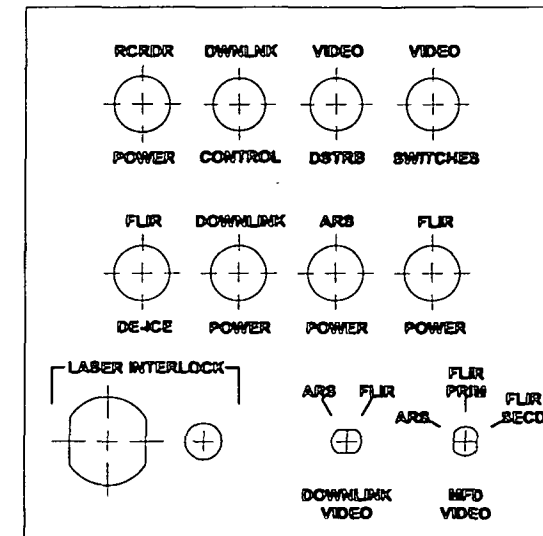
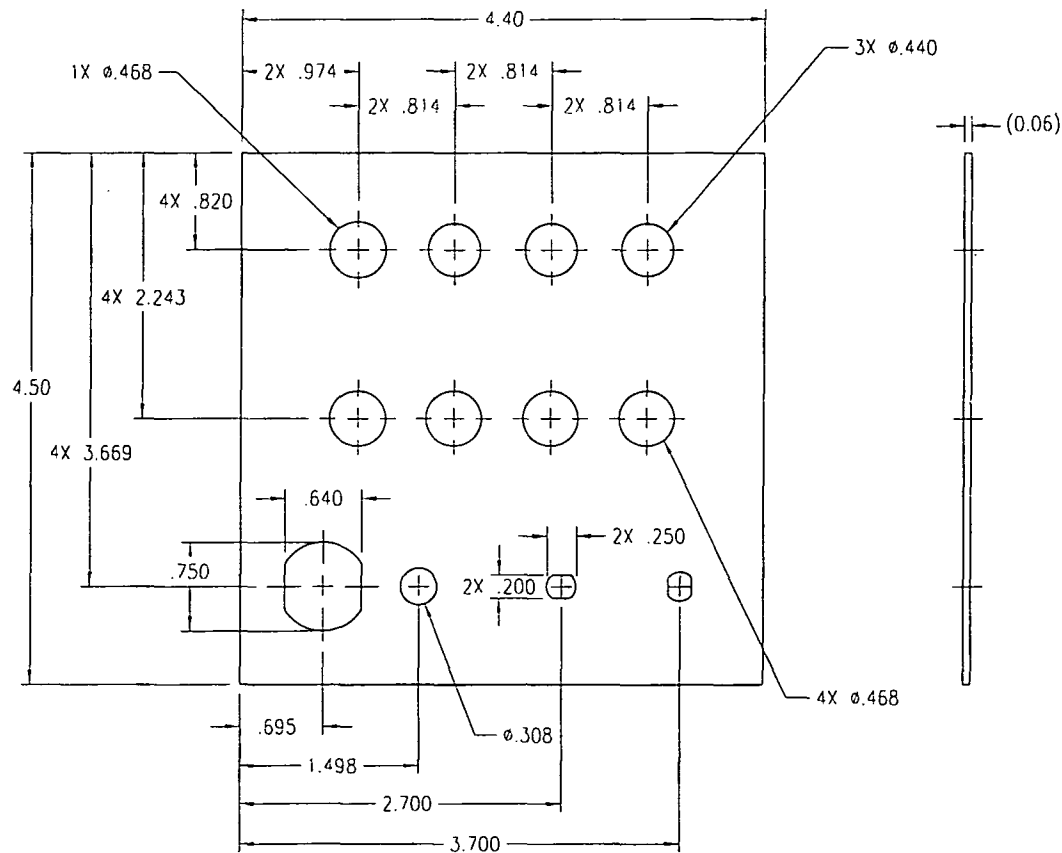
-23 DOUBLER

SUGGESTED MAT'L: .06" THK 6061-T6 ALUMINUM 00-A-250/11
FINISH: BLACK POLYURETHANE POWDER COAT CARDINAL C241-BK303
(BUILD 1)

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PROTO

Paravion® Inc.		TITLE			DRAWING NUMBER	
Technology		MOUNT PARTS FBI HAWK OWL PROJECT			C182ARS-1000	
DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED:		DRAWN BY	CHK'D BY	APRVD. BY	DATE	REV
.X = ±.1		TN	TN	REB	1/17/11	C
.XX = ±.05						
.XXX = ±.010						
ANGLES = ± 1°						
THREADS:		DO NOT SCALE DRAWING				SHEET
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EXTERNAL: CLASS 2A		3RD ANGLE PROJECTION				



ENGRAVED PANEL

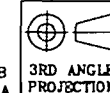
-24 C.B. PANEL

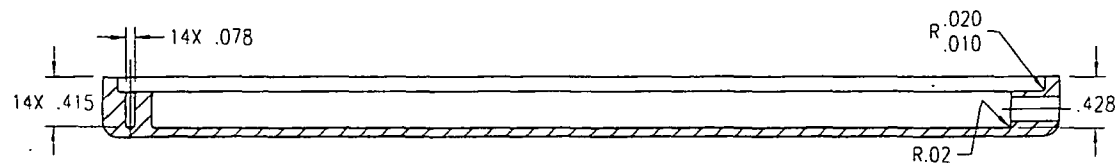
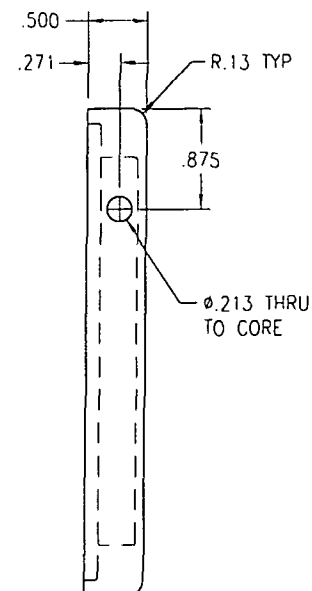
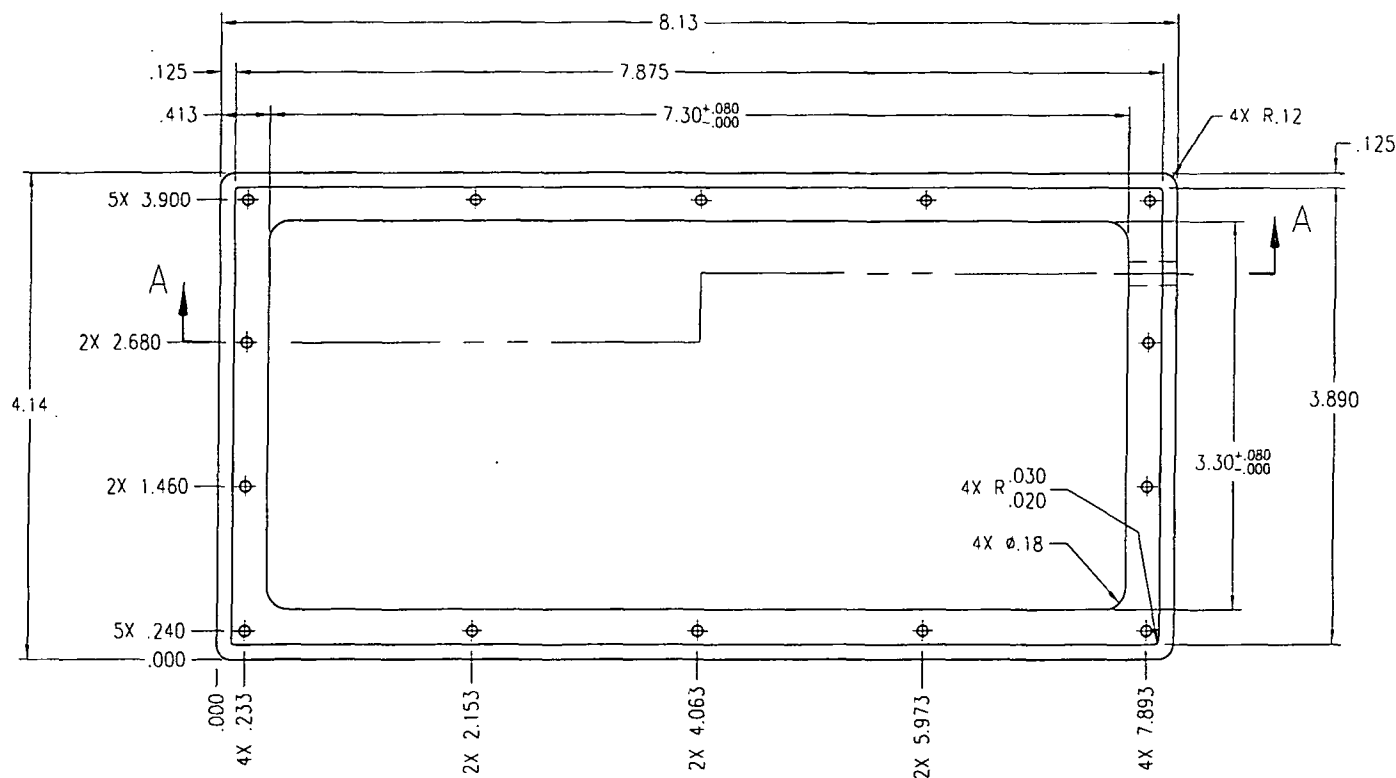
SUGGESTED MAT'L: .05" THK 6061-T6 ALUMINUM 00-A-250/11
 FINISH: BLACK POLYURETHANE POWDER COAT CARDINAL C241-BK303
 (BUILD 1)

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Paravion® Inc.		TITLE MOUNT PARTS FBI HAWK OWL PROJECT		DRAWING NUMBER C182ARS-1000	
DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED: .X = ±.1 .XX = ±.05 .XXX = ±.010 ANGLES = ± 1°	DRAWN BY TN	CHK'D BY TN	APRVD. BY REB	DATE 1/17/11	REV C
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SECTION A-A

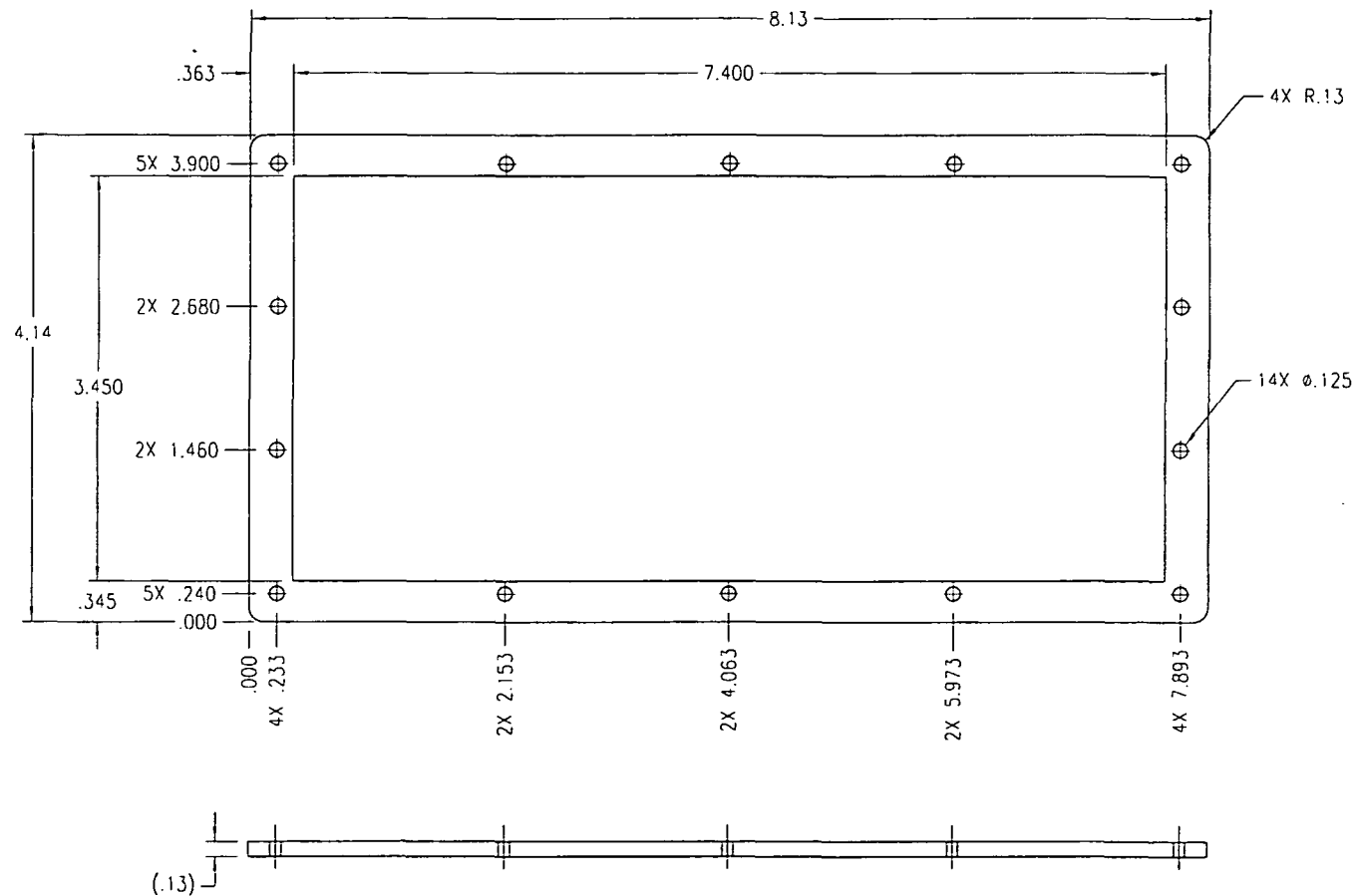
-25 BASE PLATE

MAT'L: 8-1/8" X 4-1/4" X 1/2" THK PVC SHEET PLASTIC
COLOR: GREY

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PROTO

Paravion® Inc.		TITLE		DRAWING NUMBER	
Technology		MOUNT PARTS FBI HAWK OWL PROJECT		C182ARS-1000	
DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED:		DRAWN BY	CHK'D BY	APRVD. BY	DATE
X = ±.1		TN	TN	REB	6/9/11
XX = ±.05					
XXX = ±.010					
ANGLES = ± 1°					
THREADS:		DO NOT SCALE DRAWING		REV	ECO
INTERNAL: CLASS 2B		© 2009 PARAVION TECH. INC. PARAVION IS A TRADEMARK OF PARAVION TECHNOLOGY INC.		C	-
EXTERNAL: CLASS 2A		3RD ANGLE PROJECTION		SHEET	
				8 OF 13	



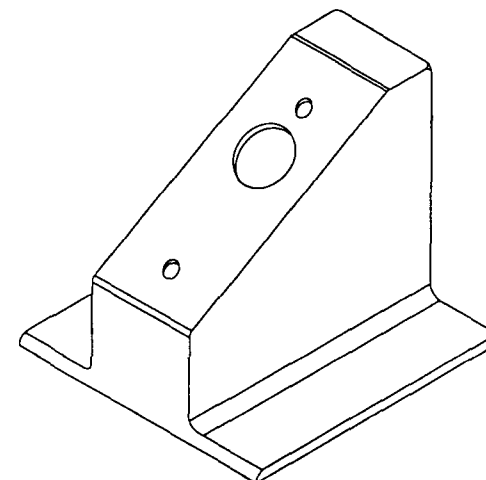
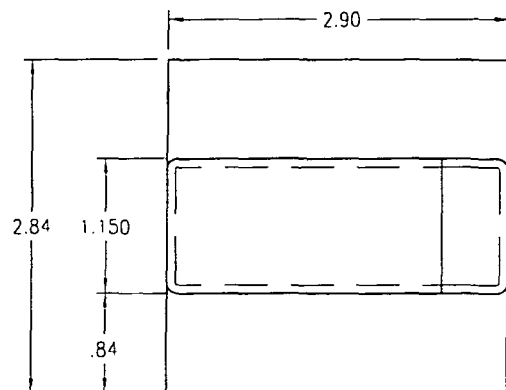
-26 TRIM

MAT'L: 8-1/8" X 4-1/4" X 1/8" THK POLYCARBON PLASTIC
 COLOR: BLACK
 (SHEFFIELD PLASTICS MACROLON GP)

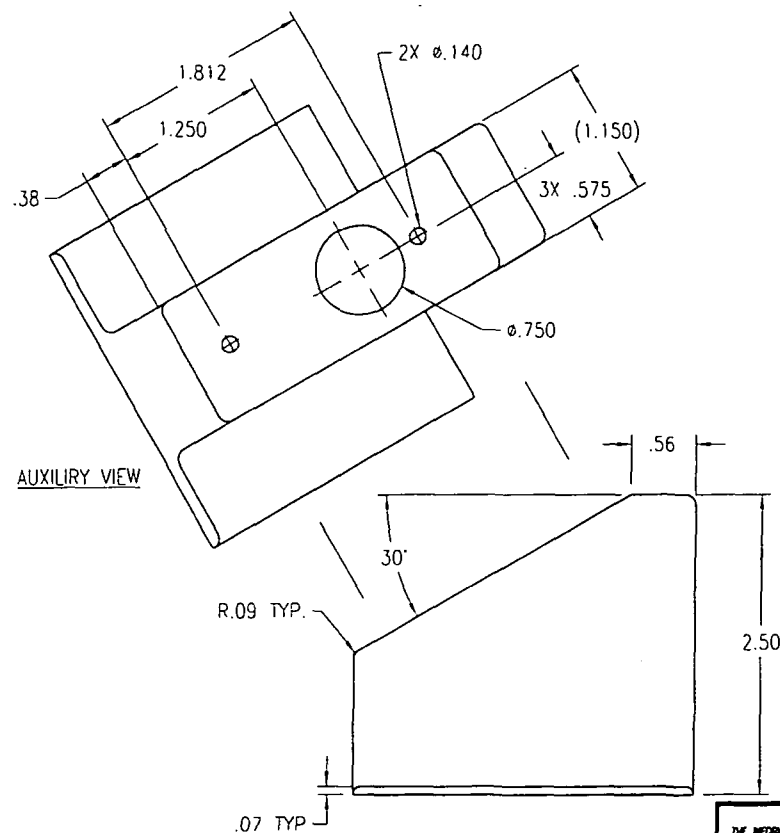
Paravion® Technology Inc.		TITLE MOUNT PARTS FBI HAWK OWL PROJECT		DRAWING NUMBER C182ARS-1000	
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THREADS: INTERNAL: CLASS 2B EXTERNAL: CLASS 2A		DO NOT SCALE DRAWING		REV C	ECO -
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PROTO



ISO VIEW
(FOR REFERENCE ONLY)



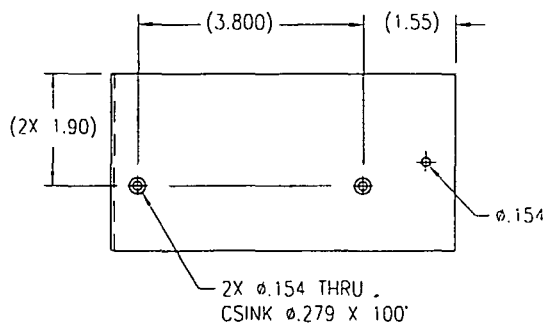
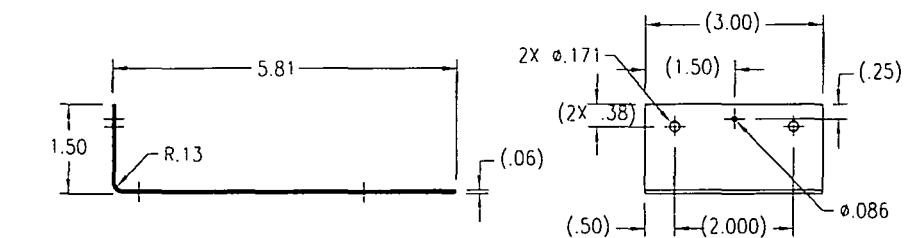
-27 SWITCH HOUSING

MAT'L: .070" THK LEXAN COLOR: CLEAR
FINISH: FLAT BLACK ENAMEL (PAINT INTERIOR SURFACE ONLY)

Paravion® Inc.		TITLE MOUNT PARTS FBI HAWK OWL PROJECT		DRAWING NUMBER C182ARS-1000	
DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED: .X = ±.1 .XX = ±.05 .XXX = ±.010 ANGLES = ± 1°		DRAWN BY TN	CHK'D BY TN	APPR'D. BY REB	DATE 6/9/11
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3RD ANGLE PROJECTION		SHEET 10 OF 13			

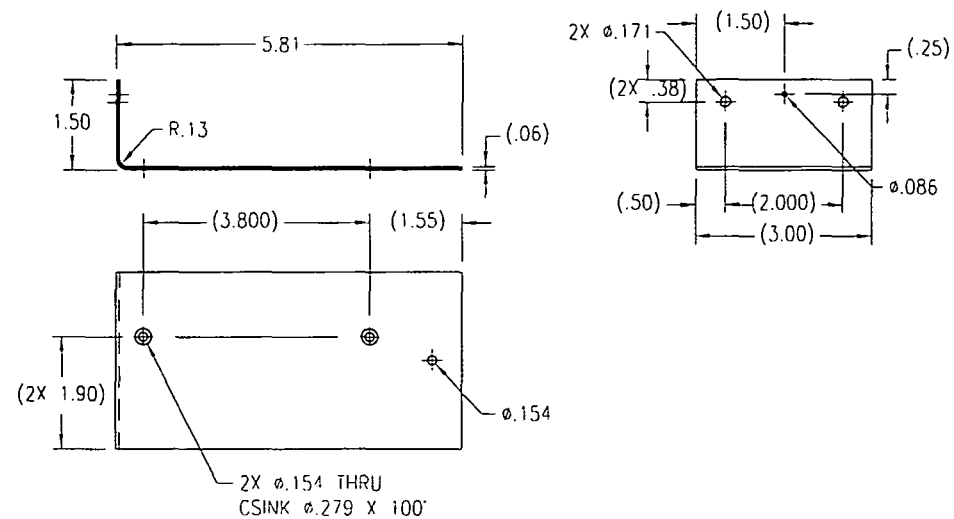
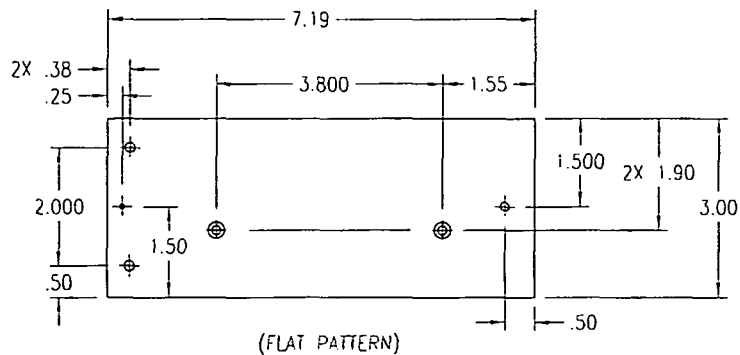
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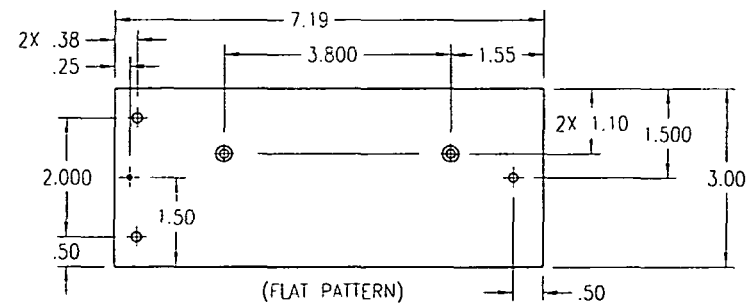
-28 L/H BRACKET

