Instruction Manual
Bayou Jumper
40 Meter Transceiver

Revision 1.0

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&
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Introduction

Thank you for purchasing a Bayou Jumper transceiver kit. We hope you will enjoy building it and have many QSOs with it. This kit is comprised of high-quality components, a silkscreened, solder-masked, double-sided PC board and front panel, and hardware for mounting in a wooden enclosure.

This kit owes its genesis to the imagination of Jim Giammanco, who envisioned this project in homage to the classic 'Paraset' transceiver, http://www.paraset.nl/ the legendary spy radio from World War II. Using the same circuit architecture as the original, Jim brought it up to date with solid-state circuitry, giving the user an authentic feel of the original radio without the high voltages and scarce components of a tube circuit.

Jim named his creation the 'Bayou Jumper' after the popular Knight 'Ocean Hopper' regenerative receiver that so many novice hams built a half-century ago, with a salute to his Louisiana heritage. His presentation on his project was one of the most popular presentations at Ozarkcon 2016. The Four-State QRP Group is proud to be able to present the Bayou Jumper to the QRP community.

The transceiver is comprised of two separate circuits, a crystal-controlled transmitter and a regenerative receiver. The transmitter uses 4SQRP's super simple, super robust NS-40 transmitter circuit, with trademark on-board spiral PCB trace inductors, and 5 watts output power.

The Bayou Jumper utilizes a regenerative receiver, the same as the original Paraset. No other receiver circuit provides the combination of sensitivity and selectivity with low parts count. Regenerative receivers were popular among hams for this reason. The receiver in the Bayou Jumper has been measured to have a Minimum Discernible Signal (MDS) of better than -120 dBm, which is as good as many commercial receivers. In the Bayou Jumper, the receiver tunes independently from the transmitter frequency, so there is a 'Spotting' function to allow the user to tune the receiver to the transmitter frequency.

Switching between transmit and receive is performed with a rotary switch, just as was done with the original Paraset. You cannot get more simple and reliable than that!

The entire transceiver was designed to fit inside a standard wooden box, available from Hobby Lobby. It can be ordered here: http://www.hobbylobby.com/Crafts-Hobbies/Wood-Crafting/Unfinished-Wood/Wood-Rectangle-Box-Set-with-Silver-Handle/p/25426-GA0369. The on-line sale is for a set of three boxes, of which the smallest is used. The boxes

can be purchased individually in stores, SKU# 662536S.

Theory of Operation

The Bayou Jumper, like the Paraset that inspired its creation, utilizes very simple and robust circuitry to achieve reliable operation. Despite this simplicity, it attains the maximum of performance from its minimum number of components, in the true spirit of QRP.

The transmitter design of the Bayou Jumper is borrowed from the 4SQRP classic 'NS-40'. This design is a master-oscillator/power amplifier circuit, with high-efficiency spiral PCB coils serving as the transmit harmonic filter. The 2N7000 Master Oscillator, Q5, works against the gate capacitance of the IRF510 power amplifier, Q4, as an unusual inverted Colpitts oscillator. The power amplifier Q4 is tuned to operate in the Class E mode, generating 5 watts from 13.6 volts, at better than 85% efficiency. Closing the key contact grounds the source circuits of Q4 and Q5 permitting oscillation to commence. If the transmit/receive switch is in the receive position, closing the key permits the Master Oscillator to oscillate without the PA operating, enabling spotting of the oscillator frequency in the receiver.

A built-in key is included in the design – just like in the original Paraset!

Because the entire PA current passes through the keying circuit, it is recommended that the transmitter be keyed through a hard contact closure, such as a relay or straight key, or else a larger MOSFET (IRF510 or larger) be used.

The receiver is a simple regenerative circuit, based on the innovative design of Charles Kitchin, N1TEV. Q2, an MPF102 JFET acts as a regenerative detector in an Armstrong circuit, with a 1N5819 diode acting as a varactor capacitor in the tickler throttle circuit. The regeneration control, potentiometer R10 varies the reverse bias voltage on the diode D2, changing its capacitance, and varying the amount of feedback current it passes through the tickler feedback winging of L1.

The receiver frequency is also tuned using a biased diode as a varactor. The inductor L1 resonates against the sum capacitance of C20, C30 and diode D3. Tuning is attained through potentiometer R8, which varies the reverse bias voltage on D3, varying its capacitance.

The antenna is coupled to the detector through the grounded-base amplifier Q1, a 2N3904. This amplifier also isolates detector oscillations, preventing them from being radiated back through the antenna. An RF attenuator control, R1,

can be used to reduce the amplitude of strong signals that might overload the receiver.

The detected audio appears at the source of the regenerative detector Q2, and is coupled though capacitor C5 to audio preamplifier Q3, a 2N3904. Its output is coupled to the Volume control R6.

The output of the volume pot is amplified by the Audio Amplifier U1. This IC, an NJM2113 is a low-noise headphone driver amplifier. Its balanced output feeds the tip and ring contacts of the Headphone jack, J4. The shell contact is left floating, placing the two headphone elements in series. This amplifier is also capable of driving an external 8 ohm speaker.

A 6-volt regulator IC, U2 provides steady bias voltage to the low-level RF and audio circuitry of the receiver, eliminating any tendency toward audio howl or instability.

Switching between transmit and receive operation is performed with a rotary switch SW1. This disables the receiver during transmit, and switches the antenna between the transmitter and receiver sections. This switch also has an OFF position, switching the antenna input to ground as well.

First Steps

Before getting started with building the kit, take some time to organize and familiarize yourself with the parts provided and check them against the Bill of Material. Building over a cookie sheet is recommended to minimize parts being lost. If parts are missing in your kit, send an email to the kitter listed at 4SQRP.com. He will promptly provide replacements.

