

(2 foot square)

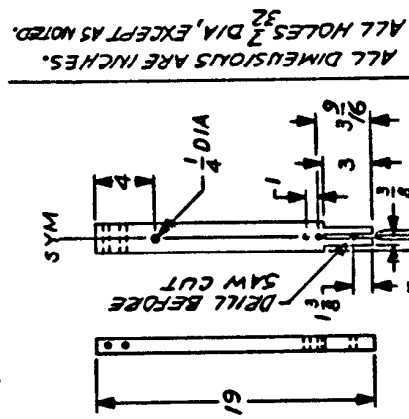
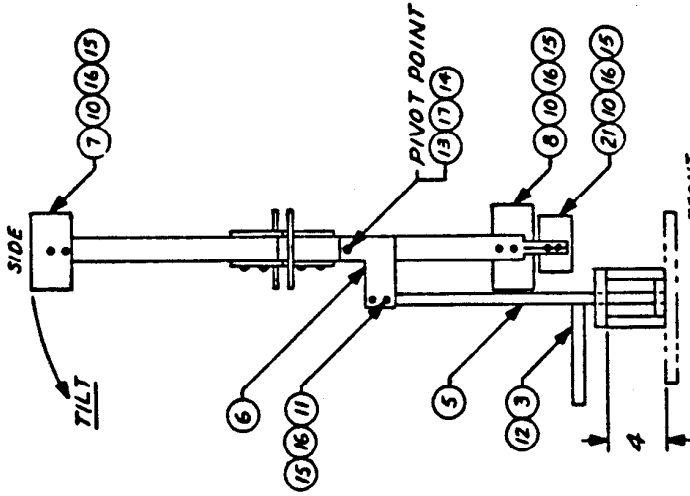
Instructions:

Frame--Assemble the four arms with the two arm supports, using two washers on each bolt; one washer between the head of each bolt and the arm support and one washer between the nut and the other arm support. Tighten all nuts finger tight. Using a square or a right angle, true up the arms, starting with the vertical arm (item 2) and one of the horizontal arms work around the frame true up the arms and tightening down on the nuts a little more. After making sure the frame is straight horizontally and vertically, tighten nuts until the washers bite into the plywood.

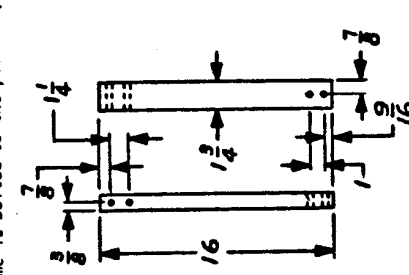
Wire--See sketch on assembly drawing for start of wire wrap. Hold wire tight when ending wrap and going through small holes; wire will tend to slip back on you. Tighten wire up by pulling it from one end to the other. You will probably find some slack once you reach the other end. Pull this through the small holes as per diagram. If wire is still slackish, you may want to thread spacers through the windings--small pieces of 1/4" plywood 6" x 3/4" will do. Place the flat end of the spacers through the windings, one turn above the next turn below the spacer and so on, right to the other side of the winding. When all (4 or 8) of the spacers are in, rotate them 90° and feel the windings tighten up. When stripping ends of the wire, do not cut any of the strands. See sketch on assembly drawing for center tap on sixth turn when using the 2 FET preamp.

Base and Support--Construct support as per diagram. I used 2 x 4 rather than 1 x 4 for the section of the base which is mounted on the 1 x 12 x 12 piece. A hole for the loop support to rotate in is drilled in this 2 x 4 block and is lined up with the hole in the top of the loop support. The support dowel (item 5) is connected to the handle (item 3) and bolted between the two pivot supports (item 6). The dowel is inserted in the base and the loop frame is bolted to the pivot support using the wingnut.

