

Copper Reel Replacement for Yagi Element Housing

Introduction

This document will show how to change the copper element out of the housing. Due to the fact that there are different types of housings this document will try and show all of them and their interior components.

Included

Terminology guide
List of Figures
Sections

Terminology Guide

Shown below are some pictures that will give you a familiarization of the antenna part names and numbers. It will also show the different housings.

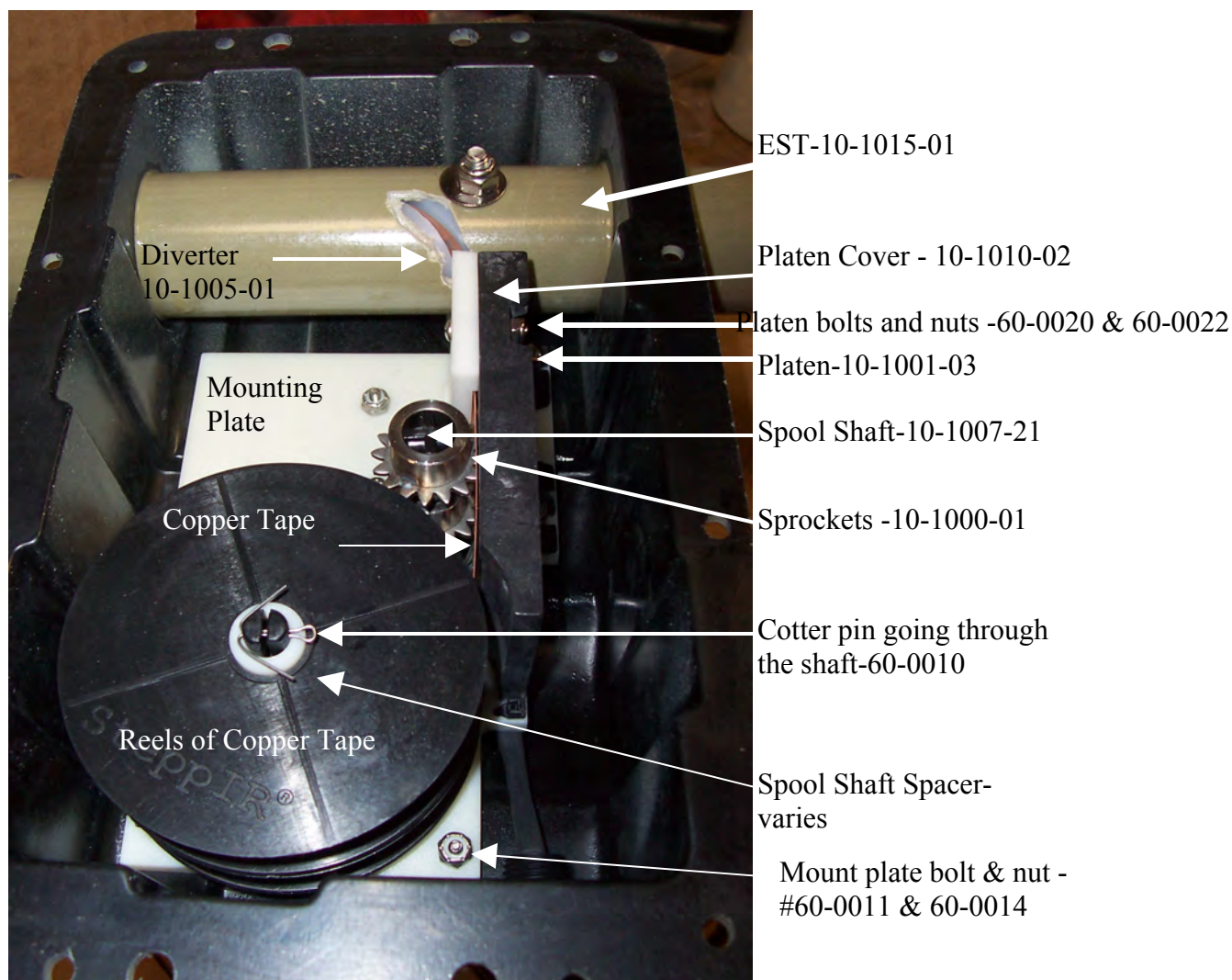


Figure A-1 - Interior View and Terminology

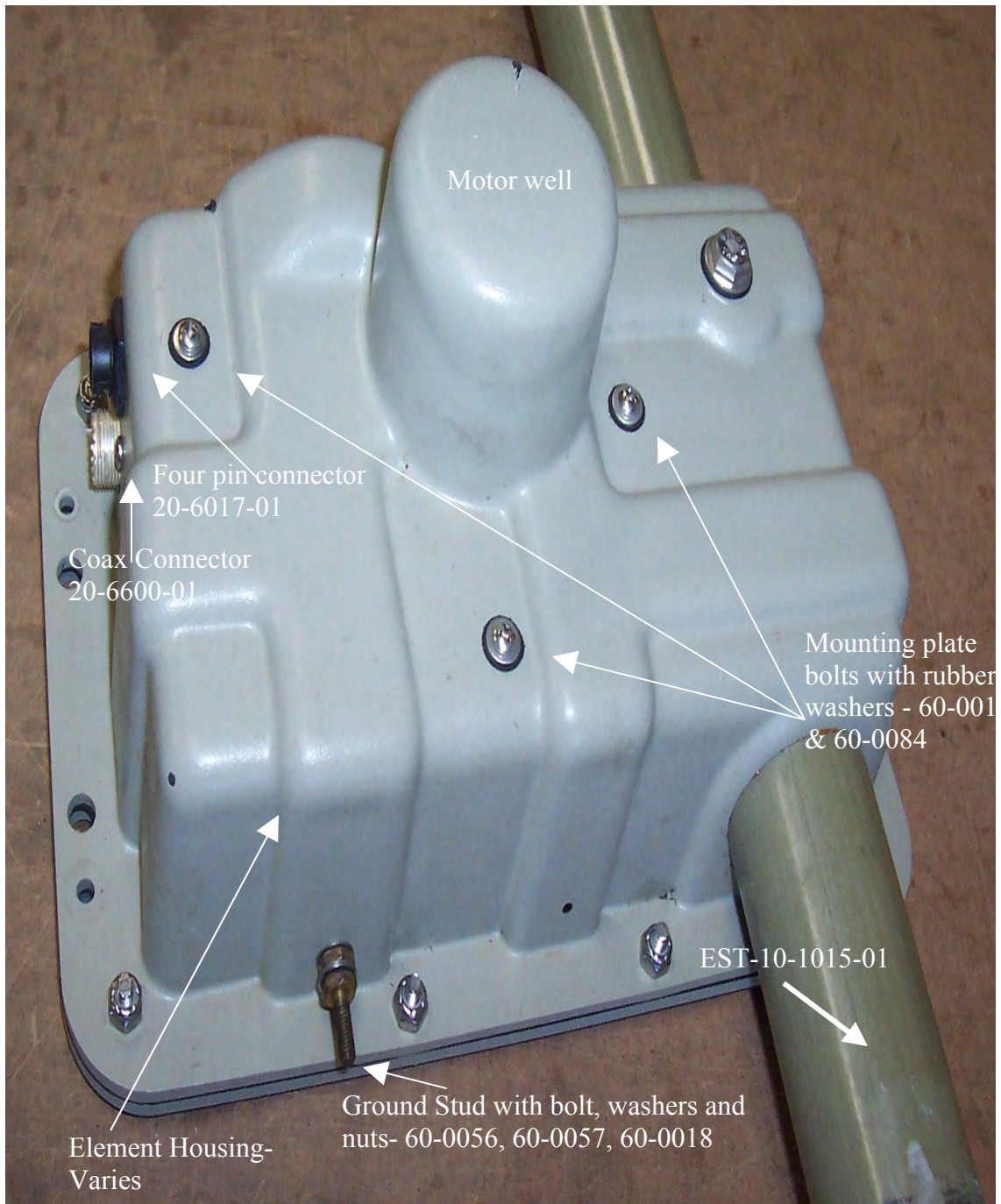


Figure # A-2 - External View and Terminology

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Warning: Do not put any petroleum based products on any of the plastic parts – this will cause them to break.

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1.1 - Unmounting the reels and bullets

Tools Needed

- Needle nose pliers
- Regular pliers
- Copper Cut guide - Figure
- Bullet punch - This is to break the bullets apart - Figure#
- Superglue
- Phillips Screwdriver #1 - Platen & Motors & #2-housing,
- ¼ Nut driver

List of Parts

- Bullets - both halves (10-1025-21)
- Plastic Tie about 14.5"
- Zip tie - 4 "
- Gasket (for appropriate housing)

Procedure

1. Remove the #10 screws from the housing, and set them off to the sides, they will be reused to reassemble the housing
2. Take off the back cover of the element housing unit. Carefully removing it without damaging the gasket, unless you have additional gaskets to replace it.
3. Once the back is off, it will depend on what type of housing it is, whether it is a driven or passive or 30/40, MonstIR, BigIR, SmallIR. There are different parts inside, baluns or coax connections and four pin connections or motor wires coming out of the housing.
4. After the cover is taken off, you will see the reels that are being held on by a cotter pin and a spacer that is connected to the spool shaft.