Schematic files are provided as part of documentation package. It is highly recommended to print a couple of copies at 11 X 17 inch format at your local UPS Store, Staples, etc. As you build, use a highlighter to mark off parts that have been soldered onto the PCB on one copy. When you think you are done, you can check that copy to verify that all of the parts have been installed. Build section schematics are also provided for convenience that match up with the build steps with their parts call-outs.

It is helpful to acquire the necessary tools and supplies before beginning. These include:

*Soldering iron – 20 to 30W, preferably thermostatically controlled.
*Fine 60/40 rosin core solder
*Wire strippers

*X-Acto knife
*Diagonal cutters
*Needle-nose pliers
*Phillips screwdriver
*Hand drill with 1/8” bit
*Non-metallic alignment tool
*Fine jeweler’s screwdrivers
*Electrical tape
*Clear fingernail polish
*Wood glue
*Clamps or spring clothespins
*Magnifier
*Digital volt-ohm-meter
*A calibrated 40M CW receiver or frequency counter

Soldering is not hard if the proper procedure is followed. The soldering iron is to be used to heat up the PC pad and component lead, and the solder applied to the pad, where it melts and flows into the hole. Do not melt the solder onto the tip of the iron and then attempt to dab it onto the joint – a defective connection will result! After soldering, check the top (component side) of the board, to be sure the solder has filed the hole completely, and wicked up around the component lead. Re-heat and apply more solder if necessary.

ENCLOSURE

The enclosure must be prepared to mount the circuit boards. Included in the kit are four wooden blocks that must be glued into the four inside corners of the box. Use wood glue to attach them. They should be spaced down from the rim of the box by the thickness of two PC boards – you may use the crystal adapter boards as a thickness gauge.

When the glue has dried, place the top panel circuit board onto the four corner blocks. Use a pencil to mark through the four corner holes in the top panel board onto the corner blocks. Remove the top panel.

There are four wood screws in the parts kit for mounting the circuit board assembly. If these are driven directly into the corner blocks, there is a risk they will split, so it is necessary to drill pilot holes for the mounting screws. Use a 1/8” bit in a hand drill, drill down approximately 1/2”.

PRELIMINARY ASSEMBLY

The first component to be installed on the PC board is the Tuning pot, R8, a 50k

potentiometer. Be certain that it is marked 503, to distinguish it from the 5k Attenuator pot, marked 502.

Place the PC board flat on your work surface, and install the legs of R8 through the PCB mounting holes so that the tips of the legs rest flush on the working surface without extending through. This guarantees that the shaft of the pot sits as high as possible. Make sure the pot shaft is vertical, and then solder the pot to the board from the top side of the board.

CAPACITORS

The ceramic monolythic capacitors used throughout the kit are small and their markings not always easy to read. Use a magnifier to verify their values before installing.

Electrolytic capacitors must be installed in the correct polarity. The cases are marked to indicate the negative terminal, which goes into the round pad on the board. Also, the longer lead is the positive lead, which goes into the square pad on the board.

Install the capacitors, solder and trim the leads. Check off each part as you install it. Do not install C31 at this time!

√	Ref	Value	Marking	Type
	C8	0.001	102	Dipped Ceramic Monolithic
	C14	0.001	102	Dipped Ceramic Monolithic
	C15	0.001	102	Dipped Ceramic Monolithic
	C28	0.0033	332	Ceramic Disk
	C1	0.01	103	Ceramic Disk
	C2	0.01	103	Ceramic Disk
	C11	0.01	103	Ceramic Disk
	C17	0.01	103	Ceramic Disk
	C24	0.033	333	Dipped Ceramic Monolithic
	C5	0.1	104	Ceramic Disk
	C7	0.1	104	Ceramic Disk
	C19	0.1	104	Ceramic Disk
	C25	0.1	104	Ceramic Disk

	C27	0.1	104	Ceramic Disk
	C29	0.1	104	Ceramic Disk
	C10	1.0	1uF	Aluminum Electrolytic
	C4	100p	101	Dipped Ceramic Monolithic
	C18	100p	101	Dipped Ceramic Monolithic
	C26	100p	101	Dipped Ceramic Monolithic
	C20	120p	121	Dipped Ceramic Monolithic
X	~~C31~~	~~22p~~	~~22~~	~~Dipped Ceramic Monolithic~~ **DO NOT INSTALL YET**
	C16	220p	221	Dipped Ceramic Monolithic
	C23	390p	391	Dipped Ceramic Monolithic
	C3	4.7u	4.7uF	Aluminum Electrolytic
	C6	4.7u	4.7uF	Aluminum Electrolytic
	C9	4.7u	4.7uF	Aluminum Electrolytic
	C13	4.7u	4.7uF	Aluminum Electrolytic
	C22	470p	471	Dipped Ceramic Monolithic
	C12	47u	47uF	Aluminum Electrolytic

For the resistors and axial leaded inductors, the leads should be bent in a gentle radius about 0.1" from the body of the part, so that the component body is not stressed or broken. If you have a bending jig, use it. The body of these components should rest flush against the board surface when mounted.

INDUCTORS

There are two molded inductors in the circuit. They are much larger than resistors. Let's add these next.

√	Ref	Value	Marking	Type
	L2	1.0uH	1.0uH or Brown-Black-Brown	Molded Axial Choke
	L2	470uH	470uH	Molded Axial Choke

RESISTORS

Next, install the resistors.

√	Ref	Value	Marking	Description
	R16	100	Brown-black-brown	1/4w 5% axial
	R17	1.0k	Brown-black-red	1/4w 5% axial
	R2	1.0M	Brown-black-green	1/4w 5% axial
	R4	1.0M	Brown-black-green	1/4w 5% axial
	R15	100k	Brown-black-yellow	1/4w 5% axial
	R3	2.7k	Red-violet-red	1/4w 5% axial
	R12	3.3k	Orange-orange-red	1/4w 5% axial
	R7	3.3k	Orange-orange-red	1/4w 5% axial
	R13	330k	Orange-orange-yellow	1/4w 5% axial
	R5	33k	Orange-orange-orange	1/4w 5% axial
	R11	470k	Yellow-violet-yellow	1/4w 5% axial
	R9	470k	Yellow-violet-yellow	1/4w 5% axial
	R14	470k	Yellow-violet-yellow	1/4w 5% axial

SEMICONDUCTORS

Identify and install the following components. Be certain that their polarity is correct, and that they match the board silkscreen symbols.

