



Broadcast Microwave Services, Inc.

TAA-101/TAA-101S ANTENNA ACTUATOR

Installation/Operation Manual



ENGLISH (UK)

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If you do not understand the contents of this manual:
Do not operate this equipment.

Also, translation of this manual into any EC official language can be made available, at your cost.

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Se non si capisce il contenuto del presente manuale
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È anche disponibile la versione italiana di questo manuale, ma il costo è a carico dell'utente.

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Om Ni inte förstår informationen i denna handbok
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Podemos asimismo suministrarle una traducción de este manual al (idioma) previo pago de una cantidad adicional que deberá abonar usted mismo.

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Subsequent updates	2006-2008	Rev. A through G
Added Figure 9, Caution, page 15	March 2009	Rev. H
Added installation and removal tool instructions, starting page 18	October 2009	Rev. J
Updated max speed figure to correspond to STC.	January 2010	Rev. K
Updated speed, deployment figures based on new calculations; added drawings	March 2010	Rev. L
Included TAA-SM-22 (P/N 8001272972)	November 2010	Rev. M
Adjusted RF exposure distance due to latest test reports	August 2011	Rev. N

Conventions Used in This Manual



NOTE: Notes provide supplementary information. They are highlighted for emphasis, as in this example, and are placed immediately after the relevant text.



CAUTION: Cautions give information which, if strictly followed, will prevent damage to equipment or other goods. They are boxed for emphasis, as in this example, and are placed immediately preceding the point at which the reader requires them.



WARNING: Warnings give information which, if strictly observed, will prevent personal injury or death, or damage to personal property or the environment. They are boxed and shaded for emphasis, as in this example, and are placed immediately preceding the point at which the reader requires them.

ATTENTION!



CAUTION: DO NOT use right-angle connectors or adapters on the RF Power Out cable assemblies. Right-angle connectors may have significant RF power loss at the operating frequencies of this system.

CAUTION: FOR ALL BMS TRANSMITTERS: Operation of this product generally requires a license. It is the responsibility of the user to obtain all required operating licenses.



FOR PRODUCTS AWAITING FCC CERTIFICATION: This device has not been authorized as required by the rules of the US Federal Communications Commission. This device is not, and may not be, offered for sale or lease, or sold or leased, in the US until authorization is obtained.



NOTE: Actual Acceptance Test Procedure (ATP) Test Data results by product serial number are shipped with all units and indicate the equipment to be operating within advertised specifications.

Read and Follow Instructions

All safety and operating instructions should be read before this product is operated. All operating and use instructions should be followed. This manual should be retained for future reference.

EMC Compliance

This equipment is certified to the EMC requirements detailed in the technical specifications. To maintain this certification, only use the cables supplied or if in doubt contact BMS Customer Service.

RF Exposure Information

For body worn operation, the device has been tested and meets FCC RF exposure guidelines when used with an accessory that contains no metal and that positions device a minimum of 57 cm (when a 6dBi antenna is used) from the body. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

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1 INTRODUCTION

The TAA-101 Antenna Actuator Assembly deploys an omni-directional antenna below the aircraft allowing unrestricted views between the omni and ground sites. Both the TAA-101 and the TAA-101S are designed to avoid line-of-sight obstacles created by aircraft features that might interfere with transmission. This greatly enhances continuous communication between the helicopter and its associated transmit and/or receive site. The TAA-101S Antenna Actuator is sealed for harsh environments.

This dependable low cost antenna actuator may be skid- or cross-tube-strut mounted. A breakaway release mechanism assures safety if the antenna is still deployed when the helicopter lands.

Features:

- Low cost
- Lightweight
- 360° azimuth coverage
- Quick installation
- In-flight deployment
- Stows for landing
- TAA-101S for harsh environments
- Deployed/stowed indicators

This document provides instructions for the installation, operation and maintenance of both the TAA-101 and the TAA-101S Antenna Actuator Assemblies.



NOTE: A safety placard is referenced in the relevant STC. The placard's BMS part number is 200169303.

Broadcast Microwave Services (BMS) is a leader in wireless digital microwave technology providing innovative products for the television broadcast, video, telemetry and surveillance industries. A wholly owned subsidiary of Cohu, Inc., BMS designs and manufactures a comprehensive line of microwave communications equipment for broadcasting sports venues, law enforcement and military applications. BMS also builds and integrates command and control centers to provide fully functioning, complex, end to end digital systems.

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2 SYSTEM DESCRIPTION

The TAA-101 and TAA-101S Antenna Actuator Assemblies consist of the Antenna Actuator that deploys the antenna; a Bracket Mount Assembly used to attach the Actuator to the Helicopter; the Up/Down Box to control the actuator; and the interconnection cables.

The main components of the Antenna Actuator are a gear head motor, worm and worm gear assembly. The gear head motor is pinned to the worm and drives the worm gear when the motor is energized with a 24 to 32 volt dc signal. The motor/worm combination in turn drives the worm gear assembly. The polarity of the dc signal determines the direction that the motor turns. Therefore, connecting dc of one polarity will deploy the antenna, and reversing the polarity will stow the antenna. At both ends of the travel of the worm gear, a roll pin in the side of the worm gear actuates a limit switch. When the switch is opened the power to the motor is disconnected and the unit will remain in this position until a command is given (reversed polarity voltage) to move in the opposite direction. The worm/worm gear combinations are of the type that cannot be back driven; therefore power is not required to maintain the position of the antenna. The Antenna Actuator is available in sealed and non-sealed versions as well as configurations for left or right side mounting depending on the application.

The Antenna Actuator Assembly has two hardened steel pins on the side of the unit, which snap into sockets on the Bracket Mount Assembly. The Bracket Mount Assembly has spring-loaded release pins that retain the Antenna Actuator Assembly. This is to provide a weak link to protect the aircraft in the event the helicopter is landed with the antenna deployed. The release pins allow the Antenna Actuator to detach to prevent damage to the helicopter.



CAUTION: Landing with the antenna deployed will damage the antenna.

When the actuator is in the stowed position the omni is parallel to the skid and above ground level and does not interfere with take off or landing of the helicopter.

There are several types of Bracket Mount Assemblies depending on the application. This document applies to the cross tube strut mount and skid mount assemblies:

- a cross-tube strut mount bracket assembly (Figure 1):
 - P/N 810140225 – 2.25" dia.
 - P/N 810140250 – 2.50" dia.
 - P/N 810140260 – 2.60" dia.
- a low profile skid mount bracket assembly;
- a low profile skid mount bracket assembly with BMT75 mount;
- a 4-inch lift skid mount bracket assembly.

The cross-tube strut mount bracket assembly (Figure 1) attaches to the struts of the helicopter.

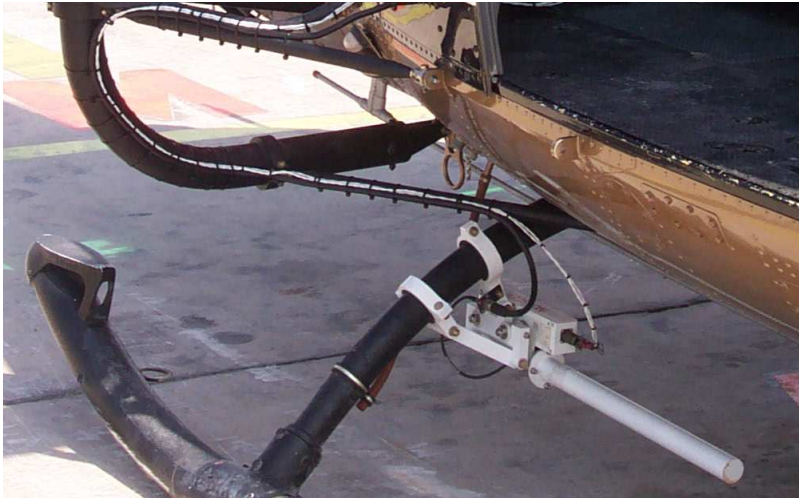


Figure 1. Cross-tube strut mount

The low profile skid-mount bracket assembly (Figure 2) is attached to the helicopter skid by using stainless steel clamps. Since the skid diameters vary on the different makes of helicopters, bracket assemblies are available to accommodate several of the more popular helicopters.



Figure 2. Low profile skid mount

The low profile bracket assembly with BMT75 mount functions the same as the low profile bracket and has a place to mount a BMS BMT75 transmitter directly to the bracket.

The 4-inch lift skid mount bracket assembly (Figure 3) is a taller version of the low profile bracket assembly, it functions the same but the 4-inch lift provides an advantage in some applications.



Figure 3. Low profile and 4-inch lift skid mounts

Deployment of the antenna actuator is controlled by the Up/Down Box which also supplies it with power. There are other deployment control units available as part of an integrated broadcast system (HCP-50, HCP-100, HCP-50-HCII). Please contact BMS for more information on integrated systems.

2.1 TAA-101 and TAA-101S Components and Accessories

All TAA-101 or TAA-101S assemblies require the antenna actuator, skid mount, and a device for deployment control. The following table lists the available options and corresponding part numbers.

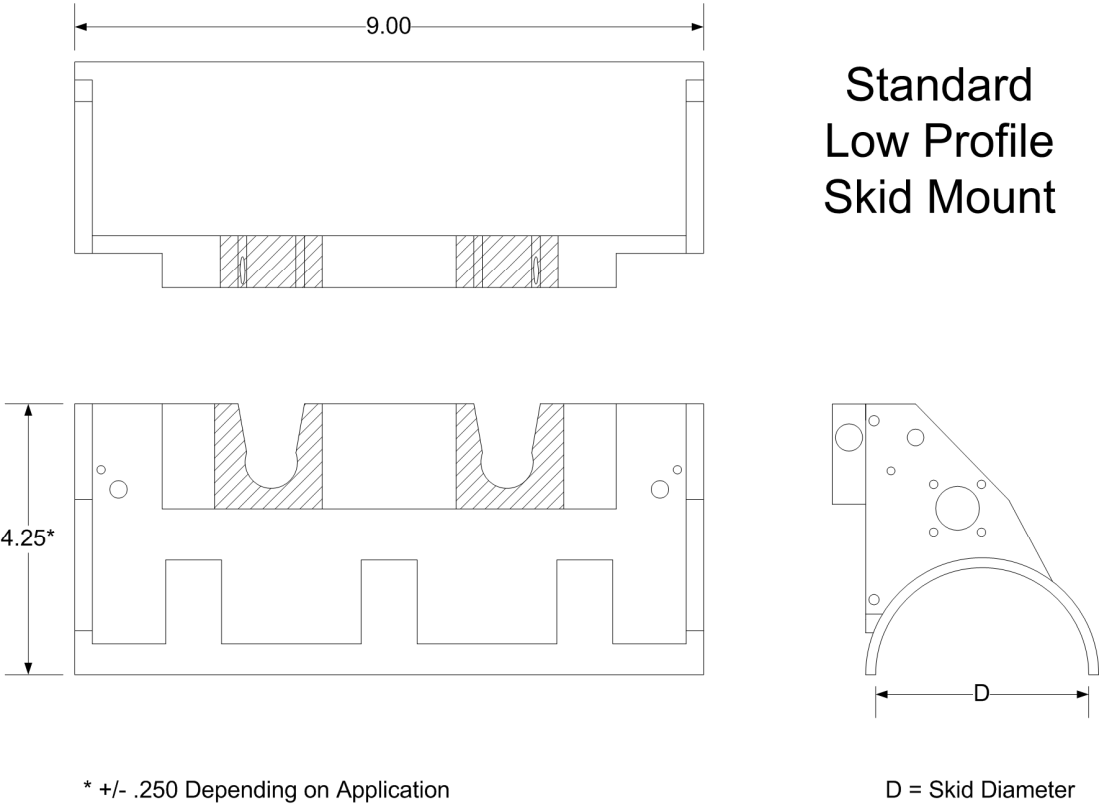
Table 1. TAA-101 components and accessories

Component	Description	Part Number
Antenna Actuator		
	Kit, TAA-101-LSM, Left Side Mounting	870169302
	Kit, TAA-101-RSM, Right Side Mounting	870169304
	TAA-101S-L, Left Side Mounting with RF cable	800169324
	TAA-101S-R, Right Side Mounting with RF cable	800169323
Deployment Control		
	TAA-101-UD Up/Down Box	800195701
Cables		
	1–7GHz Cable Set	730805000
	20" Replacement Cable for TAA-101S ¹	610805025
Tools		
	TAA-101 Installation and Removal Tools Kit	870169391
	TAA-101 Installation Tool	800169391
	TAA-101 Removal Tool	800169392

