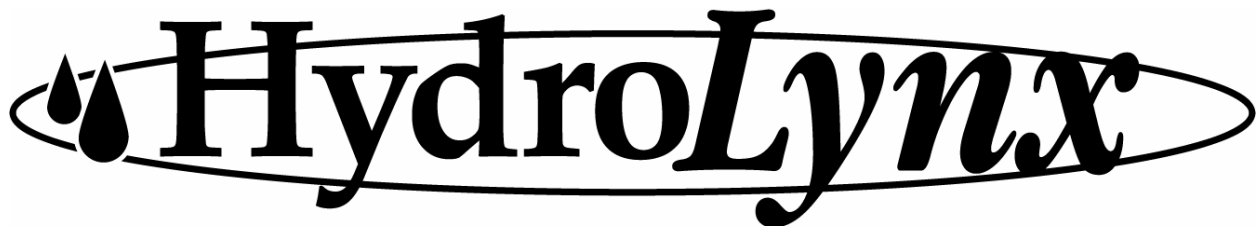


HydroLynx Systems, Inc.

Model 50386R
Receiver

Instruction Manual



Document No: A102682
Document Revision Date: August, 2006

Receiving and Unpacking

Carefully unpack all components and compare to the packing list. Notify HydroLynx Systems immediately concerning any discrepancy. Inspect equipment to detect any damage that may have occurred during shipment. In the event of damage, any claim for loss must be filed immediately with the carrier by the consignee. If the equipment was shipped via Parcel Post or UPS, contact HydroLynx Systems for instructions.

Returns

If equipment is to be returned to the factory for any reason, call HydroLynx between 8:00 a.m. and 4:00 p.m. Pacific Time to request a Return Authorization Number (RA#). Include with the returned equipment a description of the problem and the name, address, and daytime phone number of the sender. Carefully pack the equipment to prevent damage during the return shipment. Call HydroLynx for packing instructions in the case of delicate or sensitive items. If packing facilities are not available, take the equipment to the nearest Post Office, UPS, or other freight service and obtain assistance with packaging. Please write the RA# on the outside of the box.

Warranty

HydroLynx Systems warrants that its products are free from defects in material and workmanship under normal use and service for a period of one year from the date of shipment from the factory. HydroLynx Systems' obligations under this warranty are limited to, at HydroLynx's option: (i) replacing; or (ii) repairing; any product determined to be defective. In no case shall HydroLynx Systems' liability exceed product's original purchase price. This warranty does not apply to any equipment that has been repaired or altered, except by HydroLynx Systems, or that has been subjected to misuse, negligence, or accident. It is expressly agreed that this warranty will be in lieu of all warranties of fitness and in lieu of the warranty of merchantability.

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1.0 INTRODUCTION

1.1 General Description

The 50386R is an FM radio receiver that operates with a frequency in the VHF or UHF band. The frequency used for each system is selected by the customer. Within the United States, the frequency must be applied for and approved for use by the FCC.

1.2 Equipment Included

50386R
Receiver/Decoder Cable
5030 Charger with 5-pin female connector
Battery Power Cable
Battery

1.3 Specifications

Enclosure:	Desktop
Radio specifications:	Refer to radio manual
Power Required:	12 Vdc
Standby Current:	65 mA
Transmit Current Drain:	2 Amps
Battery:	12 Vdc, 12 AH
Charger:	120 Vac, 0.2 A
Antenna Input Connector(s):	N-type female lightning arrestor
Audio output:	800 mVpp, Typical
Operating temperature:	-40 to 60 °C
Humidity:	0 to 95 %, non-condensing
Size:	7.25 in. x 2.75 in. x 9 in.
Weight:	3 lbs.

2.0 INSTALLATION

The 50386R/D Receiver/Decoder is composed of two devices; a radio receiver; and a demodulator. The 50386R radio receiver is installed at or near the antenna tower. The 50386D decoder is installed at or near the operator's office.

