JOHNSON
ELECTRONIC
EQUIPMENT

E. F. JOHNSON COMPANY
WASECA MINNESOTA

ASSEMBLY AND OPERATION INSTRUCTION MANUAL

JOHNSON VIKING MOBILE VFO

Introduction to the

JOHNSON VIKING MOBILE Variable Frequency Oscillator Assembly, Calibrating, and Operating Instructions

Good workmanship and careful adherence to instructions are necessary in the building and operating of the Mobile Variable Frequency Oscillator. Although the design of this VFO was carried out with the objective of reducing the number of critical circuits to a minimum and making assembly simple, the capacitor and inductor values of the tuned circuit components were necessarily chosen with a given parts layout; therefore, the builder should duplicate the layout shown in the illustrations and described in the text. Circuits should be checked against the schematic diagram during the several steps of assembly. Much time and effort may be saved by finding an error or deviation from the illustrated layout before the unit is completed. Read each step through before commencing the operation.

The accuracy of frequency adjustments will be largely determined by the amateur's requirement and the standard he has available. The calibrating instructions should be understood before attempting to make initial frequency adjustments. After the frequency setting and adjustments have been completed to the satisfaction of the user, there is little reason to expect much change with time; however, it is always wise to check the frequency calibration frequently if the VFO dial scale is depended upon for determining the frequency of the transmitter.

The Viking Mobile VFO has only two controls. A little care in noting the position of the Bandswitch and the Tuning dial before completing transmitter tuning will assure the operator of a correct frequency indication. The operating instructions are very simple but important. Be certain they are understood before using the VFO.

WARNING

The Viking Mobile VFO derives its power from the transmitter low voltage power supply or an auxiliary supply. The B+ source to the VFO must be off to remove the 250 to 300 volts in the VFO. The "OFF" position of the bandswitch does not remove this voltage. Take care to avoid shock.

C O N T E N T S

STANDARD WARRANTY

Adopted and Recommended by the

Radio - Electronics - Television Manufacturers Association

The E. F. Johnson Company warrants each new radio product manufactured by it to be free from defective material and workmanship and agrees to remedy any such defect or to furnish a new part, except for electron tubes, in exchange for any part of any unit of its manufacture which under normal installation, use and service disclosed such defect, provided the unit is delivered by the owner to us or to our authorized radio dealer or wholesaler from whom purchased, intact, for our examination, with all transportation charges prepaid to our factory, within ninety days from the date of sale to original purchaser and provided that such examination disclosed in our judgment that it is thus defective.

This warranty does not extend to any of our radio products which have been subjected to misuse, neglect, accident, incorrect wiring not our own, improper installation, or to use in violation of instructions furnished by us, nor extend to units which have been repaired or altered outside of our factory, nor to cases where the serial number thereof has been removed, defaced or changed, nor to accessories used therewith not of our own manufacture, nor to electron tubes.

Defective electron tubes should be returned directly to the tube manufacturer for adjustment at the following addresses:

(a) For RCA tubes to: Adjustment Service, RCA at the nearest of the following addresses:

34 Exchange Place
Jersey City 2, New Jersey

3601 South Adams Street
Marion, Indiana

6355 East Washington Blvd.
Los Angeles 22, California

(b) For General Electric tubes to:

Adjustment Service
Owensboro Tube Works
General Electric Company
Owensboro, Kentucky

Any part of a unit approved for remedy or exchange hereunder will be remedied or exchanged by the authorized radio dealer or wholesaler without charge to the owner.

This warranty is in lieu of all other warranties expressed or implied and no representative or person is authorized to assume for us any other liability in connection with the sale of our radio products.

1. CHASSIS COMPONENT ASSEMBLY. Refer to Figures 1 and 2. Do not solder connections until instructed to do so. It should be noted that all wire connections are not shown in Figure 1. Follow the instructions implicitly.

   a. Install rubber grommets G1, G2, G3 in chassis, CH3.

   b. Mount X1, miniature socket for 6BH6 oscillator. Use two 3/16" 4-40 screws (the shortest supplied), two #4 shakeproof washers, a #6 teardrop solder terminal and two 4-40 nuts. Position as shown in Figure 1, using the following hardware sequence, from the underside of the chassis:

      (1) the screw head
      (2) #6 teardrop (only as shown in Figure 1)
      (3) #4 shakeproof washer
      (4) chassis (remember, screw was inserted from underside)
      (5) the socket mounting foot
      (6) 4-40 nut.

   c. Using diagonal cutters, cut off pin connections 2, 3, 6 and 7 close to ceramic base of X2, miniature socket for OA2 voltage regulator--only pins 1, 4 and 5 will be used in wiring. Mount X2 in same manner as X1, above. Bend pin connections 1 and 4 down toward chassis to horizontal position. Pin 4 should be bent toward the teardrop.

   d. Mount X3, miniature socket for 6BH6 buffer-multiplier, in same manner as X1, above.

   e. Mount X5, a six point terminal strip, as shown in Figure 1 using the following hardware sequence starting from the topside of the chassis:

      (1) 1/4" 6-3 screw
      (2) chassis
      (3) #6 shakeproof washer
      (4) #6 teardrop (only on rear screw)
      (5) terminal strip mounting foot
      (6) 6-32 nut

   f. Mount HW68, pilot light mounting spacer 3/4" long, with following sequence, from top of chassis:

      (1) 1/4" 6-32 screw
      (2) #6 shakeproof washer
      (3) chassis
      (4) mounting spacer

   g. Connect a 5" length of red plastic covered wire, stripped 5/16" on each end, between pin 5 of X2 and pin 6 of X1. Train this lead along the front corner of the chassis. Do not solder.

   h. Connect a 2 3/4" length of black plastic covered wire, stripped 5/16" on one end and 5/8" on the other, between pin 4 of X2 (which should be bent down toward the teardrop) and the adjacent teardrop. Use the 5/8" bared end and insert through the teardrop to pin 4 of X2. Solder at both pin 4 and teardrop. Leave remaining end of wire free for present.

1. i. Cut lead wires of R2, 18K, 2 watt resistor (color code brown, gray, orange, silver), to 7/16" and 1 1/2" length. Place a 1 1/8" length of black insulating tubing over the long lead. Place R2 parallel to front of chassis as shown in Figure 1 and connect short lead to pin 1 of X2. The long lead should be connected to terminal 3 (counting from front of chassis) of X5. Train this lead as shown keeping resistor against chassis. Solder at X2 only.

j. Connect a 3 3/8" length of red wire, stripped 5/16" each end, between pin 5 of X2 and pin 6 of X3. Train this lead down against the chassis and solder at pin 5 of X2 only.

k. Connect a 3 3/8" length of green wire, stripped 5/16" each end, between terminal 4 of X5 and pin 3 of X3. Train lead down against chassis. Solder at X3 only.

l. Connect a 2 5/8" length of green wire, stripped 5/16" each end, between terminal 4 of X5 and pin 4 of X1. Train lead down against the chassis as shown and solder at X1 only.

m. Strip a 1 5/8" length of black covered wire and connect from the bottom hole of pin 7 of X3 through the socket center shield, through the bottom hole of pin 4 of X3 and to the teardrop at X3. Solder at center shield only.

n. Strip a 1 5/8" length of black covered wire and connect from the bottom hole of pin 7 of X1 through the socket center shield, through the bottom hole of pin 3 of X1 and to the teardrop at X1. Solder at center shield and pin 3 of X1 only.

o. Connect R1, 47K 1/2 watt resistor (color code yellow, violet, orange, silver), between bottom hole of pin 1 of X1 and the teardrop at X1. R1 should be positioned downward near the chassis in order to provide clearance for connections to pin 2. Solder at teardrop only.

p. Connect a 3 3/4" length of red wire, stripped 5/16" on one end and 7/16" on the other, to the bottom hole of pin 2 of X1 (use 5/16" stripped end). This lead should be trained tightly around X5 and through grommet G1. Bend lead back on top side of chassis in order to keep it positioned. Solder at pin 2 taking care to avoid filling top pin hole with solder.

q. Connect a 2" length of blue wire, stripped 5/16" each end, between pin 5 of X1 and terminal 2 of X5. Train as shown and solder at pin 5.

r. Connect C8, 43 mmfd tubular capacitor (color code black, yellow, orange, black, orange), between pin 1 of X1 and terminal 1 of X5. Solder at pin 1.

s. Connect a 4 1/16" length of green wire, stripped 5/16" on one end and 7/16" on the other, the 5/16" end to terminal 1 on X5. This lead should be trained downward to the chassis, across the chassis and through grommet G1, bending the excess back on top of the chassis to keep lead positioned. Solder at terminal 1.

t. Connect a 2 1/4" length of black wire, stripped 5/16" on each end to the teardrop at the rear of X5. Train this lead directly across to and through grommet G1, bending the lead back as was done above. Do not solder.

u. Connect R3, 47K 1/2 watt resistor (color code yellow, violet, orange, silver), between pin 1 of X3 and the teardrop at X3. Train resistor downward against chassis. Do not solder.

