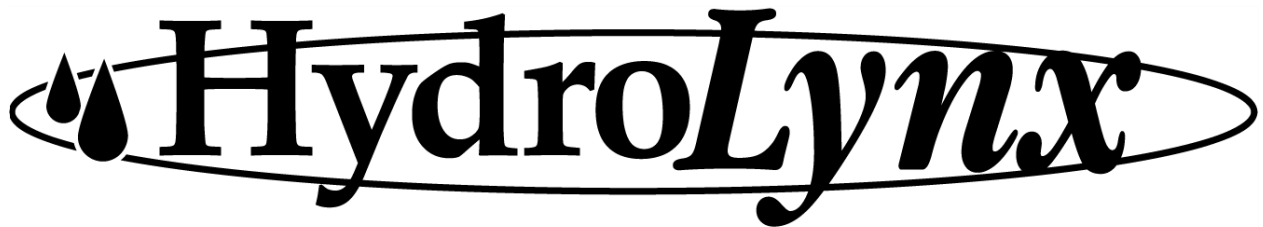


# HydroLynx Systems, Inc.

**Model 5062  
Remote Station Tester**

**Instruction Manual**



Document No: A102830  
Document Revision Date: December, 2004

## 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.

## Address

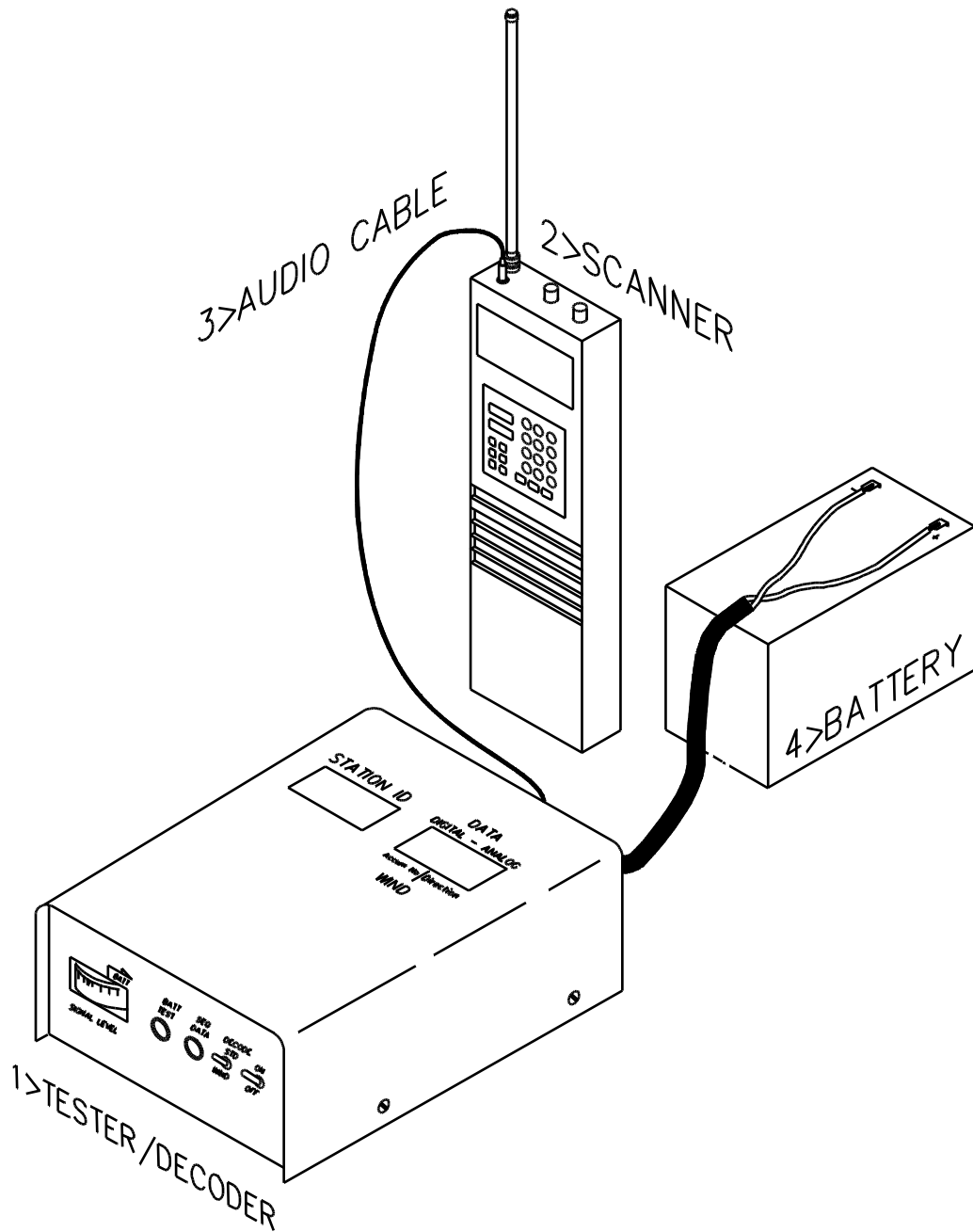
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# TABLE OF CONTENTS

