

W. W. W.

5 BAND BC-458 CONVERSION KIT WITH BANDSPREAD DIAL

- 1 - Calibrated dial scale
- 1 - 0A3/VR75 voltage regulator tube
- 1 - 12 volt 2A filament transformer 27PF356
- 1 - Full wave bridge Selenium Rectifier 600 ma.
- 1 - 3000 mfd. 12V filter capacitor and mounting plate
- 1 - Bandswitch, 4 pole 5 pos. and SPST, ceramic
- 1 - Bandswitch mounting plate
- 3 - Miniductors cut to size
- 1 - 20 watt 6000 ohm resistor with mounting brackets .4000 0H1
- 1 - Octal male plug and cap
- 1 - 50 mmfd. var. capacitor, APC
- 1 - Bristol Wrench
- 4 - Rubber feet
- 4 - #6 sheet metal screws for rubber feet
- 2 - .005 mfd. ceramic capacitors
- 1 - .001 mfd. mica capacitor (10% Tan)
- 10 - Ft. RG58AU coaxial cable for RF & B plus
- 1 - Knob for bandswitch
- 2 - Transformer mounting spacers 7/16" long
- 1 - Line cord
- 2 - 3/8" grommet
- 3 - Cable clamps
- 6 - 4-40 screws, 4 nuts, 2 lockwashers
- 8 - #6 shakeproof ground lugs
- 2 - 3/8-32 nuts
- 1 - 3/8" lockwasher
- 1 - Rectifier mounting bracket
- 3 - 6/32-1" screws
- 5 - 6/32-5/16" screws
- 8 - 6/32 nuts
- 9 - #6 lockwashers
 - 12" white wire
 - 56" yellow wire
 - 12" bare hookup wire
 - 6" spaghetti
 - 48" lacing cord

DE LUXE CASE & FRONT PANEL FOR BC 458 VFO

An attractive gray wrinkle cabinet 5-1/2" wide, 8-3/4" high and 13" deep with silk screened front panel and all holes drilled; matches models 10 and 20 Multiphase Exciters. Identical in size with the Sideband Slicer. Price: \$10.00