5. First you will need to extend the copper out of the Element Housing Unit and Element Support Tube - rotate the drive sprocket manually to extend the copper element so that you can gain access to the bullets. The bullets will need to be taken off so that the copper can be retracted out of the EST.
6. Once the bullets are exposed, take the bullet punch (figure #1-1) and place it in the middle of the two pieces (see figure 1-2 for locations) and push it down so that it breaks apart the two pieces of plastic. **Caution: Be careful on this** - This bullet punch is spring loaded so that it will force the punch in between the two pieces of plastic. If the bullets are an older style then you will have to unsolder the pieces

that are soldered onto the copper (this is on the 1st Generation bullets only), (the figures show the different types of bullets used).

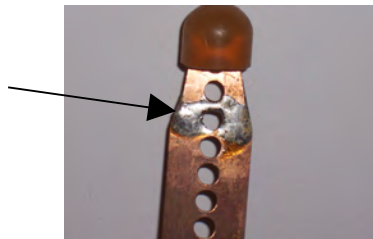


Figure #1-1 Bullet Punch



Figure #1-2 - Location to put bullet punch

Unsolder
here



1st Generation



2nd Generation



3rd Generation

Figure 1-3 - Different generation of bullets

7. After the bullets have been taken off, it is sometimes hard to get one half of the bullet off of the copper; you will have to put the bullet punch in between the copper and the bullet, **CAUTION: be careful not to damage the copper.**
8. After that has been done to both sides, then use your finger to slowly retract the copper back into the housing and into the EST and all the way to the platen and platen cover. Be sure and put a piece of plastic tie into the last holes of the copper to hold the copper into place (see figure 1-4). Do not allow the copper strips to move past the brushes or drive sprocket, there has been a specific pre load given to the spring inside the reel. If the copper moves past the drive sprocket you will lose the pre load in the spring.