SECTION NO.	PAGE NO.
Equipment Configuration and Parts Identification .....	4
1.0 INTRODUCTION .....	5
1.1 General Description .....	5
1.2 Equipment Supplied .....	5
1.3 Specifications .....	5
2.0 INSTALLATION .....	5
2.1 Connections .....	6
2.1.1 Scanner .....	6
2.1.2 Tester .....	6
2.1.3 RS232 Option .....	6
3.0 THEORY OF OPERATION .....	6
3.1 Introduction .....	6
3.2 Controls .....	7
3.2.1 Scanner .....	7
3.2.2 Tester .....	8
3.3 Input & Output .....	9
3.3.1 Scanner .....	9
3.3.2 Tester .....	9
3.3.3 RS232 Option .....	9
4.0 TESTING AND MAINTENANCE .....	10
4.1 Testing with the 5062 .....	10
4.1.1 Signal Out - Deviation .....	10
4.1.2 Signal In - Sensors .....	10
4.2 Scanner/Signal Meter Calibration .....	10
4.3 Maintenance .....	11
4.3.1 Battery .....	11
4.3.2 LCD Display .....	11
4.4 Trouble Shooting .....	11
5.0 FORMS AND DRAWINGS .....	12

### Equipment Configuration and Parts Identification



## 1.0 INTRODUCTION

### 1.1 General Description

The Model 5062 Remote Station Tester is a portable "central site" and is useful during installation, routine maintenance, and trouble shooting of remote sites. With the 5062-RS232 option, the tester can be used as an emergency back-up for the 5051R/DE. The 5062 includes a radio scanner, the decoder/tester, the audio cable, and a battery.

### 1.2 Equipment Supplied

- 1> 5062 Chassis with:
  - Interconnect PCB
  - Modem PCB
  - Display PCB
- 2> Scanner with:
  - Antenna
  - Charger
  - Carrying case
- 3> Audio Cable
- 4> Battery
- 5> RS232 Option with:
  - RS232 cable
  - Battery cable
  - Batteries, 2 each 9.5AH
- 6> 5071RST Option - Display program for laptop computers

### 1.3 Specifications

Power:	7 AH battery
Dimensions:	9" x 7-1/4" x 3"
Display:	LCD (Liquid Crystal)
Scanner:	Uniden BC100XLT (refer to mfg manual)

## 2.0 INSTALLATION

The 5062 is a portable "in-the-field" test unit and is not designed to be permanently installed. NOTE: Prior to using the 5062 tester in the field, the batteries must be fully charged to provide the best possible operation.

## 2.1 Connections

### 2.1.1 Scanner

Refer to the scanner top view diagram for the locations of the connections.

- Attach antenna to female BNC connector.
- Plug audio cable into EAR PH jack.

### 2.1.2 Tester

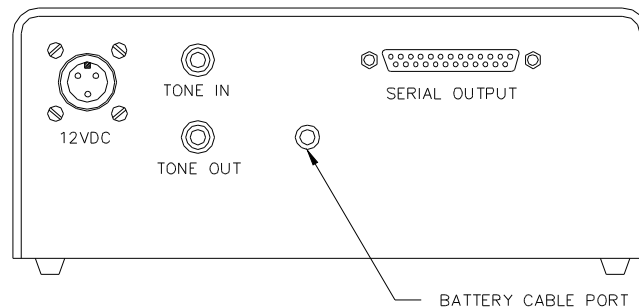
Refer to the rear panel view of the tester for wiring connector locations.

- Plug audio cable from the scanner into TONE IN jack.
- Connect battery cable lugs to battery terminals [RED(+), BLACK(-)].

**CAUTION:** Failure to properly connect battery will cause extensive damage.

### 2.1.3 RS232 Option

- Connect two batteries to double battery bracket
- Attach 3-pin MS connector to 12VDC 3-pin bulkhead connector
- Connect serial computer cable (25-pin) to SERIAL OUTPUT
- Connect serial computer cable to computer COM port.



**5062 Remote Station Tester - Rear Panel View**

## 3.0 THEORY OF OPERATION

### 3.1 Introduction

The 5062 receives, decodes, stores, and displays ALERT formatted data transmissions from remote sites which allows the technician to verify gauge operation "on-site." The signal level meter allows the technician to verify transmitter deviation.

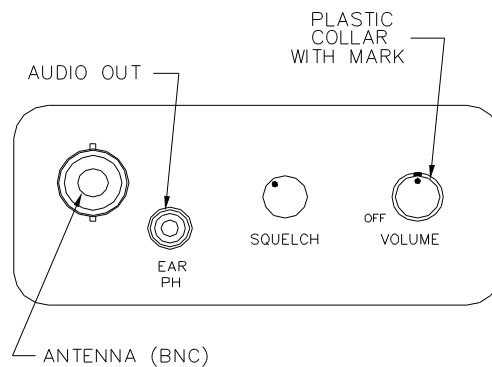
With the RS232 option, the 5062 will substitute for the 5051R/DE Receiver/Decoder at the central station which allows the 5062 to be used as an emergency backup and facilitates troubleshooting of faulty equipment.

Note: The 5062 is a battery powered test unit and is not intended for permanent installation.

