

## PM-2 LIGHTWEIGHT A-C POWER SUPPLY

## 1.1 DESCRIPTION. (Refer to figure 1.)

The PM-2 Lightweight A-C Power Supply is a part of a complete high-frequency single-sideband station in a suitcase-sized carrying case. The complete station consists of the KWM-2 Transceiver, PM-2 Power Supply, and the carrying case. Either the power supply, the KWM-2, or the carrying case may be purchased separately, or as a group. The power supply converts 110- or 220-volt a-c power to suitable voltage and current values for operation of the KWM-2

Transceiver. It clamps to the rear of the KWM-2 so that both transceiver and power supply may be packed in the lightweight carrying case for portability. The assembled combination may be lifted together from the case; set on desk or table; connected to an a-c power source, suitable antenna, microphone, and key; and operated as a portable station. Microphone, key, and antenna are not furnished. A small speaker is included in the PM-2. Adequate space is included in the carrying case for the small station accessories (not furnished). The entire package weighs approximately 40 pounds.

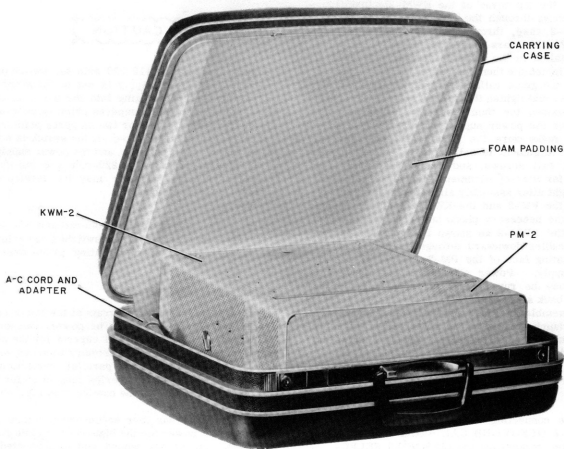


Figure 1. PM-2 and KWM-2 Packed in Carrying Case



## 2.1 INSTALLATION. (Refer to figures 2 and 8.)

a. Remove the KWM-2 from its case.  
b. Slide the PM-2 and KWM-2 together as shown in figure 2. In turn, set each guide rail over the PM-2 slide bar, and mark the perforations which align with the holes in the guide rails. These guide rails must be mounted on the inside of the KWM-2 case as shown in figure 2.

c. Install the three 5/16 x 4-40 machine screws through their split-lock washers, through the perforations in the KWM-2 case, through the three slotted holes in the guide rail, into the holes of the tapped plate as shown in figure 8. Do this for the guide rail on both sides of the KWM-2 case. Do not tighten the guide rail screws at this time.

d. Install the two large chassis nuts in the holes of the KWM-2 chassis side walls as shown in figure 3 and figure 8.

e. Replace the KWM-2 in its case. Slide the PM-2 and the KWM-2 together. Be careful that the two power supply connectors engage correctly. Be sure to support both so that their bottom surfaces are in line.

f. Open the top cover of the KWM-2. Install the thumb screws through the large holes in the sides of the KWM-2 case, through the slots in the ends of the PM-2 slide bars, into the chassis nuts which were installed in the KWM-2 chassis side walls in step d. Tighten the thumb screws.

g. Hold the guide rails down against the top of the slide bars, and tighten the screws securing the guide rails. Loosen the thumb screws. Disengage and reassemble the power supply and the KWM-2 a few times to make sure the guide rail and the power connector alignment is satisfactory. If not, loosen the guide rail screws, and readjust the guide rail positions for correct alignment. Leave the guide rail screws tight after assembly alignment is satisfactory.

h. Pull the PM-2 and the KWM-2 apart far enough to make the necessary phono jack connections to the rear of the KWM-2 as shown in figure 4. Run the shielded cables downward through the cord channels in the mating face of the PM-2 and underneath the power supply. Power cables for the 399C-1 or 312B-5 may be run through the large holes in the front and back sides of the PM-2.

i. Reassemble the PM-2 and the KWM-2, and tighten the two thumb screws in the sides of the assembly to hold the two units together. Figure 5 shows the completed assembly.



