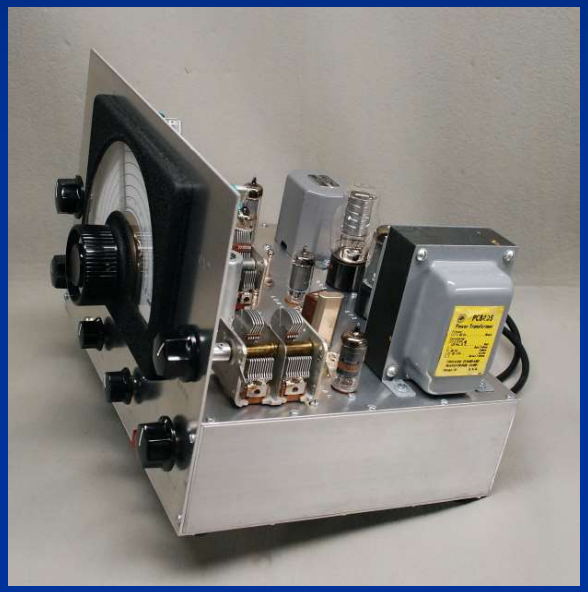
Aluminum Chassis Construction



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Method Of Construction

Aluminum Sheet

Aluminum Bars

Drilled and Tapped

Held Together With Machine Screws

Origin Of Method

Greg and Jim Trutko W8EXI

The Wingfoot VFO Exciter

Built With The Help Of
Goodyear Aerospace

Advantages:

Chassis Can Be Any Size
Strong Servicable
Eases Construction and Wiring
Good Looking
Construction Of Chassis Is Part Of The Project

Disadvantages:

More Expensive
Requires More Tools – Initial Investment
More Work Than A Ready Made Chassis
Requires Some Skill In Working With Tools

Eases Construction and Wiring

Eases Maintenance

Safety - Safety - Safety

Eye Protection

Hearing Protection

Wear An Apron

Use Tools Only For Intended Purpose

Keep Cutting Tools Sharp

Replace Worn Blades and Drills

Keep Hair Restrained

No Long Or Rolled Up Sleeves

Raw Materials

Aluminum Sheet

Aluminum Rectangular/Flat Bar

Raw Materials

Aluminum

Sheet:

5052 or 5052 H32 Aluminum Sheet
6061Aluminum Sheet
1/16”

Rectangular Bar Or Flat Bar

6061 Aluminum
2” x 3/16”

Don’t Worry About Temper

Hardware

Screws:

4-40 Machine Screw
Slot or Phillips Head
1/4” 3/8” 1/2”

Yes!

Other:

#4 Lockwasher
Split or
Internal Tooth

#4 Hex Nut

No!

Where To Get:

Amazon.com
(Order Items At Same Time)

ebay

Other Web Sites

Cutting Tools
Hacksaw

Full Size 10” or 12”

Mini

Cutting Tools

Hacksaw Blades

Bi-Metal Blade

10” or 12”

24 TPI (Medium) To Cut Aluminum Sheet

18 TPI (Coarse) To Cut Rectangular Bar

Don’t Skimp On Blade!

Cutting Tools

Band Saw or Scroll Saw

Very Handy But Not Necessary

Band

Scroll

Be Sure To Get Metal Cutting Blade

Jigsaw and Reciprocating Saw Not Recommended

Sanding Tool
Combination Sander

1” x 30” Belt

5” Disc

80 and **120** Grit

Small Footprint

Inexpensive

Very Useful

Required

Drilling/Tapping Tools

Variable Speed Drill and 1/16” to 1/4” Bits

Drill and Tap Set
(4-40 Plug Tap and #43 Drill)

Tap Wrench

Center Punch

Other Tools

6” Stainless Rule

Square

Vise Hammer Normal Workshop Tools

Method Of Construction

Sides:
2” x 3/16” Aluminum
Drilled and Tapped

Front, Top, Bottom, Rear
1/16” Aluminum Sheet
Drilled

Fastened Together
With 4-40
Machine Screws

Modus Operandi:

Saw Metal To Approximate Size

Sand Metal To Final Size

Drill And Tap And Use Machine Screws To Hold It Together

Cut And Sand Sidebars First

Drill And Tap Sidebars Last

Sidebars will be used to check dimensions of the top and bottom panels.