√	Ref	Value	Description
	D1	1N5819	Diode
	D2	1N5819	Diode
	D3	1N5819	Diode
	Q1	2N3904	TO-92 NPN
	Q3	2N3904	TO-92 NPN
	Q5	2N7000	TO-92 MOSFET
	Q4	IRF510	TO-220 MOSFET
	Q6	IRF510	TO-220 MOSFET
	Q2	MPF102	TO-92 JFET
	U1	NJM2113	8-DIP

	U2	78L06	TO-92 IC

LARGE COMPONENTS

Install the remaining potentiometers, R1, R6, and R10 to the board. Mount these flush to the PCB, and verify they are straight and vertical.

√	Ref	Value	Description
	R1	5k	Potentiometer
	R6	50k	Potentiometer
	R10	50k	Potentiometer

Add C21 and C30, the two trimmer capacitors. **These mount on the bottom side of the board,** and are soldered from the top. Notice the case has a flat side. When installing, orient the flat side to match the outline on the component silkscreen on the bottom of the board.

√	Ref	Value	Description
	C21	4-20pF	Trimmer Cap
	C30	4-20pF	Trimmer Cap

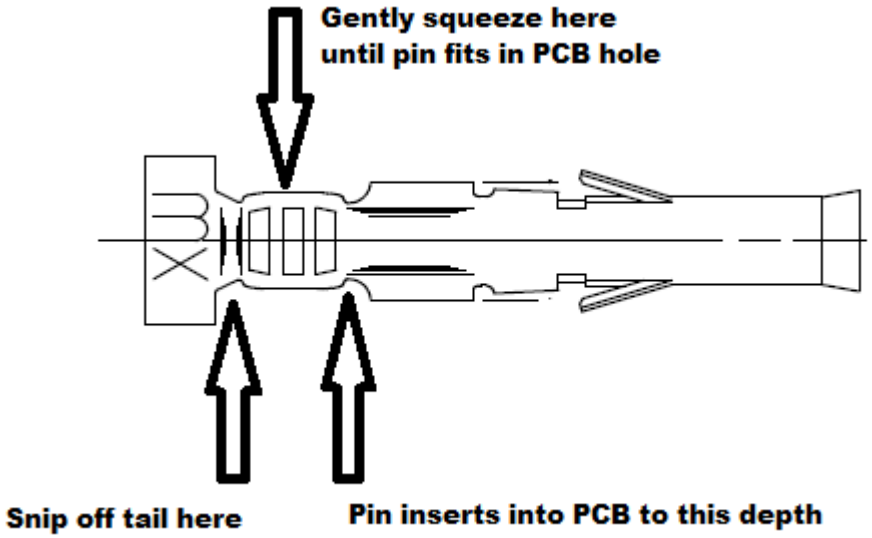
HARDWARE, SWITCHES AND CONNECTORS

☐ Install the rotary switch SW1. Be certain that Pin 1 is inserted into the square pad. Make sure the connector is fully seated on the PCB before soldering into place. Using a pair of diagonal cutters, cut 1/4” from the end of the black plastic shaft

☐ Add the contact post for the built-in key. This is a 3/8” hex standoff. Install this using a 3/8” screw with two flat washers between the standoff and the PCB.

☐ Install the BNC jack to its location at the upper left of the PCB.

☐ Prepare the Molex connector inserts to create the crystal sockets. Take each of the inserts, and, using diagonal cutters, snip off the bottom ‘fishtail’ per the diagram:



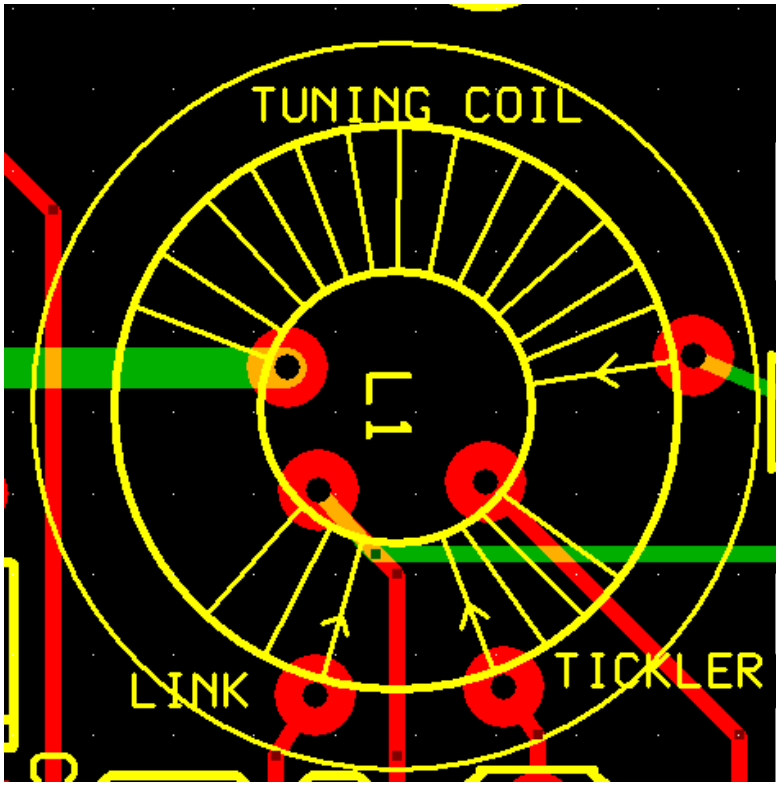
Using fine-nose pliers, gently squeeze the crimp area marked into the diagram until the pin fits into the holes in the board for the crystal socket. Make certain they are both vertical before soldering, and adjust as necessary to correct.