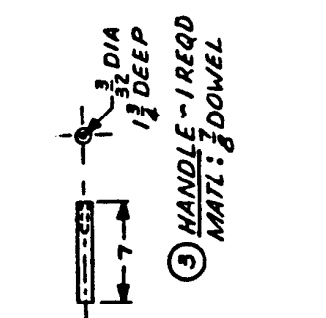
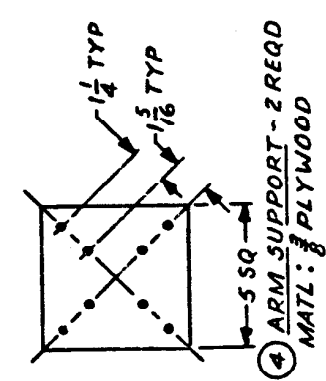
NO.	DESC	QTY
1	ARM	3
2	ARM	1
3	HANDLE	1
4	ARM SUPPORT	2
5	SUPPORT	1
6	PIVOT SUPPORT	2
7	WIRE SUPPORT	3
8	WIRE SUPPORT	1
9	10 RD HD SCREW X 3	8
10	10 RD HD SCREW X 1 1/2	10
11	10 RD HD SCREW X 2	2
12	8 WOOD SCREW X 2 1/2	1
13	4-20 STONE BOLT X 2	1
14	4-20 WING NUT	1
15	10 HEX NUT	20
16	10 FLAT WASHER	38
17	4 FLAT WASHER	1
18	18 AWG, STRAND, 85 FT	1
19	BASE, MAKE FROM 1 X 4 X 20	1
20	1 X 1/2 X 12	1
21	PREAMP ASSEMBLY 2 FET	1
	OPTIONAL: POINTER	1
	360° PROTRACTOR	1



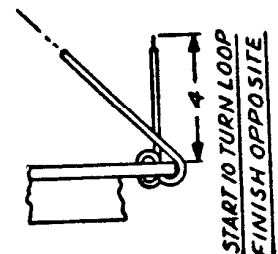
② ARM - 1 REQ
MATERIAL DIMENSIONS NOT SHOWN SAME AS ①



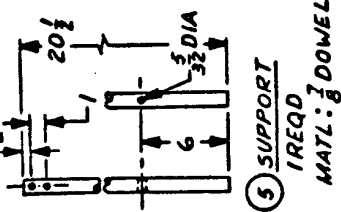
① ARM - 3 REQ
MATERIAL: 1/2 X 1 1/4 PINE



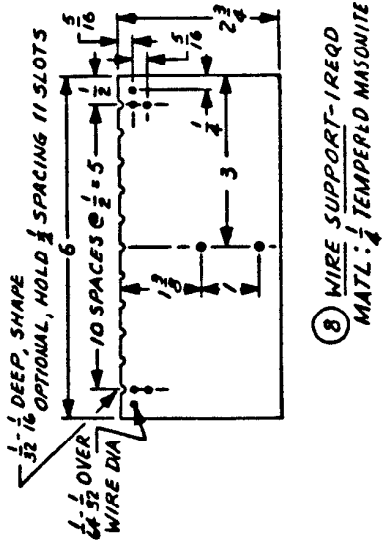
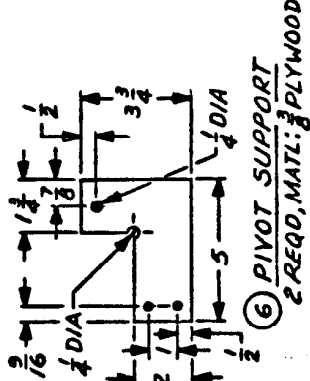
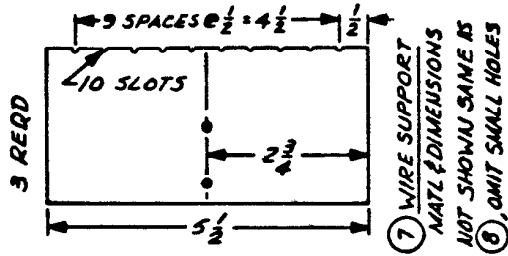
NOTE: DO NOT CUT THRU STRANDS WHEN STRIPPING WIRE.



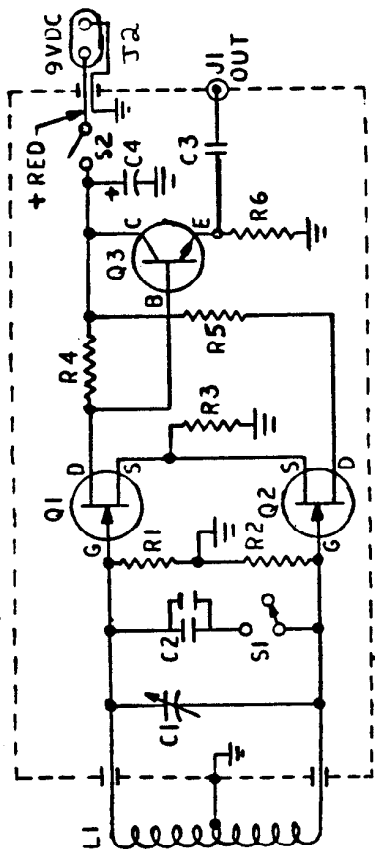
Side view of item 5. Take a wood rasp or file to this section and flatten the dowel 2" down on either side where the bolts run through. Dowel should be 3/4" wide at this point.



