



L.A.R.A. Newsletter October 2016

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IN THIS ISSUE

From the Prez

It's October! Beautiful weather, starting to cool down and many activities going on. My hopes are that everyone will take part and help out at some of these events. Next month we will be planning a Christmas Party and we need ideas.
 Len, KC5MPX

LARA Logo

Have you been wondering where to get the neat club logo for a shirt, cap, or bag? Well, here's the answer – click [here](#) and scroll down to Embroidery Files.

Choose the logo you want to use and take it along with the garment of your choice to any embroidery shop and they will fix you right up.

HOT NEWS

The Amateur Radio Parity Act HR1301 passed the US House and is headed to the Senate for vote. This is exciting news for amateurs in restricted areas for antennas. It's gaining momentum now, so please go to the [ARRL website](#) to draft a letter to both our Senators to urge the passing.

L.A.R.A On-Line
 Web site – [click here](#)
 By-Laws -- [By-Laws](#)
 SOP -- [SOP](#)

HEADS UP
 The October Business Meeting will be held in conjunction with the JOTA event at L.L. Woods Park, 1000 Arbour Way
 Don't go to the fire station.

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L.A.R.A. Newsletter
 Is published each month for the purpose of informing L.A.R.A. members of current events and issues of interest to the membership. Articles and suggestions are always welcome. Articles that appear in this publication may be reproduced provided credit is given to *L.A.R.A. Newsletter* and to the original source.

Lewisville EOC in A Box

By: Eric Hutmacher, OEM

The Lewisville Office of Emergency Management recently placed in service a mobile Emergency Operations Center (EOC). The purpose of the unit is to support EOC operations in Lewisville and beyond. It was paid for by a Urban Area Security Initiative (UASI) grant, which means it has to maintain a regional support role in the DFW area. It's main purpose is to transport AV equipment, printers, lights, PA system, a military style Zumro inflatable tent, two 2000 watt generators, and one 10,000 watt generator. We have a field desk and all AV and printer equipment are in ruggedized pelican cases for safe travels.

The trailer is enclosed, insulated, with dual axle. An air conditioning unit with heat strip is installed in the event we need to work out of it.

The unit is designed to roll out to a Lewisville facility or a neighbor who has requested the capability and assist in the managerial function of managing large events and/or emergencies. It is intended to be a hauler of the equipment which will then be wheeled out and set up in a quick and efficient manner. The thought being that we will usually have a room with four walls, a roof, and power. If not, we can be flexible by setting up the Zumro tent, firing up the generators and operating out of the trailer as well.

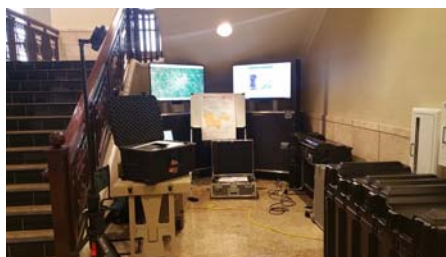
Stop by and see this new unit at the LFD Open House Saturday, Oct. 8



Deployment Trailer



Zumro Inflatable Tent



Deployed Equipment

Repeaters?

Interested in learning about how repeaters work?

As we build our 220 repeater, you have an opportunity to learn how repeaters are built and work. We are looking for members who want to learn to manage and repair the repeater. If you are interested send an email to Jim Lavin, K5VZ at jlavin@jimlavin.net.

Training

Skywarn Training

Storm spotter classes are conducted by the National Weather Service and are required biennially.

An [online course](#) is also available if you missed the local class.

FEMA - [IS-100.b Introduction to ICS](#)

FEMA - [IS-700.a National Incident Management System \(NIMS\), An Introduction](#)

West Gulf Division - [ARES Standardized Training Plan](#) Task Book

JOTA Update

By: Ron Ford, KF5OMH

The Boy Scout Jamboree-on-the-Air (JOTA) is right upon us – Saturday October 15, 0800-1300. Even if you don't plan to operate come on out and observe. There will be things to help with other than the technical stuff.

It looks like scout attendance will be small, but that's OK as it will be more fun for the boys that do come out.