Before connecting to a-c line and operating KWM-2 OFF-ON-NB-CAL switch to the ON position, make sure the LINE VOLT SELECTOR SWITCH of the PM-2 is set to the proper position for the a-c power source which will be used. If the switch is set to 110-volt operation and the power supply is operated from a 220-volt supply, damaging high voltages may be developed before the fuse blows.

j. Observe the caution above. To remove the PM-2 case, remove the two Phillips-head screws from the rear (fuse side). Pull the PM-2 from its case, and check the LINE VOLT SELECTOR SWITCH to make sure it is set for the line voltage which will be used. Replace power supply in case, and reassemble to the KWM-2. Plug the female connector of the a-c line cord into the a-c connector of the PM-2 and the male line cord connector into the a-c outlet. The round pin of the a-c connector is a ground connection. If the a-c outlet is not fitted with a mating-type connector, use the adapter furnished, and ground the green wire. The PM-2/KWM-2 combination now is ready for use.

## 3.1 OPERATION.

Do not operate the power supply and transceiver inside the carrying case with the cover closed. Make sure there is adequate ventilation for the heat-generating components of the equipment. Output is adequate for maximum KWM-2 ratings in LOCK key under intermittent conditions. DO NOT operate in LOCK key or TUNE positions under continuous key-down conditions.



Make certain the 110/220 selector switch on the PM-2 Power Supply is set to the proper position before plugging into the a-c source. It is fused for four amperes primary current on 110 volts a-c and for two amperes primary current on 220 volts a-c. If the switch is set to the 110-volt position, and the power supply is operated from a 220-volt a-c supply, damaging high voltages may be developed before the fuse blows.

Except for the above cautions, operation of the power supply is controlled from the switches and relays in the KWM-2. No other operating procedures are required.

## 4.1 CIRCUIT DESCRIPTION.

Figure 9 is a schematic diagram of the PM-2 Lightweight A-C Power Supply. The power transformer T1 furnishes all voltages and current for the power supply outputs. It has two primary windings so that they may be switched to parallel connection for 110-volt operation and to series connection for 220-volt operation. Observe the caution of paragraph 3.1.

The transformer has four secondary windings. One furnishes the power for the high-voltage plate supply rectifiers. It is not tapped and is connected to a half-wave voltage-doubling rectifier circuit, CR1 through CR4. The output of the voltage doubler is filtered by an RC filter consisting of C1, C2, C3, C4, and R2. Another winding furnishes power for the +275-volt plate supply output. It is connected to a full-wave bridge rectifier consisting of CR5 through

CR8. The output is filtered by the pi-section filter consisting of C7A, C7B, and L1. A third winding furnishes voltage for the adjustable bias supply rectifier, CR9. This is a half-wave rectifier, the output from which is filtered by C5, C6, R7, and part of R8. Resistor R8 is adjustable and, with R7 and R9, forms a voltage divider from which the adjustable bias voltage output is taken. All rectifiers are the small, silicon type 1N1492 units. The rectifier cells are stacked in series in each leg of the high-voltage doubler supply in order to limit the voltage across each unit to that which is safely within its limits of tolerance. In all three d-c supplies, a surge-suppressing resistor is inserted to limit the peak current through the rectifiers during filter capacitor charging times immediately after the supply is turned on. The fourth winding furnishes filament power for the KWM-2.

The outputs of the power supply and the primary switching leads are connected to pins of an 11-pin female cable connector, P2. This connector mates with the power plug on the rear of the KWM-2. The a-c line cord furnished with the PM-2 is a three-wire cord, fitted with a three-pin male plug for connection to the a-c source and a three-pin female connector which fits the a-c jack on the PM-2. The round pin of the plug is connected to the power supply ground, and, when plugged into the proper a-c outlet, returns the KWM-2 ground to earth through the a-c supply. If no such proper a-c outlet is available, use the adapter plug furnished with the power supply, and ground the green wire which extends from the adapter. This arrangement automatically provides a ground for the power supply and the KWM-2.

## 5.1 MAINTENANCE.

Maintenance of the PM-2 Power Supply consists of checking and replacing the silicon rectifiers and checking and replacing of electrolytic capacitors. Silicon rectifiers may be checked with an ohmmeter.

