

FM Broadcast Kits & Accessories From Free Radio Berkeley

First, a word from our legal department:

For educational purposes only. These kits are offered for the furtherance of one's knowledge regarding radio frequency design and principles. At all times during operation the assembled unit must be connected to a dummy load. Part 73 of the FCC rules prohibits the unlicensed operation of these transmitters when connected to an antenna. All responsibilities for the ultimate use of these kits are born solely by the builder and/or operator.

All kits are complete and come with professionally manufactured, drilled and tinned PC boards. All coils are pre-wound. Each unit, unless specified, requires 12-14 volts for proper operation. Full instructions and diagrams included. Required tools include a 25-30 watt soldering iron with a fine tip, diagonal cutters, needle nose pliers, assorted screwdrivers and other small hand tools. Full assembly diagrams and instructions are included with each kit. Antenna construction diagrams are provided with each transmitter or amplifier order.

Certain kits are designed to work with each other. The 15, and 40 watt amplifiers are designed to be driven to full power with about 1/2-1 watt of input power, hence they work very well with the 1/2 watt PLL transmitter. If you wish to only boost a 1/2 watt signal to 5-7 watts then choose the 6 watt amplifier kit. An amplifier only increases the output power of a given input signal, it can not produce an FM signal whereas a transmitter or an exciter creates the FM signal at a suitable power level for possible further amplification by an RF amplifier.

TRANSMITTERS - EXCITERS

1 Watt No Tune PLL Transmitter/Exciter - \$105

Our newest PLL kit design. Using state of the art wideband components from Minicircuits, this PLL covers the entire broadcast band without any additional tuning steps other than setting the 10 position dip switch. The dipswitch can either be on the circuit board or mounted remotely on an enclosure panel. This kit comes partially assembled with the surface mount components soldered on. It is available fully assembled for \$175

AMPLIFIERS

1/2 to 1 watt Amplifier - \$30

1/2 to 1 watt output for an input power of 10 mw. Great for boosting lower power VFOs and low power Ramsey FM-10 type kits. Very compact size, 3 1/2 X 1 1/2 inches. An optional transistor can be substituted to take the power up to 1 1/2 watts, add \$5 for this option.

1 Watt Broadband Amplifier (50Mhz - 1 Ghz) - \$60

Partially assembled no tune design. 2 stages of gain and power. Amplify either 10 or 50 milliwatts to 1 watt.

6 watt Broadband RF Amplifier - \$35

Uses a rugged 6 watt transistor. It is designed to boost 1/2 to 1 watt transmitters to a bit higher output power, producing up to 8 watts of output power. A very small and compact circuit measuring 3 x 1 1/2 inches. Easy, quick assembly with no tuning needed. Requires 12-14 volts DC at 3/4 to 1 amp for operation.

15 watt RF Amplifier - \$60

Uses a very high gain (14dB, power gain of at least 25X) RF transistor to boost a 1/2 watt input to 15 watts. Measures 2 1/2 by 5 inches and fits into a 6 inch brick enclosure (available punched and drilled). Includes heat sink. Easy, point to point surface mount assembly. Requires 12-14 volts at 2 amps for operation.

30-40 Watt Amplifier - \$105

30 to 40 watts of output power for an input of 1/2 watt. This is a two stage unit with a 5 watt and a 40 watt amplifier on the same board. Easy, large surface mount type assembly. Works very well with the 1/2 watt PLL transmitter. Requires 7 amps at 12-14 volts DC

75 or 150 Watt Amplifier \$250

Choose either 75 or 150 watts. The 75 requires 6-7 watts to drive it to full power. Amplifiers requires tuning to desired frequency. The 150 watt requires 15-20 watts to drive it to full power. A 6-7 amp 24-28 volt DC power supply is needed for the 75 watt amp while the 150 uses a 12-15 amp 24-28 volt DC power supply

75 Watt Power FET Amplifier \$250

Uses a high power FET. Needs only 1-1 1/2 watts to drive it to full power. Requires a 6-7 amp 24-28 volt DC power supply.