☐ Assemble the power jack. Strip 1/4” from the ends of the 3” red and black stranded wires. Solder the red wire to the solder lug on the center pin of the power jack, and the black wire to the lug connecting to the outer shell of the jack. Use an ohmmeter if not sure which lug is which. Solder the red wire to the ‘+12v’ pad on the PC board, and the black wire to the ‘-’ pad on the PC boards.

☐ Wire up the 12v power plug so that 12v can be applied to the circuit.

TRANSFORMER

☐Next, wind the toroid L1.



It is essential that this inductor be wound properly with the correct number of turns, the proper winding direction, and location. By following the diagram on the schematic and PCB silkscreen successful construction can be assured. Notice each winding has one turn that is labeled with an arrow. This is the end from which the winding begins, coming up from the PCB, passing over the top and through the center of the core. Ignore the number of turns shown on the diagram above, but follow exactly the directions that follow. For additional help with winding, consult the directions at http://wa0itp.com/toroidophobia.html

☐ Locate the toroid core, and the 24AWG magnet wire. Take the toroid, and wind the main tuning coil, 19 turns around it with the wire. Remember that turns are counted as the number of times the wire passes through the center of the toroid. It is essential that the turns are pulled snugly around the toroid, so that there is no slack between the wire and core. When complete, cut the wire ends to about 1/2".

☐ The next winding to apply is the tickler winding. If the tuning coil is at the top side, the tickler is at the lower right position. Wind 4 turns of 24AWG magnet wire for the tickler winding. When complete, cut the wire ends to about 1/2".

☐ Finally, wind the two-turn input link at the lower left position of the core. When complete, cut the wire ends to about 1/2”.

Strip and tin each of these wire ends prior to inserting on the PC board.

There are a number of methods for stripping the insulation from magnet wire. The wire provided in the kit is thermally strippable. If you have a higher wattage or thermostatically controlled soldering iron, the heat from this (at least 750 degrees F) will be sufficient to strip the insulation from the wire. Alternately, insulation may be removed using sandpaper or a sharp hobby knife, prior to tinning.

☐ Inspect the PC board closely for unsoldered connections, cold solder joints, solder balls or splatter, improperly installed or incorrect components, and correct as necessary.

FRONT PANEL COMPONENTS

☐ Assemble the built-in key. Obtain the key leaf spring. This is a rectangular piece of plated PCB with three holes. Install two 6-32x 3/8” screws through the top of the front panel. On the bottom of the board, slip the leaf spring over these screws, and mount using two hex nuts on the bottom. Use a small drop of clear fingernail polish on the end of the screws to keep the nuts from working back loose.

☐ Mount the key knob onto the leaf spring by inserting it through the top of the front panel, and fixing it in place using the 8-32 screw from beneath.

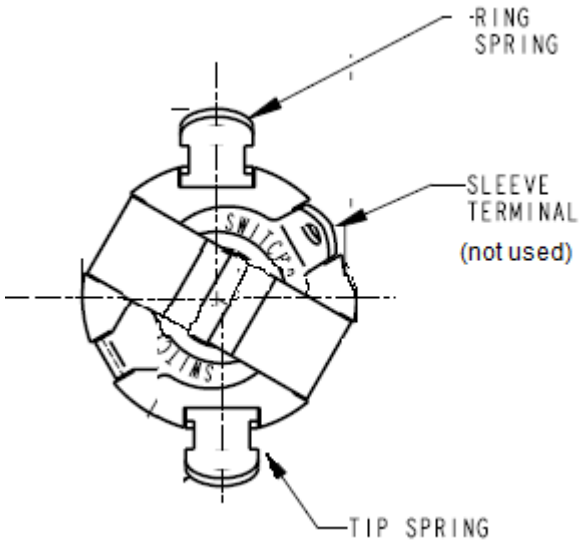
Key knob

☐ Mount the two 1/8” stereo jacks to the front panel by inserting them through the bottom, and fixing them in place using the included knurled nuts. Cut three

pieces of the 22 AWG bus wire, each approximately 2” long.

☐ Onto the jack for the headphone output, solder a piece of the bus wire to the solder lug for the tip contact and one to the ring contact.

☐ Onto the jack for the external key, solder a piece of bus wire to the solder lug for the tip contact.



3.5 mm Audio Jack Pinouts

☐ Install the six standoffs to the top side of the main PC board using the 6-32 x 3/8” screws.

☐ Remove the nut from the top of the rotary switch. The existing hardware stackup is too thick to permit the top panel to be installed with the nut in place without warping the board. Remove the star washer also. Be careful not to dislodge the keying washer, or else the switch travel limits will be affected. Carefully bend a shallow angle into the star washer, so that the middle is bent upward about 1/16”, or 1.5mm, and then replace it. This will apply compression between the front panel and key washer to prevent it from moving. (If the keying washer falls out, put it back in so that the keyed lug enters the hole marked ‘3’.)