ITEM	DESCRIPTION	COLLINS PART NUMBER
PM-2 A-C POWER SUPPLY		097-6102-00
C1, C2, C3, & C4	CAPACITOR, DRY, ELECTROLYTIC: 20 uf -10% ±50%, 450 v dc	183-1054-00
C5, C6	CAPACITOR, ELECTROLYTIC: 10 uf, -10% ±100%, 150 v dc	183-1040-00
C7	CAPACITOR, ELECTROLYTIC: 2 section; 450 v dc; 40 uf ea. section	183-1009-00
CR1 thru CR9	DIODE: silicon; type 1N1492: G.E.	353-1661-00
F1	FUSE, CARTRIDGE: 4 amps, 125 v, glass enclosed, 4 spares furnished	264-0217-00
F2	FUSE, CARTRIDGE: 2 amp, 250 v dc, normal instantaneous; one time	264-4070-00
L1	REACTOR: filter type, 3 hy min 210 ma dc, 45 ohms ±10%	044-0899-668

Forward resistance is approximately 3 ohms, and reverse resistance is approximately 200,000 ohms. When replacing rectifiers, be certain to observe proper polarity. Also, when replacing electrolytic capacitors in the filters, make certain to observe the proper polarity as indicated in the schematic diagram.

## 6.1 SPECIFICATIONS.

Input requirements . . . 110 or 220 volts, 50 to 400  
cps, 4 or 2 amps.

Outputs (nominal)

Heater power . . . 6.0 to 6.3 volts a-c at 11.0  
amperes.

Low-voltage B+ . . . 275 volts at 175 ma.

High-voltage B+ . . . 750 to 800 volts at 250 ma.

Bias voltage . . . -50 to -90 volts, no current  
requirement.

Size . . . 7-3/4 inches high, 14-3/4  
inches wide, 4 inches deep.  
The depth dimension is the  
total extension behind the  
KWM-2.

Weight

PM-2 . . . 13.5 pounds.

Case, KWM-2,  
and PM-2 . . . 42.0 pounds.

## 7.1 PARTS LIST.

Following is a parts list of the PM-2 Power Supply. Figures 6 and 7 show parts location. Figure 9 is a schematic diagram of the PM-2.

ITEM	DESCRIPTION	COLLINS PART NUMBER
LS1	LOUDSPEAKER: 4 ohms voice coil	
R1	RESISTOR, WIREWOUND: 20 ohms ±5%, 5 w	747-5426-00
R2	RESISTOR, WIREWOUND: 200 ohms ±5%, 11 w	747-0237-00
R3, R4	RESISTOR, COMPOSITION: 0.47 megohms ±10%, 1 w	745-3464-00
R5	RESISTOR, WIREWOUND: 40.0 ohms ±5%, 5 w	747-5432-00
R6	RESISTOR, COMPOSITION: 47 ohms ±10%, 1 w	745-3296-00
R7	RESISTOR, COMPOSITION: 3900 ohms ±10%, 1 w	745-3377-00
R8	RESISTOR, VARIABLE, WIREWOUND: 5000 ohms ±10%, 2 w	750-0503-00
R9	RESISTOR, COMPOSITION: 4700 ohms ±10%, 1 w	745-3380-00
S1	SWITCH, TOGGLE: 30 v dc at 20 amp, 250 v dc at 0.5 amp resistive, 115 v ac, 60 cps at 25 amp, 220 v ac, 60 cps at 9 amp resistive	266-3060-00
T1	TRANSFORMER POWER STEP-DOWN, STEP-UP: pri 115/230 vrms, sec 325 v, 230 v, 110 v, 6.3 v	044-0898-662
XF1	FUSEHOLDER: extractor post type; 125 v, 5 amp;	265-1002-00
XF2	accommodates 3AG cartridge fuse	

