



High Sierra Electronics
Model 3300/3310 ALERT Repeater
Instruction Manual 60-3300 Series(B)

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1.0 INTRODUCTION

1.1 General Description:

The Model 3300/3310 Store and Forward Repeater includes the electronics necessary to receive, decode, and retransmit ALERT/IFLOWS messages. When the receive channel is quiet, the messages are *forwarded* on the transmit channel. A Maxon SD-125 narrow band compliant transceiver may operate on a single frequency or on separate receive and transmit frequency. The repeater is housed either in a rack mount chassis or NEMA enclosure. The duplex option can only be used if the transmit frequency is different from the receive frequency. With the duplex option (3300-20), the repeater will rebroadcast messages while messages are still being received. This greatly increases data throughput and eliminates missed data while the repeater is transmitting.

1.2 Receiving, Inspection and Unpacking:

The 3300 Store and Forward is a rugged unit; however, you should still exercise care during unpacking and installation. Remove the 3300 carefully from its box and identify each component listed on the enclosed packing list(s). Should any parts be missing, quickly notify High Sierra Electronics Customer Service. Please have your packing list available when you call.

If any of the items are received in damaged condition, notify the carrier immediately and request an inspection. You must notify the carrier within 15 days of shipment. If a claim is not made within that time period, then the carrier will not acknowledge any claim for the lost or damaged goods.

1.3 Specifications:

Power:	12 VDC @ 46mA Standby (with Maxon Radio).
Current:	1.5 Amps when transmitting. (total transmit time = 200ms transmit warm-up time + 133ms per sensor value to be transmitted or repeated.)
Optional:	25W VHF Power Amplifier increases current to \approx 4 Amps.
Batteries:	Two 12 Volt DC 12 Amp Hour Rechargeable Sealed Gel Cell.
Battery Charging:	Either Ac Power or at least a 1.5 Amp Solar Panel.
Frequency:	UHF or VHF.
Radio:	Maxon SD-125 frequency programmable. Signal level of receiver = 700mV p-p @ 2.5kHz deviation. Tone from logic PCB = 700mV p-p @ 2.5kHz deviation. Squelch breaks at \sim 0.5uV (-113dbm).
Connectors:	Solar or AC Back-up Power: 3 pin MS type. Antenna: BNC Standard, Specify N or PL-259.
Size:	19" W x 10 1/4" D x 5 1/4" H for Rack Mount Chassis. 10" W x 16" D x 5" H for NEMA Enclosure.
Weight:	7 Lbs. for Rack Mount Chassis. 26 Lbs. For Nema Enclosure with two batteries.

2.0 INSTALLATION

2.1 Start-up:

1. Connect the antenna.
2. Plug in the batteries, making sure of the polarity.
Black is negative, Red is positive. (On rack mount unit, use MS 3 pin connections on back panel with appropriate cables.)
3. Connect either the solar panel or the AC float charger.
4. On power up, the Active light will flash once per second indicating a power cycle condition.
5. To initialize the station and echo suppression:
 - Press and hold the test button for 10 **seconds**.
(The test button is located on the outside of **back panel** for the rack mount enclosure. For the NEMA version the test button is on the green controller.) This will stop the flashing of the Active light.

3.0 OPERATION

3.1 Status Report:

As a timed report or in response to ALERT Command Sequence, the Repeater will send a Self Report. The report contains Battery Voltage Data Value and Status Bits. The Battery voltage can be calculated as:

$$\text{Voltage} = (\text{Raw ALERT Value} * 0.0078) + .2\text{V} \text{ (Base station multiplier} = 0.0078, \text{ adder} = 0.2)$$

Since the lower order bits are used for status information, the resolution of measurement will be approximately 0.25V.

3.2 Self Report ID:

The **Self Report ID** is recorded in non-volatile memory. The Self Report Data value is comprised of Battery Voltage (a 6 bit value) and Status Bits which indicate Repeater Enabled or Disabled, Pass All/Pass-Reject setting, Command Enable setting.

The state of Enable/Disable indicators are also transmitted as status bits (low order bits) in the Self-Report Data. The high order bits of the Self-Report indicate battery voltage.