At position where handle fits to main support, make two cuts about 1/4" into dowel 7/16" on either side of hole. Chip out section of dowel between the two cuts with a chisel and file the resulting gap smooth to accept the end of the handle (item 3)



DIFFERENTIAL BALANCED PREAMP W/EMITTER FOLLOWER OUTPUT



- CHASSIS GROUND

DOTTED LINE INDICATES MINI BOX

PREAMPLIFIER Here is a suggested assembly method for the two FET preamp. You can use perfboard and pins or construct yourself a PC board for this.

- C1--365 pf variable capacitor (Circuit Specialists A1-233 can be used)
- C2--330 pf and 15 pf capacitor in parallel
- C3--.01 uf
- J1--phono jack (such as RS 274-346)
- J2--9 volt battery snap
- L1--loop
- C4--100 uf, 15v electrolytic capacitor

- Q1,Q2--2N3819 or 2N5484, matched if possible
- Q3--2N3646
- R1,R2--100 kΩ
- R3--1 kΩ
- R4,R5--4.7 kΩ
- R6--2.2 kΩ
- S1,S2--SPST switch

- 3 - 1/4" long machine screws with nuts
- vernier control for C1
- 4 - solder lugs bent to right angles
- aluminum mini-box 4 x 2 1/2 x 2 1/2" approx.
- piece of perfboard 2 1/8 x 3 1/4 x 2 1/4"
- thick elastic band
- length of RG-58U coax to run from preamp to receiver
- RCA phono plug
- screw type terminal strips; 2 screws.



* --If Q1 and Q2 are 2N5484, use the base diagram at left



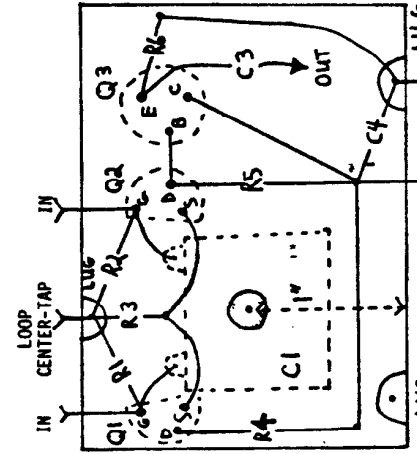


figure 1 CIRCUIT BOARD (hole for C1 is 1/4")

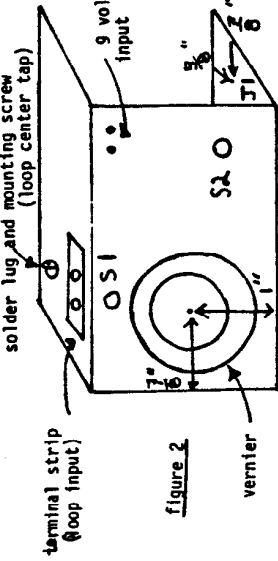


figure 2

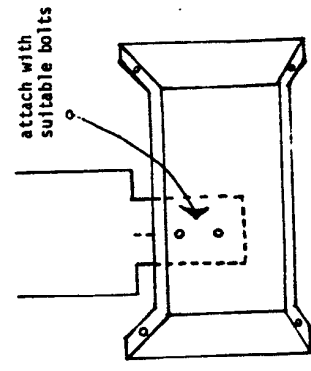


Figure 4--other half of mini-box connected thusly to frame

--Q1 and Q2 are on the underside of the board mounted in sockets.
 --The shaft of C1 is facing out through the board in this view, while the body of C1 is behind the board.
 --C2 is run from one side of C1 to S1, which is mounted on the case; the other wire from S1 runs to the other side of C1, as per schematic.