5071RST Option is a display program which is used to log data received by the 5062 when used with the RS232 option and a laptop computer. The test transmissions received are stored on disk.

## 3.2 Controls

### 3.2.1 Scanner



**Scanner - Top View**

**Volume/Off** is marked for proper output using the calibration procedure listed in section 4.2. Setting the volume control to any other position may cause the tester to operate intermittently or not at all.

**Squelch** is adjusted before the audio cable is plugged into the EAR PH jack. Rotate the squelch knob clock-wise (CW) until scanner breaks squelch (loud hiss). Then rotate the knob counter-clock-wise (CCW) until scanner is squelched; continue CCW just slightly beyond this point.

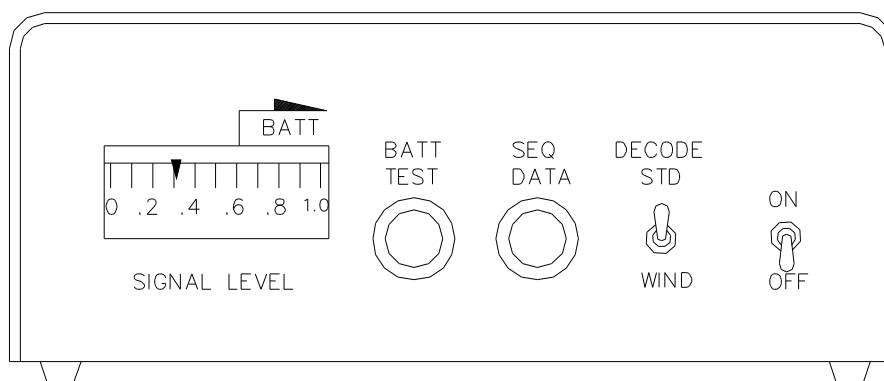
**Key pad controls** are described in the scanner manual.

Operation notes:

**RF Noise:** The scanner is a broad band receiver and may receive strong signals located many channels away from the programmed frequency. The technician may remove the scanner antenna to improve scanner operation. Turning the squelch knob further CCW may also be necessary. It may become necessary to increase the transmitter RF Warm Time setting during testing with the scanner in order to improve the scanner operation.

**International UHF frequencies:** The scanner can receive signals in the frequency range 385MHz to 405MHz. The formula  $A + 21.6 = B$  is applied where A is the desired frequency and B is the frequency entered into the scanner. This method monitors a harmonic of the transmission. The signal strength will be weaker.

### 3.2.2 Tester



**5062 Remote Station Tester - Front Panel View**

**On/Off Switch:** turns the power ON or OFF. The toggle switch has special fitting to prevent accidental operation; to operate, pull outward on the toggle switch bat.

**Decode Switch:** selects Standard (STD) or Wind data format for display. Select STD position for use with all sensors except wind sensors.

STD - Decodes the 11-bit ALERT value field into a 4-digit number with a range of 0000 to 2047. The range may be limited further by the sensor type and/or by the data transmitter, e.g. analog values of 0000 to 0255 for Model 5050.

WIND - The ALERT format for wind data combines the lower 5-bits of the Wind Run accumulator and upper 6-bits of Wind Direction analog-to-digital conversion into the 11-bit ALERT wind value field. The 5062 decodes the ALERT wind data field into two, 2-digit numbers. Wind run has a range of 00 to 31 and then rolls over. Wind direction is decoded into 10 degree increments for a range of 00 to 35; thus: North=00, East=09, South=18, and West=27.

**Seq Data Switch:** sequences stored data to the display. The 5062 stores the twenty most recent ALERT data messages received and displays the most recent. Press and hold the SEQ DATA switch, this will permit the technician to display the stored messages beginning with the most recent.

**Batt Test Switch:** allows the technician to read an indication of battery voltage. Pressing the battery test button will produce a reading on the Signal Level meter; for a charged battery the needle will be above the BATT line. Recharge or replace the battery if needle is below BATT line.

**Signal Level Meter:** provides an indication of the transmitter deviation when a message is being received. The FCC requires transmitter deviation be checked when the station is installed and once a year there after. See section 4.2 for signal level meter calibration.

**LCD Displays:** the ID number and Data value of the most recent, or sequenced, ALERT message is displayed. The 5062 provides two LCD displays. Each LCD display is a 4-digit panel meter.

**TESTER.3A EPROM Program:** internally controls the functions of the 5062.

### 3.3 Input & Output

#### 3.3.1 Scanner

The scanner receives Radio Frequency (RF) data transmissions as input and demodulate the Frequency Modulation (FM) signals into audio tones. These ALERT format Frequency Shift Keying (FSK) tones are the signal output.

#### 3.3.2 Tester

**Interconnect PCB:** receives ALERT format FSK tones as input from the scanner and outputs them to the modem PCB.

**Modem PCB:** demodulates these tones into TTL logic levels for output. ALERT format: 2133 Hz is logic "1" and 1920 Hz is logic "0". The output is at 300 baud.

**Display PCB:** decodes and stores the twenty most recent ALERT messages (ID# and Data value) into a LAST IN FIRST OUT (LIFO) register; it outputs the most recent to the LCD displays. The SEQ DATA switch allows the user to step through the LIFO register and display its contents.