MAT'L: .060" THK 6061-T6 ALUMINUM QQ-A-250/11
 FINISH: BLACK POLYURETHANE POWDER COAT CARDINAL C241-BK303
 (BUILD 1 PER AIRCRAFT)
 (MOUNTS VIDEO GAIN MODULE)



-29 R/H BRACKET

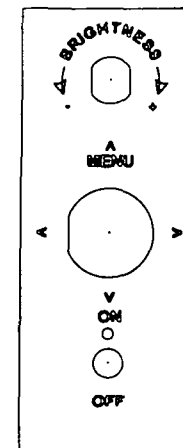
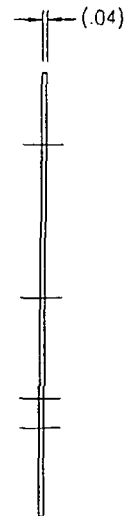
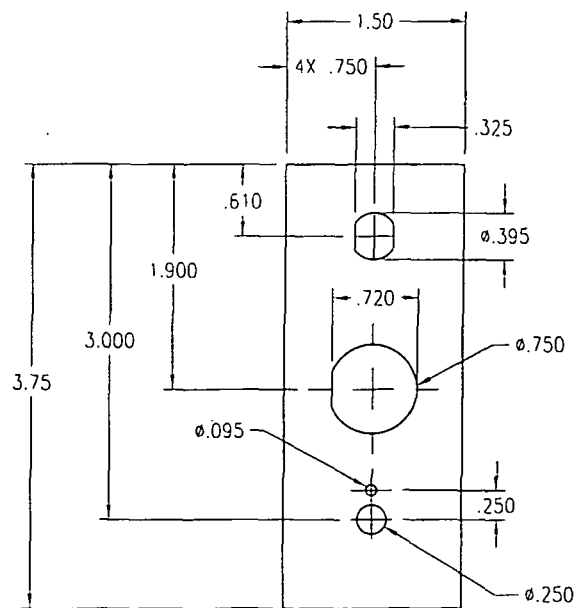
MAT'L: .060" THK 6061-T6 ALUMINUM QQ-A-250/11
 FINISH: BLACK POLYURETHANE POWDER COAT CARDINAL C241-BK303
 (BUILD 1 PER AIRCRAFT)
 (MOUNTS VIDEO GAIN MODULE)



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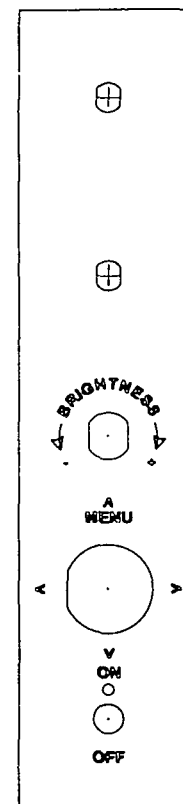
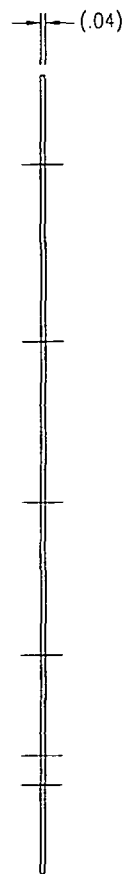
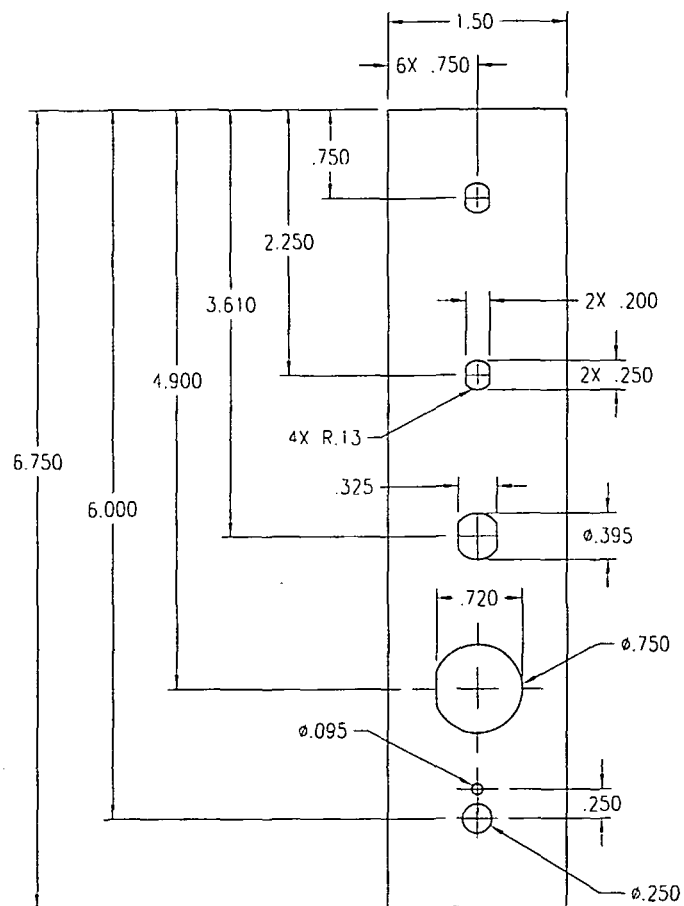


COMPLETED PART

-30 PLACARD

SUGGESTED MAT'L: .04" THK 6061-T6 ALUMINUM QQ-A-250/11
 FINISH: BLACK POLYURETHANE POWDER COAT CARDINAL C241-BK303
 (BUILD 1)

Paravion® Inc. Technology		TITLE MOUNT PARTS FBI HAWK OWL PROJECT		DRAWING NUMBER C182ARS-1000	
DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED: .X = ±.1 .XX = ±.05 .XXX = ±.010 ANGLES = ± 1°		DRAWN BY TN	CHK'D BY TN	APRVD. BY REB	DATE 1/17/11
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COMPLETED PART

-31 PLACARD

(APPLICABLE TO: C206 STATIONAIRE ONLY)

SUGGESTED MAT'L: .04" THK 6061-T6 ALUMINUM 00-A-250/11

FINISH: BLACK POLYURETHANE POWDER COAT CARDINAL C241-BK303

(BUILD 1)

Paravion® Technology Inc.		TITLE MOUNT PARTS FBI HAWK OWL PROJECT		DRAWING NUMBER C182ARS-1000	
DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED:		DRAWN BY	CHK'D BY	APPR'D. BY	DATE
.X = ±.1		TN	TN	REB	1/17/11
.XX = ±.05					
.XXX = ±.010					
ANGLES = ± 1°					
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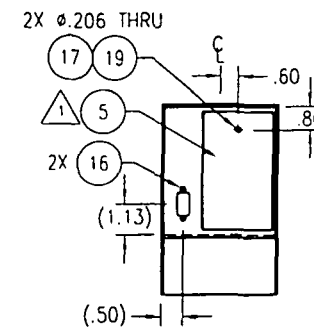
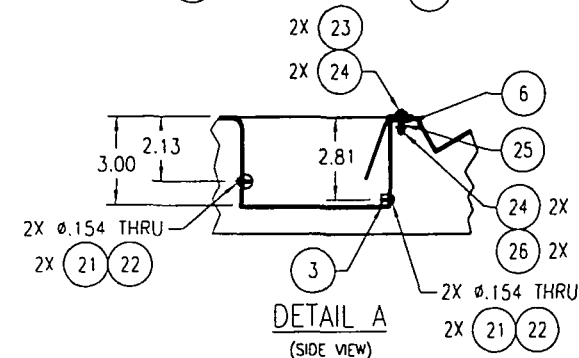
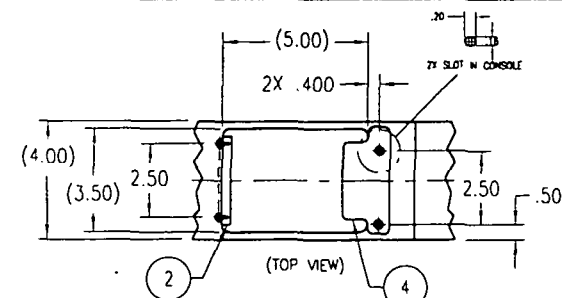
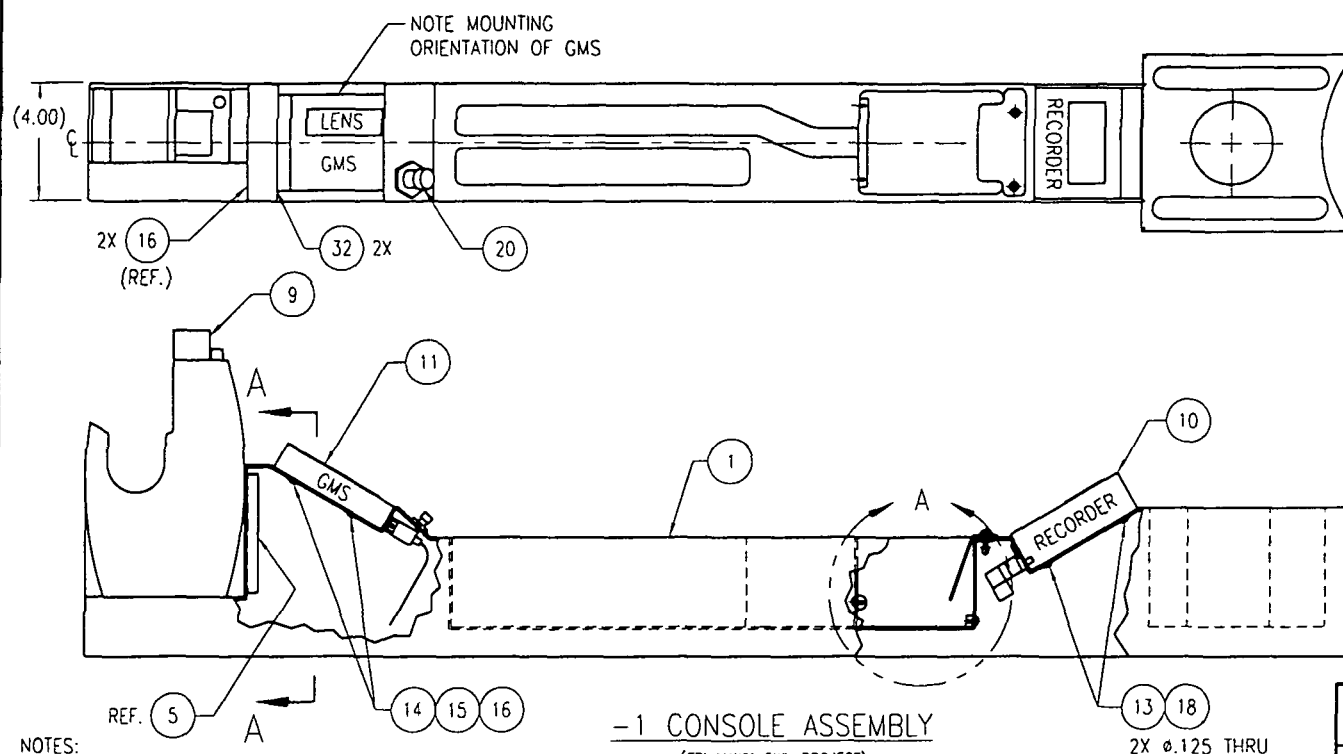
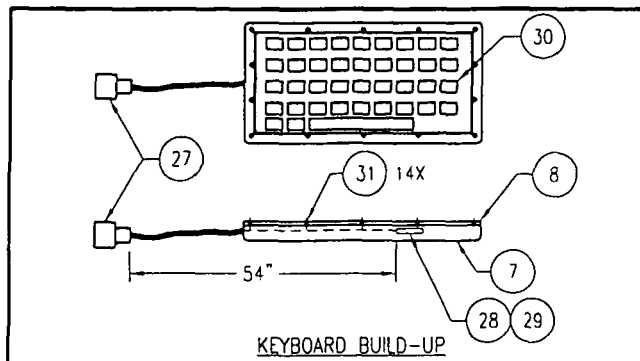
6	35	CT4B	CABLE TIE
7	34	CTB7	CABLE TIE
6	33	CTM2B	CABLE TIE MOUNT
15	32	MS35206-227	SCREW
14	31	4 X 1/2 PHPN	STAINLESS STEEL SCREW
1	30	SL-75-OEM-USB	KEYBOARD ASSY
5	29	CPX076	FEMALE CONTACT
-1	ITEM	PART NUMBER	DESCRIPTION
ASSY			
QTY			

1	28	CPX075-1	HEADER CONNECTOR
1	27	17-200121 (REF.)	USB CABLE (PROVIDED W/KEYBOARD)
2	26	MS21042L08	NUT
2	25	S-5030-12	SPRING
4	24	NAS1149DN832J	WASHER
2	23	MS27039-08-15	SCREW
4	22	NAS1149FN632P	WASHER
4	21	MS35206-226	SCREW
1	20	17-200161	RECEPTACLE
1	19	NAS1149F0332P	WASHER
2	18	NAS1149FN432P	WASHER
1	17	AN3-5A	BOLT
6	16	MS21042L04	NUT
4	15	MS35206-215	SCREW
4	14	NAS1149DN432J	WASHER
2	13	M3 X 0.5X8mm	PAN HEAD SCREW
1	12	C182IRC-3000-1	CONSOLE WIRING
1	11	DOWNLINK RCU-V	GMS UNIT (CUSTOMER SUPPLIED)
1	10	2000-7000	NANO FLASH RDR (CUSTOMER SUPPLIED)
1	9	MOTOROLA XTVA	CONVERTER COMM. UNIT (CUSTOMER SUPPLIED)
1	8	C182ARS-1000-26	TRIM
1	7	C182ARS-1000-25	BASE PLATE
1	6	C182ARS-1000-23	DOUBLER
1	5	C182ARS-1000-17	BRACKET
1	4	C182ARS-1000-20	BRACKET
1	3	C182ARS-1000-22	BAR
1	2	C182ARS-1000-21	BAR
1	1	C182IRC-1000-50	CONSOLE
-1	ITEM	PART NUMBER	DESCRIPTION
ASSY			
QTY			

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NOTES:

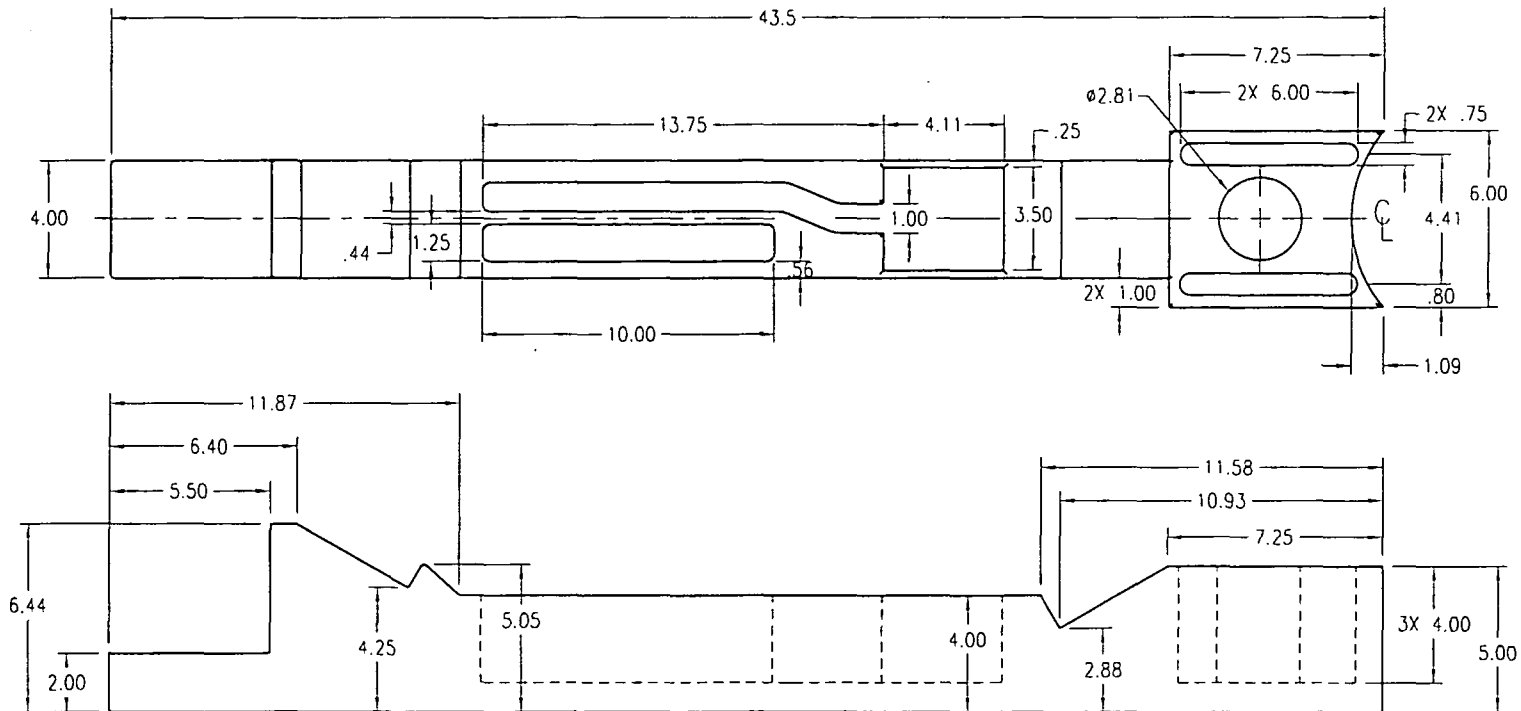
- 1 CEMENT INTO POSITION SHOWN USING: OATEY ABS CEMENT #30902, BLACK.
- 2 FOR CTM2B MOUNTS REMOVE FOAM TAPE AND APPLY CYANOACRYLATE TO ATTACH MOUNTS.
3. USE TEMPLATES FOR HOLES AND CUTOUTS.

-1 CONSOLE ASSEMBLY
(FBI HAWK OWL PROJECT)

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Paravion® Inc.		TITLE		DRAWING NUMBER	
Technology		C182 CONSOLE		C182IRC-1000	
DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED:	DRAWN BY	CHK'D BY	APRVD. BY	DATE	REV
.X = ±.1 .XX = ±.06 .XXX = ±.010 ANGLES ± 1°	TN			8/15/2011	-
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VENDOR PART NUMBER:
C182IRC-1000-50V

-50 CONSOLE

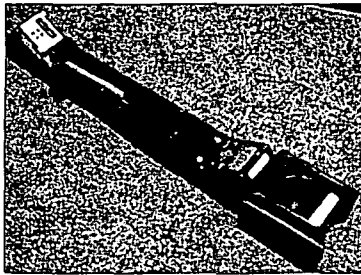
NOTES:

1. MAT'L USED: .100/.080 BLACK KYDEX PLASTIC.
(GRADES 100, T, 200, 6200, 6565 ACCEPTABLE)
2. VENDOR: PLASTIC CREATIONS LTD.
4640 IRONTON ST.
DENVER, CO. 80239

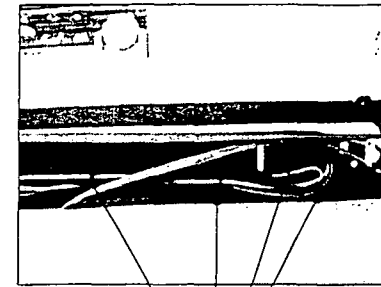
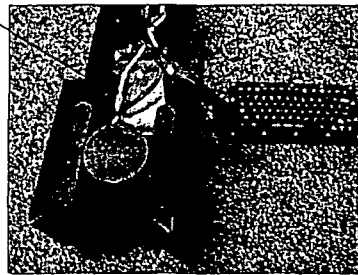
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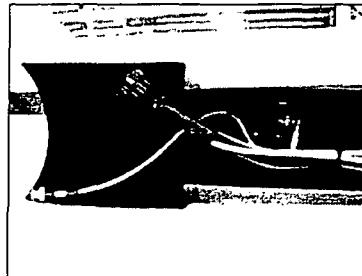
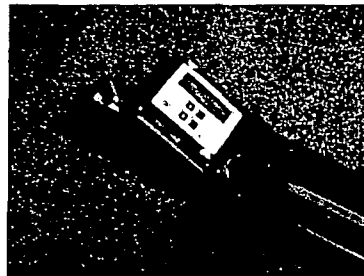
Paravion® Technology Inc.		TITLE C182 CONSOLE		DRAWING NUMBER C182IRC-1000	
DIMENSIONS IN INCHES TOLERANCES EXCEPT WHERE NOTED: .X = ±.1 .XX = ±.06 .XXX = ±.010 ANGLES = ± 1°		DRAWN BY TN	CHK'D BY	APRVD. BY	DATE 8/15/2011
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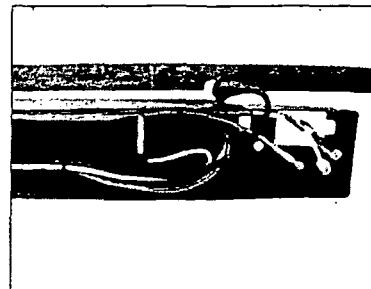
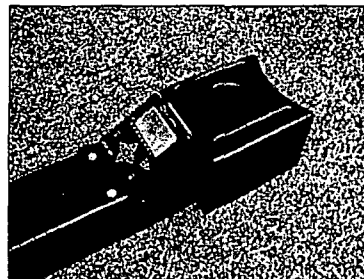


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-1 CONSOLE ASSEMBLY

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DOCUMENT NO. ER-ARS-214-2; INSTALLATION STRUCTURAL ANALYSIS

6 October 2011, Robert E. Bristol

Paravion Technology, Inc.