¹ Replaces the cable from the TAA-101 to the Omni Antenna for both Cable Sets

Table 2. Actuator mounting bracket assemblies

TAA-101 Actuator Mounts with NON-MEMORY Release Pins			
Helicopter	Skid Diameter (inches)	BMS Part #	Type
Hughes 300	2.500	8001272951	Skid Mount
Hughes 500	2.800	8001272952	Skid Mount
MD 500	2.800	8001272952	Skid Mount
Robinson R44	2.800	8001272952	Skid Mount
Bell 206/206B	3.000	8001272953	Skid Mount
Bell Jet Ranger	3.000	8001272953	Skid Mount
Eurocopter EC-120	3.000	8001272953	Skid Mount
Aerospatiale	3.200	8001272954	Skid Mount
Astar AS 350 (B)	3.200	8001272954	Skid Mount
Bell 214B	4.125	8001272955	Skid Mount
Bell 222/230/412	4.125	8001272955	Skid Mount
UH1 Hughie	4.125	8001272955	Skid Mount
Robinson R22	2.000	8001272956	Skid Mount
MD 600	3.500	8001272957	Skid Mount
Eurocopter EC-135	3.750	8001272958	Skid Mount
MD-900	3.320	8001272959	Skid Mount
MD 500/R44	2.800	8001272960	Skid Mount w/ BMT75
Jet Ranger/206B	3.000	8001272961	Skid Mount w/ BMT75
BLIMP	1.500	8001272962	Skid Mount
Eurocopter	1.500	8001272963	Step mount w/ BMT75
Super Puma Mount	N/A	8001272964	Belly Mount
Blackhawk	N/A	8001272965	Belly Mount
Bell 222/230/412	4.125	8001272966	Skid Mount w/ 4" Lift
Jet Ranger 206B/EC-120	3.000	8001272967	Skid Mount w/ 4" Lift
Aerospatiale	3.200	8001272968	Skid Mount w/ 4" Lift
American Eurocopter BK-117A3	3.500	8001272969	Skid Mount
American Eurocopter BO-105	3.548	8001272970	Skid Mount
AUGSTA BELL AB-212	3.937	8001272971	Skid Mount
Schweizer Model 333	2.250	8001272972	Skid Mount



Standard Low Profile Skid Mount

* +/- .250 Depending on Application

D = Skid Diameter

Figure 4. Low profile skid mount outline drawing

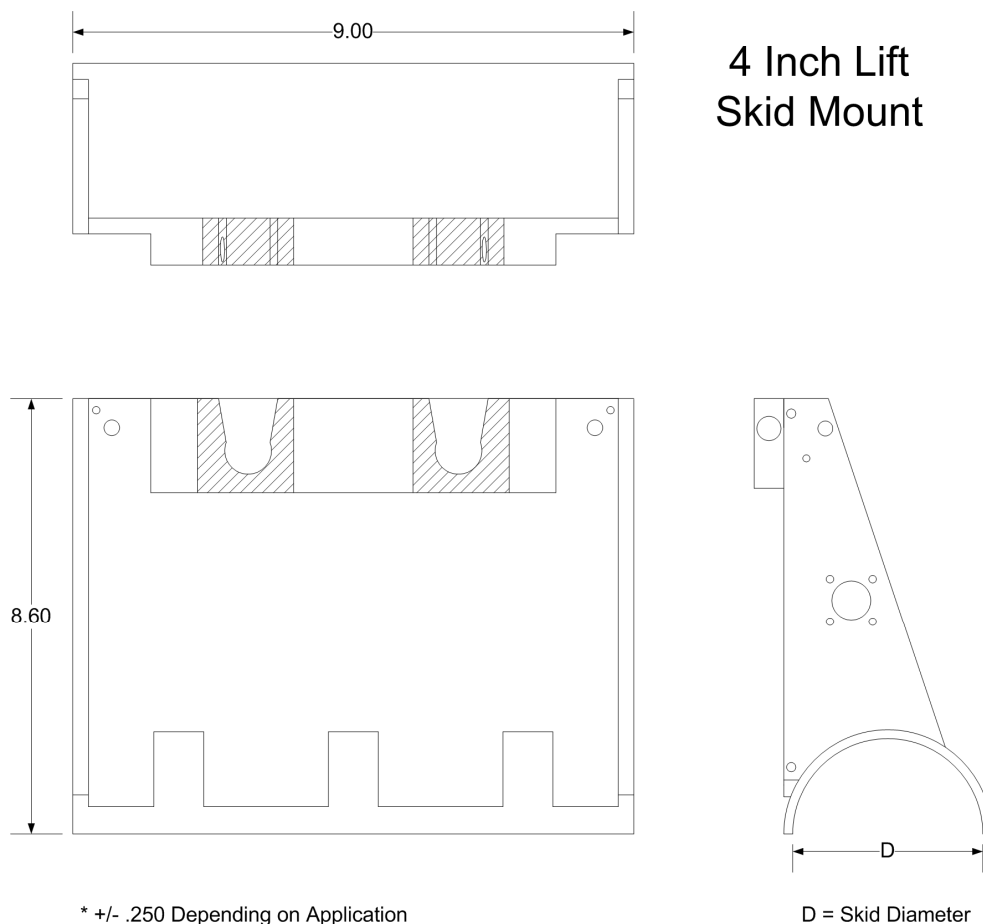


Figure 5. Four-inch lift skid mount outline drawing

2.2 Technical Specifications

Table 3. Antenna actuator characteristics

	TAA-101 (Left or Right)	TAA-101S (Left or Right)
Size	9.125" x 1.86" x 4.0" (23.18 x 4.72 x 10.16 cm)	8.62" x 1.74" x 4.87" (21.89 x 4.42 x 12.37 cm)
Weight	< 5 lbs (2.27 kg)	< 6 lbs (2.72 kg)
Voltage Required	24 – 34 VDC	24 – 34 VDC
Power	32 W Max.	32 W Max.
Operating Temp	-4 to + 140 °F (-20 to +60° C)	-4 to + 140 °F (-20 to +60° C)

Table 4. Deployment control unit

	Up/Down Box
Size	3.13" x 1.38" x 1.395" (8.41 x 3.51 x 3.54 cm)
Weight	.4 lb (.18 kg)
Voltage Required	28 – 32 VDC
Power	1 A
Operating Temp	-4 to + 140 °F (-20 to +60° C)

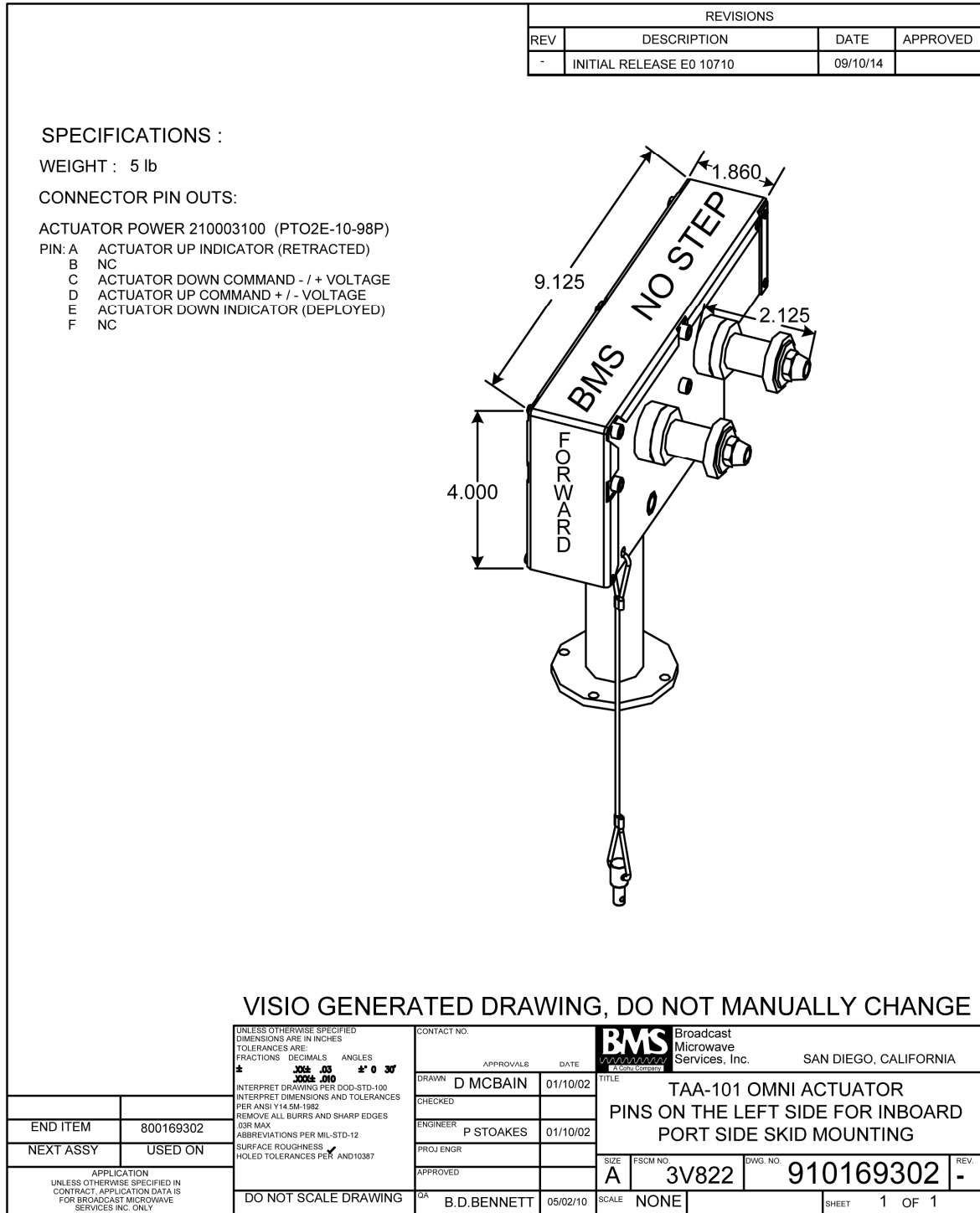


Figure 6. TAA-101 left side mount (LSM)

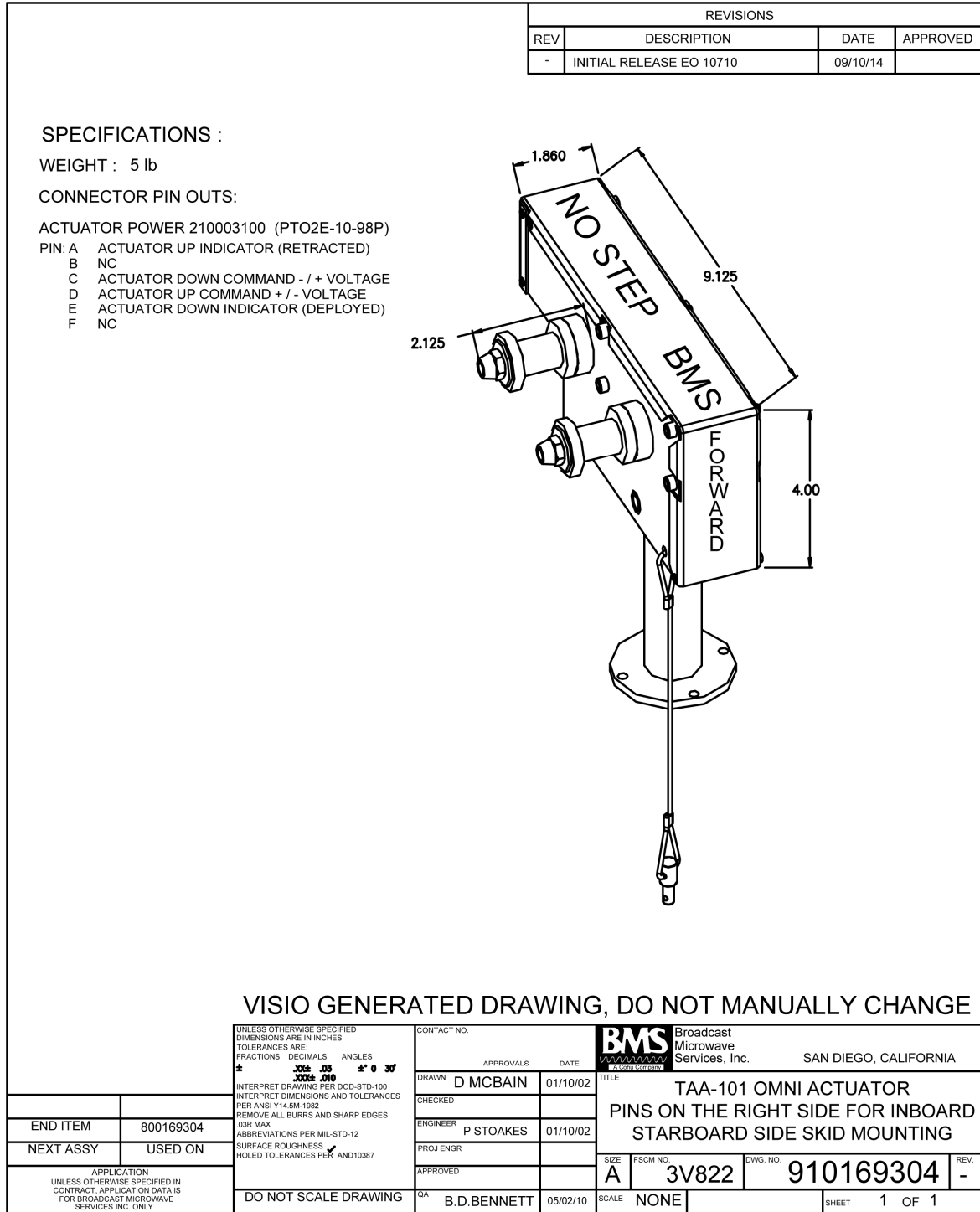


Figure 7. TAA-101 right side mount (RSM)

