

<b>DRAWING LIST FOR TRUE QUANTITY GAUGE INSTALLATION</b>				Document Number	REVISION LEVEL
ORIGINATOR JRR, TRR				7DL	Rev A
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**Drawing list on second page**

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**DRAWING LIST**

<u>Document Number</u>	<u>Title</u>	<u>Rev.</u>	<u>Date</u>
<b>Installation Data</b>			
7-II	Installation Instructions	A	4 SEP 2015
7-0-0-TAB	True Quantity Gauge Installation	A	4 SEP 2015
7-0-1-000	Unit Wiring Overview	A	4 SEP 2015
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7-0-5-000	Quantity Probe Mounting	A	4 SEP 2015
<b>Manufacturing Data</b>			
6-1-0-000	Main Display Unit	D	12 NOV 2013
6-1-4-00E	Front Cover, English	A	4 JUL 2013
6-1-4-00M	Front Cover, Metric	A	4 JUL 2013
6001-0001	Main Display Box	4	9 NOV 2013
6-2-0-000	Remote Display Unit (optional)	B	12 NOV 2013
6001-0002	Remote Display Box	4	9 NOV 2013
6-3-0-TAB	Quantity Probe Assembly	F	23 AUG 2015
6-3-1-TAB	Quantity Probe	J	23 AUG 2015
6-3-2-000	Probe Float	A	15 JUL 2011
6-3-3-000	Quantity Probe Clamp	C	10 APR 2013
6-4-0-000	Pressure Probe	B	30 DEC 2011
6-5-0-000	Quantity Probe Cable	D	9 NOV 2013
6-6-0-000	Pressure Cable	C	9 NOV 2013
6-7-0-000	Power Cable	C	9 NOV 2013
6-8-0-000	Remote Cable (optional)	D	9 NOV 2013
<b>Engineering Analysis</b>			
WEIGHT-1	Weight & Balance Analysis	C	2 MAR 2015
ELECTRICAL-1	Electrical Load Analysis	C	30 JUN 2015
<b>Test Plan</b>			
GROUND TEST-H	Ground Test Plan	A	4 SEP 2015
<b>Continued Airworthiness</b>			
ICA-H	Instruction for Continued Airworthiness	A	4 SEP 2015

<b>INSTALLATION INSTRUCTIONS</b>				Document Number 7-II	REVISION LEVEL Rev A
ORIGINATOR JRR, TRR			ISSUE DATE 04 Sept 2015	APPROVED BY TRR	
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**INSTALLATION INSTRUCTIONS**

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**PARTS LIST**

QTY	DESCRIPTION		PART NUMBER
1	Main Display Unit		PN 6-1-0-000
1	Pressure Probe		PN 6-4-0-000
1	Quantity Probe	Bell 206	PN 6-3-1-120
		R-44	PN 6-3-1-075
1	Quantity Probe Clamp		PN 6-3-3-000
1	Probe Float		PN 6-3-2-000
1	Quantity Probe Cable		PN 6-5-0-000
1	Pressure Probe Cable		PN 6-6-0-000
2	Grommets		MS 35 489-XX
1	Washer		NAS 1149C1290R
1	Power Cable		PN 6-7-0-000
<i>OPTIONAL EQUIPMENT</i>			
1	Remote Display Unit		PN 6-2-0-000
1	Remote Cable		PN 6-8-0-000

**NOTE:**

\*The Drawing 6-3-1-TAB was updated to have the last three digits of the part number be the stroke length of the quantity probe.

**INSTALLATION: Bell 206 / Isolair****PRESSURE PROBE INSTALLATION**

Tee transducer PN 6-4-0-000 into center boom at nozzle fitting within 45 degrees of vertical such that the transducer will drain.

**COCKPIT DISPLAY INSTALLATION**

Cockpit display (PN 6-1-0-000) may be mounted in dash, or atop of dash or light bar. If in dash is elected, cut hole in dash per Main Display Mounting Drawing (7-0-2-000). Attach display behind dash using the four (4) faceplate screws. If on-dash or light bar mount is elected, produce mounting brackets per Main Display Mounting drawing (7-0-2-000). Attach mounting brackets to top of dash using two (2) AN526-832 screws and two (2) AN365-832 nuts. Attach display to brackets using the bottom two (2) faceplate screws. Install 3M mounting tape under display to add stability.

**QUANTITY PROBE INSTALLATION**

Drill  $\frac{3}{4}$  inch hole in top of tank between front access covers and 16  $\frac{1}{2}$  inches aft of tank front. Insert probe (PN 6-3-1-120) through hole. Slide stainless washer, Stainless steel self-locking nut, float (PN 6-3-2-000) (NO side up) and clamp (PN 6-3-3-000) onto probe. Attach clamp to probe such that the top of clamp is 1  $\frac{1}{2}$  inch from bottom of probe. Apply sealant to underside of probe head and seat on tank, connector forward. Apply moly grease to threads of probe and install washer and self-locking nut. Reinstall access covers.

See Quantity Probe Drawing 7-0-5-000

**REMOTE DISPLAY INSTALLATION (optional)**

Produce mounting brackets per Main Display Mounting Drawing (7-0-3-000). Locate Remote Display PN 6-2-0-000 on ceiling at STA 82.7 and 12 inches to right of center line. Orientate display to show toward right rear window. Attach mounting brackets to channel using two (2) NAS1329A3K80 rivnuts and AN526-1032 screws. Attach display to mounting brackets using two (2) rear cover screws. Display may be orientated straight aft if loading is done from both sides of aircraft or an additional remote display may be added to left side of aircraft as a mirror image of the right side installation.

**CABLE INSTALLATION: Bell 206 \ Isolair****Running the Cables:**

Run the cables away from high power lines such as: Air conditioner, Blower, motor, pump, or main buss lines. If a cable must pass one of these lines try and pass at a right angle. See Drawing 7-0-0-TAB

**Quantity Probe Cable:**

To connect the Quantity Probe to the main box, use the Quantity Probe Cable (PN 6-5-0-000). You can identify this cable because it is the only one with a  $90^\circ$  connection. The end with the  $90^\circ$  connection connects to the top of the quantity probe. The other end of the cable connects to the back of the main box to the port labeled "QTY GAUGE".

Route cable forward and up through belly at STA 52.7 (ADF loop hole). Route cable forward through tunnel and up through instrument pedestal to main display. If on-dash mount is elected, exit dash through 1" hole and close with grommet. Coil excess cable and tie-wrap cable along the route to ensure no interference with controls.

**Power Cable:**

To connect the power to the main box, use the Power Cable (PN 6-7-0-000). You can identify this cable because it has a connector only on one end.

Connections to aircraft using AMP terminal ends or other methods acceptable by AC 43.13:

Black: connects to aircraft Ground

Blue: connects to +24V through a 1 amp breaker (Klixon 7227-2-1 or equivalent) label breaker (Hopper Display) Breaker to be installed into breaker panel.

Brown: connects to the collective switch side of the Hobbs meter.

The other end of the cable connects to the back of the main box to the port labeled "POWER".

**Pressure Probe Cable:**

To connect the Pressure probe to the main box, use the Pressure Probe Cable (PN 6-6-0-000). You can identify this cable it will be the *larger diameter cable with 4 pins* in the male end. The female end of the cable connects to the Pressure Probe. The other end of the cable connects to the back of the main box to the port labeled "PRES GAUGE".

Silicone seal connector to transducer after installation. Tie-wrap cable to spray plumbing and route to join Quantity Cable, follow Quantity Cable to Main Display and secure in same manner as Quantity Cable. Ensure no interference with controls. Seal belly at STA 52.7 with grommet or silicone seal.

**Remote Box Cable:**

To connect the Remote Box to the main box, use the Remote Cable (PN 6-8-0-000). You can identify this cable it will be the *smaller diameter cable with 4 pins* in the male end. The female end of the cable connects to the Remote Box. The other end of the cable connects to the back of the main box to the port labeled "REMOTE".

Tie-wrap cable to aircraft wire bundle from front of windshield to STA81. Coil excess cable and tie-wrap to bundle

**INSTALLATION: R-44 / Simplex****PRESSURE PROBE INSTALLATION**

Tee transducer PN 6-4-0-000 into center boom at nozzle fitting within 45 degrees of vertical such that the transducer will drain.

**COCKPIT DISPLAY INSTALLATION**

Cockpit display (PN 6-1-0-000) may be mounted in dash, or atop of dash or light bar. If in dash is elected, cut hole in dash per Main Display Mounting Drawing (7-0-2-000). Attach display behind dash using the four (4) faceplate screws. If on-dash or light bar mount is elected, produce mounting brackets per Main Display Mounting drawing (7-0-2-000). Attach mounting brackets to top of dash using two (2) AN526-832 screws and two (2) AN365-832 nuts. Attach display to brackets using the bottom two (2) faceplate screws. Install 3M mounting tape under display to add stability.

**QUANTITY PROBE INSTALLATION**

Open front access panel of tank. Drill  $\frac{3}{4}$  inch hole in bottom of tank one inch aft of center in sub tank opening. Enlarge sub tank opening to 3 inch diameter centered on  $\frac{3}{4}$  inch hole. Apply chemical resistant sealant (Permatex 77B) to mating surface of quantity probe PN 6-3-1-075 and install through  $\frac{3}{4}$  inch hole from the underside with the connector pointed aft. Install  $\frac{3}{4}$  inch large area stainless steel washer with sealant applied between the tank and washer. Apply moly grease to  $\frac{3}{4}$  inch threads on quantity probe. Install stainless steel self-locking nut. Install float (PN 6-3-2-000) on probe with NO side towards probe head. Install clamp (PN 6-3-3-000) such that the float side is 1  $\frac{1}{2}$  inch from end of probe. Reinstall access panel.

See Quantity Probe Mounting Drawing 7-0-5-000

**CABLE INSTALLATION: R-44 / Simplex****Running the Cables:**

Run the cables away from high power lines such as: Air conditioner, Blower, motor, pump, or main buss lines. If a cable must pass one of these lines try and pass at a right angle. See Drawing 7-0-0-TAB

**Quantity Probe Cable:**

To connect the Quantity Probe to the main box, use the Quantity Probe Cable (PN 6-5-0-000). You can identify this cable because it is the only one with a  $90^\circ$  connection. The end with the  $90^\circ$  connection connects to the top of the quantity probe. The other end of the cable connects to the back of the main box to the port labeled "QTY GAUGE".

Drill one inch hole in belly skin. Route cable forward and up through belly, close hole with Grommet or silicone. Attach cable to tank with silicone and tie wraps. Route cable up through instrument pedestal to main display, if on-dash mount is elected, exit dash through 1" hole and close with grommet. Coil excess cable and tie-wrap cable along the route to ensure no interference with controls.

**Power Cable:**

To connect the power to the main box, use the Power Cable (PN 6-7-0-000). You can identify this cable because it has a connector only on one end.

Connections to aircraft using AMP terminal ends or other methods acceptable by AC 43.13:

Black: connects to aircraft Ground

Blue: connects to +24V through a 1 amp breaker (Klixon 7227-2-1 or equivalent) label breaker (Hopper Display) Breaker to be installed into breaker panel.

Brown: connects to the collective switch side of the Hobbs meter.

The other end of the cable connects to the back of the main box to the port labeled "POWER".

**Pressure Probe Cable:**

To connect the Pressure probe to the main box, use the Pressure Probe Cable (PN 6-6-0-000). You can identify this cable it will be the *larger diameter cable with 4 pins* in the male end. The female end of the cable connects to the Pressure Probe. The other end of the cable connects to the back of the main box to the port labeled "PRES GAUGE".

Silicone seal connector to transducer after installation. Tie-wrap cable to spray plumbing and route to join Quantity Cable, follow Quantity Cable to Main Display and secure in same manner as Quantity Cable. Ensure no interference with controls. Seal belly with grommet or silicone seal.



## **DIP SWITCH SETTINGS**

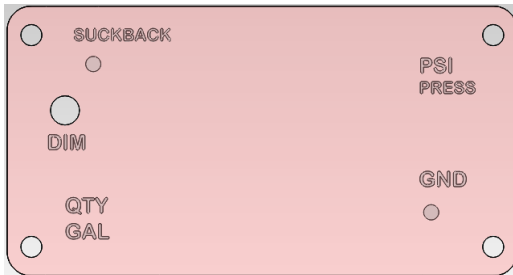
To check dip switch setting without opening the box refer to the “Display Settings Info” section. The Main Box is the same for all aircraft. The way the box is set for a particular aircraft is thru the dip switch settings.

To change the dip switch setting unscrew the dim button cover and take the four screws out of the back of the main box. You will now be able to slide the main board and back out of the box. On the top of the main board you will see a series of dip switches. The switches are labeled and switch 1 should be closest to the display board. For a serial number C or later the dip switches are on the back of the display board with switch 1 at the top.

**Setting the Switches:** Switch 1 is used to select English or Metric units, when switch 1 is turned on then Metric is selected.

If Metric is selected the Main Display should be relabeled to indicate “LITER” and “BAR”. The remote display should be relabeled to indicate “LITERS X 10”.

Relabeling can be done with self-adhesive labels or by changing from the English to Metric Front Cover both shown below.



6-1-4-00E Front Cover, English  
Units are labeled “PSI” and “GAL”



6-1-4-00M Front Cover, Metric  
Units are Labeled “BAR” and “LITER”

Switch 8 is used to invert ground mode indication; normal setting is switch 8 off.

The other switches are used to select the aircraft you have. Refer to the table for the settings for your aircraft.

Plane	Software Ver Intro	Display	Switch 2	Switch 3	Switch 4	Switch 5	Switch 6	Switch 7
Bell 206	<b>106</b>	<b>Bell 206</b>	OFF	<b>ON</b>	<b>ON</b>	OFF	<b>ON</b>	OFF
R-44	<b>110</b>	<b>Rob 44</b>	OFF	OFF	OFF	<b>ON</b>	<b>ON</b>	OFF

Software Ver Intro, is the software version that that model airplane was added to the software. All later software has preceding aircrafts data. To check software version, hold dim button when powering the unit on.

## **TROUBLE SHOOTING**

If the unit is not powering on, check the power supply for the box.

- Check circuit breaker
- Make sure you have the black to ground and the blue to power
- Check cable connection to back of main display box, remove and reinstall power cable from main box

If you get an Error on either line of the display it is saying that the sensor is out of range.

- If the Error is on the pressure line the error is with the pressure probe, or connection.
- If the Error is on the quantity line the error is with the quantity probe, or connection.

An error is normally caused by a bad connection or sometimes the cable. Check your connections and make sure you did not kink the cable when running it. You can check the continuity of the cable with a multi meter to verify if it is the cable.

If you have erratic or incorrect readings on the quantity gauge.

- Check the cable connections from the main box to the quantity gauge, remove and reinstall connections
- Check that the float is free on the rod and functioning properly.
- Check that quantity rod is not overly coated with residue, clean rod with power washer
- Check that no magnetic hardware or strong magnetic fields are around the Quantity gauge.

If the pressure displays numbers that are obviously incorrect; cycle power off then on holding the dim button with spray pump off. Doing this will set a new zero pressure setting.

## **TESTING**

See Ground test document #Ground test – 1.

**Any Further Questions Please Email:**

**[ReabeDesign@gmail.com](mailto:ReabeDesign@gmail.com)**

**or Call**

**TIP-PLAN-FIX  
(847) 752-6349**

## **OPERATION INSTRUCTIONS**

### **Normal Operation/Screen Dimming:**

During operation the display will show the boom pressure reading on the upper line and the hopper quantity on the lower line. There are two green LED's in the display. The LED labeled "GROUND" is located in the lower right hand side of the display and this is used to show when the quantity is set to ground mode. The LED labeled "SUCK BACK" is located in the upper left hand side of the display and this is used to show a negative pressure in the boom. Dim button maybe repeatedly pressed to change cockpit display brightness.