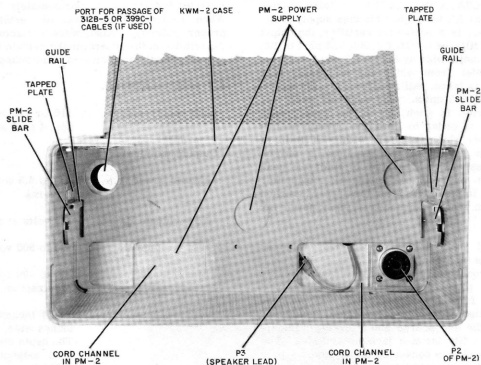


Figure 2. Installing Guide Rails

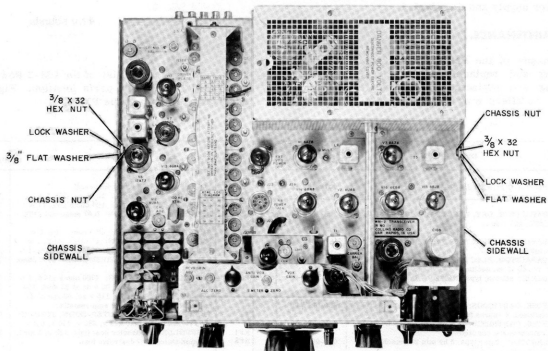


Figure 3. Installation of Chassis Nuts in KWM-2 Chassis Side Walls

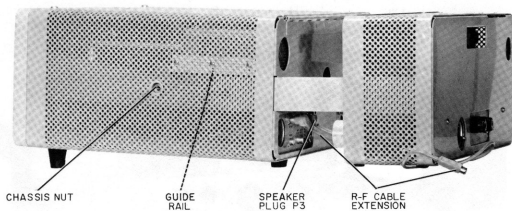


Figure 4. Phone Jack Connections to KWM-2 During Assembly of KWM-2 and PM-2

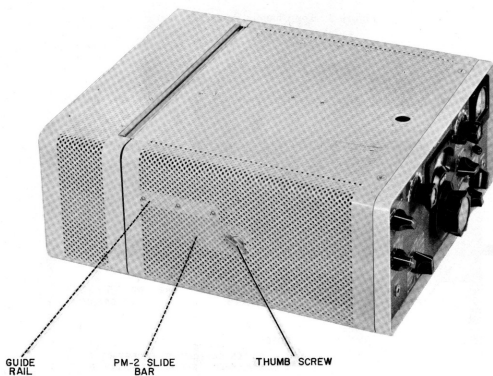


Figure 5. PM-2 Assembled to KWM-2

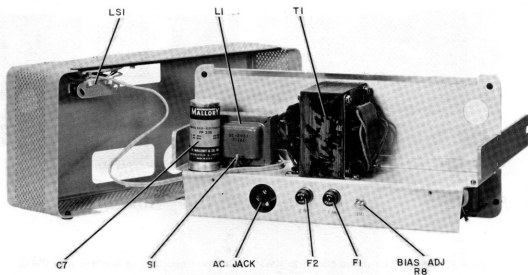
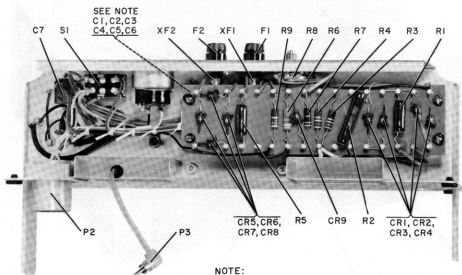


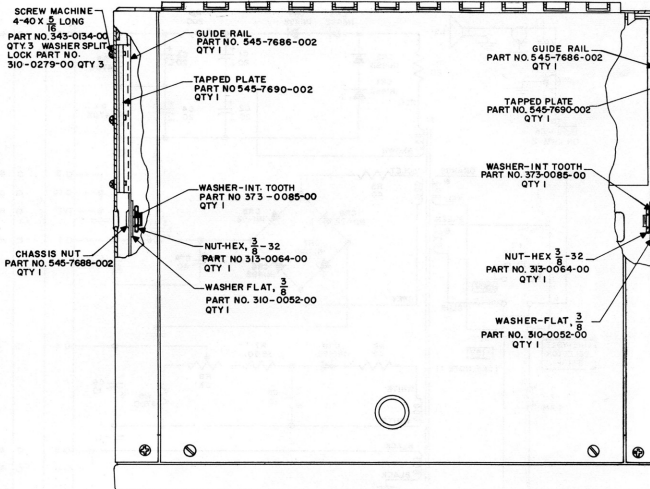
Figure 6. Top Chassis Parts Location



NOTE:

ALL FILTER CAPACITORS, EXCEPT C7 ARE  
ARRANGED UNDER THE MOUNTING BOARD.

