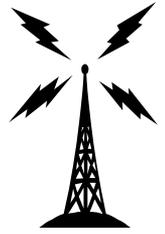


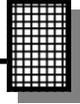
HIGH INTERCEPT POINT FM BROADCAST AMPLIFIER



Ramsey Electronics Model No. FMBA1

Antenna mounted amplifier does its job BEFORE the line loss !

- **Virtually overload proof.**
- **Ideal preamp for use near cities or strong local stations.**
- **Mast mount for best signal to noise ratio and performance.**
- **Also works great for low power FM transmitters.**
- **Put your power at the antenna, not in the feedline.**
- **Very well filtered with 5 sections of low pass filtering for excellent harmonic performance.**
- **Operates on 15 Volts DC.**
- **Clear, concise instructions guide you step-by-step to a finished product that works FIRST time.**



PARTIAL LIST OF AVAILABLE KITS

RAMSEY TRANSMITTER KITS

- FM25B FM Stereo Transmitter
- AM1 AM Transmitter
- TV6 Television Transmitter
- FM100B Professional FM Stereo

Transmitter

RAMSEY RECEIVER KITS

- FR1 FM Broadcast Receiver
- AR1 Aircraft Band Receiver
- SR2 Shortwave Receiver
- AA7 Active Antenna
- SC1 Shortwave Converter

RAMSEY HOBBY KITS

- SG7 Personal Speed Radar
- SS70A Speech Scrambler
- MX5, MX-10 Mixers
- MD3 Microwave Motion Detector
- PH15 Peak hold Meter
- TFM3 Tri-Field Meter
- STC1 Stereo Transmitter Companion

RAMSEY AMATEUR RADIO KITS

- DDF1 Doppler Direction Finder
- HR Series HF All Mode Receivers
- QRP Series HF CW Transmitters
- CPO3 Code Practice Oscillator
- QRP Power Amplifiers

RAMSEY MINI-KITS

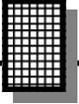
Many other kits are available for hobby, school, scouts and just plain FUN. New kits are always under development. Write or call for our free Ramsey catalog.



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KIT ASSEMBLY AND INSTRUCTION MANUAL FOR

HIGH INTERCEPT POINT FM BROADCAST AMPLIFIER KIT

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INTRODUCTION

Thank you for purchasing the FMBA1 FM Broadcast Amplifier. The FMBA1 can be used as a state of the art amplifier for almost any low power transmitter or you can set the FMBA1 up as an excellent receive preamp. With 5 sections of low pass filtering, your signal will come in crystal clear over all of the noise and interference. And with an incredible gain of up to 38.5dB (7079 times the input power) at 100 Mhz, you will notice a big difference in the signal distance and clarity. A gain of 38.5dB means that only 125 micro watts will get you 1 watt of crystal clear power!

You'll notice that the PC board included with your kit contains plating on both sides of the board. This topside ground "plane" is necessary to create the proper RF impedance in the traces run on the bottom side of the board. We have also used the latest in trouble free amplifiers, the MAV3 IC, to provide crystal clear linear amplification.

NOTE TO NEWCOMERS: If you are a first time kit builder, you may find this manual easier to understand than you may have expected. Each part in the kit is checked off as you go, while a detailed description of each part is given. If you are to follow each step in the manual in order, and practice good soldering and kit building skills, the kit is next to fail-safe.