### **Display Setting Info:**

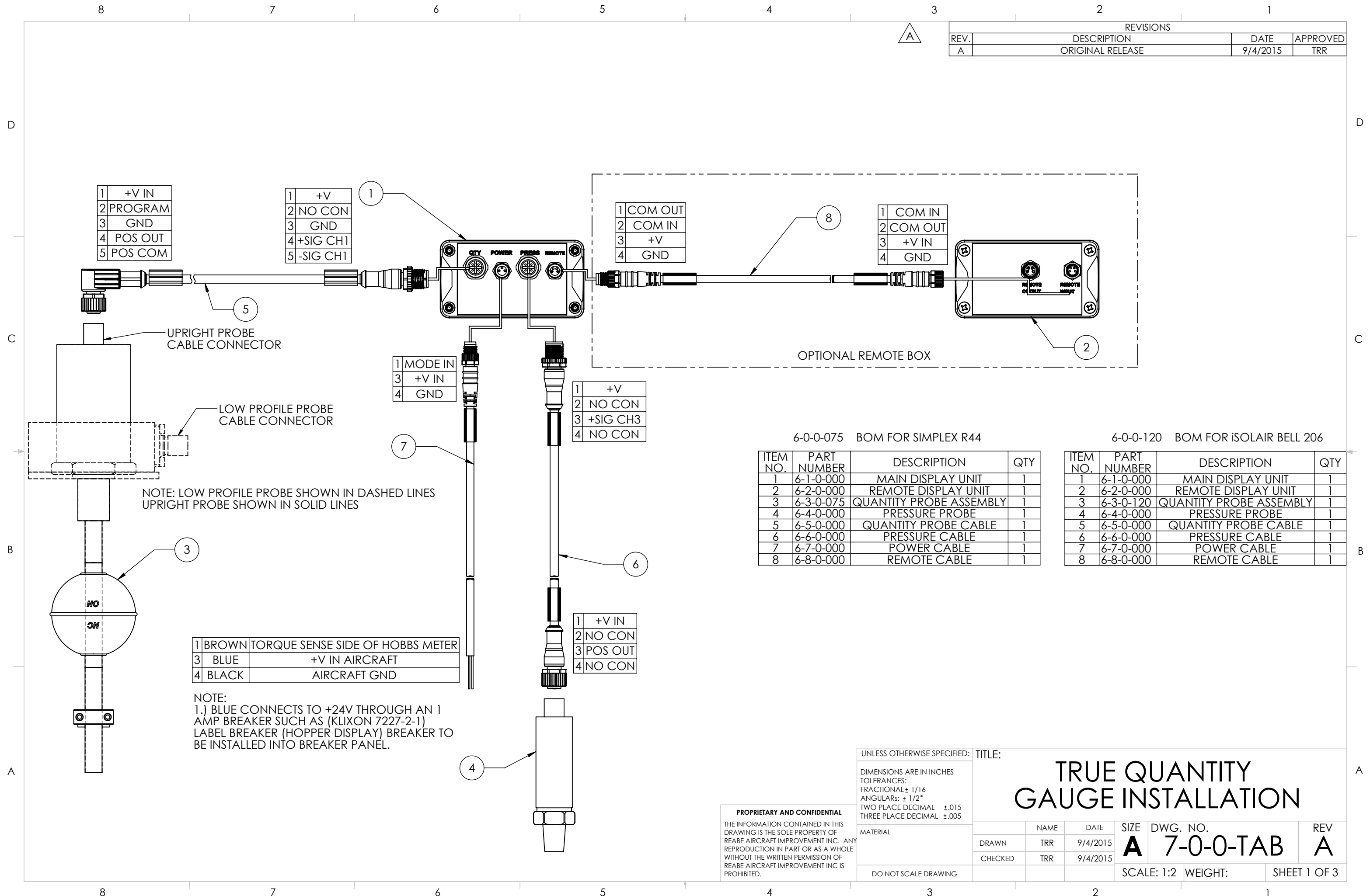
To see what the Dip Switch settings are, hold down the DIM button when the box is powered on, release button when "Cal" is displayed. The box will then display the Firmware Version, Units and Aircraft settings.

This will also set a new zero point for the pressure gauge.

### **Gyro Attitude Initialization:**

With aircraft parked on a level surface, press and hold the DIM button then turn power on. Continue to hold the DIM button through boot sequence until display shows "Press Butt." At this point press DIM 3 times and wait for "Good Cal" to be displayed.

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
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1	+V IN
2	PROGRAM
3	GND
4	POS OUT
5	POS COM

1	+V
2	NO CON
3	GND
4	+SIG CH1
5	-SIG CH1

1	COM OUT
2	COM IN
3	+V
4	GND

1	COM IN
2	COM OUT
3	+V IN
4	GND

1	MODE IN
3	+V IN
4	GND

1	+V
2	NO CON
3	+SIG CH3
4	NO CON

1	+V IN
2	NO CON
3	POS OUT
4	NO CON

1	BROWN	TORQUE SENSE SIDE OF HOBBS METER
3	BLUE	+V IN AIRCRAFT
4	BLACK	AIRCRAFT GND

NOTE:  
1.) BLUE CONNECTS TO +24V THROUGH AN 1 AMP BREAKER SUCH AS (KLIXON 7227-2-1) LABEL BREAKER (HOPPER DISPLAY) BREAKER TO BE INSTALLED INTO BREAKER PANEL.

6-0-0-075 BOM FOR SIMPLEX R44

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	6-1-0-000	MAIN DISPLAY UNIT	1
2	6-2-0-000	REMOTE DISPLAY UNIT	1
3	6-3-0-075	QUANTITY PROBE ASSEMBLY	1
4	6-4-0-000	PRESSURE PROBE	1
5	6-5-0-000	QUANTITY PROBE CABLE	1
6	6-6-0-000	PRESSURE CABLE	1
7	6-7-0-000	POWER CABLE	1
8	6-8-0-000	REMOTE CABLE	1

6-0-0-120 BOM FOR ISOLAIR BELL 206

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	6-1-0-000	MAIN DISPLAY UNIT	1
2	6-2-0-000	REMOTE DISPLAY UNIT	1
3	6-3-0-120	QUANTITY PROBE ASSEMBLY	1
4	6-4-0-000	PRESSURE PROBE	1
5	6-5-0-000	QUANTITY PROBE CABLE	1
6	6-6-0-000	PRESSURE CABLE	1
7	6-7-0-000	POWER CABLE	1
8	6-8-0-000	REMOTE CABLE	1

UNLESS OTHERWISE SPECIFIED: TITLE:

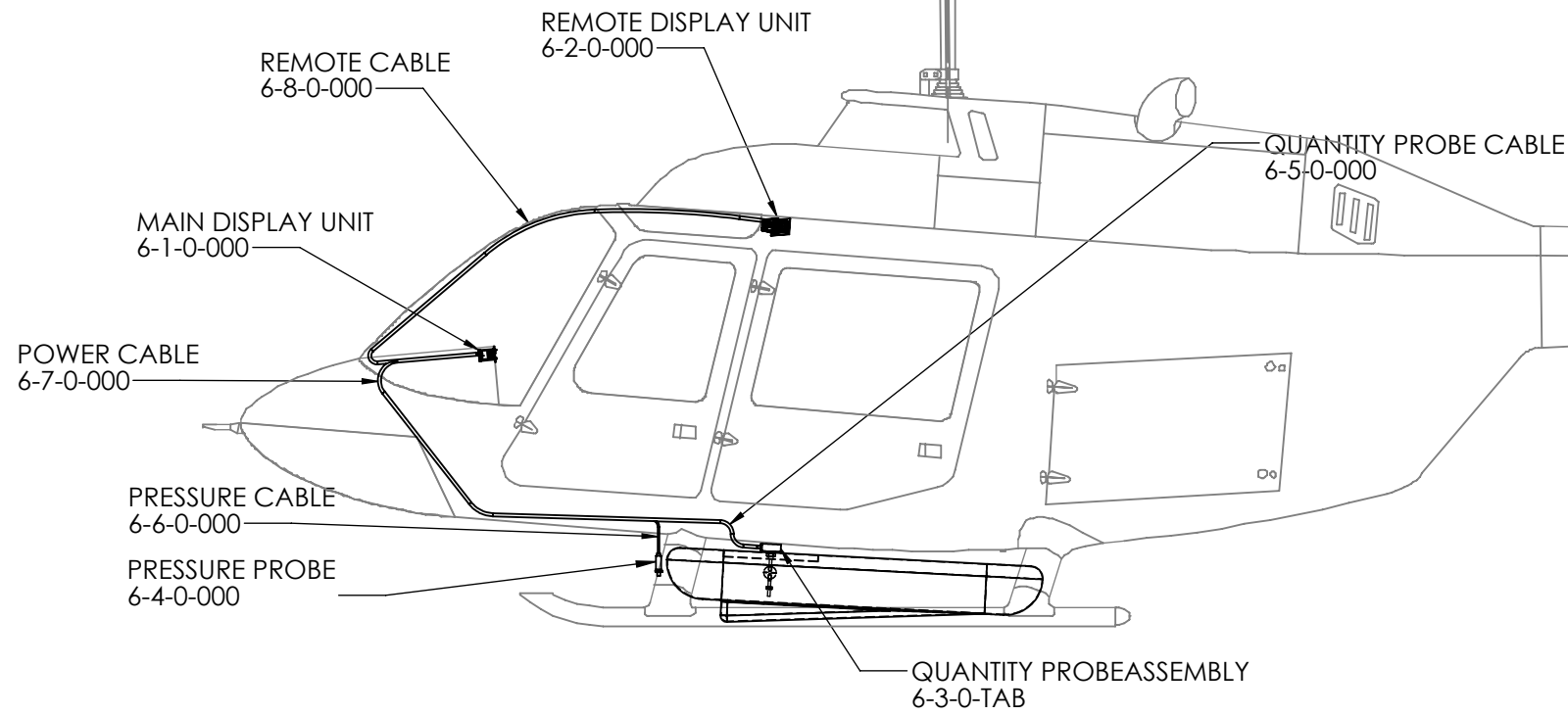
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TOLERANCES:  
FRACTIONAL: ± 1/16  
ANGULARS: ± 1/2°  
TWO PLACE DECIMAL ±.015  
THREE PLACE DECIMAL ±.005

# TRUE QUANTITY GAUGE INSTALLATION

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	CHECKED	TRR	9/4/2015	SCALE: 1:2	WEIGHT:
					SHEET 1 OF 3

# BELL 206 ISOLAIR



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TITLE:  
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 TOLERANCES:  
 FRACTIONAL:  $\pm 1/16$   
 ANGULARS:  $\pm 1/2^\circ$   
 TWO PLACE DECIMAL:  $\pm .015$   
 THREE PLACE DECIMAL:  $\pm .005$

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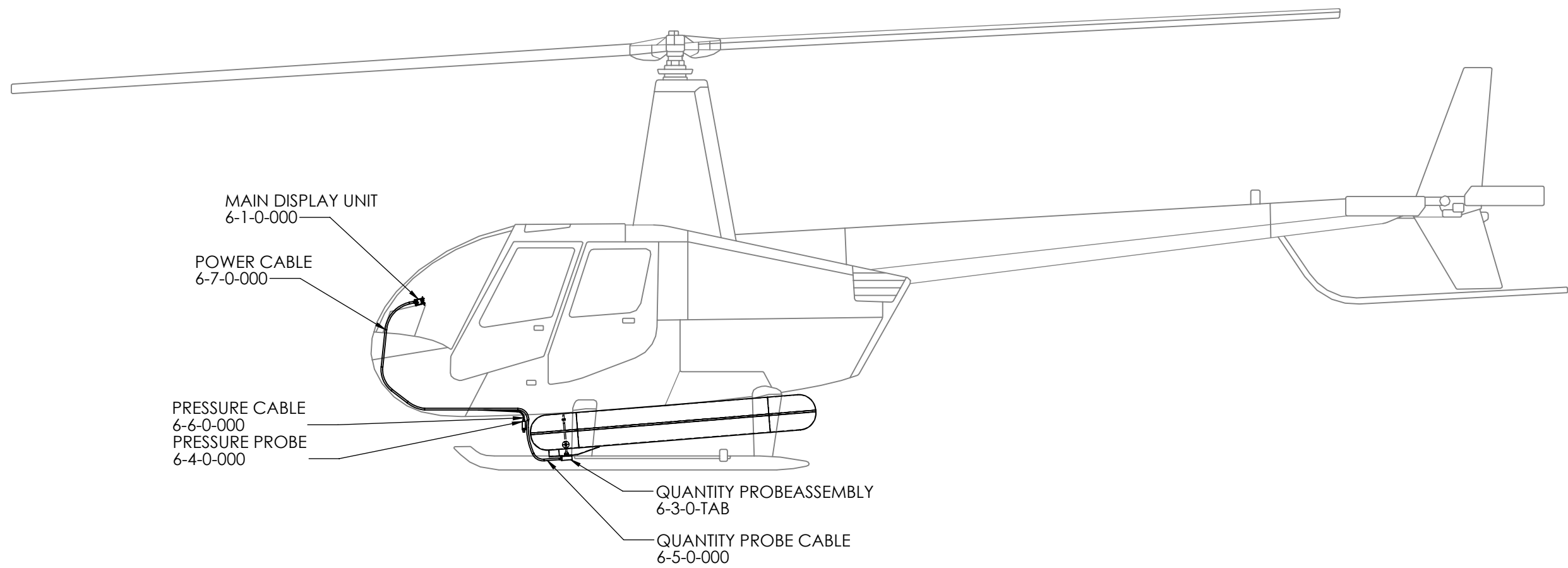
## TRUE QUANTITY GAUGE INSTALLATION

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CHECKED: TRR	9/4/2015	SCALE: 1:30 WEIGHT:		SHEET 2 OF 3

8 7 6 5 4 3 2 1

D  
C  
B  
A

# R44 SIMPLEX



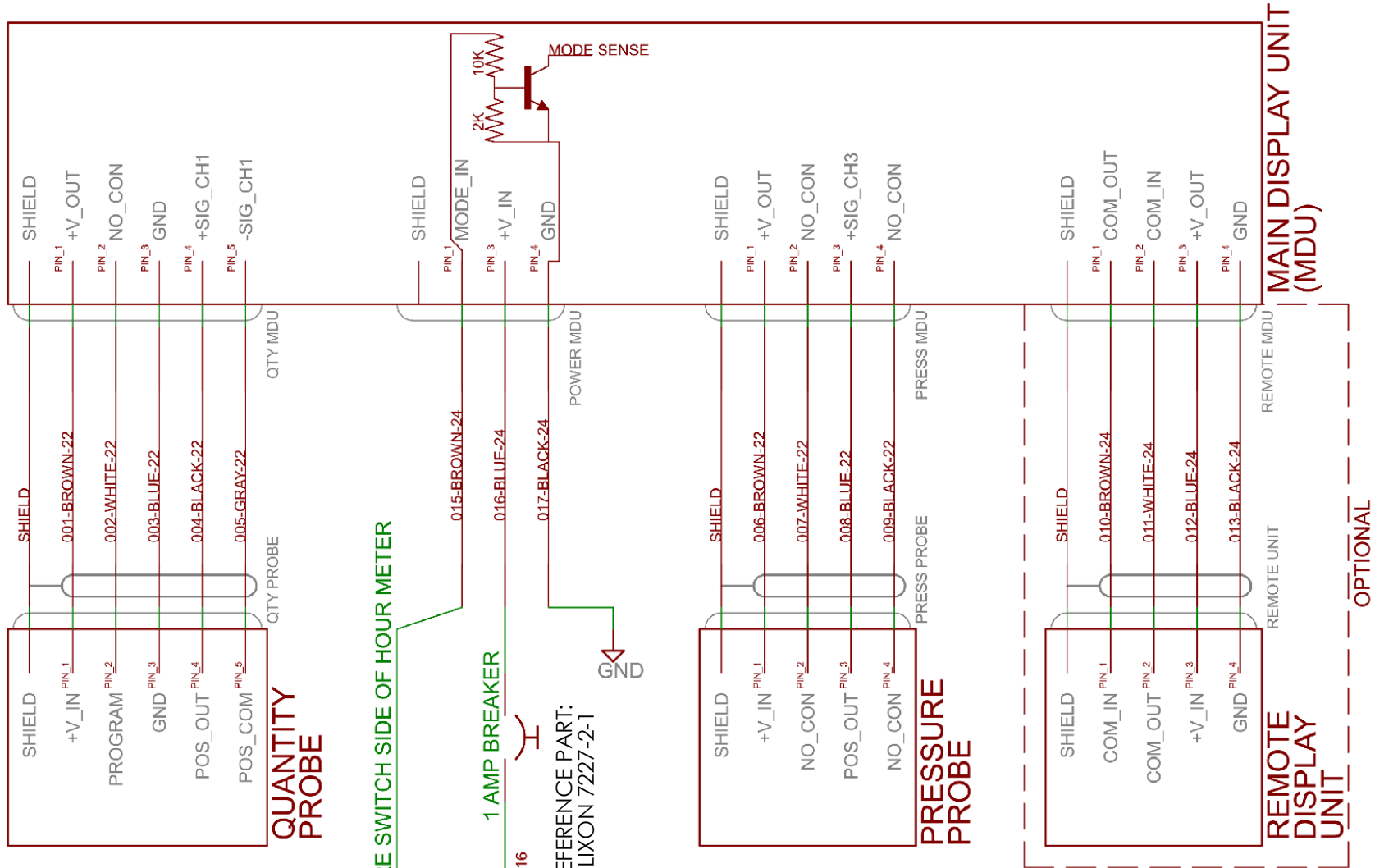
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TITLE:		<b>TRUE QUANTITY GAUGE INSTALLATION</b>		
MATERIAL	NAME	DATE	SIZE	DWG. NO.
DO NOT SCALE DRAWING	DRAWN	TRR	9/4/2015	<b>A</b> 7-0-0-TAB
	CHECKED	TRR	9/4/2015	REV <b>A</b>
SCALE: 1:36			WEIGHT:	SHEET 3 OF 3