☐ Install the front panel onto the circuit board. Insert the power jack into the front panel, and tighten its nut. Insert the bus wires on the headphone connector and the key jack though the appropriate holes in the board as you

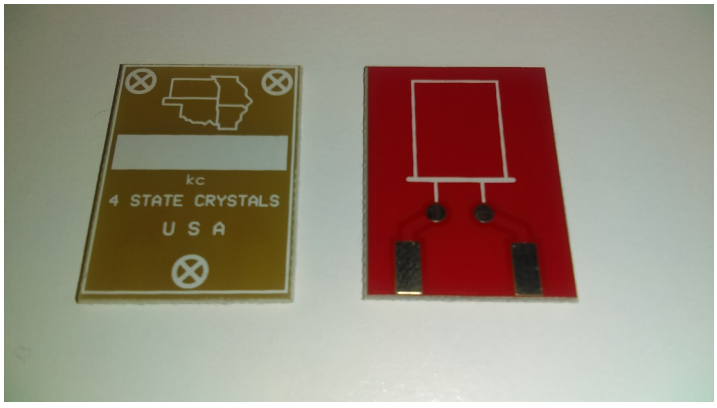
bring the boards together. Attach the front panel using six 6-32 x 3/8” screws. Gently pull the bus wires snug, and solder them into place on the circuit board.

☐ Add the two plastic insulating sleeves through the crystal socket holes in the front panel, down over the crystal socket pins. If the socket pins are not centered under the front panel holes, hear the solder on their bases and reposition them.

CRYSTAL ADAPTERS

The Bayou Jumper has a front panel crystal socket to fit FT243 crystals, the old style Novice crystals that can still be found in hamfests by the thousands. The kit includes two HC-49 packaged crystals, for 7.030 and 7.122 MHz. These are the two QRP ‘watering hole’ frequencies where most of the QRP activity takes place. Also included are two adapter boards that you can use to build your own FT-243-compatible crystals.

Assembly of the crystal adapters is pretty straightforward. Trim the leads of the HC-49 crystals and bend them so the body of the crystal sits flat on the board. Solder them down to the two round pads. Cut two lengths of #10 bus wire about 5/8” long, and solder down to the two rectangular pads. Check the spacing against the crystal socket on the PCB. Using a fine file or emory board, taper the ends of the #10 wires so they insert into the sockets smoothly.



Crystal Adapters

If the builder has any of the old stye FT243 crystal holders, the miniature HC-49 size crystals can be mounted inside the FT243 case for a truly vintage appearance!

RECEIVER TUNING SETUP

☐ With all board-mount components installed, the next step is to set up the receiver for the desired tuning range, and the regeneration control for the proper range. It is necessary to have a calibrated CW receiver, a calibrated 40M signal source, or use the Bayou Jumper's spotting function to calibrate the receiver.

☐ Connect the 12v power plug cable to a regulated 12v supply or battery, and insert it into the 12v power jack. Plug headphones or computer speakers into the 'PHONES' jack of the Bayou Jumper.

☐ Turn the Bayou Jumper power switch into the RECEIVE position. Turn the ATTEN, VOLUME, and REGEN controls to their maximum clockwise positions, and the TUNE control to the minimum counterclockwise position. You should hear a hiss in the headphones, indicating that the receiver audio is operating.

☐ If you have a frequency counter and a high-impedance probe, you may sample the oscillator frequency at the test point labeled TP1 on the back side of the board.

Alternately, If you have a calibrated CW or shortwave receiver, turn it on, and make sure it is in the CW mode. Place the Bayou Jumper next to it. Sweep the receiver tuning from roughly 6.5 MHz to 7.5 MHz. Somewhere within that range you should hear the oscillations of the regenerative detector, which should fall near 7.0 MHz.

Alternately, if a calibrated receiver is not accessible, a separate transmitter may be used to generate a calibration signal. Connect the transmitter into a dummy load, and connect a short length of wire to the BNC connector of the Bayou Jumper. Tune the transmitter to 7.050 MHz, and key it. Rotate the tuning control of the Bayou Jumper until you hear the transmitted signal, which should fall at approximately halfway through the tuning range. If it is not heard, re-adjust the transmitter to 7.000MHz or 7.100 MHz to see if the signal can be heard.

Alternately, if neither of these options is available, the transmitter spotting feature allows you to use the transmitter master oscillator as a reference signal. Insert the 7.030 MHz crystal into the crystal socket, place the Bayou Jumper power switch in the RECEIVE position, and turn the ATTEN control fully counter clockwise. Turn the VOLUME control knob to the 10 o'clock position, and the

REGEN control fully clockwise. Depress the key knob, and rotate the TUNING knob through its range. You should hear two heterodynes, and the receiver will be tuned to 7.030 at the midpoint between the two. This point should occur at approximately the '3' position on the tuning knob.

If no signals are heard, the regenerative detector may not be oscillating. Jump ahead to the next section to adjust the regeneration range.

If the frequency of the Bayou Jumper regenerative oscillator is more than approximately 10 kHz off, you may use the trimmer capacitor C30 to adjust the frequency of the oscillation. Using a fine jeweler's screwdriver, rotate the trimmer capacitor setting approximately 1/8 of a turn until the desired frequency is set.

If the trimmer capacitor C30 has insufficient range, you may manually squeeze together the turns of the toroid transformer L1 to lower the oscillation frequency, or spread them further apart to increase the frequency, and then fine-tune using C30.

If there is still insufficient range using both C30 and by adjusting the turns spacing of L1, you may have to remove or add a turn to the tuner winding of L1. If you remove the mounting nuts from the POWER, PHONE and KEY jacks, the front panel can be removed without having to desolder anything. Removing a turn will increase the oscillator frequency, adding a turn will decrease it. Once this is done, repeat the calibration process to set the range of the tuning control.

REGENERATION SETUP

☐ The next step in receiver setup is to adjust the regeneration control range. Set the TUNING control to the middle of its range, the VOLUME control to maximum clockwise, and listen to the headphone audio. Rotate the REGEN control knob from maximum to minimum, and back. You should notice a marked change in the audio hiss in the headphones at some point along the knob travel, as the detector JFET Q2 enters and exits oscillation. This should occur near the midpoint of its travel. Adjusting the trimmer capacitor C20

If there is no change to the hiss while adjusting the REGEN control, it means that the regeneration must be adjusted to either increase or decrease the amount of RF feedback in this circuit. If you can hear the heterodyne of the Bayou Jumper's regenerative oscillator in your separate calibrated receiver, or, hear the signal of a nearby CW transmitter or the spot frequency when keying,

then you have too much regenerative feedback. In this case, remove one turn of the tickler winding of L1, and re-test.