#### 3.3.3 RS232 Option

The modem PCB will output RS232 signal when supplied with 12 and -12 Vdc at 3-pin connector labeled 12VDC (RS232 option).

## 4.0 TESTING AND MAINTENANCE

### 4.1 Testing with the 5062

#### 4.1.1 Signal Out - Deviation

The signal level meter must be calibrated for this test to be valid. Refer to section 4.2. Refer to the basic gauge manual section 4.1.2 - deviation test.

- Initiate transmission.
- Record Signal Level Meter reading during test transmission.
- Limit = System specified deviation  $\pm 0.25\text{kHz}$

Use of the scanner allows the test technician to be able to listen to the actual transmission signal. An experienced technician can sometimes detect a specific problem based upon the sound of the signal.

#### 4.1.2 Signal In - Sensors

Compare data transmitted to sensor parameter input.

- Measure and record sensor parameter input as it is presented at the sensor, e.g. number of tips of 5050P rain gauge, water level, temperature, etc. Calculate expected transmit value using curves provided in the drawing section.
- Initiate transmission.
- Read and record the value displayed. It may be necessary to sequence through the stored data to display the correct sensor ID number.
- Compare the transmitted reading to expected value.
- The values obtained should be equal within specified tolerances.

EXAMPLE: Pressure transducer with 25.5 ft range; water level is 18.9 ft above the transducer; Water Level vs. Binary Code Curve reads 189. The transmitted value is 0190; this comparison states that the transmitted value is one increment (0.1 ft) above the expected and is acceptable.

Note: the sensors may be manually operated in order to obtain controlled data values during the system test, e.g. tip the rain gauge bucket, or rotate the wind vane.

### 4.2 Scanner/Signal Meter Calibration

The calibration procedure listed in this section will assure accurate deviation readings. Use of a radio service monitor is recommended for this procedure. The procedure should be performed only by trained service personnel.

Input FM signal: Frequency: set for system

Tone: 2133 Hz

System deviation:  $\pm 2.5$  kHz typical or  $\pm 4.0$  kHz

Gen level: 10  $\mu$ V

- Adjust scanner volume to proper setting (align dot on knob to mark on plastic collar).
- Adjust deviation to  $\pm 4.0$  kHz.
- Verify tone output is 800 mVpp sine wave at 4.0 kHz deviation.
- Adjust deviation to system deviation if other than  $\pm 4.0$  kHz and record signal level meter reading.
- Adjust deviation to limits and record signal level meter reading.

#### TYPICAL EXAMPLES:

Deviation	Signal Level	Limits
$\pm 2.5$ kHz	0.5	0.45/0.55
$\pm 4.0$ kHz	0.8	0.75/0.85

### 4.3 Maintenance

#### 4.3.1 Battery

Refer to battery manual. Freshly charged or new batteries will always give the best operating performance. A regularly scheduled battery replacement routine will help avoid problems with batteries. When rechargeable batteries are being used, always have a spare battery being charged or in storage at full charge. Check stored batteries regularly to avoid gradual discharge of the battery.

#### 4.3.2 LCD Display

If the instrument is exposed to direct sunlight or to temperatures over 120°F for long periods, the LCD display may appear to fade. To correct this condition, place the 5062 into a cool, shaded location.