8 7 6 5 4 3 2 1

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NOTES:  
1.) INSTALL WIRING IN ACCORDANCE WITH AC 43.13-1B



PRESSURE SWITCH SIDE OF HOUR METER

V+ 018-WHITE-16

1 AMP BREAKER

REFERENCE PART:  
KLIXON 7227-2-1



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ANGULARS: ± 1/2°  
TWO PLACE DECIMAL ±.015  
THREE PLACE DECIMAL ±.005

MATERIAL

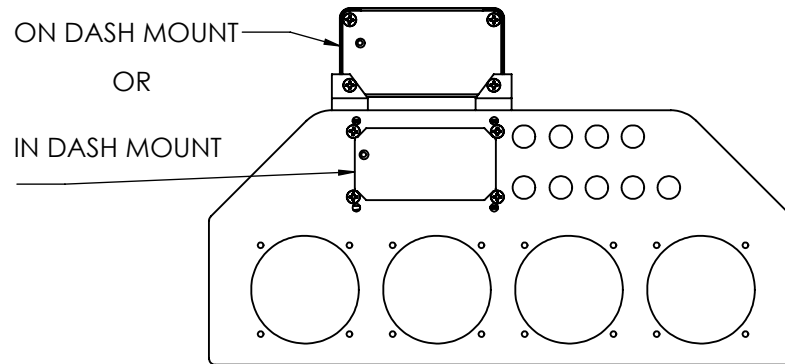
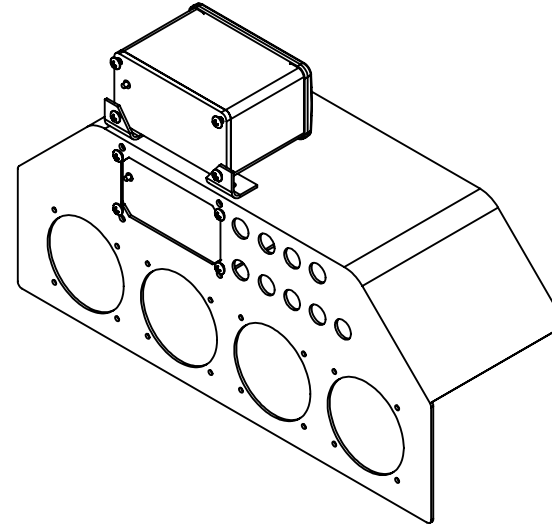
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TITLE: **UNIT WIRING OVERVIEW**

NAME	DATE	SIZE	DWG. NO.	REV
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CHECKED TRR	9/4/2015	SCALE: 1:1 WEIGHT:		SHEET 1 OF 1

A

REVISIONS			
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 ANGULARS:  $\pm 1/2^\circ$   
 TWO PLACE DECIMAL  $\pm .015$   
 THREE PLACE DECIMAL  $\pm .005$

# MAIN DISPLAY MOUNTING

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MATERIAL

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DRAWN	TRR	9/4/2015	<b>A</b>	<b>7-0-2-000</b>	<b>A</b>
CHECKED	TRR	9/4/2015			
			SCALE: 1:4	WEIGHT:	SHEET 1 OF 3

5

4

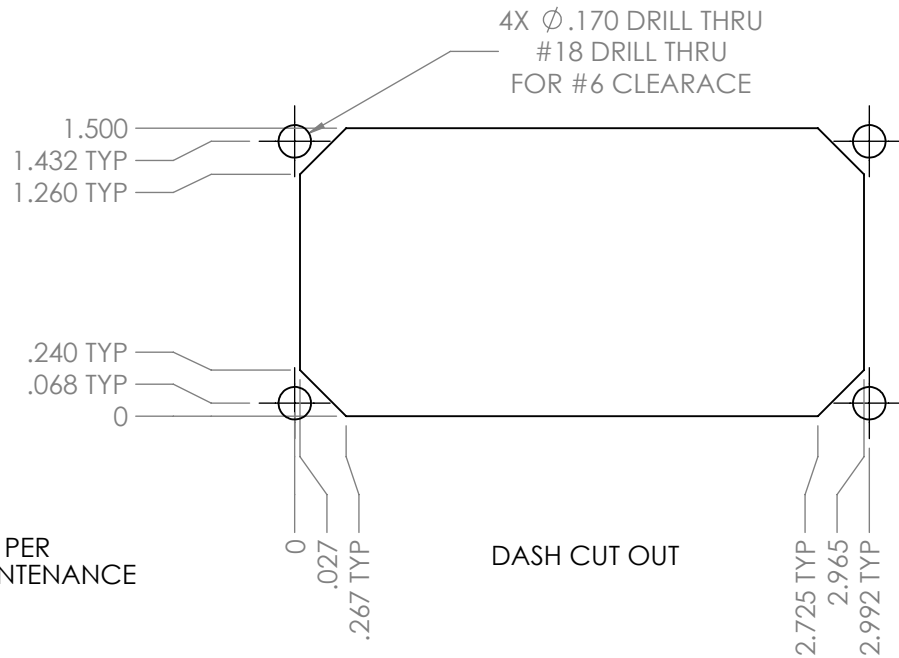
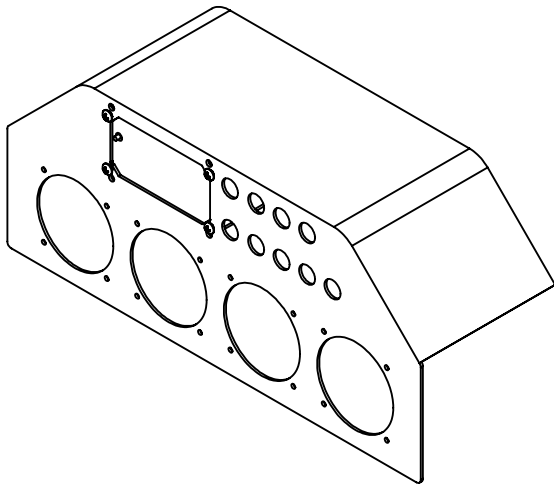
3

2

1



# IN DASH MOUNT



NOTE:  
PAINT CUTOUT PER  
AIRCRAFT MAINTENANCE  
MANUAL

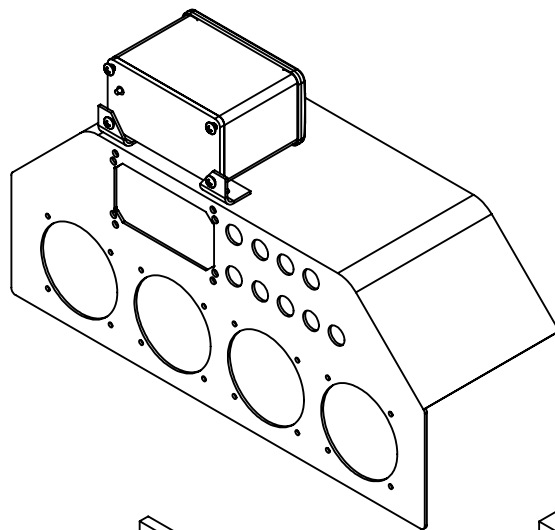
**PROPRIETARY AND CONFIDENTIAL**  
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UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS ARE IN INCHES  
TOLERANCES:  
FRACTIONAL  $\pm 1/16$   
ANGULARS:  $\pm 1/2^\circ$   
TWO PLACE DECIMAL  $\pm .015$   
THREE PLACE DECIMAL  $\pm .005$

MATERIAL  
  
DO NOT SCALE DRAWING

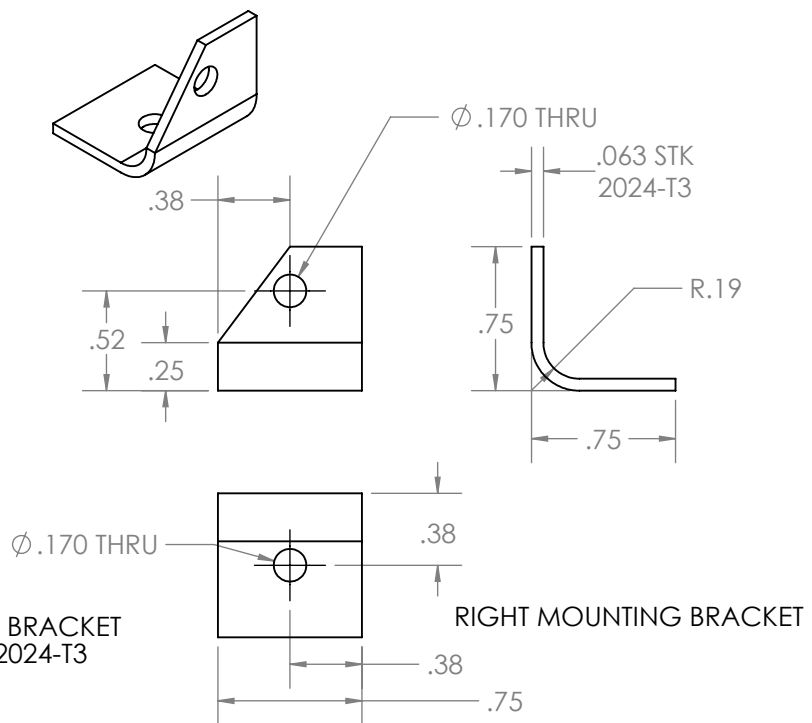
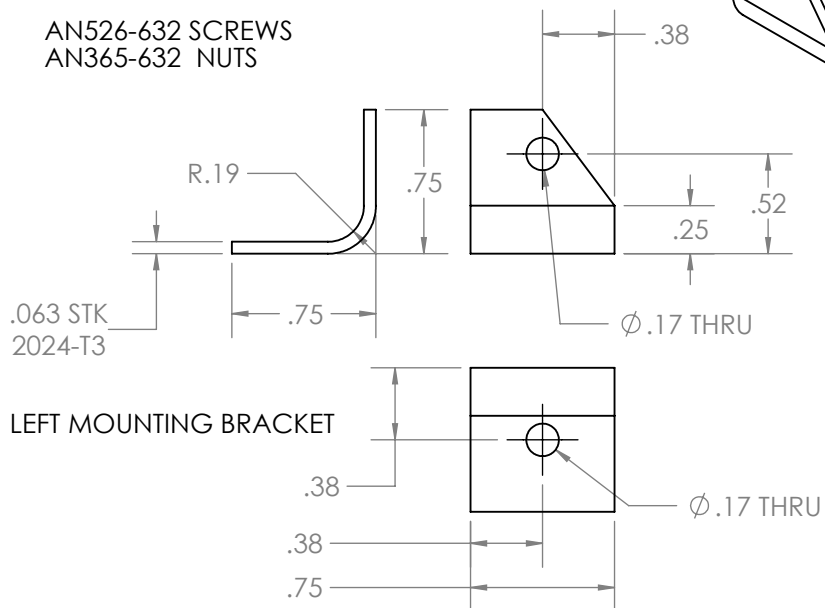
UNLESS OTHERWISE SPECIFIED:		TITLE:							
		<b>MAIN DISPLAY MOUNTING</b>							
	NAME	DATE	SIZE	DWG. NO.	REV				
DRAWN	TRR	9/4/2015	<b>A</b>	<b>7-0-2-000</b>	<b>A</b>				
CHECKED	TRR	9/4/2015							
SCALE: 1:1			WEIGHT:		SHEET 2 OF 3				

ON DASH MOUNT



MOUNTING BRACKETS  
BOLTED TO DASH USING:

AN526-632 SCREWS  
AN365-632 NUTS



UNLESS OTHERWISE SPECIFIED: TITLE:

DIMENSIONS ARE IN INCHES  
TOLERANCES:  
FRACTIONAL  $\pm 1/16$   
ANGULARS:  $\pm 1/2^\circ$   
TWO PLACE DECIMAL  $\pm .015$   
THREE PLACE DECIMAL  $\pm .005$

# MAIN DISPLAY MOUNTING

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MATERIAL

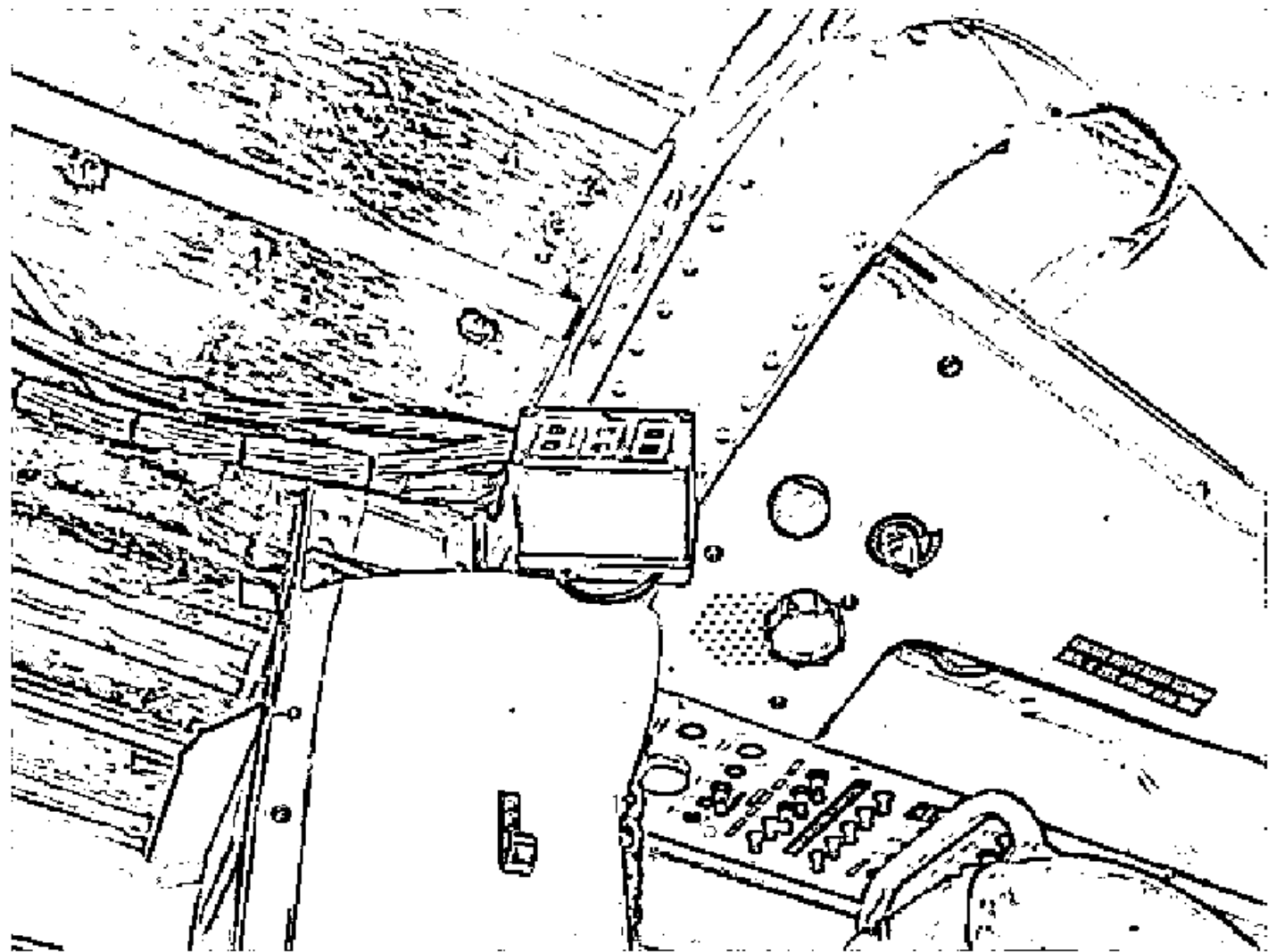
DO NOT SCALE DRAWING

NAME	DATE	SIZE	DWG. NO.	REV
DRAWN TRR	9/4/2015	<b>A</b>	<b>7-0-2-000</b>	<b>A</b>
CHECKED TRR	9/4/2015			
SCALE: 1:1		WEIGHT:		SHEET 3 OF 3