Choose Your Dimensions

Chassis Height
Is 2 1/8”

Front Panel Height

Chassis Depth

Chassis Width

Practice
Practice

Practice all of the following techniques.

Practice makes perfect!

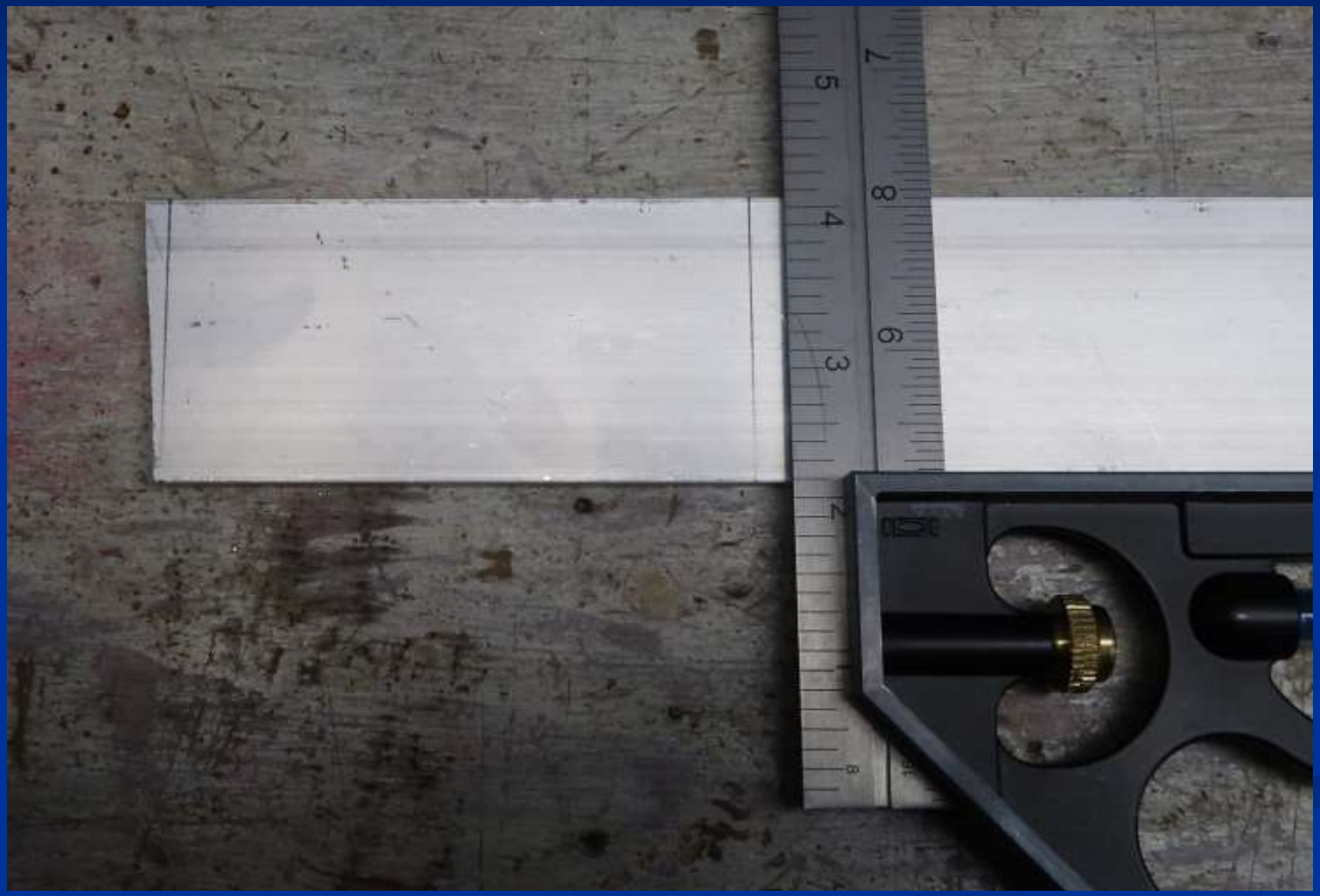
Cutting The Sidebars

The final depth is 1/8” more than the sidebar length.

Use a square to draw a sharp line as close to the unfinished end as possible.

At the desired distance, use a square to draw another sharp line.

Cutting The Sidebars



Cutting The Sidebars

Cut the piece off as close to your line as possible.
Do not cut <u>on the line</u>!

Cutting The Sidebars

Squaring Up The Belt Table

Be sure the belt platen is properly adjusted.

Use a square to make sure the belt table is square to the belt/platen.

Squaring Up The Disc Table

Use a square to make sure the disc table is square to the disc.

Squaring Up The Guide

Use a square to make sure the guide is square to the disc.

Disc Sanding The Sidebars

120 Grit

Take your time, let the machine do the work. Keep to the front half of the disc.

The bar will get hot. Allow it to cool as necessary.

Keep to the front half of the disc.

Lay the bar on the disc table against the guide. Move the guide back and forth to sand rough ends off up to your lines.

Aluminum Panel Dimensions

Primary Dimension:

The width you chose for your chassis.
One dimension of all your pieces must be exactly the same as this. (They will be sanded to the same length.)

Other Dimensions:

For the back the height is exactly 2 1/8".

For the front the height is your chosen front panel height.

For the top and bottom the depth is exactly the length of the sidebars.

Cutting The Aluminum Panels

Use a square to draw a rectangle of the desired dimensions:

Use a straight side of the stock if possible, otherwise draw a straight line.