Filters

It is absolutely imperative to use a filter to prevent interference from harmonics generated by the transmitter. Both these filters are low pass types which start to attenuate the signal at 108-110 MHz or so. Not using a filter will create problems and give the FCC ammunition to use against us. A clean signal is essential to the success of this movement.

7 Element Output Filter Kit - \$15.00

A seven element low pass filter, composed of 4 coils and 3 capacitors, to flatten those harmonics. This one works well with the 6 watt and 15 watt amplifiers. Enclosure is \$12.00

9 Element Heavy Duty Filter Kit - \$25.00

A nine element low pass filter which will handle power levels to at least 100 watts. Use this filter with the 30 or 40 watt amplifiers. Enclosure is \$15.00

Dummy Loads

Always use a dummy load when testing and tuning transmitters and amplifiers. A dummy load is a non-inductive resistive load which simulates an ideal antenna impedance of 50 ohms. Never use an antenna for testing and tuning transmitters.

20 Watt Dummy Load Kit - \$15.00

Essential for tuning up and testing transmitters and amplifiers. Will handle 20 watts without any strain, higher powers for a briefer period of time. Presents a 50 ohm impedance. to the transmitter.

50 Watt Dummy Load - \$40 500 Watt Dummy Load \$75

Fully assembled commercial units. The 50 watt is a small bench unit while the 500 watt load is a "can antenna" style with the resistive element suspended in a bath of mineral oil in a one gallon can.

Antennas

An FM broadcast station's signal strength is extremely dependent on having a properly tuned and positioned antenna. Tuning an antenna requires changing the length of one of more elements and/or the cable attachment point. An SWR meter is needed to properly tune the antenna.

Comet Antenna - \$115.00

A commercially made antenna for the FM broadcast band. It is a 5/8 ground plane design that assembles quickly and easily. It tunes by sliding the inner element up and down. Has a gain of 2.

ANTENNA KITS

Some are partial kits, just go to your local plumbing supply or hardware store for the copper pipe and/or wire needed for completion. Full construction diagrams and instructions included.

J-Pole - \$45

Works very well for urban areas. Very easy assembly. No soldering of copper pipe required for assembly. Can be adjusted for operation over the entire FM band. Includes the aluminum antenna elements.

Slim Jim - \$20

SO239 connector and clamps. Works very well for urban areas where a powerful horizontal pattern is needed. If used at too great of height, an area surrounding the antenna will be skipped over due to its low angle of radiation. Even at a height of only about 12 feet mounted on a traffic sign pole this antenna was able send a 5 watt signal 2-3 miles. Requires soldering of copper pipe. Can be placed inside a 6" piece of black plastic pipe for concealment. Provides a gain of 2-3.

Dipole - \$30

Easy and quick design. Includes the aluminum antenna elements.

POWER SUPPLIES

Unless you are planning on operating from a 12 volt lead acid battery or from the lighter socket in a vehicle you will need an AC operated DC power supply. Wall adapter units cannot be used. We have the following units available. Small switching type supplies for mounting inside the enclosure are available as well, see the no-tune PLL section. 2 amp 12 volt switcher - \$30, 3 amp 24-28 volt switcher \$40.

PS-3 - 2.5 Amp 13.8 V DC power supply - \$35

Use this to power either the 1/2 watt PLL transmitter or a 1/2 watt PLL with a 6 watt amplifier

PS-7 - 6 Amp 13.8 V DC power - \$45

Use this to power the the 15 watt amplifiers.

PS-14 - 12 Amp 13.8 V DC power supply - \$75

Use this to power the 40 watt amplifier

The above are Pyramid brand power supplies, We have higher quality Astron 13.8 volt DC power supplies available as well.