NOTE:  
PAINT CUTOUT PER  
AIRCRAFT MAINTENANCE  
MANUAL

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	ORIGINAL RELEASE	9/4/2015	TRR

BOX IS MOUNTED 12 INCHES TO THE RIGHT OF CENTER LINE OF THE HELICOPTER TO THE CENTER LINE OF THE BOX ON STA 82.7

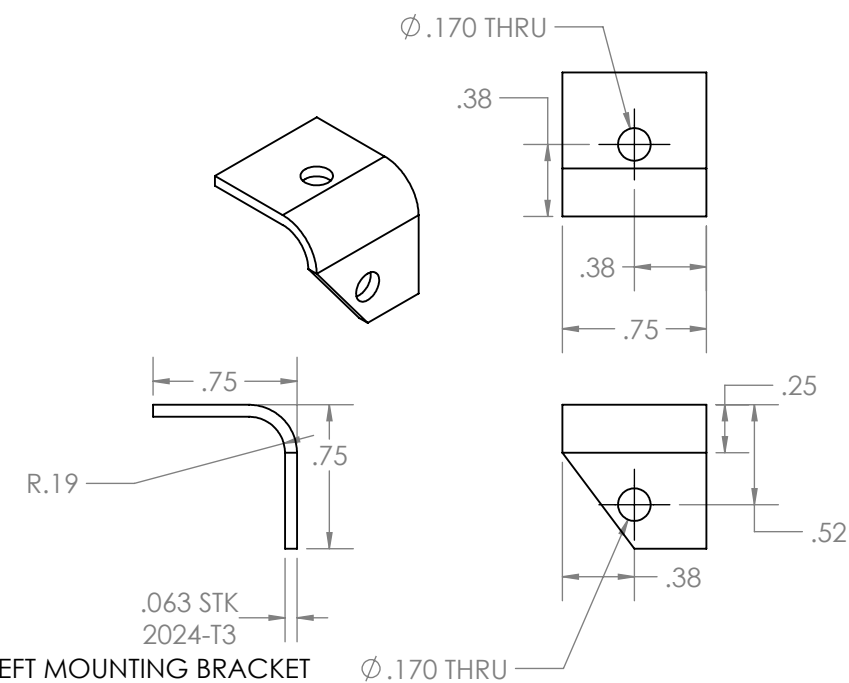
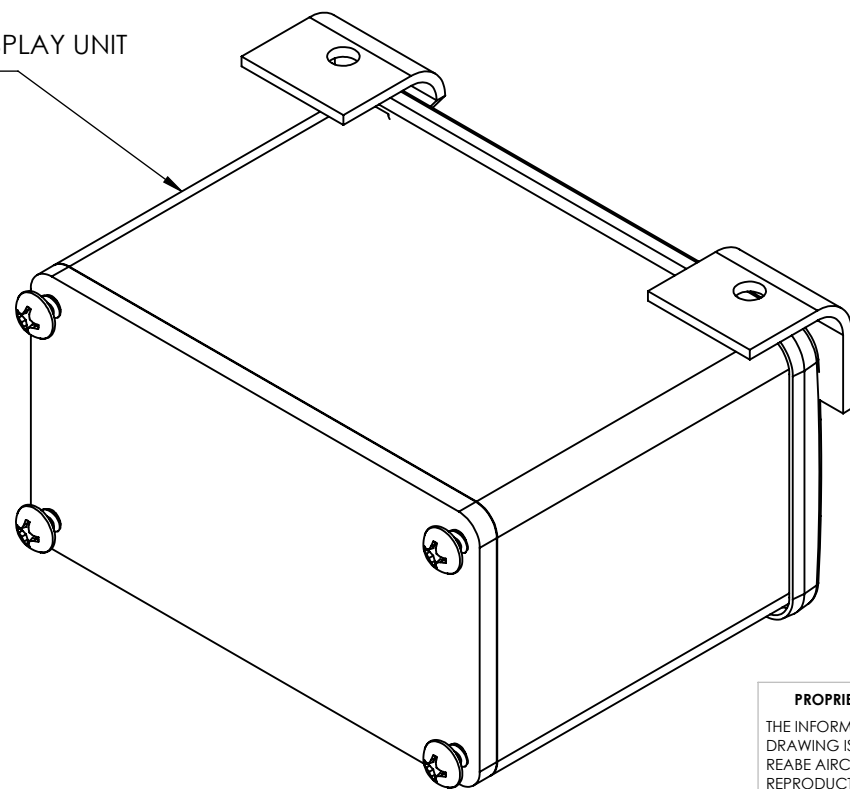
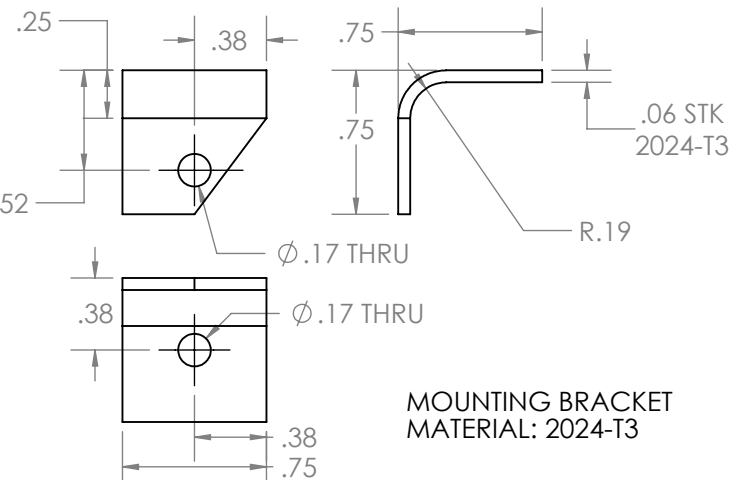


MOUNTING BRACKETS  
BOLTED TO STA-82.27 USING:

NAS1329A3K80 RIVNUTS  
AN526-1032 SCREWS

REMOTE DISPLAY UNIT  
6-2-0-000

RIGHT MOUNTING BRACKET



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UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS ARE IN INCHES  
TOLERANCES:  
FRACTIONAL ± 1/16  
ANGULARS: ± 1/2°  
TWO PLACE DECIMAL ± .015  
THREE PLACE DECIMAL ± .005

TITLE:

# REMOTE DISPLAY MOUNTING

MATERIAL		NAME	DATE	SIZE	DWG. NO.	REV
DO NOT SCALE DRAWING		TRR	9/4/2015	<b>A</b>	<b>7-0-3-000</b>	<b>A</b>
		TRR	9/4/2015	SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	ORIGINAL RELEASE	9/4/2015	TRR

THIS PAGE IS FOR NOTES

UNLESS OTHERWISE SPECIFIED: TITLE:

DIMENSIONS ARE IN INCHES  
 TOLERANCES:  
 FRACTIONAL  $\pm 1/16$   
 ANGULARS:  $\pm 1/2^\circ$   
 TWO PLACE DECIMAL  $\pm .015$   
 THREE PLACE DECIMAL  $\pm .005$

# QUANTITY PROBE MOUNTING

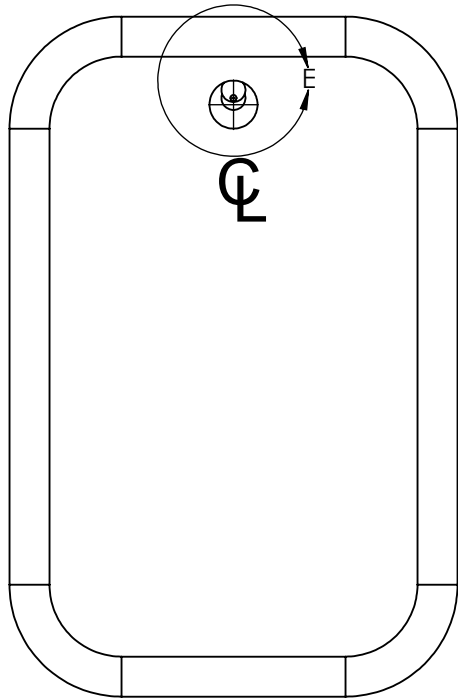
**PROPRIETARY AND CONFIDENTIAL**  
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MATERIAL

DO NOT SCALE DRAWING

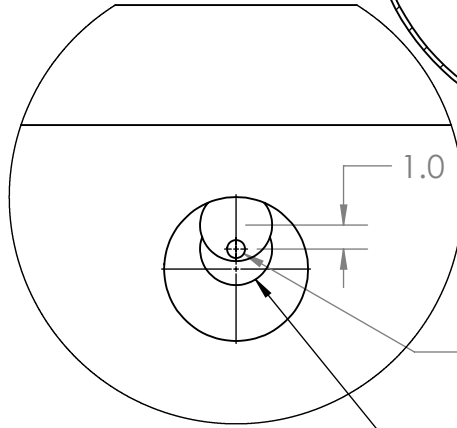
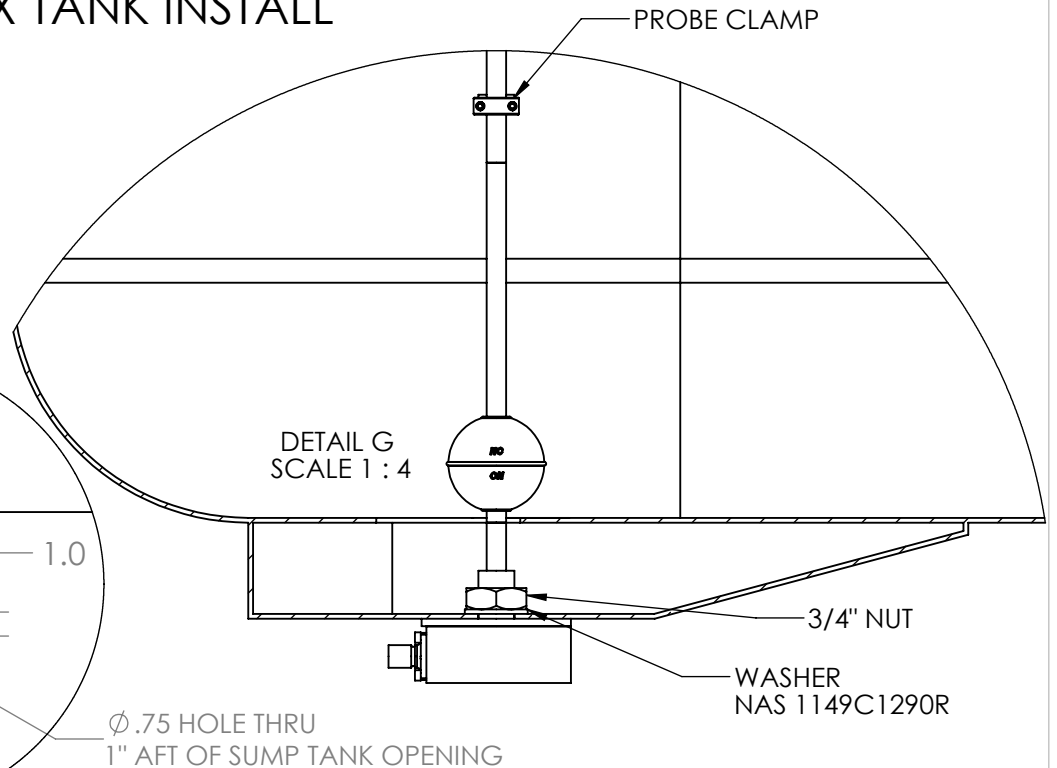
	NAME	DATE	SIZE	DWG. NO.	REV
DRAWN	TRR	9/4/2015	<b>A</b>	<b>7-0-5-000</b>	<b>A</b>
CHECKED	TRR	9/4/2015			
			SCALE: 1:5	WEIGHT:	SHEET 1 OF 4

# FRONT OF TANK



TOP VIEW OF TANK

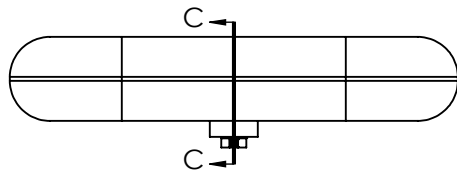
# R44 SIMPLEX TANK INSTALL



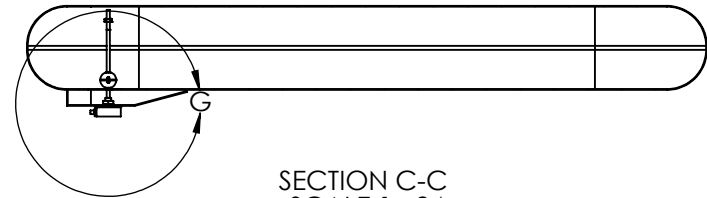
DETAIL E  
SCALE 1 : 8

Ø .75 HOLE THRU  
1" AFT OF SUMP TANK OPENING

INLARGE SUB TANK HOLE TO 3" DIA  
CENTERED ON NEW .75" HOLE



FRONT VIEW OF TANK



SECTION C-C  
SCALE 1 : 24

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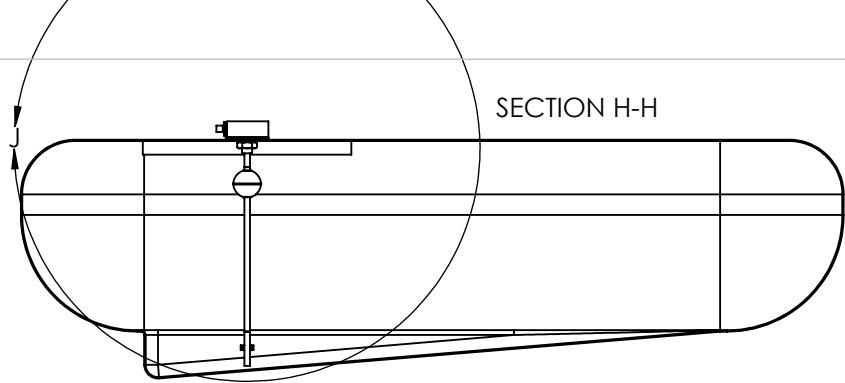
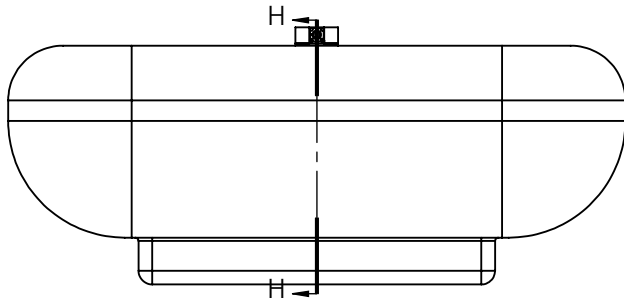
UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS ARE IN INCHES  
TOLERANCES:  
FRACTIONAL ± 1/16  
ANGULARS: ± 1/2°  
TWO PLACE DECIMAL ±.015  
THREE PLACE DECIMAL ±.005

MATERIAL  
DO NOT SCALE DRAWING

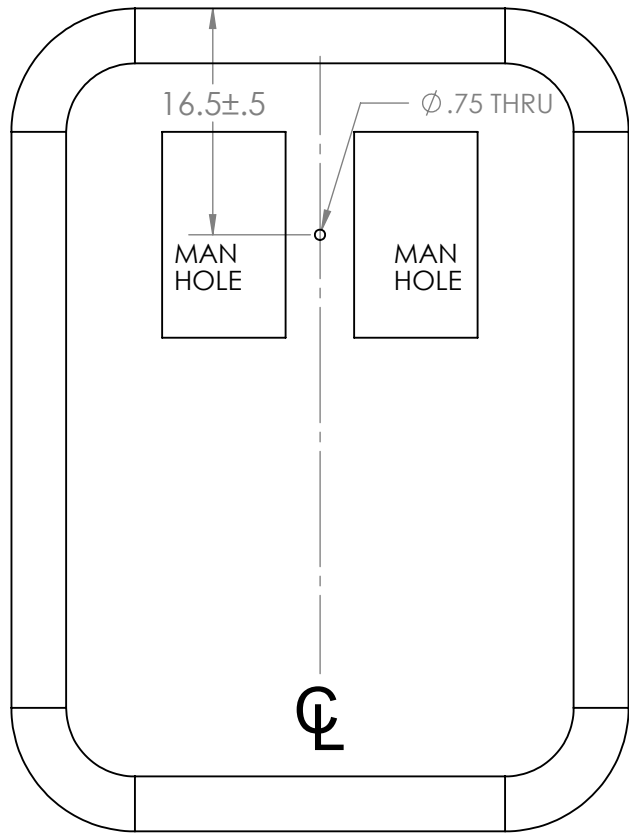
TITLE:

# QUANTITY PROBE MOUNTING

	NAME	DATE	SIZE	DWG. NO.	REV
DRAWN	TRR	9/4/2015	<b>A</b>	<b>7-0-5-000</b>	<b>A</b>
CHECKED	TRR	9/4/2015			
SCALE: 1:24			WEIGHT:		SHEET 2 OF 4



FRONT OF TANK



16.5±.5

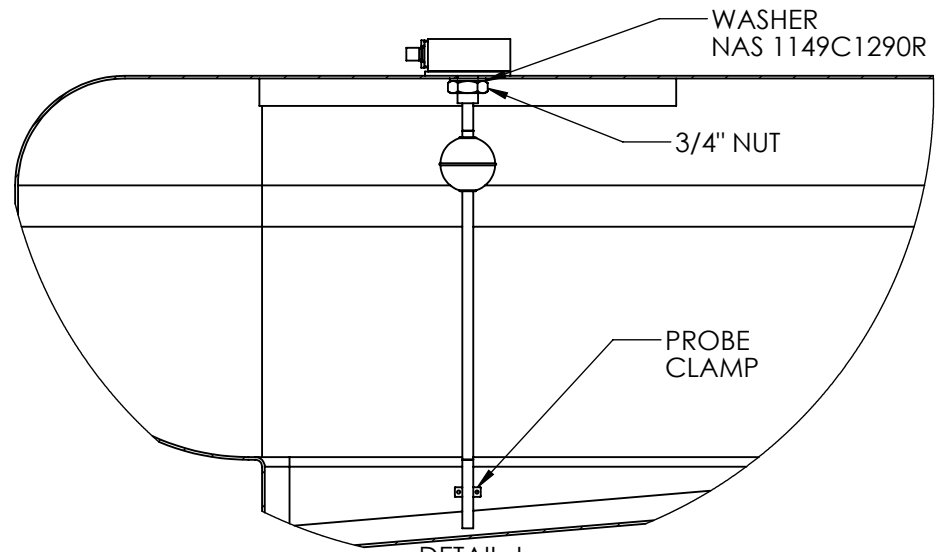
Ø.75 THRU

MAN HOLE

MAN HOLE



TOP VIEW OF TANK



WASHER  
NAS 1149C1290R

3/4" NUT

PROBE CLAMP

DETAIL J  
SCALE 1 : 7

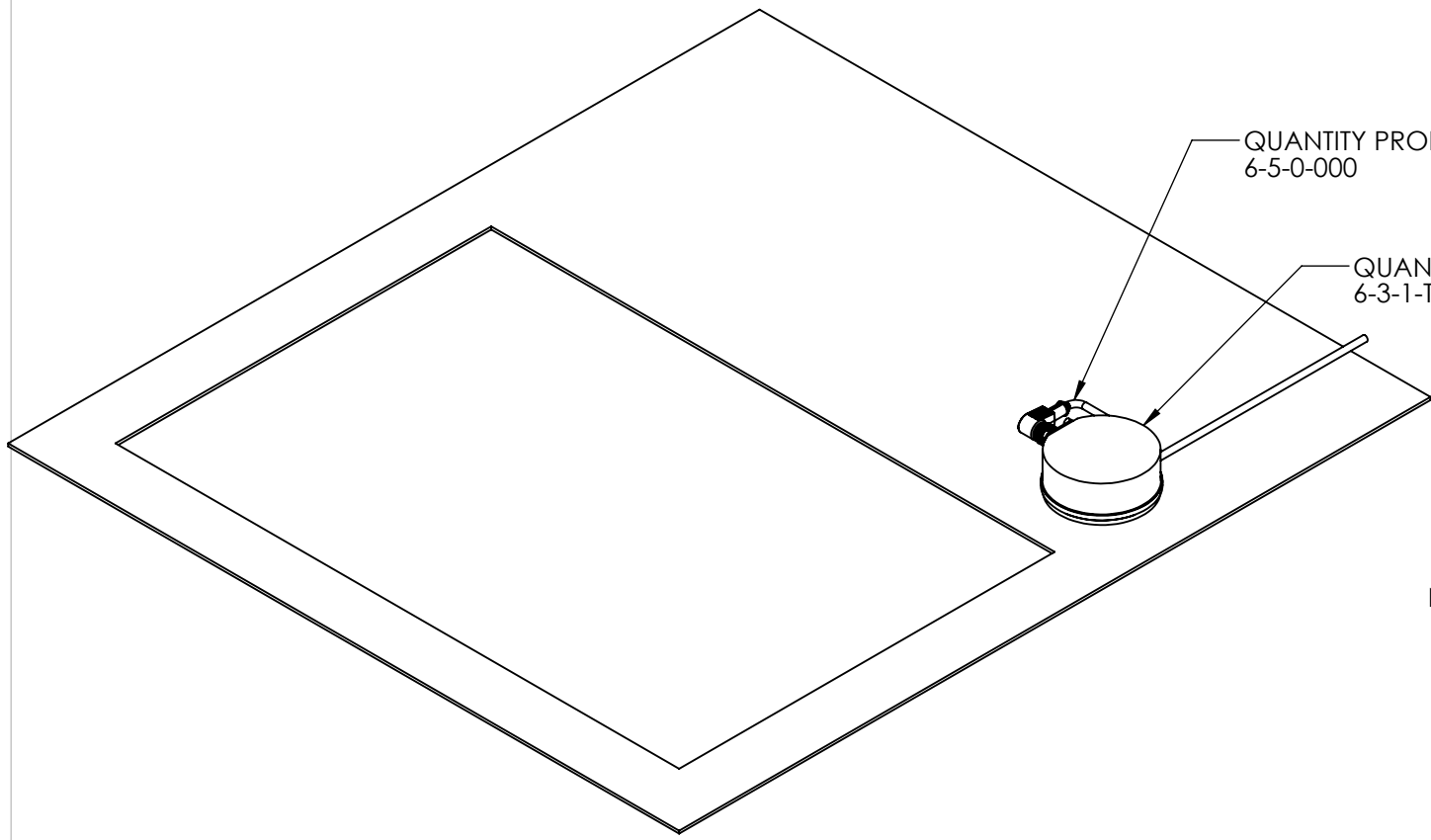
BELL 206 ISOLAIR TANK

**PROPRIETARY AND CONFIDENTIAL**  
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TOLERANCES:  
FRACTIONAL ± 1/16  
ANGULARS: ± 1/2°  
TWO PLACE DECIMAL ±.015  
THREE PLACE DECIMAL ±.005

MATERIAL		NAME		DATE		SIZE		DWG. NO.		REV	
DO NOT SCALE DRAWING		TRR		9/4/2015		<b>A</b>		<b>7-0-5-000</b>		<b>A</b>	
		CHECKED		TRR				SCALE: 1:14		WEIGHT:	
										SHEET 3 OF 4	

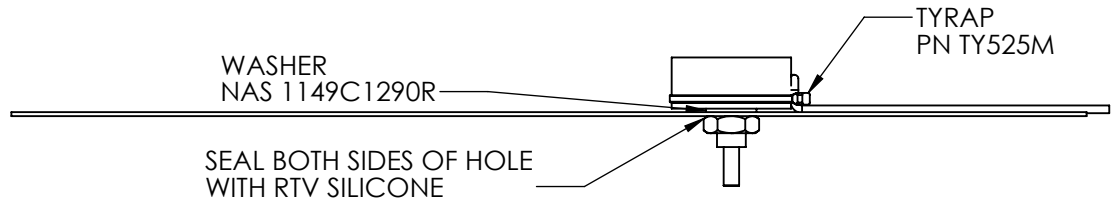
QUANTITY PROBE MOUNTING



QUANTITY PROBE CABLE  
6-5-0-000

QUANTITY PROBE  
6-3-1-TAB

NOTE: WIRE POINTING FORWARD



WASHER  
NAS 1149C1290R

TYRAP  
PN TY525M

SEAL BOTH SIDES OF HOLE  
WITH RTV SILICONE

**△ LOW PROFILE PROBE  
TYPICAL INSTALLATION,  
WIRE LOCATION**

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FRACTIONAL  $\pm 1/16$   
ANGULARS:  $\pm 1/2^\circ$   
TWO PLACE DECIMAL  $\pm .015$   
THREE PLACE DECIMAL  $\pm .005$

TITLE:

**QUANTITY PROBE  
MOUNTING**

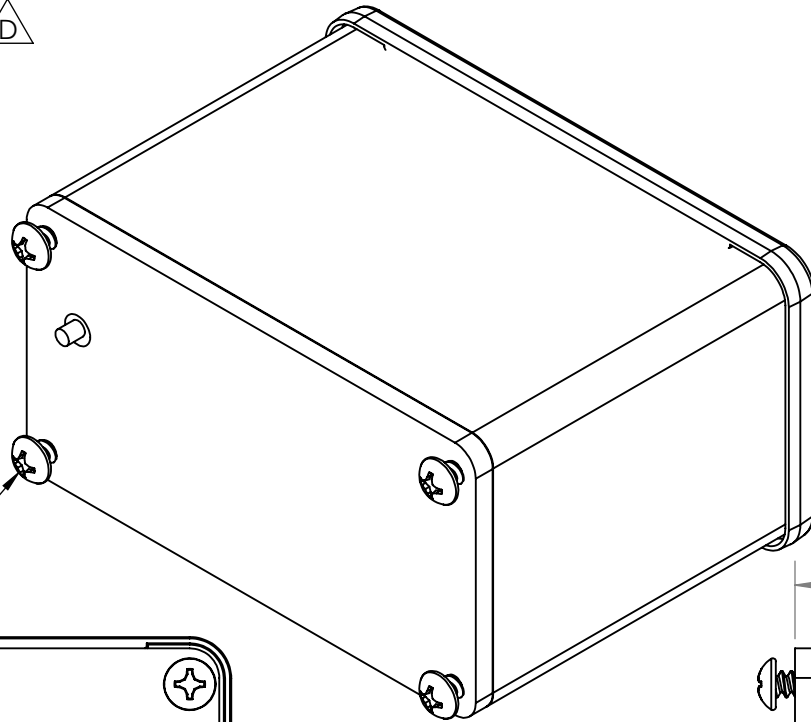
MATERIAL	NAME	DATE	SIZE	DWG. NO.	REV
	DRAWN	TRR	9/4/2015	<b>A</b> 7-0-5-000	<b>A</b>
	CHECKED	TRR	9/4/2015		
DO NOT SCALE DRAWING			SCALE: 1:5	WEIGHT:	SHEET 4 OF 4

PART NUMBER: 6-1-0-000 A B C D

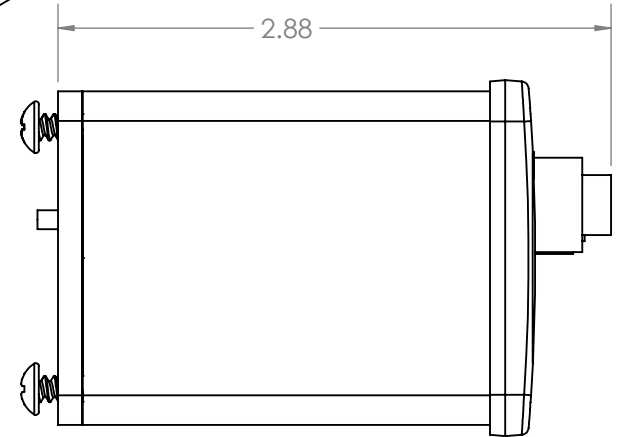
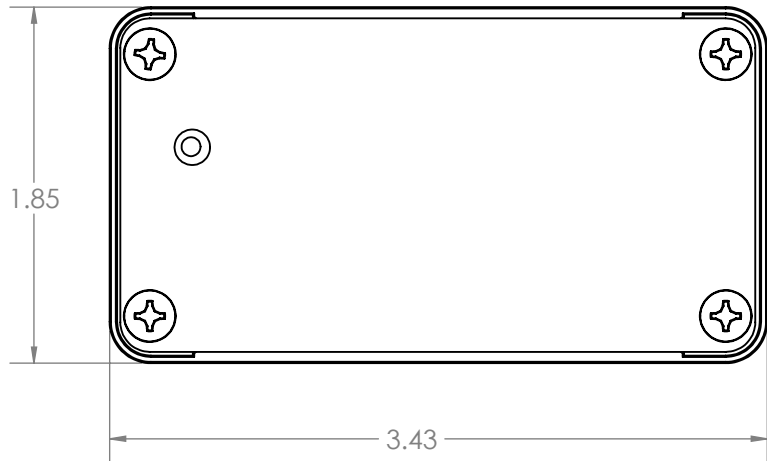
MANUFACTURE: REABE DESIGN LLC  
MFG PART NUMBER: 6001-0001

MAIN DISPLAY BOX

CASE: EXTRUDED ALUMINUM  
BACK COVER: CAST ALUMINUM  
FRONT COVER: ACRYLIC SHEET



MS51861-29AB  
#6-20 X 1 PAN HEAD  
SHEET METAL SCREW



REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	ORIGINAL RELEASE	07/20/2011	TRR
B	REABE DESIGN LLC, FLIPED REMOTE CONNECTOR FOR SERIAL NUMBE "B" AND LATTER UNITS	1/4/2012	TRR
C	REABE DESIGN LLC, ADDED 24V DC POWER OUT IN SERIAL NUMBER "C" AND LATTER UNITS	6/28/2012	TRR
D	REABE DESIGN LLC, REV 4 IS SERIAL NUMBER "D" AND LATTER	11/12/2013	TRR

UNLESS OTHERWISE SPECIFIED: TITLE:

DIMENSIONS ARE IN INCHES  
TOLERANCES:  
FRACTIONAL  $\pm 1/16$   
ANGULARS:  $\pm 1/2^\circ$   
TWO PLACE DECIMAL  $\pm .015$   
THREE PLACE DECIMAL  $\pm .005$

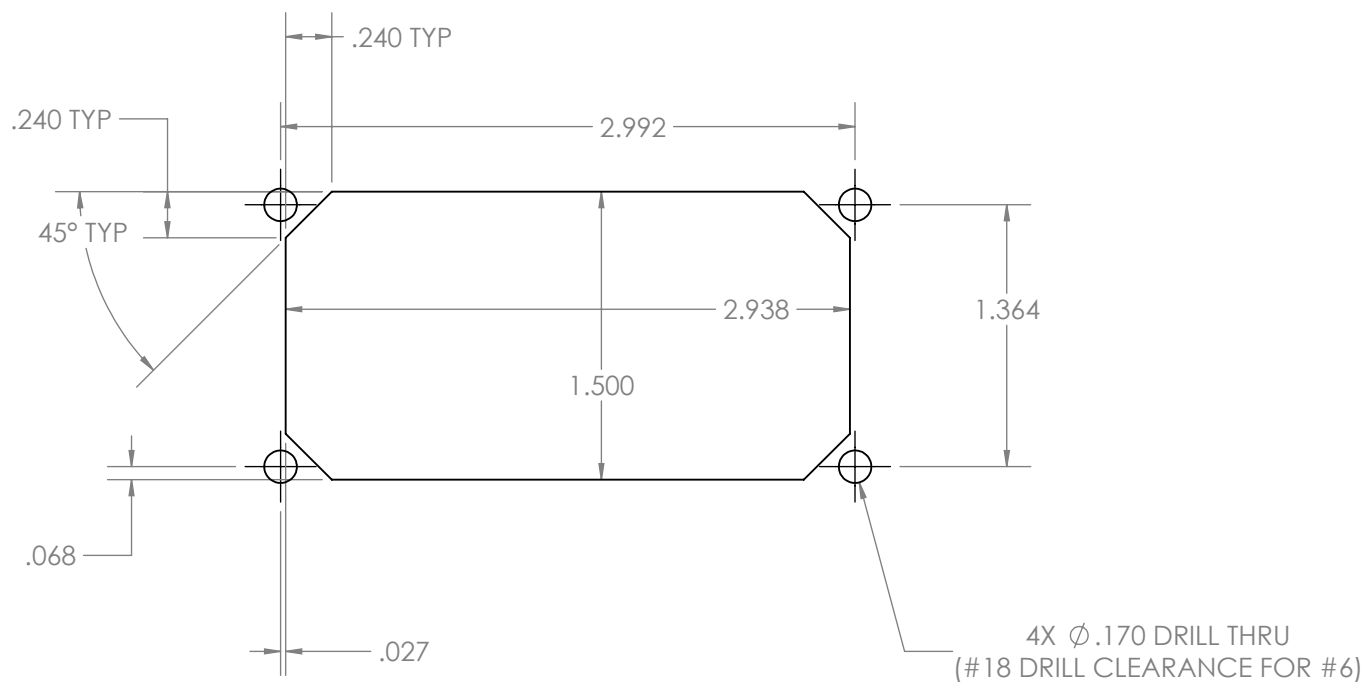
# MAIN DISPLAY UNIT

**PROPRIETARY AND CONFIDENTIAL**  
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MATERIAL  
  
DO NOT SCALE DRAWING

	NAME	DATE	SIZE	DWG. NO.	REV
DRAWN	TRR	7/20/2011	<b>A</b>	<b>6-1-0-000</b>	<b>D</b>
CHECKED	TRR	7/20/2011			
			SCALE: 1:1	WEIGHT: .5 LBS.	SHEET 1 OF 4