If, on the other hand, you are not hearing any oscillations in your separate CW receiver, or hearing any CW notes in your Bayou Jumper Receiver when connected to an antenna, then you have insufficient regenerative feedback. In this case, install C16, the 22p capacitor, and re-test.

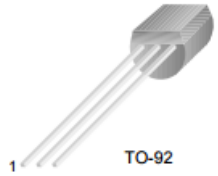
Re-check the receiver calibration. When the receiver calibration is satisfactory, paint the toroid with a slight coating of clear fingernail polish to fix the turns in place.

TROUBLESHOOTING

If your Bayou Jumper does not operate after assembly, repeat the visual inspection of solder joints. Compare the component placement diagram with the instructions to be certain that all components were installed in their correct locations.

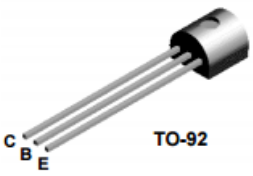
A check of voltages at strategic locations on the board while under power can serve to isolate problems to a particular circuit. The following table lists nominal voltages on the unit on receive, with the regeneration control fully counterclockwise. If an entry is marked 'xxx' **do not attempt to measure it.**

MPF102



1. Drain 2. Source 3. Gate

2N3904



2N7000

78L06

1. Output 2. GND 3. Input

Component	Pin	Rx Voltage
Q1	E	5.4
	B	6
	C	6
Q2	G	0
	D	6
	S	1.5-3.5
Q3	E	0
	B	0.65
	C	2-4
Q4	G	xxx
	D	12
	S	xxx
Q5	G	3
	D	12
	S	xxx
Q6	G	12
	D	0
	S	0
U1	1	0
	2	5.7
	3	5.7
	4	5.7
	5	5.7
	6	12
	7	0
	8	5.7
U2	1	6
	2	0
	3	12

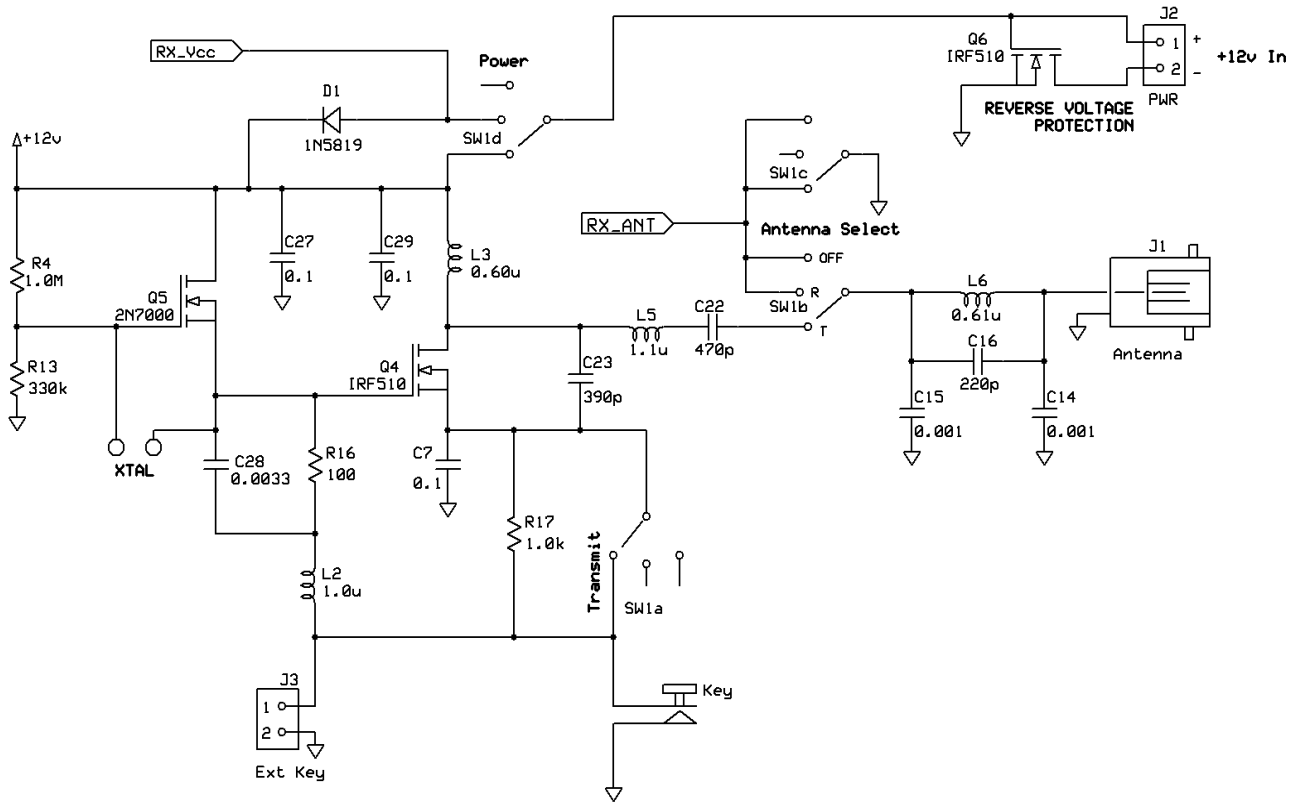
OPERATING THE RADIO

Operation of the Bayou Jumper is fairly straightforward. Make sure you are operating into an antenna with good VSWR – 1.5:1 or better. The transmitter in the Bayou Jumper is not overly sensitive with VSWR, but it has no built-in protection against loads that could cause damage. It is best to use a tuner with a resistor-bridge type VSWR sensor, such as the 4SQRP 4S-Tuner.