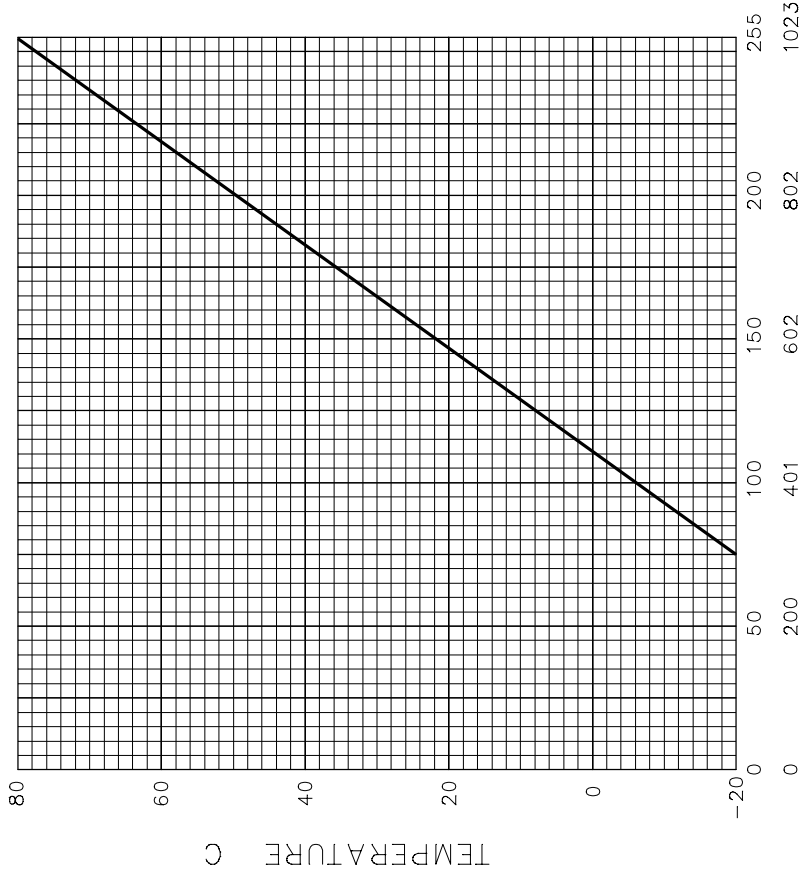
### 4.4 Trouble Shooting

Trouble shooting techniques for the 5062 are presented below. These suggestions are for common operating problems that are easily corrected. Should a problem exist that is not correctable by the techniques given, a trained technician should use the schematics provided to help identify and locate the problem. Otherwise, contact HydroLynx for assistance.


- Nothing works - check battery voltages; check cables and connectors.
- Data is garbled - check scanner volume and squelch.
- No signal from scanner - check frequency entered into scanner; check audio cable and connectors.

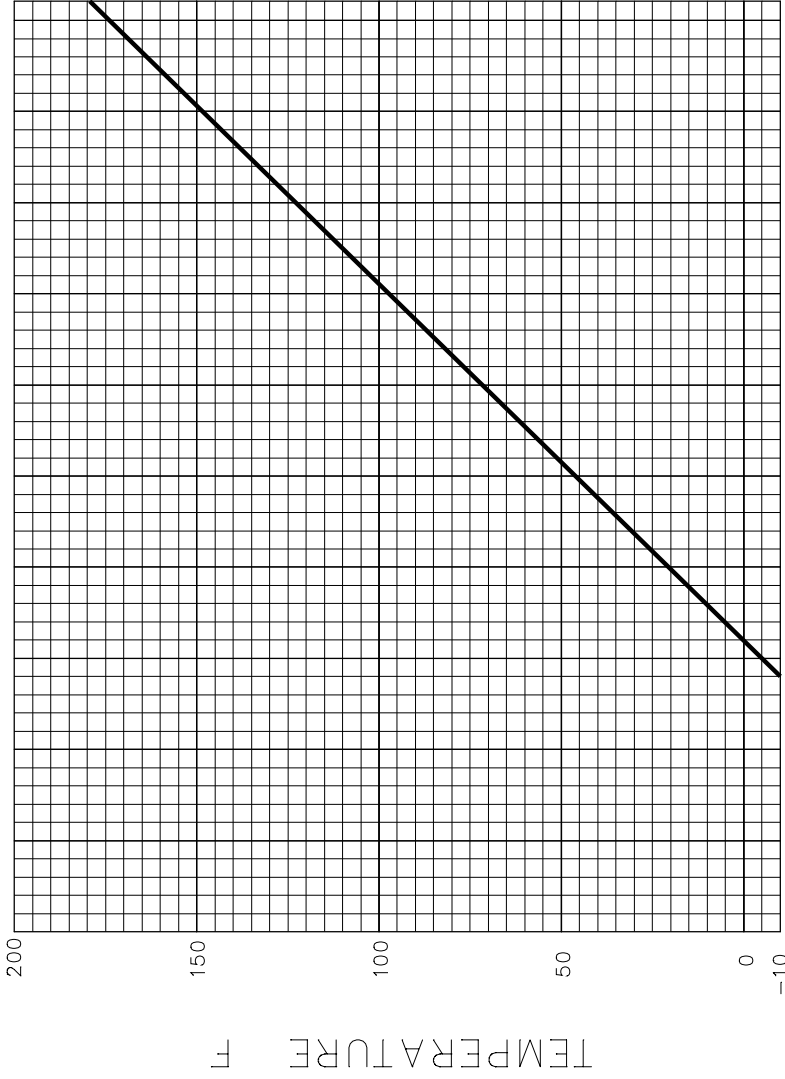
## 5.0 FORMS AND DRAWINGS

AC101024	Curve - Temperature (°C) vs. Binary Code
AC101025	Curve - Temperature (°F) vs. Binary Code
AC101026	Curve - Barometric Pressure (millibars) vs. Binary Code
AC101027	Curve - Relative Humidity (%) vs. Binary Code
AC101030	Curve - Water Level (25.5 ft) vs. Binary Code
AC107468	Outline - 5062 Remote Station Tester Chassis
AC107483	Wiring Diagram - 5062 Remote Station Tester Chassis