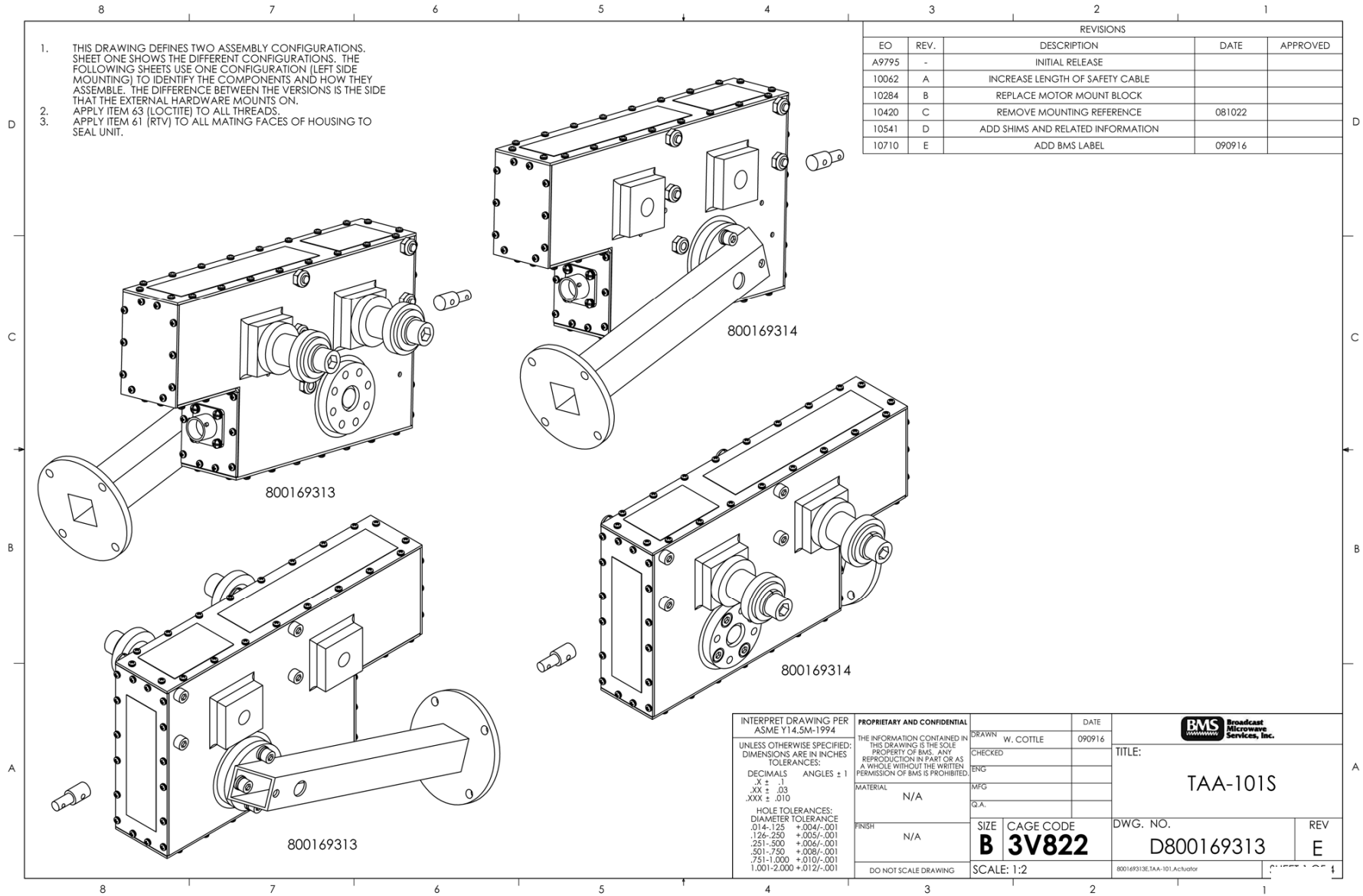


Figure 8. TAA-101S

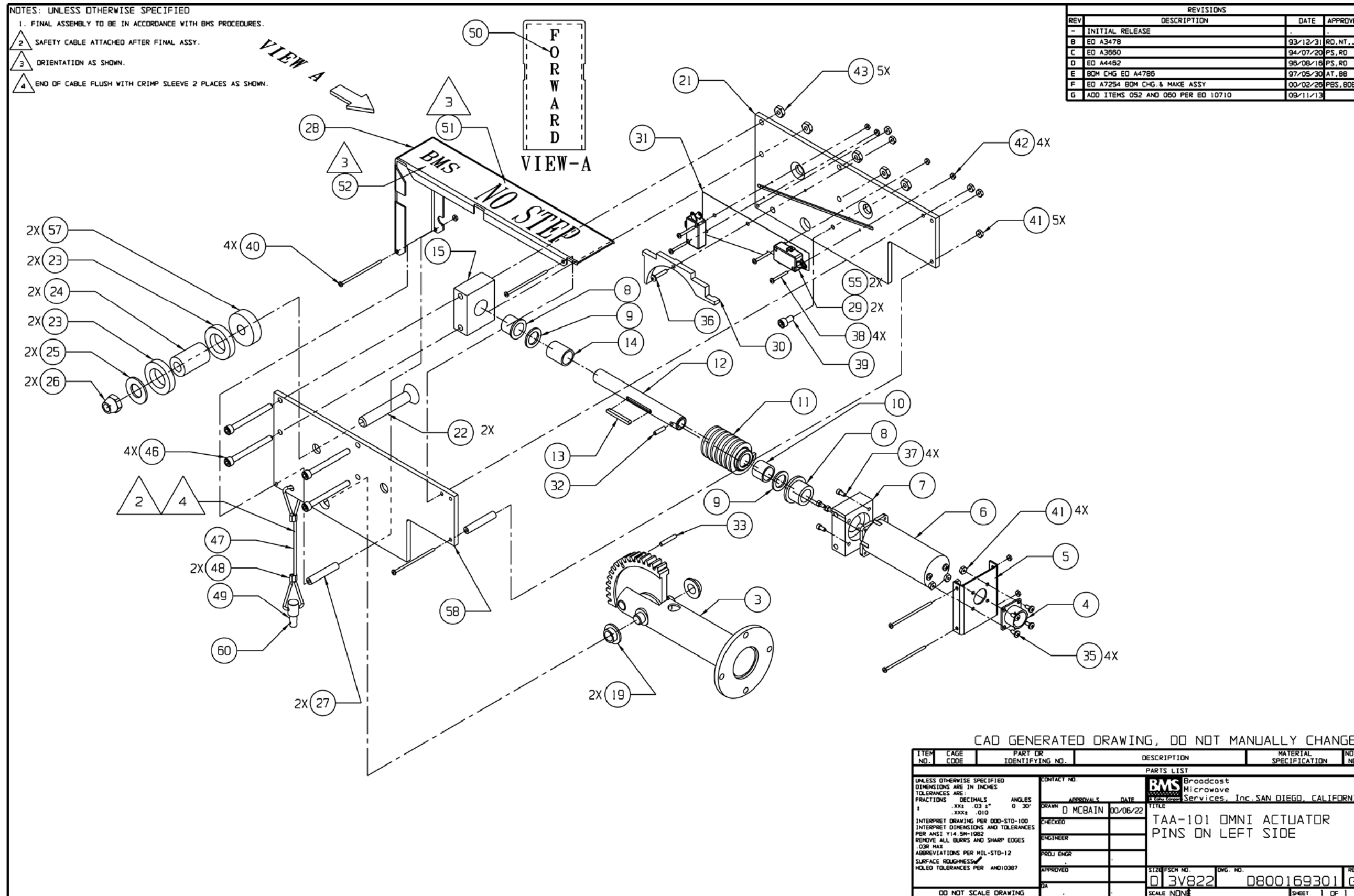


Figure 9. TAA-101, left side, exploded view

CAD GENERATED DRAWING, DO NOT MANUALLY CHANGE

ITEM NO.	CAGE CODE	PART OR IDENTIFYING NO.	DESCRIPTION	MATERIAL SPECIFICATION	NOTE NO.
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES XXX .03 ±" 0 30' XXX .010					
CONTACT NO. BMS Broadcast Microwave Services, Inc. SAN DIEGO, CALIFORNIA			PARTS LIST		
DRAWN D MCBAIN		DATE 00/06/22	TITLE TAA-101 OMNI ACTUATOR PINS ON LEFT SIDE		
CHECKED			SHEET NO. 3V822		
ENGINEER			DWG. NO. 0800169301		
PROJ ENGR			REV. G		
APPROVED			SCALE NONE		
DO NOT SCALE DRAWING			SHEET 1 OF 1		