D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
Battery Voltage (top 6 bits of 11 bit value)						Cmd Enable	PassAll Pass/Reject			Enable

3.3 Command Sequence:

Remote control of the Repeater is available as an **option**. The Repeater can be remotely commanded to enable or disable re-transmission and to change from PassAll to Pass/Reject. The ID which the Repeater will recognize for commands is stored in EEPROM as **Command ID**.

The Repeater will respond to each command with a Status Report to indicate receipt of the message and the state of the Enable Bit.

3.4 Pass/Reject:

The Repeater can be programmed to **Pass All** IDs or to selectively Pass and Reject specific IDs or Blocks of IDs. The Pass All function can be enabled or disabled independently to retain programming of Pass and Reject tables. Blocks of IDs (00 - 31d) can be set to Pass or Reject. This block table toggles the setting of each block from Pass to Reject through the Graphical Interface Program.

- IDs within a "Pass Block" can be individually rejected.
- IDs within a "Reject Block" can be individually passed.

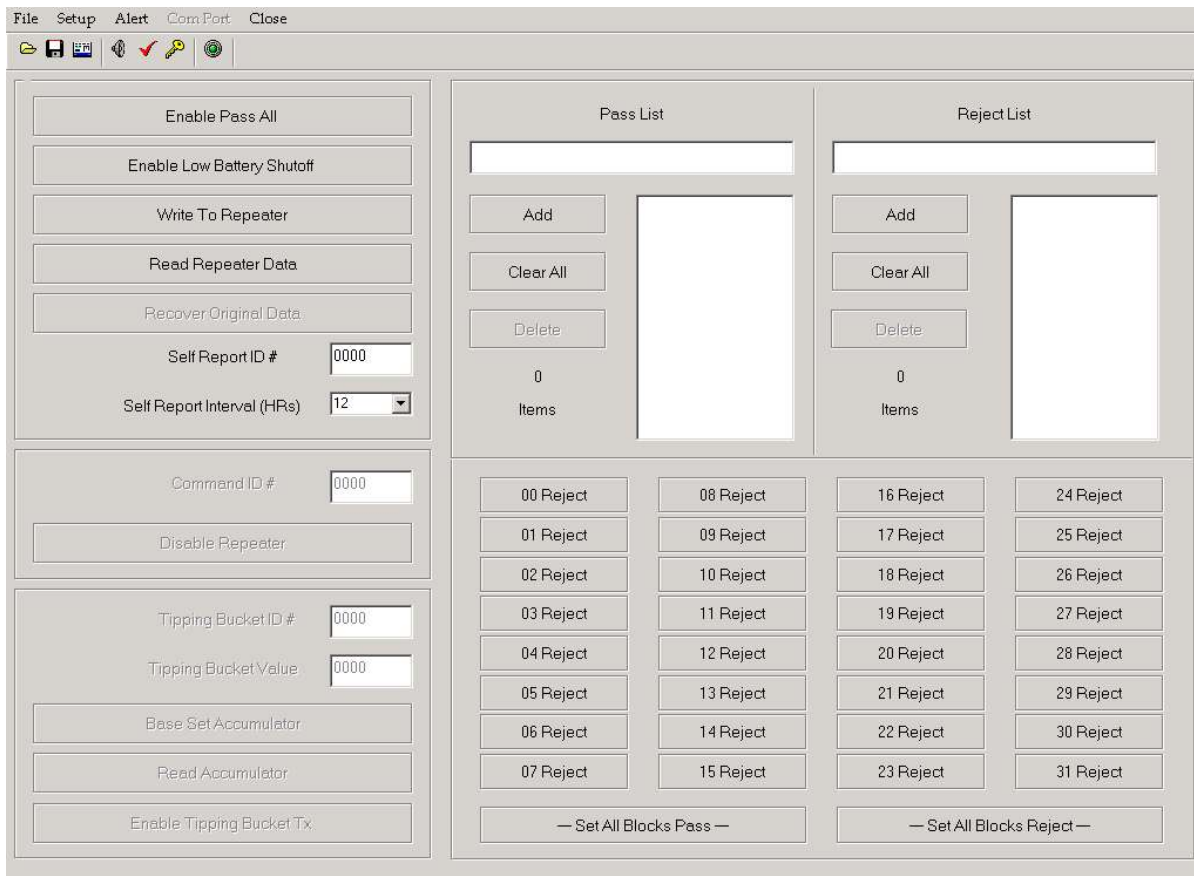
To optimize repeater performance, using pass and reject blocks is preferable. Use of individuals IDs should be kept to a minimum.