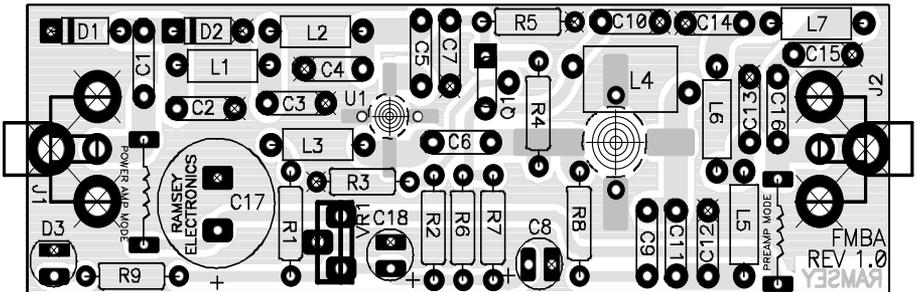
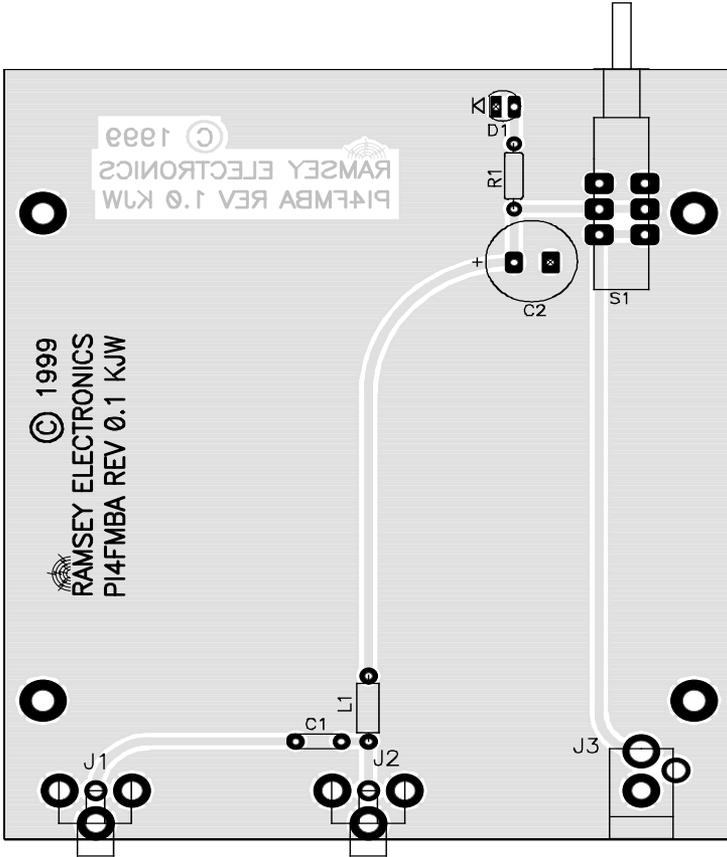
FMBA1 CIRCUIT DESCRIPTION

The components on the larger P14FMBA board are used to supply the voltage to run the smaller amplifier/preamp board. The DC supplied to the control box is sent up the coax to the amplifier board. This DC is supplied to VR1 which then provides a regulated 12 VDC for the rest of the circuit.

The main components of the circuit are the MAV3 RF amplifier and Q2, an MRF581 power transistor. The MAV3 is a state of the art amplifier specially designed to work in a wide range of radio frequencies. The MAV3 amplifies the signal, but does not have the power output capabilities to push out the kind of high power we desire. For this reason, Q2 is placed in the circuit. Q2 amplifies the signal a bit more, and is capable of generating a large amount of power out of the circuit.

D1 and D2 limit the input to U1 to 0.7 volts, to keep the amplifier from being overdriven and damaged. L1, L2, C3, 4 and 5 form a lowpass filter that reduces unwanted signals entering U1. U1 then amplifies the signal and couples it through C6 to Q2. Q1 and its associated components provide the proper bias for Q2. After being amplified by Q2, the signal passes through another stage of filtering, to eliminate harmonics from the output signal. This filtering allows the FMBA1 to produce clean, undistorted RF when used with a transmitter or to "clean up" the input to your receiver when used as a preamp.

FMBA1 PARTS LAYOUT DIAGRAM



PARTS SUPPLIED WITH FMBA1

Small FMBA PC Board

Capacitors

- 7 .001 μ F disc capacitors (marked .001 or 102)[C1,C5,C6,C7,C10,C11, C16]
- 4 39 pF disc capacitors (marked 39) [C2,C4,C12,C15]
- 3 68 pF disc capacitor (marked 68) [C3,C13,C14]
- 2 10 μ F electrolytic capacitors [C8,C18]
- 1 220 μ F disc capacitor [C17]

Resistors

- 2 12 ohms (brown-red-black) [R6,R7]
- 1 150 ohms (brown-green-brown) [R1]
- 3 1K ohms (brown-black-red) [R2,R4,R5]
- 1 7.5K ohms (violet-green-red) [R3]