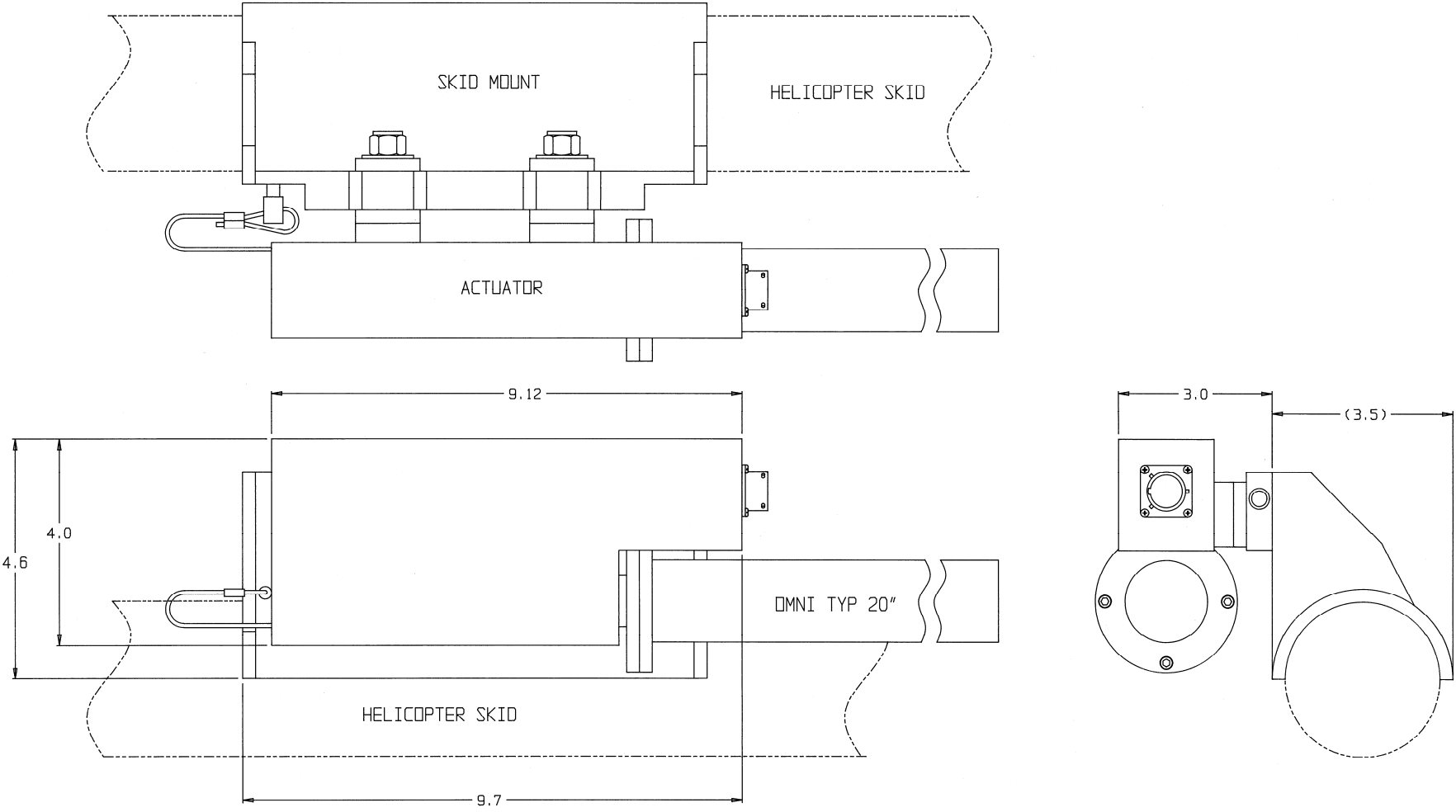


Figure 10. TAA-101 outline drawing

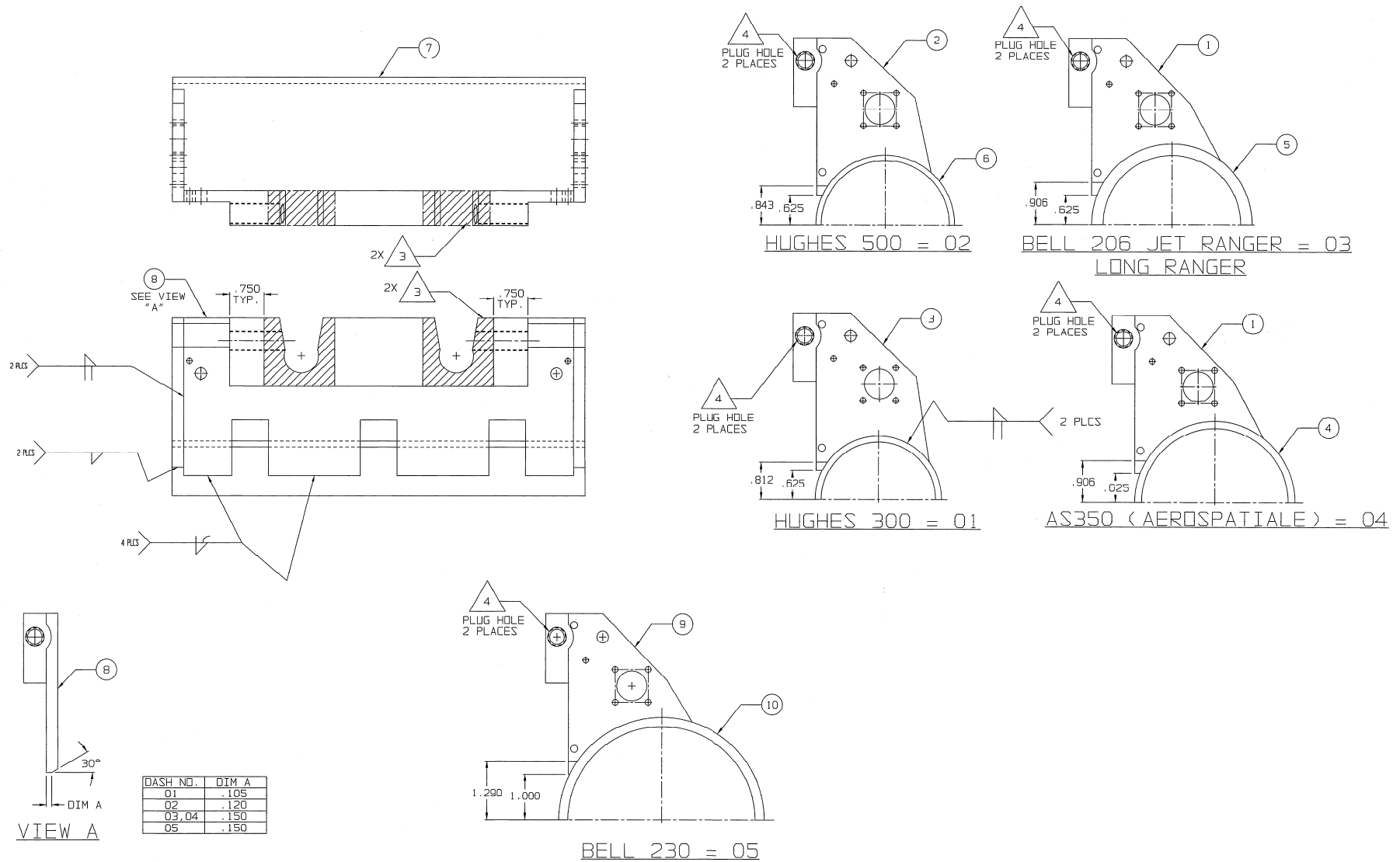


Figure 11. Weldment, Hughes 300, skid mount, low profile omni deployment

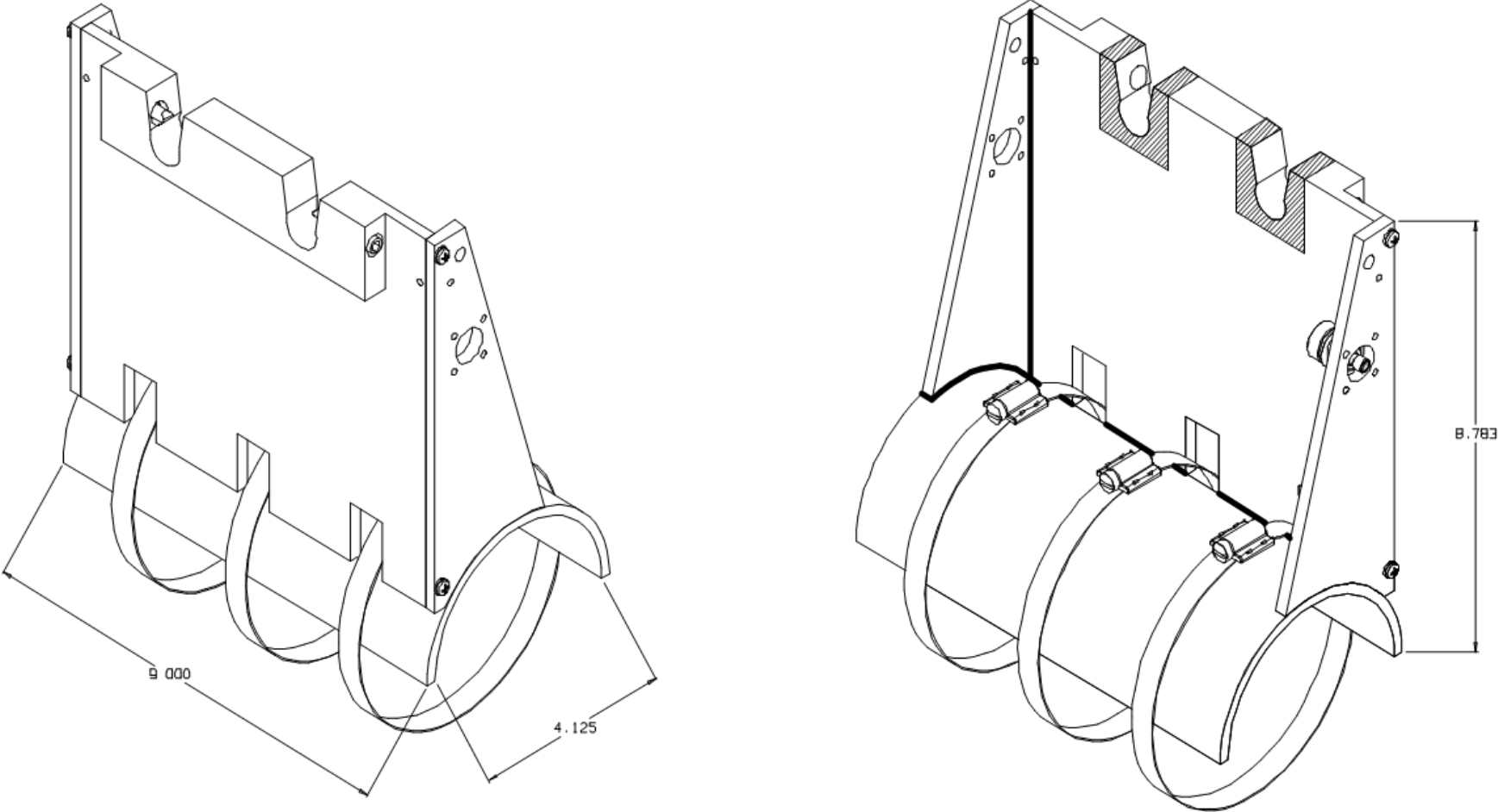


Figure 12. Bell 412 with 4.0" lift skid mount, weldment

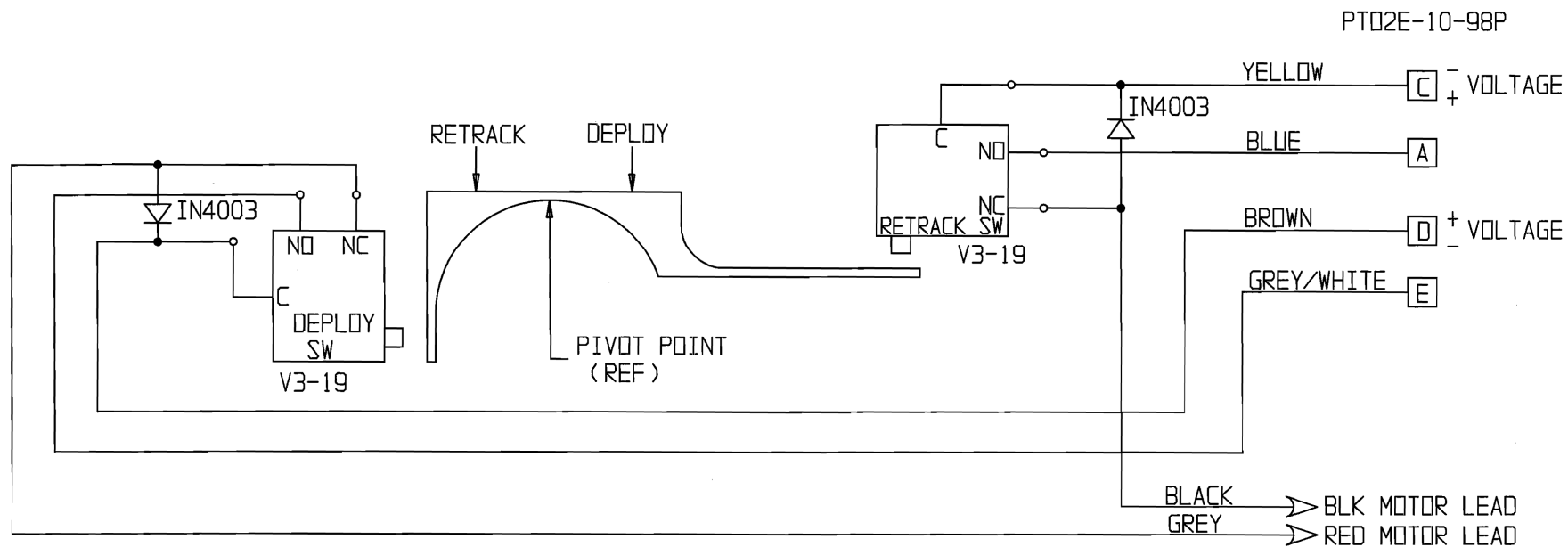


Figure 13. TAA-101 retract/deploy switch schematic

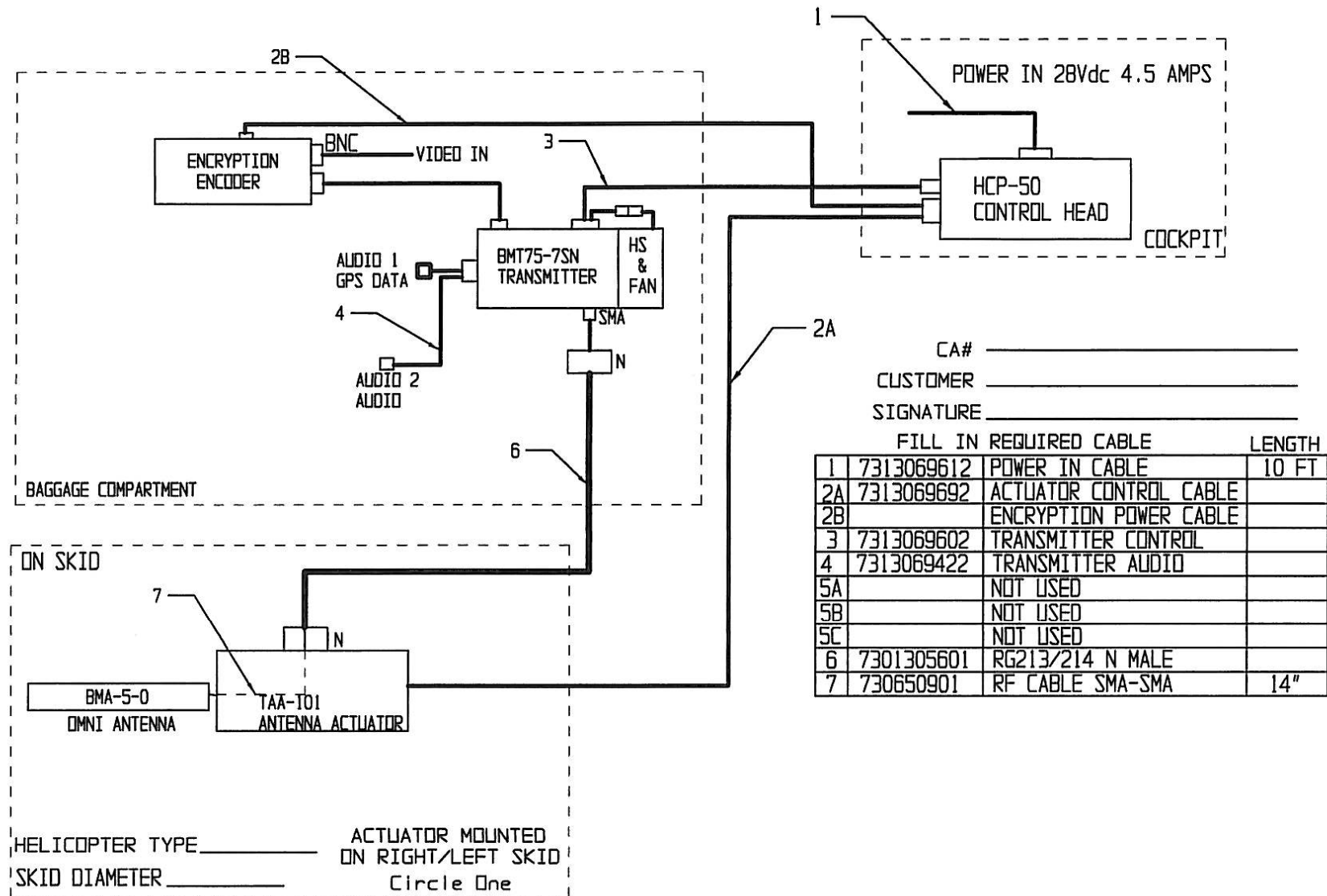


Figure 14. Typical wiring, TAA-101 in analog application