Reference Installation Drawing ARS-214-1 Rev. B dated 07-28-2011,
ARS4004-1 Controller Unit Rev. A, ARS232-2 IMU/GPS/Downlink Assy Rev. A

Calculations show that Margins-of-Safety are large reference strength of screws and components of mounting fixture. Minimum Mount Shelf 0.010 thickness, based only on ultimate strength (no rigidity needs addressed).

Actual installation mounted to shelf (2024-T3, 0.032 sheet), ARS-4130-1 brackets supported on aluminum angles (3/4"-x-3/4"-x-0.095") installed using (4 ea.) MS27039-0808, (8 ea.) NAS1149FN832P, (4 ea.) MS21042L08 exceeding requirements of this analysis.

Minimum Margin-of-Safety (35%) is based on bending in Roll-Pin Retention Slot at Ultimate 18g Sideward inertial acceleration.

INPUT: Unit Weights ARS-4004-1 $W_{t1} := 16.25$ lb. $H_{t1} := 5.10$ in.
 IMU Assy, ARS-232-2 $W_{t2} := 22$ lb. $H_{t2} := 6.00$ in.
 Hardware $W_{t3} := 0.88$ lb.

Fasteners MS24693 (#8-32) $n := 2$ per corner $\phi 8 := 0.16$

These screws attach ARS4130-13 plates to ARS4004-1 assy

Tensile Strength, $TS8 := 840$ lb. MINIMUM

Minimum C'Sink Diameter: $\phi 8 := 0.285$

MS24693 (#10-32) $N_{\text{min}} := 1$ per corner $\phi 10 := 0.19$

These screws attach ARS4130-14 feet to ARS4130-13 plates

Tensile Strength, $TS10 := 1200$ lb. MINIMUM

Minimum C'Sink Diameter: $\phi 10 := 0.333$

Materials Ref. ARS-4130-13 Mount Plate, 6061-T6 Thickness := 0.125 in.

$F_{su} := 20000$ psi

(F_{su} Conservative, app'l to all ARS-4130 components)

Ref. CFR14, FAR23, 23.561(b)(3)(ii), Amendment 23-48;

Worst-Case Ultimate inertial loading, $g_{Load} := 18$ g's

CALCULATIONS:

$$W_{t0} := \sum_{i=1}^3 W_{ti} \qquad CG := \frac{W_{t1} \cdot \frac{H_{t1}}{2} + W_{t2} \cdot \left(H_{t1} + \frac{H_{t2}}{2} \right)}{W_{t0}} = 5.6$$

$$\text{Moment} := g_{Load} \cdot W_{t0} \cdot CG = 3953 \text{ in-lb}$$

$$\text{Set } k := 1..4 \quad x_1 := 0.225 \quad x_2 := 1.025 \quad x_3 := 10.470 \quad x_4 := 11.270$$

Fastener Tension:

$$\text{Tension8} := \frac{\text{Moment} \cdot x_4}{\sum_k (x_k)^2} + \frac{W_{t0} \cdot g\text{Load}}{4 \cdot n} = 275 \quad \text{lb./screw (\#8-32 rated 840 lb.)}$$

$$\text{Margin-of-Safety, MS8} := \frac{\text{TS8}}{1.15(\text{Tension8})} - 1 = 165\% \quad \text{Including ref. to 23.625(a)(2) Fitting Factors, Amdt 23-7}$$

$$\text{Set } j := 1..2 \quad x_1 := 0.625 \quad x_2 := 10.870$$

Fastener Tension:

$$\text{Tension10} := \frac{\text{Moment} \cdot x_2}{2 \cdot \left[\sum_j (x_j)^2 \right]} + \frac{W_{t0} \cdot g\text{Load}}{4 \cdot n} = 269 \quad \text{lb./screw (\#10-32 rated 1200 lb.)}$$

COMBINED LOADING

$$\text{Margin-of-Safety, MS10} := \frac{\text{TS10}}{1.15(\text{Tension10})} - 1 = 287\% \quad \text{Including ref. to 23.625(a)(2) Fitting Factors, Amdt 23-7}$$

$$\text{Foot Shear Area: } SA := \frac{0.533 + 0.710}{2} \cdot 0.089 + 0.710 \cdot 0.030 = 0.073 \text{ q. in. (Shear Area of "foot")}$$

$$\text{Shear Stress in foot: } \text{FSS} := \frac{\text{Tension10}}{SA} = 3515 \quad \text{psi, } F_{su} = 20000 \quad \text{psi}$$

$$\text{Margin-of-Safety, MSS} := \frac{F_{su}}{1.15(\text{FSS})} - 1 = 395\% \quad \text{Including ref. to 23.625(a)(2) Fitting Factors, Amdt 23-7}$$

Fastener Shear:

$$\text{Shear8} := \frac{W_{t0} \cdot g\text{Load}}{4 \cdot n} = 88 \quad \text{Shear10} := \frac{W_{t0} \cdot g\text{Load}}{4 \cdot N} = 176$$

Because screw shear load is much much less than 1/2 of screw tensile strength and tension load is much much less than screw tensile strength, calculation of allowable shear using calculated tension load (Ref. Bruhn Chapt. D1) is unnecessary.

"TEAR-OUT", -13 PLATE

$$\text{ShearStress8} := \frac{\text{Tension8}}{\pi \Phi 8 \cdot (\text{Thickness})} = 2461 \text{ psi}, \quad \text{Margin} = \frac{F_{su}}{1.15 \cdot \text{ShearStress8}} - 1 = 607\%$$

$$\text{ShearStress10} := \frac{\text{Tension10}}{\pi \Phi 10 \cdot (\text{Thickness})} = 2059 \text{ psi}, \quad \text{Margin} = \frac{F_{su}}{1.15 \cdot \text{ShearStress10}} - 1 = 745\%$$

ROLL-PIN INSTALLATION:

(Considered in Worst-Case, as though at greatest distance from hinge point)

Ref. MS16562-32 Roll Pin, rated 2100 lb. Double Shear; $DS := \frac{\text{Moment}}{(2) \cdot (11.29)} = 175 \text{ lb.}$

Where 11.29 = Moment Arm of Roll Pin, Opposite foot contribution neglected.

"Beam" Dimensions: Width := 0.125 Height := 0.112 Minimum

$$\text{Shear Stress in "Beam": } SSB := \frac{DS}{2 \cdot (\text{Width}) \cdot (\text{Height})} = 6253 \text{ psi}$$

$$\text{ShearMargin} := \frac{F_{su}}{1.15 \cdot (SSB)} - 1 = 178\%$$

Ref. Installation Drawing ARS-214, Roll-Pin load is imposed at 0.075 inch from end of slot. Bending Stress is calculated as though DS/2 is imposed at 0.1 inch from "square" slot end.

$$\text{Second Moment-of-Area, } I := \frac{\text{Width} \cdot \text{Height}^3}{12} = 14.63 \times 10^{-6} \text{ in.}^4$$

$$\text{Slot Length, } L_n := 0.613 \text{ Load Appl'n, } a := 0.10 \quad b := L_n - a$$

$$\text{Load} := \frac{DS}{2} \quad ch := \frac{\text{Height}}{2}$$

$$\text{Ref. Mach. Hdbk Strength of Materials: Max. Bending Stress} = BS := \frac{\text{Load} \cdot a \cdot b^2 \cdot ch}{I \cdot (L_n)^2} = 23461$$

$$\text{Where } F_{ty} := 35000 \text{ psi} \quad \text{BendingMargin} := \frac{F_{ty}}{1.15 \cdot BS} - 1 = 30\%$$

$$\text{IMU, TOP PLATE INSTALLATION: } W_{t2} = 22 \text{ lb.} \quad g\text{Load} = 18$$

$$\text{Installed using 8 ea. MS24693 (\#8-32) screws: } \frac{W_{t2}}{8} \cdot g\text{Load} = 50 \text{ lb.}$$

Tension/Shear
per Screw

(Ref. 840 lb. Tension Strength)

REFERENCE AIRCRAFT INSTALLATION:

Fastener Tension $xa_1 := 0.340$ $xa_2 := 9.908$ **Worst-Case Fastener Locations**

$$\text{TensionShelf} := \frac{\text{Moment} \cdot xa_2}{4 \cdot \left[\sum_j (xa_j)^2 \right]} + \frac{Wt_0 \cdot gLoad}{8} = 188 \text{ lb./screw (\#8-32 rated 840 lb. min.)}$$

COMBINED LOADING

Assumed 4 ea. #8 screws fastening Mount Fixtures to Shelf

Actual Installation included 2 ea. #10, 2 ea. #8

Note that MS21042L08 nuts are rated 1670 lb. axial load.

Minimum Mount Shelf Thickness, based on equivalent Shear Area, material, is calculated as follows:

$$\text{Shelf} := \frac{\text{TensionShelf}}{(\pi \cdot 0.375) \cdot Fsu} = 0.008 \text{ inch Based on NAS1149, \#8 Washer, 0.375" OD}$$

$$\text{ShearShelf} := \frac{Wt_0 \cdot gLoad}{8 \cdot (\phi 8) \cdot \text{Shelf}} = 69082 \text{ psi}$$

$Fbru := 67000 \text{ psi,}$
ref. MMPDS, 6061-T6, 0.010 sheet,
 $e/D = 1.5$

The above "Minimum Shelf Panel Thickness DOES NOT consider shelf rigidity need. Calculation of minimum shelf panel ref. shear pull-through agrees approximately with calculation ref. bearing strength.

Regulatory requirements are satisfied when ARS 4004 and IMU combined assembly is mounted to a shelf greater than 0.010 inch thick, manufactured from 6061-T6 or stronger material, using 8 ea. MS24694, #8-32 or equivalent strength screws.

ENGINEERING REPORT ER-IR2300-2; STRUCTURAL ANALYSIS OF EQUIPMENT SHELF IR-2300-1 ASSEMBLY

Prepared by Robert E. Bristol, 7 October 2011

Page 1

The following calculations verify very large structural Margin of Safety reference requirements of CFR14, Part 23, 23.561 (b)(3), 23.625, reference FLIR TALON Control Electronics Unit installation on IR-2300-1 Equipment Shelf installed to C182IR-1012-1 Support Assembly.

SUMMARY: The calculations show greatest calculated bolt tension, reference 18g Forward inertial loading, to be 85 lb. imposed on #8-32 screw rated to 840 lb. and 15 lb. imposed on #6-32 screw rated 725 lb.

REF. IR-2300-1; With Talon CEU installed

LOAD LOCATION VECTORS DEFINITION

$$X_0 := \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix} \quad \text{[Bolt Pattern Center, IR-2100-1 Mount Plate (IR-2000-1 "Buttons")]}$$

$$X_1 := \begin{pmatrix} -0.28 \\ 0.00 \\ 3.10 \end{pmatrix} \quad \text{[Center-of-Gravity, Talon CEU P/N23364-200] REF. MFR'S DATA}$$

$$X_2 := \begin{pmatrix} -4.05 \\ 0 \\ 0 \end{pmatrix} \quad \text{[Bolt Pattern Center, Talon CEU "Clamp Mount"] REF. DWG. IR-2300-1}$$

$$X_3 := \begin{pmatrix} 5.65 \\ 0 \\ 0 \end{pmatrix} \quad \text{[Bolt Pattern Center, Talon CEU "Pin Mount"] REF. DWG. IR-2300-1}$$

CEU Weight := 13 lb.; [Weight of P/N23364-200 CEU] REF. MFR'S DATA

(1) CEU Inertial Loads

up := 1 forward := 2 side := 3 [REF.]

Ref. 14CFR, Part 23, Section 23.561(e), (b3):

Ultimate Load Factors: $n_{up} := 3.0$ $n_{forward} := 18.0$ $n_{side} := 4.5$

LOAD MAGNITUDE VECTORS DEFINITION

$$PV_1 := \begin{pmatrix} 0 \\ 0 \\ -n_{up} \cdot \text{Weight} \end{pmatrix} = \begin{pmatrix} 0.00 \\ 0.00 \\ -39.00 \end{pmatrix}$$

REF. UPWARD INERTIAL LOAD
IN RELATION TO AIRPLANE

$$PV_2 := \begin{pmatrix} 0 \\ -n_{forward} \cdot \text{Weight} \\ -\text{Weight} \end{pmatrix} = \begin{pmatrix} 0.00 \\ -234.00 \\ -13.00 \end{pmatrix}$$

REF. FORWARD INERTIAL LOAD
IN RELATION TO AIRPLANE

$$PV_3 := \begin{pmatrix} n_{side} \cdot \text{Weight} \\ 0 \\ -\text{Weight} \end{pmatrix} = \begin{pmatrix} 58.50 \\ 0.00 \\ -13.00 \end{pmatrix}$$

**REF. SIDEWARD INERTIAL LOAD
IN RELATION TO AIRPLANE**

Set

$$\begin{array}{lllll} i := 1..4 & x_1 := 2.015 & y_1 := 2.150 & x_3 := -2.015 & y_3 := 2.150 \\ & x_2 := 2.015 & y_2 := -2.150 & x_4 := -2.015 & y_4 := -2.150 \end{array}$$

[Bolt Pattern , IR-2100-1 Mount Plate (IR-2000-1 "Buttons")]

$$\begin{pmatrix} MX_{1,1} \\ MY_{1,1} \\ MZ_{1,1} \end{pmatrix} := X_1 \times PV_1 = \begin{pmatrix} 0.00 \\ -10.92 \\ 0.00 \end{pmatrix} \text{ lb.-in.; [Moment on Mt. Plate Bolt Pattern due to up g-load]} \quad n_{up} = 3.00$$

$$\begin{pmatrix} MX_{1,2} \\ MY_{1,2} \\ MZ_{1,2} \end{pmatrix} := X_1 \times PV_2 = \begin{pmatrix} 725.40 \\ -3.64 \\ 65.52 \end{pmatrix} \text{ lb.-in.; [Moment on Bolt Pattern due to fwd g-load]} \quad n_{forward} = 18.00$$

$$\begin{pmatrix} MX_{1,3} \\ MY_{1,3} \\ MZ_{1,3} \end{pmatrix} := X_1 \times PV_3 = \begin{pmatrix} 0.00 \\ 177.71 \\ 0.00 \end{pmatrix} \text{ lb.-in.; [Moment on Bolt Pattern due to side g-load]} \quad n_{side} = 4.50$$

Based on upward inertial load, ref. Bruhn Chapter D1

$$TX_{1,i} := \frac{x_i \cdot MY_{1,1}}{\sum_i (x_i)^2} \quad TY_{1,i} := \frac{y_i \cdot MX_{1,1}}{\sum_i (y_i)^2} \quad BT_{1,i} := (TX_{1,i} + TY_{1,i}) + \frac{n_{up} \cdot \text{Weight}}{4}$$

[Ultimate Bolt Tension, IR-2000-1 Button Installation, Upward Inertial Load]

$TX_{1,i} =$	$TY_{1,i} =$	$BT_{1,i} =$
-1.35	0.00	8
-1.35	0.00	8
1.35	0.00	11
1.35	0.00	11

$n_{up} = 3.00 \quad \text{Weight} = 13.00$

 $\sum_i BT_{1,i} - n_{up} \cdot \text{Weight} = 0.00$
Must equal zero

BTmax := max(BT) = 11 lb. [MS24693 (#8-32) rated to 840 lb. Tension ref. MS24693]

[MS21042L08 rated to 1670 lb. Tension ref. MS21042]

$$MS_1 := \frac{840}{1.15 \cdot BT_{max}} - 1 = 6478\% \quad \text{Ref. FAR23.625 Fitting Factor}$$

[Extremely High]

Where: $\Phi A := 0.285$ Minimum Head Dia., MS24693 (#8-32) Ref. Specification MS24693

$Th_0 := 0.080$ Material Thickness, Ref. Drawing IR-2300-1

$$Ashear := \pi \cdot \Phi A \cdot Th_0 = 0.072$$

$$n_{up} = 3.00 \quad F_{su} := 27000 \text{ psi; 6061-T6 Sheet, Ref. MMPDS, 3.2.6.0(b1)}$$

$$\sigma_{shear} := \frac{BT_{max}}{Ashear} = 155.03 \quad MS_2 := \frac{F_{su} \cdot Ashear}{1.15 \cdot BT_{max}} - 1 = 15044\% \quad \text{[Ref. Tear-Thru]}$$

Based on Forward inertial load, ref. Bruhn Chapter D1

$$TX_{2,i} := \frac{x_i \cdot MY_{1,2}}{\sum_i (x_i)^2} \quad TY_{2,i} := \frac{y_i \cdot MX_{1,2}}{\sum_i (y_i)^2} \quad BLT_{2,i} := (TX_{2,i} + TY_{2,i})$$

[Ultimate Bolt Tension, IR-2000-1 Button Installation, Forward Inertial Load]

$x_i =$	$y_i =$	$TX_{2,i} =$	$TY_{2,i} =$	$BLT_{2,i} =$
2.02	2.15	-0.45	84.35	84
2.02	-2.15	-0.45	-84.35	-85
-2.02	2.15	0.45	84.35	85
-2.02	-2.15	0.45	-84.35	-84

$$\frac{\sum_i BLT_{2,i}}{n_2} = 0.00$$

Must equal zero

BLTmax := max(BLT) = 85 lb. [MS24693 (#8-32) rated to 840 lb. Tension ref. MS24693]

[MS21042L08 rated to 1670 lb. Tension ref. MS21042]

$$MS_3 := \frac{840}{1.15 \cdot BLT_{max}} - 1 = 761\% \quad \text{Ref. FAR23.625 Fitting Factor}$$

[High]

Where: $\Phi B := 0.16$ Dia., MS24693 (#8-32) Ref. Specification MS24693

$Th_0 = 0.080$ Material Thickness, Ref. Drawing IR-2300-1

$$\text{Bearing Load} = BL := n_{forward} \cdot \frac{\text{Weight}}{4} = 58.50 \text{ lb./screw}$$

$$\text{Bearing Area} = BA := \Phi B \cdot (Th_0) = 0.013 \text{ sq. in. per screw}$$

$$\sigma_{\text{bearing}} := \frac{BL}{BA} = 4570 \text{ psi}$$

$$n_{\text{forward}} = 18.00$$

[Ultimate Bearing Stress, Forward Inertial Load]

$$F_{\text{bru}} := 88000 \text{ psi, Ref. MMPDS, 3.6.2.0(b1)}$$

$$MS_4 := \frac{F_{\text{bru}}}{1.15 \cdot \sigma_{\text{bearing}}} - 1 = 1574\% \quad \text{Ref. FAR23.625 Fitting Factor}$$

[Extremely High]

$$\begin{pmatrix} MX_{1,3} \\ MY_{1,3} \\ MZ_{1,3} \end{pmatrix} := X_1 \times PV_3 = \begin{pmatrix} 0.00 \\ 177.71 \\ 0.00 \end{pmatrix} \text{ lb.-in.; [Moment on Bolt Pattern due to Side g-load]}$$

$$n_{\text{side}} = 4.50$$

$$TX_{3,i} := \frac{x_i \cdot MY_{1,3}}{\sum_i (x_i)^2} \quad TY_{3,i} := \frac{y_i \cdot MX_{1,3}}{\sum_i (y_i)^2} \quad BOLT_{3,i} := (TX_{3,i} + TY_{3,i})$$

$x_i =$	$y_i =$	$TX_{3,i} =$	$TY_{3,i} =$	$BOLT_{3,i} =$
2.02	2.15	22.05	0.00	22
2.02	-2.15	22.05	0.00	22
-2.02	2.15	-22.05	0.00	-22
-2.02	-2.15	-22.05	0.00	-22

$$\frac{\sum_i BOLT_{3,i}}{n_2} = 0.00$$

Must equal zero

$$BoltT_{\text{max}} := \max(BOLT) = 22 \text{ lb.} \quad \text{[MS24693 (#8-32) rated to 840 lb. Tension ref. MS24693]}$$

[MS21042L08 rated to 1670 lb. Tension ref. MS21042]

$$MS_5 := \frac{840}{1.15 \cdot BoltT_{\text{max}}} - 1 = 3213\% \quad \text{Ref. FAR23.625 Fitting Factor}$$

[Extremely High]

$$\phi A = 0.285 \quad \text{Minimum Head Dia. } Th_0 = 0.080 \quad \text{Material Thickness } Ashear = 0.072$$

$$F_{su} := 27000 \text{ psi; 6061-T6 Sheet, Ref. MMPDS, 3.2.6.0(b1)}$$

$$MS_6 := \frac{F_{su} \cdot Ashear}{1.15 \cdot 1.5 \cdot BoltT_{\text{max}}} - 1 = 4985\% \quad \text{Ref. FAR23.625 Fitting Factor}$$

[Extremely High]

The above completes analysis of attachment to the shelf to C182IR-1012-1 Support Assy.

Ref. (8 ea.) MS24693S51 (#8-32) screws, rated $840/2 = 420$ lb. shear) to attach the Mount Pin Blocks to the IR-2300-1 plate, (4 ea.) MS24693S based on 18.0 Forward inertial loading (13 lb. at 3.10 inches above the shelf).

Ref. Figure 1, $M_x := (3.10) \cdot (n_2 \cdot \text{Weight}) = 725$ in.-lb., where: $n_2 = 18.00$
Weight = 13.00

$$Y_1 := 1.79 \quad Y_2 := 2.24 \quad Y_3 := 7.58 \quad Y_4 := 8.28$$

$$VT_i := \frac{Y_i \cdot M_x}{\sum_i (Y_i)^2}$$

$i =$	$Y_i =$	$VT_i =$
1	1.79	10
2	2.24	12
3	7.58	41
4	8.28	45

= Up Load on each ECU Tie-Down Point Due to Forward Inertia Load, 18g Ultimate

By Inspection Max Load = $ML := VT_4 = 45$ lb.

Ref. Fig. 1, $T_{\max} := \frac{1}{2} \cdot \frac{[0.81 \cdot (1.19 \cdot VT_4)]}{(0.31^2 + 0.81^2)} \cdot 1.15 = 33 \text{ lb.}$ Ref. FAR23.625 Fitting Factor
Ref. MS24693S51 (#8-32); rated 840 lb.

By Inspection Secondary Load = $M2 := VT_3 = 41$ lb.