3.4.1 Test/Reset Switch:

The momentary switch connected to the Reset Input terminal of the 3300 Controller will cause the Repeater to transmit a Status Report. If the switch is held for more than 5 seconds, the unit will initialize which will clear the echo buffer and reset the Tipping Bucket Accumulator. On the rack mount version of the repeater, a switch is mounted on the back panel for access when the top cover is in place.

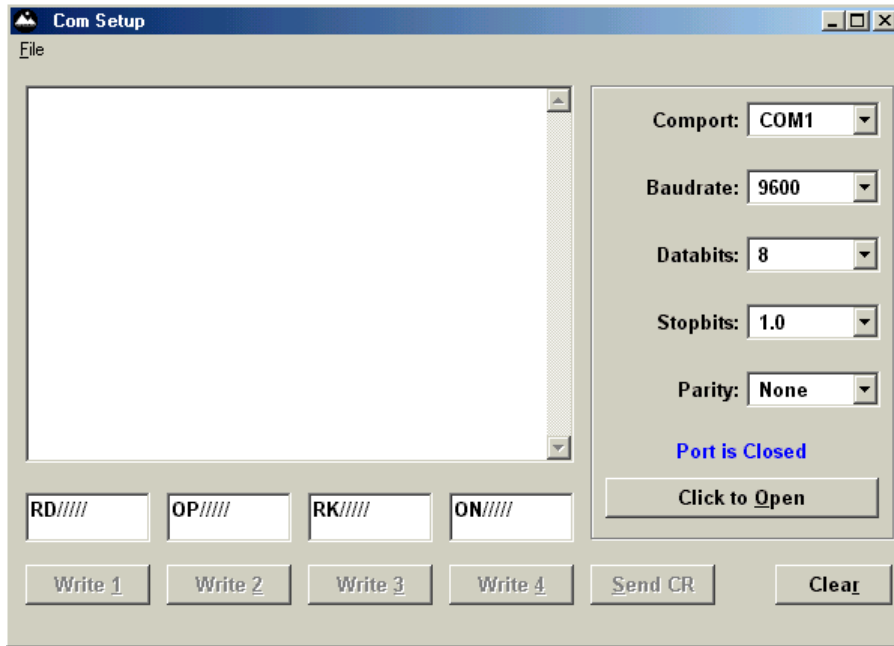
3.5 Programming Interface:

The repeater communicates with the Interface Program (Repeater2.exe) at 9600 baud (8-1-N). The program works with Windows 95, 98, 2000 and XP.



3.6 Special Programming Options:

Some programming options are only accessible using “command line” through the COM Port Setup window. This window is opened by pulling down the “Setup” menu to the Com Port option. The Com port must be open before sending commands. Commands are entered in the Write_1 , Write_2 , Write_3 , or Write_4 edit windows. Use UPPER CASE for letters. Mouse click the associated Write button to send the message.



3.6.1 Decoder Options:

ALERT data is passed to the RS232 port for viewing using a Data Display program. The filters are set using commands through the Com Port window. It is possible to view:

- all incoming messages
- only messages whose ID match those Passed on the Pass / Reject list
- only messages which are not considered Echoes
- or any combination of these filters.

Filter Option	Command
Display All (passed or rejected) IDs	OA///// (5 forward slashes)
Display Pass IDs only	OP/////
Display Echoed (and non Echoed) messages	OE/////
Display No Echoed messages	ON/////
Read back Display (pass / reject) option	RD/////
Read back Display (echo) options	RK/////

3.6.2 Special Commands:

Special Option	Command	Response	Default
Read Version Info	RV/////		
Enable Echo Supression	EE/////	ECHO-ON	ON
Disable Echo Supression	DE/////	ECHO-OFF	
Enable EIF Decode	EF/////	EIF-ON	ON
Disable EIF Decode	DF/////	EIF-OFF	

3.6.3 Baud Rate Options:

For use with older display programs, it may be necessary to set the RS232 output of ALERT/IFLOWS messages to a baud rate other than 9600. This option is set using commands through the Com Port window. This option only affects the display of incoming data messages. The programming interface will always communicate at 9600 baud.