Use a square to draw a vertical of the correct length.

Measure the required distance from this vertical and draw a second vertical.

Connect the verticals at the top.

Cutting The Aluminum Panels

Cut out the final shape. Keep as close to lines as possible. Do not cut on/inside the lines.

Belt Sanding The Panels

You cannot use the disc.

120 Grit

Lay the panel on the belt table and move it back and forth to sand off the rough end up to your line. Take your time, let the machine do the work.

Drilling The Panels

Basic Procedure

Determine where the holes should be drilled in the panels.

Center Punch The Locations

Drill 1/16” guide holes.

Use the guide holes in the panels and a pencil to mark sidebars.

Enlarge the guide holes to 5/32”

Drilling The Pilot Holes

Use sidebar to score a line exactly 3/16” from edge.

Drilling The Pilot Holes

Draw a sharp perpendicular lines 1/2” from ends. Draw equally spaced lines at other positions, typically every 1 1/2” to 2”. Centerpunch lines exactly half way to edge. .

Drill the holes with a 1/16” drill.

Using The Pilot Holes To Mark The Sidebar

Carefully align the panel on the sidebar and use a pencil to mark the sidebar.

Center punch the sidebar.

Drilling The Sidebars

Wind tape around the #43 drill 1/2” from the end. Oil the bit and hole.

Drill 1/2” deep with the #43 drill. The hole must be straight into the bar. (Use a drill press if you have one.)

Keep oiled and work the drill in and out to remove the chips.

Tapping The Sidebars

Oil Tap

Carefully thread tap straight into the hole and work back and forth. Continue until tap bottoms out. Do Not Force!

Clean tap and hole.

The Finished Sidebar And Panel

Completed Sidebar

To complete the panel drill out the holes to 5/32”.