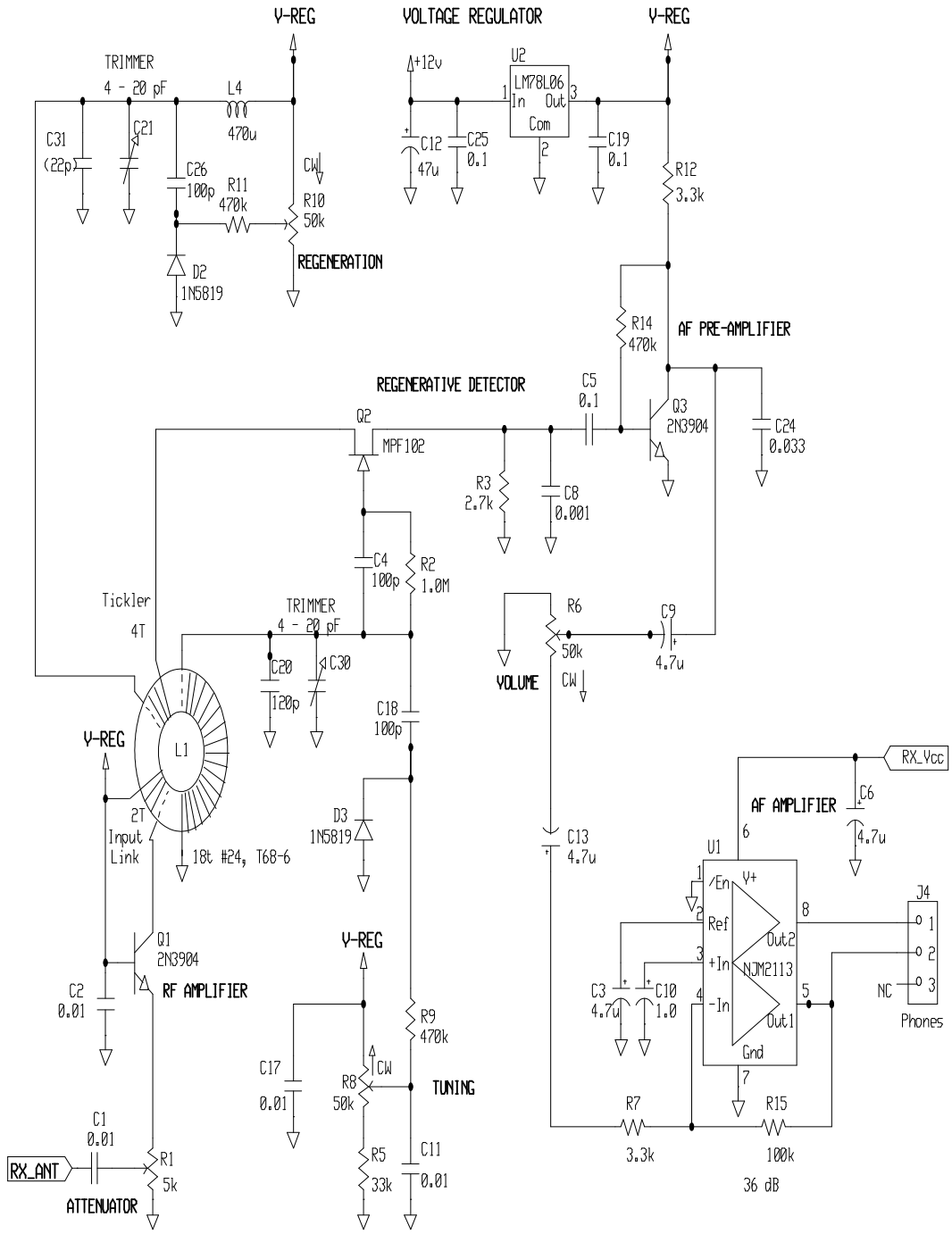
Make sure there is a crystal inserted into the socket before transmission. Turn on the receiver and verify that you hear signals

To spot the transmitter crystal frequency, first turn the ATTENuator control fully counter-clockwise. Turn the REGEN control fully clockwise. Turn the volume control to the 10 o'clock position. Key the transmitter – in the Receiver setting, only the Master Oscillator is activated, and no signal is transmitted. Rotate the tuning control. As you rotate the control, you will hear two loud regions of heterodyne whistle noise, with a dead zone in the middle. The transmitter frequency is in the middle of the two noise regions.
Returning the REGEN, ATTEN and VOLUME controls to their normal positions, you will likely hear signals. You can either call CQ or reply to a call as you would with any other rig – just be aware that you cannot change the transmit frequency without changing crystals!

There is a Yahoo Group devoted to the Bayou Jumper at https://groups.yahoo.com/neo/groups/BayouJumper/info. This will be a great community of builders who can help each other with issues that may arise, so builders are encouraged to join up!