2.1 Site Selection

2.1.1 Antenna

The receiver antenna should be installed at an elevation that is as high as practical. If possible, install the antenna onto a radio tower, tall building, or other tall structure. Refer to Radio Path Survey.

2.1.2 50386R

The 50386R must be installed as close to the antenna as possible to keep antenna cable line loss to a minimum. The 50386R is capable of driving its output signal long distances, up to 5000 feet (consult factory). For outdoor or remote installations, the 50386R must be housed within a weather-proof enclosure; otherwise it must be kept indoors.

2.2 Connections

All wiring connections are located on the back panel.

- ! Connect the antenna cable into the N-type female connector.
- ! Attach the ground screw to earth ground using a #6 stranded copper wire. The ground lug is provided on the ground screw.
- ! Attach the receiver/decoder cable using the "lug" type connectors into the Sig Out (signal out) section of the terminal block. Attach the cable shield to the ground screw (see wiring diagram).
- ! Attach the battery power cable into the terminal block. Connect battery power cable to the battery terminals.

CAUTION: Failure to observe battery polarity will cause extensive damage.
--

- ! Connect the AC charger to the 5-pin connector. Plug the AC charger into a standard AC electrical outlet.

2.3 Mounting

The 50386R is designed for "desktop" installation. Avoid placing the console in areas where there is a possibility of it getting wet. For use in remote locations, place the console into a weather-proof enclosure.

3.0 THEORY OF OPERATION

The 50386R receives data transmissions from the remote sites. The receiver circuitry demodulates the Frequency Modulated (FM) radio signals into audible tones for input into the 50386D.

3.1 Power Light

The power light is lighted whenever power is applied to the 50386R.

3.2 Radio: Tone and Squelch

The tone amplitude and squelch levels are factory set.

CAUTION: Adjustment should be made only by trained service personnel.

Tone amplitude is 800 mV

Squelch is set to 12db (SINAD measurement); Limit: $\leq 0.5 \cdot V$.

3.3 Input/Output

The 50386R receives Radio Frequency (RF) data transmissions from remote sites as input. The receiver circuitry demodulates the Frequency Modulation (FM) signals into audible tones. These tones, presented in ALERT Format, are 2133 Hz for logic "1" and 1920 Hz for a logic "0", and are the Frequency Shift Keying (FSK) output signal.

4.0 TESTING AND MAINTENANCE

4.1 Testing

4.1.1 RF Antenna Test

The antenna is tested for reflected power as if it were a transmitter antenna.

- ! Attach a wattmeter and transmitter to the antenna cable.
- ! Select the proper slug for reverse power and frequency testing (refer to wattmeter manual).
- ! Initiate a transmission. The duration of the transmission must be long enough to obtain a stable reading on the wattmeter.
- ! Compare the measured reading to the antenna system's rated reflected power.

4.1.2 Tone Out

- ! Attach an oscilloscope to the tone out terminals.
- ! Initiate a transmission to the receiver.
- ! Verify that the signal is a 800 mVpp sine wave.
- ! Refer to the radio manufacturer's service manual for adjustment instructions.

4.2 Radio Alignment

Refer to the Incoming Radio Inspection Form and to the radio manufacturer's service manual.