Upcoming Events

Go to the L.A.R.A. web site – [click here](#) Scroll down on the home page to reach the Upcoming Events calendar.

September Meeting Minutes

Recorded by Allysa Shipp, KG5DAS

LARA Meeting Minutes 9/17/16

President Len Shipp KC5MPX, called the meeting to order at 8:18

Officers in Attendance:

President: Len Shipp KC5MPX

Vice President: Jim Lavin K5VZ

Secretary: Allysa Shipp KG5DAS

Treasurer: Sharon Howard KE5JUI

Attendance:

Members:

Dan Howard KE5CIR

Erick Guzowsky KOOM

Clark Highsmith K5LGX

Marty Wells KM5OI

Jim Horton WB8YWA

Dale Chatham WA5WNI

Tim Monk WZ5TM

Mike Reitz W5EVT

Gregg Veazey KG5MFL

Steve Kline W5JK

Lee Norup K5WXR

Guests:

Gerald Dehoney KA0QTZ

Meeting Minutes from Last Meeting: Past meeting minutes were approved as posted on the website.

Motioned by: Mike Reitz W5EVT

Seconded by: Dan Howard KE5CIR

Approved by the Members

Treasurer's Report was Given by Sharon Howard KE5JUI: Starting balance \$1367. No deposits or withdrawals. Ending balance \$1367

Motioned by: Allysa Shipp KG5DAS

Seconded by: Tim Monk WZ5TM

Approved by the Members

Technical Report as given by Len Shipp KC5MPX: 145.170 working good. Discussion about programming and finding a final place for W5LVC 220 Repeater.

Motioned by: Lee Norup K5WXR

Seconded by: Mike Reitz W5EVT

Approved by the Members

New Business:

SOP - Meeting time and place: 3rd Saturday morning of the month at 8:00 AM at Central Fire Station Meeting Training Room. Possible quarterly Officer Meetings and as needed or determined during the regular meeting times.

Motion to Change the SOPs to Reflect Meeting Place: Allysa Shipp KG5DAS

Second: Dale Chatham WA5WNI

Junk Box Pass Off: Clark Highsmith K5LGX and Gregg Veazey KG5MFL

Old Business:

Outdoor Activity - JOTA

September 18 is the last day to sign up for OUR SEVA

Presentation: Silent Auction of Estate of Silent Key K5NW

Motion to Close Meeting Made by: Dan Howard KE5CIR

Seconded by: Jim Horton WB8YMA

All Members Approved

Meeting Closed at 8:54

Position	L.A.R.A. Officers	
	Name	Email
President	Len Shipp	kc5mpx@gmail.com
Vice President	Jim Lavin	jlavin@jimlavin.net
Secretary	Allysa Shipp	allyssashipp@gmail.com
Treasurer	Sharon Howard	ke5jui@arrl.net
Technical Officer	Erick Guzowsky	zaphod1@swbell.net

DIY Project

By: Jim Horton, WB8YWA

Here is a neat MIC Switch with Sound Card Interface.

First, I had a problem that most Ham's face, having a couple of rigs and wanting to use the same MIC for each. In addition, wanted both rigs to have the ability to operate PSK31 & MMSSTV.

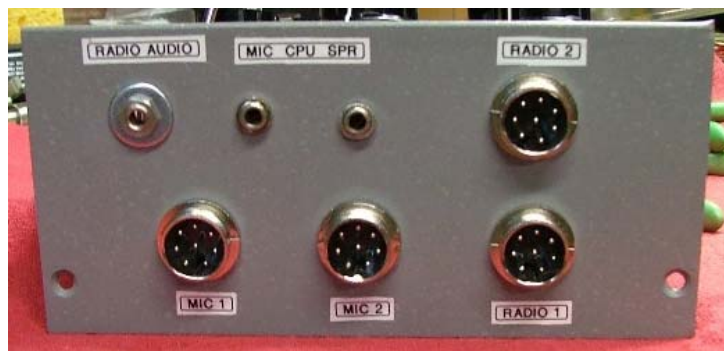
I did a lot of cable swapping while I looked for an 8 pole 2 position switch. I found all the parts easily that I needed except these 8P2T switches. Then one day, while cleaning out my junk boxes I found some old left over computer data A/B switch boxes. Opening it up I found an excellent 25 pole 2 position switch with just the correct length of wire color coded for my project. Note: these A/B switch boxes are found at flea markets and come in all configurations, but all have at least 9 poles. Some have more than 2 positions if you want to switch more MIC's or radios.

I wired two of these switches using the common of each switch and the other 2 poles to the four 8 pin female MIC Jacks, two for two rigs and two for two different MIC's (Desk & Headset). Then I switched pin 1 and 8 (ICOM audio in and out) of the common wires with a 2P2T toggle switch, one pole to 1:1 audio transformer and 10K pot for the sound card and the other back to the common wiring for MIC use.



Inside wiring and part placement

I also installed a push button (push on –push off) switch that is also wired to pin 5 and 6 (ICOM push to talk pins). This allows keying while using the headset even if keying is not done through the computer on the data mode.



Back side showing MIC and audio connectors.



Front side of completed switch

This switch can be custom made for any type of radio; the enclosure can be any style but think you should use solid metal for RF Shielding.

Wiring for the 1:1 and 10k Linear Taper is:

- Radio MIC to computer speaker - Wire one side of 1:1 transformer to arm of 10K and other lead to end of 10K.
- Wire the computer jack to this same terminating point.
- Other end of 10K is wired to ground.
- Second winding of 1:1 transformer is wire to ground with one lead while the other lead is terminated to the 2P2T switch that would be Pin 1 (MIC audio ICOM).

For the computer MIC to radio audio:

- Wire one side of 1:1 transformer to arm of 10K and other lead to end of 10K.
- Wire computer jack to this same terminating point.
- Other end of 10K is wired to ground.
- Second winding of 1:1 transformer is wire to ground with one lead while the other lead is terminated to the 2P2T switch that would be pin 8 (speaker out audio ICOM).

Let's Build Radios

By: Jim Lavin, K5VZ

Introduction

When amateur radio began, there was no Amazon, no Ham Radio Outlet, no GigaParts or DX Engineering where one could order a radio, wait a couple of days to receive it and then get on the air. Many amateurs had to build their rigs from scratch using spare parts they found or from kits they ordered from the back of magazines. This home building, gave every amateur a basic fundamental understanding of electronics and how radios worked. It also gave them the skills to not only operate and maintain their equipment, but to experiment and improve on existing circuits and develop new radios that they then shared with other amateurs by writing articles for magazines and selling kits.

If you think about it, amateur radio was the original open source hobby. Amateurs have been creating, sharing, improving, and re-sharing circuits since the hobby started and today with the Internet that sharing has only increased. Amateurs from all over the globe have great websites devoted to the hobby and the practice of home building radio equipment.

If you are new to the hobby, you might look at these sites and the projects and wonder where to start. This series of articles are my effort to give you the background and skills to do what many before us have done and that is build your own HF rig.

What You'll Need to Know

If you've read the ARRL's Understanding Basic Electronics and Basic Radio, then you'll have enough understanding to follow along and participate. I'm not one to dive deep into heavy mathematics or theory, so I'll keep the level to just what you need to know in order to understand the theory behind a component's operation and whatever math you'll need to know to make changes to a component while experimenting in the future.

I'll leave all the heavy theory and math for you to pursue as you need it as you experiment. If you want a deeper understanding of what we cover, I'd suggest you look to two books, the ARRL Handbook for Radio Communications and Experimental Methods in RF Design. They are great references and both have a lot of projects you can build to help with your understanding of building radios.

What Equipment You'll Need

The only tools you'll need will be an inexpensive digital multimeter, a soldering iron, some solder, side cutters, wire strippers, needle nose pliers, and some super glue.

If you have more test equipment available to you, that's great, you'll be able to perform more advanced troubleshooting of what you build, but we will try to show you how to troubleshoot

equipment with the basic tools above and test equipment you can build yourself.

No Messy Chemicals Needed

A lot of articles you see in QST and on the Internet, require a printed circuit board which puts a lot of people out when it comes to messing with chemicals to etch a board. Throughout this series of articles, we'll use a method of construction called Manhattan construction. We will start out with a blank copper board and then add pads where our components need to be soldered on to the board. Where ever we need a component to be soldered to a ground plane we'll solder it directly to the board. This method of construction allows us to quickly build a circuit board without all the messy chemicals or sending our design to a high priced fabrication house.

Depending on the amount of time you spend while building a circuit and how careful you are you can create circuit boards that rivals any fabricated board you can design without all the extra cost or effort.

Getting Up to Speed

We'll start off slow with some easy projects that will help us learn how to read a schematic, create a bill of materials, layout a PC board, build the circuit, and finally test and troubleshoot the circuit if it doesn't work. With the completion of each project we'll add to our set of basic test tools that we can use while we build our radio. This will not only allow us to learn by doing, but it will also help keep our cost down by adding tools that we can use to test and troubleshoot what we build without having to spend a whole lot of money for fancy test equipment.

Our Main Project

Once we've finished building our test equipment, we'll jump into building an all band HF SSB Transceiver called the HF1 designed by Ashhar Farhan, VU2ESE. This project builds on the lessons Farhan learned from his other radio projects the BITX and Minima monoband HF transceivers.

I picked the HF1 for our project for the following reasons:

- It's a SSB transceiver. Most of the kits you find out there are CW only rigs and unless you're fluent in Morse code, you can't use them once you've built them. I wanted something that you could put on the air after building it and make some contacts with it.
- It covers the entire amateur HF band from 160m to 10m. Even Technician class licensees can use it after building it, so the effort you put forward will have a return when you're finished, nothing you build will require you to have a higher license in order to operate it.
- It uses the most common components found in all radios. You'll learn about all sorts of different types of oscillators, mixers, band pass filters, amplifiers as well as digital signal generators and micro controllers.

- It's not a prefabbed kit. You will learn how to take a schematic, create a bill of materials, layout the components and if you want, design a printed circuit board before you build it.
- It's designed using individual components making it a great learning platform for radio experimentation. You can start with the original components and then swap them out with other components as you learn. A good example is the double balance mixers, initially we'll build a diode ring mixer, and then in later articles we'll replace it with other components such as the SBL-1 and NE602 mixers.

Why Am I Doing This?

After I got my license I looked at several kits which I could build at home to help in my learning and understanding of electronics and basic radio principles. After much searching I found the Elmer 101 course, which consisted of a bunch of email lessons and PowerPoint slides that walked a person through the basic electronic principles of amateur radio needed to build a CW based mono-band transceiver from a kit.

Again, not knowing Morse code, I couldn't justify putting forth the effort to build something I could never use and only be left with half the equation when it came to radios. CW modulation is only part of what one needs to know in today's world of amateur radio. One really needs to not only understand how CW signals are generated, but they need to understand how voice signals are used to modulate a carrier wave as well.

So, with that in mind, I've set out to create a new Elmer 101 course that I hope will teach all the basic principles used in today's world of amateur radio.

Of course, none of what I'm going to present to you is original material. I have to declare that I stand on the shoulders of giants when it comes to what I'm going to present in my future articles. I will present information that is rooted in the books and articles by the greats in amateur radio literature; such as Doug DeMaw - W1FB, Wes Hayward - W7ZOI, Ward Silver - NØAX, Rev. George Dobbs - G3RJV, Pete Juliano - N6QW, Bill Meara - N2CQR, Peter Parker - VK3YE, Chuck Adams - K7QO, Ashhar Farhan - VU2ESE and so many other authors that are too many to note.

To make everything available all in one place, I'm creating a website, <http://letsbuildradios.com> where you'll be able to go to find every article and all the schematics, bill of materials and circuit board layouts we'll cover.

I've also set up a mailing list that you can join at <http://www.freelists.org/list/lets-build-radios>. This way you can send questions to me as well as everybody else who is a member. I hope this gives everybody a forum they can use to discuss the

topics we cover as well as help newcomers by passing on your knowledge.

What's Coming in the Future?

To give you an idea of everything I plan to cover in this series, I thought I'd give you a loose outline of the articles to come.

1. Background Theory
2. Signal Injector
3. Signal Tracer
4. RF Probe
5. Power Meter
6. Noise Generator
7. Two Tone Generator
8. Crystal Tester
9. The Power Supply and Regulated Supplies
10. The Arduino Controller and LCD Display
11. Transmit/Receive Switching
12. The Audio Output Amplifier
13. The Microphone Amplifier
14. The Stage Amplifiers
15. The Double Balance Mixers
16. The VFO (Si5153)
17. The 55Mhz Intermediate Stage Oscillator
18. The 10Mhz Beat Frequency Oscillator
19. The CW Tone Generator
20. The 0 - 30 Mhz Low Pass Filter
21. The 45Mhz Intermediate Bandpass Filter
22. The 10Mhz Crystal Filter
23. The Transmit Power Amplifier
24. Tuning and Getting On the Air

We'll also go back and add new articles that show how to replace the various components of the system with different and more modern components which will provide you with an arsenal of building blocks that you can use to build just about any type of HF radio.

As we progress, I'll add articles that sum up the questions, answers, corrections and other conversations that I feel will add to your understanding.

Well, that's it for this month. I hope you're as excited as I am to jump in and learn about the amazing world of amateur radio by building your first HF radio.

Next month, we'll jump into some basic background theory you'll need to understand before we get started.

Until then, 73s and I hope to catch you on the local repeater.

Area Repeaters

Courtesy: DCARA *EXCITER* Newsletter

Freq.	Shift	PL	Call	Name
145.1700	-.600	110.9	W5FKN	DCARA-Denton County EOC
145.2100	-.600	110.9	N5MJQ	Metrocrest ARA-Carrollton
145.4000	-.600	110.9	NETARC	Grapevine
145.4900	-.600	85.4	WD5U	Rosston Tower
146.9200	-0.6	110.9	W5NGU	DCARA - Denton
147.300	+.600	114.8	N5ERS	Flower Mound
147.3800	+.600	110.9	K5LRK	LAARK - The Colony
224.000	-1.6	110.9		LAARK - The Colony
224.920	-1.6	110.9	AF5RS	AF5RS
441.3250	+5.0	88.5	W5NGU	Portable DCARA repeater
442.7500	+5.0	110.9	KA5R	Trophy Club
444.5125	+5.0	123	KE5UT	Celina
442.1750	+5.0	110.9	NETARC	Southlake
442.6500	+5.0	110.9	N5MJQ	Metrocrest ARA-Carrollton
443.3000	+5.0	110.9	K5LRK	LAARK-C4FM only
443.5250	+5.0	118.8	WA5LIE	DCARA - Denton
443.7375	+5.0	141.3	N6LXX	Rosston Tower
443.8750	+5.0	110.9	NETARC	DFW Airport
444.0500	+5.0	110.9	W5NGU	DCARA-Denton County EOC
444.2250	+5.0	110.9	K5CFD	Coppell
444.7000	+5.0	110.9	NETARC	Southlake
444.8500	+5.0	110.9	N5ERS	Flower Mound
927.025	-25.0	D532	N5ERS	Flower Mound
927.4125	-25.0	432	N5LS	Denton
927.6125	-25.0	110.9	W5NGU	DCARA-Denton County EOC
927.1375	-25.0	131.8	W5FKN	Decatur
1253.6000	none	none	W5NGU-G	DCARA - EOC - D*Star "G"
1293.4000	-20.0	none	W5NGU-A	DCARA - EOC - D*Star "A"
442.9250	+5.0	none	W5NGU-B	DCARA - EOC - D*Star "B"
147.4500	-1.0	none	W5NGU-C	DCARA - EOC - D*Star "C"
1259.2000	none	none	KE5YAP-G	DCARA-Rosston- D*Star "G"
1293.2000	-20.0	none	KE5YAP-A	DCARA-Rosston- D*Star "A"
440.7125	+5.0	none	KE5YAP-B	DCARA-Rosston- D*Star "B"
147.4900	-1.0	none	KE5YAP-C	DCARA-Rosston- D*Star "C"
DIGITAL	====	====	=====	=====
144.9100	none	none	W5NGU-4	DCARA Digipeater-Denton
147.970	none	none	K5YX-10	WinLink Gateway
144.990	none	none	KC5GOI	DCARA Digipeater-Rosston
144.990	none	none	KD5EOC-10	DCARA WL Gateway