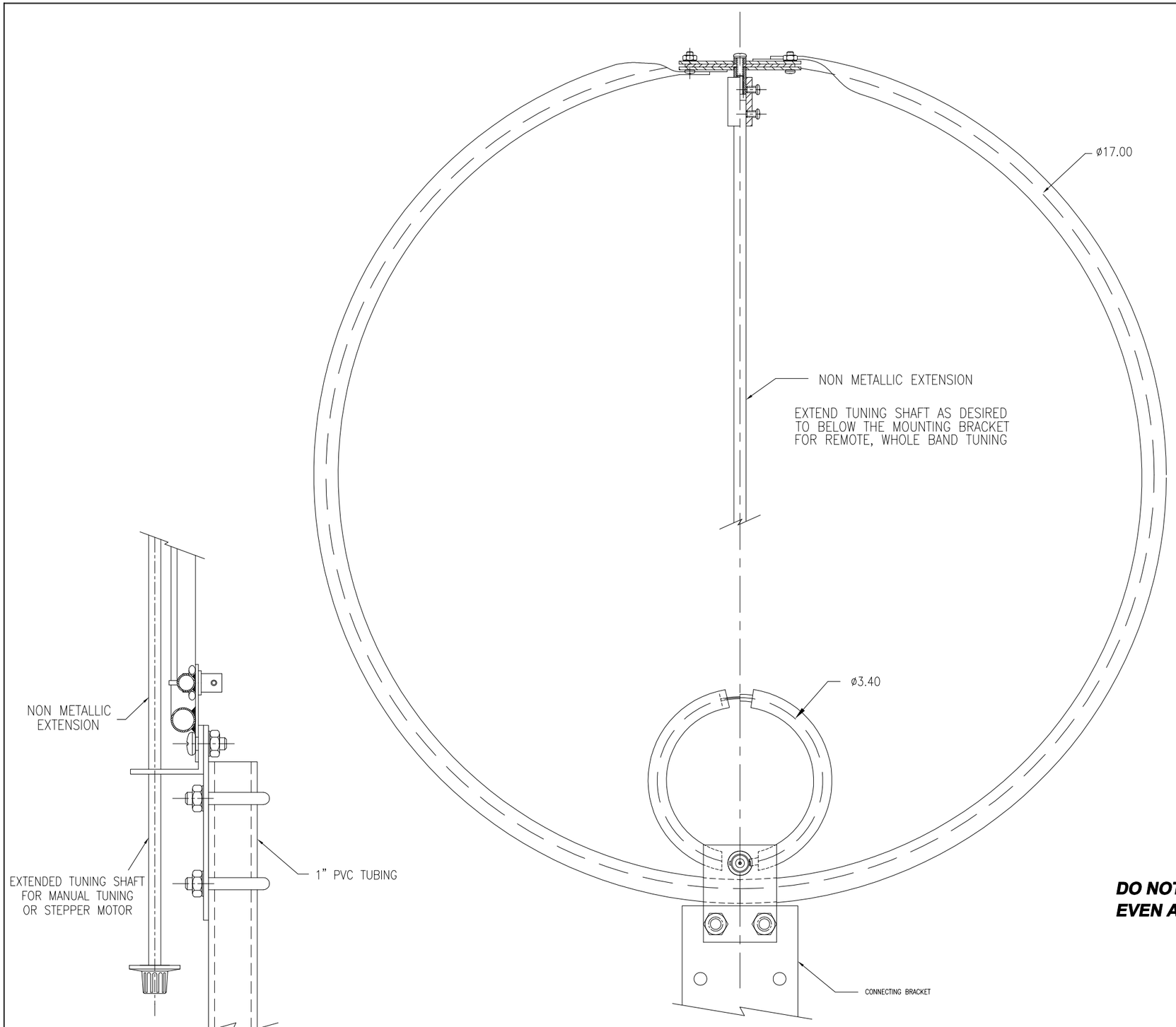
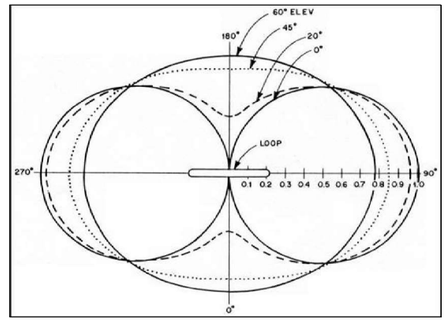
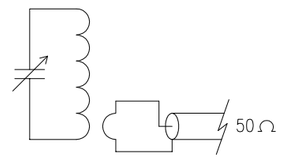
REVISIONS		
REV	DESCRIPTION	DATE





