

MINI-PROBE RECEIVER

MODEL MPR-1



**F. G. MASON**  
ENGINEERING, INC.

MINI-PROBE RECEIVER

MODEL MPR-1

## TABLE OF CONTENTS

	<u>Page</u>
I. SPECIFICATIONS	
1. General Description	2
2. Configuration	2
3. Electrical Specifications	
3.1 MPR - Receiver Section	2
3.2 Miniature Probe Display (Model S-8)	4
II. OPERATING INSTRUCTIONS	
1. Pocket Operation	
1.1 Pocket Operation - General	7
1.2 Battery Installation	7
1.3 Pocket Operation	8
2. Man-Pack Operation	
2.1 Man-Pack Operation - General	9
2.2 Setup of "2" Pack Carrier	9
2.3 Man-Pack Operation	10
3. Table Top Operation	
3.1 Table Top Operation in General	11
3.2 Table Top Setup	11
3.3 Table Top Operation	11
4. Repacking for Transportation or Storage	12
5. MPR-A3C Frequency Counter Operation	12
III. MAINTENANCE, CALIBRATION AND REPAIR	13

## I. SPECIFICATIONS

### 1. General Description:

The model MPR-1 is a portable, battery operated, miniature, modular, radio receiver consisting of basic unit with plug in tuner modules and visual display unit. It may be operated inside coat pocket with hearing aid type earphone.

### 2. Configuration:

- 2.1 Basic Unit; (Model B-8) contains IF amplifiers, converter, crystal filters, audio amplifier, batteries, signal level indicator, and all other circuits; compartment for one tuning unit required for complete receiver without visual display. Size: 4.1 x 6.4 x 17.8 cm. (1 5/8 x 2 1/2 x 7 inches.)
- 2.2 Tuning Modules: (Model TMPR-1 thru 11) contain RF filters, local oscillator, mixer, frequency dial, and plugs into basic unit. Size: 2.6 x 5 x 6.7 cm. (1 x 2 x 2 5/8 inches). Tuner #11 is (1 x 2 x 4 3/4 inches) 2.6 x 5 x 9.5 cm.)
- 2.3 Visual display unit connects with cable to basic unit socket. Size: (1 5/8 x 2 1/2 x 7 inches) 4.1 x 6.4 x 17.8 cm. Displays frequency vs. amplitude of signals received.

### 3. Electrical Specifications:

#### 3.1 MPR - Receiver Section

3.1.1 RF Tuning Range = 20 KHz to 10 GHz

3.1.2 Sensitivity for 6 DB  $\frac{s+n}{n}$   
 for RF 20 KHz/1 GHz = 3 uv or less  
 for RF 1 GHz/10 GHz = 10 uv or less

3.1.3 IF Bandwidths = 10 KHz (crystal filter)  
 90 KHz (crystal filter)  
 1 MHz

3.1.4 Tuning Motion: 6 Revolutions of tuning knob for each of 10 tuners. Slip clutch employed to prevent damage at end of travel. TMPR-11 Tuner has 20 turns.

- 3.1.5 Dials: 360 Degree Rotary barrel type dials employed on each tuner. Tuner #11 has a multi turn dial.
- 3.1.6 Fine Tuning: Provides a minimum of 2% of tuner frequency tuning motion, except on Tuner #11.
- 3.1.7 Batteries: Sufficient for 2 hours of operation. Standard 9 volt battery (5 each) employed. These batteries also supply the S-8 visual monitor.
- 3.1.8 Detectors: AM, FM, CW
- 3.1.9 Signal strength indicator:  
Column of 20 light emitting diodes indicate relative field strength of signal received.
- 3.1.10 Spurious response rejection:  
RF 20 KHz/1 GHZ = 30 DB or more  
RF 1/10 GHZ image, 2nd & 3rd harmonic no rejection  
RF 1/10 GHZ all others = 30 DB
- 3.1.11 Outputs:
- Audio (earphone level)
  - Signal meter
  - Visual display unit outlets include detect out, sweep signal input.
  - External power socket (+18 volts) (+ 9 volts)
  - External antenna
  - Frequency display program and local oscillator signal outlet.
- 3.1.12 Antennas: Whip antenna and microwave antenna mount on case of receiver for use in the portable mode.
- Other
- external antennas are provided such as a long wire and telecom adapters.
- 3.1.13 Controls:
- Tuning (6 revolutions/tuner)
  - Fine Tuning (3/4 revolution)
  - Power Switch
  - IF Gain (3/4 revolution, 50 dB attenuation min.)
  - Detector (AM/FM)
  - Earphone volume (3/4 revolution)
  - Bandwidth (wide, medium, narrow)



Tuner	RF MHz	AM Sens		Image Freq. MHz	Image Rejection	IF Freq. (MHz)	IF Rejection	Freq. Counter OP
		IF BW	6 dB S+N/N					
1	.02	20 KHz		47.02		23.5		
	3	"		50		"		
	5	"		52		"		
2	5	"		52		"		
	10	"		57		"		
3	15	"		62		"		
	15	"		237		111		
	20	"		242		"		
4	25	"		247		"		
	25	"		247		"		
	30	"		252		"		
5	35	"		257		"		
	35	90 KHz		257		"		
	55	"		277		"		
6	75	"		297		"		
	75	"		122		23.5		
	100	"		147		"		
7	130	"		177		"		
	130	"		352		111		
	160	"		382		"		
8	230	"		452		"		
	230	"		452		"		
	300	"		522		"		
9	420	"		642		"		
	420	1 MHz		642		"		
	600	"		822		"		
10	800	"		1022		"		
	800	"		1022		"		
	1200	"		1422		"		
11	1600	"		1822		"		
	1.6 GHz	"						
	5 GHz	"						
	10 GHz	"						