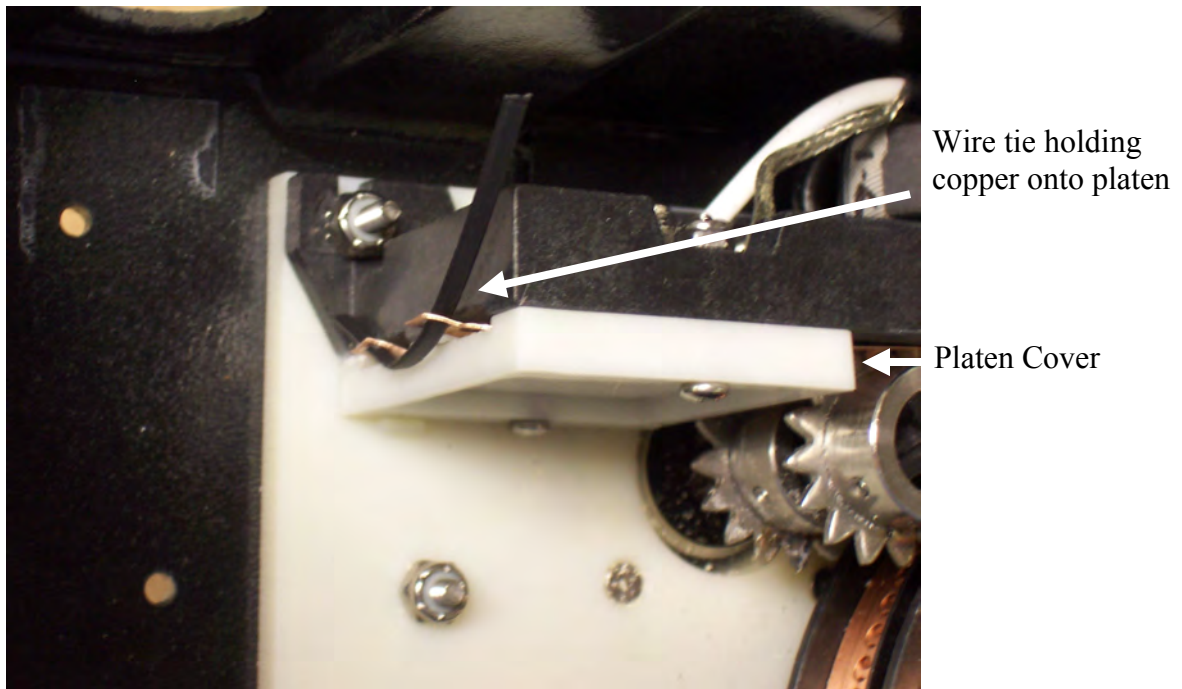


Figure #1-4 - shows zip tie location

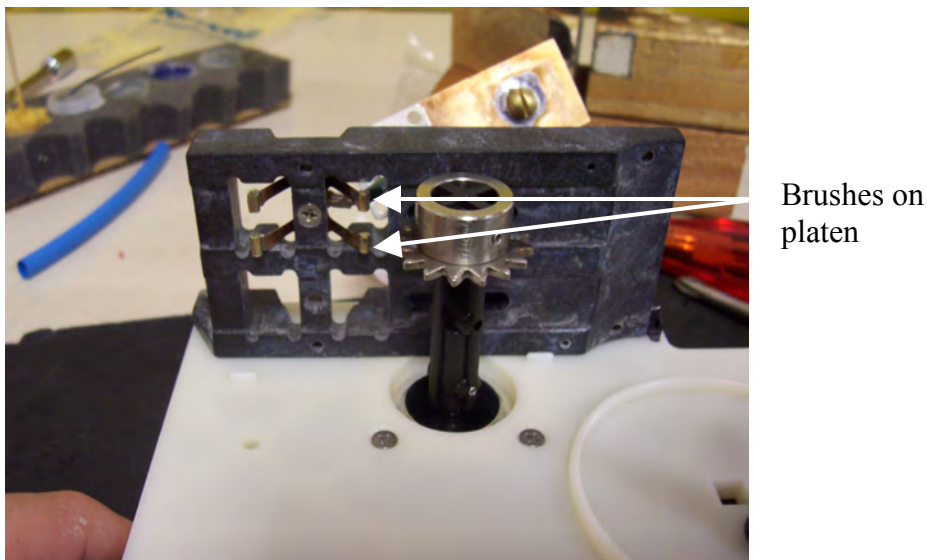


Figure #1-5-Shows brushes

9. If this applies, remove the #6 screws holding the SO-239 coax connector if it is driven element and loosen the outer nut that releases the four conductor control cable so that it can be carefully pulled out when the mounting plate is removed.
10. Remove the three #6 screws that hold the mounting plate into the housing.
11. Pull the Element housing guts out of the housing; pull the control cable carefully through the sealing connector until the motor assembly is free of the housing.
12. Remove the platen cover.
13. Do the next step one reel at a time; it is hard to do both of them at once.
14. Have wire ties close by so that you can secure the copper onto the reels.
15. Retract the copper all of the way back until it is onto the reel, holding it tightly.
16. Take the bottom one and put it back onto the sprocket and through the brushes and put a wire tie on through the end of the copper so that it will hold it onto the platen.

17. Then put a plastic piece of tie onto the first reel so that it will hold the copper onto the reel. (See figure #1-6)



Figure # 1-6 - Reel loaded with Copper with wire tie on it

18. Then slowly let the spring unwind clockwise, **DO NOT LET IT GO, AND UNWIND BY ITSELF. Use your fingers to let it slowly unwind. Count how many turns that it is, it should be about 8 turns.**
19. Once it is rewound, remove the cotter pin from the top of the shaft.
20. Remove the spacer from the top of the shaft.
21. Take the top reel of copper and pull that off and set it off to the side. Then take the second reel and retract the copper back onto the reel and wrap the wire tie around it to secure it.
22. The 30/40 and BigIR has small spacer (part # 60-0082), the SmallIR, passive, driven has the bigger spacer. Teflon coated spacers are on the 30/40 and the MonstIR
23. Take the platen cover off of the platen to be able to easily put the copper through the brushes. To do this, remove the bolts (60-0020) and the nuts (60-0022) and then the cover will come off.