RECOMMENDED DASH CUTOUT AND MOUNT

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES  
 TOLERANCES:  
 FRACTIONAL  $\pm 1/16$   
 ANGULARS:  $\pm 1/2^\circ$   
 TWO PLACE DECIMAL  $\pm .015$   
 THREE PLACE DECIMAL  $\pm .005$

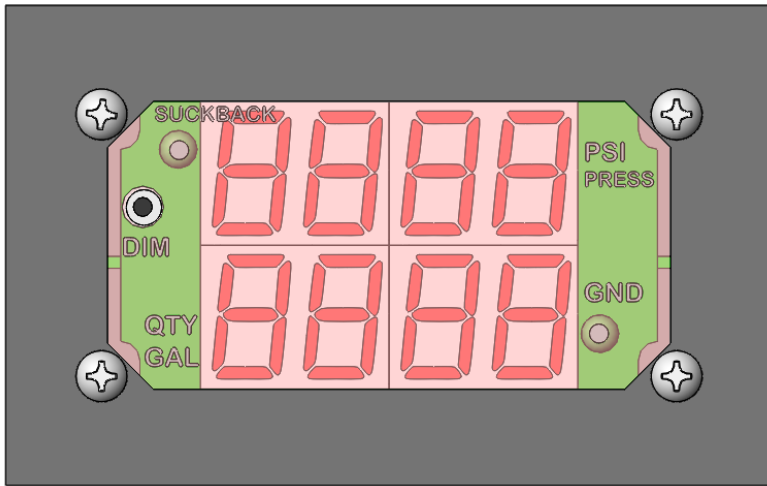
TITLE:

# MAIN DISPLAY UNIT

**PROPRIETARY AND CONFIDENTIAL**  
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MATERIAL  
  
 DO NOT SCALE DRAWING

	NAME	DATE	SIZE	DWG. NO.	REV
DRAWN	TRR	7/20/2011	<b>A</b>	<b>6-1-0-000</b>	<b>D</b>
CHECKED	TRR	7/20/2011			
SCALE: 1:1			WEIGHT: .5 LBS.		SHEET 2 OF 4



FRONT VIEW SHOWING DASH CUTOUT, LABELS, AND 7-SEG DISPLAYS

INPUT CONDITIONS:

QTY INPUT ACCROSS +SIG -SIG:  
 4MA - FULL TANK QTY READING  
 20 MA - EMPTY TANK READING

MODE IN:  
 24V- GROUND MODE  
 GND- FLIGHT MODE

PRESS INPUT INTO +SIG  
 4 MA - 0 PSI READING  
 20 MA - 250 PSI READING

OUTPUT:

REMOTE OUTPUT:  
 RS232 FOR REMOTE BOX

RATED VOLTAGE

INPUT MIN: 6 VDC  
 NOMINAL: 12 OR 24 VDC  
 MAX: 39 VDC

INTERNAL REGULATION

DIGITAL SYSTEM: 5.0 ± .1 VDC SWITCHING  
 ANALOG SENSORS: 24.0 ± .1 VDC SWITCHING

POWER CONSUMPTION

MAIN DISPLAY ONLY

MIN: .1 WATT  
 NOMINAL: 1.3 WATTS  
 MAX: 2.5 WATTS

POWER CONSUMPTION

MAIN DISPLAY WITH REMOTE AND SENSORS

NOMINAL: 2.5 WATTS  
 MAX: 4.8 WATTS

DIMENSIONS

ENCLOSURE: 3.43"W X 1.85"H X 2.88"D

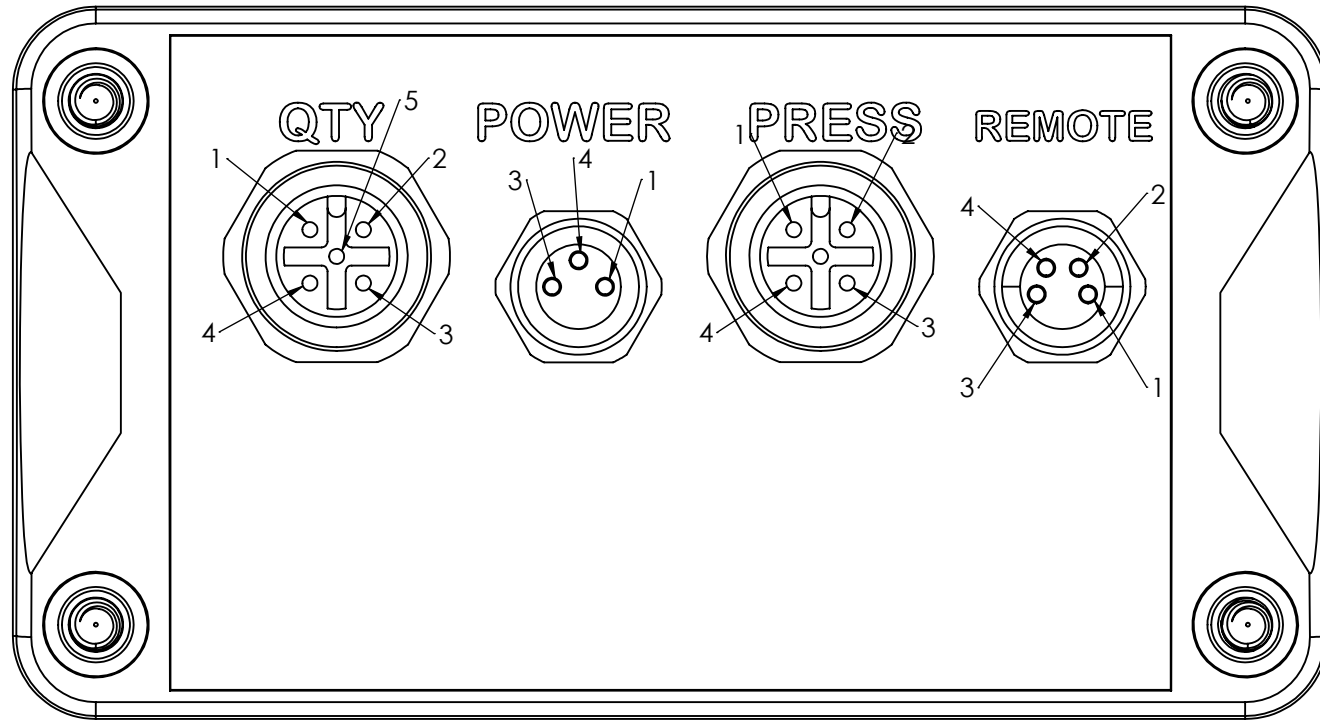
ENVIRONMENTAL

STORAGE TEMP: -40C - +85C  
 OPERATING TEMP: -20C - +80C  
 G FORCE: 10 G SHOCK TESTED  
 IP CODE: 54

**PROPRIETARY AND CONFIDENTIAL**  
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UNLESS OTHERWISE SPECIFIED:		TITLE:				
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± 1/16 ANGULARS: ± 1/2° TWO PLACE DECIMAL ±.015 THREE PLACE DECIMAL ±.005		<b>MAIN DISPLAY UNIT</b>				
MATERIAL	NAME	DATE	SIZE	DWG. NO.	REV	
	DRAWN	TRR	7/20/2011	<b>A</b>	<b>6-1-0-000</b>	
	CHECKED	TRR	7/20/2011			<b>D</b>
DO NOT SCALE DRAWING			SCALE: 1:1	WEIGHT: .5 LBS.	SHEET 3 OF 4	

PIN #	QTY	POWER	PRESS	REMOTE
1	+24V	MODE IN	+24V	COM OUT
2	NO CON	-	NO CON	COM IN
3	GND	+V IN	+SIG CH3	+V
4	+SIG CH1	GND	NO CON	GND
5	-SIG CH1	-	-	-



UNLESS OTHERWISE SPECIFIED: TITLE:

# MAIN DISPLAY UNIT

DIMENSIONS ARE IN INCHES  
 TOLERANCES:  
 FRACTIONAL  $\pm 1/16$   
 ANGULARS:  $\pm 1/2^\circ$   
 TWO PLACE DECIMAL  $\pm .015$   
 THREE PLACE DECIMAL  $\pm .005$

**PROPRIETARY AND CONFIDENTIAL**  
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MATERIAL

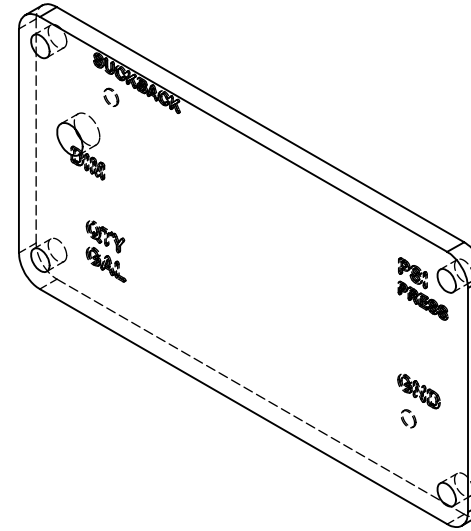
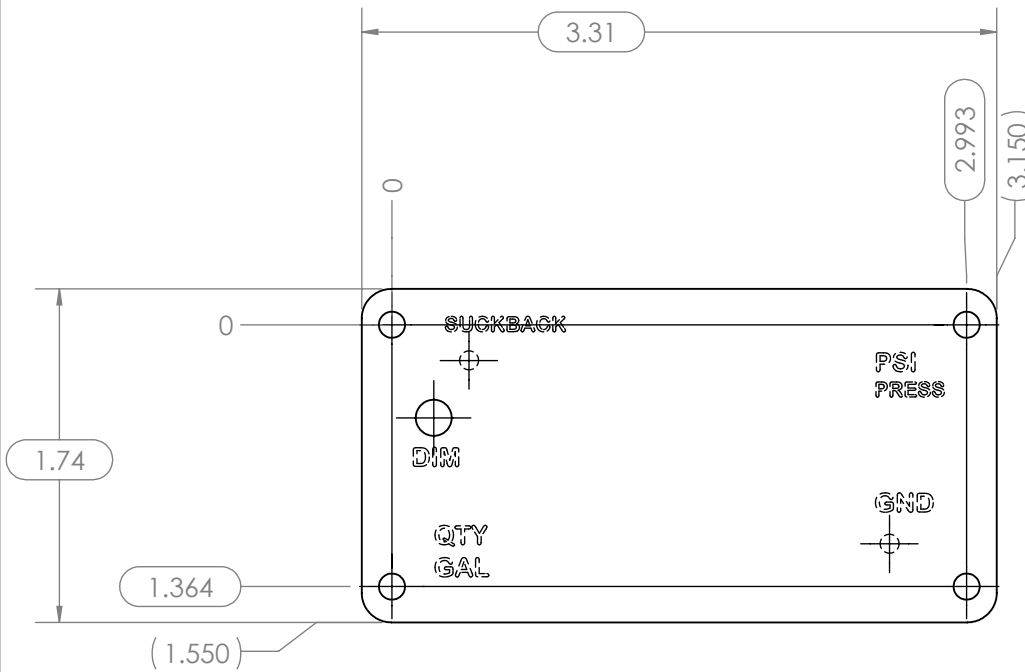
DO NOT SCALE DRAWING

	NAME	DATE	SIZE	DWG. NO.	REV
DRAWN	TRR	7/20/2011	<b>A</b>	<b>6-1-0-000</b>	<b>D</b>
CHECKED	TRR	7/20/2011			
			SCALE: 2:1	WEIGHT: .5 LBS.	SHEET 4 OF 4

PART NUMBER: 6-1-4-00E

MANUFACTURE: REABE DESIGN LLC  
MFG PART NUMBER: 6001-0001-04-E

FRONT COVER ENGLISH



UNLESS OTHERWISE SPECIFIED: TITLE:

DIMENSIONS ARE IN INCHES  
TOLERANCES:  
FRACTIONAL  $\pm 1/16$   
ANGULARS:  $\pm 1/2^\circ$   
TWO PLACE DECIMAL  $\pm .015$   
THREE PLACE DECIMAL  $\pm .005$

# FRONT COVER ENGLISH

**PROPRIETARY AND CONFIDENTIAL**  
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MATERIAL  
ACRYLIC SHEET

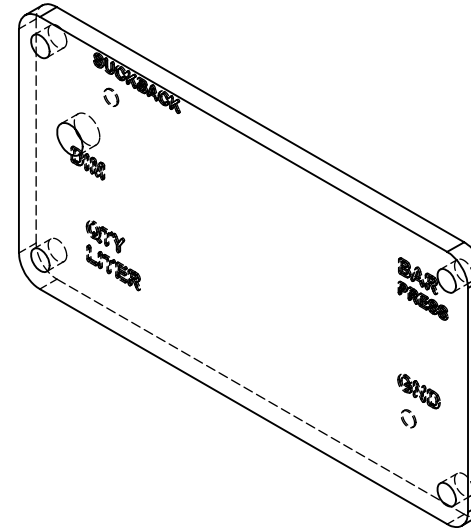
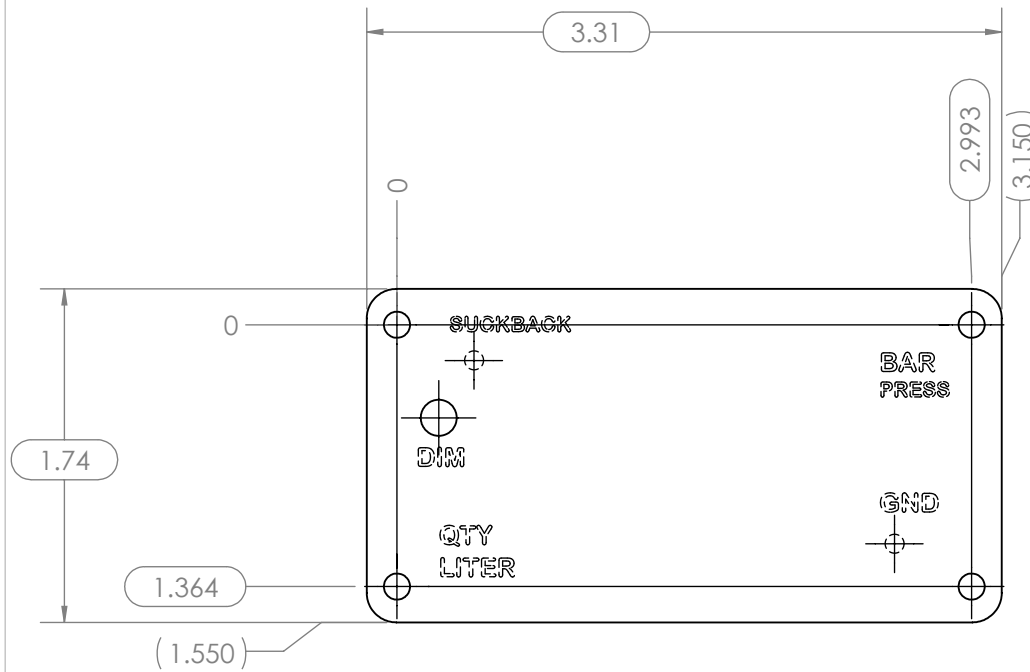
DO NOT SCALE DRAWING

	NAME	DATE	SIZE	DWG. NO.	REV
DRAWN	TRR	7/4/2013	<b>A</b>	<b>6-1-4-00E</b>	<b>A</b>
CHECKED	TRR	7/4/2013			
			SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

PART NUMBER: 6-1-4-00M

MANUFACTURE: REABE DESIGN LLC  
MFG PART NUMBER: 6001-0001-04-M

FRONT COVER METRIC



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TOLERANCES:  
FRACTIONAL  $\pm 1/16$   
ANGULARS:  $\pm 1/2^\circ$   
TWO PLACE DECIMAL  $\pm .015$   
THREE PLACE DECIMAL  $\pm .005$