Semiconductors

- 2 1N4148 diodes (small glass diodes) [D1,D2]
- 1 7812 +12 Volt voltage regulator [VR1]
- 1 PNP Transistor (marked 221334) [Q1]
- 1 MAR3 RF Amplifier (small, black, round marked with a "3") [U1]
- 1 MRF581 NPN Power transistor (small, black, round, marked 581) [Q2]

Inductors

- 5 0.1 μ H axial lead inductor (brown-black-silver-silver) [L1,L2,L5,L6,L7]
- 1 1.2 μ H inductor (looks like a resistor with brown-red-gold-silver bands) [L3]

Hardware, Misc.

- 2 "F" type jack [J1,J2]
- 1 6 hole balun [L4]
- 4 Inches #28 tinned buss wire [to wind L4]
- 2 1 1/2 " PVC endcaps (center hole drilled)
- 1 3 inch section of 1 1/2 " PVC pipe

FMBA PC Board

Capacitors

- 1 .001 μ F disc capacitors (marked .001 or 102) [C1]
- 1 1000 μ F electrolytic capacitor [C2]

Resistors

- 1 1K ohms (brown-black-red) [R1]

Inductors

- 2 1.2 μ H inductor (looks like a resistor with brown-red-gold-silver bands)
[L1, one inductor to be installed for either preamp or amplifier mode]

Semiconductors

- 1 Red LED [D1]

Hardware, Misc.

- 1 DPDT pushbutton switch [S1]
- 1 2.1 mm center pin type DC power jack [J3]
- 1 RCA-style jacks [J1]
- 1 "F" type jack [J2]

Required, not supplied

- 12 Volt DC power transformer

Case and Knob Parts

- Top Cover
- Bottom Base Tray
- 4 - Short Phillips Head Screws
- 2 - Long Phillips Screws
- Front and Rear Plastic Panels
- Front and Rear Labels
- 4 - Rubber Feet
- Appropriate Knobs for Kit

Required Tools

- Pen or Pencil
- Sharp hobby knife or hand held paper punch
- Small Phillips Head Screwdriver

RAMSEY "LEARN-AS-YOU-BUILD" ASSEMBLY STRATEGY

As you can see in examining the circuit board and components, there is a bit more to this kit than just soldering a few parts. So that you don't spend extra time "troubleshooting" instead of enjoying your new kit, we strongly recommend that you follow the assembly strategy and step-by-step procedures we provide.

Our strategy in installing parts on our PC board is to install the larger and more obvious parts such as the connectors and controls. These parts will then act as "landmarks" so that each additional device installed is seen in relationship to them, or to others previously installed.

Since the FMBA1 runs at very high frequencies, it is extremely important that you follow the instructions provided. Incorrectly installed components, excessively long component leads, and bad solder joints may mean that your kit won't work. For reasons like this it is advisable to follow the step-by-step instructions in the manual and not jump ahead.

Be sure to read through all of the steps, and check the boxes as you go along to be sure that you didn't miss any important steps. Before you switch on the power in a hurry to see results, check all transistors, the MAV3 amplifier, D1 and C2 for proper orientation. Also check the board for any possible solder shorts, or cold solder joints. All of these mistakes could have detrimental effects on your kit - not to mention your ego!

FMBA1 ASSEMBLY

Use the boxes to check off your progress.

Check all received parts against the Parts list on page 6 and 7. The parts list describes the various markings that may be found on the kit parts.

In ALL the following instruction steps, our word "INSTALL" means this:

- Insert the part, oriented correctly, into its correct holes in the PC board.
- If helpful, gently BEND the part's wire leads or tabs to hold it in place, with the body of the part snugly against the top "component side" of the PC board. This is especially important in an RF circuit such as the FMBA.
- SOLDER ALL wires or pins of the part, whether the two wires of a resistor or every pin of an IC socket.
- Nip or "trim" all excess wires extending beyond each solder connection, taking care that wire trimmings do not become lodged in PC board solder connections.

Enough said. . . Let's get building!