**CONTROL & OTHER FUNCTIONS: B8 BASIC - S8 VDU**

Basic B8 Unit and PS-16		Visual Display Unit S8	
IF Gain Control	<input type="checkbox"/>	Inside:	
Fine Tune Control	<input type="checkbox"/>	Focus	<input type="checkbox"/>
AM/FM Switch	<input type="checkbox"/>	Astigmatism	<input type="checkbox"/>
Power Switch	<input type="checkbox"/>	Horizontal Position	<input type="checkbox"/>
Phones/Speaker Interlock	<input type="checkbox"/>	Vertical Position	<input type="checkbox"/>
Battery Operation	<input type="checkbox"/>	Intensity	<input type="checkbox"/>
Power Supply Operation	<input type="checkbox"/>	Outside:	
Power Supply 115/230	<input type="checkbox"/>	Vertical Gain	<input type="checkbox"/>
Volume Control	<input type="checkbox"/>	Sweep Width	<input type="checkbox"/>
		Power Switch	<input type="checkbox"/>
		Fast/Slow Sweep	<input type="checkbox"/>
		Sweep on/off	<input type="checkbox"/>

COMPONENT CHECK LIST

Part No.	Model No.	Item	Included	Missing	Notes
30543	B-8	Basic MPR			
30545-C	TMPR-1	Tuner .02-5			
30546-C	TMPR-2	Tuner 5-15			
30547-C	TMPR-3	Tuner 15-25			
30548-C	TMPR-4	Tuner 25-35			
30549-C	TMPR-5	Tuner 35-75			
30550-C	TMPR-6	Tuner 75-130			
30551-C	TMPR-7	Tuner 130-230			
30552-C	TMPR-8	Tuner 230-420			
30553-C	TMPR-9	Tuner 420-800			
30554-C	TMPR-10	Tuner 800-1600			
30557	TMPR-11	Tuner 1.6-10 GHz			
30544	S-8	Visual Display			
30541	FC-5	Frequency Counter			

ACCESSORIES

Part No.	Quantity	Description			
PWD4163-B	2	Battery Holder			
30542	1	PS-16 AC Power Supply			
7838-A	1	Power Adapter 3/2			
5654-A	1	European Adapter #1			
5655-A	1	European Adapter #2			
R6292-A	1	Whip Antenna - MPR			
30561	1	Microwave Antenna Ass'y.			
6860-A	1	Gator clip Adapter - MPR			
6858-A	1	Ant. Cable Extension comp'l.			
6857-A	1	Microwave ant. cable comp'l.			
30540	1	2-Pack Carrier B8/S8			
30558-A	1	Long Wire Ant. Ass'y.			
30568-A	1	Short Wire Ant. Ass'y.			
30562-A	1	Blocking Capacitor			
7821-A	1	Attache' Case			
7886-A	1	Case Insert - MPR-1			
7887-A	1	- MPR-2			
7888-A	1	- MPR-3			
7967	1	Manual			
7807	1	Headset			
7832	1	Headset Cord			



## II. OPERATING INSTRUCTIONS

### 1. Pocket Operation

#### 1.1 Pocket Operation - General

By "pocket operation" we are referring to the most portable minimum size configuration of the MPR allowing use while being carried in an outside or inside coat pocket. This leaves hands free allowing unobservable radio monitoring and transmitting source location.

#### 1.2 Battery Installation

First remove B-8 basic unit from the "2 pack" carrying frame, if it is so mounted, by backing out bottom thumbscrew and pulling B-8 forward to disengage it from the rear connectors. Then remove two small thumbscrews located on each side of the rear battery cover of the B-8. If there are old batteries inside, pull string loop attached to battery printed circuit board holder to remove old batteries. Now snap the batteries off the board by carefully prying them toward the top edge of the board, not in the long direction of the board. Snap 5 new batteries in place observing the polarity signs on the board. Use only 9 volt batteries having the same physical size and connectors as the following partial list of manufacturers' and model numbers.

Eveready	<u>E146X</u>	Mercury	*
Mallory	<u>MN1604</u>	Alkaline	*

Eveready	<u>216</u>	Carbon	
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Eveready	<u>N88</u>	Nicad Rechargeable	
	*	Preferred for longest running time.	

Some Nicad rechargeable batteries even when fully charged will deliver less than the 7.5 volts minimum required to operate the MPR. Read battery labels before using. Some low cost carbon batteries will give the least running time.

If only 3 batteries are available or a lighter weight is desired, snap the 3 batteries in position numbers 1, 2 and 4. Unit may also operate on only 2 batteries by placing them in positions 3 and 5 and adding a jumper wire from the plus terminal of position 4 to the plus terminal of position 1. When using less than 5 batteries, place paper, cotton or cloth wad (non conducting) to fill in unused spaces to prevent loosening of batteries. Install batteries in B-8 by sliding the pack

into the B-8 with the battery board on the left as you face the opening so that the printed connector is aligned with the socket visible inside. Now replace cover and thumbscrews. An extra battery board is provided in case snaps become loose or corroded. This extra board can be preloaded with batteries to facilitate a quick reload if necessary. Always store preloaded pack or loose batteries so that they cannot short out by accident in the carrying case. It is highly recommended that all batteries be removed from radio equipment when not in use to prevent corrosive leakage damage and accidental drainage.