BINARY CODE

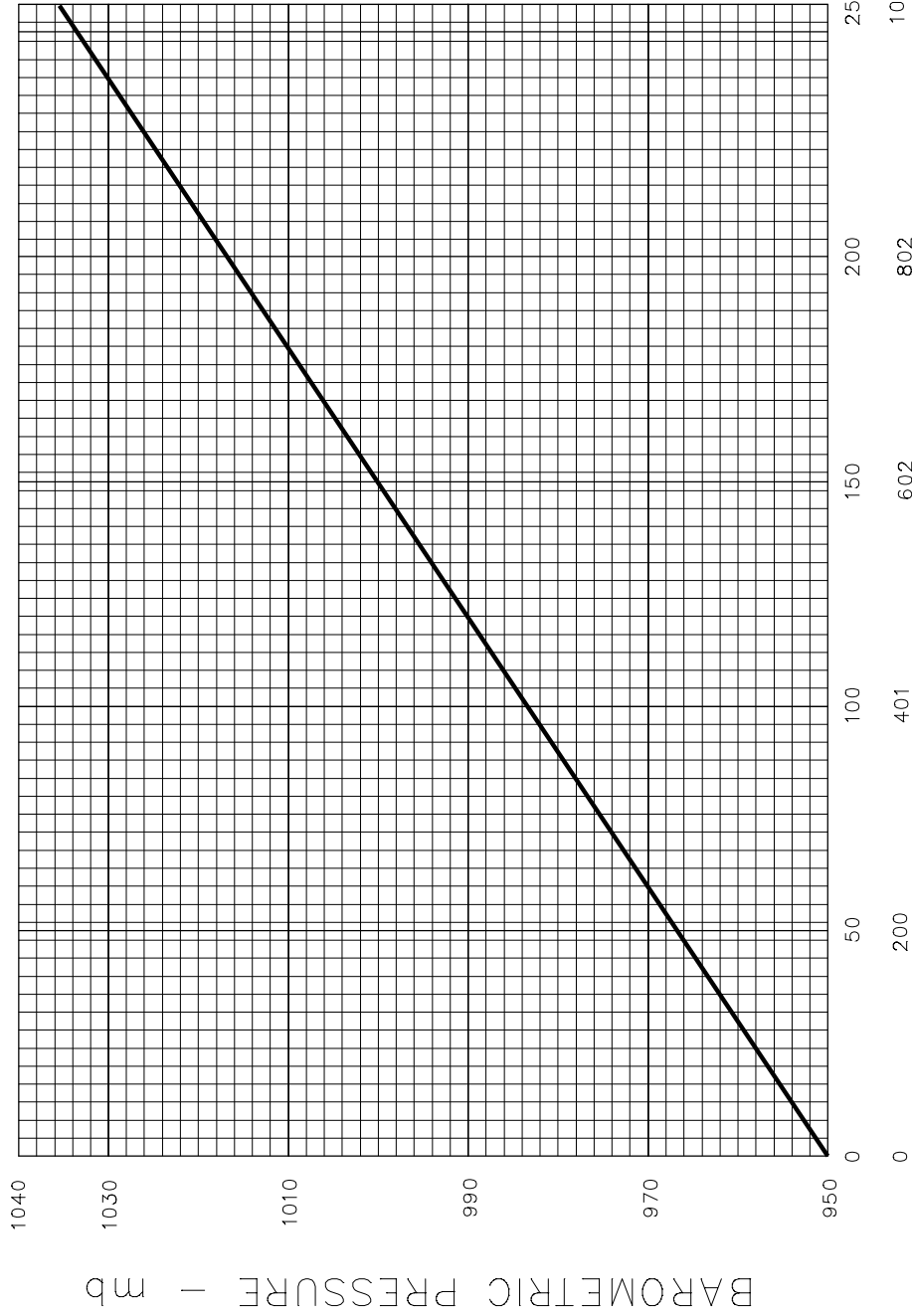
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ECN#	DESCRIPTION	DATE
MODEL USAGE		
		
	MODEL NO.	5062
	TITLE	TEMP VS BINARY CODE
DRAWN BY R. ANDERSON	DATE 5-26-99	DWG TYPE CHART
CHECKED BY	DATE	SIZE A
	DWG NO. AC101024	REV A