Ref. Fig. 1, $T2_{\max} := \frac{[0.68 \cdot (0.24 \cdot VT_3)]}{(0.25^2 + 0.68^2)} \cdot 1.15 = 15 \text{ lb.}$ Ref. FAR23.625 Fitting Factor
Ref. MS24693S27 (#6-32); rated 725 lb.

These calculations show that Margins-of-Safety reference FLIR TALON ECU installation on IR-2300-1 equipment shelf assembly, FAR requirements 23.561, 23.625 are extremely large.

United States of America
Department of Transportation Federal Aviation Administration
Supplemental Type Certificate

Number SA00294DE

This certificate, issued to Paravion Technology, Inc.
2001 Airway Avenue
Fort Collins, CO 80524

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 3 of the Civil Air Regulations.

Original Product—Type Certificate Number: 3A13
Make: Cessna
Model: R182, 182R, 182T, T182T, 182Q, & 182S

Description of the Type Design Change:

Installation of an external Infrared Imaging System in accordance with Paravion Technology Master Drawing List Report No. DL-C182IR-100, Revision N/C, dated March 19, 1997, or later FAA approved revision.

Limitations and Conditions:

1. Compatibility of this design change with previously approved modifications must be determined by installer.
2. A copy of this certificate and Flight Manual Supplement must be maintained as part of the permanent records for the modified aircraft.
3. FAA approved Aircraft Flight Manual Supplement, PR-C182IR-100M, Revision 0, dated June 6, 1997, or later FAA approved revision is required.
4. If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: January 10, 1997

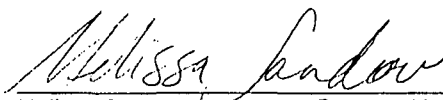
Date reissued:

Date of issuance: June 10, 1997

Date amended: 2/18/98; 4/8/04; February 17, 2009



By direction of the Administrator



Melissa Sandow (Signature) Program Manager
Northwest Mountain Region
Denver Aircraft Certification Office
(Title)

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

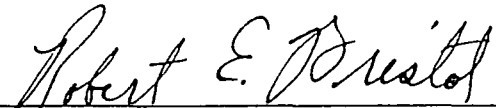
This certificate may be transferred in accordance with FAR 21.47.

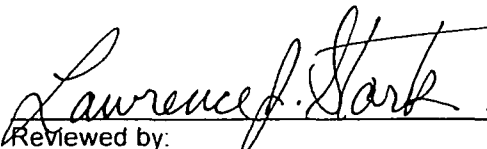
PARAVION TECHNOLOGY, INC.
2001 AIRWAY AVENUE
FT. COLLINS, COLORADO 80524

ER-C182ELP-2

Rev. N/C

Structural Substantiation Engineering Report for FLIR TALON Installation on Cessna Model 182 Aircraft

 Oct. 12, 2011
Prepared by: _____ Date: _____
Robert E. Bristol

 10-12-2011
Reviewed by: _____ Date: _____
Larry Stark

Revision History

Revision	Date	Detail of Changes	By
N/C	10-12-2011	Original REB	REB

Acronyms

AC	Advisory Circular
A/C	Aircraft
ACO	Aircraft Certification Office
CFR	Code of Federal Regulations
CP	Certification Plan
DER	Designated Engineering Representative
FAA	Federal Aviation Administration
KEAS	Knots Equivalent Airspeed
KIAS	Knots Indicated Airspeed
STC	Supplemental Type Certificate
TBD	To Be Determined
TC	Type Certificate
TCDS	Type Certification Data Sheet

Based on model R182

V_A	Design Maneuvering Speed = 112 knots (Ref. TCDS 3A13)
V_C	Design Cruising Speed = 160 knots (Ref. Cessna Literature)
V_{NE}	Never Exceed Speed = 182 knots (Ref. TCDS 3A13)
V_D	Dive Speed; 230 knots Ref. CFR14, 23.335

References

Document No.	Document Title
TCDS 3A13 Revision 69, April 20, 2009	Type Certification Data Sheet for Cessna Model 182
AC 23-19A	Airframe Guide for Certification of Part 23 Airplanes
Ref. 1	MMPDS-03, "Metallic Materials and Elements for Flight Vehicle Structures", U.S. Government Printing Office, Washington, D.C.
Ref. 2	Fluid Dynamic Drag, Hoerner, S.F.
Ref. 3	NACA-TN 2960 "Drag of Circular Cylinders for Wide Range of Reynolds Numbers and Mach Numbers"
	"Airframe Stress Analysis and Sizing", 2nd Edition, Michael C. Y. Niu, Hong Kong Conmilit Press, Ltd.
	"Analysis and Design of Flight Vehicle Structures", E. F. Bruhn, Jacobs Publishing, Inc.
	"Stress Concentration Factors", R.E. Peterson, John Wiley & Sons, 1974
	"Introduction to Flight", J. D. Anderson, McGraw-Hill Book Company

1.0 Introduction

1.1 Purpose and Scope

This report presents structural substantiation for the C182ELP-100 External Loads Provision Installation as installed to support FLIR Talon imaging unit installation. This report shows compliance to 14 CFR 23.301(a)(b)(c), 23.303, 23.305, 23.307(a), 23.321, 23.333, 23.335(a)(b), 23.337(a)(b), 23.341, 23.441(a), 23.443(a)(c), 23.471, 23.473(a)(d)(e)(g), 23.479, 23.481(a)(b), 23.483, 23.485, 23.493, 23.613, 23.619 and 23.625(a). All regulations are as set forth in Amendment 61 to CFR14, Part 23.

Representative External Loads Provision Installation, with reference load installed, is shown in Figure 1.

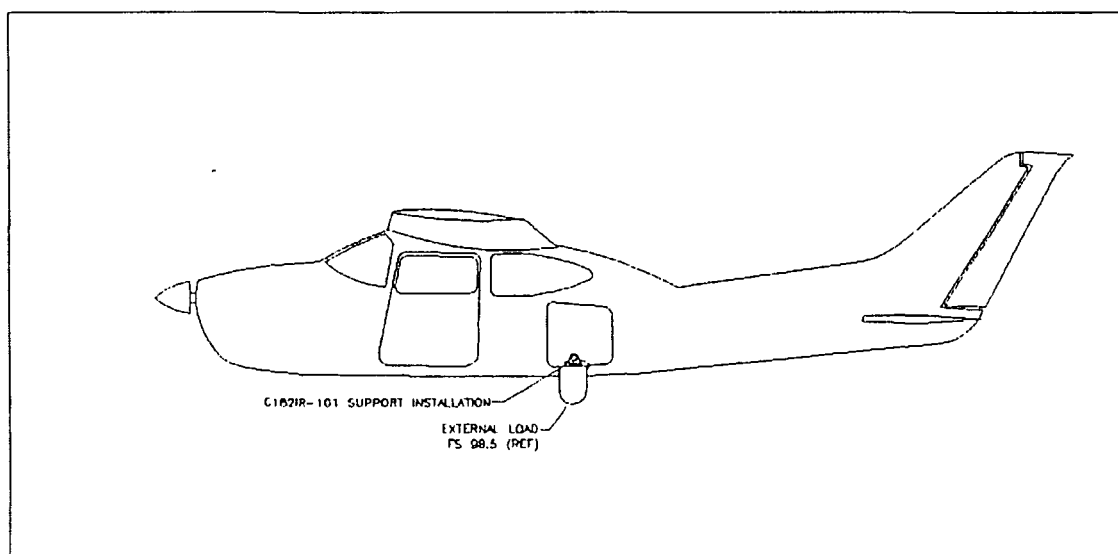


Figure 1 - External Loads Provision Installation

The External Loads Provision is mounted to the floor of the Cargo compartment of Cessna 182 aircraft, and extends through a hole cut through the Cargo compartment door. This mount accepts a second mount bracket, which is designed to accept a mount plate to which the external load is attached. This report documents loading (load weight, shape, and mount plate configuration) applicable to use with FLIR TALON system installed.

1.2 Compliance Summary

The design and analysis of the modification shows that the installation meets all applicable structural requirements identified below. The minimum margin-of-safety for each installation is shown in Table 1. Analysis begins at the FLIR TALON imager unit installation and proceeds installation of the Support Assembly (C182IR-1012) to the Cargo Compartment floor.

Margin-of-safety greater than 500% is reported as HIGH.
Minimum Margin of Safety Summary

Section	Description	Mode of Failure	Margin
Attached Calculations	SX5-606-1 Support Plate (1/4-inch 6061-T6)	Shear-Thru	High
	SX5-606-1 Support Plate, Load Attaching Bolt	Tension	411%
	IR-4301- 10 Adapter Plate (Outer Bolt Circle)	Attaching Bolt Tension	High
	IR-4301- 10 Adapter Plate (Outer Bolt Circle)	Attaching Bolt Tear-Thru	High
Attached Calculations	<u>IR-1040 Support Assy (Mount Bracket)</u>		
	Channel Rivets Installation	Shear	132%
	Bracket Installation, AN525-10 Screws	Shear	High
	Torsional Stress	Shear	491%
	Bending	Tension	High
	Rotation Lock	Static Friction	98%
Attached Calculations	<u>IR-1060-1 Bolt</u> (1/4-28, 303 Stainless)	Tension, assuming 50-70 in-lb Wrench Torque	6%
Attached Calculations	<u>C182IR-1012 Support Assy Instn</u>		
	Tube Torsional Stress	Shear	High
	Attaching Screws, IR-1032, NAS1303	Shear	77%
	Cargo Floor Screws MS35207-264, Tension	Tension	259%

Regulatory compliance for this change is based on the following:

14 CFR; Part 23 including Amendments 23-1 through 23-61.

Table 1 – Compliance Summary

14 CFR	Title	Amdt.	Compliance Statement
	Subpart C - Structure		
	GENERAL		
23.301 (a)(b)(c)	Loads.	23-48	The installation is analyzed for limit loads as calculated in this document. Appropriate Factor of Safety and Fitting Factor are included as part of this analysis
23.303	Factor of safety.	23-0	All limit loads are multiplied times a 1.5 factor of safety.
23.305	Strength and deformation.	23-45	Analysis shows that the modified structure is able to support limit loads without detrimental or permanent deformation.
23.307 (a)	Proof of structure.	23-0	Analysis using reliable methods shows that strength and deformation requirements for 23.305 are met for all load cases in 23.301.
	FLIGHT LOADS		
23.321	General.	23-45	Flight load factors for critical altitudes and weights for the flight envelope defined in the POH are used in the analysis. Compressibility effects are not significant.
23.333	Flight envelope.	23-34	Installation of Talon System does not alter the flight characteristics of the OEM aircraft. A flight envelope for use in applied loads on ELP is generated in a conservative manner.
23.335(a)(b) (c)(d)	Design airspeeds.	23-48	The installation of Talon System does not alter the design airspeeds of the aircraft. A flight envelope for use in applied loads is generated in a conservative manner.
23.337(a)(b)	Limit maneuvering load factors.	23-48	Limit maneuver load factors as prescribed in the regulation for normal category aircraft are used in the analysis with FLIR Talon System installed.

23.341(c)	Gust load factors.	23-48	Limit gust load factors as calculated per 23.341(c) are used in the analysis with FLIR Talon System installed.
	VERTICAL SURFACES		
23.441(a)	Maneuvering loads.	23-48	Maneuvering loads based on vertical surface area with FLIR Talon System installed are used in the analysis.
23.443(a)(c)	Gust loads.	23-48	Gust loads based on vertical surface area with FLIR Talon System installed are used in the analysis.
	GROUND LOADS		
23.471	General.	23-0	Installation does not alter the ground loads of the OEM aircraft. A conservative estimate of loads for use in applied loads is used in the analysis.
23.473(a)(d) (e)(g)	Ground load conditions and assumptions.	23-48	Installation does not alter the ground loads of the OEM aircraft. A conservative estimate of loads for use in applied loads is used in the analysis..
23.479	Level landing conditions.	23-45	Installation does not alter the ground loads of the OEM aircraft. A conservative estimate of loads for use in applied loads is used in the analysis.
23.481(a)(b)	Tail down landing conditions.	23-0	Installation does not alter the ground loads of the OEM aircraft. A conservative estimate of loads for use in applied loads is used in the analysis..
23.483	One-wheel landing conditions.	23-0	Installation does not alter the ground loads of the OEM aircraft. A conservative estimate of loads for use in applied loads is used in the analysis..
23.485	Side load conditions.	23-45	Installation does not alter the ground loads of the OEM aircraft. A conservative estimate of loads for use in applied loads is used in the analysis.
23.493	Braked roll conditions.	23-0	Installation does not alter the ground loads of the OEM aircraft. A conservative estimate of loads for use in applied loads is used in the analysis.

	Subpart D – Design and Construction		
23.601	GENERAL	23-0	N/A
23.613	Material strength properties and design values.	23-45	Statistically based material strength properties from MMPDS are used in the analysis. 'A' basis values are used for single member structural elements and 'B' basis values are used for redundant structure.
23.619	Special factors.	23-45	Standard analysis and aerospace grade materials are used for the design so no special factors of safety are required to address uncertainty, deterioration or appreciable variability.
23.625 (a)	Fitting factors.	23-7	A fitting factor of 1.15 was applied to each fitting substantiated by analysis. No additional fitting factor is required for continuous joints with multiple fasteners and section properties typical of the member being spliced.

Analysis is based on ultimate maneuvering load factor, gust load factor requirements, and ground loading requirements. It is shown that external load installation within loading limits will not have detrimental or permanent deformation during flight operations within certificated aircraft limitations.

FLIGHT ENVELOPE

(knots)

$V_p =$ $n_p =$

RESULTS SUMMARY:

Margins-of-Safety:

$C_d = 0.85$

$MS_1 = 1054\%$ (HIGH) Mount Plate Shear Thru
 $MS_{11} = 5857\%$ Tear-Thru, IR4301 Skirt

$MS_2 = 411\%$ Mount Plate Screws, Tension
 $MS_{21} = 1317\%$ AN3, IR-4301 Skirt

$MS_3 = 132\%$ Rivet Shear, Channels Instn

$MS_4 = 557\%$ (HIGH) Screw Shear, Bracket Instn[AN525]

$MS_5 = 491\%$ Torsional Stress, Inner Spt Tube

$MS_8 = 507\%$ (HIGH) Bending Stress, Inner Spt Tube

$MS_6 = 857\%$ (HIGH) Torsional Stress, Outer Support Tube

$Vel_p =$

"Maneuvering"	112	3.93
"Cruise"	160	5.62
"Dive"	230	4.32
"Maneuvering"	112	-1.57
"Cruise"	160	-3.62
"Dive"	230	-2.32
"Landing"	49	2.05

$MS_7 = 98\%$ Based on Friction Lock at Tapered Collar, IR-1060-1 Bolt at 50-70 in.-lb. Wrench Torque(40000 psi Tension)

$MS_{71} = 9\%$ Based on Shear(MS27039-1-11) Anti-Rotation Lock Screw Only

$MS_{90} = 139\%$ Cargo Compartment Mount Bracket Screws, Shear, Based on MS27039, #10-32

$MS_{92} = 488\%$ MS35207-264 Cargo Compartment Mount Bracket Screws, Tension

$MS_{10} = 6\%$ Tension Stress, IR-1060-1 Bolt at 50-70 in.-lb. wrench torque.

NOTE: Worst-Case Tension Loading imposed on the (10)CR3214-4 Rivets fastening the inboard end of the C182IR-1022 Support to the Cargo Floor is 27 lb. (3 lb. per rivet). These rivets are rated to 250 lb. tension each rivet.

Worst-Case Tension Loading imposed on the (4) #10 screws at the outboard end is 165 lb. (42 lb. per screw). These screws are rated to 1200 lb. tension.

2.0 External Loads

2.1 Model Information

This document is applicable to:

Cessna model 182; 182Q, 182R, 182S, 182T, T182T, R182*

Type Certificate (TC) Holder:

Cessna Aircraft Company

P. O. Box 7704

Wichita, Kansas 67277

Type Certification Data Sheet (TCDS):

3A13 Revision 69, April 20, 2009

Basic Aircraft Information from TCDS– Model 182:

Lycoming O-540., 235 Horsepower at 2400 rpm (R182)

Maneuver speed. $V_A = 112$ KIAS (R182)

Never Exceed Speed, $V_{NE} = 182$ KIAS (R182)

Maximum Takeoff Weight = 3,100 Lbs.

Maximum Landing Weight = 2,950 Lbs.

Basic Aircraft Information for Cessna website:

Maximum Useful load = 1,030 Lbs.

Wing Span = 36 Ft.

Standard Empty Weight = 2,095 Lbs.

Wing Area = 174 sq. ft.

Wing Loading = 3100 Lb./174 sq. ft. = 17.816 Lbs/sq ft

Stall Speed = 49 KCAS

- R182 is shown as worst-case

2.2 Load Axis System

The loads axis system is a "right-handed" system defined in the aircraft (A/C) coordinate system as follows:

- X: (+) LH Outboard normal to the A/C centerline of the fuselage
- Y: (+) Aft along A/C centerline of the fuselage
- Z: (+) Up normal to A/C centerline along the fuselage

Acceleration loads are provided as accelerations in "G" and are aircraft accelerations. For example;

$N_z = 5.0$ means aircraft is accelerated 5 g's vertically upward

In evaluating an item of mass, inertial load on the part is calculated as:

$$F_z = -5.0g \times (Wt \text{ of part})$$

whereby a positive acceleration imparts a negative direction inertial force.

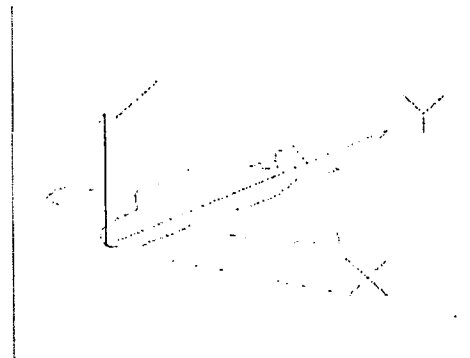


FIGURE 2, LOAD AXIS SYSTEM

2.3 Design Airspeeds

The flight envelope is per 23.333 and TCDS information:

Design Maneuvering Speed, $V_A = 112$ KIAS

Minimum design cruising speed calculated per 14 CFR 23.335(a):

Where: $W = 3100$ $S = 174$ $V_h = 182$ KIAS (V_{NE} , R182)

Ref. 23.335(a)(1) $V_C := 33 \cdot \sqrt{\frac{W}{S}} = 139$ KEAS

MINIMUM;

$V_C = 159$ KEAS, Ref. Cessna Literature

Ref. 23.335(a)(2)

$$\frac{W}{S} = 17.82 < 20 \quad (\text{multiplier 33 is required.})$$

Ref. 23.335(a)(3) V_C need not be greater than $0.9 \cdot V_H = 0.9 \cdot 182 = 164$ KEAS, Sea Level

Therefore V_C is set to **164 KIAS = 277 ft./sec. for this analysis**

Dive speed is calculated from 23.335(b):

Ref. 23.335(b)(2)(i)

$$V_D = 1.4 \cdot V_C = 230 \text{ KEAS}$$

Ref. 23.335(b)(3)

$$\frac{W}{S} = 17.82 < 20 \quad (\text{multiplier 1.4 is required})$$

Therefore V_D is set to **230 KEAS = 388 ft./sec. for this analysis**

2.4 Limit Maneuvering Load Factors

The maximum limit load factors at maneuvering speed V_C per 14 CFR 23.337 for normal category aircraft are used:

Ref. 23.337(a)(1)

$$n := 2.1 + \frac{24000}{GW + 10000} = 3.93 \quad \text{Positive, need not be greater than 3.8}$$

Ref. 23.337(b)(1)

$n = 0.4 \cdot 3.93 = 1.57$ Negative, for this analysis

Pitch, yaw and rolling accelerations due to abrupt maneuvers are relatively small for this installation due to proximity or the installation to the aircraft center of gravity. Therefore the principle loads due to maneuver are as defined by 23.337.

2.5 Limit Gust Load Factors

Maximum limit gust load factors are calculated per the method in 14 CFR 23.341. A conservative airplane normal force coefficient is assumed:

$$a := 2 \cdot \pi = 6.28 \text{ /radian (Note: } a \cdot \frac{\pi}{180} = 0.11 \text{ /degree)}$$

$$g_{\text{max}} := 32.2 \text{ feet per second per second}$$

$$\rho := 0.00238 \text{ lb-sec}^2/\text{ft}^4 \text{ (slug/ft}^3\text{)}$$

Where: MFW = 2095 + 180 = 2275 lb. (Std Empty Weight + 1 Crew)

$$\mu_g := 2 \cdot \frac{\left(\frac{\text{MFW}}{S} \right)}{\rho \cdot C_h \cdot a \cdot g} = 11.24 \quad K_g := \frac{0.88 \mu_g}{5.3 + \mu_g} = 0.60$$

Using

$$V_c := 164 \text{ knots}$$

$$N_{\text{positiveCruise}} := 1 + \frac{K_g \cdot U_{\text{dec}} \cdot V_c \cdot a}{498 \cdot \left(\frac{\text{MFW}}{S} \right)} = 5.73 \quad N_{\text{negativeCruise}} := 1 - \frac{K_g \cdot U_{\text{dec}} \cdot V_c \cdot a}{498 \cdot \left(\frac{\text{MFW}}{S} \right)} = -3.73$$

Using

$$V_d := 230 \text{ knots}$$

$$N_{\text{positiveDive}} := 1 + \frac{K_g \cdot U_{\text{ded}} \cdot V_d \cdot a}{498 \cdot \left(\frac{\text{MFW}}{S} \right)} = 4.32 \quad N_{\text{negativeDive}} := 1 - \frac{K_g \cdot U_{\text{ded}} \cdot V_d \cdot a}{498 \cdot \left(\frac{\text{MFW}}{S} \right)} = -2.32$$

2.6 Limit Ground Load Factors

The descent velocity in feet per second per 23.473(d) is;

$$V_g = 4.4 \left(\frac{W}{S} \right)^{1/4} = 9.0 \text{ ft./sec. where } W = 3100 \text{ lb., } S = 174 \text{ sq. ft.}$$

Need not exceed 10 ft./sec., may not be less than 7 ft./sec.

The landing gear static gear deflection is measured at 2.50 inches at MTOW. This indicates that the landing gear spring rate is:

$$K = \frac{2950}{2.5} = 1,180 \text{ lb. per inch}$$

The landing gear is modeled as a simple spring mass system as shown in Figure 2 – Landing Gear System.