Since you may appreciate some “warm-up” soldering practice as well as a chance to put some “landmarks” on the PC board, we'll first install some of the larger components. Have a look at the Parts Layout Diagram to help with your assembly. We will start with the larger P14FMBA circuit board.

- 1. Install J3, the 2.1 mm DC power jack. Seat the jack flat on the PC board and solder all three tabs.
- 2. Install J1, RCA jack. Mount it flush with the board and solder each lead to the bottom side of the board, making sure that the solder “flows” around all three connections.
- 3. In the same way, install J2, the PC mount “F” jack. Be sure it is flush with the PC board and that you solder all the pins.
- 4. Install S1, the Power DPDT horizontal push-button switch. It fits correctly only one way. Ensure that the white plastic switch extends out over the edge of the printed circuit board. Solder all six pins.
- 5. Install D1, the LED. The flat edge (and the shorter leg) must face away from the switch. If the LED is backwards, it will not light. Leave the leads long so that you can bend it into place to fit through the front cover.
- 6. Right next to D1, install R1, a 1 K ohm resistor (brown-black-red).
- 7. Install C2, 1000 μ F electrolytic capacitor. Electrolytics must be installed with the proper polarity. Most capacitors have the negative lead marked while PC boards usually identify the positive lead. Note the stripe or band on one side of the capacitor; this is the negative lead. The positive hole on the PC board is marked by a “+” sign. Be sure to orient the capacitor correctly before soldering.
- 8. Install L1, 1.2 μ H inductor (brown-red-gold-silver).
- 9. Install C1, .001 μ F disc capacitor [marked .001, 102 or 1nF]. It is the last part to be installed on this board.

Now that you're all warmed up we will move to the smaller board, labeled FMBA. Before setting aside the board you've been working on, give it one last check, looking for good solder joints and proper component placement. This will make things easier later.

As we did before, we'll install some of the larger components first.

- 10. Install J2, one of the PC mount “F” jacks. Carefully solder all four leads.
- 11. In the same way, install J1, the other “F” jack.
- 12. Install D1, one of the small, glass 1N4148 type diodes. One end has

FMBA1 SCHEMATIC DIAGRAMS

a black band on it; this must be oriented as shown on the PC board silkscreen.

- 13. In the same way, install D2, the other 1N4148 diode. Be sure the band is placed correctly before soldering.
- 14. Install C1, .001 μ F capacitor [marked .001, 102 or 1nF].
- 15. Install L1, 0.1 μ H inductor [looks like a resistor with brown-black-silver-silver bands]. Remember, all parts should be seated as close to the PC board as possible.
- 16. Install C2, 39 pF disc capacitor [marked 39].
- 17. Install L2, 0.1 μ H inductor [looks like a resistor with brown-black-silver-silver bands].
- 18. Install C4, 39 pF disc capacitor [marked 39].
- 19. Install C3, 68 pF disc capacitor [marked 68].
- 20. Install L3, 1.2 μ H inductor [looks like a resistor with brown-red-gold-silver bands].
- 21. Install C17, 220 μ F electrolytic capacitor. Be sure to follow the PC board silkscreen for proper orientation.
- 22. Install R1, 150 ohm [brown-green-brown].

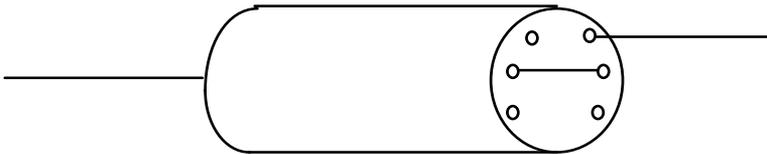
You will notice a silkscreen on the board for parts labeled D3 and R9. These two parts give a power on indication. To make the PVC enclosure easier to weatherproof, we have chosen not to install these parts. If you wish to install your own 1K resistor and LED you may do so. You will need to drill a hole for the LED and if you are mounting the amplifier outdoors, you will need to seal around the LED to weatherproof the unit.