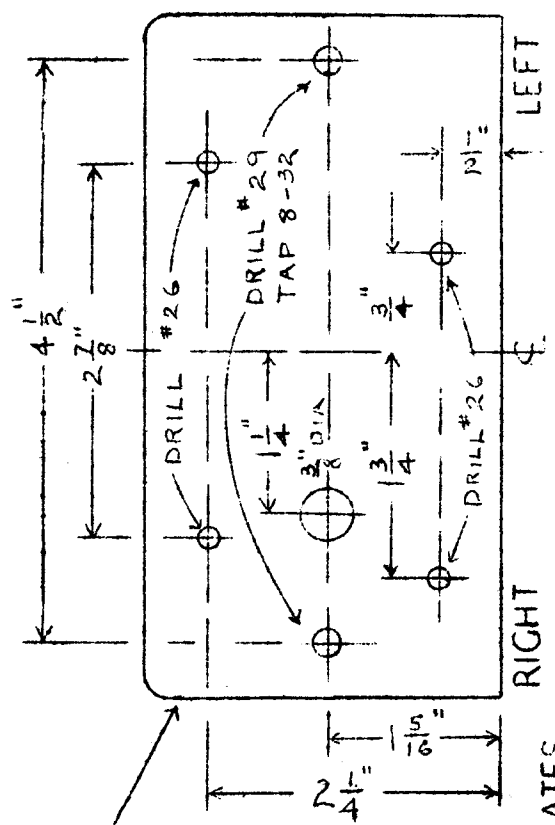
BC-458 Kit

6-3-54

Rev. 11-4-54

Printed in U.S.A

6-3-54 458 Kit
 Printed in U.S.A.
 Rev. 11-4-54



OUTSIDE
 REAR OF
 CHASSIS

LEAVE EIGHT ROTOR PLATES
 ON EACH CAPACITOR

BOTTOM VIEW

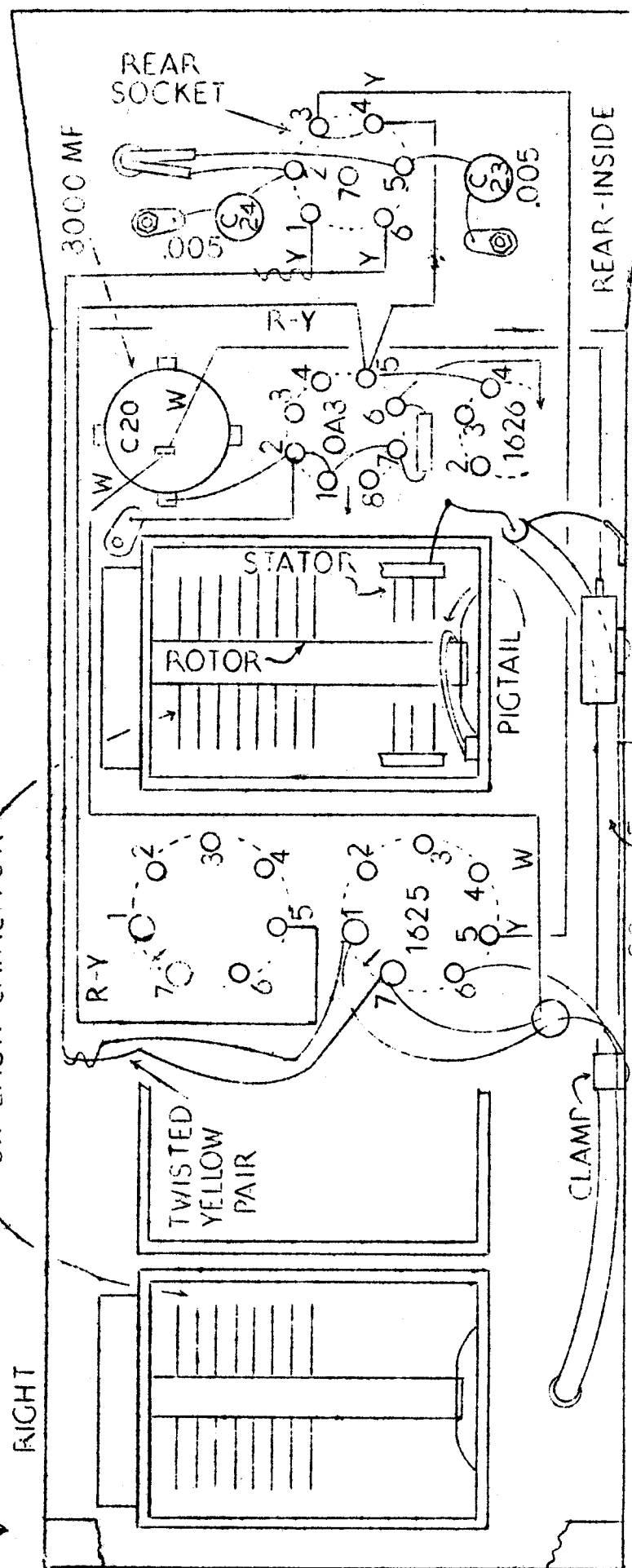


FIG. 2 FOR 101 MX MV105

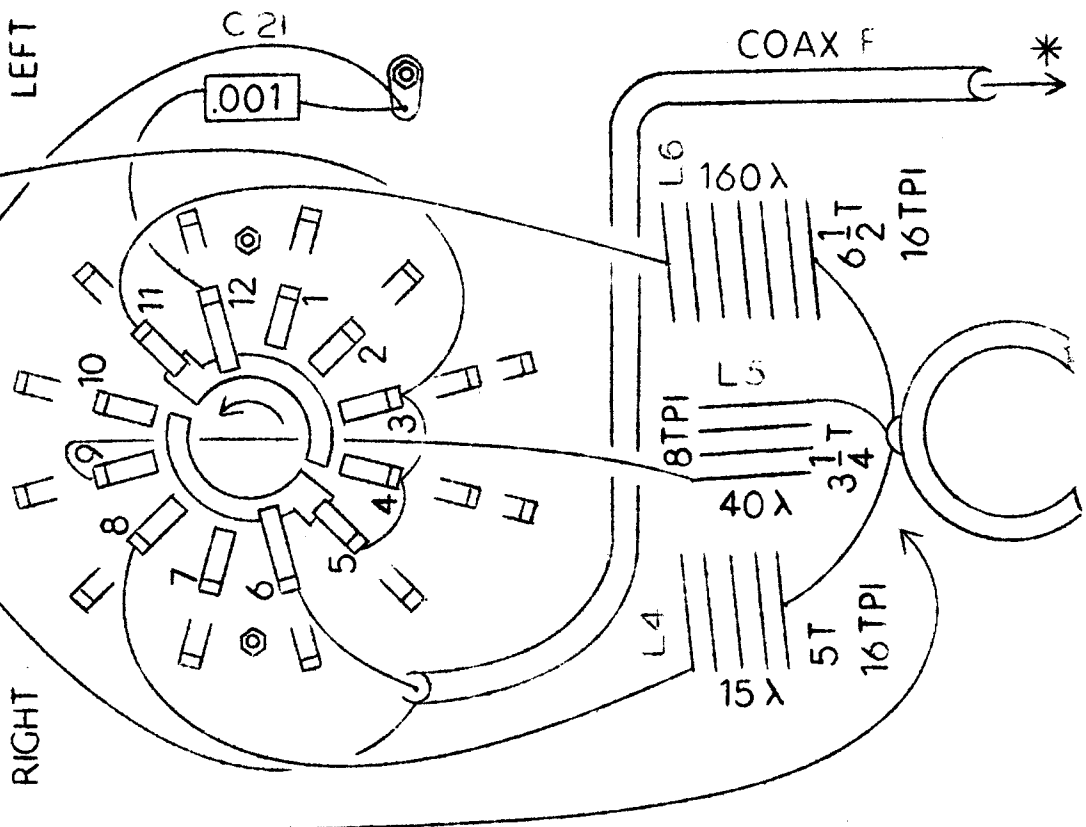
FILE 2
NOTCHES
TO MOUNT
VARI. CAP.