Astron 28-10 - 10 Amp 28 V DC power supply - \$150

Use this to power a 75 watt amplifier

Astron 28-15 - 15 Amp 28 V DC power supply - \$225

Use this to power a 150 watt amplifier

Switching 13.8 V 12 amp DC power supply - \$125

A very compact lightweight power supply that is 1/4 of the weight of the PS-14. Ideal for overseas shipments.

METERS

Power & SWR Meters

These are essential to the proper tuning and setting up of both transmitters and antennas. An antenna has to be fine tuned so that it accepts the full power of the transmitter and reflects the lowest amount possible back, that ratio of forward power to reflected power is known as the standing wave ratio (SWR). The various stages of both transmitters and amplifiers have adjustable capacitors which are used to tune the unit to the frequency of operation. A power meter allows you to see the effect of these adjustments on the power level and to set everything at an optimum level.

Economy Power/SWR meter - \$35

A compact in-line unit that works up to a frequency range of 150 MHz.

Daiwa Meters - Model CN-101 - \$100 / 100 Model CN801H - \$140

Dual cross needle meters that shows both forward and reflected power on the same meter face. Makes tuning up very easy, no need to switch back and forth between these two functions. The model CN801H has a large meter face that is very easy to read.

FREQUENCY COUNTER - \$80

To accurately maintain your operating frequency a digital frequency counter is highly recommended. This unit is a 6 digit unit usable to 350 MHz.

COAXIAL CABLES

A coaxial cable is a special type of wiring that has an inner conductor surrounded by an insulating plastic sheath which is covered by a braid of copper wire that is then covered by a plastic jacket. The 75 ohm video cable used in home TV applications is one type of coaxial cable. For most RF purposes, 50 ohm cable is used. Quite a number of 50 ohm coaxial cables are available ranging from the rather small to cables over 1" in diameter. Regardless of the type, all such cables exhibit a loss that increases with frequency of operation and the length of the cable. For most purposes we will concern ourselves with RG213 and RG8x (mini version of RG8). In very short runs RG58 can be used, but we prefer RG8x due to its lower loss and ability to stand a bit more abuse. RG213 has the lowest loss of the group. Under no circumstances should the cables be twisted, kinked or crushed, this will cause major problems. We supply both RG8X and RG213 in the following lengths. Each end is terminated with a PL259 plug.

RG8X: 25 feet - \$15, 50 feet - \$25, 75 feet- \$35, 100 feet - \$40

RG213: \$00.50 ft in 25, 50, 75 and 100 ft lengths (custom lengths - \$00.75 ft)

ENCLOSURES

BOX7

7 x 7 aluminum chassis punched and drilled for 1/2 watt PLL transmitter with or without the 6 watt amp - \$25

The Brick Enclosure

15 watt size -\$45, 20-40 watt size -\$60. 75 watt size - \$75, 150 watt size - \$95.

Combined heat sink and enclosure made from extruded aluminum. Will support a 1/2 watt PLL on a slide-in plate in combination with the 15, 40, 75 or 150 watt amplifiers.

LIMITERS

A limiter is required to prevent over modulation of the FM signal. Over modulation will cause spurious emissions and interference with other signals plus sound very distorted. It is extremely important to prevent this.

Berhringer Autocom Limiter/Compressor - \$195.00.

Professional audio limiter/compressor with lots of features.

Stereo Generator/Limiter Kit - \$95

Both functions on one circuit board (8.25 " x 6 "). Accepts hi-z RCA and ¼" phone inputs plus lo-z 3 pin. For limiter only, the cost is \$50 (supplied on smaller circuit board). For stereo generator only, the cost is \$60. Requires +/- 12 volts DC. Power supply \$35. Deluxe case \$60.

MIXERS & MICROPHONES

We offer the entire Behringer and & Samson audio line including mixers. Please inquire for catalog and pricing. Prices start at \$175.