- 23. Install R3, 7.5K [violet-green-red].
- 24. Install VR1, the 12 volt regulator. You will need to form the leads so that the part will fit into the board. Push the part down as far as it will comfortably go.
- 25. Install C18, 10 μ F electrolytic. Again, pay close attention to polarity when installing this capacitor.
- 26. Install C5, .001 μ F disc capacitor [marked .001, 102 or 1nF].
- 27. Install C7, another .001 μ F disc capacitor [marked .001, 102 or 1nF].
- 28. Install C6, yet another .001 μ F disc capacitor [marked .001, 102 or 1nF].

- ❑ 29. Install R2, a 1K ohm resistor [brown-black-red].
- ❑ 30. Install R6 and R7, both 12 ohm resistors [brown-red-black].

No, we didn't forget to install U1. We will install it and Q2, both on the solder side of the board, after we install the rest of the topside components.

- ❑ 31. Install C8, a 10 μF electrolytic, again checking polarity before installing.
- ❑ 32. There is a silkscreen on the PC board for R8 and C9, however, these parts will not be installed.
- ❑ 33. Q1 is the next part to be installed. As with electrolytic capacitors, this transistor has only one correct way it can be installed. You will note that it has two flat sides. You need to orient the larger flat side toward R4. Bend the leads so that the part can fit as close to the the board as possible without damage. Solder all three leads.
- ❑ 34. Install R4, 1K ohms [brown-black-red].
- ❑ 35. Install R5, another 1K ohm [brown-black-red].
- ❑ 36. It is time to wind L4. Look for the ferrite bead with 6 holes and the tinned buss wire that you will need to "lace" through the holes as shown. Pass 1 1/2 turns through the holes, filling three holes and leaving a lead coming out at each end. Trim the ends and bend as needed for neat installation. Solder it so that it is laying flush with the board.
- ❑ 37. Install C10, .001 μF disc capacitor [marked .001, 102 or 1nF].



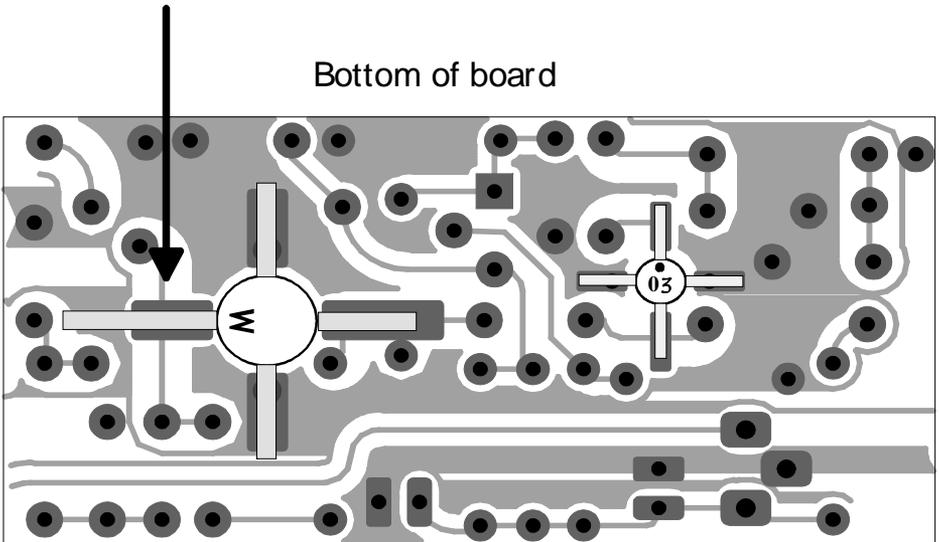
- ❑ 38. Install C13 and C14, both 68 pF disc capacitors [marked 68]. These parts along with L5, 6, 7 and C12 and 15, form the output lowpass filter for your FMBA amplifier. This filter ensures a clean RF output from your source by reducing harmonics.

- ❑ 39. Install C11, another .001 μF disc capacitor [marked .001, 102 or 1nF].
- ❑ 40. Install C12 and C15, the 39 pF disc capacitors [marked 39].
- ❑ 41. Install C16, the last .001 μF disc capacitor [marked .001, 102 or 1nF].
- ❑ 42. Install L5, L6 and L7, all 0.1 μH inductors [look like resistors with brown-black-silver-silver bands].