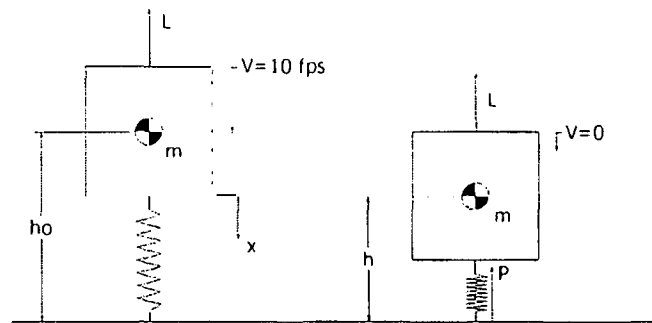


Figure 3 – Landing Gear System

The diagram above represents the airplane and landing gear at the point of initial contact with the ground where the downward velocity is 9 ft/s and the spring force is zero. Maximum acceleration occurs at the bottom of the stroke when downward velocity is zero and the spring compression and therefore resulting force and acceleration are maximum. Maximum spring compression is conservatively found by assuming the work done by the airplane is converted to spring energy. Such that;

$U = \Delta KE + FX = \Delta SE$; Work done by the aircraft = Spring Energy increase.

$\Delta KE = \frac{1}{2} \frac{GW}{g} (v^2)$ Where v = vertical velocity at contact, reduced to 0 at maximum compression, GW = aircraft gross weight at touchdown, g = acceleration of gravity.

$FX = \frac{GW}{3} Y1$ Where wing lift equal to 2/3 of airplane weight (GW) is assumed per 23.477(e).

$\Delta SE = \frac{1}{2} KY1^2$ Where K = Spring Constant ($=GW/Yo$), Yo = Static Gear Deflection at aircraft weight GW , and $Y1$ = maximum gear deflection during landing (vertical velocity = 0)

Using the above equations, the following quadratic equation can be written:

$$Y1^2 - 2 \left(\frac{Yo}{3} \right) Y1 - \left(\frac{Yo}{g} v^2 \right) = 0$$

Therefore; $Y1 = \left(\frac{Y0}{3}\right) + \sqrt{\left(\frac{Y0}{3}\right)^2 + \left(\frac{Y0}{g} v^2\right)}$

Solving for the Vertical Force on the aircraft at maximum gear deflection Y1,

$$F1 = \frac{GW}{g} Y1 + \frac{2}{3} GW$$

And: $\frac{d^2}{dx^2} y = \frac{F1}{\frac{GW}{g}} = \left[\frac{Y1}{Y0} + \frac{2}{3}\right] g$

= Maximum vertical acceleration in units of g.

Where: Y0 = 2.50 inches (= 0.21 ft Static Deflection) and v = 9 ft/sec., maximum vertical aircraft acceleration (inertia load factor) is calculated to be 2.1 g.

2.7 Limit Longitudinal Airloads

Limit drag load is calculated by the following equation:

$$F_Y = \frac{1}{2} \rho V^2 S C_d = \frac{1}{2} (0.00238) (v)^2 (S) (C_d)$$

Where: v = airspeed in ft/sec, S = Load frontal area in sq. ft (0.83),

Cd = 0.85

2.8 Limit Lateral Maneuver and Gust Airloads

External loads can also have an exposed vertical surface which results in a side or lateral load.

These calculations are based on flat area as above (side area projection of Talon installation is equivalent to frontal projection. Drag coefficient used for sideward flow is 0.85. Forces can be resolved into a normal force or lateral load on the external load by the using the cross-flow principle in Ref 2.

$$F_N = q S C_N$$

Where the q, the dynamic pressure is;

$$q = \frac{1}{2} \rho V^2$$

The normal force coefficient for a body inclined to the flow at an angle of attack is given by.

$$C_N = C_{D_{basic}} (\sin^2 \alpha)$$

$$F_x = qSC_d (\sin^2 \beta)$$

Lateral maneuver load at speeds up to V_A is calculated per 23.441 using:

Static freestream sideslip angle equal to 15 degrees per 23.441(a)(3).

Overswing angle 1.5 times static per 23.441(a)(2).

Assuming sidewash factor equal to 2.0 to account for local flow around the fuselage side due to sideslip maneuver.

$$\beta_{max} = 15 \times 1.5 \times 2.0 = 45 \text{ deg.}$$

Lateral gust load at speeds up to V_C is calculated per 23.443 using:

$$U_{de} = 50 \text{ ft./sec. at } V_C \text{ per 23.333(c)}$$

$$V_C = 164 \text{ knots} = 277 \text{ ft/sec.}$$

Equivalent sideslip angle:

$$\beta = \tan^{-1} \left(\frac{U_{de}}{V_C} \right) = \tan^{-1} \left(\frac{50}{277} \right) = 10.2 \text{ deg.}$$

Assuming a sidewash factor equal to 2.0 to account for local flow around the fuselage side due to side gust:

$$\beta_{max} = \beta(2.0) = 10.2(2.0) = 20.4 \text{ deg.}$$

Lateral gust loads at speeds up to V_D are conservatively included by using the gust velocity per 23.333(c) of 25 fps.

$$V_D = 371 \text{ fps } V_d = 230 \text{ knots} = 388 \text{ ft./sec.}$$

Equivalent sideslip angle:

$$\beta = \tan^{-1} \left(\frac{U_{de}}{V_d} \right) = \tan^{-1} \left(\frac{50}{388} \right) = 3.7 \text{ deg.}$$

$$\beta_{max} = \beta(2.0) = 3.7(2.0) = 7.4 \text{ deg.}$$

Therefore the limit lateral load for maneuver and gust conditions is as shown below, in Table 3:

Table 2 - Limit Loading for Maneuver and Gust Conditions

Condition	V (fps)	β_{MAX} (deg)	q (psf)	S (ft ²)	C _D	F _x (Lbs)	F _y (Lbs)
Maneuver (V _A)	189	45	42.5	0.83	0.85	15	30
Gust (V _C)	270	20.4	86.8	0.83	0.85	8	61
Gust (V _D)	388	7.4	179	0.83	0.85	2	126
Landing (V _S)	83	45	8.14	0.83	0.85	3	6

2.9 Limit Inertia Loading

The Turret Weight used in this analysis is 35 lbs. The Support Assembly weight used is 5 lb. The Electronic Control Unit weight is 13 lb.

Resulting applied vertical load is computed based on the maximum N_z load factors found in sections 2.4, 2.5 and 2.6., by the following equation:

$$F_z = -N_z \cdot (35)$$

2.10 Net Applied External Loads

The air loads and inertia loads for a component of maximum area and weight combined for each corner of the V-n diagram are shown in Table 3.

Table 3 – Net Limit Loads at Centroid of External Load

Case - Condition	F _x (lbs)	F _y (lbs)	F _z (lbs)
1 - V _A -positive	15	30	-138
2 - V _C -positive	8	61	-197
3 - V _D -positive	2	126	-151
4 - V _A -negative	15	30	+55
5 - V _C -negative	8	61	+127
6 - V _D -negative	2	126	+81
7 - V _S -Landing	3	6	-72

These loads are applied at the center of area for the external load (~7.9 inches below the Support Mount Plate for the Talon installation).

Applied direct loads and Moments at evaluation locations are defined in the Calculations (MathCad Format) attached to this report. Annotations are contained in the calculations listing to define the purpose of calculations. These calculations are therefore not repeated in the body of this report.

Table 4 – Net Limit Loads at Mount Plate Surface Center

Case - Condition	N _z	Direct Loads			Torsional Moment		
		P _x (lbs)	P _y (lbs)	P _z (lbs)	M _x (in-lbs)	M _y (in-lbs)	M _z (in-lbs)
1 - V _A -positive	+3.93	15	30	-138	227	-114	0
2 - V _C -positive	+5.62	8	61	-197	463	-59	0
3 - V _D -positive	+4.32	2	126	-151	957	-16	0
4 - V _A -negative	-1.57	15	30	+55	227	-114	0
5 - V _C -negative	-3.62	8	61	+127	463	-59	0
6 - V _D -negative	-2.32	2	126	+81	957	-16	0
7 - V _S -Landing	+2.05	3	6	-72	43	-22	0

These loads are representative of the FLIR Talon installation, 35 lb. Turret, 0.83 square feet projected area and 0.85 Drag Coefficient.

3.0 Allowables

3.1 Materials

All materials used in the design are specified by industry material specification with statistically based material strength properties included in the MMPDS (Ref. 1). For the analysis 'A' basis values are used for single member structural elements and 'B' basis values maybe used for redundant structure. Aerospace grade materials with proven methods of corrosion protection are used for the design so no special factors of safety are required to address uncertainty, deterioration or appreciable variability. The environmental temperatures in the area of the design are well within the allowable range for the aluminum structure used. Therefore, no correction is required to account of the effects of temperature.

Applicable material allowables from MMPDS for the materials used in the design are summarized in Table 5.

Table 5 – Material Allowables

Material	Type	Specification	F_{tu} (ksi)	F_{cy} (ksi)	F_{su} (ksi)	F_{bru} (ksi) e/D=2	E (msi)	MMPDS
6061-T6	Sheet 0.010-0.249	AMS- QQ-A- 250/11	42	35	27	88	9.9	3.6.2.0(b ₁)
6061-T62 & T6511	Plate; 0.25-2.0 in.	AMS- QQ-A- 250/11	42	36	27	88	9.9	3.6.2.0(b ₂)
6061-T6, & T62	Tube and Pipe 0.025 - 0.50 Wall Thick	AMS- WW- T-700/6	42	34	27	88	9.9	3.6.2.0(c ₁)

Mechanical properties for the minimum strength direction are used unless otherwise noted. Bearing allowables are based on 2.0 e/D.

3.2 Fasteners

All fasteners used in the design are specified by military or industry specification with statistically based material strength properties included in the MMPDS or the fastener specification. The fasteners are aerospace grade which are well proven in this type of application. No special factors of safety are required to address uncertainty, deterioration or appreciable variability. The environmental temperatures in the area of the design are well within the allowable range for fasteners used and no correction is required to account of the effects of temperature.

Fastener allowables from MMPDS or the fastener specification are summarized in Table 6.

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These loads are representative of the FLIR Talon installation, 35 lb. Turret, 0.83 square feet projected area and 0.85 Drag Coefficient.

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Applicable material allowables from MMPDS for the materials used in the design are summarized in Table 5.

Table 6 – Fastener Allowables

Fastener	Type	Nominal Diameter (in)	Tension (lbs)	Single Shear (lbs)	Ref
MS27039-1-11	Screw	0.190	2500	2125	Specification MS27039
MS35207-264	Screw	0.190	1200	600 (1/2 Tension)	Specification MS35207
AN4-10A	Bolt, Steel	0.250	4080	3680	Specification AN3 – AN20
AN3-10A	Bolt, Steel	0.190	2210	2125	Specification AN3 – AN20
AN525-10	Screw, Washer Head	0.190	4780	2125	MMPDS, AN525 EngrsEdge.com Tensile Thrd Area
MS20426AD4 MS20470AD4	Rivet	0.125	N/A	319	26000 psi Mil-R-5674F

4.1 SX5-606-3 Support Plate

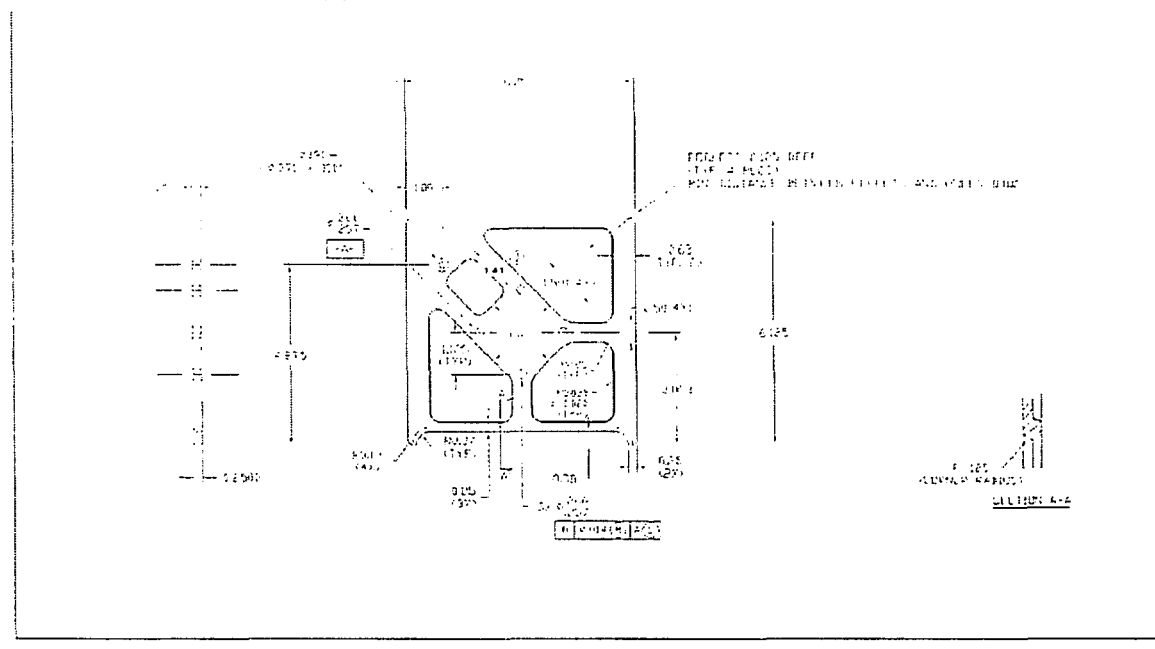


Figure 4 – SX5-606-1 Support Plate

$F_{su} = 27 \text{ ksi (A)}$
 28 ksi (B)

$F_{tu} = 42 \text{ ksi (A)}$
 43 ksi (B)

Ref. MMPDS, 3.6.2.0(b₁)

4.2 IR-1040 Mount Bracket

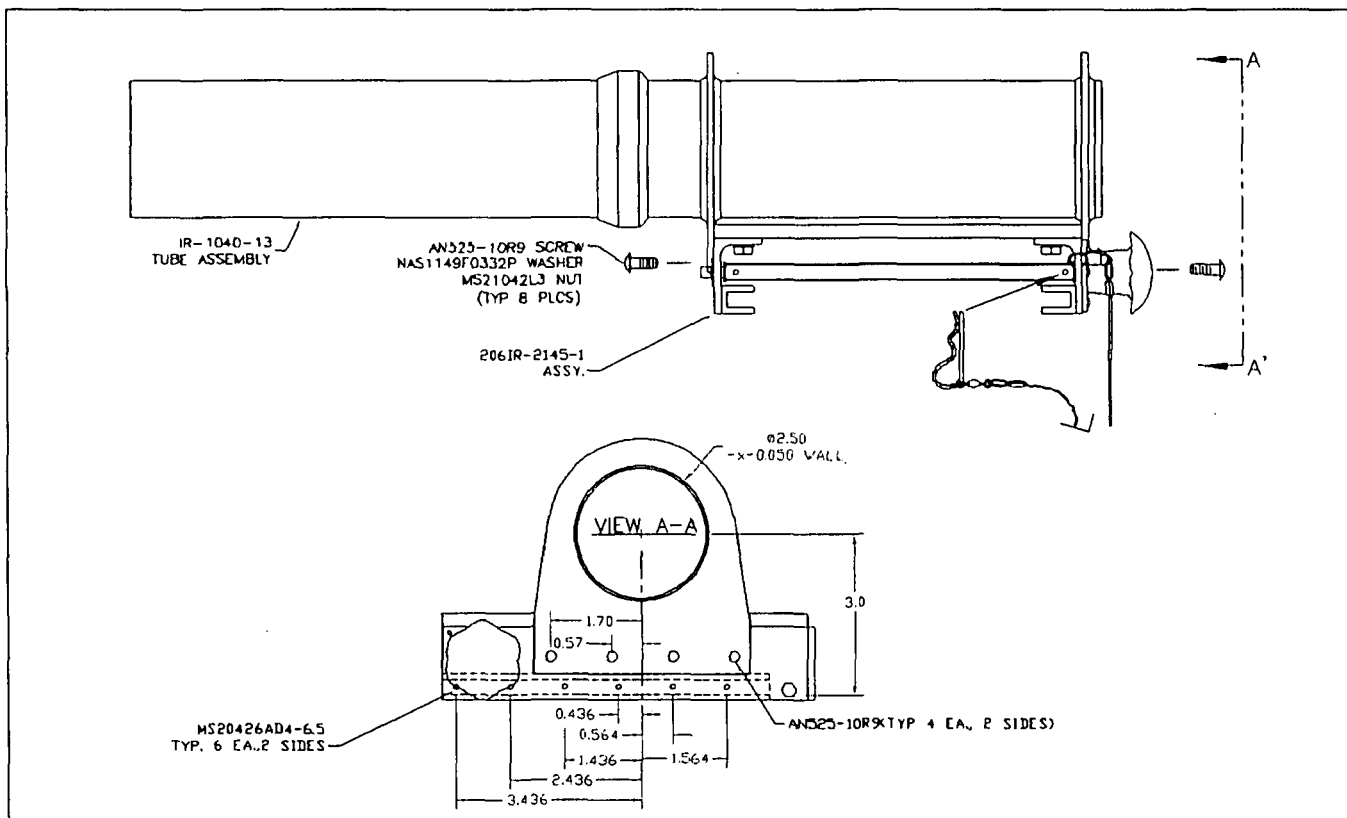


Figure 5 – Load Support Fixture (IR-1040-(X))

Note: SX5-606-1 (For FLIR Talon installation) is approximately centered in the channels shown above.

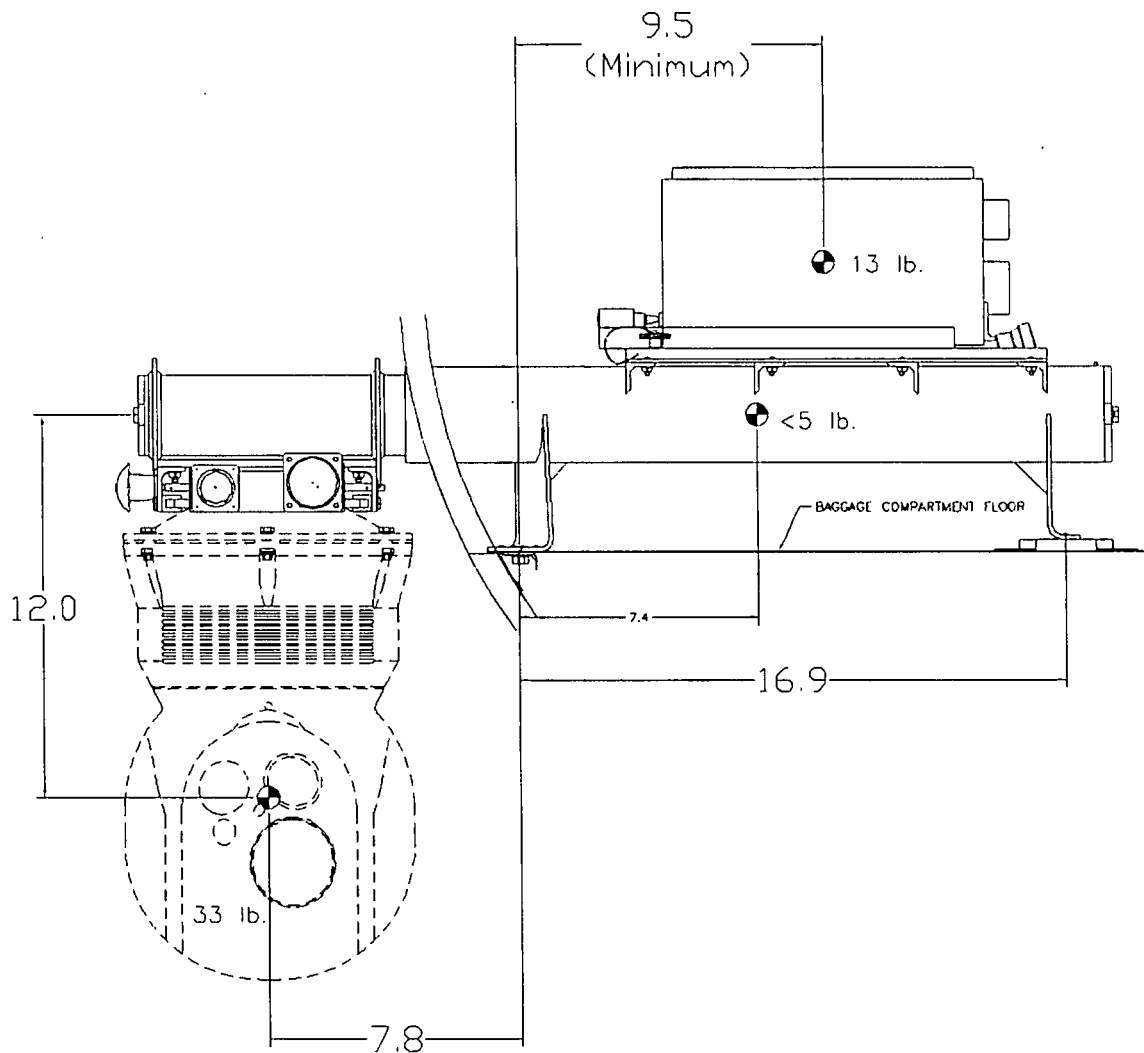


Figure 6 – Representative Load Support Installation:
IR-431-1 Assembly (Gimbal attached to IR-4301-10 and SX5-606-1),
IR-1040-(X), C182IR-1012-1

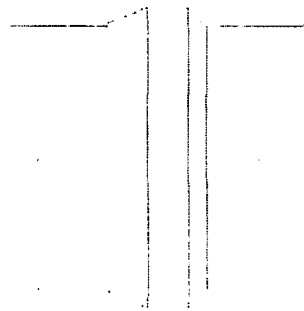


FIGURE 7, Guide Collar Detail

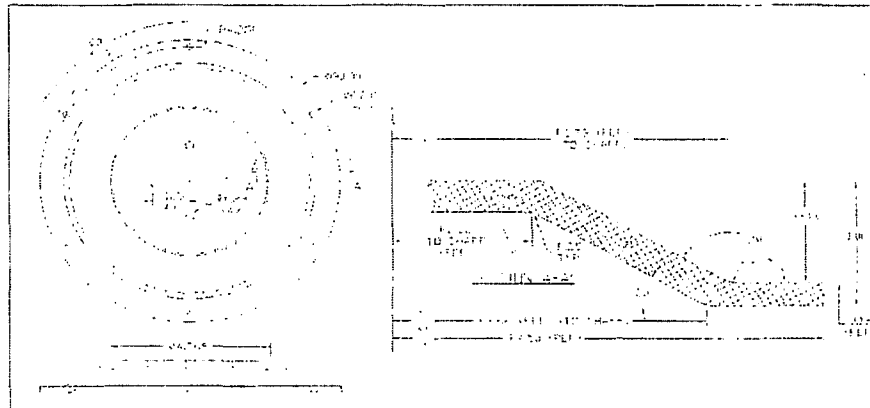


FIGURE 8, IR-4301-10 Plate

Plate Material: 6061-T6 aluminum alloy

Fsu = 27 ksi (A)
28 ksi (B)

Ftu = 42 ksi (A)
43 ksi (B)

Ref. MMPDS, 3.6.2.0(b₁)

Paravion Technology, Inc.
Fort Collins, CO

Report No. ARS-4004-901

Structural Substantiation
Equipment Installation

March 29, 2011

This report substantiates the installation of three pieces of equipment on the baggage compartment (FS 124 to FS134) shelf of a Cessna 182 aircraft. Figure 1 shows the equipment installation of the rails and the installation of the equipment on the rails.