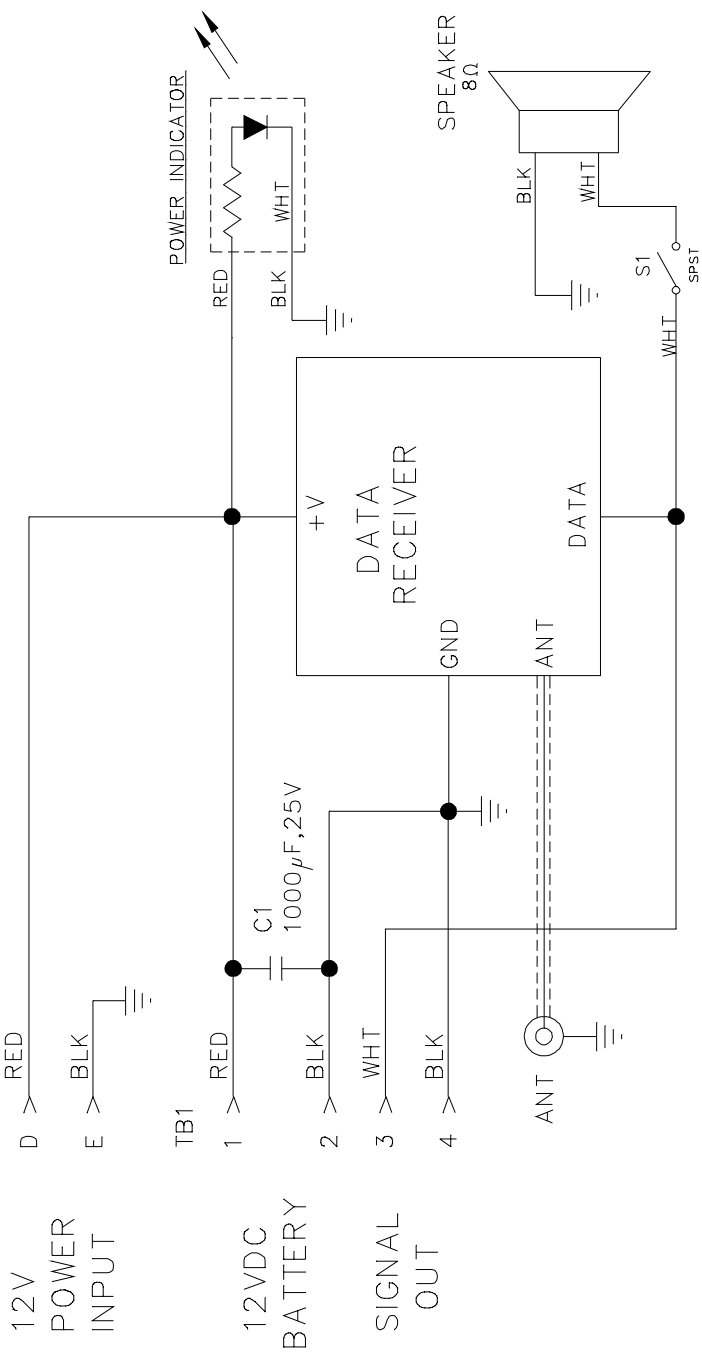
CAUTION: Radio alignment should only be performed by trained service personnel.

4.3 Maintenance

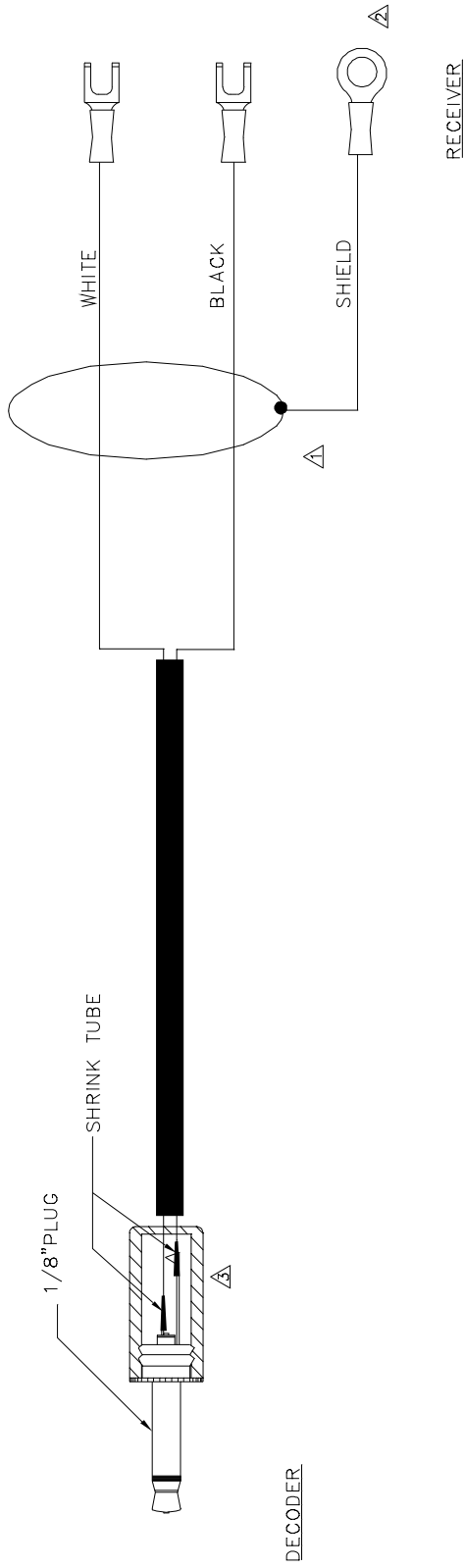
The receiver is essentially a low maintenance item, however, the battery should be tested annually and replaced whenever necessary. Refer to the battery manual.