That completes assembly of the through hole components on your amplifier board. We will now flip the board over and install the heart of the FMBA1, the two amplifiers.

- ❑ 43. Turn the board over so that the soldered side is up. Locate Q2, the MRF581, the larger of the two parts left. You should see a small “M” near one lead of the transistor. This “M” will help you orient the part correctly. When looking at the solder pads for this part you will notice that one is longer than the other two. You will also notice that one lead of Q2 is longer. The long lead on the part **does not** solder to the longer pad. The transistor should be placed so that the longer lead (and “M”) are facing J2, the output “F” jack. You will need to trim the long lead of the transistor so that it will fit on the solder pad without hanging over. Once you’re sure you have the part oriented properly, solder all four leads.

Trim this lead



- ❑ 44. Now it's time to install the MAR3 if it has not already been installed for you at the factory. Since you just finished the MRF-581 you won't have any trouble with this one. Orient the dot on the part as shown in the diagram on the preceding page, facing toward C5. You can tack the part in with a little solder, then check the orientation before soldering it in completely.

Before installing the last part you need to decide how you will be using your FMBA1. The last 1.2 μ H inductor will supply power to the smaller amplifier board we just finished building. You will connect the antenna and control box to opposite ends depending on whether you're using the unit as a preamp or as an amplifier. In preamp mode you need to connect your antenna to J1 and your receiver to J2. In this mode you must install the inductor in the place marked "preamp mode" on the PC board silkscreen. In amplifier mode you will connect your transmitter to J1 and your antenna to J2. If you are going to use the FMBA1 as an amplifier, you need to install the inductor on the opposite end of the board. The part outline is the same as the preamp mode silkscreen but it is located near C17 and is unlabeled. The easy way to know which end of the board to place the inductor is that it needs to be connected to the end of the unit that is going to the control box.

- ❑ 45. Install the 1.2 μ H inductor in the position of your choice.

That's it! All components should be installed. Before applying power it would be a good idea to take one last glance over the entire pc board. Check for:

- Missed solder joints.
- Solder shorts between components. Check your schematic and parts layout diagrams if you suspect a fault.
- Proper orientation of diodes, capacitors, and ICs.
- Ensure proper power supply polarity and voltage. (15 volts DC, center tip positive)

INITIAL TESTING AND OPERATION

Items needed:

- Transmitter or whatever you wish to amplify OR Receiver you wish to improve the sensitivity of.
- External antenna
- 15 VDC power supply
- Two lengths of coaxial cable with “F” connectors
- One shielded RCA to RCA cable

A note concerning the cable needed: All Ramsey transmitters and antennas are set up for 50 to 75 ohm impedance.

Power Amplifier Hookup

Before making any cable connections, make sure your FMBA amplifier board is set up for amplifier mode. The 1.2 μ H inductor from step 45 should be installed in the place marked for it on the silkscreen, between J1 and C17.

To begin using your Broadcast Amplifier, you will need a length of 50 to 75 ohm coaxial cable or shielded audio cable to connect the input of the power control box (J1) to your transmitter, a length of coax to connect the output of the power control box (J2) to the input of the amplifier (J1, amplifier board), and one more length of coax to connect the output of the amplifier (J2, amplifier board) to your external antenna. You will want to keep the length of all the coax as short as is reasonably possible, especially between the amplifier and the antenna.

Your FMBA was designed to operate on 15 volts DC. Connect the Ramsey AC 12-5 adapter or another suitable power supply to the DC input of your FMBA-1 power control unit. Then connect the shielded RCA to RCA cable from the “External Antenna” output of your transmitter to J1 on the power control box. If your non-Ramsey transmitter has some other type of jack for the external antenna you will need to make up or buy a cable to connect it to the FMBA-1. Next, take one of your lengths of coax and connect it to J2 on the power control box. The other end of the coax connects to the input of the FMBA board at J1. This will send not only the RF but also the DC to the amplifier board. The last piece of coax connects from the output of the FMBA, J2, to your external antenna. Again, if your external antenna has some other connector, you will need to get a suitable cable to connect the output of the FMBA to your antenna.