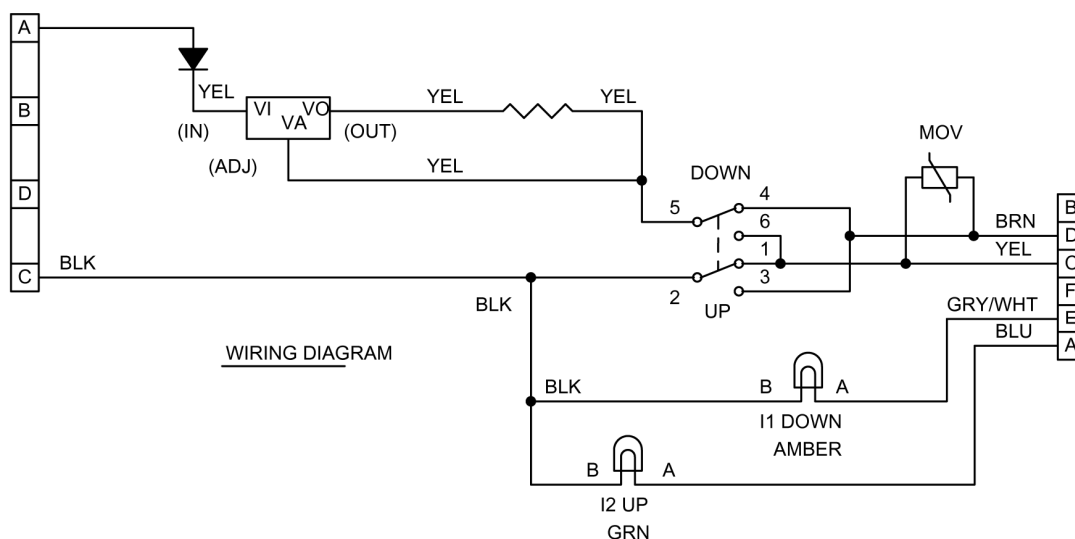
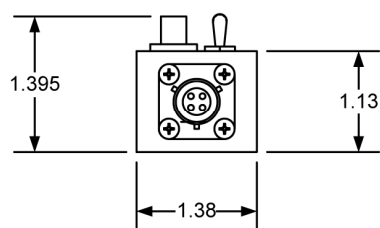
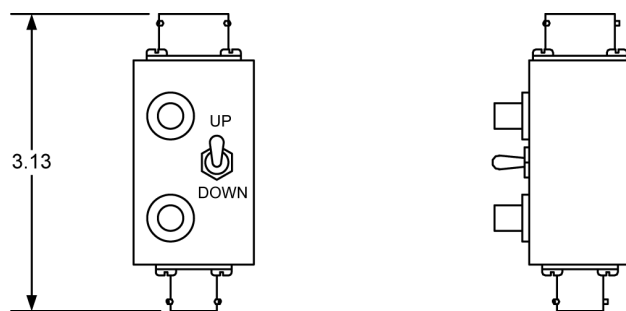


Figure 15. Up-Down Box deployment control (analog)

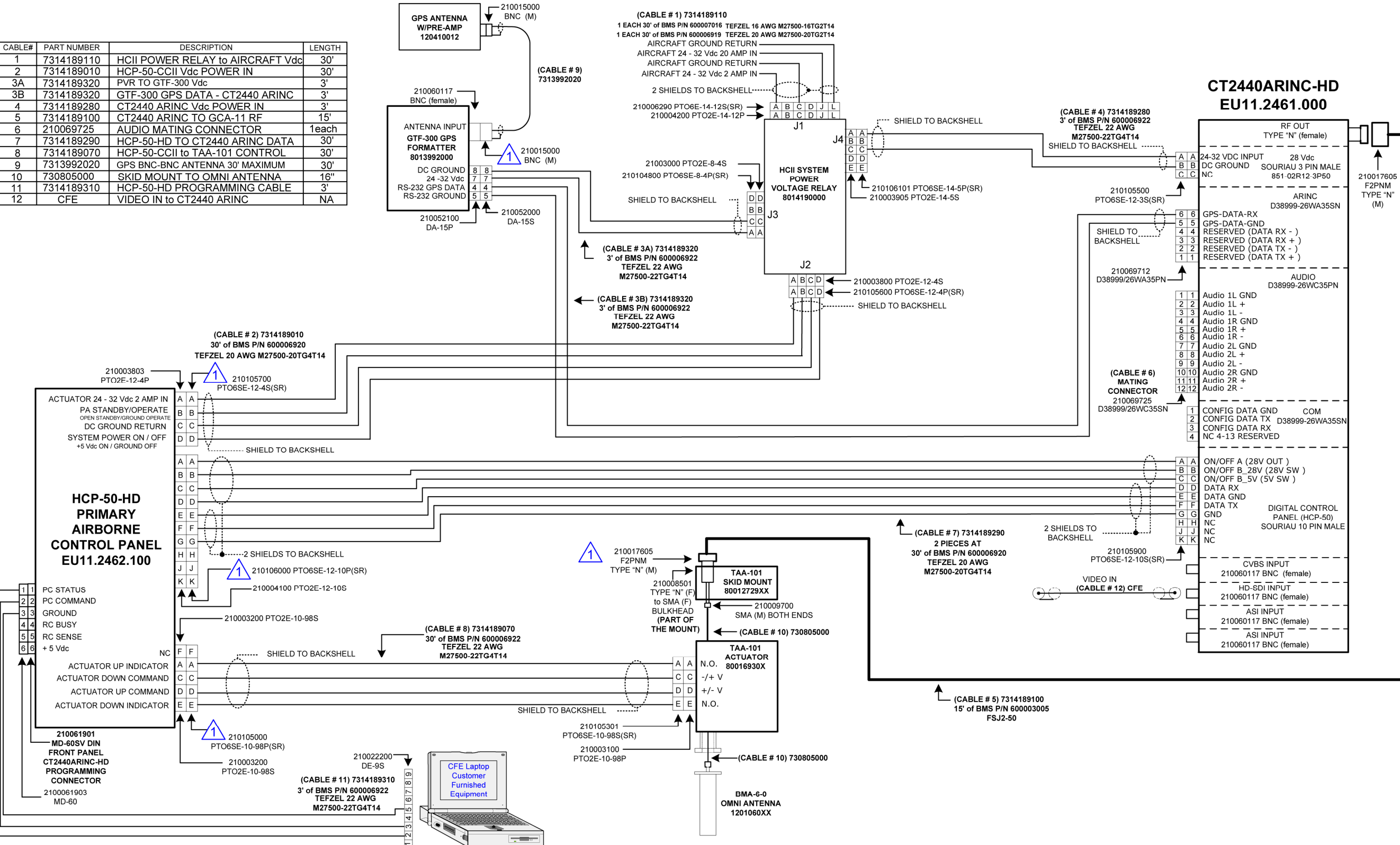


Figure 16. Typical wiring, TAA-101 in digital application

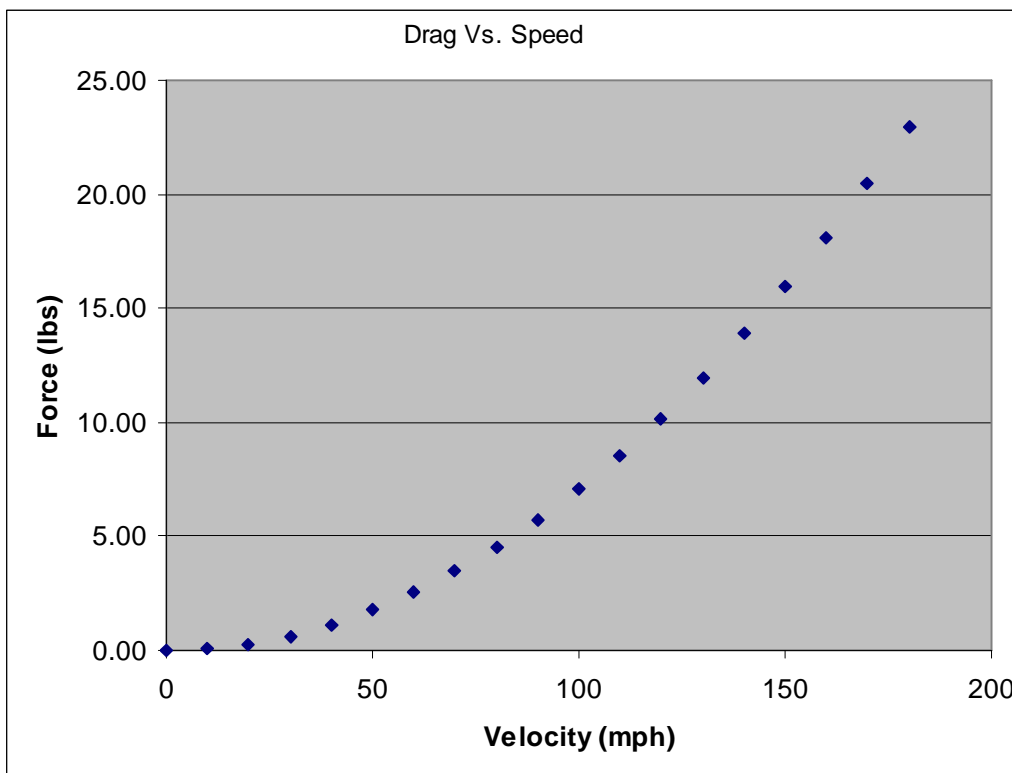


Figure 17. TAA-101 drag vs. speed graph



NOTE: The values in Figure 17 are calculated using the actuator with the BMS 20” omni antenna.