50 MMF

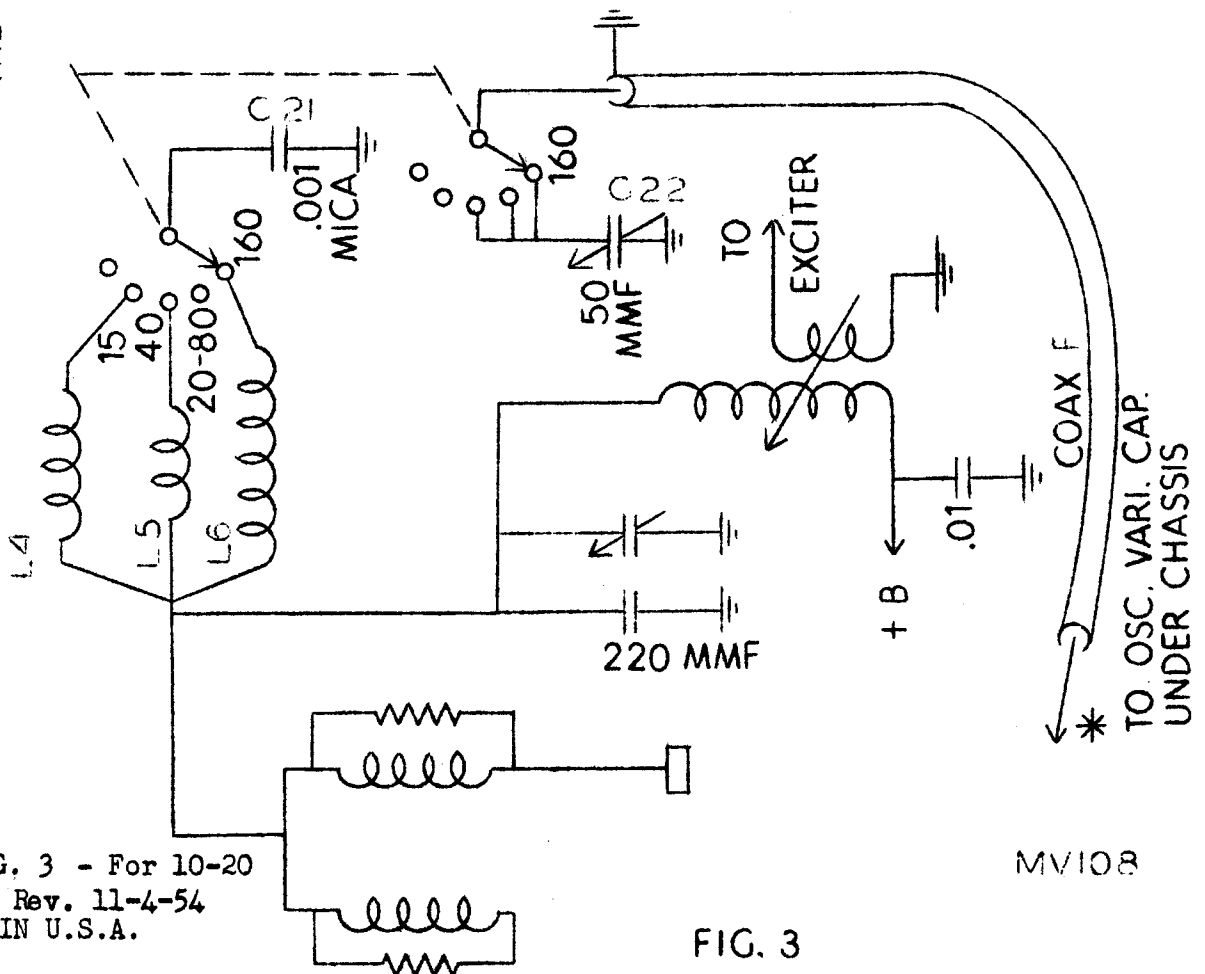
BREAK THE POLYSTYRENE STRIP
SO THAT THE LAST HALF TURN
MAY BE VARIED TO ADJUST
THE INDUCTANCE