Once all connections have been made and checked, you can power up your transmitter and then your FM Broadcast Amplifier. The LED on the power

control box should illuminate. If you have a signal strength meter on your receiver and made note of the signal strength before addition of the amplifier, you will see a large increase with the amp online. If you aren't lucky enough to be able to check your output in this manner, you can try increasing the distance between your antenna and your receiver. And remember that with such great amplification your transmitting distance should increase several times; you may find yourself going far away from your house! This will be an obvious way of telling how well your amplifier is working.

Preamp Hookup

The preamp hookup of your FMBA requires you to use the same cables but connect them in a different configuration. You will now connect the antenna to the input of the amplifier and your receiver to its output. You will be amplifying the incoming RF and feeding that increased signal to your receiver.

Before making any cable connections, make sure your FMBA amplifier board is set up for preamp mode. The 1.2 μH inductor from step 46 should be installed in the place marked "preamp mode" on the PC board silkscreen.

Begin by connecting a 15 volt DC power supply, such as the Ramsey AC 12-5, or other suitable supply, to J3, the DC input on the power control box.

One of your coax cables can now be connected to the power control box at J2. This cable will supply the DC voltage to the amplifier board as well as carrying the RF down from the amp to the power control box. You can now connect the shielded RCA to RCA cable to the antenna input of your receiver. If your receiver has a jack other than an RCA type, you will need to make up or buy a cable to connect to the power control box.

The other length of coax cable can now be connected between J1 on the amplifier board and your external antenna. Again, if your external antenna has some other connector you will need to get a suitable cable to connect the input of the FMBA amplifier board to your antenna.

To test the effectiveness of your preamp try tuning in a station that you can barely receive with your regular antenna and then connect the FMBA-1. You should pull the signal in and receive a bunch of other stations that you never knew existed!

To get the maximum performance out of your FMBA-1, whether in preamp or amplifier mode, you must use coaxial cable for all your connections. If you don't wish to make up an RCA to RCA coax cable, you must use shielded audio cable. The signal quality will be drastically reduced by using any other type of cable!

Troubleshooting

While we had hoped it wouldn't come to this, here are a few things you can check if your FMBA-1 doesn't seem to be working. Please remember that most problems occur because of bad soldering techniques and improperly placed components. A clear head and a meter are all that you probably need to solve the problem. Please run through all the troubleshooting ideas before calling the factory since it is virtually impossible for our technicians to "troubleshoot" step by step over the phone.

PROBLEM: The LED does not light when I turn it on.

SOLUTION: Even if the LED doesn't work, the amplifier may. First measure the voltage on the leg of the switch or on the lead of R1 closest to C2. If it does not read near 15V you have a problem with the power supply, power jack, or the switch is not on. Check to be sure that D1 is installed the correct way (flat side away from the switch).

PROBLEM: The LED comes on but the amplifier is not working.

SOLUTION: Make sure that the MAV3 and Q2 are installed properly. The dot on the MAV3 should point toward R3 and the "M" on Q2 should point toward J2, the output jack. Next, check the placement and orientation of all parts. If you have a voltmeter, you can check the DC voltage on the input and output of U1 and Q2. They should read as follows:

Q2 input = 0.6 VDC
output = 11 VDC

U1 input = 1.6 VDC
output = 5 VDC

PROBLEM: Everything has been checked and the unit still doesn't seem to be operating properly.

SOLUTION: When all else fails, read the inside back cover of this manual for information on sending the unit in for factory repair. For a nominal fee our technicians will get your unit up and running for you.

Conclusion

We sincerely hope that you have enjoyed the construction of this Ramsey Kit. As always, we have tried to compose our manual in the easiest, most "user friendly" format that is possible. As our customers, we value your opinions, comments, and additions that you would like to see in future publications. Thanks again, from the folks at Ramsey.

The Ramsey Kit Warranty

Please read carefully BEFORE calling or writing in about your kit. Most problems can be solved without contacting the factory.

Notice that this is not a "fine print" warranty. We want you to understand your rights and ours too! All Ramsey kits will work if assembled properly. The very fact that your kit includes this new manual is your assurance that a team of knowledgeable people have field-tested several "copies" of this kit straight from the Ramsey Inventory. If you need help, please read through your manual carefully. All information required to properly build and test your kit is contained within the pages!