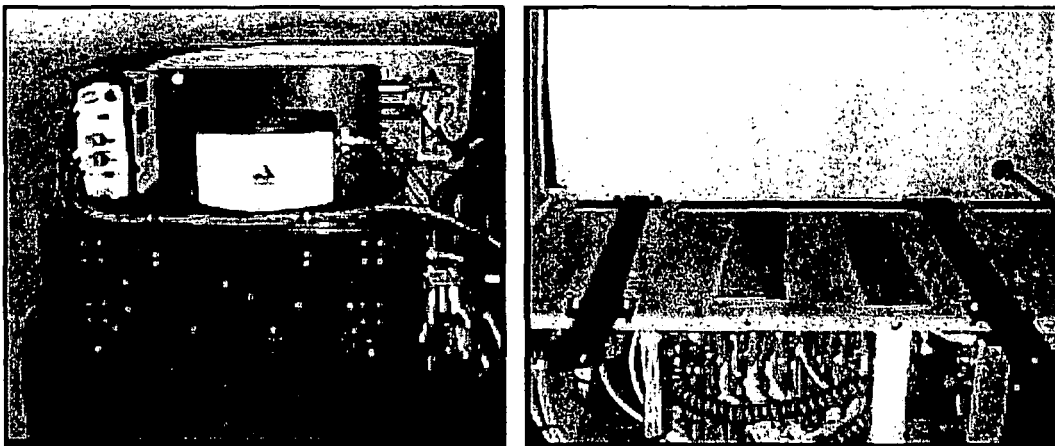


Figure 1 – Equipment Installation

Each rail is installed with two screws to the forward end of the shelf and two screws to the aft angle of the baggage shelf. The IMU is attached to the rails using four feet as shown in Figure 2. The feet are locked in place using locking blocks and roll pins.

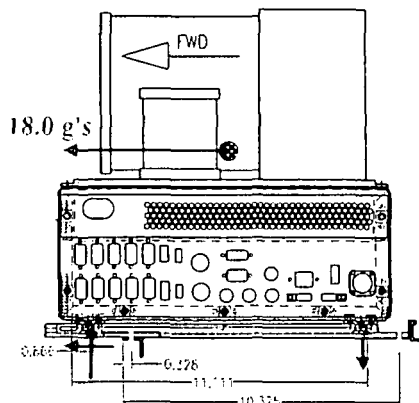


Figure 2 - Equipment Installation - Side View

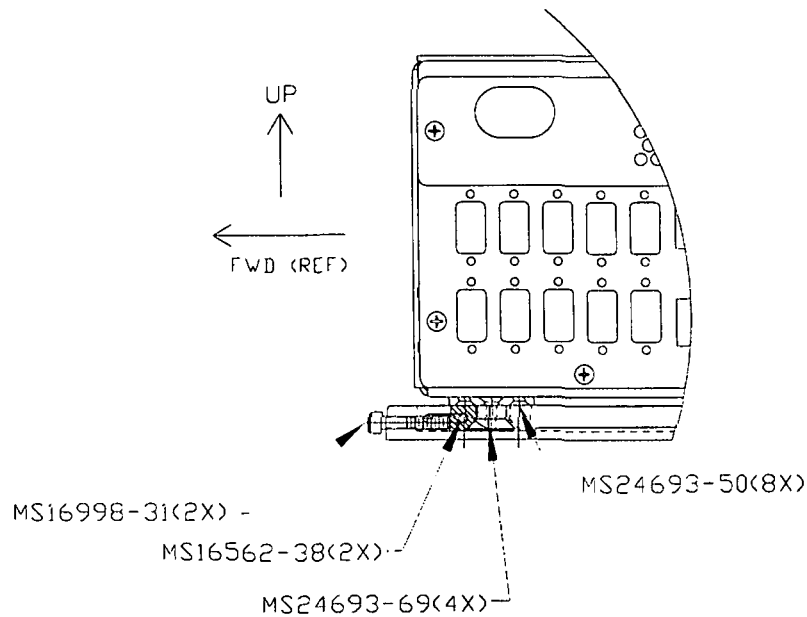


Figure 3 - Equipment Installation - DETAIL

The baggage area is placarded for 80 lbs per Cessna Pilot Operating Handbook (POH). Therefore, the vertical load is not a concern for the shelf.

The most critical condition will be the emergency forward 18.0 g's per FAR 23.561.

Max. Weight of equipment = 37.0 lbs.

Max. C.G. of equipment above shelf = 8.0 inches

Horizontal Reaction $R_H = 18.0 \times 37.0 = 666$ lbs.

This load is reacted primarily by two MS16998-31 screws in compression. The secondary load path is two MS16562-38 pins. We can conservatively assume that only the weaker of the two load path transfers load.

Single shear rating of each roll pin = 1050 lbs.

$$M.S. = (2 \times 1050 / 666) - 1 = + \underline{\underline{HIGH}}$$

Vertical Reaction $R_v = (18.0 \times 37.0 \times 8.0)/(10.25) = 520 \text{ lbs.}$

This load is reacted by the foot in two rails.

Shear area of foot $= 0.07 \text{ in}^2$

Shear stress in foot $f_s = 520/2/0.07 = 3715 \text{ psi.}$

The foot is made using 6061-T6 aluminum, $F_{su} = 27000 \text{ psi.}$

$$M.S. = (27000/3715) - 1 = + \underline{\underline{HIGH}}$$

Load is transferred to baggage shelf using screws that attach the rails to shelf.

Tensile load on screws $= (18.0 \times 37.0 \times 8.0)/(4 \times 10.0) = 133 \text{ lbs.}$

Tensile Strength of MS35206 #8-32 screws ($F_{tu} = 60 \text{ ksi}$) $= 730 \text{ lbs.}$

$$M.S. = (730/133) - 1 = + \underline{\underline{HIGH}}$$

Based on positive strength margins of the installation, the equipment installation is adequate to meet the strength requirements of the aircraft.

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

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS AUGMENTED REALITY SYSTEM INSTALLATION

This document is applicable to systems certificated under the following
Supplemental Type Certificates:
SR00682DE

The above certification documents include approval for Augmented Reality
System (ARS) installation to the following aircraft:

Bell 206A/B
Bell 206L, L-1, L-3, L-4
Bell 407

RECORD OF REVISIONS

REVISION NO.	ISSUE DATE	DATE INSERTED	BY
0	Not Distributed		
1			

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.**

[illegible]

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ADDITIONAL REFERENCE

AC43.13-2B Acceptable Methods, Techniques and Practices – Aircraft Alterations

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.

This system has no life-limited components.

[illegible]

1.0 SYSTEM DESCRIPTION

The Paravion Technology, Inc./Churchill Navigation **Augmented Reality System** (ARS) is an accessory to certain infrared and visible light imaging system installations installed under separate certification, to add display of parcel and address overlay information to the monitor screen. The Augmented Reality System is operated by the assigned observer in accordance with imaging system certification instructions.

This accessory to the previously certificated imaging system is designed as an aid to surveillance operations, requires no pilot action, and is non-essential to safety-of-flight.

The ARS uses GPS input, to determine imaging system location and viewpoint. Touch screen commands are used to enable its various options (See Users Handbook). It is designed to consume less than 4.5 amp (28VDC), and to be powered through the imaging system circuit breaker.

1.1 The ARS installation includes the following major components:

- A. Controller Assembly, 6 lbs. (2.7 kg)
- B. Serial Bypass Switch, 1.2 lbs. (0.5 kg)
- C. Inertial Measurement Unit, 5 lbs. (2.2 kg)
- D. GPS Antenna, 0.3 lbs. (0.1 kg)
- E. Cables Installation, est. 3 lbs. (~1.4 kg estimate)
- F. Monitor Mount Installation (Ref.), 1.7 lbs. (0.8 kg)
- G. Monitor Assembly (Ref. DBM-100-5T), 5.3 lbs (2.4 kg)

TABLE I

WEIGHT & BALANCE DATA					
ITEM	WEIGHT (lbs)	LONGITUDINAL		LATERAL	
		F.S. (in)	MOMENT (in-lbs)	B.L. (in)	MOMENT (in-lbs)
ARS-4000 Controller Assembly	6.0				
ARS-3500 Serial Bypass Switch	1.2				
ARS-3600 IMU ASSEMBLY	5.5				
GPS Antenna	0.3				
Cables Installation	3				
Monitor Installation	7				

Note: This table is to be completed upon system installation.

Component Weight & Balance data completed

Date:
Aircraft:
By:

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 II, TROUBLE SHOOTING GUIDE, refers to the most likely problems that may be encountered, and outlines the appropriate corrective actions. Appendix B, Inspection Checklist should be referenced during periodic Airworthiness inspections. All loose and/or replaced fasteners should be tightened per the torque requirements outlined in Appendix A.

3.0 COMPONENT REMOVAL AND REPLACEMENT

The major components of the ARS (Controller Unit and Inertial Measurement Unit) are mounted in the baggage area of the aircraft, in accordance with certificated installation data. The monitor is mounted for operation by observer in accordance with certificated installation data. The GPS antenna is mounted to the aircraft exterior in accordance with approved data.

Electrical power for the Augmented Reality System is obtained from the power supply installed to provide power to the imaging system to which the system has been added. Data transmission wiring is routed to the monitor and imaging system according to aircraft requirements in accordance with certificated ARS installation data.

Assure that imaging system power supply is switched to OFF and that electrical wires are disconnected and capped before removing any component of the system.

Component removal/re-installation order does not affect system performance after completion of the work.

NOTE: When mounting components are removed and replaced, follow torque recommendations given in Appendix A for fastener installation. Remove installed wire caps and re-install wiring. Refer to AC43.13-2B guidelines for installation of GPS antenna and other alterations as needed.

4.0 COMPONENT SERVICE PROCEDURE

If troubleshooting results in the finding of faults in the system components the Augmented Reality System must be disabled before the faulty unit is removed. Aircraft Weight and Balance should be adjusted accordingly, reference Table I of this document. The faulty component must be returned to Paravion Technology, Inc. for repair or replacement.

5.0 SYSTEM TESTING/TROUBLESHOOTING PROCEDURES

TABLE II
TROUBLE SHOOTING GUIDE

PROBLEM	ADDITIONAL SYMPTOMS	POSSIBLE CAUSE	CORRECTIVE ACTION
No video.	Cooling fans do not run	No power to ARS	Ensure that the aircraft is providing power to the ARS.
	Cooling fans may or may not run	ARS internal breakers	Ensure that the 3 circuit breakers mounted to the ARS unit are not tripped. If tripped, reset. If circuit breaker fails to reset, remove ARS unit from aircraft and send to Paravion for service.
	Cooling fans run, no beeping sound as unit powers on, no lights on IMU	12V power supply breaker blown	Reset breaker. If problem persists, remove ARS Controller unit and IMU from aircraft and send to Paravion for service.
	Cooling fans running	Monitor off	Ensure monitor is ON
		Proper video input not selected	Press "Source" on the monitor until video is shown (usually with the on-screen designation "PC" or "VGA")
Video shows ARS controls, but no camera video.		Video wiring	Inspect video wiring from ARS to monitor.
		Camera off or camera in standby	Turn camera ON and wait for initialization to complete. Ensure camera is operational.
Video indicates "NO CAMERA"		Video wiring	Inspect video wiring from camera to ARS.
		Camera off or camera in standby	Turn camera ON and wait for initialization to complete. Ensure camera is operational.
		Serial connection from camera is bad	Inspect wiring between camera serial port output and ARS.
		ARS Controller Unit internal component or wiring faulty, possible software fault.	Remove unit from aircraft and return to Paravion for service. Field repair of the ARS Controller Unit should not be attempted.

PROBLEM	ADDITIONAL SYMPTOMS	POSSIBLE CAUSE	CORRECTIVE ACTION
Camera does not turn on or hand controller is unresponsive.	Hand controller backlight is off.	No power to camera	Ensure camera has aircraft power.
		Hand controller wiring bad	Inspect wiring between hand controller and camera. If plugging the hand controller directly in to the camera solves the problem, then inspect aircraft-side wiring and replace as necessary. System will be usable in this state, but geo-pointing functions (if available) will not work.
	Hand controller backlight is on. Serial Bypass Switch (ARS-3100-1) has no LEDs lit.	Serial Bypass Switch does not have power.	Inspect wiring between Serial Bypass Switch and camera. Ensure power is available on the bypass switch (pin 1=ground, pin 2=+5v DC +/- 10%). As a temporary solution, the hand controller may be plugged directly in to the camera, or a plug shorting pins 3 and 9 may be used in place of the serial bypass switch, but geo-pointing functions (if available) will not work.
		Serial Bypass Switch has failed	Disconnect the serial bypass switch and manually short pins 3 and 9 on the cable harness. <i>Do not touch pin 2 (+5v power).</i> If the camera can be turned on, then replace the serial bypass switch. As a temporary solution, the hand controller may be plugged directly in to the camera, or a plug shorting pins 3 and 9 may be used in place of the serial bypass switch, but geo-pointing functions (if available) will not work.
	Hand controller backlight is on. Serial bypass switch has one LED lit.	Wiring bad	Inspect wiring between hand controller, serial bypass switch, and camera. If plugging the hand controller directly in to the camera solves the problem, then inspect aircraft-side wiring and replace as necessary. The system will be usable in this state, but geo-pointing functions (if available) will not work.
		Serial bypass switch has failed	Disconnect the serial bypass switch and manually short pins 3 and 9 on the cable harness. <i>Do not touch pin 2 (+5v power).</i> If the camera can be turned on, then replace the serial bypass switch. As a temporary solution, the hand controller may be plugged directly in to the camera, or a plug shorting pins 3 and 9 may be used in place of the serial bypass switch, but geo-pointing functions (if available) will not work.

PROBLEM	ADDITIONAL SYMPTOMS	POSSIBLE CAUSE	CORRECTIVE ACTION
Video indicates "INVALID IMU"		IMU not initialized	The aircraft must move at least 10 knots before the IMU initializes.
		No GPS signal	Ensure that the GPS antenna has an unobstructed view of the sky. The IMU will not work inside a hanger.
		GPS antenna is connected improperly	Ensure that the antenna is connected to IMU connector marked "Primary" and not the one marked "Secondary".
		GPS antenna and/or cable is faulty	With the aircraft outside and the ARS powered ON for at least 5 minutes, verify that the GPS light on the IMU is red or orange. No light indicates that the antenna, antenna cable, or IMU is bad and should be replaced.
Video indicates "NO IMU"		No signal from IMU	Ensure that the data cable (marked "Ethernet" on the IMU) is securely connected.
		IMU has no power.	If the IMU "Power" LED is not on, then verify wiring. Power cable should have 9-15 volts.
		IMU Failure	If the power cable has 9-15 volts and the IMU "Power" LED remains off, then replace the IMU. Contact Paravion Technology, Inc. for system recalibration instructions.
Touch screen not responsive		Wiring bad	Inspect wiring between touch screen and ARS.
Touch screen inaccurate	Fingers operate incorrect button, or finger must be in the wrong place to operate button	Touch screen needs recalibration	Contact Paravion Technology, Inc. for touch screen calibration instructions.
Road/Video alignment poor		Camera mount and/or IMU have been moved with respect to airframe since last calibration.	Contact Paravion Technology, Inc. for system calibration instructions.

IMU (ARS-3600-1): LED Definitions:

LED	Color	Condition
SdNav	Off	IMU Booting
	Red Flash	Running, but not yet operational. GPS has not yet output a valid time.
	Red	Running, but not yet operational. GPS has a valid time, but has not initialized. Waiting for the vehicle to travel > 5 m/s.
	Orange	Operational, but data is not yet real-time. This condition should not last more than 10 seconds.
	Green	Operational.
GPS	Off	GPS does not have a valid position.
	Red Flash	Operational check (startup only)
	Red	GPS has a standard position solution (SPS). This is the default state.
	Orange	GPS has a differential solution (SBAS). This is normally not used.
Power	Off	No power to the system.
	Green	System is powered; 5v internal voltage is active.
	Orange	System is powered; Outputting data to serial port. This is normally not used.

FIGURES

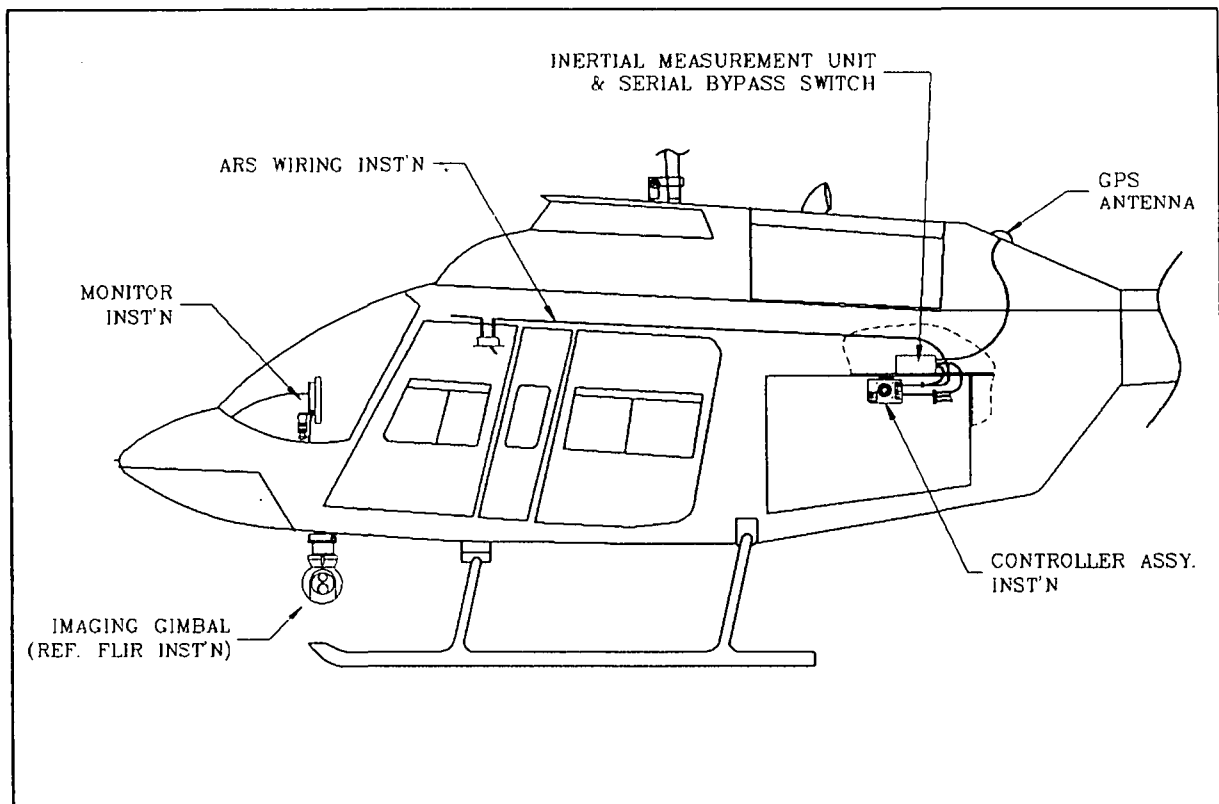


FIGURE 0: Suggested Installation, Bell 407 shown

**FIGURE 1: Aircraft-Side Wire Harness
FLIR U8000/U8500 SERIES IMAGING SYSTEM**

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Rev. 1, 04/08/08

**Paravion®
Technology Inc.**

COMPONENTS, FIGURE 1

ITEM NO	PN	DESCRIPTION	QTY	TYP
0*		Existing Imaging System Circuit Breaker	REF.	
1	ACC02E16-9S-003	CONNECTOR (Blkd Receptacle)	1	EA.
2	ARS-3600-1	INERTIAL MEASUREMENT UNIT	1	EA.
3	ES54100-2	ANTENNA, GPS	1	EA.
4	ARS-3500-1	SERIAL BYPASS SWITCH	1	EA.
5	MS27474E20F41S	CONNECTOR (Blkd Receptacle)	1	EA.
	M85049/41-12A	BACKSHELL		
6	ARS-3100-1	CABLE, PASS-THRU	1	EA.
7	ARS-3011-1	VIDEO CABLE ASSY	1	EA.
8	ARS-3011-2	TOUCHSCREEN CABLE ASSY	1	EA.
9	ARS-3010-1	POWER CABLE ASSY, IMU	1	EA.
10	ARS-3010-2	SIGNAL CABLE ASSY, IMU	1	EA.
11	ES56221-1	MONITOR POWER CABLE	1	EA.
12	ES58110-1	FUSE HOLDER	1	EA.
	AGC-3	FUSE, 3 AMP	1	EA.
13	MS27467T15B18P	CONNECTOR	1	EA.
	M85049/49-2-14W	BACKSHELL	1	EA.
14	AIM-97095	CONNECTOR (Or equiv. DE-9 Female)	1	EA.
15	MS27467T9B35P	CONNECTOR	1	EA.
	MS27506-B-9-2	BACKSHELL (Alt: MS27506-F-9-2)	1	EA.
16	V75268	75 OHM COAXIAL CABLE (Or equiv.)	15	FT.
ATTACHING HARDWARE,				
-	ARS-3600-2	HAT SECTION ASSEMBLY	2	EA.
-	MS20470AD4-X	RIVET (Length may vary)	16	EA.
-	MS35206-08XX	SCREW	4	EA.
-	NAS1149CN616R	WASHER	4	EA.
-	MS27039-08XX	SCREW (Length may vary)	4	EA.
-	MS21042L08	SELF LOCKING NUT	4	EA.
-	MS35206-XXX (#4-40)	SCREW (Length may vary)	4	EA.

WIRING SPECIFICATION:

Circuit Breaker rating must be 20A or lower

System electrical power and ground, Connector 1 Pins A and C, are M22759/16-14 or equivalent.