5.0 FORMS AND DRAWINGS

AC103421 Wiring Diagram - Chassis
AC106249 Assembly - Audio Cable to Decoder
AC108053 Assembly - Battery Cable
A100913 Incoming Radio Acceptance Procedure



N/A	REDRAWN ON NEW BORDER	5-26-99
ECN#	DESCRIPTION	DATE
MODEL USAGE		
HydroLynx		
MODEL NO. 5051R		
TITLE CHASSIS		
DRAWN BY J. MICHAELS DATE 5-26-99 DWG TYPE WIRING DIAGRAM		
CHECKED BY	SIZE A	DWG NO. AC103421
		REV A



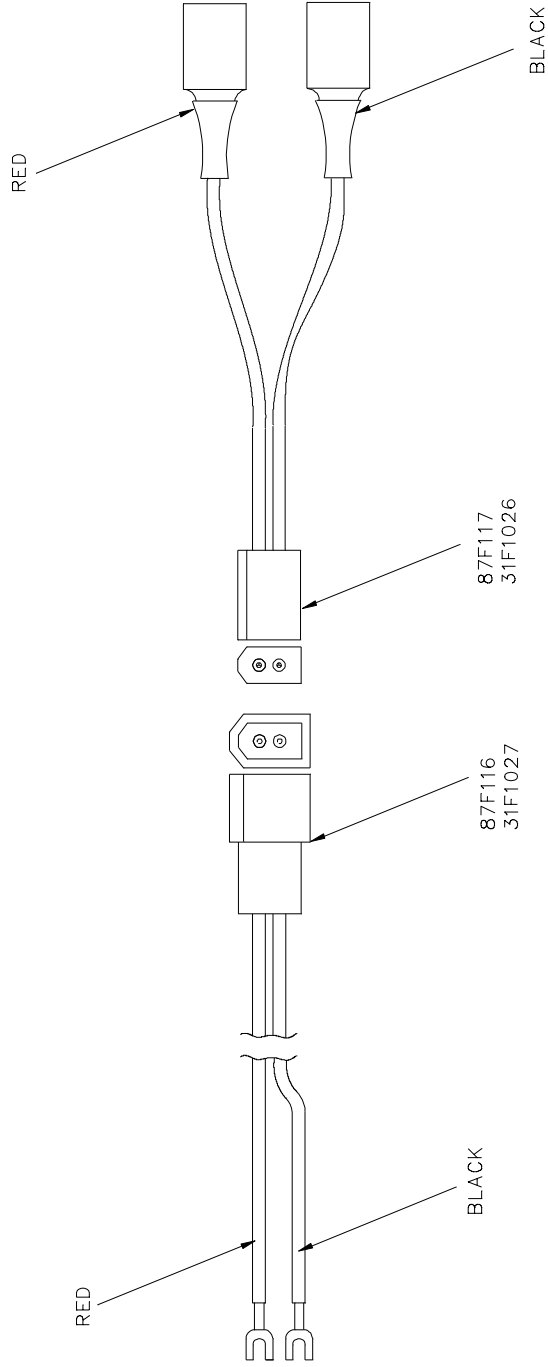
NOTES -

- 1. CABLE IS BELDEN #9533, 24 AWG, SHIELDED, 25 FT.
- 2. RING LUG CONNECTS TO EARTH GND.
- 3. DISCONNECT SHIELD FROM BLACK WIRE ON ALL EARLIER VERSIONS.

N/A	REDRAWN ON NEW BORDER	1 26 00
ECN#	DESCRIPTION	DATE
MODEL USAGE		
HydroLynx		
MODEL NO. 5051R		
TITLE CABLE, AUDIO		
DRAWN BY SEN DATE 1 26 00 DWG TYPE ASSEMBLY		
CHECKED BY DATE DWG NO. AC106249 REV D		

NOTES:

1. CABLE IS BELDEN #8205, 2-CONDUCTOR, 20AWG.
2. 3FT LENGTH TOTAL.



MODEL USAGE			
MODEL NO.	5051R		
TITLE	CABLE, BATTERY		
DWG TYPE	ASSEMBLY		
DRAWN BY	O. SCIORELLI	DATE	01/25/00
CHECKED BY		DATE	
SIZE	A	DWG NO.	AC108053
		REV	



Incoming Radio Acceptance Procedure

1. GENERAL PROCEDURE

Document No. A100913-1

This is a generic procedure for accepting a new or repaired radio. Separate sections divide the procedure into receiver and transmitter functions. If the radio requires tuning, refer to the manufacturer's radio service manual. When HydroLynx specifications are unavailable, use the manufacturer's radio specifications. Record the test results on this sheet. Record general information here:

Inspector	Chassis serial number	Model	Radio manufacturer	Frequency
Date	Radio serial number	Radio model number	Deviation	Power