NOTE: If the TAA-101 is to be installed using an FAA STC, then please observe V_{ne} (not-to-exceed velocity) as stated in the STC.



CAUTION:

- A forward velocity in excess of 140 knots may cause the actuator to stall.
- Do not exceed 145 knots forward speed with antenna deployed.

3 INSTALLATION/SETUP



NOTE: Installation should only be performed by an FAA Certified A/P or Avionics Technician.

Each component should be installed in compliance with FAA regulations and accepted industry practices. Some antenna mounts have been granted STC authorization by the FAA for particular aircraft; other installations may require additional inspection/authorization. All equipment is to be installed based on the following wiring diagram.



CAUTION: DO NOT use right-angle connectors or adapters on the RF Power Out cable assemblies. Right-angle connectors may have significant RF power loss at the operating frequencies of this system.

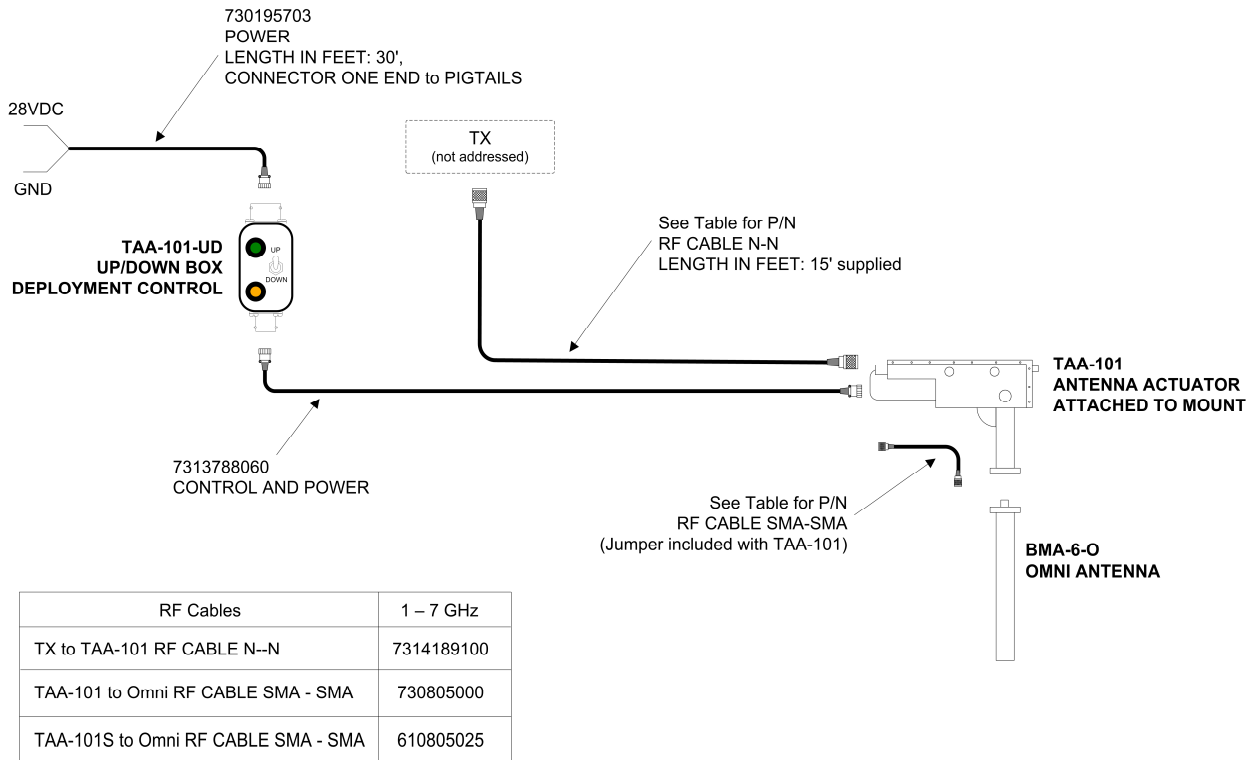


Figure 18. TAA-101 interconnect diagram

The TAA-101 and TAA-101S are side-specific. The side of the aircraft on which the TAA-101/TAA-101S is to be installed is specified at the time of equipment order. The order of installation is as follows:

1. Decide where components will be located.
2. Install mounting bracket.
3. Install deployment control unit.
4. Route cables and terminate.
5. Install omni antenna.

6. Install actuator.

3.1 Deciding the Component Locations

The placement of the mounting bracket and actuator are a function of aircraft structure, center of gravity, pilot visibility and functionality. The attachment of the mounting bracket must be structurally sound. The location should be such that the pilot can easily see whether the antenna is deployed or not. The actuator is mounted inboard so that antenna is deployed against forward motion. The “Forward” signage on the actuator must always face toward the front of the aircraft.



NOTE: The TAA-101/TAA-101S must be installed on the side specified at the time of order.

The cables are routed through the helicopter from the aircraft power to the Up/Down box, then from the Up/Down Box to the TAA-101 or TAA-101S. The RF cable from the transmitter will be routed to the Mounting Bracket of the TAA-101 and TAA-101S. The smaller RF cable routes from the Mounting Bracket to the Omni Antenna.

The Deployment Control Unit is installed in the cockpit within reach of the pilot. There are several types of Deployment Control for the TAA-101 and TAA-101S. The Up/Down Box is the only unit with the sole function to deploy and retract the antenna actuator. Other Deployment Control Units have additional features and are not covered by this documentation. Please refer to the proper documentation on the specific Deployment Control Unit for information on installation, operation and maintenance.

3.2 Installing the Mounting Bracket

The TAA-101 or TAA-101S is attached to the helicopter by a Mounting Bracket. The specific mounting bracket was selected at the time of order. Installation procedures for each type are as follows:

- Skid Mount Bracket Installation
- Cross Tube Strut Mount Bracket Installation

3.2.1 Skid Mount Bracket Installation

This procedure applies to the standard low profile skid mount, 4-inch Lift Skid Mount, and Skid Mount with BMT75 Transmitter Mount.



CAUTION: All Skid Mount Brackets must be attached directly to the skid. DO NOT clamp the skid mount bracket to the skid protection tubes. The Skid Mount can be installed on either side of aircraft.

1. Once the location for the Skid Mount Bracket Assembly has been chosen, secure the Bracket Assembly to the skid. The tube section sits on top of the skid with the thick metal vertical piece on the inside of the skid towards the center of aircraft.
2. The Bracket Assembly may now be secured to the skid using the three stainless steel hose clamps. These are placed through the slots in the bracket and around the skid. It may be necessary to lift the skid off the ground about 1/8 inch to put the clamps under the skid.
3. Before securing the clamps, position the skid mount so the antenna will deploy straight down (vertical metal piece of the bracket is perpendicular to the ground). Torque the band clamps to 50 in-lbs.

3.2.2 Cross Tube Strut Mount Bracket Installation

The Cross Tube Strut Mount (Figure 19) has two hinged clamps that can be secured to a single cross-tube strut. Three diameter sizes are available:

- P/N 810140225 – 2.25” dia.

- P/N 810140250 – 2.50" dia.
 - P/N 810140260 – 2.60" dia.
1. Orient the mount so the antenna will deploy straight down (the notches are facing up).
 2. Attach the top clamp to the strut.
 3. Loosen the bottom clamp support and adjust the angle so that the bottom clamp mates up with the strut.

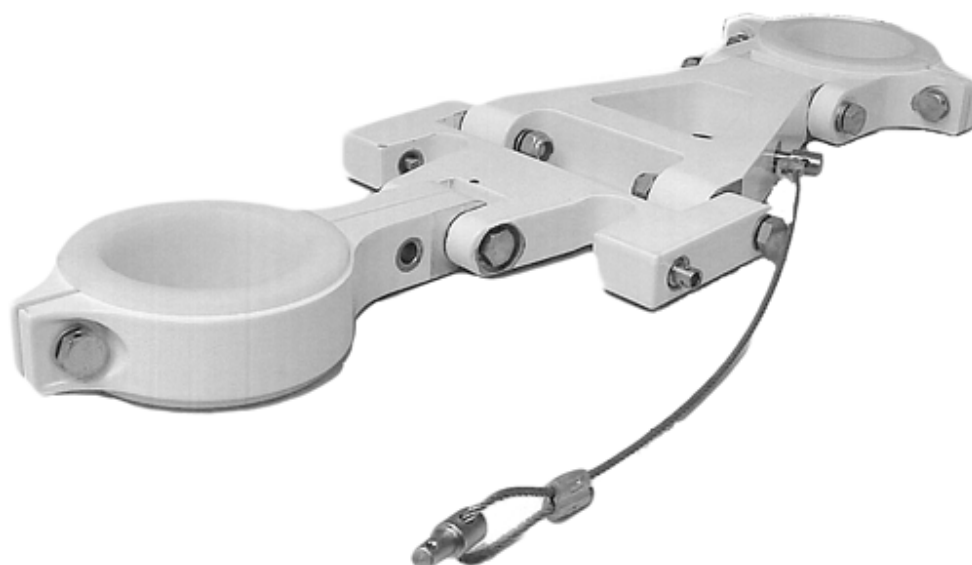


Figure 19. Cross-tube mount assembly

4. Secure the bottom clamp to the strut.
5. Secure the upper clamp support.

3.3 Cable Routing

1. Now that the Mounting Bracket has been installed, the final cable lengths can be determined.
2. Set the actuator assembly on the bracket. Do not snap the unit into the bracket at this time.
3. Proceed with routing the Power and RF cables from their destinations in the aircraft to the actuator.
4. Place grommets around any hole drilled to prevent cable damage.
5. Secure cables every 6 to 12 inches.



NOTE: Maintain signal integrity by minimizing the losses due to sharp bends in the RF cable and 90° RF connectors.

3.4 Installing the Up/Down Box

The Up/Down Box is mounted to the center console or cyclic control using Velcro strips. It is positioned so it is easily viewed by the pilot and will not interfere with normal in-flight operations.

3.5 Cable Termination

Once final cable lengths have been determined after running the cables between the installed components, they may be terminated.

3.6 Antenna Installation

To install the antenna onto the TAA-101 Actuator, the actuator will need to be extended first to allow proper access to all the mounting holes. The TAA-101S does not need to extend the actuator prior to antenna installation.

3.6.1 Antenna Installation on TAA-101

1. Remove the TAA-101 from the mounting bracket.
2. Connect the Power Cable to the TAA-101.
3. Using the Up/Down Box, extend the actuator.
4. Feed the RF cable into the hole on the side of the antenna mount through the center.
5. Connect the RF Cable to the Omni antenna.
6. Attach the omni antenna to the antenna mount with four ANS-10 screws, four MS21044N3 nuts and eight AN960-10 washers. Torque the fasteners to 20 to 25 in. lbs.

3.6.2 Antenna Installation on TAA-101S

1. Feed the RF cable into the hole on the side of the antenna mount through the center.
2. Connect the RF cable to the omni antenna.
3. Attach the omni antenna to the antenna mount with four ANS-10 screws, four MS21044N3 nuts and eight AN960-10 washers. Torque the fasteners to 20 to 25 in. lbs.
4. Connect the Power Cable to the TAA-101S.

3.7 Installing the Antenna Actuator (TAA-101 or TAA-101S)

NOTE:



- The "FORWARD" signage must always face the front of the aircraft.
- The radome of the omni antenna is easily damaged. Handle the unit with caution.
- A forward velocity in excess of 140 knots may cause the actuator up/down motor to stall.

This procedure requires the use of the Installation and Removal tool kit, P/N 870169391. The kit contains two tools (Figure 20), one for installing the actuator, P/N 800169391, and one for removing it, P/N 800169392.