1. v. Connect R4, 470 ohm 1/2 watt resistor (color code yellow, violet, brown, silver), between pin 2 of X3 and the teardrop at X3. Solder at teardrop only.

w. Connect C11, .005 mfd disc capacitor, between pin 2 of X3 and pin 4 of X3, keeping leads short with the flat side of C11 parallel to the chassis and over R3 and R4. Solder at both pins.

x. Connect C12, .005 mfd disc capacitor, between pins 6 and 7 of X3 keeping leads short with capacitor parallel to chassis. Solder at both pins.

y. Cut leads of C10, 43 mmfd tubular capacitor (color code black, yellow, orange, black, orange), to 11/16" and 1 7/16". Place a 3/8" length of black insulating tubing over the short lead and a 1 1/8" length of tubing over the long lead. Connect the short lead to terminal 2 of X5 and the long lead to pin 1 of X3. Solder at pin 1 of X3 only.

z. Mount C2, large double bearing variable capacitor on topside of chassis, front and center as shown in Figure 2. The following sequence should be used starting from underside of chassis top:

(1) 1/4" 6-32 screw
(2) #6 shakeproof washer
(3) chassis
(4) mounting foot

Center C2 carefully so that the shaft is at right angles to the front of the chassis. Tighten securely.

aa. Carefully bend the solder lugs on X4, dial light assembly, parallel to the assembly as shown in Figure 1.

Cut a 2 1/8" length of green wire, strip 5/16" from each end. Connect and solder one end to the insulated (back) solder lug on X4 with the wire parallel to and in the same direction as the light assembly mounting foot.

Mount X4 on HW68 using hardware in following sequence:

(1) 1/4" 6-32 screw
(2) #6 shakeproof washer
(3) dial light mounting foot
(4) HW68

Dress the black lead connected to teardrop at X2 (previously connected in step 1, h) along the front corner of the chassis to a point in line with the solder lug common to the shell of X4, upward along the front of the chassis and then backward to the shell lug. Connect and solder to this lug.

Connect the green lead to terminal 4 of X5. Do not solder.

2. SWITCH, OUTPUT COIL and VARIABLE CAPACITOR MOUNTING; CIRCUIT WIRING. Refer to Figures 1, 2 and 3.

a. Cut a 4 1/8" length of blue wire, strip 5/16" from each end. Connect and solder to terminal B of SW1, ceramic wafer bandswitch, (Figure 3) leaving remaining end free.

b. Strip 5/16" from each end of a 6" length of green wire. Connect to terminal 5 of X5 (on side of X5 toward center of chassis). Dress this lead downward to

2. b. the chassis; parallel to X5 toward the front of the chassis; bend at a right angle toward X2 when 1/2" from the front of the chassis; position across socket X2 between center shield and pin 5, extending straight out from side of chassis. Do not solder.

c. Remove nut from SW1 leaving shakeproof washer on switch. Mount switch on chassis as shown in Figure 3 by placing the switch through the chassis mounting hole and securing tightly with the nut previously removed. Note that the shakeproof lockwasher is between the switch and chassis. The blue lead attached in step a, above, should be pushed under the lead from C10 and through grommet G1, being dressed away from SW1 parallel to the chassis front and then at a right angle straight back to G1.

d. Connect free end of green lead (step b above) to terminal A of SW1. Do not solder.

e. Attach #6-32 spade mounting lugs to the ceramic form oscillator coil, L1. The attaching screw (1 3/8" #6-32) should be pushed through the coil form from the terminal side of the coil using the following sequence:

(1) 1 3/8" #6-32 attachment screw
(2) #6-32 spade lug
(3) fiber flat washer
(4) coil form
(5) fiber flat washer (on opposite side of coil form)
(6) #6-32 spade lug
(7) #6 shakeproof washer
(8) #6-32 nut

Tighten securely with spade lugs straight in line with coil form.

f. Mount L1 on chassis with coil terminals toward center of chassis as shown in Figure 2. Secure coil with a #6 shakeproof washer and nut on the center-most spade lug. The remaining spade lug should be secured in like manner with the addition of a teardrop solder terminal between the lockwasher and nut as shown in Figure 1, HW78. Bend the teardrop vertically away from the chassis.

g. Strip a 1 3/16" length of black wire, connect and solder to the rotor lug of C4, miniature variable capacitor. This lead should be parallel to the straight edge of the ceramic end frame and in a direction away from the stator.

h. Strip a 1 7/8" length of black wire, connect but do not solder to the rotor lug of C3, miniature variable capacitor. Dress this lead as was done above on C4.

i. Remove shaft nut from C4 (remember C4 has the shorter rotor lead) and mount on back flange of chassis using the hole nearer the chassis top (away from viewer in Figure 1). Secure tightly with nut keeping stator to left as viewed in Figure 1.

Connect rotor lead to teardrop at X5. Do not solder.

j. Remove shaft nut from C3 and mount on back flange of chassis directly over C4 (again, as viewed in Figure 1). Secure tightly with nut keeping stator to left. Rotor lead should be dressed parallel to the chassis top, across to a point above the teardrop at X5, down to, and connected to the teardrop. Do not solder.

2. k. Place a 1/2" length of black insulating tubing over one lead of C13, .005 mfd disc capacitor, and cut this lead 5/16" beyond tubing which should be against capacitor body. Connect this lead to terminal 5 of X5 after pushing uninsulated capacitor lead through the teardrop at X5. Cut excess of uninsulated lead after securing around teardrop. Solder at teardrop only. Take care to position C13 vertically as in Figure 1 so that rotor of C4 will have clearance.

l. Cut leads of C14, .005 mfd disc capacitor, to 1 1/4" and 1 1/2" length. Cut two lengths of black insulating tubing--one 1" long which is slipped over the shorter lead and the other 1 3/16" long which is slipped over the longer lead.

Position C14 as shown in Figure 1, connecting the shorter lead to pin 5 of X3 and the longer lead to terminal 6 of X5. Do not solder.

m. Remove nut and lockwasher from D1, panel bearing and shaft assembly, and insert bushing from front chassis flange in position shown in Figure 1. Place lockwasher and nut on bushing and tighten securely.

n. Strip 5/16" from each end of a 2" length of blue wire. Connect between terminals A and 6 of SW1. Train behind the switch contacts to facilitate later connections to remaining contacts. Solder at A only.

o. From a 2 7/8" length of black wire, strip 5/16" from one end and 9/16" from the other. Connect the 5/16" end to the stator lug on C4 and the remaining end through terminal 10 and around to terminal 11 of SW1 keeping the lead taut. Solder at C4 only.

p. Cut two 7/8" lengths of black insulating tubing and place one over each lead of C5, 47 mmfd tubular ceramic capacitor (color code yellow, yellow, violet, black, orange), after each lead has been cut to 1 3/16" length. Connect C5 between the rotor terminal of C3 and terminal 10 of SW1 taking care to keep the leads taut between the two terminals. Solder at C3 and terminals 10 and 11.

q. Strip 5/16" from each end of a 2 9/16" length of blue wire. Connect this lead between the stator lug of C3 and terminal 12 of SW1 keeping the lead taut. Solder at both connections.

r. Strip 5/16" from each end of a 2 3/16" length of blue wire, connect and solder one end to output coil, L4, end terminal which is the further from coil taps.

s. Mount output coil, L4, as shown in Figure 1 using the 1 3/4" #6-32 screw, the small rectangular clamp piece, BKT1, lockwasher and nut in the following sequence:

(1) Push 1 3/4" screw through hole from top of chassis.
(2) Place coil L4 over the screw with the coil taps away from the chassis top.
(3) Place clamp piece over screw against L4.
(4) #6 shakeproof over screw.
(5) #6-32 nut.