0 50 100 150 200 255  
 0 200 401 602 802 1023

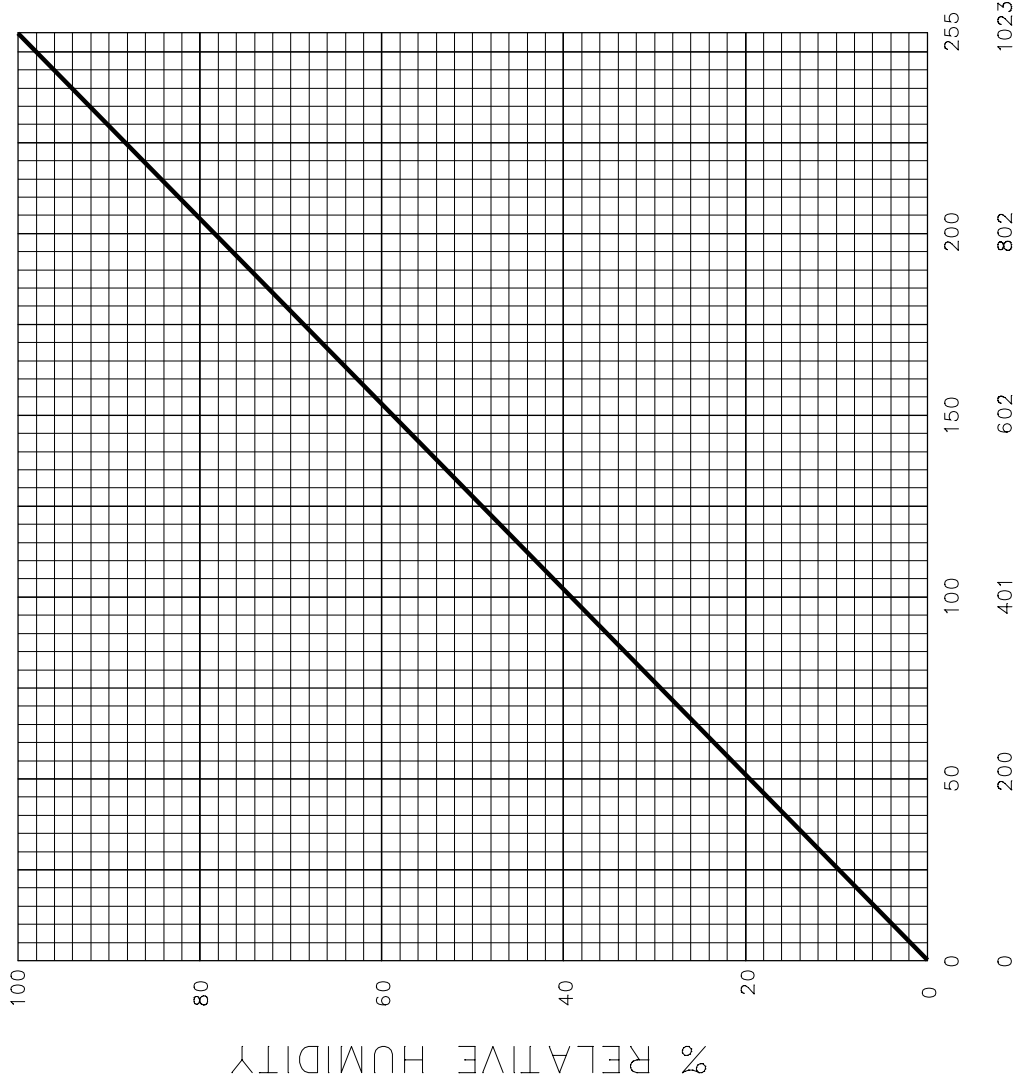
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<b>HydroLynx</b>		
MODEL NO. 5062		
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DRAWN BY H. BECKER DATE 5-26-99		
CHECKED BY DATE		
SIZE B	DWG NO. AC101025	REV A



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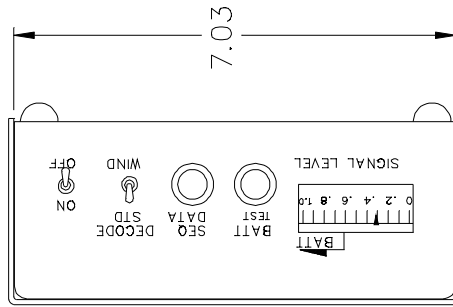
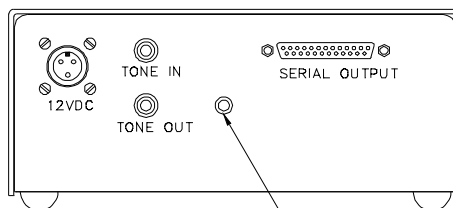
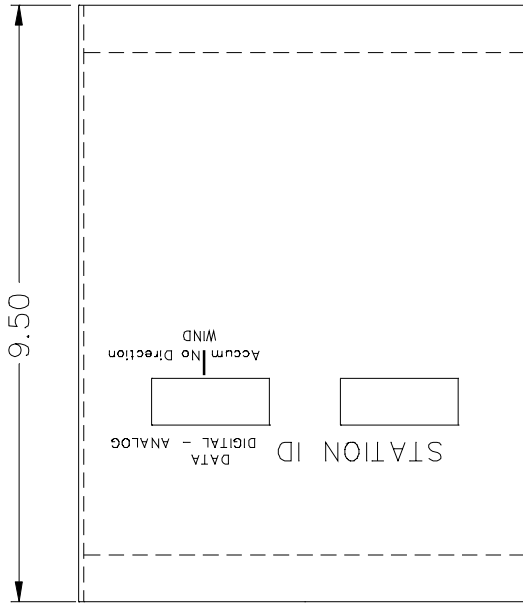
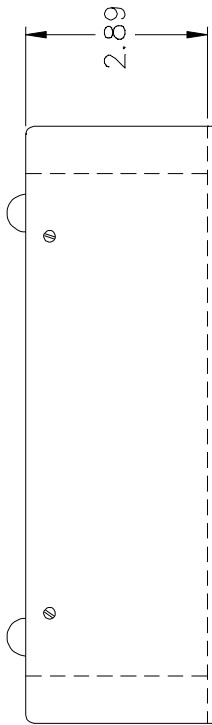
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H. BECKER	5-26-99	CHART
CHECKED BY	DATE	SIZE
		B
	DWG NO.	REV
	AC101026	A



BINARY CODE

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	TITLE	%RH VS BINARY CODE
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CHECKED BY	SIZE B	DWG NO. AC101027
		REV A