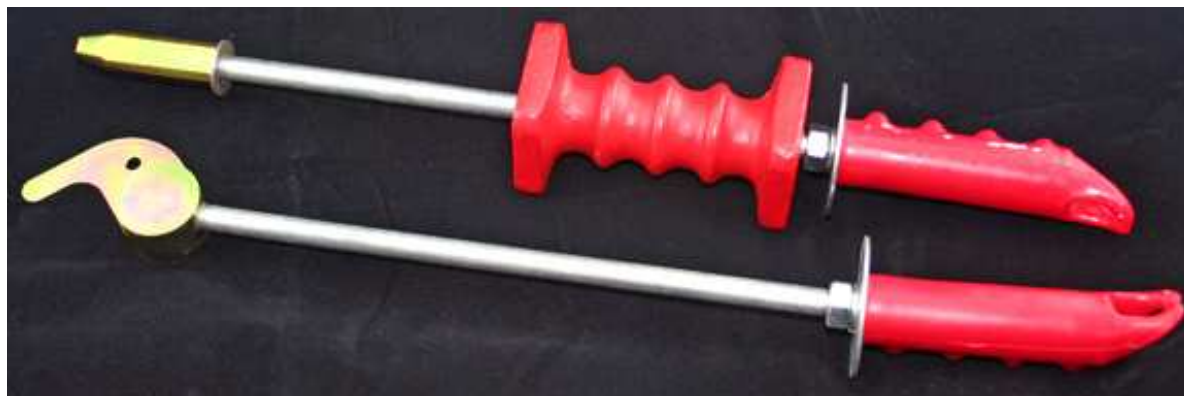


Figure 20. Actuator Installation and Removal tools

1. Ensure the skid mount bracket is mounted to the skid, if not already done. See section 3.2.
2. Retract the actuator so that the omni antenna is in the stow position (if it is not already).
3. If not already positioned, rotate the detent pins (Figure 21) so their beveled ends face up. **THIS IS VERY IMPORTANT! FAILURE TO ALIGN THE PINS IN THIS WAY MAY DAMAGE THE PRODUCT!**

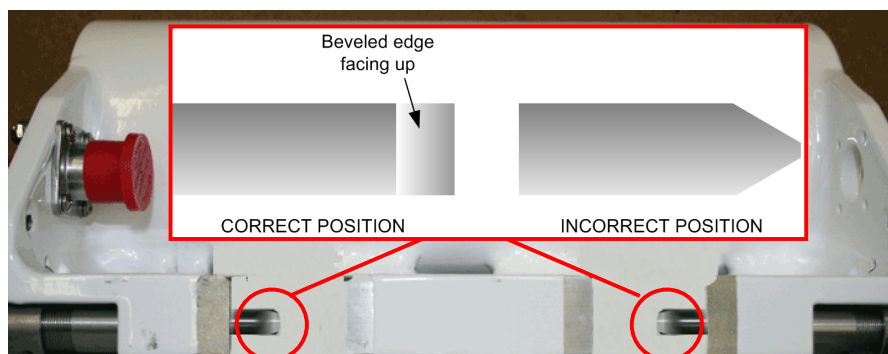


Figure 21. Position of detent pins

4. Place the actuator on the mounting bracket as shown in Figure 22. One plastic washer must be positioned on each side of the bracket, as shown. Note that the sealed actuator is shown in the figure; the unsealed actuator does not have the square-shaped boss, shown.

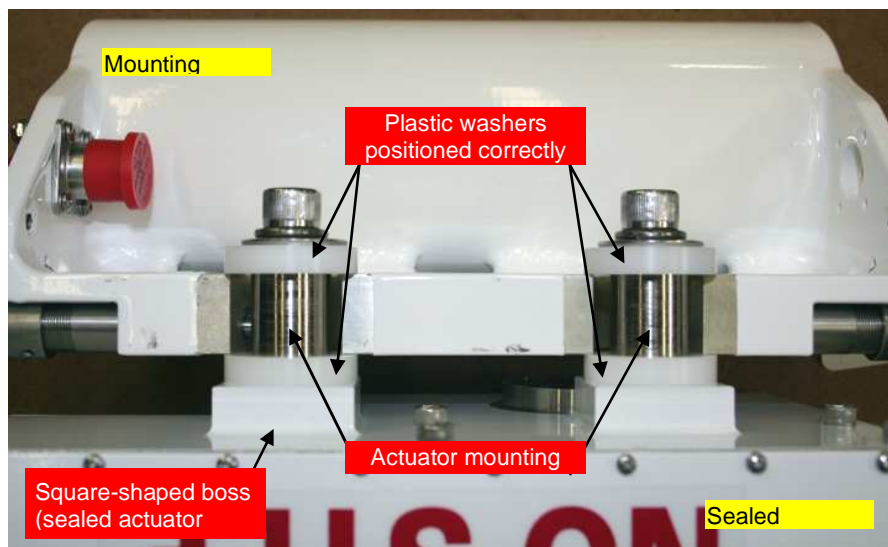


Figure 22. Aligning the actuator (sealed actuator shown)

5. Insert the square end of the TAA-101 installation tool (P/N 800169391) on the first actuator mounting pin, as shown in Figure 23. Note that the tool is positioned between each washer.

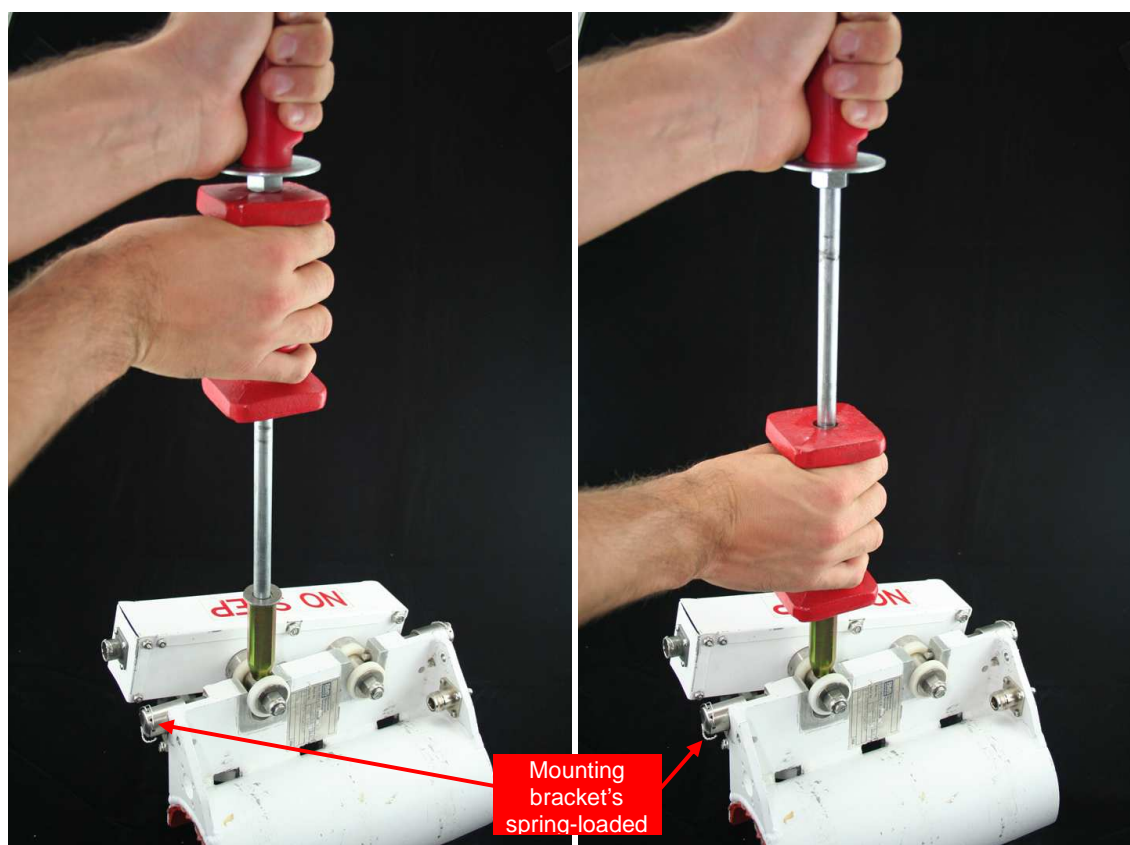


Figure 23. Using the actuator installation tool

6. Slide the tool's red plunger up, then down quickly and with enough force to push the actuator mounting pin into position. It takes considerable force to ensure the pin slides past the mounting bracket's spring-loaded detent pin.
7. Repeat step 5 for the other pin. The correctly mounted actuator is shown in Figure 24.

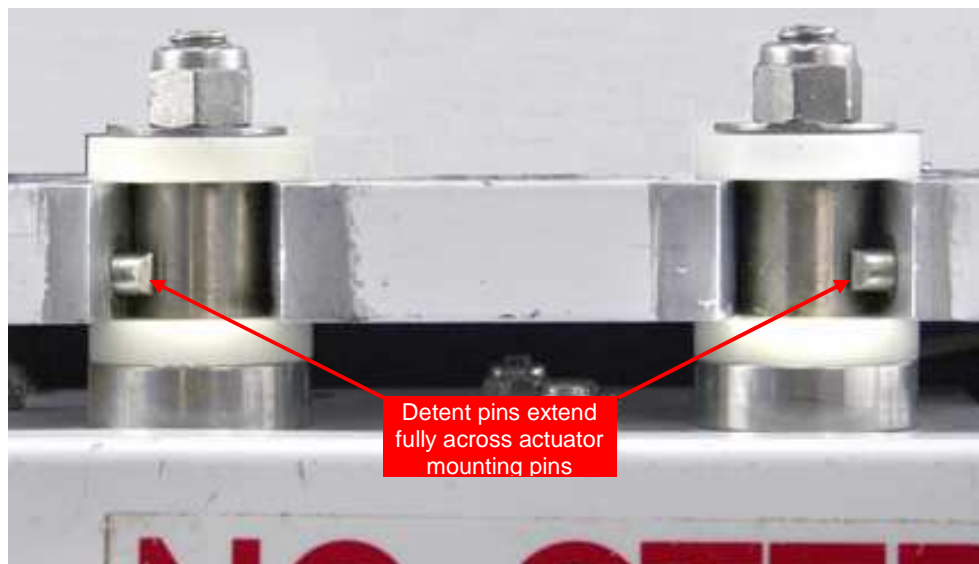


Figure 24. Actuator correctly mounted

8. Rotate the TAA-101 or TAA-101S unit with the antenna attached so that the antenna is straight up.
9. Cycle the actuator several times between stowed and deployed while monitoring whether the RF cable connected to the antenna is binding. Adjust the cable as needed to eliminate any binding.
10. Retract the actuator to the stowed position.

3.8 Removing the Antenna Actuator (TAA-101 or TAA-101S)

Removing the actuator requires the Removal tool, P/N 800169392.

1. Insert the tool's hooked end under the actuator mounting pin washer, as shown in Figure 25. Its round base should rest on the mounting bracket. NOTE: For sealed actuators, DO NOT place the hooked end under the square-shaped boss.

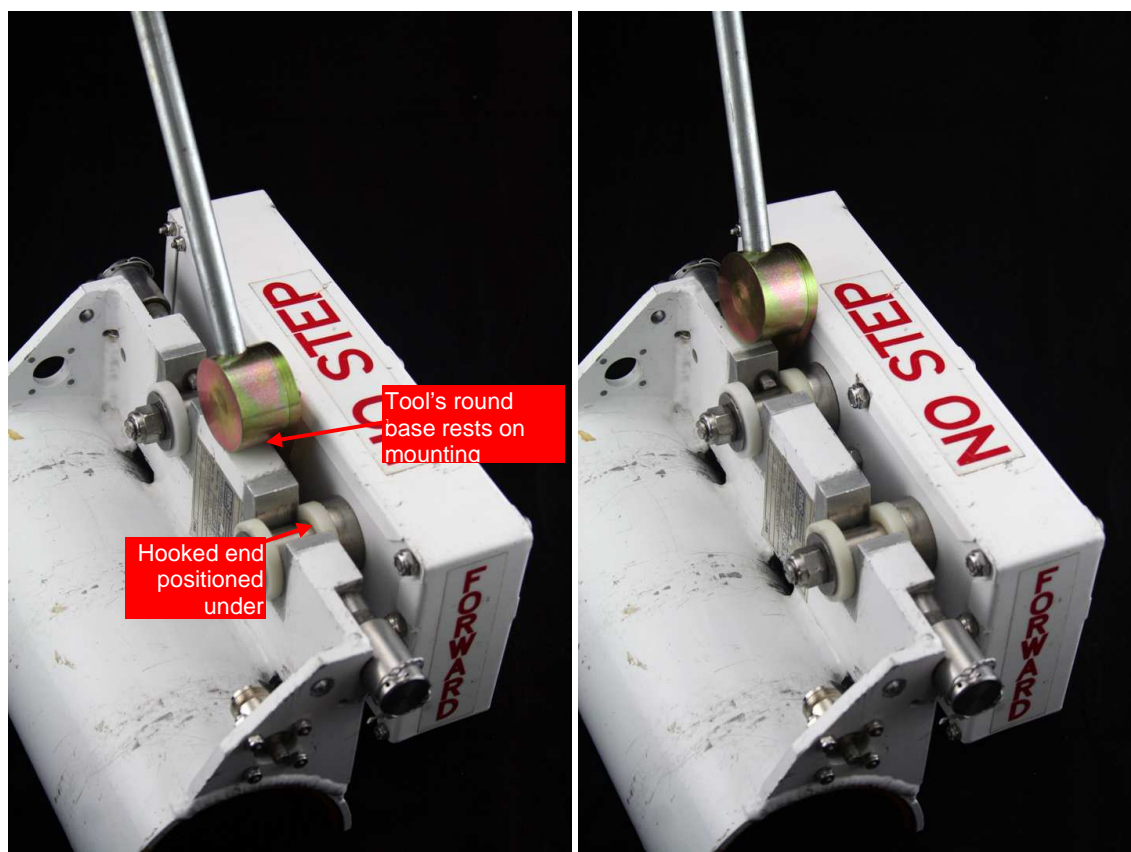


Figure 25. Using the actuator removal tool on forward and rear pins

2. With the tool positioned correctly, pull the tool back slowly and firmly to lift the actuator mounting pin past the mounting bracket's spring-loaded catch.
3. Repeat step 2 for the other mounting pin.