Assemble With 4-40 Screws And Admire Your Work

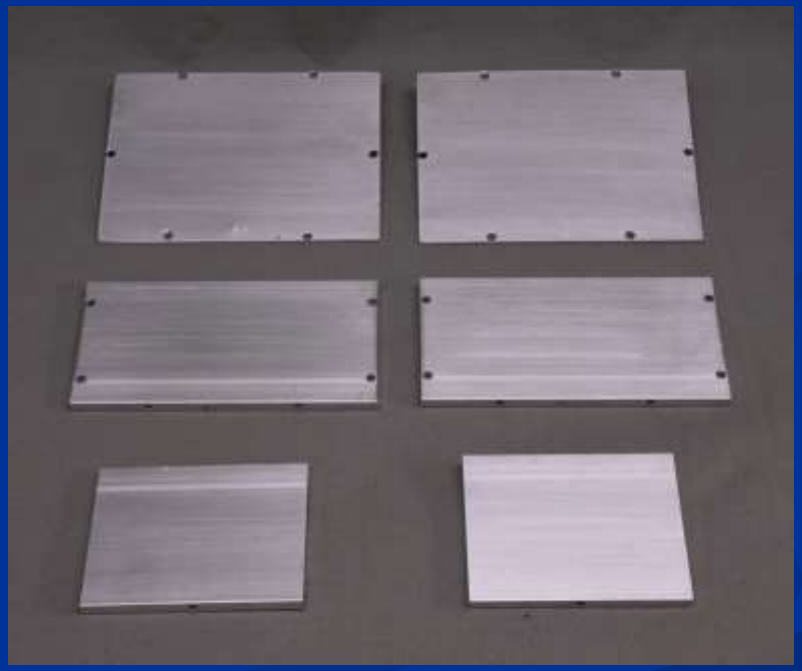
Mark each piece!

Assemble With 4-40 Screws And Admire Your Work

Finishing

Rub down with Soft Scrub cleaner and a small sponge.

Before



After

Metal Embossing
Very Difficult!

Putting It Together

Screw the various parts together with 4-40 x 3/8” screws.

Initially keep the screws loose. Then tighten them down.

You may have to enlarge a hole or two.