2.1 - Replacement of Copper Reels

1. Take the new reels and place the first one on the spool shaft, but do not remove the plastic wire tie that is on the copper reel.
2. Placing the reels is done by inserting the reel onto the shaft, but you have to make sure that the spring is set onto the shaft properly (see figure #2-1).

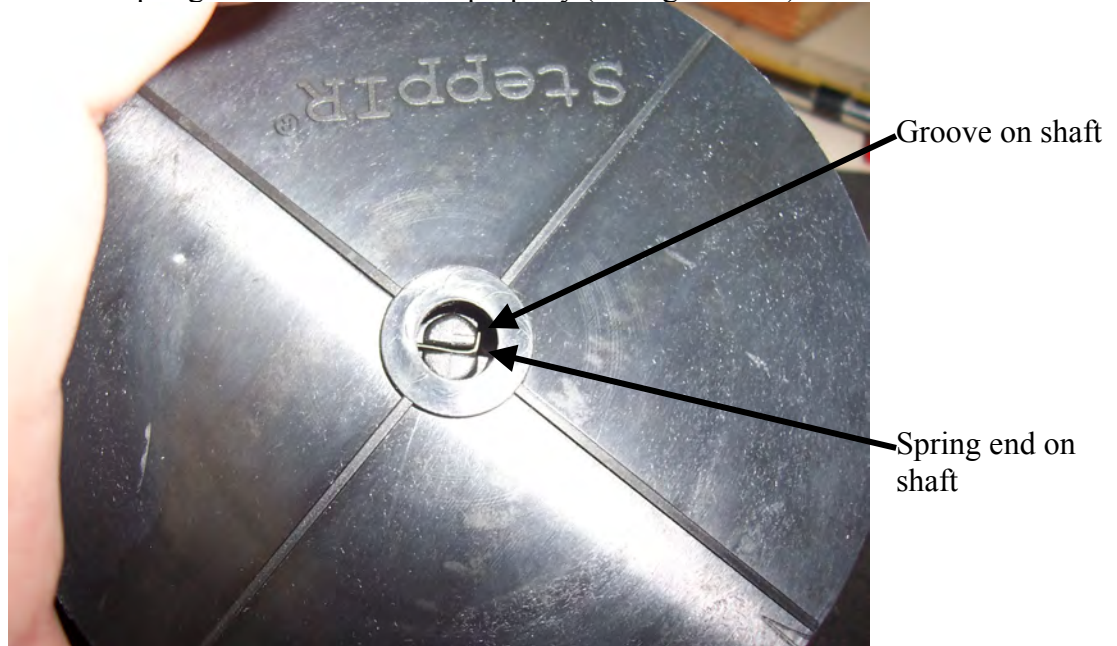


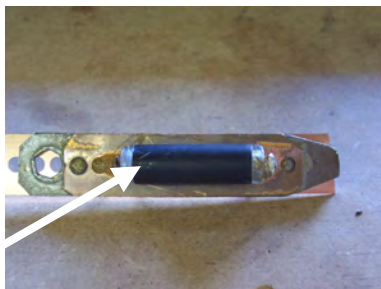
Figure #2-1 - Reel placement location

3. After that is put on, then you will wind the reel around on the shaft counterclockwise 8 times then take the copper and feed it through into the groove of the platen and then carefully lift up the brushes so that the copper will feed through until it is at the end of the platen.
4. Then secure that copper with a piece of plastic tie.
5. Next take the top reel and do the same thing as the first one.
6. Make sure that the spring is set right onto the shaft (see figure #2-1) and wind the copper reel counterclockwise 8 times, follow the arrow in figure #2-2 shows the proper way to wind the copper reel.



Figure #2-2 - Copper reel winding procedure

7. Then take off the piece of wire tie on the reel and then slowly retract the other copper reel that was at the end of the platen and bring it back so that both of the ends of the reels are together.
8. Slowly feed both of the pieces of copper back onto the platen and ease them onto the sprocket and feed them through to the brushes.
9. After the copper has been fed through then put a plastic tie through the end holes holding it in place.
10. Place the appropriate spacer for the housing you are working on, onto it and then put a cotter pin in the hole and bend it back to hold everything together.
11. Put the platen cover back on with the nuts and bolts that you used earlier.
12. Slide the copper out about 12" and trim off the sides of the copper (see figure #2-3 & 2-4) also see the attached drawing to show the amount to be trimmed off. It needs to be so that it will not catch on the inside of the EST.



Copper
cutting
guide



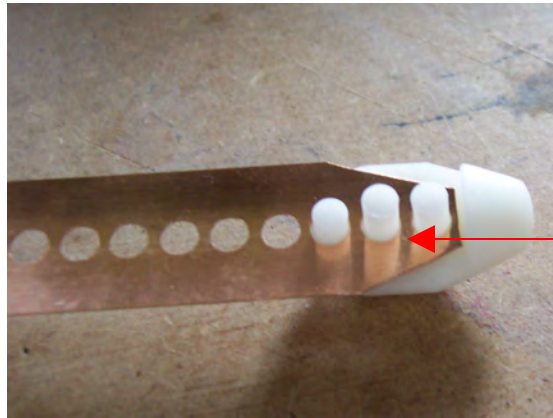
Trimmed copper edges

Figure #2-3 before trimming

Figure #2-4 after trimming with copper guide

13. Then you will place the mounting plate back inside the housing unit, placing all of the appropriate parts, back into the appropriate holes and then secure them all back into place with the appropriate screws with neoprene washers (60-0011) that were used when taking the mounting plate out of the housing unit. You are reversing the removal procedure and putting it all back together into the housing unit.

14. Take the plastic tie off and feed the copper into the diverter and the EST - do this slowly and do not bend the copper. Because the ends are trimmed, the copper should be able to feed into the diverter and EST.
15. Extend the copper out past the EST about 12", then the bullets can be put on the copper.
16. Take the bottom bullet (one with the nose) and place that onto the end of the copper tape, fit grooves into the holes and then add some superglue (see figure #2-5) onto the copper and then place the other piece of bullet in the grooves of the other bullet and then using the pliers squeeze the bullets together; they should just snap together real easily.



Add small amount of
superglue

Figure #2-5 - Superglue location

17. After the bullets have been attached to the copper elements, retract the copper back into the EST manually.
18. The cover can be put back onto the EHU, use the next pages' figures to show the proper placement of the screws to connect the EHU and the back cover. Be careful not to over tighten and crack the housing

3.1 - Screw Placement on housings

This document will show the placement of the 10-32 screws in the Element Housing Unit.

Placement of the 10-32 Screws In the Element Housing Unit (EHU)

- The back cover of the Element Housing Units are not installed at the factory. You must install the gasket and cover before mounting to the EHU.
- Screws "A" and "B" are installed with the head inserted through the back cover and the Nylok nuts are placed on the housing (top) side.
- Screws "C" are installed in the remaining holes with a flat washer under the head and go in from the housing (top) side. These screws pass through the element housing unit and the aluminum mounting bracket and are secured with Nylok nuts.
- 30/40 Housing Cover- Takes screws A, B, C
- 20m Housing Cover - Takes screws B & C
- Driven Housing Cover - Place the screw through the top of the housing, through the hole that is by the coax connector, see driven housing picture for appropriate positioning.



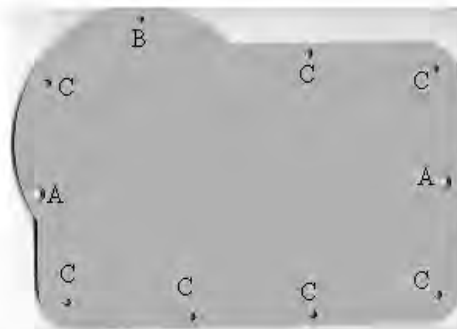
A => 10-32 X 7/8
(Flat Head)



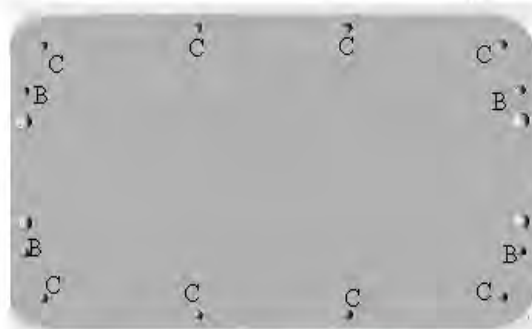
B => 10-32 X 3/4
(Pan Head-Shorter)



C => 10-32 X 7/8
(Pan Head-Longer)



30/40 Housing Cover



20m Housing Cover



Driven Housing

4.1 - Housings

This part of the document will have photographs of the different housings and what is inside of them and part numbers.

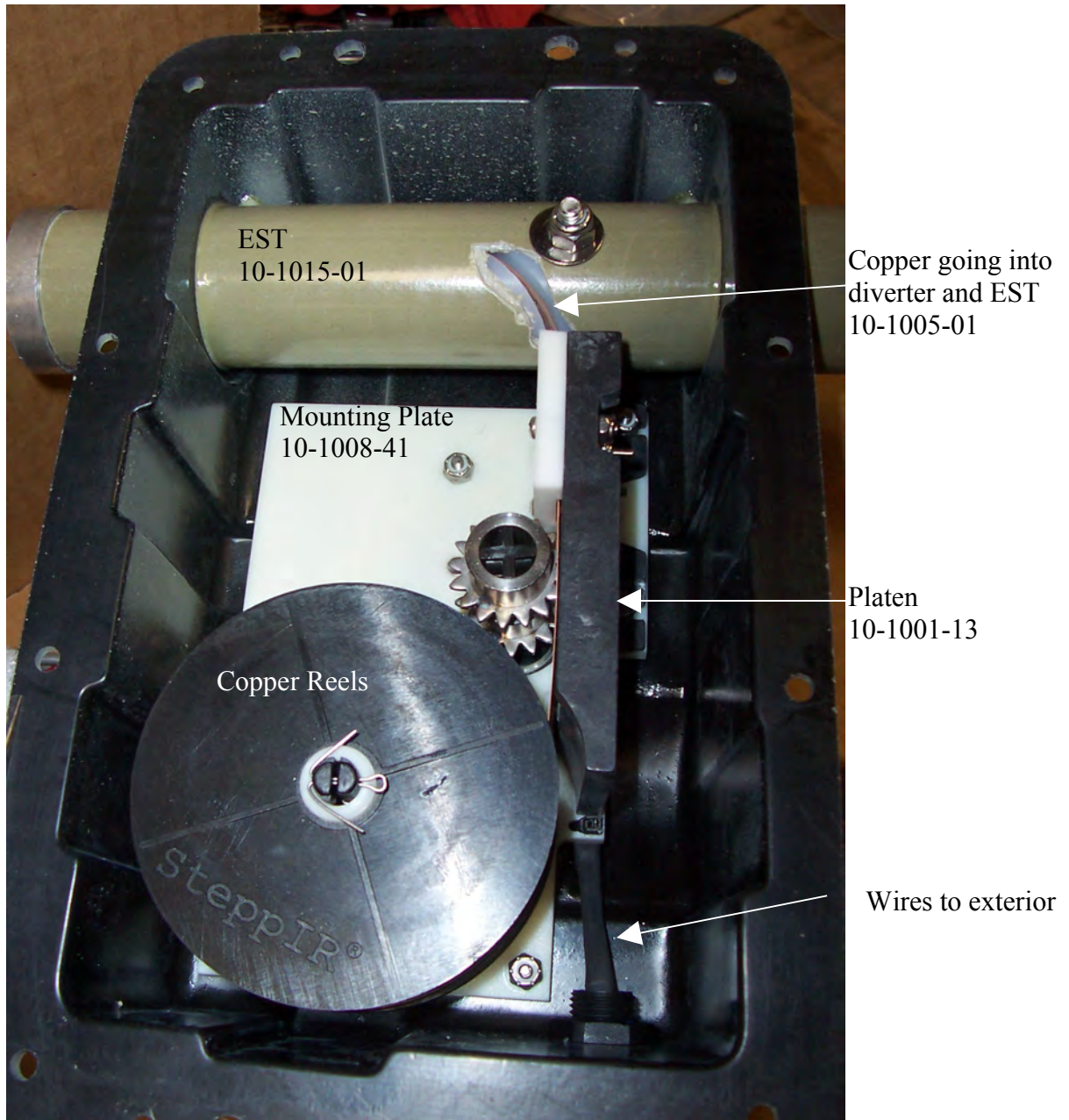


Figure # 4-1 - 3 & 4 Element Passive Housing - The difference between a 3 & 4 Element is the wire lengths - 9' 2" is 3 Element, 18' 4" is 4 Element - Same internal components and rectangular housing.

