



**EXTRACT FROM ACCUSPEED™
OPERATING INSTRUCTIONS FOR R3HNX
450 MHz UHF TRANSCEIVER & RF
AMPLIFIER BOARD**



Radio Frequency (RF) Transceiver.

The RCR 'Gold Box' incorporates the **R3HNX Transceiver Board**, together with its 'companion' **RF Power Amplifier Board**.

The R3HNX Transceiver Board is a multi channel, UHF-synthesized RF receiver with a Liquid Cystal Display (LCD). Additionally, it has a built in RF transmitter for 'POLLINGTM' data transmission. The R3HNX receiver section incorporates a microprocessor and uses Digital Signal Processing (DSP) techniques to selectively recover digital messages using CATTRON-THEIMEGTM protocol. The receiver section also has LED indicators for:

- Power ON
- **Carrier Detect** (RF signal or carrier is present)
- **VCO Lock** (receiver locked on freq.)
- **Data** (received message data)
- **Q-sync** (synchronization pulse)

The RF Power Amplifier Board is a high power RF amplifier that connects between the R3HNX Transceiver Board and the Antenna Connector. An on-board LED indicator shows when transmitted digital RF 'POLLINGTM' data from the R3HNX transmitter is being amplified and sent to the RCT.

Opening the front door of the RCR enclosure and removing the 'Gold Box' lid will expose the **R3HNX Transceiver Board**, together with its 'companion' **RF Power Amplifier Board**. Referring to Figure 1-7 and Table 1-2 below, transceiver and amplifier board LED indicators indicate system status and are particularly useful when troubleshooting and adjusting the transceiver.

Information to the User regarding FCC Compliance:

Changes or modifications not expressly approved by the manufacture could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions; (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

RF Exposure Information:

Installation of this RF device requires the antenna to be mounted in a manner that ensures a 36cm minimum separation distance from the end user(s).

Radio Frequency (RF) Transceiver, continued.

Figure 1-7. R3HNX Transceiver & RF Amplifier Board LED Indicators

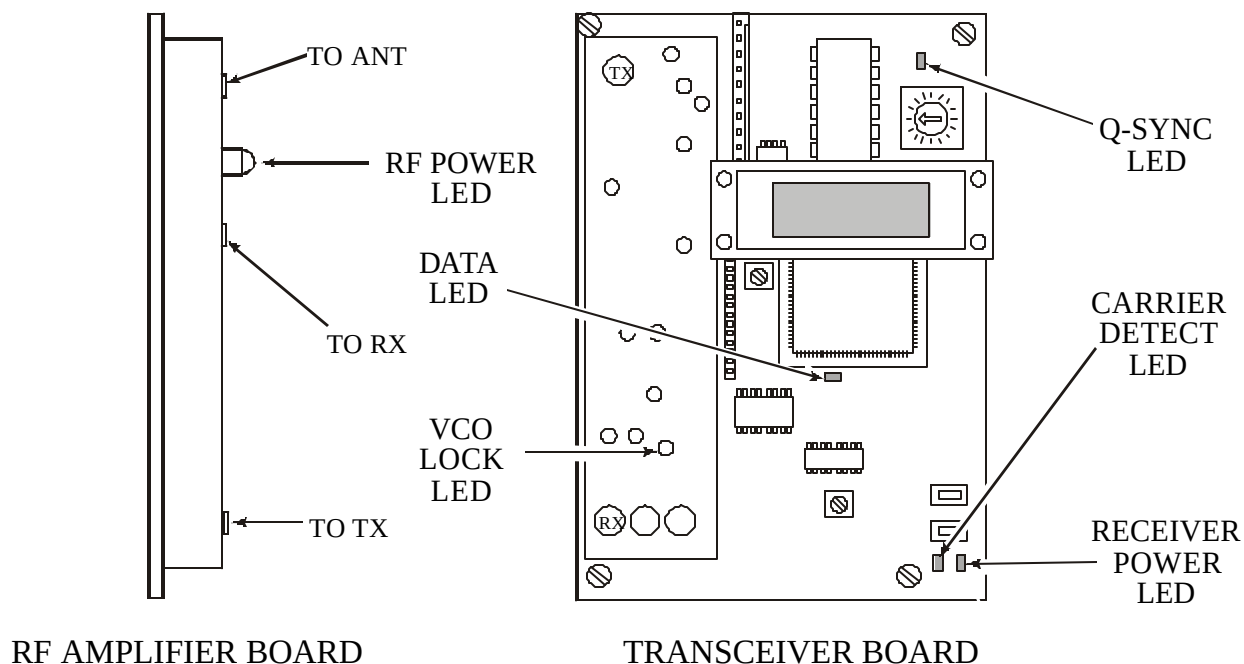


Table 1-2. R3HNX Transceiver & RF Amplifier Board LED Indicators

LED	Description
Transceiver Power	This red LED indicates the presence of DC power on the transceiver circuit board.
Carrier Detect	The green Carrier Detect LED indicates that the receiver section is receiving a RF signal.
Data	This yellow LED indicates that the received RF message contains data.
Q-Sync	This orange LED indicates an interrupt that signifies the computer/decoder has received a new message.
VCO Lock	This red LED (located underneath the EMI/RFI shield) illuminates when the transceiver frequency synthesizer is unable to lock onto the required frequency.
RF Power LED	This red LED (located on the RF amplifier) flashes when the transmitted digital RF 'POLLING™' data from the R3HNX transmitter is being amplified and sent to the RCT



SYSTEM SUMMARY – Technical Specifications

LCU [RCR]

Enclosure:	20"L x 20"H x 8"W (50.80cm x 50.80cm x 20.32cm), NEMA 4 (IP66) Steel.
Weight:	Approximately 70 lbs (31.75 kg)
Environment:	Outdoors, -22°F to 150°F (-30°C to 65°C), RH 0 to 95% non-condensing (-40°F units available – contact factory for details)
Electrical	
Input/Output connections:	Qty 4, quick connect/disconnect plugs and sockets
Solid State Digital Outputs:	Total of 96 rated at 100VDC with individual fusing at 5A
Solid State Digital Inputs:	Total of 48 rated at 74VDC with individual fusing at 5A
Electro-mechanical Outputs:	100VDC @ 10A
Output Termination:	2 screw terminals per I/O position
Receiver/Decoder Power Source:	DC-DC converter; 24-78 VDC Input/13.8 VDC output @ 0.8 A with Under/Over Voltage protection
Minimum Locomotive	
Battery voltage:	62VDC
Micro-controllers	Qty 3, Intel™ 8051 family microprocessors
Serial Communication Ports:	RS232 port for GPS Receiver/clock and external event recorder RS485 port for locomotive monitoring
Frequency Range:	447-473 MHz
Channel Spacing:	12.5 kHz
Emission/Modulation:	9K801FD ±2.5 kHz deviation
RF Transmit Power:	1.6W (factory set)
Range:	1-mile line of site
Antennas:	Qty 2, 5 dB gain, coupled antennas, mounted vertically as a broadside array for receive and transmit
Approvals:	US FCC (Part 90) Industry Canada (RSS119)
Receiver Sensitivity:	0.5 µV (20 dB quieting) typical
Frequency Stability:	±0.0005% of reference frequency
Decoder Microprocessor Speed:	11.059 MHz
Axle Generator:	120 PPR Dual Phase.

NOTE: As part of our ‘continuous improvement’ policy, CATTRON-THEIMEG™ reserves the right to change specifications without notice.