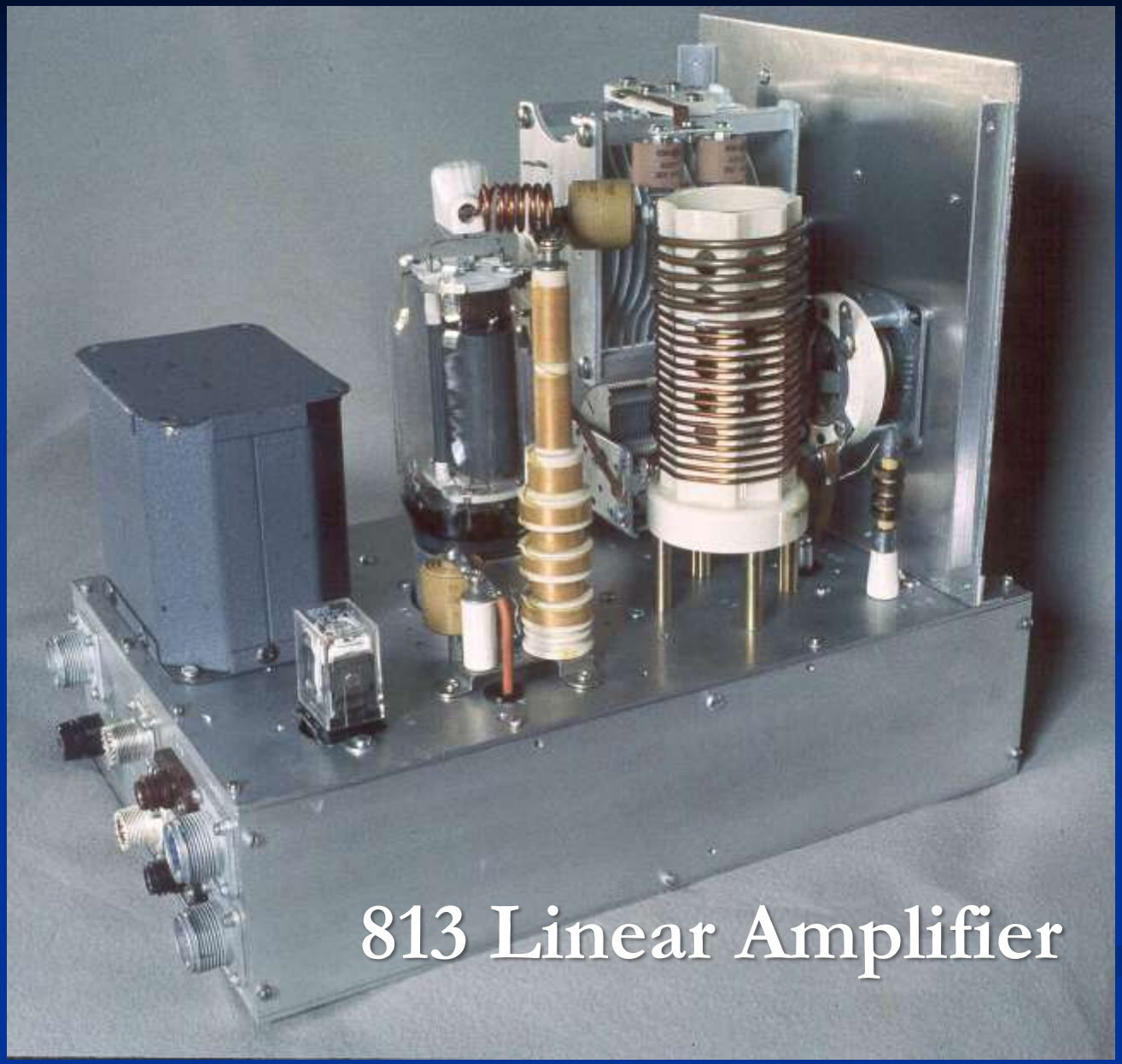
Front Panel: 5”h x 7”w
Box: 2 1/8”h x 7”w x 4”d