All other (data transmission) wires are M22759/16-22 or equivalent

NOTE: The Inertial Measurement Unit, Serial Bypass Switch, & GPS Antenna are supplied as Line Replaceable Units, assembled and calibrated at the factory. Field maintenance of these units should not be attempted.

WIRES LABELED/(COLORED) AS SHOWN

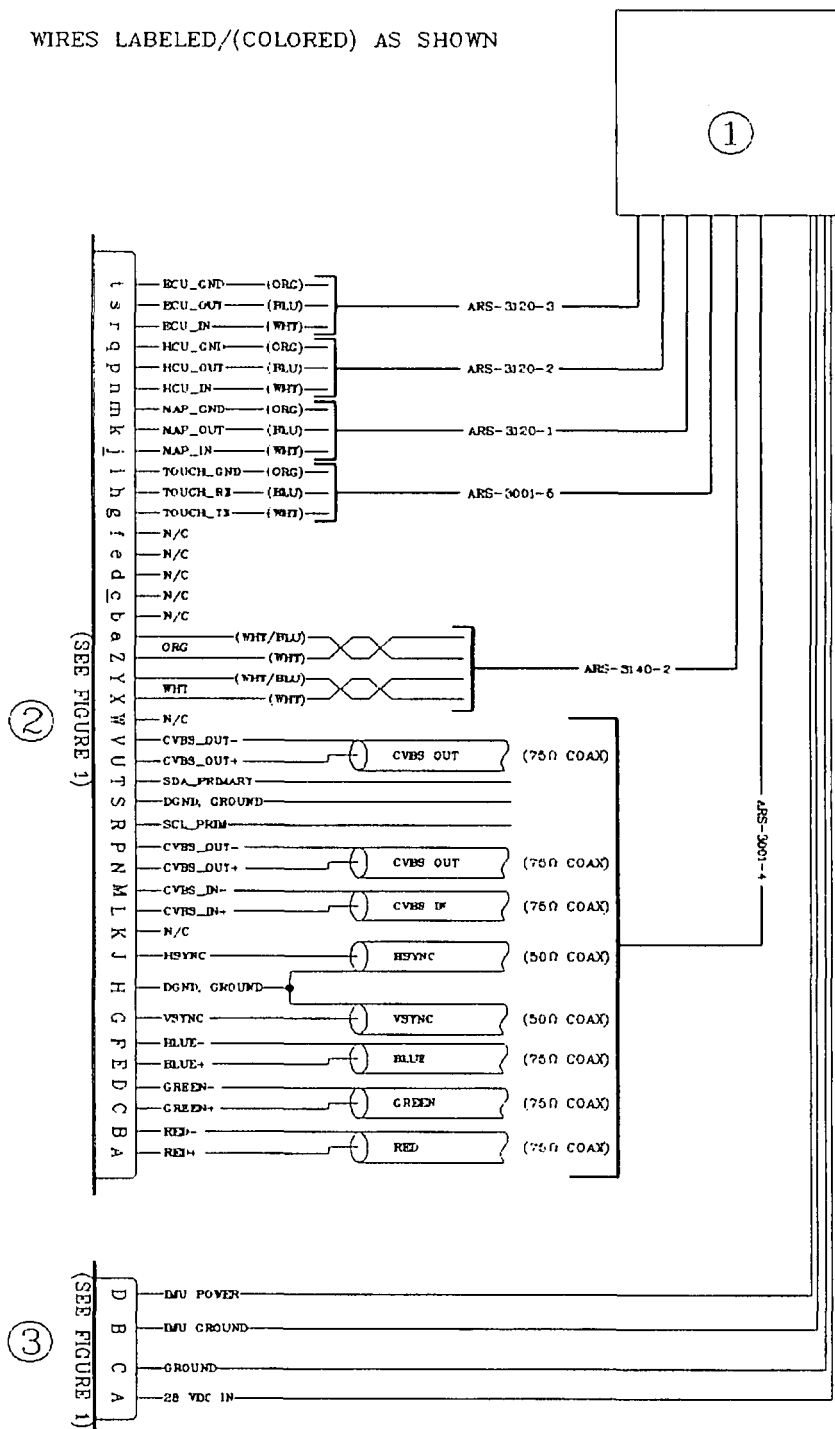


FIGURE 2: Augmented Reality System Controller Installation

COMPONENTS, FIGURE 2

ITEM NO	PN	DESCRIPTION	QTY	TYP
1	ARS-4000-1	CONTROLLER ASSEMBLY	1	EA.
2	MS27484E20F41PN	CONNECTOR	1	EA.
3	ACC02E16-9S-003	CONNECTOR	1	EA.
ATTACHING HARDWARE,				
-	MS27039-08XX	SCREW (Length may vary)	4	EA.
-	MS35333-106	LOCK WASHER	4	EA.

NOTE: The Controller Assembly is supplied as a Line Replaceable Unit, assembled and calibrated at the factory. Field maintenance of the unit must not be attempted.

APPENDIX A

STANDARD TORQUE VALUE CHART

Appendix A

RECOMMENDED TORQUE VALUES (inch-pounds) (Reference AC 43.13-1B, Change 1, Dated 9/8/98)				
CAUTION THE FOLLOWING TORQUE VALUES ARE DERIVED FROM OIL FREE CADMIUM PLATED THREADS.				
	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)
FINE THREAD SERIES				
8-36	12-15	7-9	20	12
10-32	20-25	12-15	40	25
1/4-28	50-70	30-40	100	60
5/16-24	100-140	60-85	225	140
3/8-24	160-190	95-110	390	240
7/16-20	450-500	270-300	840	500
1/2-20	480-690	290-410	1100	660
9/16-18	800-1000	480-600	1600	960
5/8-18	1100-1300	600-780	2400	1400
3/4-16	2300-2500	1300-1500	5000	3000
7/8-14	2500-3000	1500-1800	7000	4200
1-14	3700-5500	2200-3300*	10,000	6000
1-1/8-12	5000-7000	3000-4200*	15,000	9000
1-1/4-12	9000-11000	5400-6600*	25000	15000
COARSE THREAD SERIES				
8-32	12-15	7-9	20	12
10-24	20-25	12-15	35	21
1/4-20	40-50	25-30	75	45
5/16-18	80-90	48-55	160	100
3/8-16	160-185	95-100	275	170
7/16-14	235-255	140-155	475	280
1/2-13	400-480	240-290	880	520
9/16-12	500-700	300-240	1100	650
5/8-11	700-900	420-540	1500	900
3/4-10	1150-1600	700-950	2500	1500
7/8-9	2200-3000	1300-1800	4600	2700
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/300 HR. INSPECTION CHECKLIST

INSPECTION (Infrared Camera System)	COMMENTS	INITIALS
1. Check for mount fasteners security (GPS antenna and other exterior installations, interior installations). Inspect equipment and adjacent aircraft structure for condition.		
2. Torque all fasteners in accordance with Appendix A.		
3. Inspect electrical cabling for security and insulation damage. Evaluate cable routing to avoid heat and movement.		
4. Inspect Controller Assembly and surrounding area for airflow obstruction. Clean heat radiation surfaces as needed. Verify cooling fans operation.		



U.S. Department of
Transportation
Federal Aviation
Administration

MAJOR REPAIR AND ALTERATION
(Airframe, Powerplant, Propeller, or Appliance)

Form Approved
OMB No. 2120-0020
11/30/2007

Electronic Tracking Number

For FAA Use Only

INSTRUCTIONS: Print or type all entries. See FAR 43.9, FAR 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. 1421). Failure to report can result in a civil penalty not to exceed \$1,000 for each such violation (Section 901 Federal Aviation Act 1958)

1. Aircraft	Nationality and Registration Mark USA N267RH	Serial No. 18282208	
	Make CESSNA	Model 182T	Series SKYLANE
2. Owner	Name (As shown on registration certificate) CESSNA AIRCRAFT COMPANY	Address (As shown on registration certificate) ATTN: DEPT 093 3 CESSNA BLVD	
		City WICHITA	State KANSAS
		Zip 67215-1400	Country USA

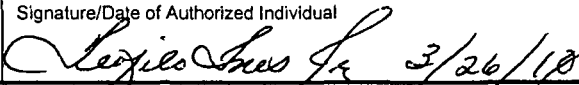
3. For FAA Use Only

4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial Number
<input type="checkbox"/>	<input checked="" type="checkbox"/>	AIRFRAME	_____	(As described in Item 1 above)	_____
<input type="checkbox"/>	<input type="checkbox"/>	POWERPLANT			
<input type="checkbox"/>	<input type="checkbox"/>	PROPELLER			
<input type="checkbox"/>	<input type="checkbox"/>	APPLIANCE	Type		
			Manufacturer		

6. Conformity Statement

A. Agency's Name and Address		B. Kind of Agency	
Name YINGLING AVIATION		<input type="checkbox"/> U.S. Certificated Mechanic	<input type="checkbox"/> Manufacturer
Address 2010 AIRPORT ROAD		<input type="checkbox"/> Foreign Certificated Mechanic	C. Certificate No.
City WICHITA State KS		<input checked="" type="checkbox"/> Certificated Repair Station	YN8R621Y
Zip 67277 Country USA		<input type="checkbox"/> Certificated Maintenance Organization	RADIO CLASS 1,2,3

D. I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B <input type="checkbox"/>	Signature/Date of Authorized Individual  3/26/10
--	---

7. Approval for Return to Service

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED

BY	FAA Fit Standards Inspector	Manufacturer	Maintenance Organization	Person Approved by Canadian Department of Transport
	FAA Designee	<input checked="" type="checkbox"/> Repair Station	Inspection Authorization	Other (Specify)

Certificate or Designation No. YN8R621Y	Signature/Date of Authorized Individual  3/26/10
---	--

NOTICE
Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished <i>(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)</i>	
<div style="border: 1px solid black; display: inline-block; padding: 5px 20px;">USA N267RH</div> Nationality and Registration Mark	<div style="border: 1px solid black; display: inline-block; padding: 5px 20px;">3/26/10</div> Date
Cessna 182T-18282208- N267RH	
INSTALLED SYSTEMS: <ul style="list-style-type: none"> Installed Yingling Aviation Installation of Cabin Skylights IAW STC SA01569WI. 	
CONTINUED AIRWORTHINESS INSTRUCTIONS: <ul style="list-style-type: none"> Reference Yingling Aviation Document No. 5640-F182-06 Rev. A, for Instructions for Continued Airworthiness Installation of Skylights in the Cessna 182T. 	
WEIGHT & BALANCE and EQUIPMENT LIST: Revised Aircraft Weight & Balance and Equipment List. See Aircraft Weight & Balance records for details.	
<p>The above installation meets the requirements for static loading in accordance with A.C.43.13-2B Chapter 1 par. 106 through 114. No changes were noted to the compass system. Further details are on file at C.R.S. # YN8R621Y under W.O. # AVI 10069.</p> <div style="text-align: center;">>>>>>>>>>>>>>END<<<<<<<<<<<<<<</div>	
<input type="checkbox"/> Additional Sheets Are Attached	

FAA Form 337 (10-06)



U.S. Department of
Transportation
Federal Aviation
Administration

MAJOR REPAIR AND ALTERATION
(Airframe, Powerplant, Propeller, or Appliance)

Form Approved
OMB No. 2120-0020
11/30/2007

Electronic Tracking Number

For FAA Use Only

INSTRUCTIONS: Print or type all entries. See FAR 43.9, FAR 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. 1421). Failure to report can result in a civil penalty not to exceed \$1,000 for each such violation (Section 901 Federal Aviation Act 1958)

1. Aircraft	Nationality and Registration Mark USA N5267RH	Serial No. 18282208	
	Make CESSNA	Model 182T	Series SKYLANE
2. Owner	Name (As shown on registration certificate) CESSNA AIRCRAFT COMPANY	Address (As shown on registration certificate) ATTN: DEPT 093 3 CESSNA BLVD	
		City WICHITA State KANSAS Zip 67215-1400 Country USA	

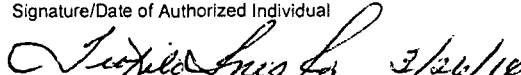
3. For FAA Use Only

4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial Number
<input type="checkbox"/>	<input checked="" type="checkbox"/>	AIRFRAME	_____	(As described in Item 1 above)	_____
<input type="checkbox"/>	<input type="checkbox"/>	POWERPLANT			
<input type="checkbox"/>	<input type="checkbox"/>	PROPELLER			
<input type="checkbox"/>	<input type="checkbox"/>	APPLIANCE	Type _____ Manufacturer _____		

6. Conformity Statement

A. Agency's Name and Address		B. Kind of Agency	
Name YINGLING AVIATION		<input type="checkbox"/> U.S. Certificated Mechanic	<input type="checkbox"/> Manufacturer
Address 2010 AIRPORT ROAD		<input type="checkbox"/> Foreign Certificated Mechanic	C. Certificate No.
City WICHITA	State KS	<input checked="" type="checkbox"/> Certificated Repair Station	YN8R621Y RADIO CLASS 1,2,3
Zip 67277	Country USA	<input type="checkbox"/> Certificated Maintenance Organization	

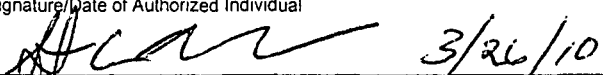
D. I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B <input type="checkbox"/>	Signature/Date of Authorized Individual  3/26/10
--	---

7. Approval for Return to Service

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED

BY	FAA Fit Standards Inspector	Manufacturer	Maintenance Organization	Person Approved by Canadian Department of Transport
	FAA Designee	X Repair Station	Inspection Authorization	Other (Specify)

Certificate or Designation No. YN8R621Y	Signature/Date of Authorized Individual  3/26/10
--	---

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished

Date _____

>>>>>>>>>>>END<<<<<<<<<<<<<

FAA Form 337 (10-06)



U.S. Department of
Transportation
Federal Aviation
Administration

MAJOR REPAIR AND ALTERATION
(Airframe, Powerplant, Propeller, or Appliance)

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1. Aircraft	Nationality and Registration Mark USA N267RH	Serial No. 18282208	
	Make CESSNA	Model 182T	Series SKYLANE
2. Owner	Name (As shown on registration certificate) CESSNA AIRCRAFT COMPANY		Address (As shown on registration certificate)
			Address ATTN: DEPT 093 3 CESSNA BLVD
			City WICHITA State KANSAS
			Zip 67215-1400 Country USA

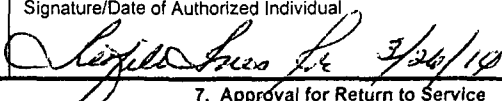
3. For FAA Use Only

4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial Number
<input type="checkbox"/>	<input checked="" type="checkbox"/>	AIRFRAME	_____	(As described in Item 1 above)	_____
<input type="checkbox"/>	<input type="checkbox"/>	POWERPLANT			
<input type="checkbox"/>	<input type="checkbox"/>	PROPELLER			
<input type="checkbox"/>	<input type="checkbox"/>	APPLIANCE	Type		
			Manufacturer		

6. Conformity Statement

A. Agency's Name and Address		B. Kind of Agency	
Name YINGLING AVIATION		<input type="checkbox"/> U.S. Certificated Mechanic	<input type="checkbox"/> Manufacturer
Address 2010 AIRPORT ROAD		<input type="checkbox"/> Foreign Certificated Mechanic	C. Certificate No.
City WICHITA	State KS	<input checked="" type="checkbox"/> Certificated Repair Station	YN8R621Y
Zip 67277	Country USA	<input type="checkbox"/> Certificated Maintenance Organization	RADIO CLASS 1,2,3

D. I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B <input type="checkbox"/>	Signature/Date of Authorized Individual  3/24/10
--	--

7. Approval for Return to Service

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED

BY	FAA Fit Standards Inspector	Manufacturer	Maintenance Organization	Person Approved by Canadian Department of Transport
	FAA Designee	X Repair Station	Inspection Authorization	Other (Specify)

Certificate or Designation No. YN8R621Y	Signature/Date of Authorized Individual  3/24/10
---	---

NOTICE
Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

[illegible]

USA N267RH

Nationality and Registration Mark

3/26/10
Date

Date _____

Provisional Wiring: The aircraft was wired for future install of an Aileron Servo Disable Switch. Wiring was installed from the pilot's instrument panel to the Garmin GIA #1, GIA #2 and the Avionics Dimming Potentiometer.

EO Number 182-0364

Further details are on file at C.R.S. # YN8R621Y under W.O. # AVI 10069.

>>>>>>>>>>END<<<<<<<<<<<<<

FAA Form 337 (10-06)



U.S. Department of
Transportation
Federal Aviation
Administration

MAJOR REPAIR AND ALTERATION
(Airframe, Powerplant, Propeller, or Appliance)

Form Approved
OMB No. 2120-0020
11/30/2007

Electronic Tracking Number

For FAA Use Only

INSTRUCTIONS: Print or type all entries. See FAR 43.9, FAR 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. 1421). Failure to report can result in a civil penalty not to exceed \$1,000 for each such violation (Section 901 Federal Aviation Act 1958)

1. Aircraft	Nationality and Registration Mark USA N267RH	Serial No. 18282208	
	Make CESSNA	Model 182T	Series SKYLANE
2. Owner	Name (As shown on registration certificate) CESSNA AIRCRAFT COMPANY	Address (As shown on registration certificate) Address <u>ATTN: DEPT 093 3 CESSNA BLVD</u> City <u>WICHITA</u> State <u>KANSAS</u> Zip <u>67215-1400</u> Country <u>USA</u>	

3. For FAA Use Only

4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial Number
<input type="checkbox"/>	<input checked="" type="checkbox"/>	AIRFRAME	_____	(As described in Item 1 above)	_____
<input type="checkbox"/>	<input type="checkbox"/>	POWERPLANT			
<input type="checkbox"/>	<input type="checkbox"/>	PROPELLER			
<input type="checkbox"/>	<input type="checkbox"/>	APPLIANCE	Type _____ Manufacturer _____		

6. Conformity Statement

A. Agency's Name and Address		B. Kind of Agency	
Name <u>YINGLING AVIATION</u>		<input type="checkbox"/> U.S. Certificated Mechanic	<input type="checkbox"/> Manufacturer
Address <u>2010 AIRPORT ROAD</u>		<input type="checkbox"/> Foreign Certificated Mechanic	C. Certificate No.
City <u>WICHITA</u> State <u>KS</u>		<input checked="" type="checkbox"/> Certificated Repair Station	<u>YN8R621Y</u>
Zip <u>67277</u> Country <u>USA</u>		<input type="checkbox"/> Certificated Maintenance Organization	<u>RADIO CLASS 1,2,3</u>

D. I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B <input type="checkbox"/>	Signature/Date of Authorized Individual
--	---

7. Approval for Return to Service

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED

BY	FAA Fit Standards Inspector	Manufacturer	Maintenance Organization	Person Approved by Canadian Department of Transport
	FAA Designee	X Repair Station	Inspection Authorization	Other (Specify)

Certificate or Designation No. YN8R621Y	Signature/Date of Authorized Individual
---	---

NOTICE
Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

[illegible]

Date _____



U.S. Department of
Transportation
Federal Aviation
Administration

MAJOR REPAIR AND ALTERATION
(Airframe, Powerplant, Propeller, or Appliance)

Form Approved
OMB No. 2120-0020
11/30/2007

Electronic Tracking Number

For FAA Use Only

INSTRUCTIONS: Print or type all entries. See FAR 43.9, FAR 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. 1421). Failure to report can result in a civil penalty not to exceed \$1,000 for each such violation (Section 901 Federal Aviation Act 1958)

1. Aircraft	Nationality and Registration Mark USA N267RH	Serial No. 18282208		
	Make CESSNA	Model 182T	Series SKYLANE	
2. Owner	Name (As shown on registration certificate) CESSNA AIRCRAFT COMPANY		Address (As shown on registration certificate)	
			Address <u>ATTN: DEPT 093 3 CESSNA BLVD</u>	
			City <u>WICHITA</u>	State <u>KANSAS</u>
			Zip <u>67215-1400</u>	Country <u>USA</u>

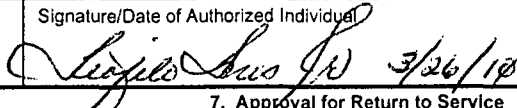
3. For FAA Use Only

4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial Number
<input type="checkbox"/>	<input checked="" type="checkbox"/>	AIRFRAME	_____	(As described in Item 1 above)	_____
<input type="checkbox"/>	<input type="checkbox"/>	POWERPLANT			
<input type="checkbox"/>	<input type="checkbox"/>	PROPELLER			
<input type="checkbox"/>	<input type="checkbox"/>	APPLIANCE	Type		
			Manufacturer		

6. Conformity Statement

A. Agency's Name and Address		B. Kind of Agency	
Name <u>YINGLING AVIATION</u>		<input type="checkbox"/> U.S. Certificated Mechanic	<input type="checkbox"/> Manufacturer
Address <u>2010 AIRPORT ROAD</u>		<input type="checkbox"/> Foreign Certificated Mechanic	C. Certificate No.
City <u>WICHITA</u>	State <u>KS</u>	<input checked="" type="checkbox"/> Certificated Repair Station	<u>YN8R621Y</u> <u>RADIO CLASS 1,2,3</u>
Zip <u>67277</u>	Country <u>USA</u>	<input type="checkbox"/> Certificated Maintenance Organization	

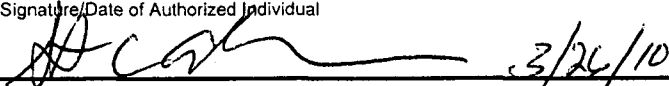
D. I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B <input type="checkbox"/>	Signature/Date of Authorized Individual  3/26/10
--	--

7. Approval for Return to Service

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED

BY	FAA Fit Standards Inspector	Manufacturer	Maintenance Organization	Person Approved by Canadian Department of Transport
	FAA Designee	X Repair Station	Inspection Authorization	Other (Specify)

Certificate or Designation No. <u>YN8R621Y</u>	Signature/Date of Authorized Individual  3/26/10
--	---

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

Nationality and Registration Mark

Date _____

>>>>>>>>>>END<<<<<<<<<<<<<

FAA Form 337 (10-06)



U.S. Department of
Transportation
Federal Aviation
Administration

MAJOR REPAIR AND ALTERATION
(Airframe, Powerplant, Propeller, or Appliance)

Form Approved
OMB No. 2120-0020
11/30/2007

Electronic Tracking Number

For FAA Use Only

INSTRUCTIONS: Print or type all entries. See FAR 43.9, FAR 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. 1421). Failure to report can result in a civil penalty not to exceed \$1,000 for each such violation (Section 901 Federal Aviation Act 1958)