MATERIAL  
ACRYLIC SHEET

DO NOT SCALE DRAWING

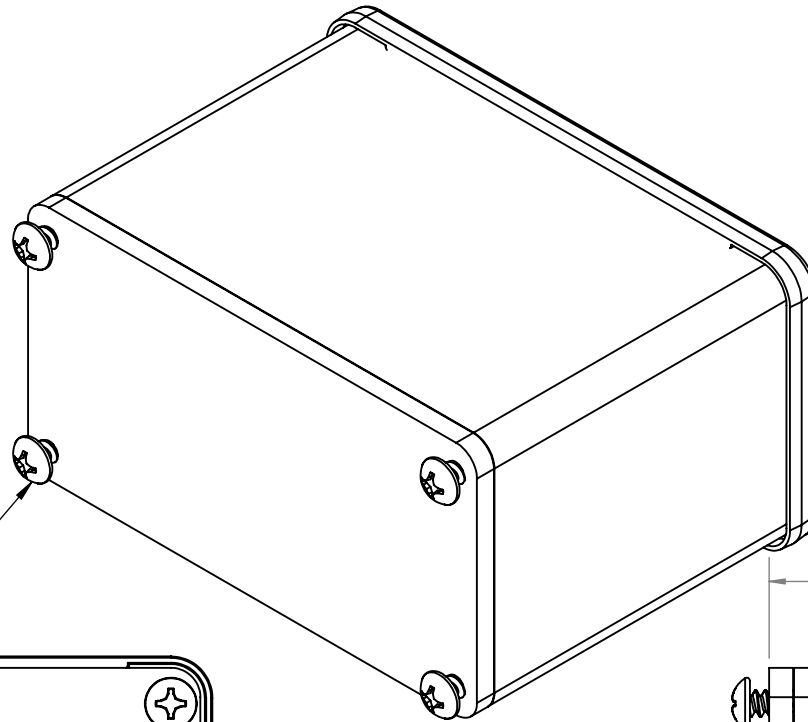
UNLESS OTHERWISE SPECIFIED:		TITLE:		<b>FRONT COVER METRIC</b>		
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULARS: $\pm 1/2^\circ$ TWO PLACE DECIMAL $\pm .015$ THREE PLACE DECIMAL $\pm .005$						
MATERIAL	NAME	DATE	SIZE	DWG. NO.	REV	
ACRYLIC SHEET	TRR	7/4/2013	<b>A</b>	<b>6-1-4-00M</b>	<b>1</b>	
	CHECKED	TRR	7/4/2013			
SCALE: 1:1			WEIGHT:		SHEET 1 OF 1	

PART NUMBER: 6-2-0-000 A B

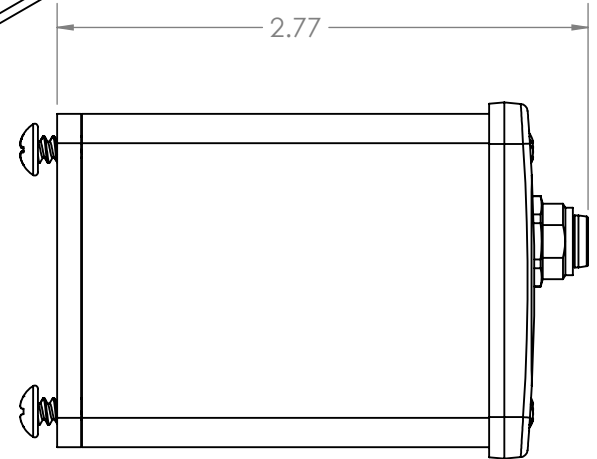
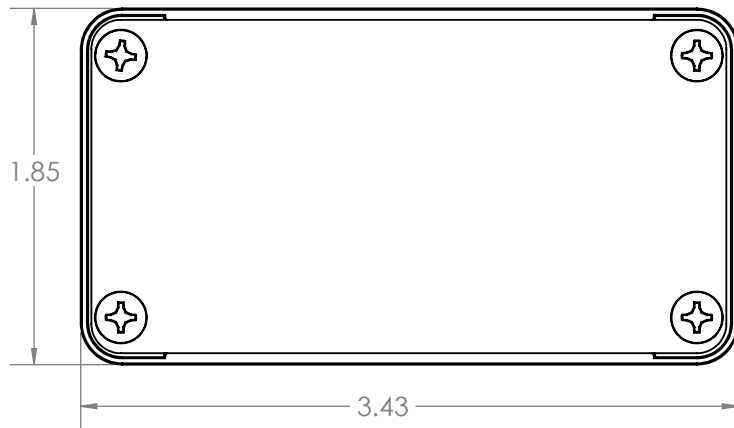
MANUFACTURE: REABE DESIGN LLC  
MFG PART NUMBER: 6002-0001

REMOTE DISPLAY BOX

CASE: EXTRUDED ALUMINUM  
BACK COVER: CAST ALUMINUM  
FRONT COVER: ACRYLIC SHEET



MS51861-29AB  
#6-20 X 1 PAN HEAD  
SHEET METAL SCREW



REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	ORIGINAL RELEASE	7/20/2011	TRR
B	ADDED REMOTE OUT	11/12/2013	TRR

UNLESS OTHERWISE SPECIFIED:

TITLE:

# REMOTE DISPLAY UNIT

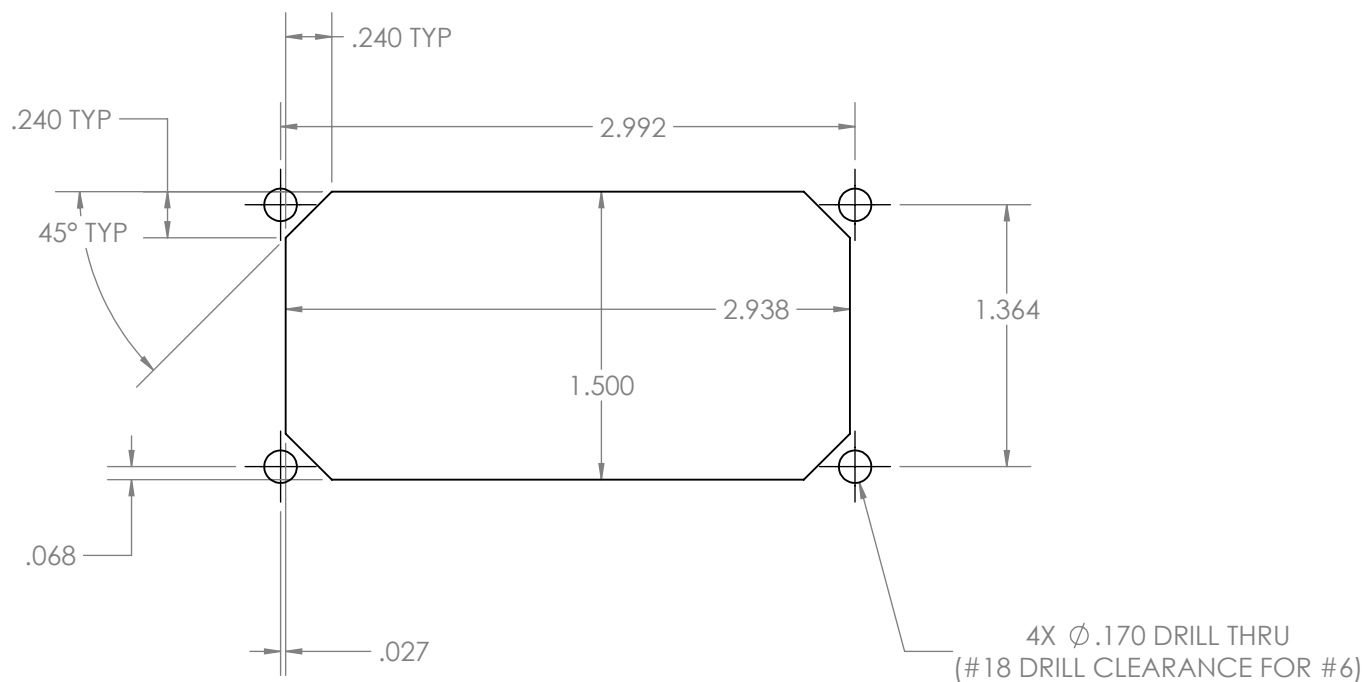
DIMENSIONS ARE IN INCHES  
TOLERANCES:  
FRACTIONAL  $\pm 1/16$   
ANGULARS:  $\pm 1/2^\circ$   
TWO PLACE DECIMAL  $\pm .015$   
THREE PLACE DECIMAL  $\pm .005$

**PROPRIETARY AND CONFIDENTIAL**  
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MATERIAL

DO NOT SCALE DRAWING

	NAME	DATE	SIZE	DWG. NO.	REV
DRAWN	TRR	7/20/2011	<b>A</b>	<b>6-2-0-000</b>	<b>B</b>
CHECKED	TRR	7/20/2011			
			SCALE: 1:1	WEIGHT: .5 LBS.	SHEET 1 OF 4



RECOMMENDED CUTOUT AND MOUNT

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES  
 TOLERANCES:  
 FRACTIONAL  $\pm 1/16$   
 ANGULARS:  $\pm 1/2^\circ$   
 TWO PLACE DECIMAL  $\pm .015$   
 THREE PLACE DECIMAL  $\pm .005$

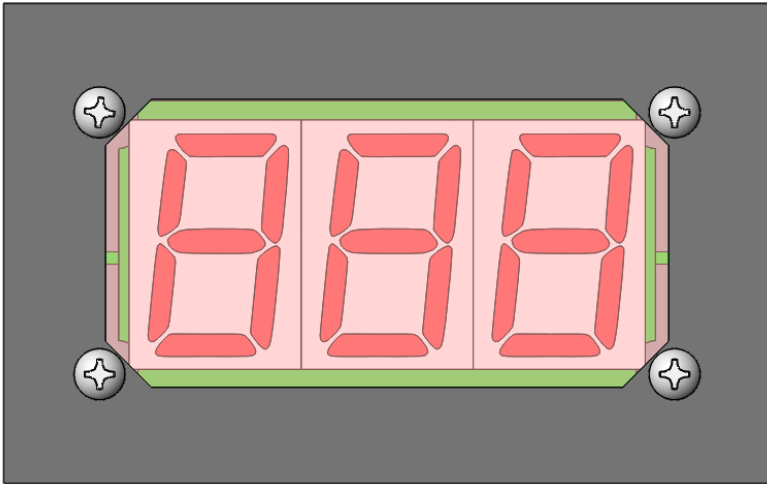
TITLE:

# REMOTE DISPLAY UNIT

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MATERIAL  
  
 DO NOT SCALE DRAWING

	NAME	DATE	SIZE	DWG. NO.	REV
DRAWN	TRR	7/20/2011	<b>A</b>	<b>6-2-0-000</b>	<b>B</b>
CHECKED	TRR	7/20/2011			
			SCALE: 1:1	WEIGHT: .5 LBS.	SHEET 2 OF 4



FRONT VIEW SHOWING CUTOUT AND 7-SEG DISPLAYS

INPUT:

REMOTE INPUT:  
RS232 FOR REMOTE BOX

OUTPUT:

REMOTE OUTPUT:  
RS232 FOR REMOTE BOX



**RATED VOLTAGE**

INPUT  
MIN: 6 VDC  
NOMINAL: 12 OR 24 VDC  
MAX: 39 VDC

**INTERNAL REGULATION**

SYSTEM: 6.0 ± .1 VDC SWITCHING  
MICROPROCESSOR: 5.0 ± .1 VDC LINEAR

**POWER CONSUMPTION**

MIN: .1 WATT  
NOMINAL: 1.4 WATTS  
MAX: 2.7 WATTS

**DIMENSIONS**

ENCLOSURE: 3.43"W X 1.85"H X 2.74"D

**ENVIRONMENTAL**

STORAGE TEMP: -40C - +85C  
OPERATING TEMP: -20C - +80C  
G FORCE: 10 G SHOCK TESTED  
IP CODE: 65

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES  
TOLERANCES:  
FRACTIONAL ± 1/16  
ANGULARS: ± 1/2°  
TWO PLACE DECIMAL ±.015  
THREE PLACE DECIMAL ±.005

TITLE:

**REMOTE DISPLAY UNIT**

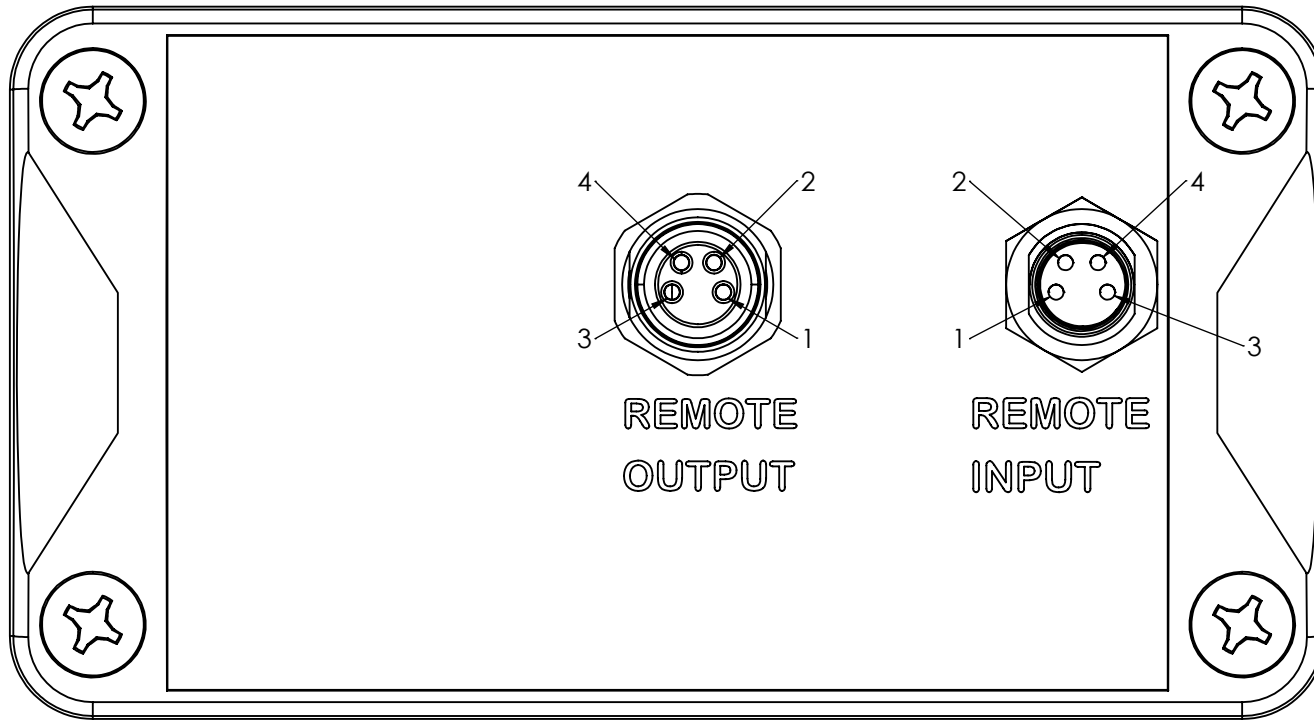
**PROPRIETARY AND CONFIDENTIAL**  
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MATERIAL			
DO NOT SCALE DRAWING			

	NAME	DATE	SIZE	DWG. NO.	REV
DRAWN	TRR	7/20/2011	<b>A</b>	<b>6-2-0-000</b>	<b>B</b>
CHECKED	TRR	7/20/2011	SCALE: 1:1	WEIGHT: .5 LBS.	SHEET 3 OF 4



PIN #	REMOTE INPUT	REMOTE OUTPUT
1	COM IN	COM OUT
2	COM OUT	COM IN
3	+V IN	+V OUT
4	GND	GND



UNLESS OTHERWISE SPECIFIED: TITLE:

# REMOTE DISPLAY UNIT

DIMENSIONS ARE IN INCHES  
 TOLERANCES:  
 FRACTIONAL  $\pm 1/16$   
 ANGULARS:  $\pm 1/2^\circ$   
 TWO PLACE DECIMAL  $\pm .015$   
 THREE PLACE DECIMAL  $\pm .005$

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MATERIAL

DO NOT SCALE DRAWING

	NAME	DATE	SIZE	DWG. NO.	REV
DRAWN	TRR	7/20/2011	<b>A</b>	<b>6-2-0-000</b>	<b>B</b>
CHECKED	TRR	7/20/2011			
			SCALE: 2:1	WEIGHT: .5 LBS.	SHEET 4 OF 4

WEIGHT & BALANCE ANALYSIS					Document Number WEIGHT-1	REVISION LEVEL Rev C
ORIGINATOR JRR, TRR			ISSUE DATE 30 August 2011		APPROVED BY TRR	
REVISION HISTORY	REVISION DATE	REVISED BY	APPROVED BY	DESCRIPTION OF REVISION		
A	8/30/11	JRR	TRR	DOCUMENT CREATED		
B	10/03/11	TRR	TRR	DOCUMENT FORMAT CHANGED		
C	3/02/15	TRR	TRR	ADDED CHART FOR W&B CALCULATION		

**WEIGHT & BALANCE ANALYSIS**

*Data*-This data applies to all approved aircraft.