1. DEFECTIVE PARTS: It's always easy to blame a part for a problem in your kit, Before you conclude that a part may be bad, thoroughly check your work. Today's semiconductors and passive components have reached incredibly high reliability levels, and it's sad to say that our human construction skills have not! But on rare occasions a sour component can slip through. All our kit parts carry the Ramsey Electronics Warranty that they are free from defects for a full ninety (90) days from the date of purchase. Defective parts will be replaced promptly at our expense. If you suspect any part to be defective, please mail it to our factory for testing and replacement. Please send only the defective part(s), not the entire kit. The part(s) MUST be returned to us in suitable condition for testing. Please be aware that testing can usually determine if the part was truly defective or damaged by assembly or usage. Don't be afraid of telling us that you 'blew-it', we're all human and in most cases, replacement parts are very reasonably priced.

2. MISSING PARTS: Before assuming a part value is incorrect, check the parts listing carefully to see if it is a critical value such as a specific coil or IC, or whether a RANGE of values is suitable (such as "100 to 500 uF"). Often times, common sense will solve a mysterious missing part problem. If you're missing five 10K ohm resistors and received five extra 1K resistors, you can pretty much be assured that the '1K ohm' resistors are actually the 'missing' 10 K parts ("Hum-m-m, I guess the 'red' band really does look orange!") Ramsey Electronics project kits are packed with pride in the USA. If you believe we packed an incorrect part or omitted a part clearly indicated in your assembly manual as supplied with the basic kit by Ramsey, please write or call us with information on the part you need and proof of kit purchase.

3. FACTORY REPAIR OF ASSEMBLED KITS:

To qualify for Ramsey Electronics factory repair, kits MUST:

1. NOT be assembled with acid core solder or flux.
2. NOT be modified in any manner.
3. BE returned in fully-assembled form, not partially assembled.
4. BE accompanied by the proper repair fee. No repair will be undertaken until we have received the MINIMUM repair fee (1/2 hour labor) of \$25.00, or authorization to charge it to your credit card account.
5. INCLUDE a description of the problem and legible return address. DO NOT send a separate letter; include all correspondence with the unit. Please do not include your own hardware such as non-Ramsey cabinets, knobs, cables, external battery packs and the like. Ramsey Electronics, Inc., reserves the right to refuse repair on ANY item in which we find excessive problems or damage due to construction methods. To assist customers in such situations, Ramsey Electronics, Inc., reserves the right to solve their needs on a case-by-case basis.

The repair is \$50.00 per hour, regardless of the cost of the kit. Please understand that our technicians are not volunteers and that set-up, testing, diagnosis, repair and repacking and paperwork can take nearly an hour of paid employee time on even a simple kit. Of course, if we find that a part was defective in manufacture, there will be no charge to repair your kit (But please realize that our technicians know the difference between a defective part and parts burned out or damaged through improper use or assembly).

4. REFUNDS: You are given ten (10) days to examine our products. If you are not satisfied, you may return your unassembled kit with all the parts and instructions and proof of purchase to the factory for a full refund. The return package should be packed securely. Insurance is recommended. Please do not cause needless delays, read all information carefully.

High Intercept Point FM Broadcast Amplifier Kit Quick Reference Page Guide

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REQUIRED TOOLS

- Soldering Iron Ramsey WLC100
- Thin Rosin Core Solder Ramsey RTS12
- Needle Nose Pliers Ramsey MPP4 or RTS05
- Small Diagonal Cutters Ramsey RTS04
- <OR> Technician's Tool Kit TK405

ADDITIONAL SUGGESTED ITEMS

- Holder for PC Board/Parts Ramsey HH3
- Desoldering Braid Ramsey RTS08
- Digital Multimeter Ramsey M133

Price: \$5.00

Ramsey Publication No. MFMBA1

Assembly and Instruction manual for:

RAMSEY MODEL NO. FMBA1



RAMSEY ELECTRONICS, INC.

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<u>TOTAL SOLDER POINTS</u> 115
<u>ESTIMATED ASSEMBLY TIME</u>
Beginner 3 hrs
Intermediate..... 2 hrs
Advanced..... 1 hr