LEFT

RIGHT



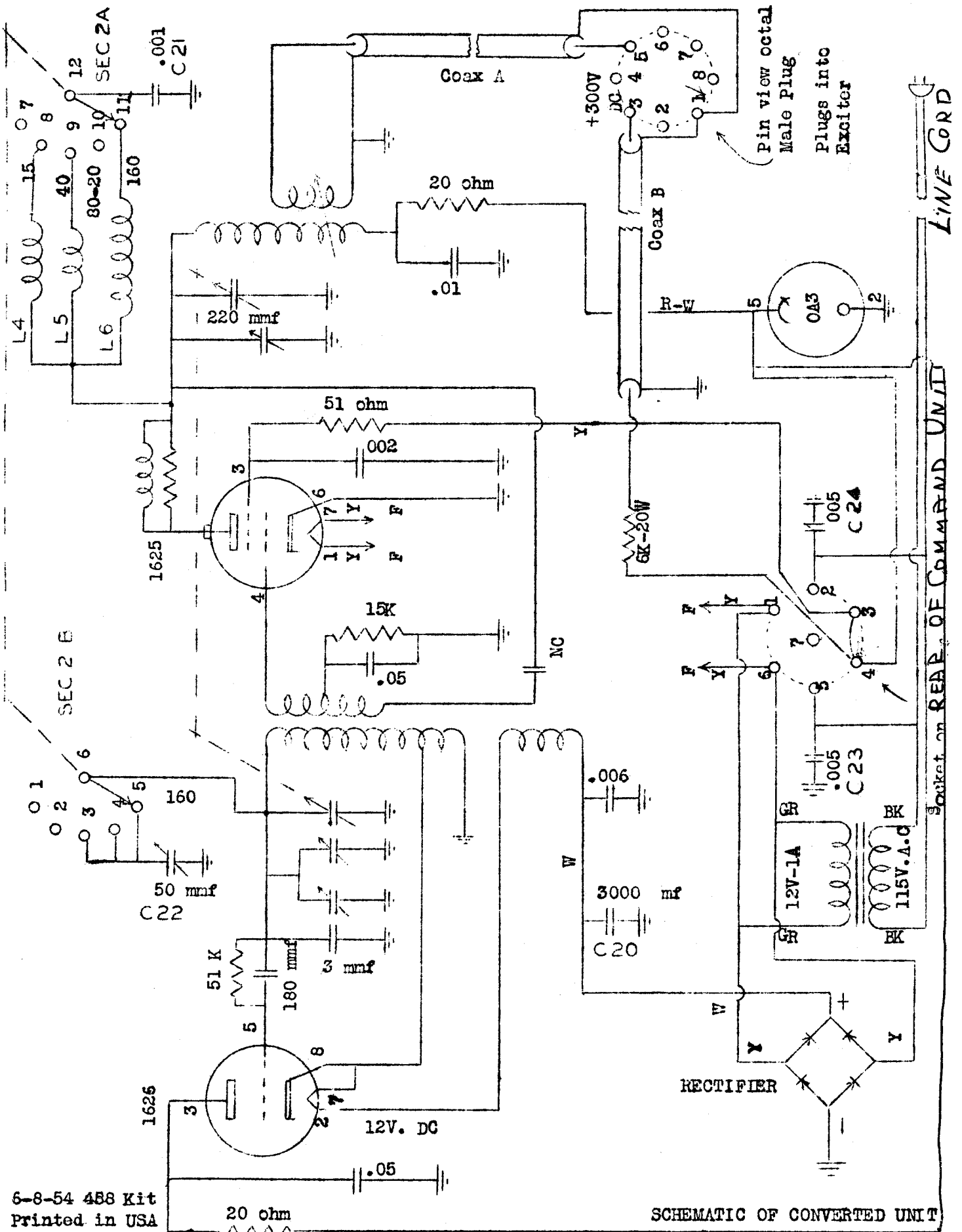
TERM.# 1 TO 12 ON WAFER FARTHEST FROM PANEL



458 Kit
VFO - FIG. 3 - For 10-20
10-27-54 Rev. 11-4-54
PRINTED IN U.S.A.

FIG. 3

MV108



6-8-54 488 Kit
Printed in USA

SCHMATIC OF CONVERTED UNIT

FIG. 4 MV106

DETAILED INSTRUCTIONS FOR BC-458 FIVE BAND CONVERSION KIT

Remove the cover and the bottom plate. Save the screws. Remove tubes.

In the following instructions the Right side of the chassis is the side with the frequency knob and the two worm gears. In order to avoid confusion while wiring, it is suggested that you mark the chassis Right and Left with pencil or crayon on the top, bottom and rear.

AT THE EYE TUBE SOCKET (VT138-1629) ON THE RIGHT OF THE CHASSIS

1. Remove the two white leads from the wire wound resistor to pins #2 and #7 of the socket.
2. Remove the wire wound resistor and twist off the brackets.
3. Carefully remove the remaining white wire from pin #7. This lead will later connect to the 3000 mfd. filter capacitor. Remove the resistors and the rest of the leads and the socket. Discard. In order to prevent a B plus short, remove the red lead that goes to the 1626 socket pin #3. Now remove the other red wire to the 3-.05 mfd. capacitor center pin. Discard both leads.

AT THE RELAY UNDERNEATH THE CHASSIS

1. Cut black and tan leads from relay coil and remove from circuit.
2. Cut the two red leads from the relay contacts and tape separately or remove from circuit.
3. Cut the bare wire at the relay that goes to the 1625 socket Pin #6
4. Remove and discard the relay. Enlarge the hole which formerly held the relay and mount a soldering lug and ground clamp with #6 hardware.
5. Solder bare wire from 1625 socket pin #6 to the solder lug.

AT THE FRONT PANEL

1. Remove entire antenna loading coil assembly and mounting brackets. Remove the bakelite strip which holds the wiper contact for the antenna coil. Cut the bare wire which runs from the bakelite strip to the final tank coil. Discard.
2. Cut wires from the antenna grounding relay and remove wires from circuit. Remove relay and discard.
3. Remove the antenna binding post and insulators. With a small file, make two notches horizontally to hold the 50 mmf variable trimmer capacitor. Mount the trimmer with two #4-40 screws and lockwashers.
4. Remove calibrated window and discard.
5. Remove large hex nut and dial.