Baud Option	Command
Write Baud Rate 9600	WB9600/ (1 forward slash)
Write Baud Rate 4800	WB4800/
Write Baud Rate 2400	WB2400/
Write Baud Rate 1200	WB1200/
Write Baud Rate 0600	WB0600/
Write Baud Rate 0300	WB0300/

3.7 Echo Supression:::

Transmissions which are identical to those recently received (<2 minutes) are not repeated. The echo buffer will overrun after 8 messages. Identical messages sent after 8 previous messages will be repeated. The echo buffer will be cleared 2 minutes after the last message is received.

3.8 EIF Data Format:

The Enhanced IFLOWS format is used for data transmissions in a few regions of the USA. This format is decoded and retransmitted differently from ALERT format. In regions where no IFLOWS data is expected, it is possible to disable decoding of IFLOWS to reduce false data transmissions due to interference.

4.0 MAINTENANCE

4.1 Daily:

- Make sure remote sites are passed through the Repeater by observing that they are received at the base station Computer.

4.2 Weekly:

- Check the battery reports.

4.3 Annually:

- The batteries should be replaced with freshly charged ones.
- Check the forward and reverse power of antenna cable with watt meter.
- Check Cables, Connectors, Desiccant, Quiescent current, loose nuts and bolts, and leaks.
- Check Solar Panel short circuit current and open current voltage.

4.0 TROUBLESHOOTING

If the Model 3300 Store and Forward Repeater does not perform to specifications, assistance is always available by calling High Sierra Electronics Customer Service between 8:00am and 5:00pm Pacific Time at (800) 275-2080; Fax (530) 273-2089.

5.0 RETURNS

If you need to return this product for any reason, call *High Sierra Electronics* at (530) 273-2080 between 8:00 a.m. and 4:00 p.m. Pacific Coast time. Ask for a return Authorization Number (RA#) to be assigned to your unit. Carefully pack the unit so that it will not be further damaged in shipment. Write the RA# on the outside of the box and on any paperwork enclosed with the unit. Please include a written description of the problem and any unique conditions that occurred when the unit failed.

6.0 WARRANTY

High Sierra Electronics warrants that the equipment it manufactures is free from defects in materials and workmanship, as follows:

Non-Intrusive Road Surface Sensors for 1 Year from Warranty Start Date

All other HSE manufactured equipment for 3 Years from Warranty Start Date

For product purchases, warranty shall begin upon delivery of product to the purchaser. For system/construction contracts and projects, the warranty start date for each site or installation shall be the first of; the date of the commencement of beneficial customer use of the product (even if certain sites, components, options or accessories included in the project are scheduled for later delivery or installation), upon completion of system installation, or 3 months from the date of factory shipment.

If equipment fails because of such defects and High Sierra Electronics (HSE) is notified of the failure within three (3) years from the date of shipment, the following shall apply. Purchaser obtains a Return Materials Authorization (RMA) from HSE and returns the equipment to the HSE factory for diagnosis. HSE will correct any such failure by, at its sole discretion, either repairing any defective or damaged equipment, providing a replacement in exchange for the defective product, or by providing any necessary replacement part(s) required to restore it to its normal operation, and will return it to Purchaser.

This warranty shall be void in its entirety if equipment is damaged by Acts of God, power surge, misuse, abuse, negligence, modification without prior approval, accident, wear and tear, mishandling, misapplication, intrusion of or exposure to liquids, or other causes unrelated to defective materials or workmanship. Any equipment repaired or replaced by HSE shall be covered by this warranty for the longer period of ninety (90) days from date of repair or the remainder of the original three (3) year warranty.

Equipment that fails under conditions other than those covered above will be repaired at the Buyer's expense at the price of parts and labor in effect at the time of repair. Such repairs are warranted for a period of ninety (90) days from the date of reshipment to the Buyer. Replacement or spare components are also warranted for a period of ninety (90) days from the date of shipment.

High Sierra Electronics warrants that the installation material and the quality of installation is free from defects in materials and workmanship and is warranted for one (1) year.