Figure 7. Bottom Chassis Parts Location



TOP VIEW OF RADIO

NOTES:

1. REMOVE CHASSIS FROM CABINET.
2. INSTALL THE CHASSIS NUTS AND STIFFENER PADS IN THE FLAT SIDED HOLES IN THE SIDE WALLS OF THE CHASSIS. USE THE  $\frac{3}{8}$ -32 HEX NUTS AND THE INTERNAL TOOTH WASHERS FOR MOUNTING HARDWARE, AS SHOWN IN THE TOP VIEW.
3. INSTALL THE GUIDE RAILS AND THE TAPPED PLATES ON THE INSIDE SURFACE OF THE CABINET WALLS. USE THE 4-40 MACHINE SCREWS AND LOCK WASHERS AS SHOWN IN THE TOP VIEW, SIDE VIEW & SECTION A-A.
4. REASSEMBLE CHASSIS INTO CABINET.
5. IF NECESSARY, THE VERTICAL POSITION OF THE GUIDE RAILS MAY BE ADJUSTED TO FIT THE MOUNT BY LOOSENING THE THREE 4-40 MACHINE SCREWS AND REPOSITIONING EACH GUIDE RAIL WHILE THE RADIO IS ON THE MOUNT AND THE THUMB SCREWS ARE PROPERLY SEATED IN THE SLOTS OF THE CHROME SUPPORT ARMS.



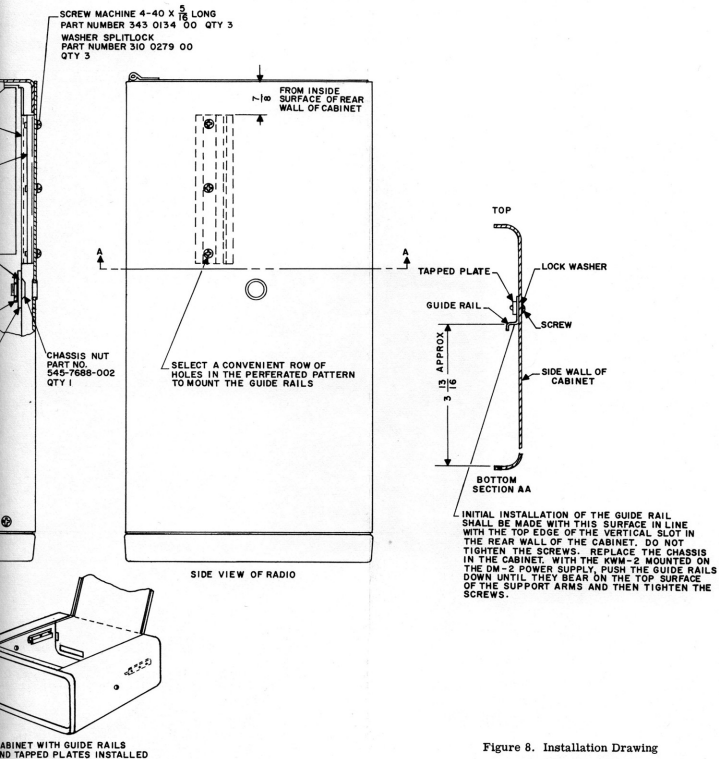


Figure 8. Installation Drawing

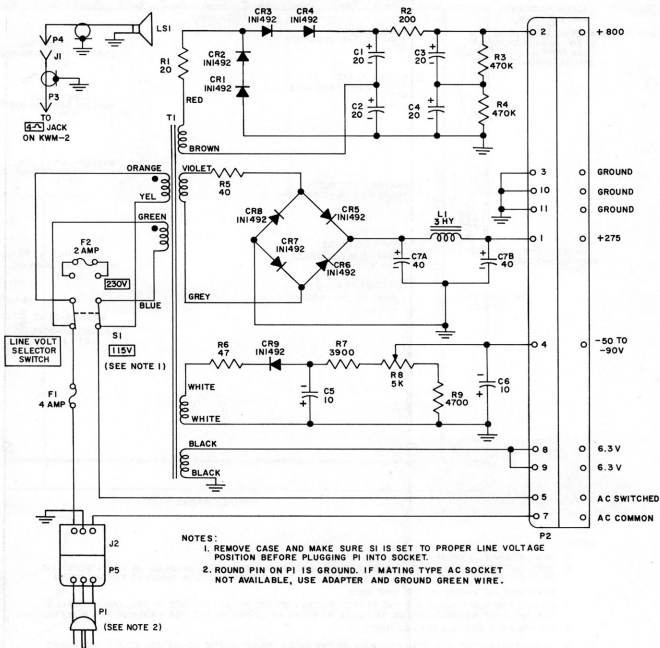


Figure 9. PM-2 Lightweight A-C Power Supply, Schematic Diagram