The blue lead should pass under the leads from C10 and C14 to terminal 6 of SW1. Center coil on the screw with coil terminals positioned as shown, center clamp piece and tighten securely. Take care that coil terminal pins do not short against mounting screw. Connect blue lead at terminal 6 of SW1. Do not solder.

2. t. Cut each lead of R5, 4700 ohm 1/2 watt resistor (color code yellow, violet, red, silver), to 3/4" length and slip a 7/16" length of black insulated tubing over each lead. Connect between pin 5 of X3 and terminal 6 of SW1. Solder at SW1 only.

u. Strip 5/16" from each end of a 2 1/8" length of red wire and connect between terminal 3 of SW1 and pin 5 of X3. Solder at terminal 3 only.

v. Strip 5/16" from each end of a 2 1/8" length of black wire and connect between the first tap on L4 (away from the chassis) to terminal 5 of SW1. Solder both connections.

w. Strip 5/16" from each end of a 2 1/8" length of blue wire and connect between the remaining tap on L4 and terminal 4 of SW1. Solder both connections.

x. Strip 5/16" from each end of a 1 7/8" length of red wire and connect between the end terminal on L4 away from the chassis and pin 5 of X3. Solder at both connections.

3. OSCILLATOR COIL, R.F. CHOKE AND CABLE WIRING. Refer to Figures 1 and 2.

a. On top of chassis, connect black wire to rotor lug of C2. Do not solder.

b. Connect green and blue leads to stator terminal of C2 nearest oscillator coil, L1. Solder.

c. Strip 5/16" from each end of a 1 1/4" length of black wire and connect from rotor lug of C2 to the oscillator coil terminal nearer to chassis (not the terminal nearest the chassis as this is just a tie-point terminal). Do not solder.

d. Cut leads of C7, 500 mmfd silver mica capacitor (ruby colored body), to 1 1/16" and 7/16" lengths. Place a 3/4" length of black insulated tubing over the long end and connect the long end to the rotor lug of C2 with C7 extending toward socket X3 and the narrow side of C7 toward the chassis. Solder at rotor lug.

Bend C7 long lead, near body, so that the short lead will connect to the tie-point terminal on L1 (terminal closest to chassis) as shown in Figure 2. Do not solder at tie-point.

e. Connect red wire to tie-point terminal on L1. Do not solder.

f. Connect C6, 500 mmfd silver mica capacitor (ruby colored body) between L1 tie-point terminal and C2 stator lug nearer to socket X3. Cut off excess lead length and solder at tie-point only.

g. Strip 5/16" from each end of a 1 13/16" length of red wire and connect from topmost terminal of L1 to stator lug of C2 nearer to socket X3. Solder at stator lug only.

h. Cut leads of C1, 47 mmfd N470 tubular ceramic capacitor (color code blue, yellow, violet, black, orange) to 7/16" length and connect across L1 coil terminals (two top terminals) in position shown in Figure 2. Solder both connections.

i. Cut the leads of L3, small single pie R.F. choke, to 13/16" length. Slip a 1/2" length of black insulated tubing over each lead and connect between terminals 2 and 3 of X5 with the body of L3 aligned with and above X5. Solder at terminal 2 only.

3. j. Cut the leads of L5, small single pie R.F. choke, to 5/8" length. Connect between terminals 3 and 5 of X5 with the body of L5 aligned with and above X5. Solder at terminal 5 only.

k. Cut leads of C15, .005 mfd disc capacitor, to 13/16" and 3/4" lengths. Slip a 1/2" length of black insulated tubing over the longer lead and connect it to terminal 3 of X5. Connect the remaining lead to the teardrop terminal at HW78, Figure 1. The capacitor should be placed flat against the chassis as shown. The green lead which connects to pin 4 of X1 may be lifted to provide room for C15. Note that C16 will be placed on top of C15 in the following step. Do not solder.

l. Cut leads of C16, .005 mfd disc capacitor, to 13/16" and 5/8" lengths. Slip a 1/2" length of black insulated tubing over the longer lead and connect it to terminal 4 of X5. Connect the remaining lead to the teardrop at HW78. Position C16 above and against C15. The green lead may now be dressed down again over the capacitors. Do not solder.

m. Prepare RG-59/U coaxial output cable, G4, and PL-259 plug, PL-1A, assembly using the following steps:

(1) Cut and remove 1 1/4" of outer vinyl cover from one end of the RG59U cable.

(2) Push the UG176U adapter, P1-1B, over the cable end with the large diameter end first. Position the adapter to expose 1" of the copper braid beyond the adapter. If the adapter fits very tightly on the vinyl cover, reduce the diameter of the cover by filing or slicing the surface very thinly about 1/2" back with a sharp knife until the adapter slides over the cover.

(3) With the thin lip of the adapter 1" from the end of the cable, whose vinyl covering has been removed, comb the braid wires and lay them back evenly over the adapter lip. Cut off the excess braid strand length 3/8" back so that the braid strands do not reach the adapter threads.

(4) Holding the adapter in place, cut and remove 9/16" of polyethylene insulation from the end, exposing the inner conductor.

(5) Turn the outer knurled cylinder off of the coaxial plug, PL-1A. Pass the inner plug part over the end of the cable, guiding the inside of the plug pin over the inner conductor. Turn the plug to engage the adapter UG176U threads and tighten the two parts together with gas pliers and vise or other suitable tool.

(6) Solder the inner part of the plug to the braid wires and adapter the cut-away section holes. Use a hot iron and run in a small amount of solder through each hole, flowing the solder over the braid wires.

(7) Solder the inner conductor to the tip of the pin and cut off the excess inner conductor. File away or scrape off excess solder.

(8) Screw the outer PL259 cylinder over the plug inner piece.

n. Prepare power cable, G5, and octal plug, PL2, assembly using following steps:

(1) Remove the shell from the 8 prong plug PL2 by prying with a screw driver.

(2) Remove the outer covering and unbraid 1 1/2" of shield braid on one end of

3. n. the three conductor shielded cable. Divide the loose shield strands in two parts and twist the strands of each part together. Strip 1/2" of insulation off each of the three conductors.

Insert the twisted braid conductors in pins 1 and 2 of the plug, pull through the pins 1/4" and solder. Insert and solder each of the three conductors to pins of the plug, allowing each to extend 1/16" beyond the pin end as follows:

(1) Black tracer to pin 8
(2) White lead to pin 7
(3) Red tracer to pin 3
(4) Trim excess wire off all pins when the connections to the pins have been completed. File away or scrape off excess solder. Attach shell.

o. Mount teardrop terminal at HW55 starting from top surface of chassis using following sequence:

(1) 1/4" 6-32 screw
(2) chassis
(3) #6 shakeproof washer
(4) #6 teardrop
(5) nut

Tighten securely and bend teardrop upward away from chassis.

p. Place end of three conductor power cable through grommet (at rear of chassis) which is closer to top surface of chassis. Pull through several inches so that end may be prepared. Use following steps in preparing and attaching cable:

(1) Remove outer insulated cover for distance of 1 13/16".
(2) Tin the shielded braid adjacent to insulated cover for distance of 1/4".
(3) Strip a 1 5/8" length of red wire, wrap one turn around the tinned braid area prepared in previous step and solder. This lead should be at a right angle to the cable.
(4) Using a knife, nick the braid strands at the end of the tinned area and break them off neatly thus exposing the three leads.
(5) Strip 5/16" from the lead with red tracer.
(6) Cut lead with black tracer 1/8" from shield as this lead will not be used.
(7) Cut 1/4" from end of white lead and then strip 5/16".
(8) Draw cable back through grommet and place lead connected to braid through hole in teardrop at HW55. Leave loose and do not solder.
(9) Connect red tracer lead to terminal 3 of X5 and carefully solder all connections found at this terminal.
(10) Connect white lead to terminal 4 of X5 and carefully solder all connections found at this terminal.

q. Place coaxial output cable through remaining grommet at rear of chassis and pull through several inches to facilitate preparation as described in following steps:

(1) Starting at a point 11/16" from the end of the cable, remove 1/4" of the vinyl insulating jacket thus exposing the shield braid. Tin the shield braid. Avoid excess heat which will melt insulation.
(2) Remove the 11/16" portion of the insulating jacket at the end of the cable.
(3) Using a knife, nick the braid strands at the end of the tinned area and break them off neatly.