The following work must be done ONLY if our shield case and panel are to be used. Otherwise ignore instructions relating thereto.

The panel attached to unit is not removed.

If the rectangular bandswitch plate has been used on a converted unit it must be removed from panel.

If the 50 mmf variable capacitor has been used on a converted unit it must be removed from front panel.

The new panel has been designed from the average of many units and matches the front panel holes of most BC-458s. It may be necessary to enlarge four #6 screw holes on your old front panel for best alignment of all holes.

6. Remove frequency chart plate and rivets.
7. Remove two studs which held calibrated window
8. Remove antenna coupling knob and save. Use Bristol Wrench
9. Remove frequency control knob and save. Use Bristol Wrench
- *10. To remove antenna coupler, lock "knob" on left side of panel. Crush plastic knob with pliers and pull pin out of knurled collar. Remove collar and locking cam.
- *11. Antenna inductance locking knob is removed same as No. 10
12. Remove rivet holding antenna inductance lock spring
- *13. Frequency lock knob is crushed with pliers and pin removed from knurled collar. Remove collar from shaft. The 3/16" shaft is grasped with pliers and pulled away from front of panel. A saw is now used to cut off shaft very close to outside of panel.
14. Cam is pushed out through rear side of panel.
15. Break away black metal ring which is under dial. Drill out rivets with a 1/8" drill. Do not damage gear inside panel.
16. Remove all burrs and high spots from outside of front panel with a file or sandpaper.
17. Remove two pointed head screws at bottom of panel.
18. Two holes, about 1-5/8" below top of panel are to be enlarged for #6 screws with a #26 drill. Hold the new panel over the old one for exact location of holes. Also mark old panel for drilling holes where dial pointer screws will need clearance.
19. The new panel is mounted over the present panel with four #6 screws, washers and nuts.
20. At the holes you enlarged, a solder lug is placed under nut on left side as shown in Figure 3.
21. A special washer is supplied for use underneath the new dial when necessary.
22. Mount ceramic wafer switch (have supporting screws in a horizontal line) with backing nut, lockwasher and nut.
23. Mount knob on switch shaft. Fasten two black plastic knobs to "Frequency" and "Antenna Coupling" shafts.
24. Turn the antenna coupler shaft counterclockwise, all the way. The knob is then fastened to shaft with arrow pointing at 7:00 o'clock.
25. Mount 50 mmf capacitor with two #4 screws and lock washers through holes in new panel and through slots in old panel.

*Some BC-458s have locking knobs fastened with a set screw which can be removed with a Bristol Wrench. On other units a pin is used to hold knob and can sometimes be removed. As a last alternative the knob may be crushed with pliers.

AT REAR OF CHASSIS

1. Drill two #29 holes 4-1/2" on centers. See Fig. 2
2. Tap for #8-32 screws. These are to fasten case to chassis.

ON TOP OF THE CHASSIS

1. It will be necessary to cut a portion of the oscillator shield can lip at the right rear corner so that it will clear the 3000 mfd. filter capacitor. (See Fig. 1) Temporarily place the 3000 mfd. capacitor in the empty socket hole and mark the place where the capacitor extends over the lip of the shield with a pencil. Now remove the oscillator shield can and cut this portion away.

2. Drill a 3/8" hole about 3/4" directly below the present 1/2" hole in the side of the can so that the rotor of the oscillator padding capacitor will be accessible.
3. Loosen the two Bristol head screws that hold the oscillator padding capacitor shaft.
4. Set the single plate trimmer on the top of the oscillator capacitor for half capacity.
5. Drill two holes and mount the filter capacitor plate under the socket previously used for the eye tube (1629)
6. Replace the oscillator shield can temporarily with two screws on each side. Mount the 3000 mfd. capacitor in the plate.
7. On the left side of the chassis about 1-1/2" behind the front panel, there is a threaded bushing that formerly held the bakelite strip. Drill this out with a 1/4" drill and enlarge to 3/8". Co-ax cable passes thru this hole.
8. On left side of chassis, 5" behind front panel and 5/8" from left edge of chassis, a 3/8" diameter hole is to be drilled for a grommet. Place grommet in hole. Filament wires will pass thru this grommet.
9. Mount Selenium rectifier bracket on left side of chassis with foot towards gear on coil, as follows: remove one screw from small gear support bracket and substitute a longer screw for it; one you have removed elsewhere. Fasten rectifier bracket on top of gear bracket with longer screw.
10. Mount rectifier to bracket with a 1" #6 screw, lockwasher and nut. Have head of screw toward left side. Have rectifier terminals toward rear of chassis.

ON THE REAR OF CHASSIS (OUTSIDE)

SEE FIGURE 2

1. Drill 4 holes with #26 drill as shown. These are for filament transformer and 6K-20 watt resistor.
2. Drill a 3/8" hole as shown, for grommet. Place grommet in hole.