1. Aircraft	Nationality and Registration Mark USA N267RH	Serial No. 18282208	
	Make CESSNA	Model 182T	Series SKYLANE
2. Owner	Name (As shown on registration certificate) CESSNA AIRCRAFT COMPANY		Address (As shown on registration certificate)
			Address ATTN: DEPT 093 3 CESSNA BLVD
			City WICHITA State KANSAS
			Zip 67215-1400 Country USA

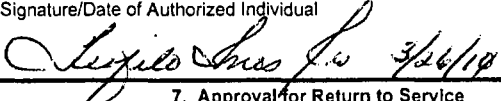
3. For FAA Use Only

4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial Number
<input type="checkbox"/>	<input checked="" type="checkbox"/>	AIRFRAME	_____	(As described in Item 1 above)	_____
<input type="checkbox"/>	<input type="checkbox"/>	POWERPLANT			
<input type="checkbox"/>	<input type="checkbox"/>	PROPELLER			
<input type="checkbox"/>	<input type="checkbox"/>	APPLIANCE	Type		
			Manufacturer		

6. Conformity Statement

A. Agency's Name and Address		B. Kind of Agency	
Name YINGLING AVIATION		<input type="checkbox"/> U.S. Certificated Mechanic	<input type="checkbox"/> Manufacturer
Address 2010 AIRPORT ROAD		<input type="checkbox"/> Foreign Certificated Mechanic	C. Certificate No.
City WICHITA State KS		<input checked="" type="checkbox"/> Certificated Repair Station	YN8R621Y
Zip 67277 Country USA		<input type="checkbox"/> Certificated Maintenance Organization	RADIO CLASS 1,2,3

D. I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B <input type="checkbox"/>	Signature/Date of Authorized Individual  3/24/10
--	--

7. Approval for Return to Service

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED

BY	FAA Fit Standards Inspector	Manufacturer	Maintenance Organization	Person Approved by Canadian Department of Transport
	FAA Designee	X Repair Station	Inspection Authorization	Other (Specify)

Certificate or Designation No. YN8R621Y	Signature/Date of Authorized Individual  3/24/10
--	--

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

[illegible]

Date _____



U.S. Department of
Transportation
Federal Aviation
Administration

MAJOR REPAIR AND ALTERATION
(Airframe, Powerplant, Propeller, or Appliance)

Form Approved
OMB No. 2120-0020
11/30/2007

Electronic Tracking Number

For FAA Use Only

INSTRUCTIONS: Print or type all entries. See FAR 43.9, FAR 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. 1421). Failure to report can result in a civil penalty not to exceed \$1,000 for each such violation (Section 901 Federal Aviation Act 1958)

1. Aircraft	Nationality and Registration Mark USA N267RH	Serial No. 18282208	
	Make CESSNA	Model 182T	Series SKYLANE
2. Owner	Name (As shown on registration certificate) CESSNA AIRCRAFT COMPANY	Address (As shown on registration certificate) Address ATTN: DEPT 093 3 CESSNA BLVD City WICHITA State KANSAS Zip 67215-1400 Country USA	

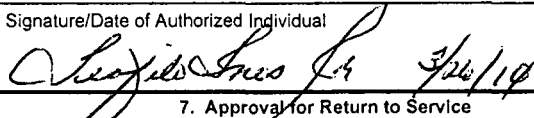
3. For FAA Use Only

4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial Number
<input type="checkbox"/>	<input checked="" type="checkbox"/>	AIRFRAME	_____	(As described in Item 1 above)	_____
<input type="checkbox"/>	<input type="checkbox"/>	POWERPLANT			
<input type="checkbox"/>	<input type="checkbox"/>	PROPELLER			
<input type="checkbox"/>	<input type="checkbox"/>	APPLIANCE	Type _____ Manufacturer _____		

6. Conformity Statement

A. Agency's Name and Address Name YINGLING AVIATION Address 2010 AIRPORT ROAD City WICHITA State KS Zip 67277 Country USA		B. Kind of Agency <input type="checkbox"/> U.S. Certificated Mechanic <input type="checkbox"/> Foreign Certificated Mechanic <input checked="" type="checkbox"/> Certificated Repair Station <input type="checkbox"/> Certificated Maintenance Organization		<input type="checkbox"/> Manufacturer C. Certificate No. YN8R621Y RADIO CLASS 1,2,3
---	--	---	--	--

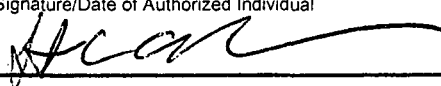
D. I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B <input type="checkbox"/>	Signature/Date of Authorized Individual  3/26/10
--	---

7. Approval for Return to Service

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED

BY	FAA Flt Standards Inspector	Manufacturer	Maintenance Organization	Person Approved by Canadian Department of Transport
	FAA Designee	X Repair Station	Inspection Authorization	Other (Specify)

Certificate or Designation No. YN8R621Y	Signature/Date of Authorized Individual  3/26/10
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NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished

8. Description of Work Accomplished
(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

USA N267RH

Nationality and Registration Mark

3/26/10

Date _____

Cessna 182T- 18282208- N267RH

Installation Description: The following equipment was installed IAW Mfr's Installation Manual P/N 150-049106 Rev F and the AC 43.13-2B. Using the existing mission radio interface system. System is powered from Mission Buss (Electrical Buss 3) thru a 5 Amp pull type circuit breaker.

Installed Equipment:

Wulfsberg P-2000VHF Digital/Analog Tactical FM Radio:

- Wulfsberg P-2000VHF Digital/Analog Tactical FM Radio:
- Wulfsberg FM Transceiver P-2000VHF P/N 400-049200-11-011-2135-2135, 3.0 lbs @ arm 14.0
 - Comant VHF FM (bent whip) Antenna P/N CI292-3, .5 lbs @ arm 60.7
 - Comant VHF FM (bent whip) Antenna P/N CI292-3, .5 lbs @ arm 143.0

OPERATIONAL GROUND CHECKS: Post installation ground functional and interference tests were performed IAW Wulfsberg Installation Drawing 150-049106 Rev F or later.

EMI testing performed IAW YINGLING AVIATION Emi Test Doc. 23507-F206-10 Rev IR or Later on 03/26/10 and found to be satisfactory.

CONTINUED AIRWORTHINESS INSTRUCTIONS: Reference Wulfsberg ICA Drawing 100-049102 Rev A (12/13/03) or later.

WEIGHT & BALANCE and EQUIPMENT LIST: Revised Aircraft Weight & Balance and Equipment List. See Aircraft Weight and Balance records for details.

Operators Manual: Wulfsberg Flexcom 2000 (P-2000/C2000/RT2000) Manual No. 150-049105 Rev D or Later

The above installation meets the requirements for static loading in accordance with A.C.43.13-2B Chapter 1 par. 106 through 114. Electrical load Calculation was performed IAW AC43.13-1B Chap 11 Para 36 and found to be less than 80% of electrical system capacity. No changes were noted to the compass system. Further details are on file at C.R.S. # YN8R621Y under W.O. # AVI 10069.

>>>>>>>>>>END<<<<<<<<<<<<<<

☐ Additional Sheets Are Attached

FAA FORM 8130-6, APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE

Form Approved O.M.B. No. 2120-0018
12/31/2010

 U.S. Department of Transportation Federal Aviation Administration		APPLICATION FOR U. S. AIRWORTHINESS CERTIFICATE		INSTRUCTIONS - Print or type. Do not write in shaded areas; these are for FAA use only. Submit original only to an authorized FAA Representative. If additional space is required, use attachment. For special flight permits complete Sections II, VI and VII as applicable.																												
		1. REGISTRATION MARK N267RH		2. AIRCRAFT BUILDER'S NAME (Make) Cessna Aircraft Company		3. AIRCRAFT MODEL DESIGNATION 182T		4. YR MFR 2010	FAA CODING																							
		5. AIRCRAFT SERIAL NO. 18282208		6. ENGINE BUILDER'S NAME (Make) Lycoming Engines		7. ENGINE MODEL DESIGNATION IO-540-AB1A5																										
		8. NUMBER OF ENGINES One		9. PROPELLER BUILDER'S NAME (Make) McCauley Propeller Systems		10. PROPELLER MODEL DESIGNATION B3D36C431/80VSA-1		11. AIRCRAFT IS (Check if applicable) <input type="checkbox"/> EXPORT <input type="checkbox"/> IMPORT																								
APPLICATION IS HEREBY MADE FOR: (Check applicable items)																																
A. <input checked="" type="checkbox"/> STANDARD AIRWORTHINESS CERTIFICATE (Indicate category) <input checked="" type="checkbox"/> NORMAL <input type="checkbox"/> UTILITY <input type="checkbox"/> ACROBATIC <input type="checkbox"/> TRANSPORT <input type="checkbox"/> COMMUTER <input type="checkbox"/> BALLOON <input type="checkbox"/> OTHER																																
B. <input type="checkbox"/> SPECIAL AIRWORTHINESS CERTIFICATE (Check appropriate items)																																
I. AIRCRAFT DESCRIPTION	7. <input type="checkbox"/> PRIMARY 9. <input type="checkbox"/> LIGHT-SPORT (Indicate Class) <input type="checkbox"/> AIRPLANE <input type="checkbox"/> POWER-PARACHUTE <input type="checkbox"/> WEIGHT-SHIFT CONTROL <input type="checkbox"/> GLIDER <input type="checkbox"/> LIGHTER THAN AIR 2. <input type="checkbox"/> LIMITED																															
	5. <input type="checkbox"/> PROVISIONAL (Indicate class) <input type="checkbox"/> Class I <input type="checkbox"/> Class II																															
	3. <input type="checkbox"/> RESTRICTED (Indicate operation(s) to be conducted) <table border="1" style="width:100%; font-size: x-small;"> <tr> <td>1. AGRICULTURE AND PEST CONTROL</td> <td>2. AERIAL SURVEY</td> <td>3. AERIAL ADVERTISING</td> </tr> <tr> <td>4. FOREST (Wildlife conservation)</td> <td>5. PATROLLING</td> <td>6. WEATHER CONTROL</td> </tr> <tr> <td colspan="3">0. OTHER (Specify)</td> </tr> </table>								1. AGRICULTURE AND PEST CONTROL	2. AERIAL SURVEY	3. AERIAL ADVERTISING	4. FOREST (Wildlife conservation)	5. PATROLLING	6. WEATHER CONTROL	0. OTHER (Specify)																	
	1. AGRICULTURE AND PEST CONTROL	2. AERIAL SURVEY	3. AERIAL ADVERTISING																													
	4. FOREST (Wildlife conservation)	5. PATROLLING	6. WEATHER CONTROL																													
	0. OTHER (Specify)																															
	4. <input type="checkbox"/> EXPERIMENTAL (Indicate operation(s) to be conducted) <table border="1" style="width:100%; font-size: x-small;"> <tr> <td>1. RESEARCH AND DEVELOPMENT</td> <td>2. AMATEUR BUILT</td> <td>3. EXHIBITION</td> </tr> <tr> <td>4. AIR RACING</td> <td>5. CREW TRAINING</td> <td>6. MARKET SURVEY</td> </tr> <tr> <td colspan="3">0. TO SHOW COMPLIANCE WITH THE CFR</td> </tr> <tr> <td colspan="3">7. OPERATING (Primary Category) KIT BUILT AIRCRAFT</td> </tr> <tr> <td colspan="3">8. OPERATING LIGHT-SPORT</td> </tr> <tr> <td colspan="3"> <table border="1" style="width:100%; font-size: x-small;"> <tr> <td>8A</td> <td>Existing Aircraft without an airworthiness certificate & do not meet § 103.1</td> </tr> <tr> <td>8B</td> <td>Operating Light-Sport Kit-Built</td> </tr> <tr> <td>8C</td> <td>Operating light-sport previously issued special light-sport category airworthiness certificate under § 21.80</td> </tr> </table> </td> </tr> </table>								1. RESEARCH AND DEVELOPMENT	2. AMATEUR BUILT	3. EXHIBITION	4. AIR RACING	5. CREW TRAINING	6. MARKET SURVEY	0. TO SHOW COMPLIANCE WITH THE CFR			7. OPERATING (Primary Category) KIT BUILT AIRCRAFT			8. OPERATING LIGHT-SPORT			<table border="1" style="width:100%; font-size: x-small;"> <tr> <td>8A</td> <td>Existing Aircraft without an airworthiness certificate & do not meet § 103.1</td> </tr> <tr> <td>8B</td> <td>Operating Light-Sport Kit-Built</td> </tr> <tr> <td>8C</td> <td>Operating light-sport previously issued special light-sport category airworthiness certificate under § 21.80</td> </tr> </table>			8A	Existing Aircraft without an airworthiness certificate & do not meet § 103.1	8B	Operating Light-Sport Kit-Built	8C	Operating light-sport previously issued special light-sport category airworthiness certificate under § 21.80
	1. RESEARCH AND DEVELOPMENT	2. AMATEUR BUILT	3. EXHIBITION																													
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	8B	Operating Light-Sport Kit-Built																														
8C	Operating light-sport previously issued special light-sport category airworthiness certificate under § 21.80																															
6. <input type="checkbox"/> SPECIAL FLIGHT PERMIT (Indicate operation (s) to be conducted, then complete Section VI or VII as applicable on reverse side) <table border="1" style="width:100%; font-size: x-small;"> <tr> <td>1. FERRY FLIGHT FOR REPAIRS, ALTERATIONS, MAINTENANCE, OR STORAGE</td> </tr> <tr> <td>2. EVACUATE FROM AREA OF IMPENDING DANGER</td> </tr> <tr> <td>3. OPERATION IN EXCESS OF MAXIMUM CERTIFICATED TAKE-OFF WEIGHT</td> </tr> <tr> <td>4. DELIVERING OR EXPORTING</td> </tr> <tr> <td>5. PRODUCTION FLIGHT TESTING</td> </tr> <tr> <td>6. CUSTOMER DEMONSTRATION FLIGHTS</td> </tr> </table>								1. FERRY FLIGHT FOR REPAIRS, ALTERATIONS, MAINTENANCE, OR STORAGE	2. EVACUATE FROM AREA OF IMPENDING DANGER	3. OPERATION IN EXCESS OF MAXIMUM CERTIFICATED TAKE-OFF WEIGHT	4. DELIVERING OR EXPORTING	5. PRODUCTION FLIGHT TESTING	6. CUSTOMER DEMONSTRATION FLIGHTS																			
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5. PRODUCTION FLIGHT TESTING																																
6. CUSTOMER DEMONSTRATION FLIGHTS																																
C. <input type="checkbox"/> MULTIPLE AIRWORTHINESS CERTIFICATE (check ABOVE: "Restricted Operation" and "Standard" or "Limited" as applicable)																																
A. REGISTERED OWNER (As shown on certificate of aircraft registration) <input type="checkbox"/> IF DEALER, CHECK HERE <input checked="" type="checkbox"/>																																
NAME Cessna Aircraft Company				ADDRESS 14115 Russ Meyer Blvd., PO Box 1996, Independence, KS 67301																												
B. AIRCRAFT CERTIFICATION BASIS (Check applicable blocks and complete items as indicated)																																
<input checked="" type="checkbox"/> AIRCRAFT SPECIFICATION OR TYPE CERTIFICATE DATA SHEET (Give No. and Revision No.) 3A13 - Revision 69				<input checked="" type="checkbox"/> AIRWORTHINESS DIRECTIVES (Check if all applicable AD's are complied with and give the number of the last AD SUPPLEMENT available in the biweekly series as of the date of application) 08-10																												
AIRCRAFT LISTING (Give page number(s)) N/A				SUPPLEMENTAL TYPE CERTIFICATE (List number of each STC incorporated) N/A																												
C. AIRCRAFT OPERATION AND MAINTENANCE RECORDS																																
<input checked="" type="checkbox"/> CHECK IF RECORDS IN COMPLIANCE WITH 14 CFR section 91.417			TOTAL AIRFRAME HOURS 3.5			3. EXPERIMENTAL ONLY (Enter hours flown since last certificate issued or renewed) 3																										
D. CERTIFICATION - I hereby certify that I am the registered owner (or his agent) of the aircraft described above, that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 et seq. and applicable Federal Aviation Regulations, and that the aircraft has been inspected and is airworthy and eligible for the airworthiness certificate requested.																																
DATE OF APPLICATION Feb 18, 2010			NAME AND TITLE (Print or type) David W. LaPierre Director Quality, Independence				Signature 																									
IV. INSPECTION AGENCY VERIFICATION	A. THE AIRCRAFT DESCRIBED ABOVE HAS BEEN INSPECTED AND FOUND AIRWORTHY BY (Complete the section only if 14 CFR part 21.183(d) applies).																															
	2. 14 CFR PART 121 CERTIFICATE HOLDER (Give Certificate No.)		3. CERTIFICATED MECHANIC (Give Certificate No.)		6. CERTIFICATED REPAIR STATION (Give Certificate No.)																											
	5. AIRCRAFT MANUFACTURER (Give name or firm)																															
DATE		TITLE				SIGNATURE																										
V. FAA REPRESENTATIVE CERTIFICATION	(Check ALL applicable block items A and B)																															
	A. I find that the aircraft described in Section I or VII meets requirements for				<input checked="" type="checkbox"/> THE CERTIFICATE REQUESTED <input type="checkbox"/> AMENDMENT OR MODIFICATION OF CURRENT AIRWORTHINESS CERTIFICATE																											
	B. Inspection for a special flight permit under Section VII was conducted by:				FAA INSPECTOR CERTIFICATE HOLDER UNDER																											
	DATE Feb 18, 2010 MIDO/FSDO CE-43				DESIGNEE'S SIGNATURE AND NO. Robert R. Evans ODA-100129-CE																											
				FAA DESIGNEE 14 CFR part 65 14 CFR part 121 or 135 14 CFR part 145																												

VI PRODUCTION FLIGHT TESTING	A. MANUFACTURER							
	NAME		ADDRESS					
	B. PRODUCTION BASIS <i>(Check applicable item)</i>							
	<input type="checkbox"/> PRODUCTION CERTIFICATE <i>(Give production certificate number)</i>							
	<input type="checkbox"/> TYPE CERTIFICATE ONLY <input type="checkbox"/> APPROVED PRODUCTION INSPECTION SYSTEM							
C. GIVE QUANTITY OF CERTIFICATES REQUIRED FOR OPERATING NEEDS								
DATE OF APPLICATION		NAME AND TITLE <i>(Print or type)</i>		SIGNATURE				
VII SPECIAL FLIGHT PERMIT PURPOSES OTHER THAN PRODUCTION FLIGHT TEST	A. DESCRIPTION OF AIRCRAFT							
	REGISTERED OWNER		ADDRESS					
	BUILDER <i>(Make)</i>		MODEL					
	SERIAL NUMBER		REGISTRATION MARK					
	B. DESCRIPTION OF FLIGHT							
	FROM		TO					
	VIA		DEPARTURE DATE	DURATION				
	C. CREW REQUIRED TO OPERATE THE AIRCRAFT AND ITS EQUIPMENT							
	<input type="checkbox"/>	PILOT	<input type="checkbox"/>	CO-PILOT	<input type="checkbox"/>	FLIGHT ENGINEER	<input type="checkbox"/>	OTHER <i>(Specify)</i>
	D. THE AIRCRAFT DOES NOT MEET THE APPLICABLE AIRWORTHINESS REQUIREMENTS AS FOLLOWS:							
	E. THE FOLLOWING RESTRICTIONS ARE CONSIDERED NECESSARY FOR SAFE OPERATION: (Use attachment if necessary)							
	F. CERTIFICATION - I hereby certify that I am the registered owner (or his agent) of the aircraft described above; that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 <u>et seq.</u> and applicable Federal Aviation Regulations; and that the aircraft has been inspected and is safe for the flight described.							
	DATE		NAME AND TITLE <i>(Print or type)</i>			SIGNATURE		
VIII AIRWORTHINESS DOCUMENTATION/FAA DESIGNEE use only	<input checked="" type="checkbox"/>	A. Operating Limitations and Markings in Compliance with 14 CFR section 91.9, as Applicable			G. Statement of Conformity, FAA Form 8130-9 <i>(Attach when required)</i>			
	<input type="checkbox"/>	B. Current Operating Limitations Attached			H. Foreign Airworthiness Certification for Import Aircraft <i>(Attach when required)</i>			
	<input type="checkbox"/>	C. Data, Drawings, Photographs, etc. <i>(Attach when required)</i>			I. Previous Airworthiness Certificate issued in Accordance with 14 CFR Section _____ CAR _____ <i>(Original attached)</i>			
	<input checked="" type="checkbox"/>	D. Current Weight and Balance Information Available in Aircraft						
	<input type="checkbox"/>	E. Major Repair and Alteration, FAA Form 337 <i>(Attach when required)</i>			<input checked="" type="checkbox"/> J. Current Airworthiness Certificate Issued in Accordance with 14 CFR Section 21.183(a)			
	<input checked="" type="checkbox"/>	F. This inspection Recorded in Aircraft Records			K. Light-Sport Aircraft Statement of Compliance, FAA Form 8130-15 <i>(Attach when required)</i>			

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION-FEDERAL AVIATION ADMINISTRATION
STANDARD AIRWORTHINESS CERTIFICATE

1 NATIONALITY AND REGISTRATION MARKS N267RH	2 MANUFACTURER AND MODEL Cessna Aircraft Company 182T	3 AIRCRAFT SERIAL NUMBER 18282208	4 CATEGORY Normal
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5 AUTHORITY AND BASIS FOR ISSUANCE

This airworthiness certificate is issued pursuant to the Federal Aviation Act of 1958 and certifies that, as of the date of issuance, the aircraft to which issued has been inspected and found to conform to the type certificate therefor, to be in condition for safe operation, and has been shown to meet the requirements of the applicable comprehensive and detailed airworthiness code as provided by Annex 8 to the Convention on International Civil Aviation, except as noted herein.

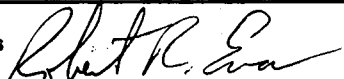
Exceptions:

None

DUPLICATE

6 TERMS AND CONDITIONS

Unless sooner surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator, this airworthiness certificate is effective as long as the maintenance, preventative maintenance, and alterations are performed in accordance with Parts 21, 43, and 91 of the Federal Aviation Regulations, as appropriate, and the aircraft is registered in the United States.

DATE OF ISSUANCE Feb 18, 2010	FAA REPRESENTATIVE Robert R. Evans 	DESIGNATION NUMBER ODA-100129-CE
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Any alteration, reproduction, or misuse of this certificate may be punishable by a fine not exceeding \$1,000 or imprisonment not exceeding 3 years or both.
THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE FEDERAL AVIATION REGULATIONS.