3. q. (4) Strip a 2" length of blue wire, wrap one turn around tinned braid and solder, leaving lead at a right angle to the cable. Avoid excess heat.
(5) Cut 1/4" of polyethylene insulation away from inner coax conductor (from end) taking care not to nick the conductor.
(6) Draw cable back through the grommet and place the lead connected to the braid through the hole in the teardrop at HW55. Leave loose and do not solder.
(7) Connect inner conductor of cable to terminal 6 of X5 and solder.
(8) Draw leads taut at HW55, cut away excess and solder.

r. The four pie RF choke, L2, will be connected between pin 2 of X1 and the teardrop at HW78. Prepare L2 as shown in Figure 4 and connect the cut-away end through the large hole in pin 2 of X1. With the other end of L2 adjacent to HW78, solder at pin 2. Using a short piece of stripped wire, thread through the teardrop at HW78 and the hole in the soldering tab of L2. Draw tight by twisting, cut away excess wire, solder at L2 and all connections which have been brought to the teardrop.

s. Connect C9, .005 mfd disc capacitor, between pins 6 and 7 of X1 after cutting leads to 1/4" length. C9 should be positioned vertically (away from the socket) in order to provide clearance to the side of the chassis. Solder both connections.

t. Look over the assembly at this time, carefully checking for unsoldered connections, loose nuts or screws, solder drippings, wire or insulation cuttings and cold soldered joints. Make a thorough examination of all connections and check back in the assembly instructions if some connection appears to be incorrect.

u. Place C2, main tuning capacitor, in fully meshed position and place drive pulley hub assembly, D2, on C2 shaft, flat surface of pulley toward C2. Position D2 lightly against the "C" washer on the shaft with the pulley rim opening pointing toward D1, the panel bearing and shaft assembly. Tighten set screws securely.

v. The dial cord is strung as shown in Figure 5. Pass end of dial cord, D3, through loop of one of the dial cord tension springs, D4 and tie the end of the cord securely using a double knot. Slip the other loop of D4 over the upper right ear tab of the pulley, D2, with the dial cord passing through the rim opening. Slip the remaining tension spring, D5, over the upper left ear tab. With capacitor C2 fully meshed, grasp the pulley with the left hand to prevent rotation, draw the cord through the rim opening so that tension is on spring D4 (as evidenced by slight parting of coil turns) and draw around pulley rim in counter-clockwise direction keeping tension on cord and cord toward rear pulley rim to provide room for a second turn. When approximately three-quarters of a turn has been made around the pulley, draw the cord down around the shaft of the panel bearing assembly and make approximately one and one-half turns in a counter-clockwise direction.

The cord is then drawn up to the pulley rim, in front of the previous turn, around the rim counter-clockwise and through the rim opening. The cord is clamped to the rim with the left thumb and the free end of the cord passed through the free loop of tension spring D5. Draw the cord back through the rim opening thus putting observable tension on D5. Now use left thumb to clamp the cord at the tension spring loop and with the right hand tie a slip knot tight against the spring loop. Tie a second and third slip knot tight against the preceding knots. Both tension springs should be in tension--if not, re-string and re-tie cord until they are.

3. v. Be sure to keep the cord taut during the stringing operation. Grasp drive shaft and rotate C2 through several complete cycles to check overall dial cord drive. If operation is satisfactory, cut away excess cord. If not, restring the cord until satisfactory operation is obtained.

w. The maroon dial backing plate should now be attached to the front chassis flange, using the two 15/32" tubular spacers and 3/4" 6-32 screws to space the plate away from the chassis. Place the large hole in the plate over the shaft of C2 with the maroon finish away from C2 and with the small holes toward the bandswitch and tuning drive shafts. Position a spacer between the plate and front chassis flange, a #6 shakeproof between the plate and spacer, insert a 3/4" 6-32 screw from the front and put a #6 shakeproof and #6 nut on screw on back of flange. With both screws attached, center the hole relative to the shaft of C2 and tighten both screws securely. Be sure that pin 5 of X2 is bent clear of the mounting screw and chassis so that there is no danger of shorting.

x. Taking care to avoid damaging the insulation, move the top turn of the coil winding on L1 so that it is separated from the remaining turns a distance of 1/8" to 5/32". A knife may be carefully placed between the turns and pushed sideward to move the turn. The knife should be worked back and forth around the circumference of the coil. In most coils, the solder terminal will prevent the full turn from being displaced the desired distance but this is normal and will cause no difficulty.

The bottom turn should be spaced approximately 1/16" from the remaining turns in a manner similar to that used above.

Anchor the top turn only using coil dope such as "Q" Dope "Q Max" or other polystyrene cement. If such cement is not readily available, "Duco" household cement or clear model airplane cements may be used. Avoid excess cement--use only enough cement to anchor the turn.

4. PRELIMINARY TESTS AND CHECKOUT

a. Place type 6BH6 tubes in sockets X1 and X3 and place tube shields over both tubes. A type OA2 tube is placed in socket X2. A #47 6.3 volt lamp is used in the dial light socket, X4 (use 12 volt lamp for 12 volt filament operation).

b. Attach the knobs (temporarily) to the bandswitch and tuning shafts. Turn the bandswitch to the counter-clockwise position (75 meters).

c. Plug the octal power plug into a power supply which provides 6.3 volts (or 12.6 volts if wired for 12 filament supply) for filament power and 250 to 300 volts B+ power. The VFO may be plugged into the VFO receptacle of the Johnson Viking I, Viking II or Mobile transmitters (in the case of the Viking I or II only when the VFO is wired for 6 volt filament supply) to obtain the necessary power.

d. Check the lighting of the 6BH6 filaments, the pilot light and check the OA2 which should have a violet glow between the electrodes.

e. Set the trimmer capacitors, C3 and C4 (back flance of chassis), a mid-range and attach a short antenna wire, 1 1/2 to 2 feet long, to the center conductor of the output coax plug, PL1.

f. Set up a receiver which can be set to within 25 KC of the center of the 75 meter, 40 meter and, if possible, 15 meter bands, within a few feet of the VFO.

4. g. With the receiver beat frequency oscillator (BFO) turn on, set the receiver at approximately 3,875 KC. Swing the VFO tuning capacitor, C2, through full range slowly. The VFO signal should be heard beating with the receiver BFO.

h. Set the receiver at 7,250 KC, turn the VFO bandswitch one step clockwise (40 meters) and turn the VFO to zero beat with the receiver which indicates 40 meter output.

i. Set the receiver at 21.4 MC (or 10.7 MC if 21.4 cannot be obtained) to check 15 meter output. Advance bandswitch one step clockwise (15 meter VFO position) and tune VFO for zero beat with receiver.

j. With VFO beating with receiver in either 75 meter, or 40 meter, or 15 meter bandswitch position, turning the bandswitch to the furthest clockwise position (VFO "OFF") should cause the VFO output to cease as evidenced by the beat note disappearing.

k. If no signal is found near the ranges indicated in any of the previous steps, first couple the VFO more closely to the receiver and try again. If still no signal is heard, check supply voltages at VFO (on terminal strip X5), tubes and wiring against schematic diagram. Check carefully for cold soldered joints and check tightness of screws at teardrop grounding points.

l. When VFO operating has been checked satisfactorily as in above steps, the coax fitting may be plugged into a transmitter and the VFO checked for sufficient drive on all bands (be certain that VFO is set within the bands by monitoring against receiver or standard). It should be remembered that the transmitter should be capable of being driven by 10 volts or less and that the VFO output circuit includes the transmitter input capacity which should be approximately 35 mmfd. The VFO has more than enough output to drive any Johnson Viking transmitter on any band, 75 through 10 meters.