Equipment supplied by HSE and manufactured by others carries the respective manufacturer's warranty. HSE assumes no warranty obligation either expressed or implied for equipment manufactured by others and supplied by HSE. Other manufacturer's equipment supplied by HSE can be serviced through HSE.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANT ABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ALL OF WHICH IS EXPRESSLY DISCLAIMED



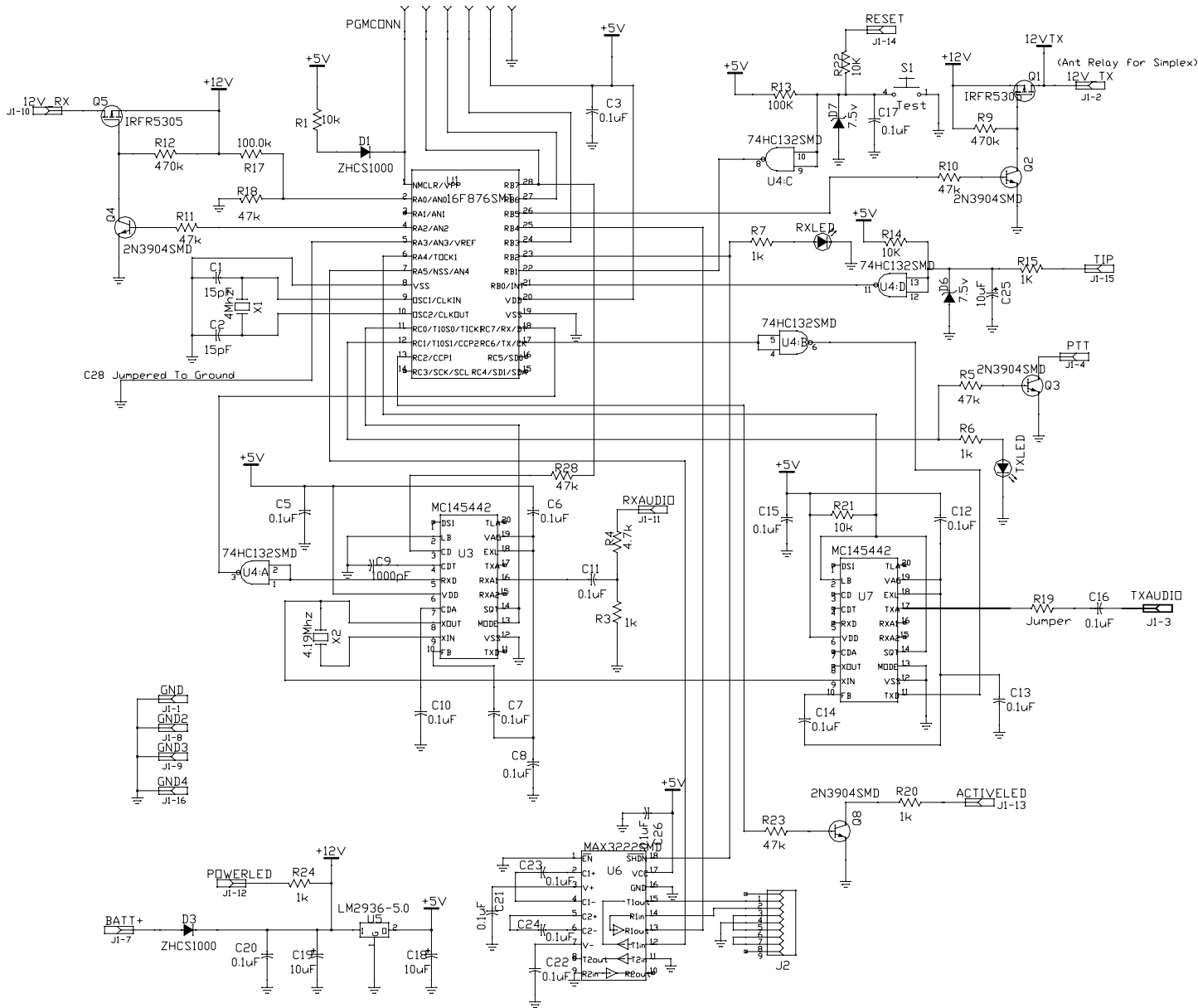
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7.2 04-13079-02, Duplex Repeater Schematic Diagram:



7.3 06-3300/3310-xx Wire Diagram:

INSERT APPROPRIATE DIAGRAM FROM 3300app.pdf file: See Blue production ticket