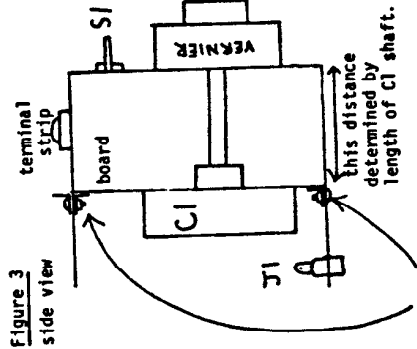


Figure 3 side view

solder lugs bolted to box and soldered to perf pins mounted on board

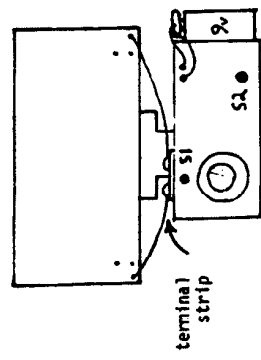


Figure 5

- A) Set up perboard according to figure 1. The solder lugs will support the perboard in the mini-box. The left hand edge of the board as shown should end up snug with the edge of the mini-box.
- B) Take mini-box and punch out a 3/4" diameter circle for vernier (if you use one of the 1 1/2" diameter 7:1 Japanese jobs; try a local supplier), centered according to figure 2. Drill suitable holes for S1, S2, the 9 volt battery leads, the mounting bolts for the perboard, the terminal strips and J1.
- C) Temporarily mount the perboard in the mini-box using the bolts and solder lugs. Line up the vernier control with C1's shaft through the 3/4" hole. Mark the vernier mounting holes. Remove the vernier and perboard, and drill suitable holes for vernier mounting.
- D) Mount S2 and S1. Thread battery clip leads through their holes and connect one side of S2 to the positive (red) lead of the battery clip. Attach a short length of hook up wire to the other side of S2. Connect a length of hook up wire to one side of S1. Connect the other side of S1 to C2 using a short lead between C2 and the switch but leaving a longer lead on the other side of C2. Mount the terminal strip on the box.
- E) Bolt vernier control onto box. Remove perboard after setting C1 with its plates unmeshed. Set vernier knob at maximum, and tighten set-screw on vernier after inserting C1's shaft. Mount the last solder lug on the outside of the box using the perboard support bolt nearest to the terminal strip. Solder leads from C2 and S1 to each side of C1. Solder loose piece of wire from S2 to the point where +9 v is indicated on circuit board. Solder the negative (black) battery lead to ground as indicated.
- F) Mount J2 and hook up C3 from E of Q3 to the center pin of the jack.
- G) Mount the other half of the mini-box onto the loop frame. Bolt the two halves of the mini-box together using the screws supplied. Solder the loop center tap lead to the lug mounted on the box. Solder each end of the loop to suitable lugs which will mate with the terminal strip. Attach the loop ends to the terminal strip. If using a ferrite loop with this preamp, solder ends of loop directly to the terminal strip.
- H) With S2 off, hook up battery to the clip and support battery with elastic band around body of mini-box.
- I) Solder one end of the piece of coax to the RCA plug (center of coax to center of plug; braid of coax to outside of plug). The other end goes to the receiver--center to the antenna terminal, braid to ground. You may have to attach an appropriate connector depending on your receiver antenna terminal.
- J) Plug the phono plug into the loop amplifier, attach other end of the cable to the receiver. Try to make sure receiver is hooked up to a good ground; this can help to define nulls better.

Operation--With preamp power switch in "OFF" position, install battery. With preamp range switch on "HI", preamp will tune from about 730 to 1600 khz. In the "LO" position, preamp will tune from 540 to 740 khz. Tune receiver to 1600, tune preamp for a peak on 1600 and you will note a sharp increase in signal in signal strength or background noise when the peak is reached. The low end can be peaked in the same manner. Make sure preamp is tuned to correct frequency.

Nulling--This takes time, patience and practice, so go slowly. Many stations can be nulled by pointing the front or back of the loop at the station to be nulled (loop at "0" tilt); on stronger stations tilt the loop 15-25 degrees and point the front of the loop at the station, check null depth on receiver's meter. Rotate loop 180° and point back of loop at station, check null depth. Using the position with the deepest null (lowest meter reading), move loop back and forth slowly; at the same time adjust the tilt slowly, usually 'up' for a local and 'down' for a distant station. GO SLOWLY. If you have a strong local that slops over on adjacent frequencies, put the sloppy one in the deepest null possible, tune receiver and preamp to frequency desired, trying not to move loop while tuning preamp. This will take care of the slop. When nulling an extra strong local or semi-local, try picking a time when they're transmitting voice (talk), as this will be the easiest time to null them. If a station uses a directional antenna pattern, your location in regards to this pattern will have a lot to do with your ability to null or log the station.

Note: the Sanserino loop is available as a kit from Radio West; the loop amplifier is pre-assembled, eliminating the touchiest part of building it. Price--\$85.