5. CABINET, POINTER AND PANEL ASSEMBLY. Refer to Figure 6.

a. Push the coaxial and power plugs, PL1 and PL2, through the 1 5/16" diameter hole in the back of CH2, cabinet back and sides. Draw the cables through the opening until the back of the chassis is touching the cabinet.

b. Spread apart the front flanges of CH2 so that the chassis may be pushed into the enclosure against the back. When the chassis has been pushed into the enclosure so that the back flange of the chassis is touching the back of the enclosure, the sides are pushed together into their normal position.

c. Note that two lengths of #4 sheet metal screws are supplied with the kit, 1/4" length and 5/16" length. The shorter length screws, 1/4", are used to fasten the cabinet back, top and bottom. The longer length screws, 5/16", are reserved for attachment of the plastic front panel. Separate the five (only four are used, one is a spare) 5/16" screws at this time to avoid a mixup.

d. Position the chassis within CH2 so that the two small holes in the chassis back flanges are aligned with the corresponding holes in CH2. Place a 1/4" sheet metal screw through each hole in CH2 and secure in chassis, drawing up screws just to the point where they are seated. They will be tightened later.

e. The plastic panel, CH5, is edge-lighted so it is necessary to have the filament of the pilot lamp in line with the panel in order to introduce sufficient light into the panel. Since the filament in the pilot lamp is approximately 5/32"

5. e. back from the tip of the bulb, a dome, which permits the tip of the bulb to project through the panel and thus bring the filament into alignment with the panel, has been provided.

With the pilot lamp in the socket (#47 type bulb for 6 volt filament wiring, #1488 for 12 volt wiring), place a straight edge across the front flanges of CH2 slightly above the pilot lamp. Adjust the position of the dial light assembly, X4, such that the filament of the pilot lamp is 7/64" out from the front flanges as measured from the straight line established by means of the straight edge. Tighten X4.

f. Set the tuning capacitor at full mesh position--not against the pin stop but in the position where the top edges of the rotor and stator plates are even. Take care in succeeding operations not to disturb this setting.

g. Place the front panel, top and bottom, CH1, over CH2 and attach temporarily by means of two 1/4" screws at rear center of both top and bottom. Draw up the screws just short of the point where they would seat (CH1 slightly loose permitting fore and aft movement).

h. Using a 1/4" #6 screw, attach the dial pointer, K3, to the shaft of the tuning capacitor, the dial pointer being in the horizontal position (parallel to the top edge of panel). Tighten screw only moderately as pointer position must be checked in following step before final tightening.

i. Note that there are two dial pointer reference marks on the plastic, calibrated panel. These horizontal marks, one just to the left of the "3.75" calibration mark and the other symmetrically disposed on the left side of the panel, should be in line with the pointer when the plastic panel is attached to the cabinet.

j. Carefully place the plastic panel in position on top of CH1 with the holes in CH2, CH1 and CH5 carefully aligned (the four 5/16" screws may be temporarily installed here to facilitate alignment, if desired). The pointer should be in line with the reference marks (if pointer touches plastic dial, carefully bend the pointer away from the panel--rotate pointer to be sure that clearance is maintained around full travel of pointer). If the pointer is not aligned with the reference marks, reposition the pointer until it is aligned taking care not to disturb the tuning capacitor setting. Tighten pointer screw securely in aligned position.

k. Remove the two 1/4" screws from top and bottom of CH1.

6. CALIBRATION

a. The VFO is first calibrated on the 75 meter band. It is very important that this band be carefully calibrated as the calibration of all the higher frequency bands is dependent upon the primary calibration obtained on 75 meters. It is worth spending a little extra effort here as only one simple adjustment is necessary for all remaining bands once the 75 meter band calibration has been completed. Read the instructions through before starting calibration.

b. The accuracy of the Viking Mobile VFO will be no better than that of the signal generator or source used to calibrate it. To fully utilize the stability and calibration capabilities of the VFO, the frequency standard or source used to calibrate it should have an accuracy of .01% or better. Most crystal standards or crystal calibrated variable frequency standards (such as the LM and BC-221 series) are satisfactory for normal calibration purposes.

6. b. A crystal controlled transmitter or exciter may be used as a frequency calibration source but is must be remembered that crystal holder nameplate frequencies usually are not exact due to oscillator circuit variations, aging, poor original calibration and other causes.

c. The frequency calibration source must have a moderate signal output, capable of being easily detected by the receiver which will be used for zero beat indication, at the following frequencies:

F1 Any given frequency (preferably a VFO scale mark frequency) between 3.770 and 3.800 mc. or any of the first four harmonics of 3.770 to 3.800 mc. which will fall within the range of the receiver. Exmples of frequency possibilities are 3.790, 7.580, 11.310 and 15.160 mc.

F2 Any given frequency (preferably a VFO scale mark frequency) between 3.950 and 3.980 mc. or any of the first four harmonics within the range of the receiver.

F3 Any given frequency (preferably a VFO scale mark frequency) between 7.175 and 7.225 mc. or any of the first four harmonics within the range of the receiver.

Warm up the signal generator or source for at least 1/2 hour before using it for VFO calibration.

d. Set up a receiver capable of detecting each of the frequencies chosen in c, above. Attach antenna leads to the receiver input and the signal generator output and bring the leads together until signal generator output can be picked up by the receiver. Separate or shorten the leads as found necessary to keep the receiver from blocking due to excessive signal input.

Allow the receiver to warm up for approximately 1/2 hour, to stabilize the local oscillator, and log the dial settings for frequencies, F1, F2 and F3. The best frequency oscillator in the receiver may be used to log and compare the signal generator and VFO frequencies but it is desirable to obtain the final zero beat indication between the VFO and signal generator signals without the beat frequency oscillator. Take care to avoid setting the receiver on or logging image frequencies.

e. Set the signal generator on F2, the frequency between 3.950 and 3.980 mc. chosen in c, above, and tune the receiver to F2. Turn off BFO in receiver.

f. After CH1 has been placed in position over CH2 and attached with top and bottom rear screws, warm up the Viking Mobile VFO for 1/2 hour with the bandswitch in the "75" position. Attach an antenna lead to the output coaxial plug (PL1) pin and bring the lead near the receiver antenna.

g. The inductance of L1 is now adjusted so that correct tracking will be realized. Since it may be necessary to make several small adjustments of the coil turns to obtain correct tracking, all of the cabinet screws are not used in order to facilitate disassembly of the cabinet to make adjustments. The plastic panel should be placed in position, aligned with the holes in CH1 and CH2 (this is necessary as the position of the cabinet sides relative to L1 will affect the frequency), and the dial pointer set as described in the following section.

h. Set the VFO dial at F2 (between 3.950 and 3.980 MC--making certain that CH1, CH2 and CH5 are aligned) and adjust the trimmer capacitor C3 (the shaft closer to

6. h. the bottom of the cabinet) until the VFO signal is heard on the receiver beating with the signal generator signal. Carefuuly adjust C3 for zero beat. C3 must be close to half mesh position (slot in shaft parallel to bottom of cabinet). If it is not, adjust bottom turn (in rare cases, top turn may also require adjustment) of L1 to shift C3--spread turns to obtain greater mesh of C3, push turns together to obtain lesser mesh. Remember that after each adjustment of L1, the cabinet must be in position (all pieces aligned) with pointer set at F2 when C3 is again adjusted for zero beat. When zero beat is obtained with C3 shaft slot in horizontal position, proceed with following step.

i. Place 1/4" sheet metal screws in all holes in top and bottom of assembly. Draw up screws just short of contact with CH1.

j. Place 5/16" sheet metal screws through CH5 and CH1, attaching both to CH2. Holding CH5 reference marks in best alignment with pointer, tighten all four screws.

k. Tighten two back screws. Tighten top and bottom screws.

l. Attach knobs, K1 and K2, to the tuning and bandswitch shafts. Place the bandswitch in the Counter-clockwise position, secure knob with marker pointing toward "75" band marking. The tuning knob requires no positioning.

m. Since the cabinet has been tightly assembled, it will be necessary to check for zero beat with dial set at F2 again by adjustment of C3.

n. Set the signal generator on F1, the frequency between 3.770 and 3.800 mc. chosen in c, above, and tune the receiver to F1. Turn off BFO in receiver.

o. Turn the "Tuning" control so that the VFO dial pointer is in the vicinity of F1. Turn for zero beat with signal generator signal on receiver. Carefully observe and record VFO dial reading. If it is the same as or within 3 kilocycles of F1, you may consider the "75" meter calibration complete and proceed on to step r, below. If the dial reading is more than 3 kilocycles higher or lower than F1, it will be necessary to adjust the inductance of the oscillator coil, L1. If the dial reading is higher in frequency than F1, the inductance of L1 must be increased (by pushing coil turns closer together). If the dial reading is lower in frequency than F1, the inductance of L1 must be decreased (by spreading the coil turns).

p. In the back of the cabinet is a small hole through which the coil turns of L1 may be observed. In some cases, with care, it is possible to adjust the bottom turn of L1 and thus avoid disassembling the cabinet to adjust L1. A small, pointed plastic or wooden stick should be used to avoid damaging the wire insulation. If any difficulty is experienced in trying this adjustment, remove CH1 and CH5.