Basic 4 channel mono mixer kit - \$45

An introductory level mixer kit that has two channels set for hi-z microphones and 2 channels for mono line level sources. Will operate on two 9 volt batteries. Two mixer circuit board can be ganged for 8 channels. Optional led vu and headphone board kit - \$35 and limiter circuit board kit - \$35

Samson Mixpad 4 - \$175

A good choice for portable and field operations. It features two XLR low impedance inputs with one stereo input for a CD player or tape unit. Power source is either AC or 9 volt batteries.

Pyramid PM4001 DJ Mixer - \$165

Entry level DJ mixer with 1 XLR microphone input and 8 line level inputs including 2 phono.

Pyramid PM8200 DJ Mixer - \$225

Pyramid's better quality mixer with 2 XLR microphone inputs and 3 turntable inputs plus 6 line level inputs.

Nippon America DJ Mixer - \$325

3 XLR microphone channels, 3 turntable channels and 6 line level stereo inputs.

Samson S-12 hypercardoid microphone - \$60.

An excellent low impedance unit for the broadcast studio. 25 foot XLR cable is \$18.00

VARIOUS & SUNDRY ITEMS

Tweak stick - \$2.50

Essential to tuning transmitters and amplifiers. Non-conductive body with tiny metal blade at end. In tuning these transmitters and amplifiers a metal screwdriver will cause false tuning to happen due to the interactive effects of the metal and the holder of the screwdriver with the circuit. A plastic TV tuning tool kit can be found at Radio Shack as well

Seizing the Airwaves - \$13.00

A Free Radio Handbook by Ron Sakolsky and Stephen Dunifer. Let us conjure up a vision of a Wild Radio Stampede disrupting the territorialized lines of Authority artificially drawn in the air surrounding Mother Earth..... Within this book, the myriad voices of the Free Radio Movement come alive with the same urgency that has challenged both corporate and governmental control of radio-activity. If seizing the airwaves is a crime, then welcome to the millennial police state.

Proceeds from the sales of these kits go to the furtherance of micropower broadcasting, bringing a voice of empowerment to every community.

Please add \$6.00 for handling and shipping for 1-2 kits and \$3.00 for each additional kit. \$6.00 for the 2.5 & 7 amp power supply and for each brick enclosure and \$15.00 for the 14 amp power supply. Normal shipment is either UPS ground or priority mail depending on size and weight. COD orders add \$8.00. Air mail to other countries, \$12.00 per kit. We ship within 2-3 weeks after receipt of order, sometimes sooner depending on the work load.

Payment to be made out to Free Radio Berkeley. Foreign orders please pay by money order drawn on US bank

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Check our web site for more information and the latest updates - www.freeradio.org

Assembled FM Broadcast Transmitters From Free Radio Berkeley IRATE

Using a Phase Locked Loop design to ensure frequency stability, transmitters manufactured by Free Radio Berkeley have proven to be very reliable under a variety of conditions. The PLL exciter and companion amplifier(s) are enclosed in an extruded two-piece aluminum enclosure with cooling fins along the entire length of the top side. Transmitter models include 15 watt, 40 watt, 75 watt and 150 watt units. External power meters, frequency displays and filters are available as options. All transmitters require an external power supply, 13-14 volts for the 15 & 40 watt models and 24-28 volts for the 75 & 150 watt models. This allows the transmitters to be operated directly from AC mains connected DC power supplies, battery arrays charged by solar or wind power or vehicular power sources. A built-in protection circuit guards against reverse voltage and high SWR conditions.

Free Radio Berkeley transmitters are currently operating in a variety environments from free radio stations in the United States to the mountains of Chiapas to the coastal plains of Haiti to sub sahara West Africa. The transmitters are designed according to a philosophy of rugged simplicity and functionality. As a result, the cost of these units is much less than comparative models. Further, Free Radio Berkeley provides training in the construction and manufacture of its transmitters. Our goal is to put as many community radio stations on the air as possible and create in-country assembly facilities using Free Radio Berkeley supplied parts kits.

Pricing Information

15 watt transmitter - \$400 (power supply - \$50)

40 watt transmitter - \$650 (power supply - \$125)

75 watt transmitter - \$850 (power supply - \$175)

150 watt transmitter - \$1200 (power supply - \$225)

300 watt (different enclosure, requires 48 volts DC) - \$1800 (power supply - \$425)

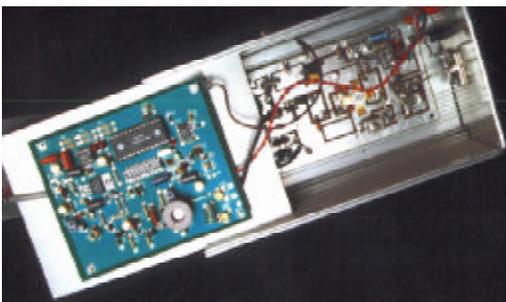
Daiwa Power SWR meter - \$150

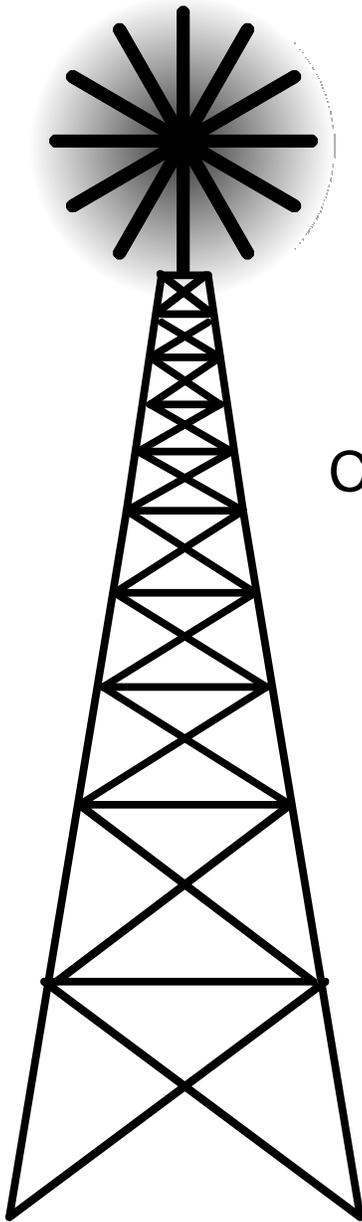
Frequency Display - \$95

Filter for 15 watt - \$40

Filter for 40 & 75 watt - \$75

In addition, FRB IRATE offers complete broadcast station packages that include mixers, compressor/limiters and microphones.





ON THE AIR QUICK PACKAGE \$615

Complete 30-40 watt transmitter kit package

Includes:

No tune PLL exciter, partially assembled
30-40 watt amplifier

Comet 5/8 ground plane antenna

Extruded aluminum enclosure/heatsink

13-14 volt power supply

Power/SWR Meter

Frequency counter

Dummy load

Coaxial cable for antenna not supplied.
Very low loss RG 213 is available
for \$00.50 a foot with connectors

This kit package is designed for easy assembly. The PLL kit is our new no tune design which requires only a few components to be soldered to the circuit board. The 30-40 watt amplifier is very easy to assemble and is easy to tune since it is a broadband design based with only two tuning points on the output side..

Other Transmitter Kit Packages

1 Watt Package - \$305

15 Watt Package - \$430

6 Watt Package - \$340

75 Watt Package - \$800

All packages include power supply, filter, dummy load, frequency counter, power/swr meter and enclosure. Comet antenna is not included. It is available at an additional cost of \$115. PLL kit is our new no-tune design and comes partially assembled.

Send your order to Free Radio Berkeley, 1442A Walnut St. #406, Berkeley, CA 94709. Shipping costs for the 20 & 40 watt packages are \$25, \$15 for the 1/2, 6 and 15 watt packages. Terms are cash, check or COD. COD orders may be sent to: frbspd@crl.com or called in (510) 549-0732. Check our web site for further information and updates - www.freeradio.org.