30m/20m Receive Converter

Box for VFO Keying Amplifier

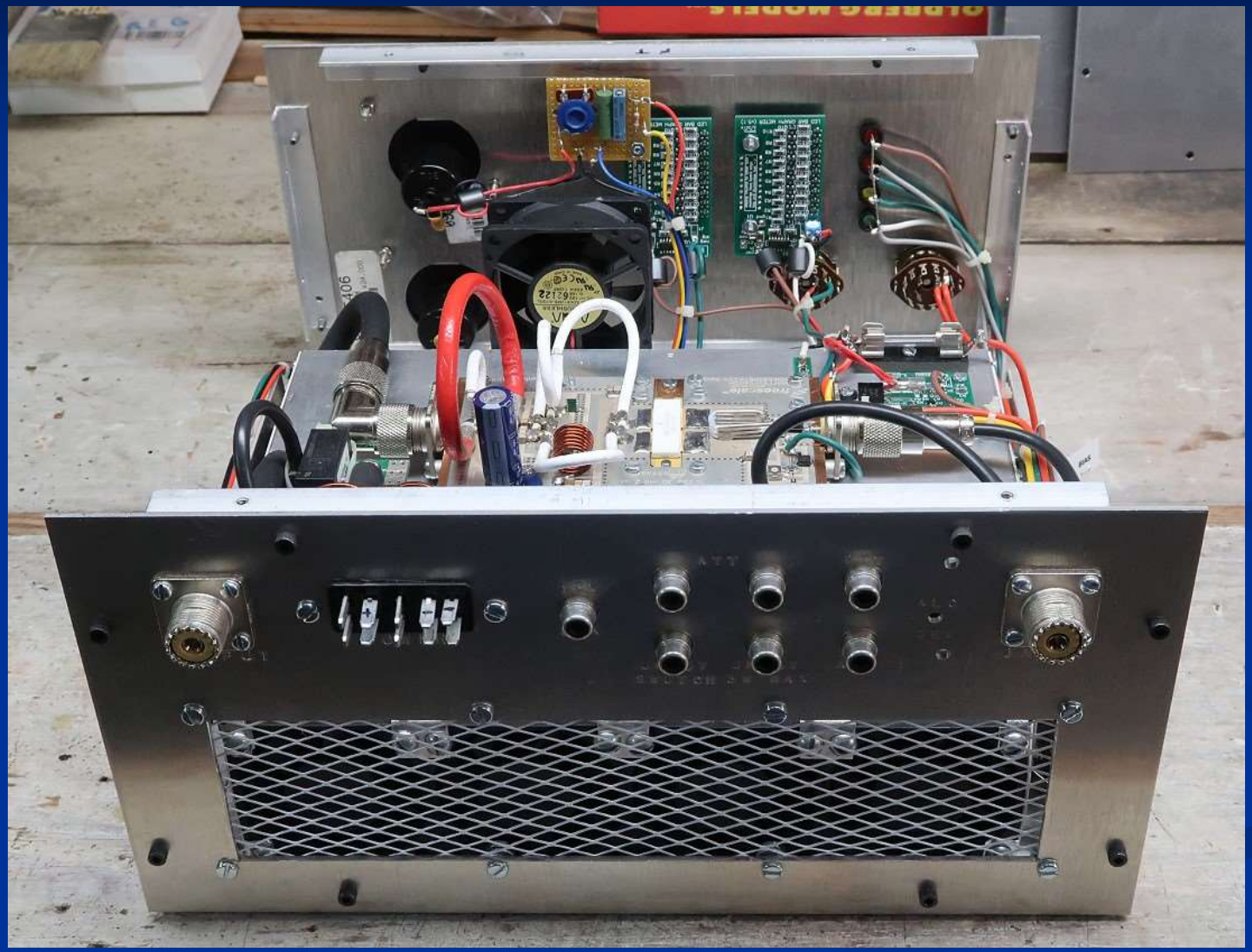
6CL6 One Tube Transmitter

6146 Linear Amplifier

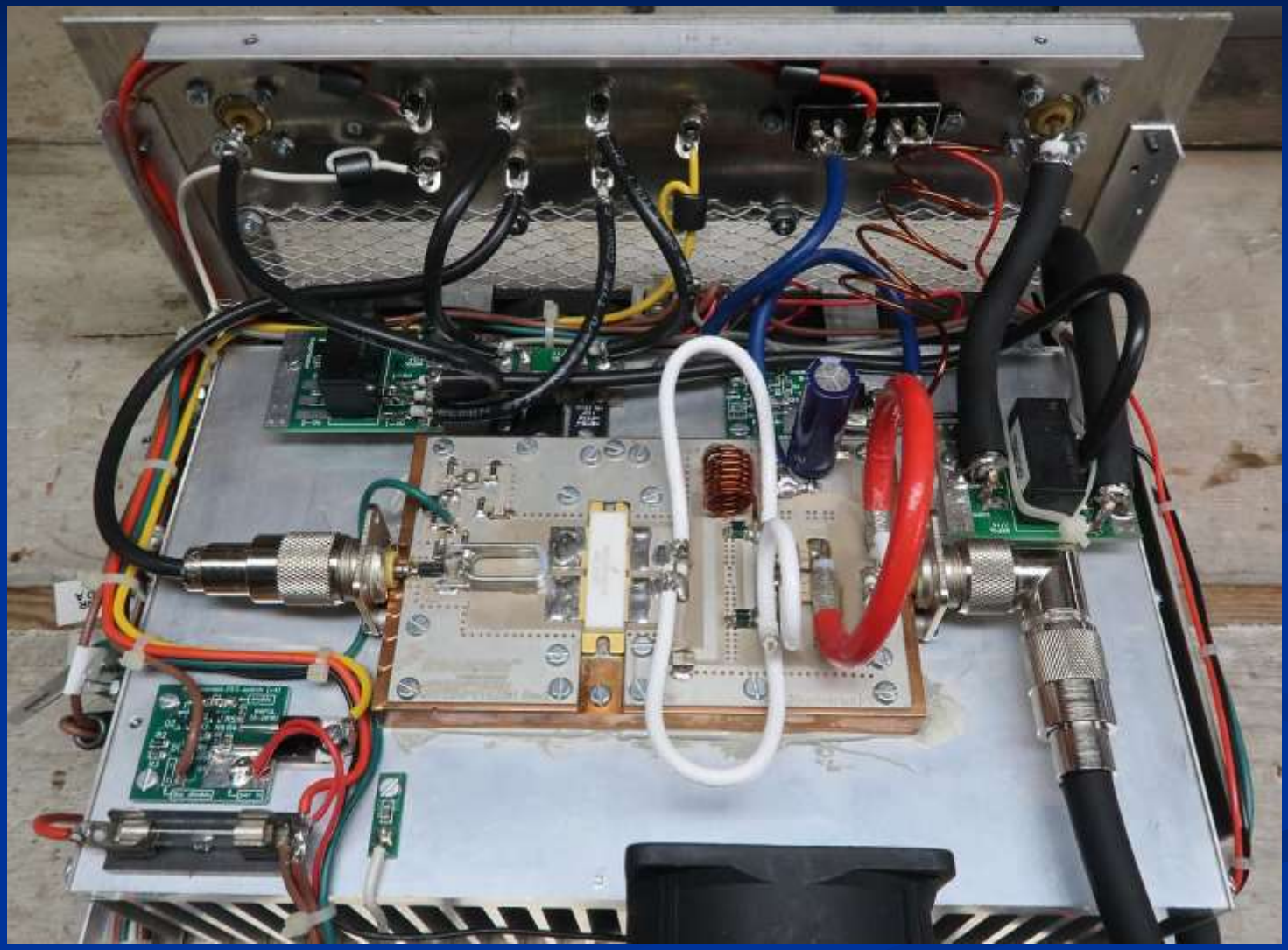

813 Linear Amplifier