			±kHz	Mhz W

2. REQUIRED EQUIPMENT

- radio service monitor SINAD meter oscilloscope miscellaneous tuning wands

3. TRANSMITTER

Frequency Error

- Key the transmitter with no tone in. Observe frequency error:

Hz
Yes No

- Limit frequency error $\leq \pm 500$ Hz:

Power Out

- Key the transmitter. Observe power out:

W
Yes No

- Limit within specifications:

Deviation

- Inject tone as specified by the HydroLynx model or radio specification. Observe deviation (adjust as required):

kHz
Yes No

- Limit within specifications:

4. RECEIVER

Frequency error and selectivity

- Inject carrier frequency: generator level = 10 μ V and 1 μ V
tone = 1 kHz ± 0.005 kHz
deviation = ± 3 kHz

- Increase carrier frequency, 1 kHz steps; observe SINAD meter. Record number of steps SINAD is above 12 dB:

kHz

- Decrease carrier frequency, 1 kHz steps; observe SINAD meter. Record number of steps SINAD is above 12 dB:

kHz

- Subtract these two values and enter the difference:

kHz
Yes No

- Limit the recorded difference ≤ 5 kHz:

Sensitivity

- Inject carrier frequency; reduce the generator level until 12 dB SINAD is observed:

μ V
Yes No

- Limit generator level ≤ 0.5 μ V at 12 dB SINAD

Squelch

- Adjust the squelch threshold at generator level which produces 12 dB SINAD.

- Limit unsquelch and squelch when generator level is slightly increased and decreased:

Yes No

Tone Out

- Inject carrier frequency: generator level = 10 μ V
tone = 2 kHz ± 0.2 kHz
deviation = ± 3 kHz or work order specification

Vpp
Yes No

- Observe the tone output with the oscilloscope and adjust to 0.8 Vpp (or specified).

- Limit within specifications: