



Release 2.0, 2002-Jul-05

Preface to Release 2.0

Release 2 of the R-390A/URR Technical Reference (R-390A Y2K-R2) collects and corrects the inevitable errors and omissions of the release 1 document. Many people volunteered significant amounts of time to ferret out and document needed corrections. I am indebted to the following contributors for their assistance:

Al Solway	Bruce Maclellan	Dan Malone, KAØCWD
David Wise	Glenn Little	Jim Miller, N4BE
John Bunting, W4NET	Norman Ryan	Tom Marcotte
Walter Wilson		

Effective version numbers of sub-documents:

Document	Title	Current Revision	Pages
"This Document"	Front Matter	8	9
CHAPTER 1	GENERAL INFORMATION	8	12
CHAPTER 2	OPERATION	7	18
CHAPTER 3	FUNCTIONAL DESCRIPTION	7	28
CHAPTER 4	SCHEDULED MAINTENANCE	6	7
CHAPTER 5	TROUBLESHOOTING	8	68
CHAPTER 6	CORRECTIVE MAINTENANCE	10	93
CHAPTER 7	PARTS LIST	6	68
CHAPTER 8	INSTALLATION	5	10
Total:			313

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The most current copy of this document is available at <http://www.r-390a.net/y2k-r2/index.htm>.

2002-Jul-05

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Preface to Release 1.0

This project was initiated to fill a gap in the documentation that was electronically available for the R-390A/URR receiver. Many of the issued manuals contained errors or had been superseded by newer manuals. Many of the copies available were of poor quality or incomplete.

Discussions over the past several years on the R-390 mailing list revealed that there was a great deal of additional knowledge about the R-390A/URR that had not been captured in the technical manuals nor anywhere else.

In July 1999, Barry Hauser and I began discussions with several recognized R-390A/URR experts to determine how to best capture the wealth of information that was known about the receiver but had not been gathered together and documented where it was easily referenced. Pete Wokoun, KH6GRT chimed in, volunteering to reproduce as many of the drawings as possible using modern drawing software. Dan “Hank” Arney graciously provided new color photographs for reference. Joe Foley provided safety information.

We examined the manuals published from 1955 through 1985. The U.S. Navy Technical Manual for the R-390A/URR Radio Receiver (1985-May-15) was chosen as the basis for further work.

The stated goals of this project are to:

1. Re-create the 1985 U.S. Navy Manual in a format that would allow addition of commentaries, footnotes, and additional information.
2. Replace the poor black-and-white photographic images with new color plates
3. Replace the line and schematic drawings with newly drawn ones
4. Add footnotes referencing related documentation, attributing the additional material and corrections to the authors, and explaining unclear passages in the text
5. Update the parts lists with currently available components
6. Add descriptions, methods, and suggestions that were not covered in the original manual

Effective version numbers of sub-documents:

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“This Document”	Front Matter	7	8
CHAPTER 1	GENERAL INFORMATION	7	12
CHAPTER 2	OPERATION	6	17
CHAPTER 3	FUNCTIONAL DESCRIPTION	7	28
CHAPTER 4	SCHEDULED MAINTENANCE	5	7
CHAPTER 5	TROUBLESHOOTING	7	65
CHAPTER 6	CORRECTIVE MAINTENANCE	9	94
CHAPTER 7	PARTS LIST	5	68
CHAPTER 8	INSTALLATION	4	10
Total:			309

The 21st Century R-390A/URR Technical Reference (Y2K-R2)

This document would not have been possible without the assistance of many volunteers who assisted with typing, proofreading, drawing, photographing, copying, and researching. We are deeply indebted to the following contributors for their assistance:

Dan "Hank" Arney
Joe Foley
John Harvie

Dr. Gerald Johnson
Nolan Lee
W. Li

John Patterson, KB4SLV
Walter Wilson

In addition we want to thank Alan Waller, K3TKJ, for his generosity in providing a forum for use by enthusiasts of the R-390A/URR receiver - the R-390 mail reflector on QTH.net.

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2000-May-29

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Conventions and Notations used in the preparation of this document:

1. Additional material will be identified by the use of a shaded text block with attribution to the author in a footnote. For example:

This is text that was added to the original manual¹

2. Removed material will be identified by the use of a ‘strike-through’ with attribution to the author in a footnote. For example:

~~This is text that was removed from the original manual~~²

3. Reference material will be identified by the use of a footnote that specifies the document name, number and issue date.

This is text that needs a reference³

¹ This is the reference to the author of the added text.

² This is the reference to the author of the deleted text.

³ This is the name, number and issue date of the reference document.

Joe Foley's Safety Section⁴

I guess I'm the lucky sucker that was appointed author. OK, just so everyone understands that I take NO responsibility for anyone getting hurt playing around with this radio stuff.

YOU'RE ON YOUR OWN!!!! This is a general discussion of safety advice ONLY. Its by NO means the ultimate last word, and it sure WON'T guarantee that you won't get zapped or drop the silly thing on your foot. I won't even get into the magnetic repulsion heavy objects demonstrate when hurtling toward steel toe boots. They always hit that part of the foot that's not covered. Hello, Mr. Murphy!

So, you got this thing home without hurting yourself, you can still stand up straight, that's good. Now you know why radiomen were the strongest men in the military. Proper lifting techniques are important here. Lift with your legs, with your back straight, if its too heavy, don't hesitate to get help, or the right equipment. Now you know why military radios have BIG handles. Planning helps if you buy one of these at a hamfest, ask anyone who's carried one to the parking lot, you'll need a strong cart of some kind. Yeah, right, if you buy more than one you'll need a strong car! That's why the standard Boatanchor Search and Recovery Vehicle is a 3/4 ton truck!

All right! We've got it to the bench. It should go to the bench first. Before you plug it in take a LONG close look at it. Is the cord grounded, does it have three wires, one being green? Make sure that is securely fastened to the chassis. What's the cord cap look like? That's the end that goes into the wall socket, sorry, some people don't know that's what its called. The screws used to fasten the wires WILL come loose from repeated heating, or handling, check to see that they're tight, also that they're assembled right, white wire/silver screw, black wire/gold screw, green wire/green screw. DONT ASSUME THE LAST OWNER KNEW WHAT HE WAS DOING. Check everything.

Are the fuses the right ones? Time to check the manual. Oh, yeah, the manual! You are going to read the manual aren't you? The R-390 and early versions of the R-390A only had one fuse in the back. It was deemed necessary to put two more in because when the radio developed shorts they were spectacular!! Fire ball time! Fuses are good, fuses work!

⁴ Version 1, Courtesy of Joe Foley

Now that the power into the radio has been checked do a visual check on the innards. Look for burn marks, hot spots, bad wiring. Do the resistance checks in the manual at every tube socket and resistor. Check the operation of all switches, if any bind or feel loose this is a good time to fix them. The FUNCTION switch has a microswitch mounted on it. If this isn't adjusted right you won't be able to shut down the power to the radio, this isn't good on a radio you're doing a first startup test on. Pay close attention to the Filter Capacitors, they are a popular failure point. They may work fine, explode, or just get very hot, like mine did. You might want to pull all of the modules and continue your visual check, this should be mandatory if its an older model as the Black Beauty capacitors may act just like the above mentioned Filter Capacitors.

Is it power time? That's your decision. If you do it's a good idea to bring it up to full voltage on a variable transformer (variac), slowly, while checking for smoke/heat/sparks. One problem with a variac is that the voltage is dependent on the current passing through it. It should always have a voltmeter attached to it. It should also be connected to a Ground Fault Circuit Interrupter. If the radio continually trips the GFCI check the line filter. Places that normally get hot after warm-up, besides the tubes, are the crystal oven (switchable), the mechanical filters, and the small round can in the back right corner, this is another crystal oven with a thermostat that clicks on and off, there's no switch for it.

How to put it into a rack?? That's not easy if the rack is six feet high and it goes at the top. I'm able to tip my rack onto its back, then I can lower the radio carefully into it, without scratching the paint. The front panel IS NOT to be used to support the whole weight of the radio. The transmission will be mechanically stressed causing it to bind. Your rack needs slides for the radio to slip in properly, at the very least the back needs to be supported, solidly. Make sure your rack is balanced, some racks need weight placed on the bottom if the load is top heavy, especially if its on casters. Tip-overs could get ugly.

The original 1985 Navy Manual cover:

SPAWAR 0913-LP-009-1400

EE125-AB-OMI-010/P6I0 R390A/URR

Technical Manual

Radio Receiver R-390A/URR

Operation, Maintenance and
Installation Instructions
with Parts Lists

This manual supersedes NAVELEX 0967-LP-063-2010
of 15 April 1970 including
Interim Changes T-1 through T-7.

Published by Direction of
Commander, Space and Naval Warfare System Command

15 MAY 1985

Forward

EE125-AB-OMI-010/P610 R390A/URR describes and provides instructions and parts list for the installation, operation, and maintenance of Radio Receiver R-390A/URR.

The technical content of this manual reflects the installation of the following changes, performed in the field of the listed equipment.

Radio Receiver R-390A/URR	Field Change
All	No. 1
Shipboard only	No. 2
Shipboard only	No. 3
Shipboard only	No. 4
Shipboard only	No. 5
Shipboard only	No. 6
Shipboard, Supplementary Radio Spaces only	No. 7
Selected Ships only	No. 8

EE125-AB-OMI-010/P610 R390A/URR is comprised of eight chapters:

- CHAPTER 1 - GENERAL INFORMATION
- CHAPTER 2 - OPERATION
- CHAPTER 3 - FUNCTIONAL DESCRIPTION
- CHAPTER 4 - SCHEDULED MAINTENANCE
- CHAPTER 5 - TROUBLESHOOTING
- CHAPTER 6 - CORRECTIVE MAINTENANCE
- CHAPTER 7 - PARTS LIST
- CHAPTER 8 - INSTALLATION

This Technical Manual is in effect upon receipt and supersedes NAVELEX 0967-LP-063-2010 (formerly NAVSHIPS 0967-063-2010) of 15 April 1970 including Interim Changes T-1 through T-7. Extracts from this publication may be made to facilitate preparation of other Department of Defense publications.