4 USER INTERFACE

There are several Deployment Control Units available for the TAA-101 and TAA-101S. The Up/Down Box is the only unit with the sole function to deploy and retract the antenna actuator. Other Deployment Control Units have additional features not covered by this documentation. Please refer to the proper documentation for the specific Deployment Control Unit for information on installation, operation and maintenance.

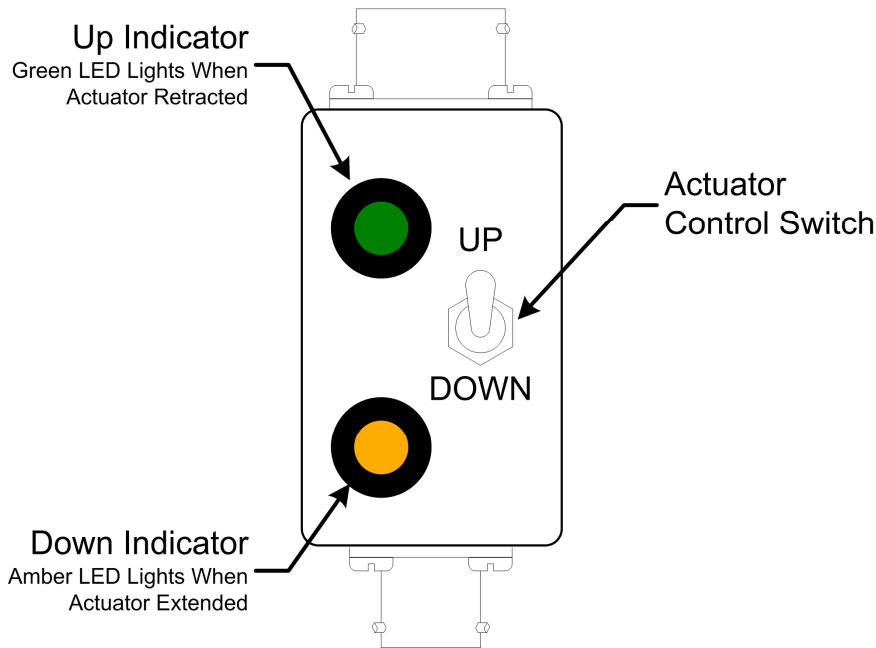
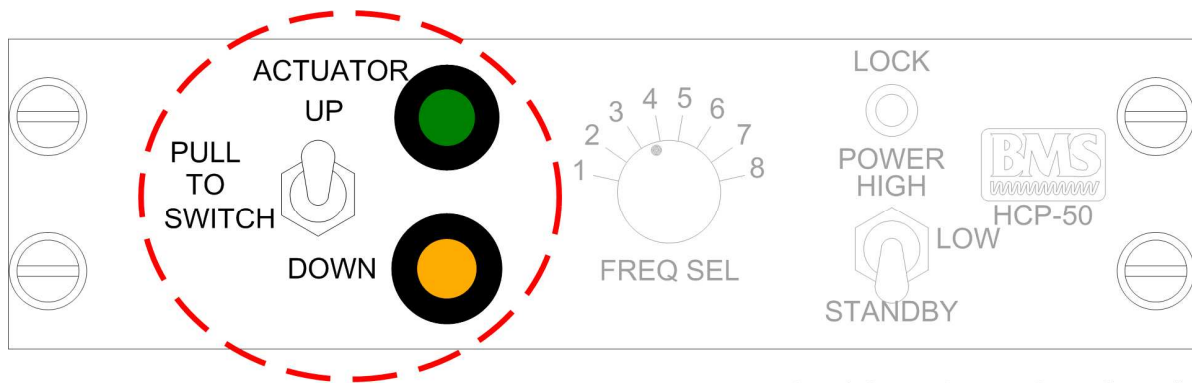


Figure 26. Up/Down Box interface

Below is an example of an alternate Deployment Control that has been incorporated with a transmitter control in a Helicopter Control Panel (HCP).



HCP-50 Series System Control Panel

Figure 27. Alternate deployment control

5 OPERATION

CAUTION:



- Follow all procedures precisely to ensure initialization and operation.
- The TAA-101 and TAA-101S deployment is for **IN-FLIGHT** operation **ONLY**.
- The Antenna needs to be properly **STOWED** (retracted) prior to take-off and Landing.

Deploy the antenna by pulling the Actuator Control Switch out and putting it in **DOWN** position. It takes the antenna about 15 seconds to deploy. The yellow light will indicate when the antenna is fully deployed. No lights will indicate when the actuator is between deployed and stowed.

CAUTION:



- A forward velocity in excess of 140 knots may cause the actuator to stall.
- Do not exceed 145 knots forward speed with antenna deployed.

Stow the actuator by pulling the Actuator Control Switch out and putting it in the **UP** position. It takes about 15 seconds to stow. The green light will indicate when the antenna is properly stowed. No lights will indicate when the actuator is between deployed and stowed.

6 PREVENTIVE MAINTENANCE

In order to ensure system longevity it is highly recommended that the following preventive maintenance procedures be done at the appropriate time.

6.1 Maintenance Schedule

Procedure	Every 100 Hours of Flight	Every 25 Hours of Flight	Preflight
Up/Down Box			
Inspect mounting hardware			<input checked="" type="checkbox"/>
Inspect wiring (connection, chafing)			<input checked="" type="checkbox"/>
Skid Mount			
Inspect clamps for wear	<input checked="" type="checkbox"/>		
TAA-101			
Verify operation	<input checked="" type="checkbox"/>		
Inspect for debris in mechanism	<input checked="" type="checkbox"/>		
Clean and lubricate mechanism	<input checked="" type="checkbox"/>		
Inspect mounting hardware			<input checked="" type="checkbox"/>
Inspect wiring (connection, chafing)			<input checked="" type="checkbox"/>
TAA-101S			
Verify operation	<input checked="" type="checkbox"/>		
Inspect mounting hardware			<input checked="" type="checkbox"/>
Inspect wiring (connection, chafing)			<input checked="" type="checkbox"/>

6.2 Maintenance Procedures

6.2.1 Operation Verification

1. Use the actuator removal tool, P/N 800169392, to remove the actuator from the rear socket on the mount. See section 3.8 for instructions.
2. Rotate the TAA-101 so that the antenna can deploy without damage.
3. Power the system, then deploy and retract the antenna.
4. If the TAA-101 is operating correctly, turn off the power and reinstall the actuator into the mount with the installation tool, P/N 800169391. See section 3.7 for instructions.
5. If the TAA-101 is not operating properly, see the TROUBLESHOOTING section.

6.2.2 Clean and Lubricate TAA-101 Mechanism

1. Remove the actuator from the mounting bracket using the actuator removal tool, P/N 800169392. See section 3.8 for instructions.
2. Turn the actuator upside down and deploy the antenna to expose the gear.
3. Clean the gear and housing with denatured alcohol to remove all dirt and grit.
4. Inspect for abnormal wear.

5. Lubricate the mechanism by placing 1/8 in. square of lubricant (101 Moly Grease or equivalent) on each tooth of the brass gear.
6. Retract and deploy the antenna 3 times to work in lubricant.
7. Retract the antenna.
8. Install the actuator onto the mounting bracket using the actuator installation tool, P/N 800169391. See section 3.7 for instructions.

7 WARRANTY

BMS warrants that, at time of delivery, the product will be free from defects in materials and workmanship provided the equipment or system is installed, operated and maintained in accordance with the Operation and Maintenance manual or such other BMS documentation as may be applicable. Any such defect reported to BMS within two years, BMS will take reasonable and prompt action to repair or replace such equipment. Should any of the components be defective, please contact BMS immediately. Please have the following information available so we can best serve you.

- Customer name, contact name, contract number, and email address;
- BMS product model number (Figure 28);
- Product serial number (Figure 28);
- Detailed description of problem;
- Return information.

Much of this information can be found on the product label found on the component (Figure 28).

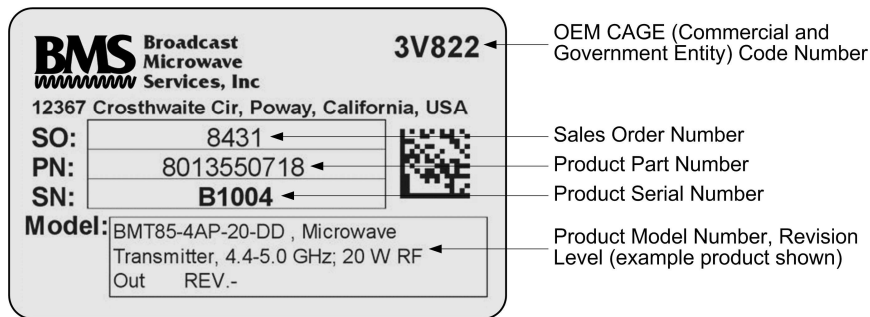


Figure 28. Product label

Defective components under BMS warranty will be repaired/replaced promptly at the discretion of BMS. Items no longer under warranty will require a PO before repairs can proceed.



NOTE: All goods returned for service require an RMA #. Any goods received without an RMA# may not be processed in a timely manner. Please contact BMS for an RMA#.

7.1 Customer Service Information

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 Website: www.bms-inc.com • E-mail: sales@bms-inc.com

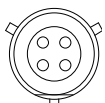
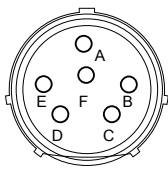
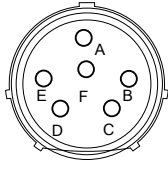
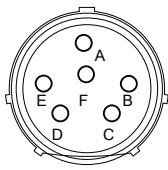
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8 TROUBLESHOOTING

Below is a list of common problems along with the possible causes and solutions.

Fault	Cause	Solution
TAA-101 Not Deploying	No Power	Check Power
		Check Cable Assembly
TAA-101 Not Retracting	No Power	Check Power
		Check Cable Assembly
	Debris in Mechanism	Clean Mechanism

8.1 Connector Pin-outs

Up/Down Box		
PTO2E-8-4P	PIN	
	A	Power In
	B	No Connection
	C	Ground
	D	No Connection
PTO2E-10-98S	PIN	
	A	Actuator Up Indicator (Retracted)
	B	No Connection
	C	Actuator Down Command (-/+ VOLTAGE)
	D	Actuator Up Command ((+/- VOLTAGE)
	E	Actuator Down Indicator (Deployed)
	F	No Connection
TAA-101		
PTO2E-10-98P	PIN	
	A	Actuator Up Indicator (Retracted)
	B	No Connection
	C	Actuator Down Command (-/+ VOLTAGE)
	D	Actuator Up Command ((+/- VOLTAGE)
	E	Actuator Down Indicator (Deployed)
	F	No Connection
TAA-101S		
PTO2E-10-98P	PIN	
	A	Actuator Up Indicator (Retracted)
	B	No Connection
	C	Actuator Down Command (-/+ VOLTAGE)
	D	Actuator Up Command ((+/- VOLTAGE)
	E	Actuator Down Indicator (Deployed)
	F	No Connection