**AIRTRACTOR: DATAM: WING LEADING EDGE**

Item	Weight Lbs.	Arm Inch	Moment
Main Display	0.5	59	29.5
Remote Display	0.5	109	54.5
Pressure Transducer	0.1	72	7.2
Quantity Probe	2.5	3	7.5
Cables	1	73	73
<b>Total System</b>	<b>4.6</b>	<b>37.3</b>	<b>171.7</b>

**OTHER AIRCRAFT: CALCULATE USING CHART BELOW**

Item	Weight Lbs.	X Arm Inch	= Moment
Main Display	0.5		
Remote Display	0.5		
Pressure Transducer	0.1		
Quantity Probe	2.5		
Cables	1		
<b>Total System</b>	<b>4.6</b>	<b>-----</b>	

**Total Moment** \_\_\_ ÷ **Total Weight** \_\_\_ = **Arm** \_\_\_

Jeffery Reabe AP 399649349 IA

<b>ELECTRICAL LOAD ANALYSIS</b>				Document Number <b>ELECTRICAL-1</b>	REVISION LEVEL <b>Rev C</b>
ORIGINATOR <b>JRR, TRR</b>			ISSUE DATE <b>30 August 2011</b>	APPROVED BY <b>JRR</b>	
REVISION HISTORY	REVISION DATE	REVISED BY	APPROVED BY	DESCRIPTION OF REVISION	
<b>A</b>	<b>8/30/11</b>	<b>JRR</b>	<b>TRR</b>	<b>DOCUMENT CREATED</b>	
<b>B</b>	<b>10/03/11</b>	<b>TRR</b>	<b>TRR</b>	<b>DOCUMENT FORMAT CHANGED</b>	
<b>C</b>	<b>6/30/15</b>	<b>JRR</b>	<b>JRR</b>	<b>UPDATED FOR NEW AIRCRAFT ON AML</b>	

**ELECTRICAL LOAD ANALYSIS**

¼ Amp @ 24VDC

True Quantity System Usage

¼ Amp

1 Amp Breaker

Jeffery Reabe AP 399649349 IA

<b>GROUND TEST PLAN</b>				Document Number <b>GROUND TEST-H</b>	REVISION LEVEL <b>Rev A</b>
ORIGINATOR <b>JRR, TRR</b>			ISSUE DATE <b>4 September 2015</b>	APPROVED BY <b>TRR</b>	
REVISION HISTORY <b>A</b>	REVISION DATE <b>09/04/15</b>	REVISED BY <b>JRR</b>	APPROVED BY <b>TRR</b>	DESCRIPTION OF REVISION <b>DOCUMENT CREATED</b>	

**GROUND TEST PLAN**

1. Introduction

The purpose of this Ground Test is to provide a method for demonstrating the proper installation and operations of the Digital Payload Hopper Quantity Indication system and Spray Boom Pressure Indication system ("True Hopper" system).

NOTE: For the initial certification testing and for initial installation testing, all the test steps must be completed. This procedure is also referenced in the ICA to be used after maintenance is accomplished; for testing to support maintenance activities, the steps with the "\*" may be omitted.

2. Installation and Configuration

a. Verify continuity checks have been completed.

PASS \_\_\_\_\_ FAIL \_\_\_\_\_

b. Ensure the HOPPER DISPLAY circuit breaker is pushed in. While holding the "DIM" button on the Main Display Unit, turn on aircraft master power. Verify that the unit starts the self-test: all characters on the Main Display Unit (drawing 7-1-0-000) and the Remote Display Unit (drawing 7-2-0-000) are illuminated; verify the selected unit of measure (gallons or liters); verify aircraft model displayed matches the model being tested.

PASS \_\_\_\_\_ FAIL \_\_\_\_\_

3. Functional Ground Test

a. Repeatedly cycle the "DIM" button on the Main Display Unit, ensure that the brightness level of the Main Display Unit changes.

PASS \_\_\_\_\_ FAIL \_\_\_\_\_

b. Pull the HOPPER DISPLAY circuit breaker. Ensure that all system has power is removed, and the Main Display and Remote Display are extinguished.

PASS \_\_\_\_\_ FAIL \_\_\_\_\_

- c. Push in the HOPPER DISPLAY circuit breaker. Ensure that the Main Display and Remote Display Unit (if installed) indicates Pressure 0, Quantity Model; BELL\_206=1, R44=0. Ensure the Ground Light is illuminated.

PASS \_\_\_\_\_ FAIL \_\_\_\_\_

- d. Raise Quantity Float (by hand or by filling with water) to top of float travel. Verify that the Main Display Unit and Remote Display (if installed) quantity indication with tank full, for model: R44 = 100Gal; BELL\_206 = 103 Gal. (tolerance of +/- 10%).

Note: If Main Display indicates FULL, lower the float 0.050"

PASS \_\_\_\_\_ FAIL \_\_\_\_\_

- e. For a helicopter do not start the engine, just raise the collective with battery on. Verify the Ground Light is extinguished and the Remote Display (if installed) indicates FLT. With the float in the same position as in step 3d, verify that the Main Display quantity indication is for model: R44= 50; BELL\_206=85. (Tolerance of +/- 3%)

Note: If Main Display indicates FULL, lower the float 0.050"

PASS \_\_\_\_\_ FAIL \_\_\_\_\_

- f. Turn spray pump ON with boom valve OFF. Verify negative pressure indication and "SUCK BACK" light illuminated.

PASS \_\_\_\_\_ FAIL \_\_\_\_\_

- g. Turn boom valve ON. Verify positive indication and "SUCK BACK" light is extinguished.

PASS \_\_\_\_\_ FAIL \_\_\_\_\_

- h. Shut down the engine.

- i. Ensure no leaks are present in the system.

PASS \_\_\_\_\_ FAIL \_\_\_\_\_

j.\* With power on the aircraft and all systems operating normally. Operate each aircraft system and equipment through a representative range of its functional envelope while qualitatively assessing EMI/RFI. Note any effects below.

- VHF Comm \_\_\_\_\_
- VOR/ILS \_\_\_\_\_
- DME \_\_\_\_\_
- GPS \_\_\_\_\_
- \_\_\_\_\_ \_\_\_\_\_
- \_\_\_\_\_ \_\_\_\_\_

PASS \_\_\_\_\_ FAIL \_\_\_\_\_

Ground Test Date: \_\_\_\_\_  
Performed By: \_\_\_\_\_

<b>INSTRUCTIONS FOR CONTINUED AIRWORTHINESS</b>				Document Number <b>IAC-H</b>	REVISION LEVEL <b>Rev A</b>
ORIGINATOR <b>JRR, TRR</b>			ISSUE DATE <b>4 September 2015</b>	APPROVED BY <b>TRR</b>	
REVISION HISTORY	REVISION DATE	REVISED BY	APPROVED BY	DESCRIPTION OF REVISION	
<b>A</b>	<b>09/04/15</b>	<b>JRR</b>	<b>TRR</b>	<b>DOCUMENT CREATED</b>	

**INSTRUCTIONS FOR CONTINUED AIRWORTHINESS**

1)Introduction

Modification of an aircraft by this Supplemental Type Certificate obligates the aircraft operator to include the maintenance information provided by this document in the Operator’s Aircraft Maintenance Manual and the Operator’s aircraft scheduled maintenance program. This is applicable to all aircraft on the AML.

2)Description

A helicopter equipped with a belly mounted spray system has no means to inform the pilot how much payload is aboard. The Reabe Aircraft Improvement Digital Payload Hopper Quantity Indication system and Spray Boom Pressure Indication system (“True Hopper” system) is both a highly reliable and a highly accurate indicator of payload.

The Digital Payload Hopper Quantity Indication system and Spray Boom Pressure Indication system (“True Hopper” system) consists of a magnetostrictive sensor, pressure sensor and a digital cockpit display, with an optional external display. Both sensors are industrial components that are qualified for the application used in this aircraft alteration. The displays are custom designed components that indicate the quantity of the hopper (gallons or liters) and pressure of the of the spray boom (PSI).

The magnetostrictive probe and floating magnet measures payload fluid level to the nearest 0.001 inch of travel on the probe. The cockpit display uses look up tables to convert the probe output to the quantity of fluid in the tank. There are 2 look up tables, one for ground attitude and one for flight attitude, and is selected using an input from the aircraft hour meter torque pressure switch. The display also performs data averaging to reduce sloshing effects, thus increasing the accuracy of the system. If a remote display indicator is installed, an RS232 signal is sent from the cockpit display to the remote display, both displays will indicate the same quantity. A pressure sensor is installed in the left boom pressure line, and is wired to the display. The display indicates the pressure in the boom line, and also alerts the pilot if negative pressure is present by illuminating a light on the display indication “suck back”. This indicates when the aircraft recirculating ball valve feature is working. The cockpit display can be dimmed using the dim button.

There are differences in the installation design data for each of the Aircraft. The primary difference is due to the size of the hopper, which will require different part number probes, changing the probe length. There are dip switches on the indicator that then account for the probe/hopper changes in each model.

*“TRUE QUANTITY” HOPPER QUANTITY & BOOM PRESSURE GAUGE*

3)Control, Operation Information/Special Procedures

The cockpit display can be dimmed using the “dim” push button on the display.

The power to the Digital Payload Hopper Quantity Indication system is controlled by the Klixon PN 7277-2-1 or equivalent circuit breaker (1 amp), located in the breaker panel labeled Hopper Display.

4)Servicing

The Digital Payload Hopper Quantity Indication system service is based on condition only. There are no additional maintenance servicing requirements.

5)Maintenance Instructions

It is the Operators/Owners responsibility to ensure that the maintenance performed on the system does not adversely affect its intended function.

The system parts inside the hopper may be pressure washed. Do not pressure wash any cable or cable connections.

Displays may be cleaned with a soft cloth. Avoid any abrasive cleaners to prevent scratching the plexiglass face of the displays.

At Annual Inspection check components for security of mounting and conduct Ground Test per Special Inspection section.

6)Troubleshooting

See Installation Instructions (Install-1 page 6)

7)Removal and Replacement Information

1.Main Display PN 6-1-0-000 Removal

- a.Pull Breaker labeled Hopper Display
- b.Disconnect cables from back of display
- c.Remove mounting screws from face of display

2.Main Display Replacement See Main Display Mounting Drawing 7-0-2-000

- a.Mount display using faceplate screws
- b.Connect cables to back of display
- c.Energize Hopper Display breaker

3.Remote Display PN 6-0-2-0-000 Removal

- a.Pull Breaker labeled Hopper Display
- b.Disconnect cables from back of display
- c.Remove mounting screws from face of display

4.Remote Display Replacement See Remote Display Mounting Drawing 7-0-3-000

- a.Mount display using faceplate screws
- b.Connect cables to back of display
- c.Energize Hopper Display breaker

5.Pressure Probe PN 6-4-0-000 Removal

- a.Pull Breaker labeled Hopper Display
- b.Disconnect cable from top of probe



“TRUE QUANTITY” HOPPER QUANTITY & BOOM PRESSURE GAUGE

c. Disconnect probe from pressure line

6. Pressure Probe Replacement

a. Connect probe to pressure line

b. Connect cables to top of probe

c. Attach probe to airframe using zip ties

d. Energize Hopper display breaker

7. Quantity Probe PN 6-3-1-xxx Removal

a. Pull Breaker labeled Hopper Display

b. Disconnect cable from top of probe

c. Remove Quantity Probe clamp from bottom of probe

d. Remove float from Probe

e. Remove retaining nut from Quantity Probe inside hopper

f. Withdraw probe from hopper

8. Quantity Probe Replacement See Quantity Probe Mounting Drawing 7-0-5-000

a. Insert Probe into Hopper

b. Install retaining nut inside hopper

c. Install float NO side up

d. Attach Probe clamp to bottom of probe

e. Connect cable to top of probe

f. Apply silicone to top of connection

g. Energize Hopper Display Breaker

9. After replacement, ground test per Special Inspection Requirements

8) Diagram

See Gauge Installation Drawing 7-0-0 TAB Sheet 1

9) Special Inspection Requirements:

Ground Test

1. Introduction

The purpose of this Ground Test is to provide a method for demonstrating the proper installation and operations of the Digital Payload Hopper Quantity Indication system and Spray Boom Pressure Indication system (“True Hopper” system).

NOTE: For the initial certification testing and for initial installation testing, all the test steps must be completed. This procedure is also referenced in the ICA to be used after maintenance is accomplished; for testing to support maintenance activities, the steps with the “\*” may be omitted.

2. Installation and Configuration

a. Verify continuity checks have been completed.

PASS \_\_\_\_\_ FAIL \_\_\_\_\_

*“TRUE QUANTITY” HOPPER QUANTITY & BOOM PRESSURE GAUGE*

- b. Ensure the HOPPER DISPLAY circuit breaker is pushed in. While holding the “DIM” button on the Main Display Unit, turn on aircraft master power. Verify that the unit starts the self-test: all characters on the Main Display Unit (drawing 7-1-0-000) and the Remote Display Unit (drawing 7-2-0-000) are illuminated; verify the selected unit of measure (gallons or liters); verify aircraft model displayed matches the model being tested.

PASS \_\_\_\_\_ FAIL \_\_\_\_\_

## 3. Functional Ground Test

- a. Repeatedly cycle the “DIM” button on the Main Display Unit, ensure that the brightness level of the Main Display Unit changes.

PASS \_\_\_\_\_ FAIL \_\_\_\_\_

- b. Pull the HOPPER DISPLAY circuit breaker. Ensure that all system has power is removed, and the Main Display and Remote Display are extinguished.

PASS \_\_\_\_\_ FAIL \_\_\_\_\_

- c. Push in the HOPPER DISPLAY circuit breaker. Ensure that the Main Display and Remote Display Unit (if installed) indicates Pressure 0, Quantity Model; BELL\_206=1, R44=0. Ensure the Ground Light is illuminated.

PASS \_\_\_\_\_ FAIL \_\_\_\_\_

- d. Raise Quantity Float (by hand or by filling with water) to top of float travel. Verify that the Main Display Unit and Remote Display (if installed) quantity indication with tank full, for model: R44 = 100Gal; BELL\_206 = 103 Gal. (tolerance of +/- 10%).

Note: If Main Display indicates FULL, lower the float 0.050”

PASS \_\_\_\_\_ FAIL \_\_\_\_\_

- e. For a helicopter do not start the engine, just raise the collective with battery on. Verify the Ground Light is extinguished and the Remote Display (if installed) indicates FLT. With the float in the same position as in step 3d, verify that the Main Display quantity indication is for model: R44= 50; BELL\_206=85. (Tolerance of +/- 3%)

Note: If Main Display indicates FULL, lower the float 0.050”

PASS \_\_\_\_\_ FAIL \_\_\_\_\_

- f. Turn spray pump ON with boom valve OFF. Verify negative pressure indication and “SUCK BACK” light illuminated.

PASS \_\_\_\_\_ FAIL \_\_\_\_\_

- g. Turn boom valve ON. Verify positive indication and “SUCK BACK” light is extinguished.

PASS \_\_\_\_\_ FAIL \_\_\_\_\_

- h. Shut down the engine.
- i. Ensure no leaks are present in the system.

PASS \_\_\_\_\_ FAIL \_\_\_\_\_

- j.\* With power on the aircraft and all systems operating normally. Operate each aircraft system and equipment through a representative range of its functional envelope while qualitatively assessing EMI/RFI. Note any effects below.

- 1.VHF Comm \_\_\_\_\_
- 2.VOR/ILS \_\_\_\_\_
- 3.DME \_\_\_\_\_
- 4.GPS \_\_\_\_\_
- 5. \_\_\_\_\_ \_\_\_\_\_
- 6. \_\_\_\_\_ \_\_\_\_\_

PASS \_\_\_\_\_ FAIL \_\_\_\_\_

Ground Test Date: \_\_\_\_\_  
Performed By: \_\_\_\_\_

10)Protective Treatment

Electrical connection at top of probe is covered using RTV silicon seal.

11) DATA

Power up unit while holding dimmer button. Firmware version and model calibration will be displayed.

12) SPECIAL TOOLS: None

13) N/A

14)TBO: None

15) Airworthiness Limitation The airworthiness limitations section is FAA approved and specifies maintenance required under §§ 43.16 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

There are no additional airworthiness limitations applicable to the Air Tractor aircraft as a result of this installation.

16) Revisions: To be submitted by STC holder.