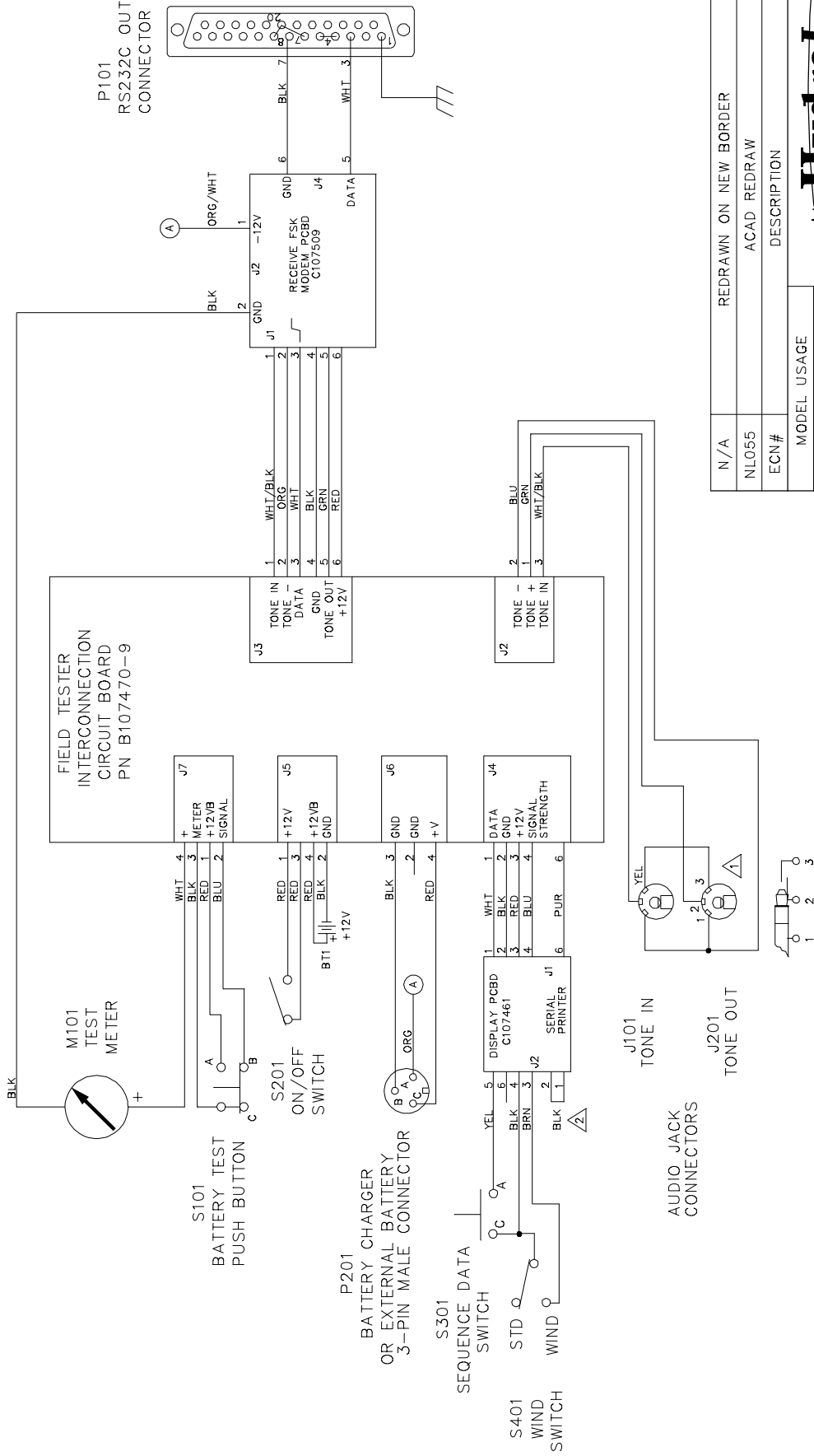


N/A	REDRAWN ON NEW BORDER	10/20/98
NL055	NEW RELEASE	4/14/95
ECN#	DESCRIPTION	DATE
MODEL USAGE		
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES		
FRACTIONS = € N/A		
.XX = € .01		
.XXX = € .005		
MATL	N/A	
FINISH	N/A	
TREATMENT	N/A	
DRAWN BY	HKD	DATE 10/20/98
CHECKED BY		DATE
DWG NO.	B	SIZE
AC107468		OUTLINE
REV	B	REV
		B



MODEL NO. 5062

TITLE REMOTE STATION TEST



- NOTES: 1. AUDIO JACKS MUST BE ISOLATED FROM CHASSIS.  
 2. FOR PERMANENTLY KEYED PRINTER CONNECT J2-1 TO J2-2 ON DISPLAY PC BD.  
 3. RECEIVERS ARE OPTIONAL INTERNAL RX1 OR EXTERNAL RECEIVER USES J101.

N/A	REDRAWN ON NEW BORDER	10/2/98
NL055	ACAD REDRAW	4/12/98
ECN#	DESCRIPTION	DATE
MODEL USAGE		
<b>HydroLynx</b>		
SERIAL NO. 5062		
TITLE CHASSIS		
DRAWN BY R. CHAMBERLIN DATE 10/2/98		
CHECKED BY B DATE 10/2/98		
SIZE B		DWG NO. AC107483
REV B		REV B