SMALL LOOP RADIATION PATTERN



EQUIVALENT SCHEMATIC

DO NOT TOUCH THE LOOP AT ANYTIME DURING TRANSMITTING.
EVEN AT 10 WATTS, VOLTAGES APPROACHING 1KV ARE PRESENT.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± 1/32 DECIMALS .XX ± .015 .XXX ± .005 ANGLES ± 1°
SURFACE FINISH
BREAK EDGES .005~.020 RADIUS OR CHAMFER

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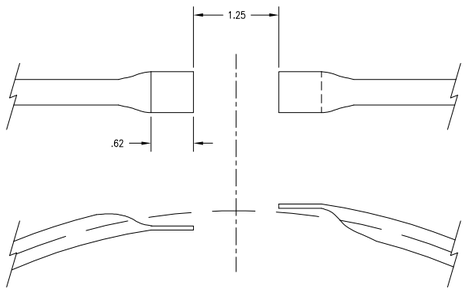
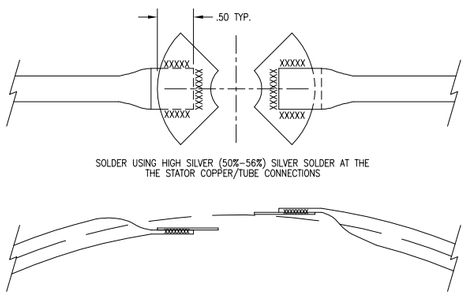
TITLE: 6M MAGNETIC LOOP – VERTICAL CAPACITOR

DRAWN	SCALE	DATE
WA4MNT		8/09/22
SHEET 3 OF 4	REF.	DWG.# 6M MAG LOOP

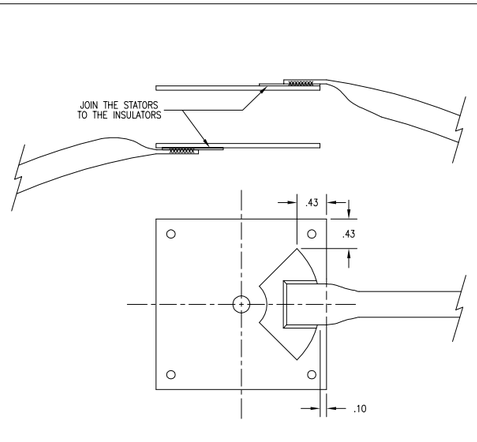
REVISIONS		
REV	DESCRIPTION	DATE



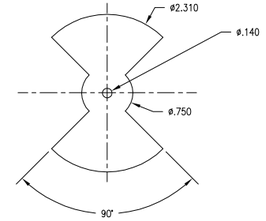
FORM FROM ø1/2" SOFT COPPER TUBING TO THE 17" CENTER DIAMETER, WITH THE 1.25" GAP, AND FLATTEN THE TUBE ENDS AS SHOWN



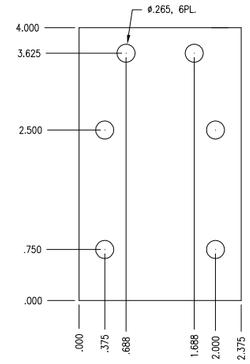
SOLDER USING HIGH SILVER (50%-56%) SILVER SOLDER AT THE THE STATOR COPPER/TUBE CONNECTIONS



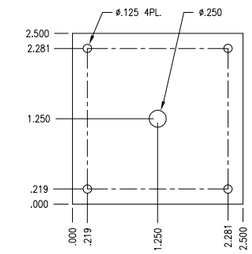
ROUGHEN OR SANDBLAST THE INSIDE SURFACE OF THE STATOR AND OUTSIDE OF THE INSUALTOR FOR ADHESIVE. USE A THIN LAYER OF CYANOACRILIC ADHESIVE TO JOIN THE STATOR AND INSULATOR ON EACH SIDE AS SHOWN



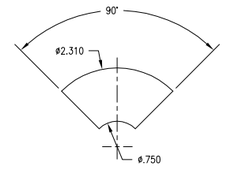
ROTOR
MAT'L – 1/16" THK. COPPER, BRASS, OR ALUMINUM
DEBURR EDGES TO PREVENT STATOR DAMAGE



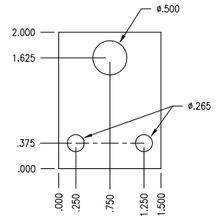
CONNECTING BRACKET
MAT'L – 1/8" THK. ALUMINUM



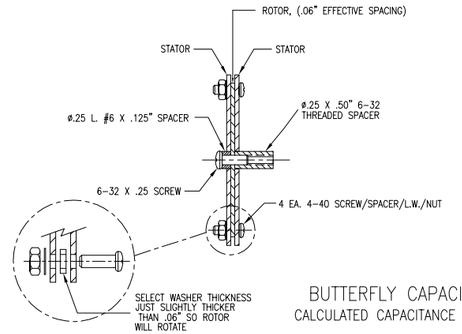
INSULATOR
MAT'L – 1/16" THK. FR4
2 REQUIRED

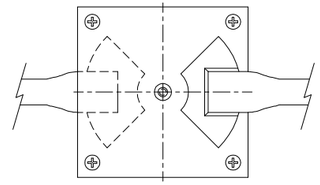


STATOR
MAT'L – 1/32" THK. SHEET COPPER OR BRASS
2 REQUIRED

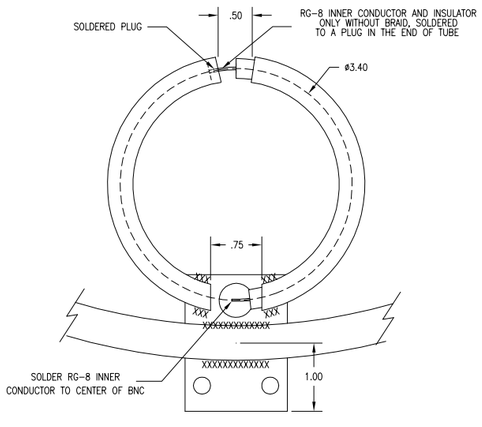


MOUNTING BRACKET
MAT'L – 1/16" THK. COPPER OR BRASS



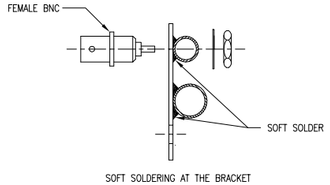


BUTTERFLY CAPACITOR
CALCULATED CAPACITANCE 5-30pF



FORM THE INPUT LOOP FROM 3/8" SOFT COPPER TUBING, CUT AS SHOWN

FARADAY INPUT LOOP DETAILS



SOFT SOLDERING AT THE BRACKET

https://www.daycounter.com/Calculators/Plate-Capacitor-Calculator.phtml

1.88 IN^2 COPPER W/FR4/.06" SPACING K=4.2
AIR BREAKDOWN GAP = .26" (19.8KV)

NOTES:

THIS 6M MAGNETIC LOOP IS DESIGNED AS A **TRANSMITTING**/RECEIVING ANTENNA. MEANING THE SOLDERED CONNECTIONS AT THE HIGH CURRENT PORTION OF THE LOOP ARE JOINED WITH HIGH SILVER (55%) SOLDER. THIS MUST BE MAINTAINED FOR EFFICIENT TRANSMITTING. SOFT SOLDER OR MECHANICAL JOINTS AT THESE POINTS WILL RESULT IN VERY HIGH LOSSES AND POOR POWER TRANSFER.

THE TUNING CAPACITOR IS A BUTTERFLY DESIGN, MEANING THERE ARE NO WIPERS BETWEEN THE CAPACITOR AND THE HIGH CURRENT PORTION OF THE LOOP THAT WILL DEGRADE PERFORMANCE.

SOFT SOLDER CAN BE USED TO JOIN THE INPUT LOOP/OUTPUT LOOP AT THE MOUNTING BRACKET POINTS, AS THEY ARE AT THE NULL POINT OF THE ANTENNA DESIGN.

USE 50%-55% SILVER SOLDER FOR SOLDERING THE OUTPUT LOOP TO STATOR COPPER CONNECTIONS.

MAPP GAS WITH A STANDARD HAND HELD TORCH HEAD CAN BE USED FOR THE SILVER SOLDERING.

FOR ALL WEATHER/OUTDOOR USE, COVER THE CAPACITOR.
THE MINIMUM CAPACITOR PLATE SPACING IS GOOD FOR 120 WATTS.

FEEL FREE TO MODIFY THE DESIGN FOR SIMPLIFICATION OR TO USE MATERIALS ON HAND, BUT MAINTAINING THE ABOVE SILVER SOLDERING REQUIREMENTS FOR TRANSMITTING.

DO NOT TOUCH THE LOOP AT ANYTIME DURING TRANSMITTING.
EVEN AT 10 WATTS, VOLTAGES APPROACHING 1KV ARE PRESENT.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS DECIMALS ANGLES
± 1/32 .XX ± .015 ± 1°
.XXX ± .005
SURFACE FINISH √
BREAK EDGES .005-.020
RADIUS OR CHAMFER

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TITLE: 6M MAGNETIC LOOP – VERTICAL CAPACITOR

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WA4MNT		8/09/22
SHEET 4 OF 4	REF.	DWG.# 6M MAG LOOP

A great practical paper on Small Magnetic Loops can be found here:
https://www.nonstopsystems.com/radio/pdf-ant/article-antenna-mag-loop-2.pdf

or

http://www.ahars.com.au/uploads/1/3/9/8/13982788/article-antenna-mag-loop-2.pdf

Links used in design:

https://www.daycounter.com/Calculators/Plate-Capacitor-Calculator.phtml

https://qrpbuilder.com/wp-content/uploads/2022/07/aa5tb_loop_v1.22a-MKR-mods.zip