### 1.3 Pocket Operation

Only the basic B-8 unit, one tuning unit, one antenna and earphone are used. The receiver is activated by a Tuner/Power interlock switch that automatically turns power on when tuner is inserted. Tuner must be withdrawn to turn power off. A few "S" meter lamps will light. Select tuner unit that covers the frequency range desired. Insert tuner carefully in front opening of B-8 so that panel markings are "right side up". When the tuner is correctly engaged, its panel is almost flush (except for TMPR-11) with the B-8 front face. The tuner knob and dial can be used as a handle to insert and withdraw the tuner. The tuner is held in by the connector and side spring tension only. Be careful not to drop tuner out by rough handling. Connect short wire or other antenna to the antenna connector on the front of the B-8. Connect the earphone to the phone jack also on front of B-8. Set controls as follows:

Fine Tune: Center

IF Gain: Maximum clockwise. Back off counter clockwise if "S" meter is off scale to observe level changes.

AM/FM: To match modulation of incoming signal. If unknown, place in position that gives least audio distortion. If searching, set to AM up to 35 MHz (T1, 2, 3, 4) then FM to 1.6 GHz (T5, 6, 7, 8) and AM then to 10 GHz (T11).

AFC: To lock signal on.

Bandwidth: Generally 10 KHz BW to an RF of 35 (T1, 2, 3, 4); 90 KHz BW to an RF of 420 (T5, 6, 7, 8) and 1000 KHz BW to 10 GHz RF (T9, 10, T11)

Volume Control: Set for earphone level desired.

Tuner Knob: Adjust tuner knob by rotating until desired frequency is indicated on the dial. Tune signal in for maximum "S" meter reading (most lamps lit). Fine adjustment may be made by rotating the "Fine Tune" control.

Now place unit in inside or outside jacket or coat pocket and walk in direction which increases the sound level and the "S" meter of the signal. As you approach the transmitting source, the sound may

reach a constant limited level and all of the lamps of the "S" meter may be lit. At this point reduce the "IF" gain by rotating the control counter clockwise until "S" meter is at  $\frac{1}{2}$  scale or less and proceed to move in a direction to increase the "S" meter level again. Repeat this procedure until transmitting source is found physically. It may be necessary to retune the tuner frequency knob to keep signal on peak adjustment.

## 2. Man-Pack Operation

### 2.1 Man-Pack Operation - General

Man-Pack or carry operation is like the pocket operation except that the equipment is carried in hand or worn on a belt or shoulder strap rather than in a pocket. Also the visual display unit as well as the receiver are used allowing more sophisticated signal searching and analysis at the expense of a larger but still portable size.

### 2.2 Setup of "2" Pack Carrier

Setting up the "2 pack" carrier. (Refer to diagram #1)  
 The purpose of the "2 pack" carrier is to join the basic receiver (B8) with the visual display unit (S8) and various antennas so that the system may be conveniently carried about. It is called a 2 pack carrier because it is intended that future systems may have more than these two units in a system such as the addition of a frequency counter and other modules. First install fresh batteries in basic unit S-8 as per paragraph 1.2. To mount the basic (B8) unit in the carrier, place it in the left side and slide it back such that the right rear blue connector mates with the corresponding connector of the carrier. Hold carrier and basic unit together, turn carrier over and insert and tighten thumb-screw in center region of the B8. The basic unit is now fully mounted. Next mount the visual display unit in the same manner on the right side of the carrier. Next adjust the handle by loosening the thumbscrews on each side of the carrier and swing it around to the front so that when it is held by the handle it hangs down with controls up. Tighten right hand thumbscrew only. Now rotate "U" shaped antenna mounting bracket located under left hand thumbscrew until the antenna mounting screw points toward the handle. Tighten left hand thumbscrew. Next thread on the whip antenna to this screw by carefully rotating it clockwise. Now connect the wire from the antenna bracket to the antenna connector on the front of the basic unit. If other antennas such as the short or long wire are to be used, connect them directly to the basic receiver and disregard direction of the antenna bracket but be sure to tighten the left hand thumbscrew to hold the handle in place. If the

T-11 microwave unit is to be used, remove whip antenna and rotate antenna bracket so that the side opposite the screw faces the "S" meter surface of the B-8. Now mount the triangular microwave antenna on the bracket with the thumbscrew provided so that the antenna protrudes away from the left side of the carrier. Then attach microwave antenna cable protruding from the front of the T-11 tuner to the antenna with the matching gold connectors.

The other antenna connector on the B-8 is inactive when the T-11 Tuner is used so that the other antennas may be left connected or removed. The carrier is now ready to be carried by hand or with a strap around the neck or shoulder. Clip straps through holes in the handle. See Special Operating Instructions for TMR-11 Microwave Tuner on Page 16.

### 2.3 Man-Pack Operation

The receiver section (B8) and tuner selected are operated in the same manner as described in paragraph 1.3. The visual display unit (S-8) is powered from the batteries in the basic receiver section. The basic receiver is switched on and off when a tuner is inserted and withdrawn operating an internal interlocking switch. When the tuner is mounted in the basic unit the visual display unit may now be switched on by the power switch on the S8 front panel. The S-8 should only be turned on when needed to conserve battery power. To operate the S-8, turn the power on, switch the sweep switch to on and set the lower knob with the horizontal arrows maximum clockwise. This will provide the maximum sweep width (dispersion) of the display. Now set the knob with the vertical arrows clockwise until noise (grass) appears on the base line. As the tuner frequency control is adjusted the incoming signals will appear on the display, and a buzzing noise will occur in the phones. Set the signal to be investigated on the center dot marker of the S-8 base line. Place the switch marked F-S (Fast-Slow) in "S" position and the audio in the earphones should become clear enough to identify. If not, turn sweep off with the sweep ON-OFF switch. The signal pattern displayed will change in width and direction depending on the position of the AM/FM and bandwidth switches of the basic unit. In "FM" the pattern will be that of an "S" curve. The fast position of the F-S switch speeds up the number of scans per second for a brighter pattern, however the audio becomes intelligible. The purpose of the display unit is to aid in signal searching, identification, and relative level indication. It is also an aid to following signals that are drifting or moving with frequency and is especially useful when operating the T-11 microwave tuner since a slight drift or movement in frequency of either the transmitter or receiver will cause loss of audio and "S" meter indication. When the sweep is in "OFF" position the display becomes a time base display showing the post detection