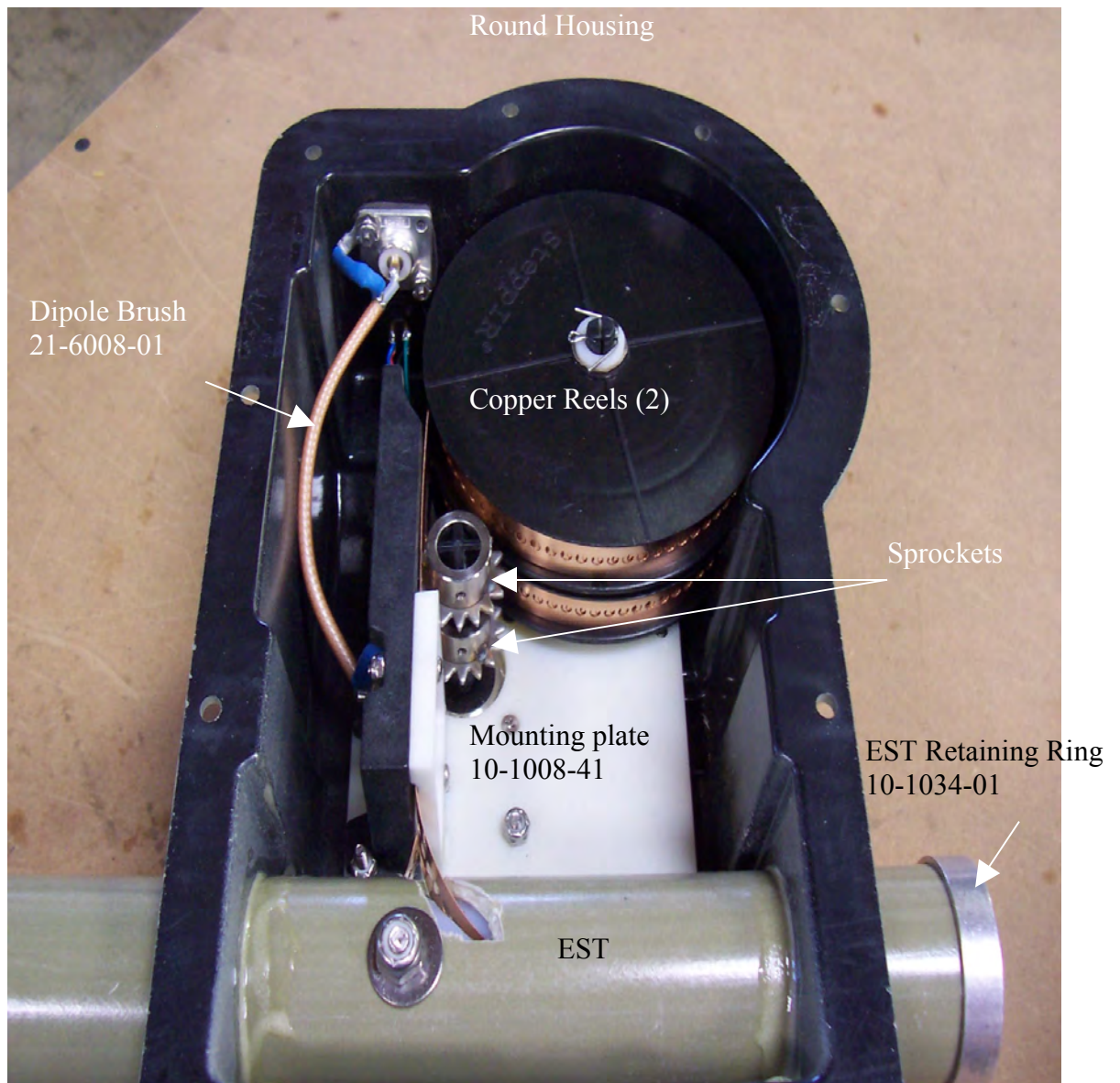


Figure 4-2 - 30/40 Dipole - Round Housing - Has Dipole brushes

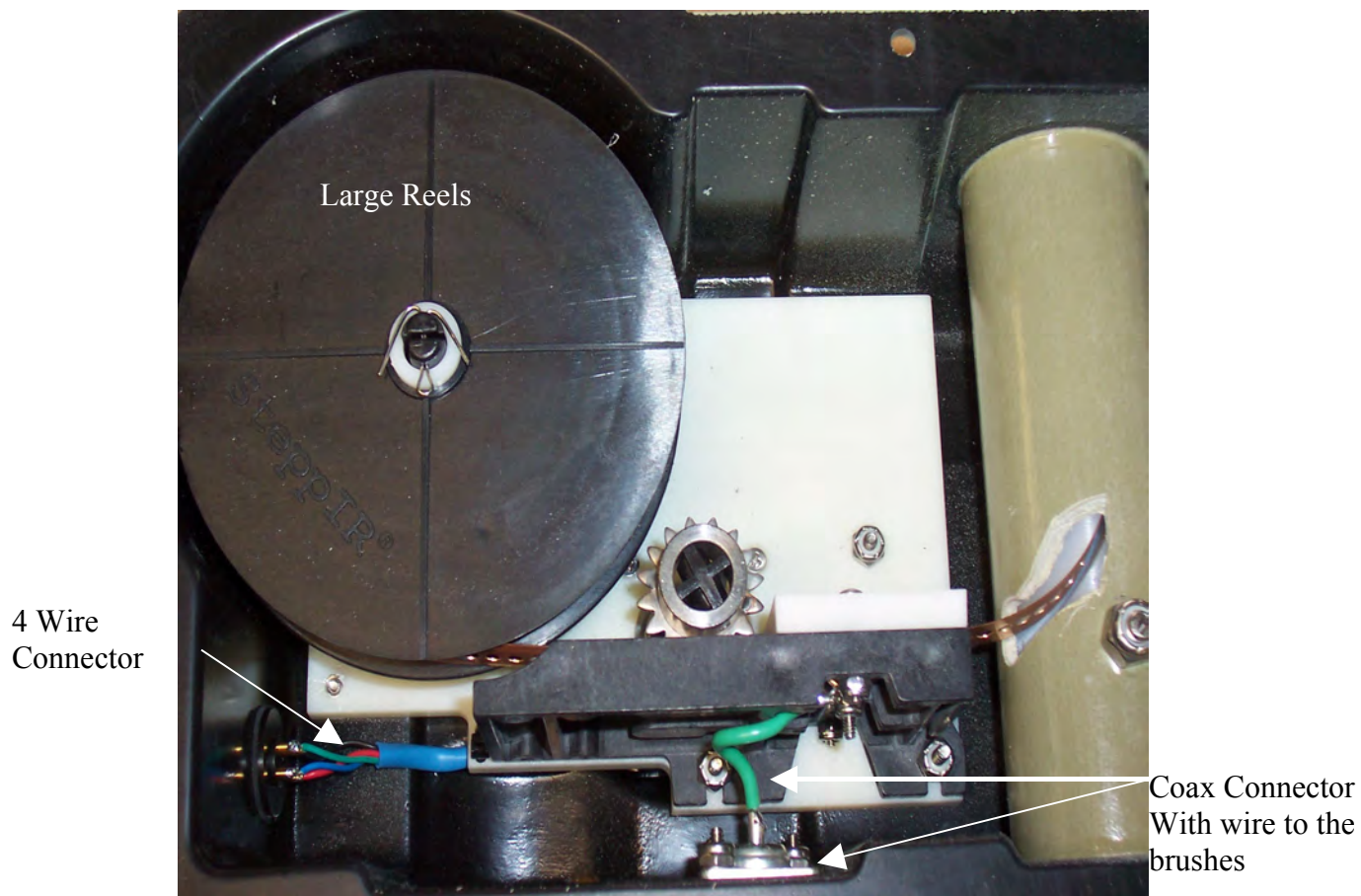


Figure 4-4 - *BigIR MKIII* Interior photo - Single Reel of Copper

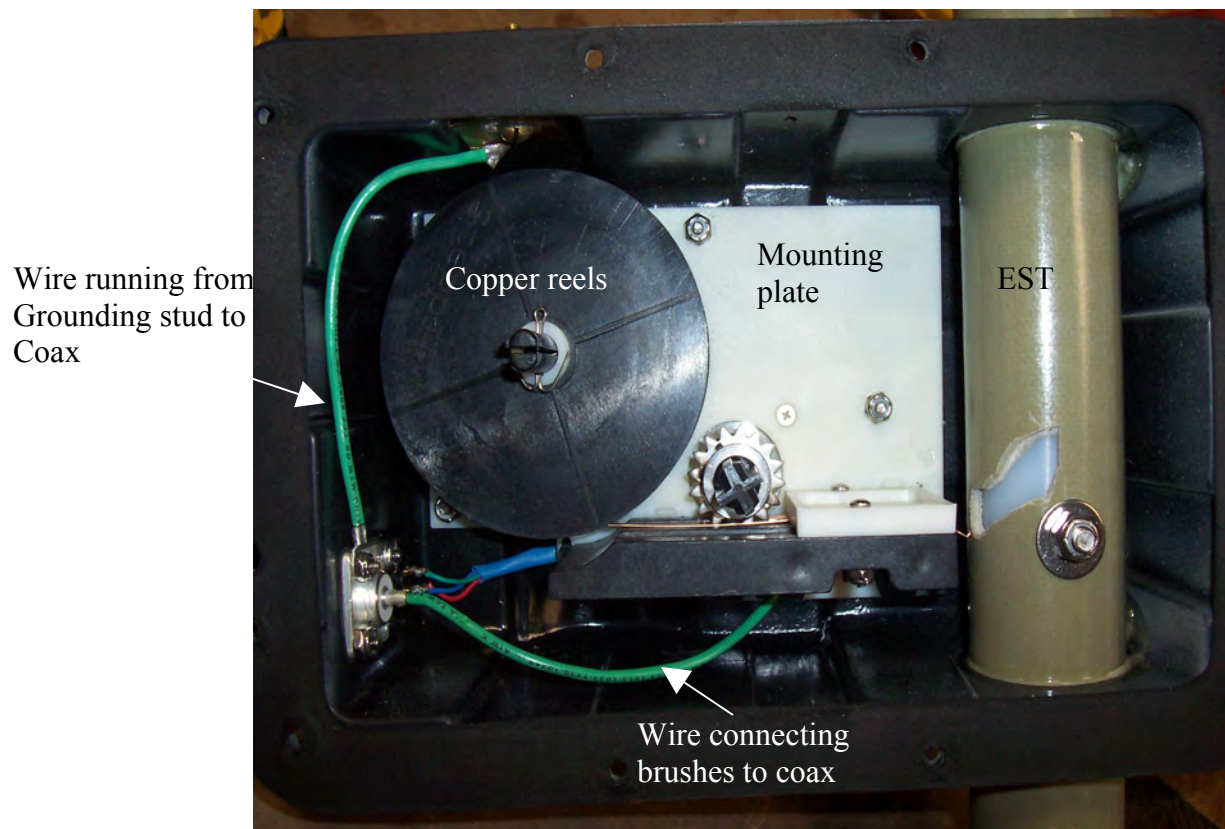


Figure 4-5 - *Small IR* Interior photo - Single Reel of Copper



Figure #4-6 - *Driven housing* - interior view has a rectangular and also has a balun