Only a very small movement of a coil turn will be needed to adjust L1 so large increments are to be avoided. After each adjustment of L1, reassemble the cabinet tightly and repeat steps e, f, g and h above except that VFO warmup time may be decreased if the unit has not been opened too long which would result in excessive cooling off.

q. When the 75 meter calibration is satisfactory, turn the bandswitch to "10, 20, 40" position and if the VFO has not been warmed up already for 1/2 hour, let it warm up for this period of time.

6. r. Set the signal generator on F3, the frequency between 7.175 and 7.225 mc. chosen in step c, and tune the receiver to F3. Turn off the BFO in receiver.

s. Set the VFO dial at F3.

t. Adjust trimmer capacitor C4 (the shaft closer to the top of the cabinet) until the VFO is zero beat with the receiver. This completes the calibration. A drop or two of coil dope can be placed on the bottom coil turn of L1 to anchor it firmly if there is any question that it may have been loosened during adjustment. Normally, the turn will be tight. The dope may be applied by carefully working through the hole in the back of the cabinet or by removing the cabinet.

u. It should be remembered that a mobile VFO is not intended as a precision device or frequency standard. Therefore, perfection in calibration is not intended and should not be attempted. The Viking Mobile VFO will be on or within a few kilocycles of the calibration points on all bands.

If it is desired to improve the calibration at the high end of the 10 meter band, the rearmost rotor plate of C2 may be bend slightly. Only the edge of the plate, which is meshed at the high frequency end of the band, should be bent either toward the stator plate (to reduce the dial reading) or away from the stator plate (to increase the dial reading). However, this can be a tedious job and is mentioned only for those people who might feel that the additional effort is worthwhile.

7. OPERATION

a. The Viking Mobile VFO has been designed as a crystal substitute. The output of more than 10 volts r.m.s. across 25,000 ohms in the frequency ranges of 3.75 to 4.00 mc., 7.050 to 7.450 mc., and 10.575 to 10.850 mc. may be applied directly across the crystal oscillator grid circuit of many transmitters (including the Viking Mobile Transmitter) to take the place of 75 meter, 40 meter or 30 meter (for 21 mc. doubling) crystals normally used in these transmitters.

b. The Viking Mobile VFO dial calibration for the 15 meter or 21 mc. band is correct in either the "10, 20, 40" or "15" positions of the bandswitch. However, the VFO output frequency is on 40 meters in the "10, 20, 40" position for those transmitters which triple to get to 15 meters and is on 30 meters (10.6 mc.) in "15" position for those transmitters which double to get to 15 meters (such as the Viking Mobile Transmitter).

c. The VFO has only the two controls, "TUNING" and "BAND" but it is imperative that the proper band and frequency setting be selected for the desired operating frequency. Particular care should be observed when changing bands. Obviously, to obtain output on the higher frequencies, the transmitter must provide suitable frequency multiplication in the exciter stages.

d. The output circuit of the Viking Mobile VFO is a broadly pretuned circuit which depends upon the output cable and the transmitter input capacity to some extent. It is therefore impossible to obtain full VFO output with a cable length, between the VFO and transmitter, that differs markedly from that provided with the VFO. The transmitter total input capacity should be between 30 and 40 mmfd to center the VFO maximum output in the VFO frequency ranges.

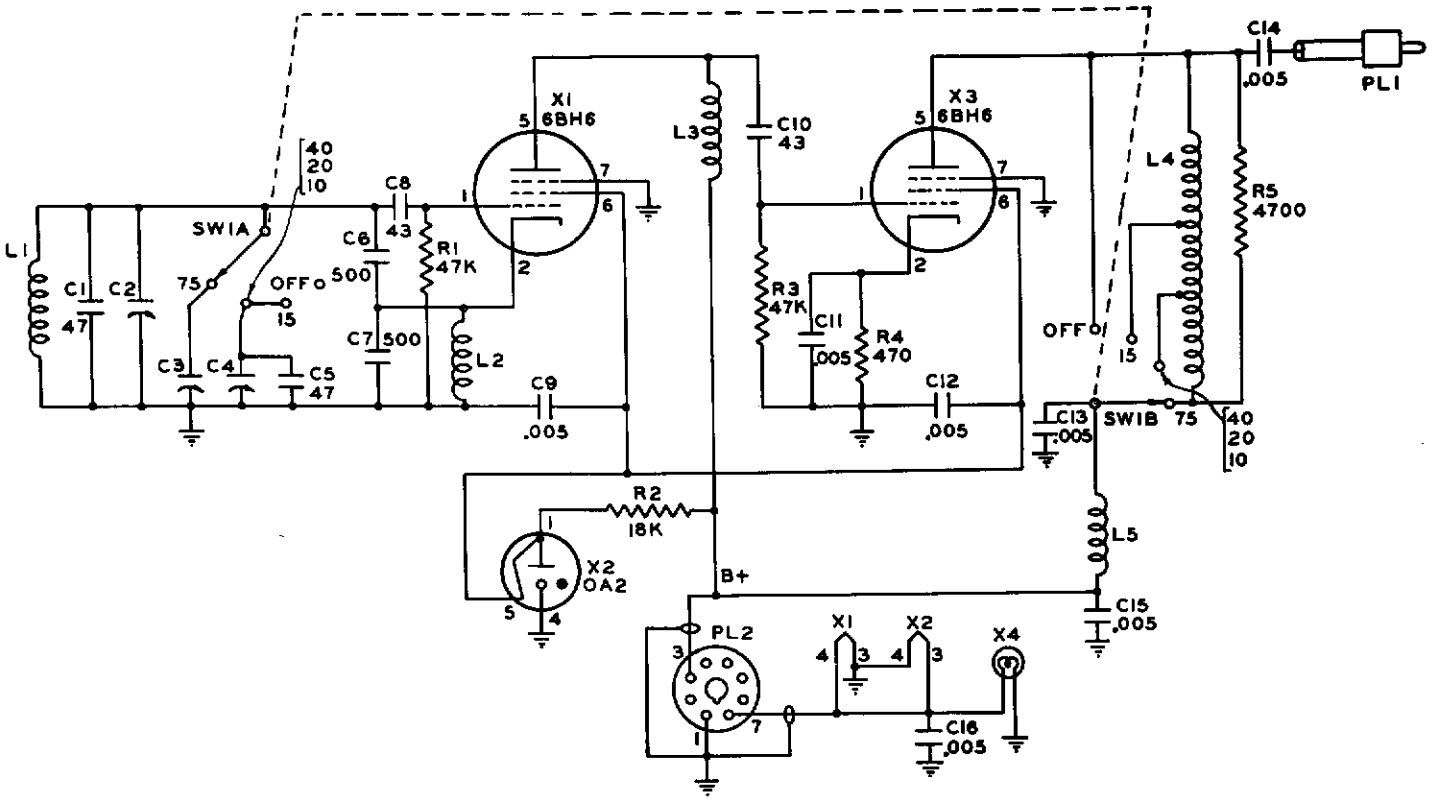
e. The power requirements of the VFO are 6 to 7 volts at .45 amperes (or 12 to 14 volts at .30 amperes if wired for 12-14 volt system) and 250 to 300 volts plus D.C. to chassis ground at 20 ma.