signal. In RF bands that are very crowded with signals, back off the sweepwidth control (lower control with horizontal arrows) to spread signals out on base line. The carrier also has a small loudspeaker internally mounted. If the earphones are removed the audio will be heard from this loudspeaker instead of the phones. The main purpose of the speaker is to locate transmitting microphones by the feed-back technique. The hidden microphone picks up the speaker sound and starts up a howling sound in the same manner as a maladjusted public address system.

### 3. Table Top Operation

#### 3.1 Table Top Operation in General

When the MPR is used in an initial countermeasures search to scan all frequency bands, table top operation is preferred since each tuning head must be mounted sequentially in the B8. Table top operation allows hands to be free to change tuners. Also it allows the AC power of the building to be used instead of batteries.

#### 3.2 Table Top Setup

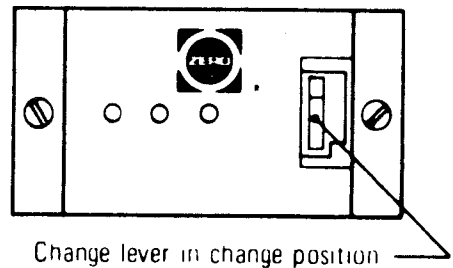
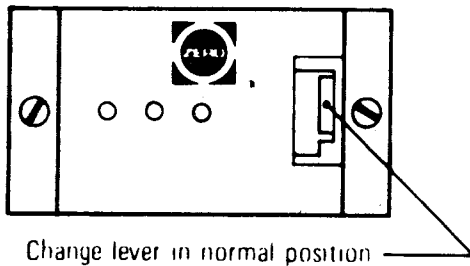
Mount the basic unit (B8) and visual display unit (S-8) in the 2 pack carrier as per paragraph 2.2. Now loosen both handle thumbscrews and swing handle down to act as a prop to raise the front panel face off the table to a convenient angle. Tighten the right hand knob only. Then adjust the antenna bracket on the left side so that the antenna mount screw points up vertically. Mount the whip antenna or micro-wave or long wire antennas as per paragraph 2.2. To operate receiver on AC power mains, first set PS-16 power supply line switch to the proper AC voltage (115-230). To do this remove fuse cap and plastic switch lock. Set the switch to 115 or 230 according to the local voltage. Then replace the plastic lock by placing the switch handle in the hole which locks the switch in the proper position and replace the fuse cap to retain the lock. Now plug the two micro audio plugs through the rear panel of the carrier into the B8 rear jacks according to the matching color codes. Plug AC plug into wall outlet using appropriate foreign adapters. A few "S" meter lights should light when a tuner is plugged in. Insertion of the AC supply jacks disconnects the internal batteries.

#### 3.3 Table Top Operation

Table Top operation is the same as previously described for the carrier operation except that the long wire antenna may be used conveniently for the lower frequencies to 100 MHz.

#### 4. Repacking for Transportation or Storage

Leave basic unit and visual display unit mounted in the 2-pack carrier but remove the tuner, antennas and power supply plugs. Place the carrier in the matching cut out of the case foam insert. (This cut out precludes leaving a tuner mounted thereby eliminating the problem of accidentally leaving the batteries switched on). Place all other parts in their matching pockets. Place small accessory parts in plastic pouch before putting them in the accessory pocket. The microwave antenna may be stored in the lid pocket of the attache' case. The combination lock of the attache' case may be changed according to the following instructions:



This product comes to you equipped with the latest development in a key-security lock.

It is set at the factory to open at 000. You may leave it at this setting if you wish and always open the case by turning the dials to 000 or you can set YOUR OWN SECRET COMBINATION on the three dials in the following manner:

**STEP 1** Looking at the back of the

lock inside the case, you will see the change lever extending from the body of the lock.

**STEP 2** Now move the change lever so that it hooks in behind the notch or change position in the opening of the lock case (please refer to illustration). Leave it in this position while you follow step 3.

**STEP 3** Turn the dials to your own secret number and mark the number

down in some place where you can refer to it (in case you forget the number.)

**STEP 4** Without disturbing the setting of the dials, move the change lever back to its original (normal) position. Make sure you have done this before closing case and using lock. Your lock will now open only at your own secret combination. If you want to change to a new combination, simply repeat steps 2, 3, & 4.



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#### 5. MPR-A3c Frequency Counter Operation

The frequency counter of the Mason Model A3C receivers that have been so modified, can be used to indicate precisely the frequency of the MPR up to 1600 MHz. Set the A3C up as per the normal operating instructions except that one of the multi coax antenna cable plugs now has 6 pins while

the other end has 4 pins. The six pin plug must go to the receiver antenna stand. Also the modification replaces the old frequency display "on-off" switch with a 3 position rotary switch marked Off-On-MPR. The off and on positions operate the A3C as before. Now plug the extra 9 pin blue plug of the A3C antenna cable into the left hand rear socket of the MPR B8 section. Now the "OFF-ON-MPR" switch can select either the MPR frequency or the A3C frequency or turn the counter off. The digital display is automatically programmed to read the proper frequency no matter what tuner is in the MPR or what tuner switch position the A3C is in. The exceptions to this are that the A3C must not be in the band T9, 10, or 11, to read MPR frequencies, the counter will not work on the MPR microwave tuner T-11, and the S-8 visual display unit sweep must be off. When the MPR is unplugged or inactive and the A3C switch is in MPR position, random digits will appear which are meaningless.