Figure 4-7 - 30/40 Driven - round housing has big reels inside and has balun

MONSTIR

Monstir's have bigger reels and different types of diverters inside.

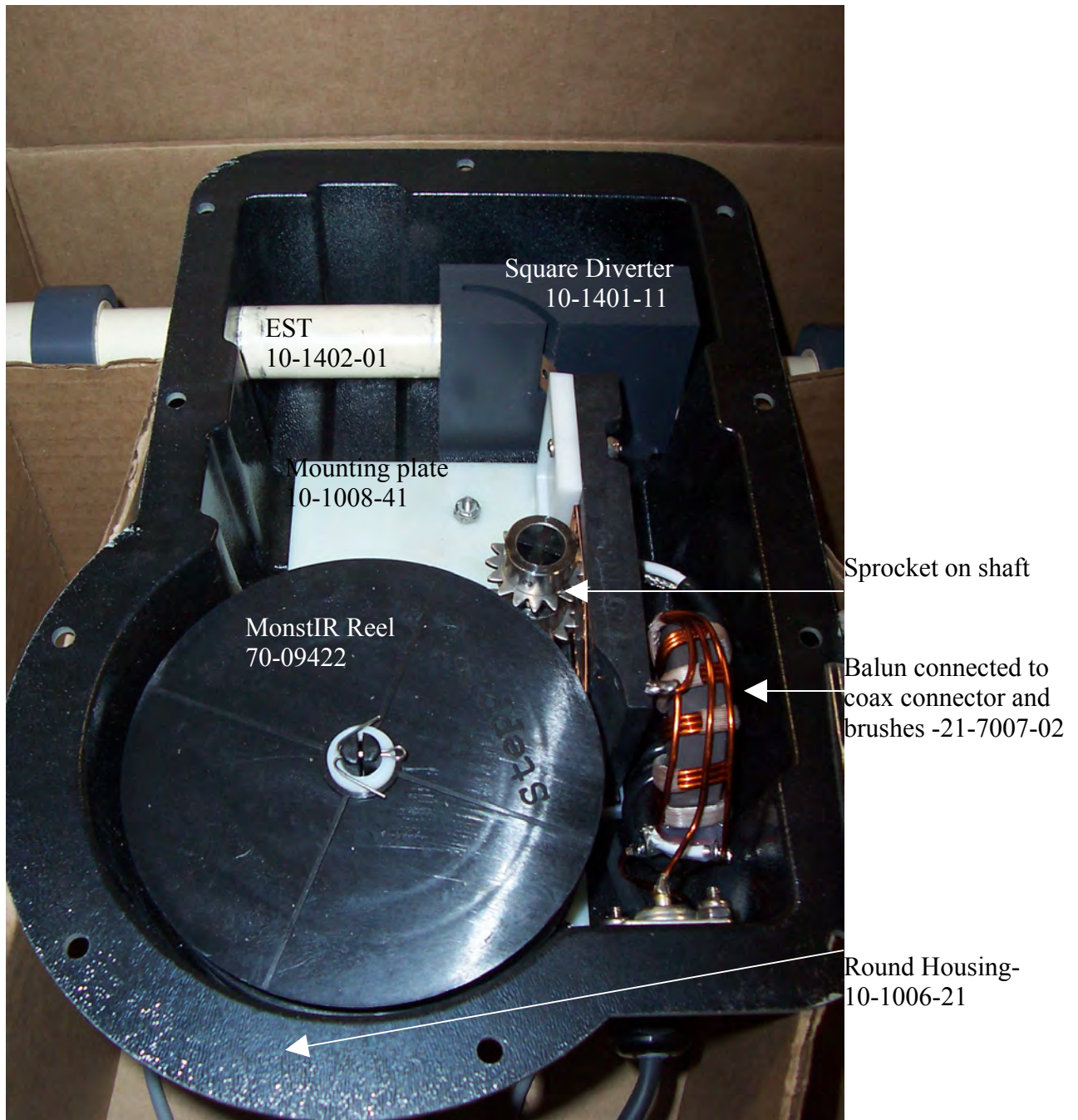


Figure 4-8 - *MonstIR 40m Driven* - has round housing and balun and square diverter



Figure 4-9 - *MonstIR 40m Passive Director & Reflector* - have round housings, big reels, and no baluns



Figure 4-10- *MonstIR 20m Passive Director 1*