6x2 Superheterodyne Receiver

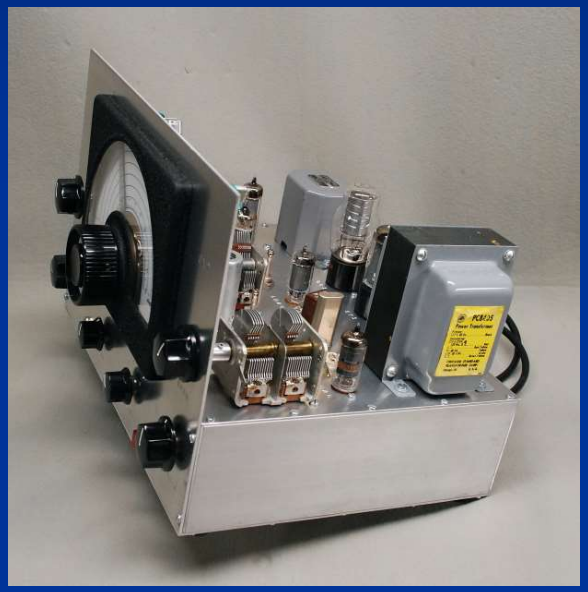
1kW 2m LDMOS Amplifier



1kW 2m LDMOS Linear Amplifier



Thanks For Coming!



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