### III. MAINTENANCE, CALIBRATION AND REPAIR

1. It is highly recommended that should malfunction occur, the entire system with all components be returned to F. G. Mason Engineering, Inc., 1700 Post Road, Fairfield, Conn. 06430 for repair and calibration.
2. If this is inconvenient, then only the component requiring repair need be returned. The malfunctioning component may be determined best by substituting known functioning components if a second system is available. If not and test instruments are not available try to test by tuning into known broadcast stations.
3. There should be some signals on each tuner band except the microwave area. If only one tuner seems to be bad, that tuner only requires repair. If all tuners numbers 1, 2, 6 and 11 are low in sensitivity or out, then the trouble is in the B8 basic unit 23.5 MHz IF section. If all tuners 3, 4, 5, 7, 8, 9 and 10 are poor in sensitivity or no sensitivity then the trouble is in the B8 basic unit 111 MHz IF section.
4. If poor or no sensitivity occurs with all tuning heads make sure first that operating instructions have been followed carefully. The following is a list of common operator errors:
  - a.) PS-16 line switch not set to local voltage.
  - b.) Connectors not fully engaged. PS-16 to B8 Basic connectors reversed, tuner not fully inserted, earphone connector loose, etc.
  - c.) I. F. gain control not maximum.
  - d.) Bandwidth and AM/FM switch improperly set.
  - e.) Antenna not connected.
  - f.) Batteries exhausted.
  - g.) Battery connectors corroded or loose.
  - h.) Improper batteries.

5. If it is absolutely necessary to field repair the MPR, contact the manufacturer for information as per paragraph 2. Schematics and pictorial drawings may be ordered.

6. Disassembly of Components

6.1 Tuners TMPR-1 thru TMPR-10

Remove screw located at the rear of the tuner with the large diameter head near to the connector. Leave other screw in place. Carefully pull cover off tuner by holding knobs in one hand and remove cover with other. Cover should be pulled away from front panel. Now remove spring clip holding inner cover in place. Inner cover may now be removed from tuner. Reassemble tuner in the same manner. To adjust the dial, back out the dial set screw located at the end of the dial label. Rotate tuner knob to the stop position and force dial drum in direction for dial correction. Retighten set screw.

6.2 B-8 Basic Unit

First, remove batteries as per paragraph II, 1.2. Remove 4 small screws below separation line on the left side of the B-8. Do not remove other screws from this surface. On the right hand surface remove 2 screws located on the upper cover towards the front. Now remove 2 screws located just under the separation line remaining. Do not remove other screws from this surface or the bottom or rear surfaces. Now pull upper and lower portions apart. A small screwdriver may be necessary to pry the units apart. The upper and lower internal parts are now exposed but joined together with a cable harness. For further access of the electronic components in the upper portion remove the 6 screws holding the inner cover on. This cover may now be removed exposing the underside of the IF amplifier printed circuit board and controls. Inductor tuning cores may be adjusted through the holes in the printed circuit board through which the cores may be seen. Do not attempt to make any adjustments without proper instrumentation, schematic diagrams and instructions. The battery compartment and tuner compartments and their associated connectors are accessible in this configuration. Repairs or replacements of these components in the lower portion of the B-8 may be made by removing the 2 mounting brackets held in by screws in the cover located on the bottom and side surfaces. Also the interlocking micro switches that tuner insertion activate may be adjusted for proper action. Reassemble unit by following the disassembly instructions in reverse order. When assembling upper and lower portions of the B-8, be sure that no wires are pinched or being cut and that the alignment tabs are all in proper position.



### 6.3 S-8 Visual Display Unit

Remove 4 small size screws from bottom surface. Leave 2 other screws in place. Pull lower and upper portions apart. A small screwdriver may be necessary to pry them apart. The 5 trimming potentiometers are now accessible for adjustment. The label nearby indicates location and function of these controls. To remove the printed circuit board, remove the 2 screws on the left surface of the bottom portion of the S-8. Slide the board up and out. To remove the cathode ray tube and high voltage converter assembly, remove the 2 remaining large screws from the bottom of the S-8 and pull the assembly up as a unit. The cathode ray tube may now be removed from the socket. When reassembling be sure that the upper and lower sponge pads are in place around the CRT and that the green plastic filter is in the proper position. When replacing the top cover of the S-8 be sure that the stand off posts align properly and that the cover tabs are in proper position. Also BE SURE THAT NO WIRES ARE BEING PINCHED OR CUT.