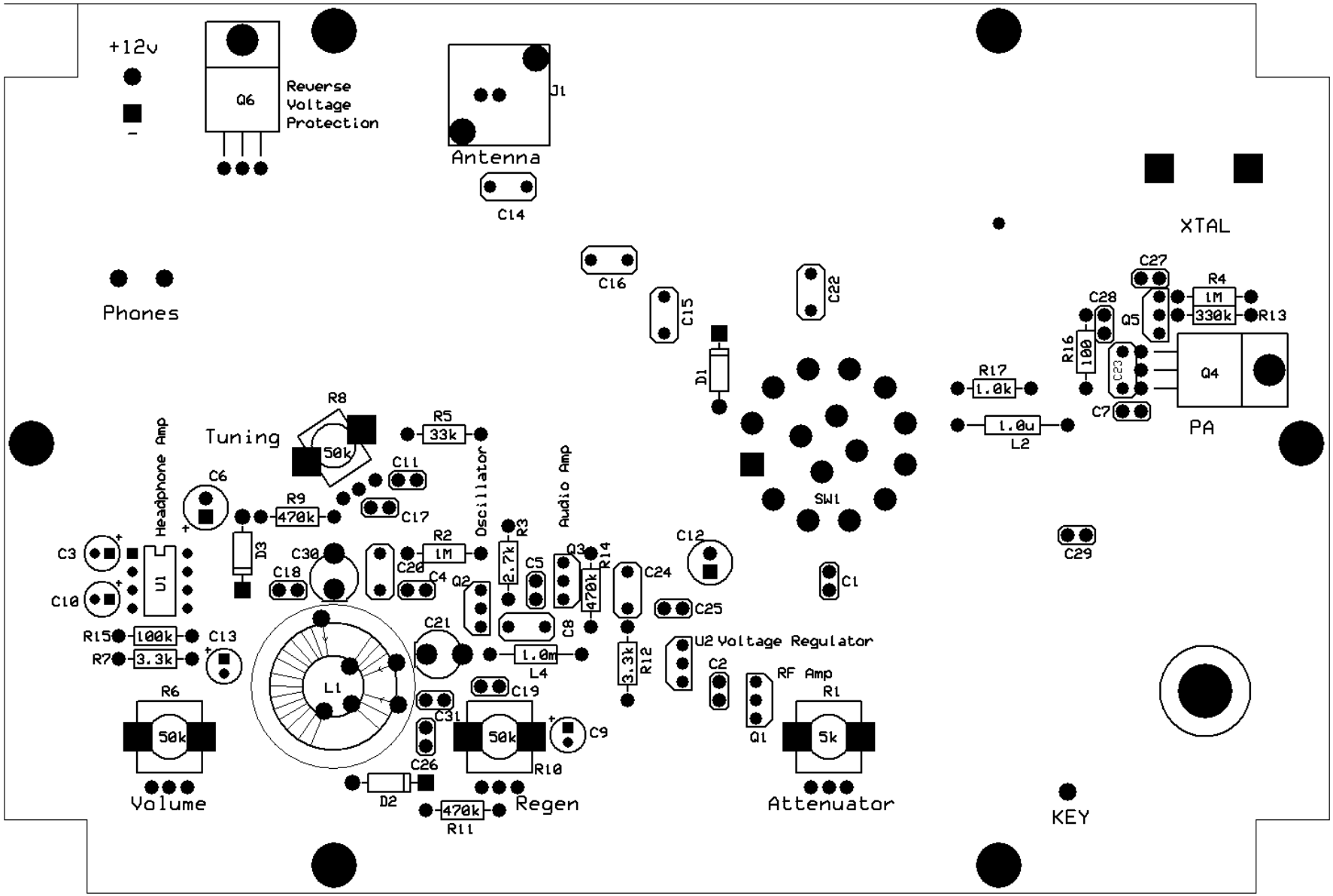
4SQRP		
Bayou Jumper - Transmitter		
N5IB - NM0S	Rev 1.0 4/21/2016	Page 2 of 2



4SQRP

Bayou Jumper Receiver

N5IB NM0S


+12v
-
Q6
Reverse
Voltage
Protection
J1
Antenna
C14
XTAL
Phones
C16
C15
C22
C27
R4
1M
330k
R13
C28
Q5
R16
100
C23
C7
Q4
PA
D1
R17
1.0k
1.0u
L2
SW1
C29
C1
Headphone Amp
Tuning
R8
50k
R5
33k
C11
C6
R9
470k
C17
Oscillator
Audio Amp
C3
C10
U1
D3
C30
C18
R2
1M
C20
C4
Q2
R3
2.7k
C5
C8
Q3
R14
470k
C24
C12
C25
R15
100k
R7
3.3k
C13
C21
1.0m
L4
U2 Voltage Regulator
C2
R12
3.3k
L1
C19
C31
C26
D2
R6
50k
Volume
50k
R10
C9
R11
470k
Regen
RF Amp
Q1
R1
5k
Attenuator
KEY

DESIGN NOTES

- Tuning range approximately 120 to 150 kHz – enough to cover the Extra Class CW band through the old "Novice Band."
- One knob tuning – no bandset/bandspread needed.
- Only one toroid to wind.
- Varactor tuning employing readily available Schottky diodes as varactor diodes. Regeneration control also employs a "Schottky varactor" as the throttle capacitor.
- Use of potentiometers controlling only the varactor DC bias for tuning and regeneration means the controls are not "hot" with RF, so "hand effect" detuning is minimized.
- RF attenuator control, which is useful when employed with full-scale antennas. Optional receiver audio muting for use with a transmitter.
- Robust headphone audio, and will drive a small speaker with modest volume.
- Current drain about 20 mA.

Ref	Type
D1	1N5819
D2	1N5819
D3	1N5819
Q1	2N3904
Q2	MPF102
Q3	2N3904
Q4	IRF510
Q5	2N7000
Q6	IRF510
U1	NJM2113
U2	LM78L06

Ref	Type
J1	BNC Antenna
J2	Power
	Power plug
J3	1/8" Stereo
J4	1/8" Stereo
J5	Molex Pin
	Shoulder Washer
J6	Molex Pin
	Shoulder Washer
SW1	4p3t switch

QTY	Desc.
15	3/8" x 6-32 screw
6	5/8"- 6-32 Standoff
1	3/8" - 6-32 standoff
4	6-32 nuts
4	1/2" - 6 sheet metal screws
1	3/8" - 8-32 brass
4	#6 flat washers
1	Tuning Knob
3	Control Knobs
1	Pointer Knob
1	Keyer Knob
4	2" 3/8" sq Wood Dowel
6'	24 AWG magnet wire
6"	22 AWG Bus Wire
6”	10 AWG bare copper
3”	Red/Black Hookup Wire