CHASSIS BOTTOM PLATE

1. Drill four #33 holes about 1" in from each corner and mount the rubber feet with #6 self-tapping screws.

UNDERNEATH THE CHASSIS

1. Open the tuning capacitor by turning the frequency control counterclockwise as far as it will go. It is necessary to remove the rotor plates from each of the two tuning capacitors until eight rotors remain in each one. Remove those plates farthest from the worm drive as shown in Fig. 2. To remove the plates gently rock the rotor plates with a long nose pliers one at a time, until they become loose. If too much force is used the rotor may become dislodged and the small ball bearings will fall out. Care should also be taken not to exert any pressure on the stator sections as this can cause the glass insulating beads to fall out.
2. At the rear variable capacitor a pigtail should be installed. See Fig. 2. Solder one end to rotor shaft and other end to rivet which holds rotor spring.
3. The end stator plate may be bent slightly toward right to give the pigtail more clearance.

AT THE 1626 SOCKET (FORMERLY CRYSTAL SOCKET)

1. Remove resistor between pin #3 and #8. Discard
2. Remove black lead from pin #3 and discard
3. Unsolder end of resistor from pin #5
4. Unsolder two black leads from pin #5
5. Disconnect black wire from pin #5 on rear socket and discard
6. Reconnect remaining black wire from pin #5 and end of resistor, (See step 3) to pin #6
7. Add a jumper between pin #1 and #2
8. At the 1625 socket, remove red lead from pin #4 and tape end or take out of circuit.
9. Solder a jumper from 1626 socket pin #4 to VR tube socket pin #5

AT THE 7 PIN SOCKET ON THE REAR OF THE CHASSIS (INSIDE)

1. Remove the white lead from pin #1 and discard
2. Remove red lead from pin #4 and tape end or remove from circuit
3. Remove two black leads from pin #2 and discard
4. Remove black lead from rear socket pin #6 and VR socket pin #7. Discard.
5. Remove red-white lead from rear socket pin #7 and attach to VR socket pin #5
6. Solder a jumper from VR socket pin #5 to rear socket pin #4
7. On rear socket, solder a jumper from pin #3 to pin #4

AT THE 1625 SOCKETS (See Fig. 2)

1. Remove the filament leads from pin #1 and pin #7 of each tube and remove from circuit.
2. Remove the 51,000 ohm resistor from the left 1625 socket on pin #6 and pin #7 and discard.
3. Take two 18" lengths of yellow wire and twist together.
4. Solder one yellow wire to the left 1625 socket pin #1 and the other yellow wire to pin #7.
5. Run the twisted yellow pair along the right side of the chassis back to the 7 pin socket on the rear of the chassis. Solder one yellow lead to pin #1 and the other to pin #6 of the 7 pin socket on the rear of the chassis.
6. Take two yellow wires, each 9" long, and twist together. Push twisted pair through grommet to Selenium rectifier. Solder one wire of twisted pair to yellow dotted terminal lug of rectifier. Solder other yellow wire to other yellow dotted terminal lug.
7. At the left 1625 socket: solder one yellow wire to pin #7 and the other yellow wire to pin #1.
8. Solder a jumper to rectifier negative (black dotted lug) and push other end through grommet and solder to ground lug at cable clamp
9. Solder a white wire to red dotted (positive) rectifier lug and push other end through grommet and run to 3000 mf capacitor. Attach end of white wire to center terminal of capacitor.
10. Solder the white wire which you removed from pin #7 of the socket to the center (positive) terminal of the 3000 mfd. filter capacitor.
11. Add a jumper from the ground tab of the 3000 mfd. filter capacitor to pin #2 of the VR tube socket.

AT THE FRONT PANEL (Refer to Fig. 3)

1. Mount the rectangular bandswitch plate on the inside of the panel with the lettering facing the outside, with #4-40 screws. Use a soldering lug under the upper nut on the left side. (Do not mount this plate if a Slicer case and new panel are used.)
2. Mount the bandswitch with a backing nut and lockwasher on the inside of the panel and a nut on the outside. The two nuts on the frame of the switch should be in a horizontal line.
3. The bandswitch has two wafers; the one nearest the front panel is not used for this conversion. The wafer farthest from panel numbered 1 to 12 (See Fig. 3) should be used.
4. On the switch, run a jumper from term. #5 to term. #4 to term. #3 to stator of the 50 mmf variable capacitor. (See Fig. 3)
5. Add a jumper from the rotor lug of the 50 mmf variable capacitor to the left ground lug.
6. Prepare a piece of coaxial cable 16" long
7. Push the coaxial cable through the 3/8" hole which has been drilled on the left side of chassis.
8. Solder inner conductor of the coax to term. #6 of the bandswitch and the outer shield to rotor lug of the 50 mmf variable capacitor.
9. Solder the other end of the coax center conductor to the stator of the oscillator tuning capacitor at the rear of the chassis just above the 1626 socket. The cable clamp at the former relay position is used to hold the coax to the side of chassis.
10. Solder the outer shield of the coax to the ground lug at the mica capacitor on the side of chassis. Be sure that ground lug under nut holding mica capacitor is tight.
11. Cut off the right side 1625 plate connector.

INSTALLING THE THREE INDUCTORS (See Fig. 1 and Fig. 3)

1. Solder one end of a 5 turn 16TPI miniductor to term. #8 on the switch and the other end to the top lug of the ceramic coil form.
2. Solder one end of a 3-1/4 turn 8TPI miniductor to term. #9 on the switch and the other end to the top lug of the ceramic coil form.
3. Solder one end of a 6-1/2 turn 16TPI miniductor to term. #11 on the switch and the other end to the top lug of the ceramic coil form
4. Break the polystyrene strip so that the last half turn of each coil may be varied to adjust the inductance.
5. Solder a .001 mf mica capacitor from switch terminal #12 to the left ground lug.

MOUNTING THE FILAMENT TRANSFORMER (See Fig. 1)

1. Mount the transformer on the rear of the chassis with 1/2" spacers with the secondary (green) leads down. Place a soldering lug on the inside of the chassis under each nut. There should be a cable clamp on the outside of the chassis under the right spacer.
2. Trim the secondary leads (green) to proper length and solder into rear socket pins #1 and #6 from the outside.
3. Trim primary leads (black) to proper length and solder into rear socket pins #2 and #5 from the outside.
4. Mount the 6000 ohm 20 watt resistor as shown, with a soldering lug under the right bracket screw head and a cable clamp under left bracket.

MOUNTING THE FILAMENT TRANSFORMER (Cont'd)

5. Solder an insulated jumper from pin #4 of the rear socket to the left soldering tab of the 6000 ohm 20 watt resistor (outside of chassis).
6. Push about five inches of the line cord through the grommet on the right side of the chassis; tie a knot in it.
7. Solder one lead of the line cord to rear socket pin #2 and the other lead to pin #5 (inside of chassis)
8. Solder a .005 mfd. ceramic capacitor from the rear socket pin #2 to the right ground lug. Keep the leads as short as possible.
9. Solder a .005 mfd. ceramic capacitor from the rear socket pin #5 to the left ground lug. Keep the leads as short as possible.

NOTE: If the VFO is to be operated in TV fringe areas, it may be advisable to insert the ac line leads outside and to by-pass rear socket pins #1, #6 and #4 on the inside of the chassis with ceramic capacitors.

ATTACHING THE B PLUS AND RF CABLES (See Fig. 1 and 4)

1. Prepare one end of a piece of coax cable 3 feet long. Solder the center conductor to pin #3 of the octal male plug.
2. Solder the outer shield of the coax to pin #1 of the octal male plug. (This is the coax which carries the B plus. Coax "B")
3. Prepare one end of a piece of coax cable 4' 2" long. Solder the center conductor to pin #5 of the octal male plug (This is coax "A").
4. Solder the outer shield to pin #1 of the octal male plug.
5. Slip plug cover over the cable and snap on to the plug.
6. Tie or lace the cable to within about 4" of end of coax cable "B".
7. Prepare the end of the coax cable "B" and place under left cable clamp and tighten. Solder the center conductor to the right tab of the 6000 ohm resistor and the outer shield to the ground lug at the resistor.
8. Cut about 1/2" of the outer black vinyl insulation from the cable, as shown in Fig. 1. Now fill the groove with a winding of bare wire and place under the cable clamp and tighten. Grounding cable at this point will help reduce the radiation of harmonics and also help prevent the transmitter output from being introduced back into the VFO.
9. Run coax "A" over the 3000 mf capacitor and then over the oscillator shield to the ceramic PA output coil.
10. Prepare the end of the coax cable "A" and solder the center conductor to the output of the variable link which is the lug next to the large bakelite gear. Solder the coax outer shield to the ground lug on the left side of the PA coil base.

ATTACHING THE DIAL

1. Replace black metal dial as it was originally and turn the dial completely clockwise until the indicator coincides with the small white line located about 1/2" to the left of the 5.3 MC calibration. Remove the nut, the dial and the two small pins. Put on the plastic dial so that the small black line located about 1/2" to the left of the 4 MC calibration coincides with the indicator line and tighten the nut.

ALIGNMENT OF THE VFO

Set your receiver and Exciter to 21,450 kc. Advance the carrier knob. With the VFO switch in the 21 MC position and the dial at 21,450 kc., adjust the oscillator air padder (accessible through the hole you have drilled in the side of the oscillator can) for zero beat. This will occur with a little more than half capacity and the slot in the shaft will be slightly beyond the horizontal position. Now remove the can and tighten the set screws. It may be necessary to retune the small single plate air capacitor (accessible through the top of the can) for zero beat.

With the Receiver and Exciter tuned to 3.5 MC, set the VFO bandswitch to 80 meters and the dial to 3.5 MC. Tune the 50 mmfd. capacitor on the front panel for zero beat. * Peak the amplifier air padding capacitor under the chassis between the two variable capacitors for maximum VR tube brilliance or maximum exciter output with the antenna coupler set at 4.

Now return to the 21 MC band. Slowly replace the large cover on the BC-458 and observe the effect upon the output of the Exciter. Replacing this cover reduces the inductance of the coils and increases the resonant frequency. Whenever the cover is off, the coil should have slightly more inductance than necessary. The inductance can be adjusted by breaking the polystyrene strip on the coils so that the last half turn can be varied in spacing to trim the inductor to the required value.

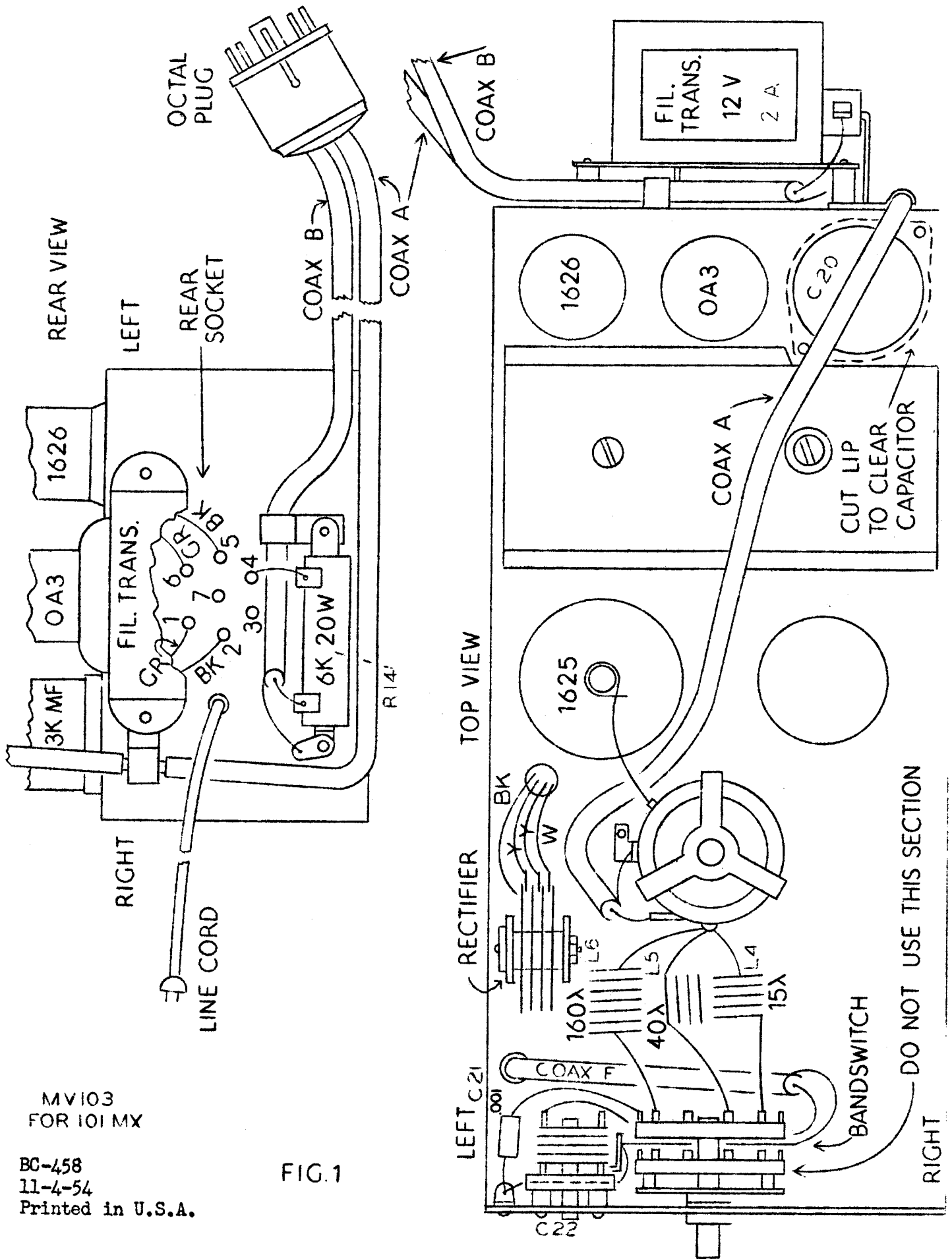
Replacing the cover will also affect the output on 40 and 160 meters, so it will be necessary to compensate for this effect.

CALIBRATION OF THE UNIT

The dial scale has been derived from the average of several units. It is suggested that the calibration be checked at 4.0 and 3.5 MC. In some cases it may be necessary to bend the split plate of the oscillator tuning capacitor (under the chassis) for greater calibration accuracy. Each time that the plate is bent, the unit should be calibrated at 3.5 MC with the 50 mmfd trimmer on the front panel. If you are unable to calibrate 4.0 properly by this means, it will be necessary to adjust the iron core slug in the oscillator coil. Try turning the slug about 1/2 turn at a time. If 4.0 appears too high on the scale, turn the slug counter clockwise. If 4.0 appears too low on the scale, turn the slug clockwise. However, each time the slug is turned it will be necessary to readjust both 21 MC and 3.5 MC.

Fasten bottom plate and cover to unit permanently. If a slicer case is used, the bottom plate and cover are not necessary. Two #8 x 1-1/2" screws are used on rear of unit to hold chassis to our slicer case.

*The plates of the 50 mmfd. capacitor will be nearly fully meshed (maximum capacity) for zero beat. If they are not, you have selected the wrong signal at 21450 KC.



MV103
FOR 101 MX

BC-458
11-4-54
Printed in U.S.A.

FIG. 1