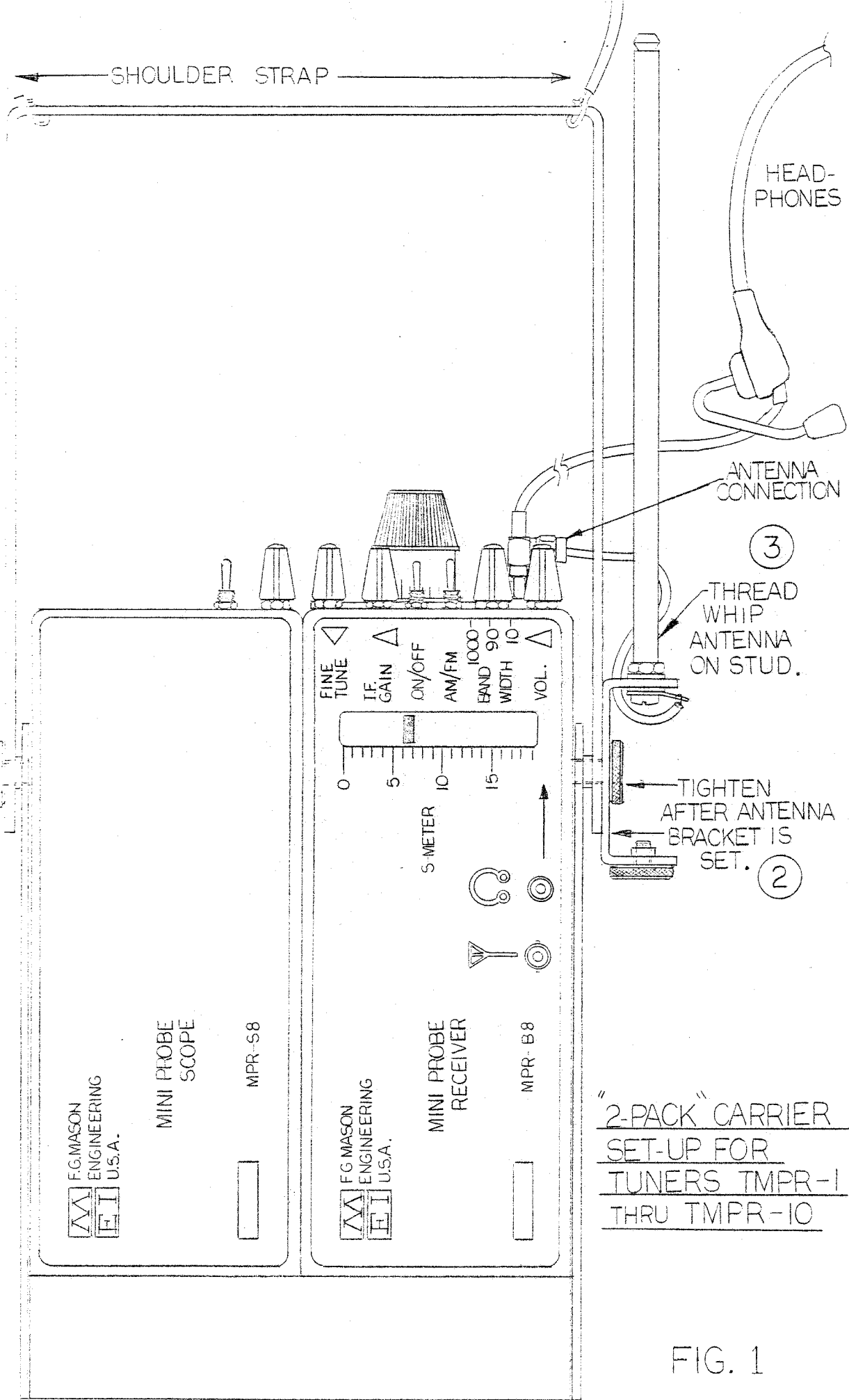
Special Operating Instructions for the TMRP-11 Tuner 1.6-10 GHz

- 1.) See paragraph 2.2 for setup of the tuner and antenna.
- 2.) This tuner operates on fundamental second and third harmonic of the local oscillator. This means that as the dial is turned across the tuning range of 1.6 to 3.3 GHz (Band 1) the tuner will also be tuning across 3.2 to 6.6 (Band 2) and 4.8 to 10 GHz (Band 3) at the same time. Since very few signals are transmitted above 1 GHz, the few signals that may be encountered can easily be identified.
- 3.) Place bandwidth in 1000 KHz, and use AM detect. Tune slowly across the band. **DO NOT FORCE KNOB AGAINST STOPS AT EITHER END OF BAND.** This may damage the mechanism. When a signal is heard and it is necessary to identify its frequency, proceed as follows:
  - a.) Any signal received will appear twice within a 50 MHz (as read on Band 1, 2 approximately one inch) motion of the dial. Always set the dial to the ~~lower~~  
*upper* of these two signal points See e.) for exceptions.
  - b.) The second "false" signal is called the image and serves to identify which frequency band the signal is on. If the image frequency is 47 MHz (about 1" on dial) removed from the correct dial setting (as read on Band 1) then the signal is on band 1 (1.6 to 3.3) therefore use the band 1 dial numbers.
  - c.) If the image is 23.5 MHz (about  $\frac{1}{2}$  inch) removed from the correct dial setting (as read on the band 1) then the signal is within Band 2. (3.2 to 6.6) therefore use the band 2 dial numbers.
  - d.) If the image is 15.66 MHz (about  $\frac{1}{3}$  inch) removed from the correct dial setting (as read on band 1) then the signal is within band 3 dial numbers. The band 3 dial numbers have been restricted to 6.6 to 10 GHz because of the large overlap of band 2 and 3 in the 4.8 to 6.6 area. If the image spacing indicates band 3 in an area of no band 3 numbers, search for the same signal in the band 2 area marked between 4.8 to 6.6. When signal is found (it will be at a point on band 2 that is the original point as read on band one multiplied by 3) use paragraphs a and c as before to read the correct frequency.
  - e.) Special Conditions:
    - 1.) A signal may only appear once between 1.60 and 1.647. It is therefore the image of a signal below 1.6 GHz. Use the TMRP-10 tuner to receive this signal.

