P.R. Schneider

RESTRICTED

RADIO MATERIEL SCHOOL

AIRCRAFT RADIO

In soldering the lead-in into a copper lug it should be remembered that the wire should not be stiff at this point. A good procedure to insure its flexibility at this point is to tin the end of the lead-in with solder for a distance of not over two-thirds the depth of the lug to be used. After heating and filling the lug with solder, insert the antenna wire as far as possible in the lug and hold firmly until the solder cools. If this process is carried out it will be found that the lead-in emerges from the solder in the lug without being stiff.

35. AIRCRAFT RADIO ANTENNA INSULATORS

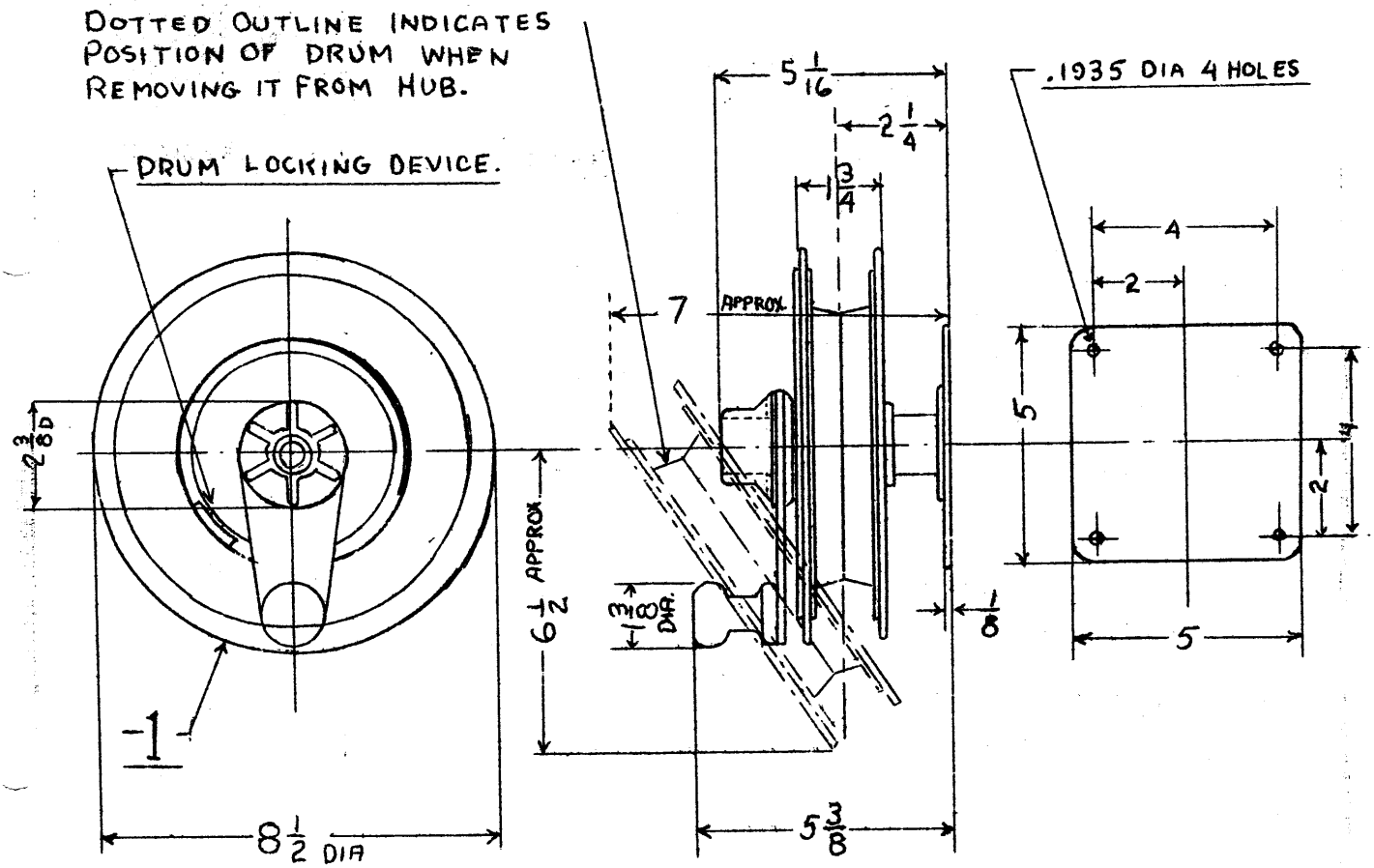
An attempt is being made to standardize all aircraft radio insulators. The type 61191 six inch and type 61192 three inch strain insulators are to be used wherever possible except for the possible exception of using the type 61087 insulator in lieu of the type 61192 for VF type aircraft. The above insulators are made of isolantite, glazed finish and have a breaking strength of 450 pounds. The old type eight inch pyrex strain insulators are not used except for some of the older patrol planes having no standpipes for trailing wire lead-out.

Three standard sizes and types of lead-in insulators are now in use. The smaller, type 61007 is used with GF and other low power equipment. Type 61016, somewhat larger is designed for use with GP or other high power transmitters, while the largest size, type 61025 is used on patrol aircraft where large insulating surface is required.

36. AIRCRAFT RADIO TRAILING WIRE ANTENNA REELS AND COUNTERS

In the past, various types of reels have been used with aircraft radio equipment, each having its merits and faults. Generally, it has been common practice to have a different type reel for each type of radio equipment but with the growing need for standardization of all equipment and accessories, a reel was designed incorporating most of the desirable features found in the various types. This reel, type NAF 213424 is shown in Fig. 28. The drum which is capable of holding 500 feet of Model J antenna wire is removable, allowing spare antenna wire to be kept on spare drums ready for instant use. Micalex is used as the R.F. insulating material. Ball bearings are used. The braking arrangement consists of 13 discs, alternately steel and bronze, compressed by a hand knob. Dimensions may be seen in Fig. 28. Fig. 29 shows the type CHS 71001-A reel used with the GO type equipment.

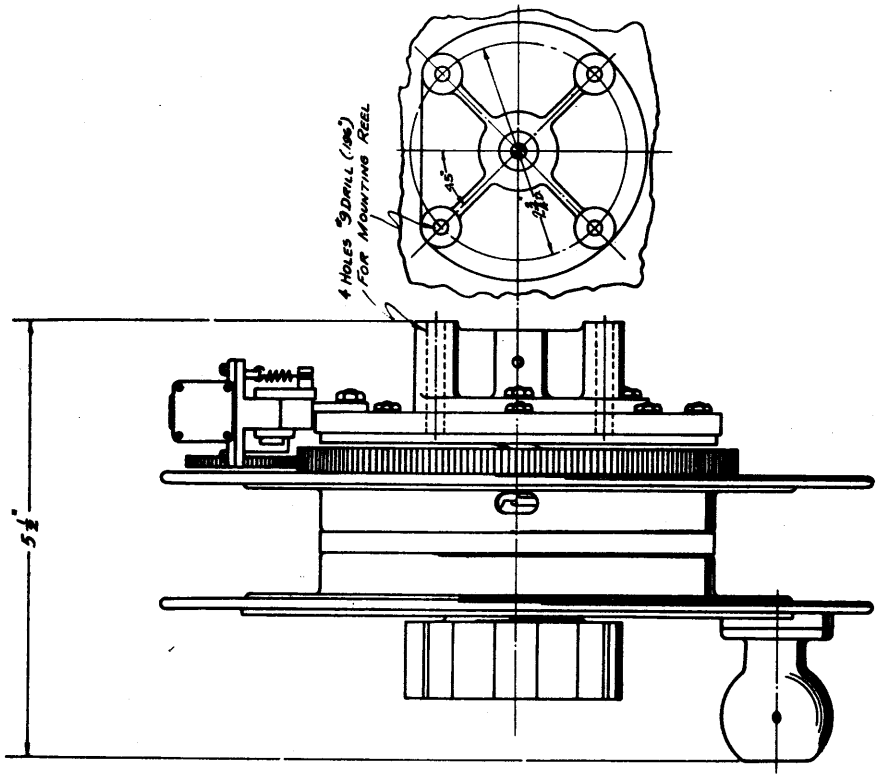
With the adoption of a standard reel it was necessary to use a standard counter assembly. Fig. 30a and 30b show the type NAF 213596 counter assembly. The only difference between the two assemblies is the method of attachment to the lead-out insulator. In Fig. 30a the assembly is screwed on to the lead-out insulator while in Fig. 30b the assembly is clamped to the lead-out insulator. It is fitted with ball bearings. There is a geared counter which indicates antenna length in feet. A reset knob permits reset of the indicator with one revolution of the knob. A snap-on arrangement per-



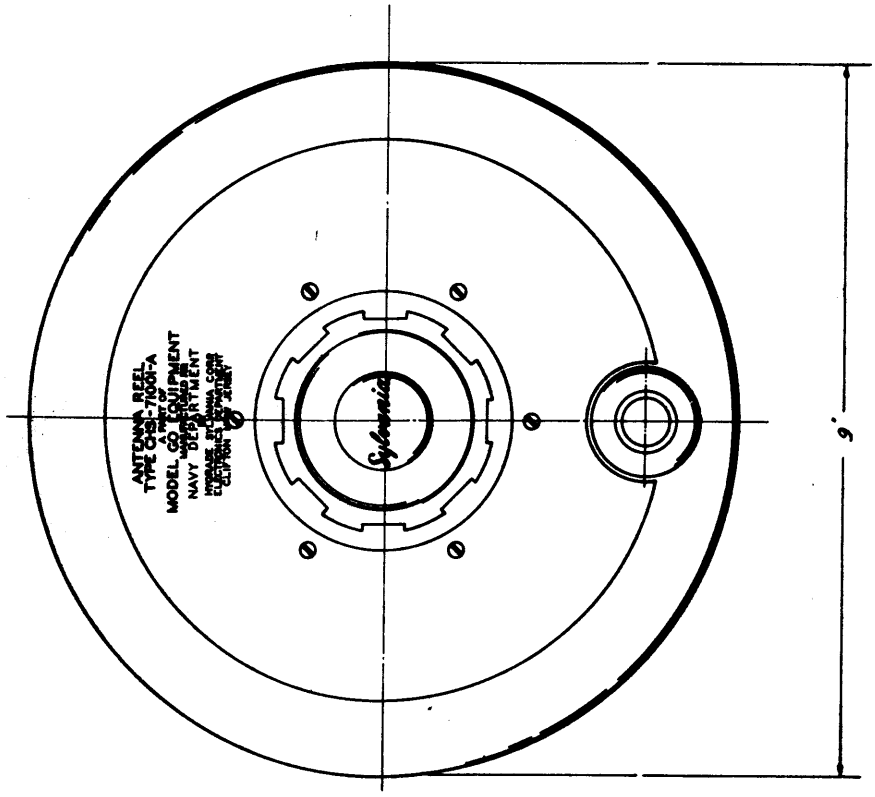
NOTES

1. Space shall be allowed for removing drum from hub as shown by dotted outline.
2. For further detailed dimensions see N.A.F. # 66845.
3. Weight shown is for Reel Ass'y less antenna wire and weight.
4. For typical installations of Reel see N.A.F. No's 213276 and 213422.
5. This Reel to be used in conjunction with Antenna Counter N.A.F. # 213596-1 or 213596-2.
6. Drill 7/32 Dia. holes in support for mounting.

Fig. 28.



ANTENNA REEL
NAVY TYPE- CNS: 71001-A
FIG. 29.



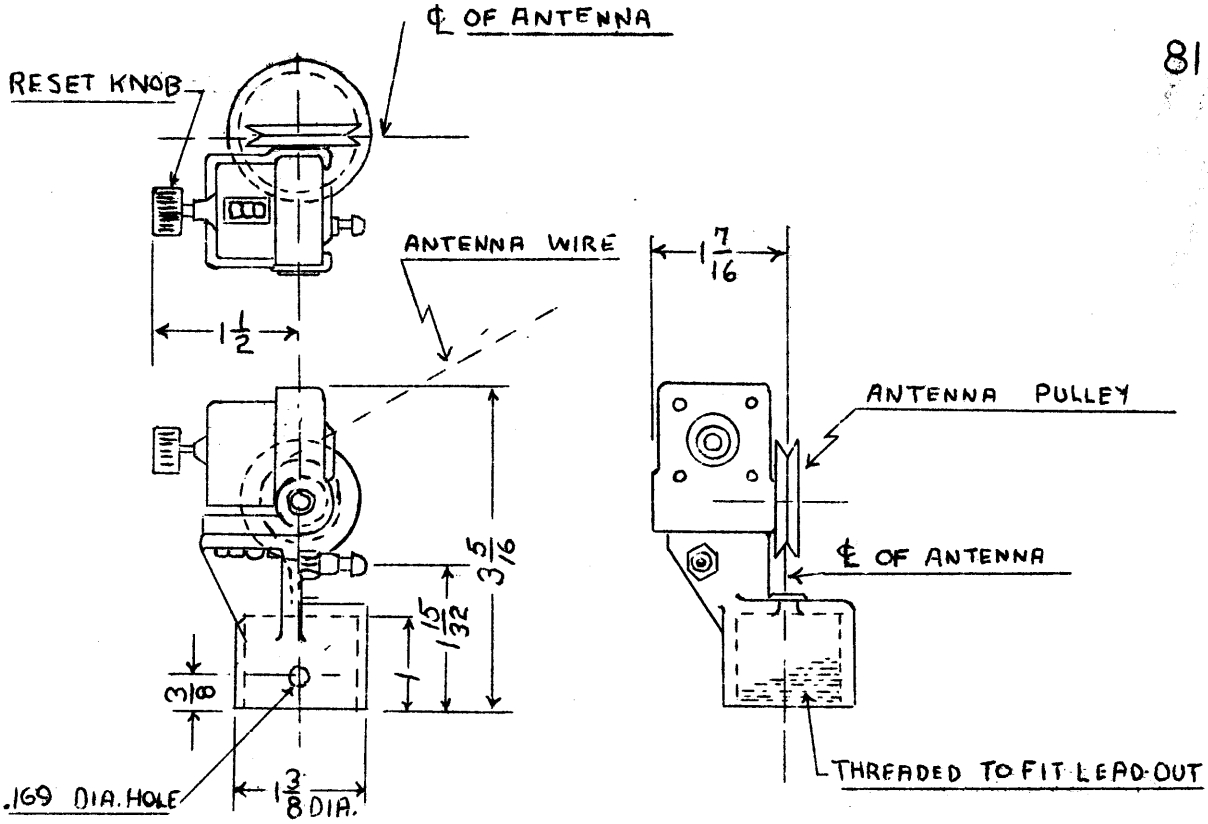


FIG. 30(a)-COUNTER ASSEMBLY-FOR USE WITH LEAD-OUT INSULATOR NAF 66405-3

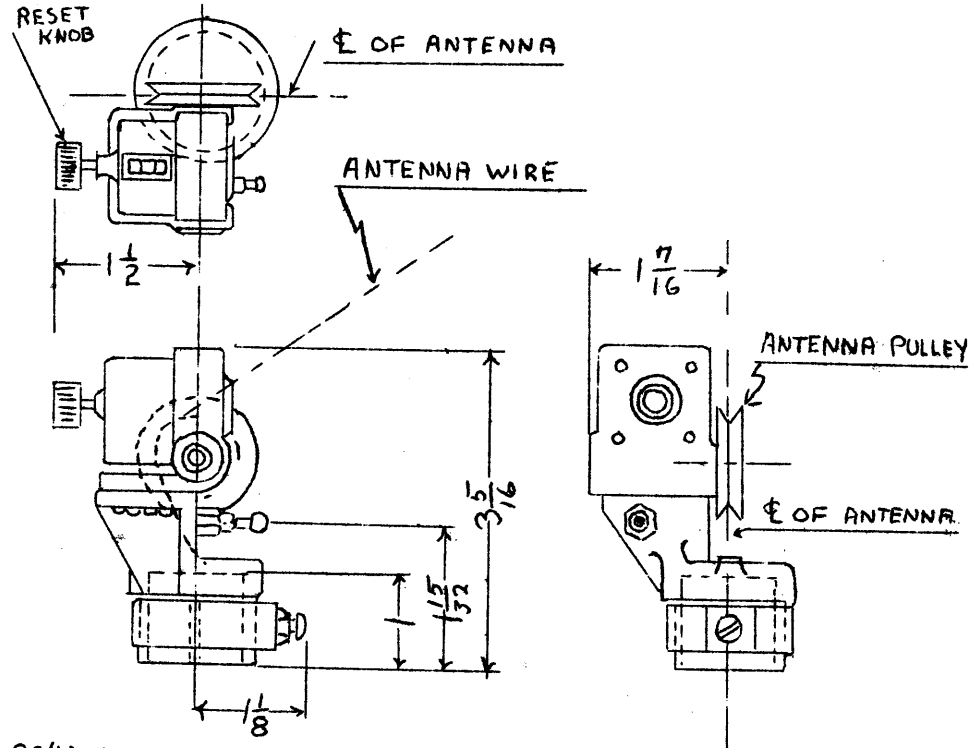
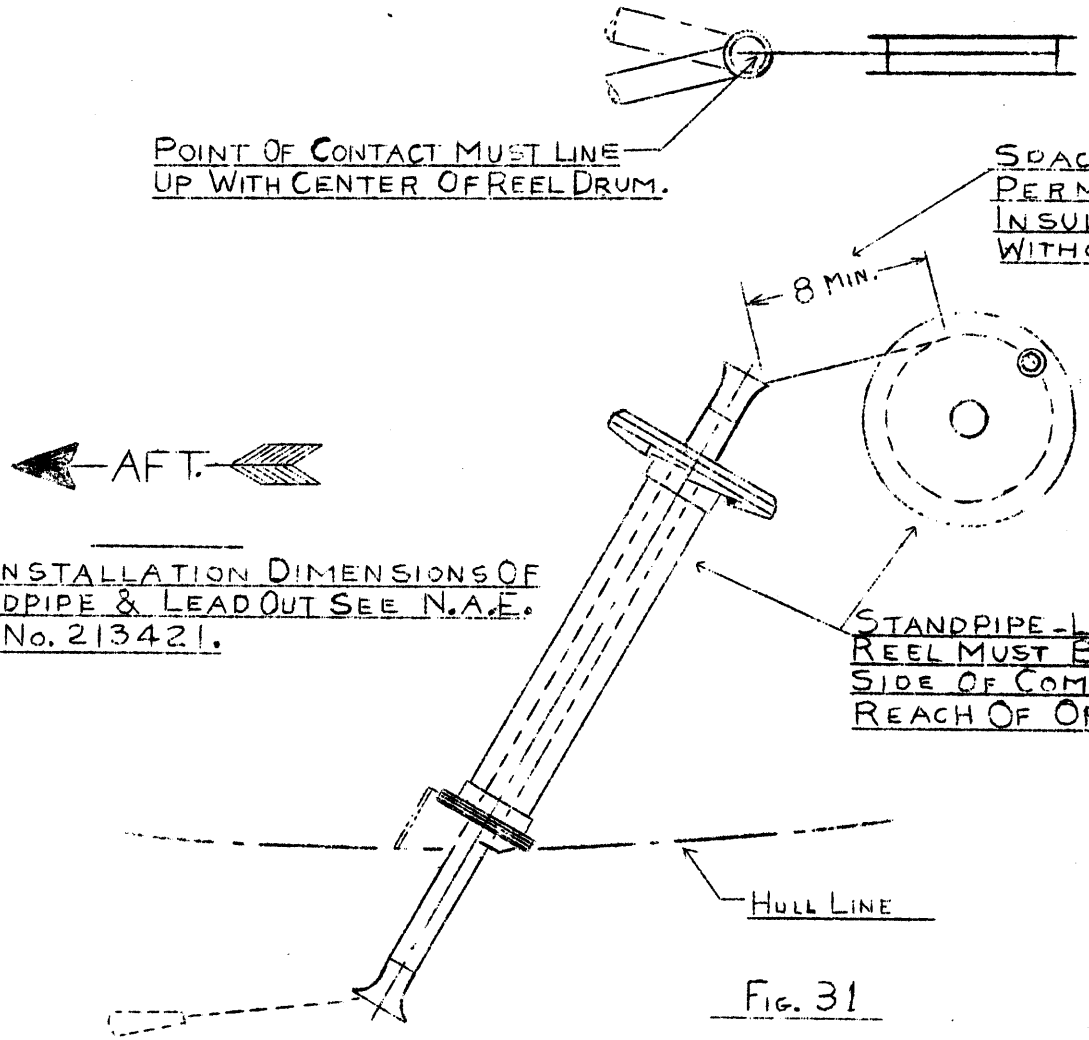
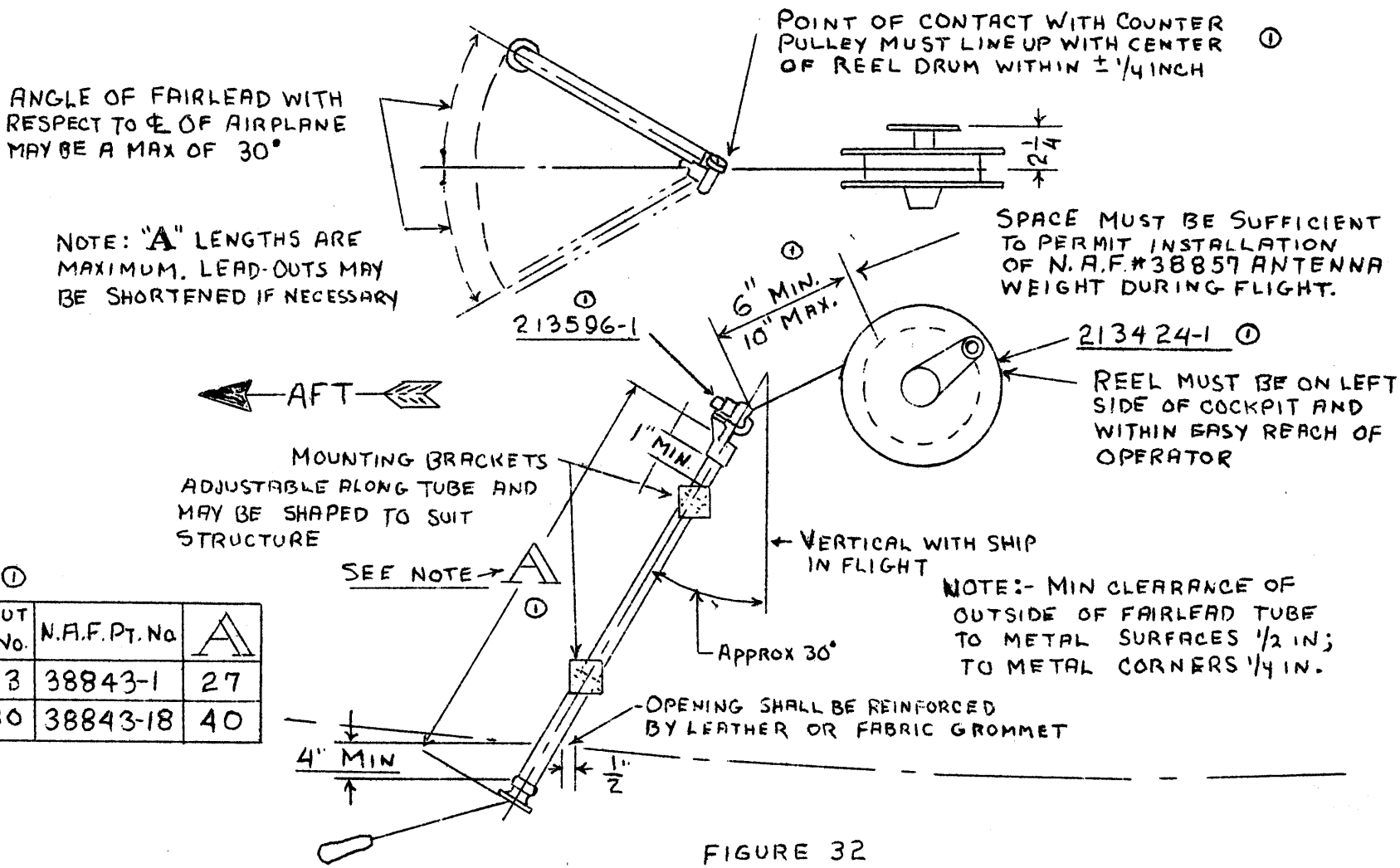


FIG. 30(b) COUNTER ASSEMBLY FOR USE WITH LEAD OUT INSULATOR NAF. 38843-18-18



1. FOR INSTALLATION DIMENSIONS OF STANDPIPE & LEAD OUT SEE N.A.E. DWG. No. 213421.

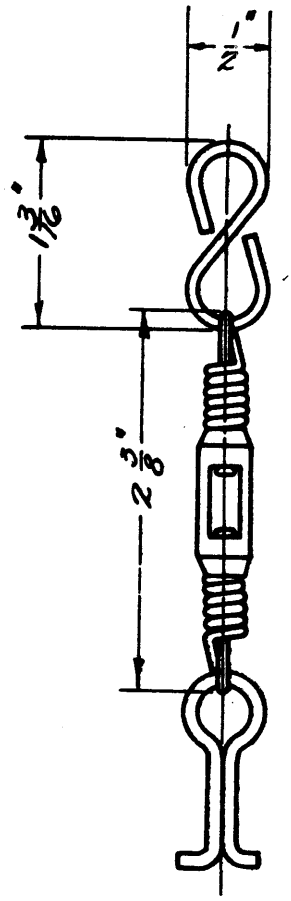
FIG. 31



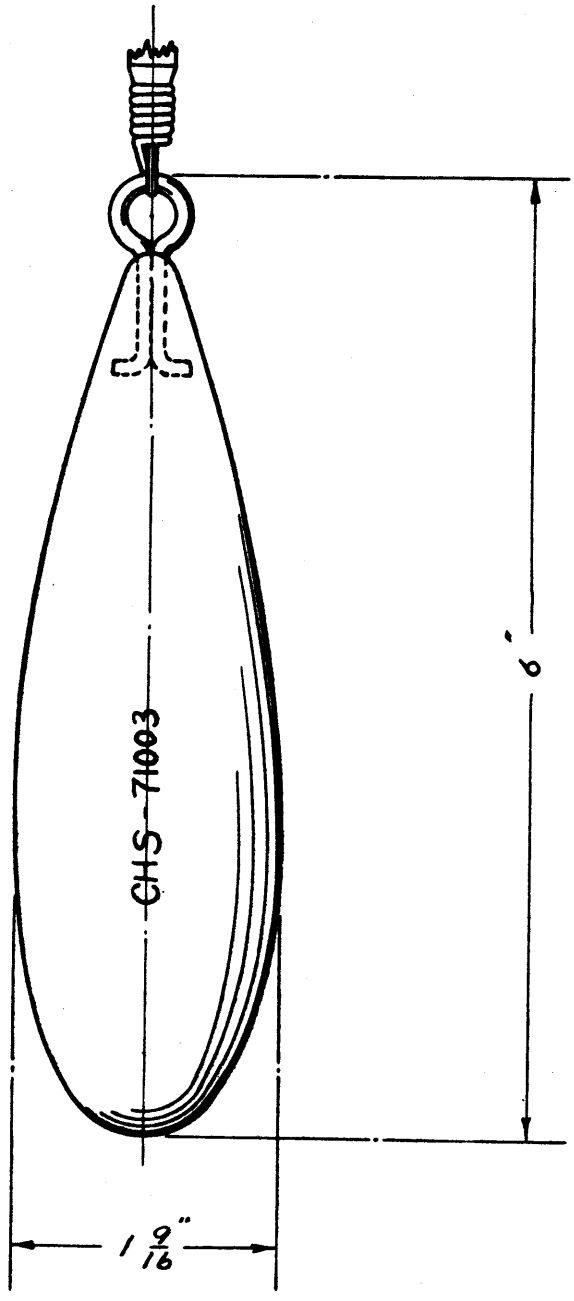
①

LEAD-OUT TYPE No.	N.A.F. PT. No.	A
61083	38843-1	27
61230	38843-18	40

FIGURE 32



WEIGHT - 2 LBS. APPROX.



ANTENNA WEIGHT -
NAVY TYPE CHS 71003
FIG. 33.

mits a Rajah clip to be connected to the counter which constitutes the antenna connection from the transmitter.

37. AIRCRAFT RADIO STANDPIPES AND LEAD-OUT INSULATORS

Fig. 31 shows a typical reel and lead-out insulator installation with a standpipe as found in metal hull flying boats. The standpipe is built into the aircraft and is a part of it. Through means of the lead-out insulator in the standpipe, it is possible to pass the trailing wire antenna out through the bottom of the hull of the flying boat. The fairlead or lead-out insulator with the antenna weight is removed from the standpipe allowing a cover to be fastened over the opening of the standpipe when on the water and when prior to landing. The sketch does not show the standard counter assembly that will normally be fastened to the top end of the lead-out insulator. The lead-out insulator is of a phenol fibre composition.

Fig. 32 shows a typical arrangement of trailing antenna lead-out. In this installation the lead-out insulator is securely fastened to the fuselage as is the case in smaller type aircraft. Installation data is shown in the sketch. The standard type counter assembly will be noticed mounted to the top of the lead-out insulator. These lead-out insulators are of a phenol fibre composition, 1 inch outside dimensions and are furnished in two lengths, 27 and 40 inches respectively.

38. AIRCRAFT RADIO ANTENNA WEIGHTS

The type 71003 antenna weights have been adopted as the standard type for all aircraft. The type 71003 antenna weight weighs within two ounces plus or minus of two pounds. It is made of 8 percent antimony and 92 percent lead. A new design high strength swivel is attached to the eye ring moulded into the weight. The practice of cutting this swivel off and securing the antenna wire directly to the eye of the weight should be discontinued as the present type swivel is of sufficient strength to afford safety within the limits of the strength of the Model J antenna wire. The CLOVE HITCH has been adopted as the standard method of securing antenna wire to the swivel of antenna weights. The clove hitch is self supporting, and offers large area of the wire at the connection for strain and wear. The clove hitch should be neatly wrapped with safety wire but should not be soldered. Fig. 33 shows the physical dimensions of the type 71003 weight. The "S" hook shown in the sketch is not used.

The type 71004 antenna weight although originally designed as a service antenna weight, proved to be unsatisfactory because of its insufficient weight and spinning characteristics but because of its physical dimensions, became readily adaptable as an emergency antenna weight. This type antenna weight is carried by all aircraft using the

fairlead type lead-out insulator. If for any reason the standard antenna weight is lost while in flight, the antenna wire may be reeled all the way in and the type 71004 emergency weight fastened to it. This weight is of such size that it will easily slip through the lead-out insulator whereas, it would be almost impossible to attach another standard antenna outside the aircraft while in flight.

39. SINGLE CONDUCTOR ANTENNA CABLE

The following table gives the specifications for the two types of stranded Model J antenna cable or wire as used on naval aircraft. Model J antenna wire has a 5-ply cotton thread running through its center and for this reason it should never be overheated while soldering and under no condition should a blow torch be used. Model J antenna wire is used on all types of aircraft with the exception of VF class where the smaller J-1 type antenna wire is used. The J-1 type antenna wire is wound around a solid wire center instead of having a cotton center. Care must be exercised in taking Model J antenna wire from spools or reels as it kinks very easily thus materially weakening the wire.

SINGLE CONDUCTOR ANTENNA CABLE

Equiv. size B-S Gauge	Stranding Model J	Dia.	Break strain lb.	Wt lb. Ft.	SS No.
17	6 strands of 7 wires No. 33 (.0071) AWG silicon bronze cabled with a strong 5-ply cotton thread. Pitch of strands - one turn to each half inch.	.064	150	.008 Max.	16-C-1400
	Model J-1				
18	6 strands of 7 wires each No. 35 (.0056) AWG wound around a .017 Dia. solid wire (phosphor bronze)	.0405	140	.005	16-C-1200