8. INSTALLATION

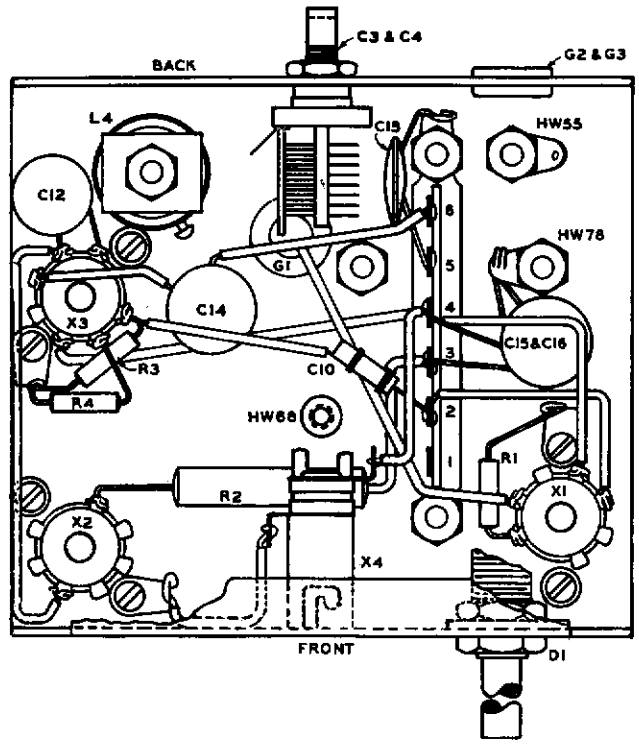
a. The Viking Mobile VFO is primarily intended for use with dashboard or front compartment mounted transmitters. The VFO should be mounted in a position which will permit the coaxial cable to reach the transmitter and the power cable to reach the power source (the octal socket on the back of the cabinet in the case of the Viking Mobile Transmitter).

b. In general, it is advisable to use a wrap-around type of bracket to mount the VFO so that minimum cabinet deflection will take place under vibration. A "U" shaped bracket can be used to clamp the cabinet under the dash or to the side, top or bottom of some other piece of equipment or part of the automobile.

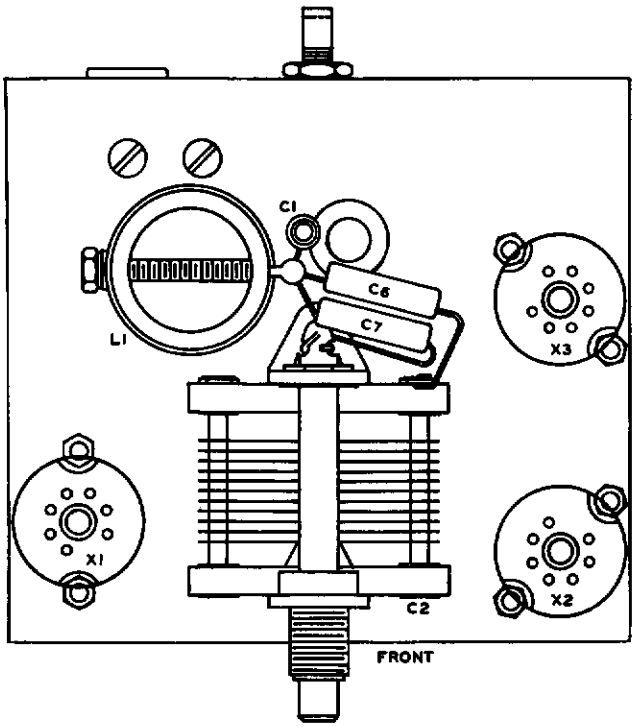
c. The VFO may be steering post mounted. Although the Viking Mobile VFO has been used successfully by direct attachment of a "U" bracket to the VFO cabinet side with sheet metal screws, it is recommended that a full wrap-around type bracket be used for steering post mounting in order to avoid cabinet deflections (and resultant frequency changes) which might be caused by very rough roads.



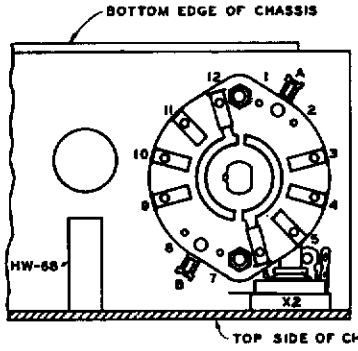
CIRCUIT DIAGRAM — VIKING MOBILE VFO



CHASSIS — BOTTOM VIEW
FIGURE 1

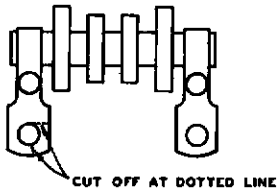


CHASSIS — TOP VIEW
FIGURE 2



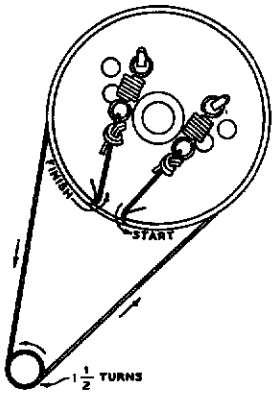
SWITCH SW1 CONTACT NUMBERING—SWITCH ROTOR IN MAXIMUM CLOCKWISE POSITION, AS VIEWED.

FIGURE 3



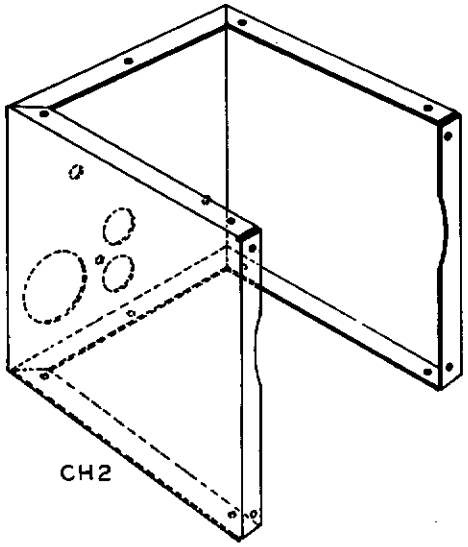
L2 RF CHOKE PREPARATION

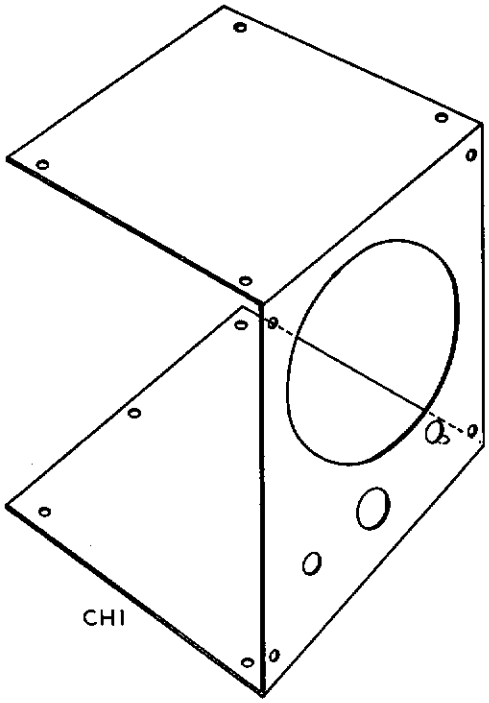
FIGURE 4

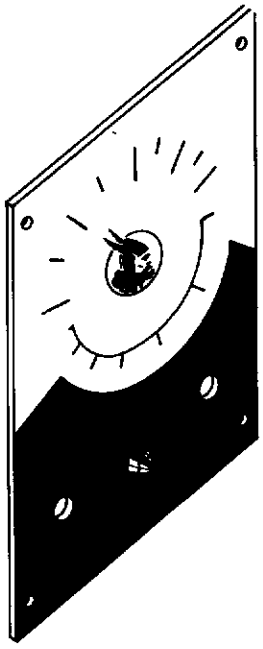


DIAL CORD STRINGING

FIGURE 5







CABINET AND PANEL ASSEMBLY

FIGURE 6

JOHNSON VIKING MOBILE VFO

Parts List

Part No.	Item No.	Qty.	Description
17.842	CH1	1	Front panel, top and bottom
17.843	CH2	1	Cabinet, back and sides
17.844	CH3	1	Chassis
17.845	CH4	1	Dial backing plate
23.1051	CH5	1	Front panel (plastic)
16.120-7	BKT1	1	Output coil clamp piece
115-256-22	D1	1	Panel bearing and shaft
23.909-2	D2	1	Drive pulley hub assembly
42.29-148	D3	2 ft.	Dial cord
16.1027-1	D4-5	2	Dial cord tension spring
23.1007	K1-2	2	Knob, phenolic
22.933	K3	1	Pointer, dial
22.113-1	G1-3	3	Rubber grommet
71.32-178	G4	3 ft.	RG59U coaxial cable
71.32-202	G5	3 1/2 ft.	3 conductor shielded cable
71.91-100	W1	24"	Black plastic #20 copper wire
71.91-102	W2	24"	Red plastic #20 copper wire
71.91-105	W3	24"	Green plastic #20 copper wire
71.91-106	W4	24"	Blue plastic #20 copper wire
42.24-77	W5	12"	.034 I.D. black extruded plastic tubing
133-278-7	S1-S2	2	1 3/4" miniature tube shield
22.934	SW1	1	Ceramic rotary switch, two pole, four position
22.935	C1	1	47 mmfd N470 UJ ceramic capacitor
22.806	C5	1	47 mmfd N220 ceramic capacitor
149-27-5	C2	1	55R18 variable capacitor
160-107-1	C3-4	2	15 Mll miniature variable capacitor
22.804	C6-7	2	500 mmfd silver mica capacitor
22.807	C8,10	2	43 mmfd ceramic capacitor
22.827	C9,11-16	7	.005 mfd disc ceramic capacitor
22.717	R1,3	2	47,000 ohm 1/2 watt resistor
22.803	R2	1	18,000 ohm 2 watt resistor
22.801	R4	1	470 ohm 1/2 watt resistor
22.802	R5	1	4700 ohm 1/2 watt resistor
23.1045	L1	1	Oscillator coil
102-750	L2	1	RF choke
22.844	L3,5	2	RF choke
23.1046	L4	1	Output coil
120-277B-1	X1-3	3	7 pin miniature socket
147-610	X4	1	Dial light assembly
22.740-6	X5	1	6 point terminal strip
22.695	PL1A	1	PL259 coaxial plug
22.799	PL1B	1	UG176U coaxial adapter
22.800	P1-2	1	Male connector Amphenol 86PM8
		1	#4 Hardware envelope
		1	#6 Hardware envelope

Wiring Changes for 12 Volt Filament Operation

If it is desired to wire the Mobile VFO for 12 volt filament operation, the following steps should be used in place of those shown in the text:

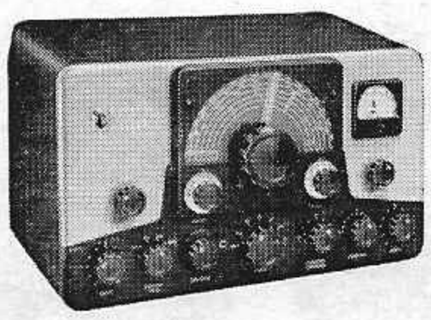
Paragraph:

1, k. Connect a 4 3/8" length of green wire, stripped 5/16" each end, between pin 3 of X3 and pin 3 of X1. Train lead down against the chassis and solder at both connections.

1, n. From a 1 1/2" length of black wire, strip 5/16" on one end and 11/16" on the other. Place the longer stripped end through the center shield of X1 and connect to the bottom hole of pin 7 of X1. The remaining end of the lead is placed between pins 3 and 4 of X1 and connected to the teardrop of X1. Solder at center shield only.

world famous
Johnson Viking amateur radio equipment

The products briefly described below are from JOHNSON'S complete line of transmitting equipment and accessories for amateur and commercial use. For detailed information on these and other popular JOHNSON products, write for your copy of Catalog 955 . . . yours on request.

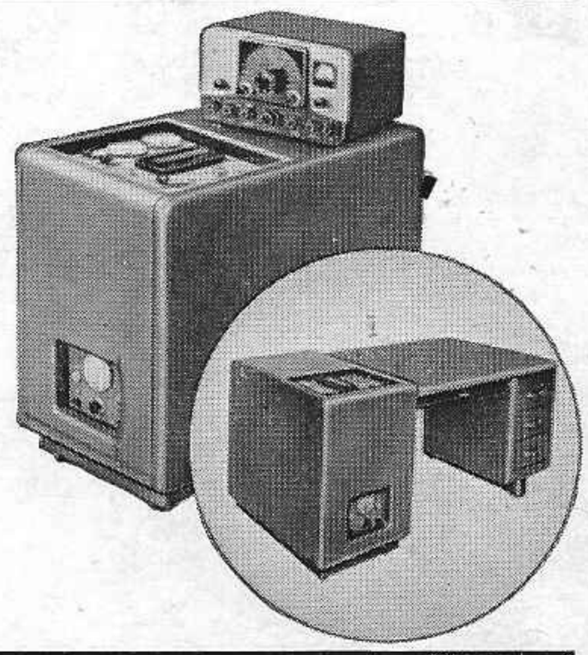


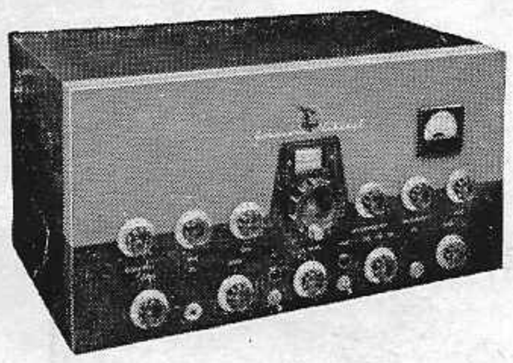
VIKING "RANGER" TRANSMITTER/EXCITER

75 watts CW input . . . 65 watts phone. All amateur bands from 10 to 160 meters. TVI suppressed—built-in VFO—timed sequence (break-in) keying system. Available as a kit or wired and tested.

VIKING KILOWATT POWER AMPLIFIER

1000 watts AM, CW or SSB. Boldly styled . . . contains every conceivable feature for safety, operating convenience and peak performance.



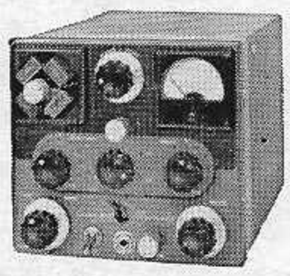


VIKING II TRANSMITTER

180 watts CW input . . . 130 watts phone. Bandswitching—all amateur bands from 10 to 160 meters—effectively TVI suppressed. Available as a kit or wired and tested.

VIKING "ADVENTURER" CW KIT

A compact 50 watt CW transmitter kit. Completely self-contained—single knob bandswitching—effectively TVI suppressed. Easily assembled by novice or experienced amateur. 80, 40, 20, 15 and 11-10 meters.

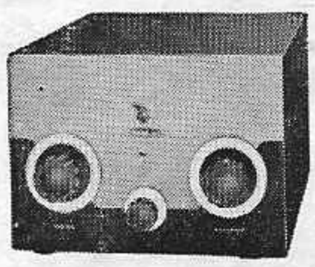


VIKING MOBILE TRANSMITTER

A power packed mobile transmitter rated 60 watts maximum PA input. Instant bandswitching 75, 40, 20, 15 and 11-10 meters. Under-dash mounting—all controls readily accessible. Available as a kit or wired and tested.

VIKING "MATCHBOX" ANTENNA COUPLER

Performs all loading and switching functions required in medium power amateur stations. Covers amateur bands from 3.5 to 30 mc. Fully shielded.

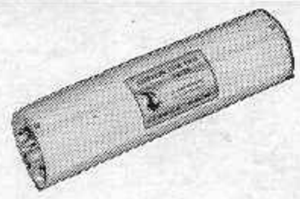


VIKING VFO KIT

Variable frequency oscillator with 160 and 40 meter output for frequency multiplying transmitters. Accurately calibrated 160 through 10 meters. Available as a kit or wired and tested.

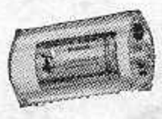
LOW PASS RF FILTER

Handles more than 1000 watts RF—provides 75 db or more attenuation above 54 megacycles.



SWR BRIDGE

Provides accurate measurement of standing wave ratios for effective use of a low pass RF filter and antenna coupler.



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