- 2.) A signal may appear only once close to the upper end of the dial. This means that the image is above 10 GHz and can be ignored.
- 3.) The TMR-11 is sensitive above 10 GHz. If the image and fundamental signals received are closer together than 15.66 MHz (as per ph. d) then proceed in like manner as b, c, and d to multiply the band one reading according to the following formula to obtain the correct frequency.

$$\text{True frequency} = \text{Band 1 } \frac{\text{Lower}}{\text{upper}} \text{ Reading X } \left( \frac{47 \text{ MHz}}{(\text{Band 1 upper} - \text{Band 1 Lower})} \right)$$

(MHz) (MHz)



SHOULDER STRAP

HEAD-PHONES

ANTENNA CONNECTION

3

THREAD WHIP ANTENNA ON STUD.

TIGHTEN AFTER ANTENNA BRACKET IS SET.

2

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MINI PROBE  
SCOPE

MPR-S8

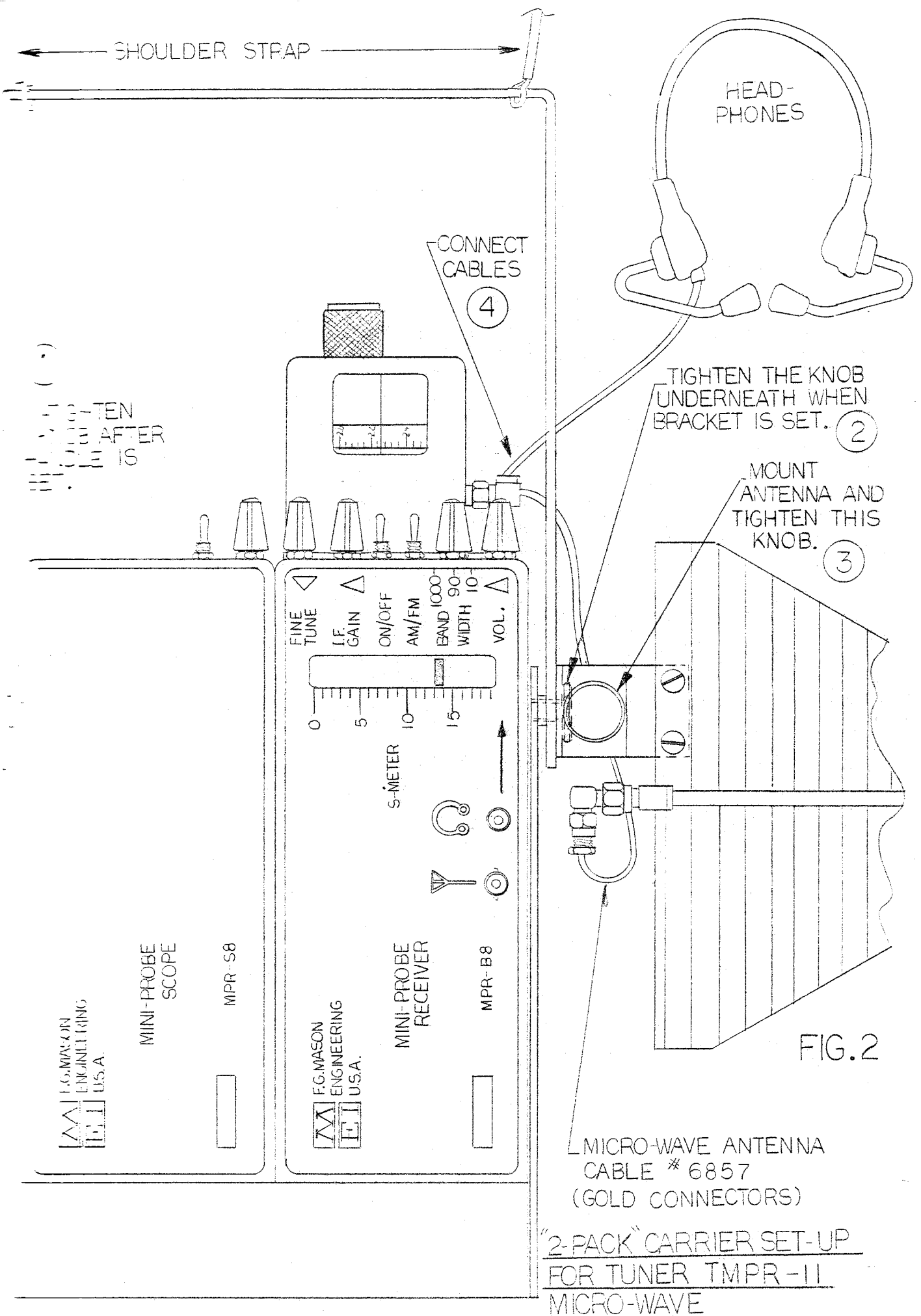
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MINI PROBE  
RECEIVER

MPR-B8

"2-PACK" CARRIER  
SET-UP FOR  
TUNERS Tmpr-1  
THRU Tmpr-10

FIG. 1



TIGHTEN  
KNOB AFTER  
BRACKET IS  
SET.

TIGHTEN THE KNOB  
UNDERNEATH WHEN  
BRACKET IS SET. (2)

MOUNT  
ANTENNA AND  
TIGHTEN THIS  
KNOB. (3)

CONNECT  
CABLES  
(4)

FIG. 2

MICRO-WAVE ANTENNA  
CABLE # 6857  
(GOLD CONNECTORS)

"2-PACK" CARRIER SET-UP  
FOR TUNER TMPR-11  
MICRO-WAVE

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TABLE TOP SET-UP  
SIDE VIEW

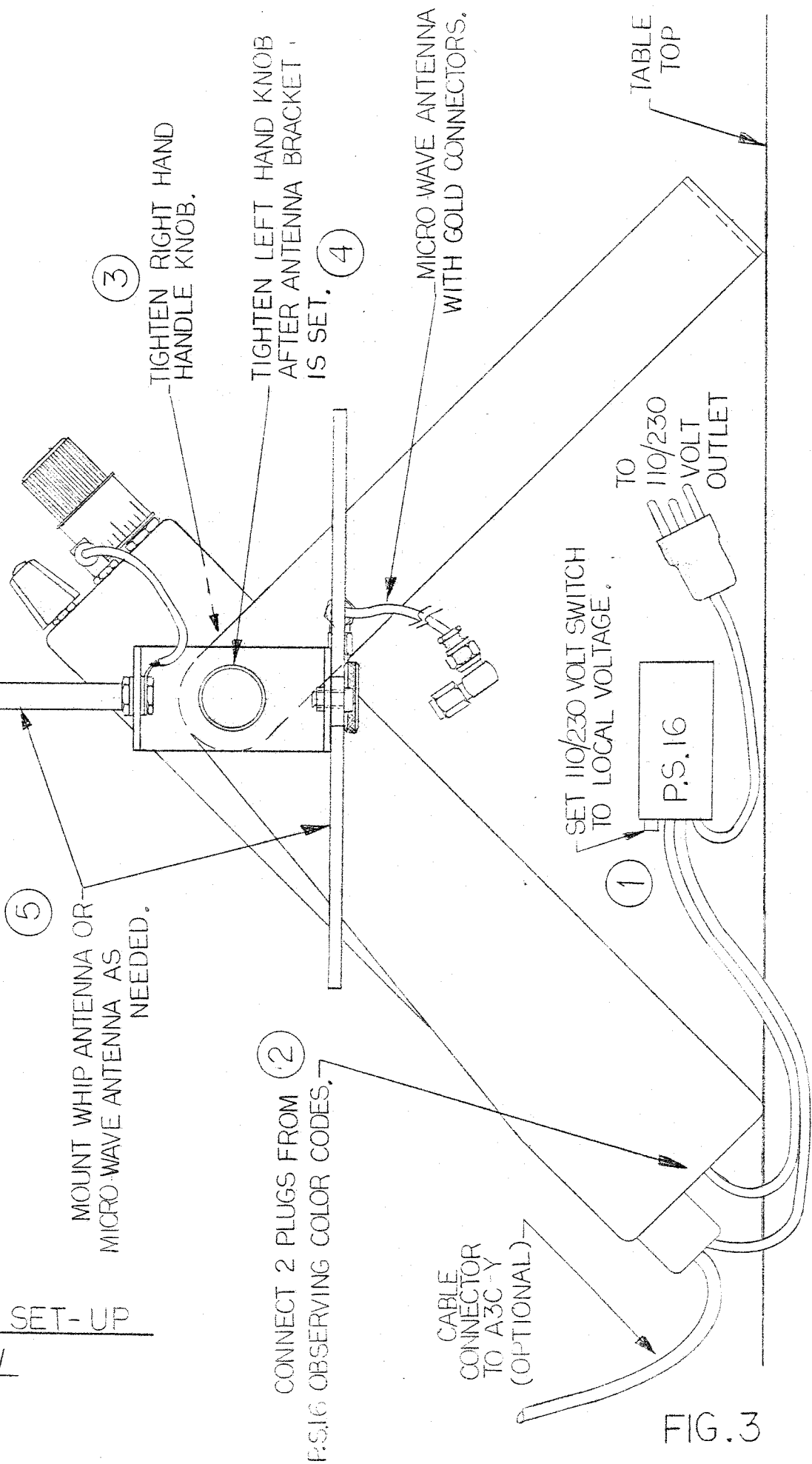


FIG. 3

MICRO WAVE ANTENNA  
MAY BE ROTATED TO  
VERTICAL PLANE.

TABLE TOP SET-UP  
FRONT VIEW

MICRO WAVE ANTENNA

MICRO-WAVE ANTENNA CABLE  
WITH GOLD CONNECTORS.

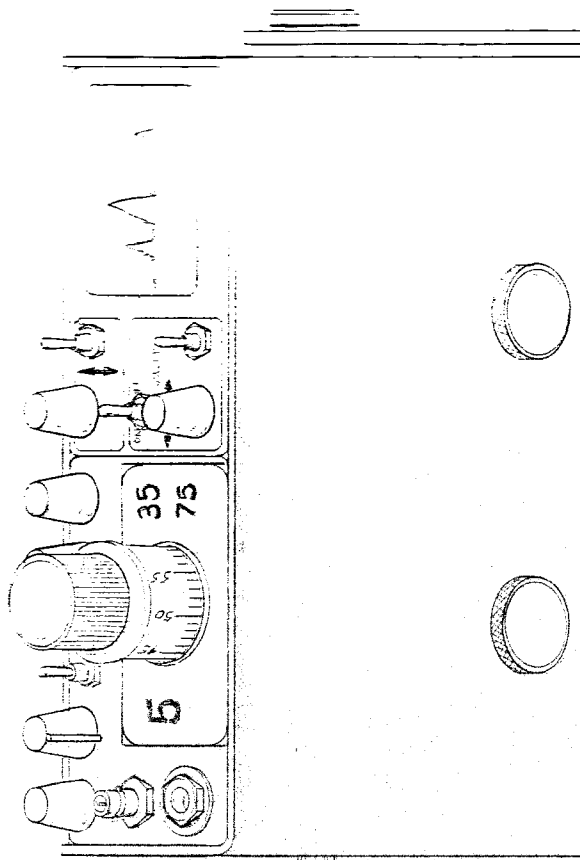


TABLE TOP

FIG. 4