RELM

WIRELESS CORPORATION

Uniden PRC
Private Radio Communications

SRH150DT & SRU450KT
Programming Guide

Scope of Manual

This service manual is intended for use by experienced technicians familiar with similar types of equipment. The manual contains all service information required for the repeater logic, power supply and wiring diagram described and is current as of the printing date. For SRH150DT tuning procedures refer to the IMH4100D service manual and the IMU3100K service manual for the SRU450KT procedures. Changes that occur after the printing date are incorporated by Service Manual Revisions. The revisions are added to the manual as engineering changes are incorporated into the equipment.

Technical Support

Technical Assistance and information is available from the Technical Support Group during normal work days between the hours of 8:00 A.M. and 5:00 P.M. Eastern Standard Time. You may write to:

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E-mail service@RELM.com

Or call our toll free number:
1-800-445-5017

Replacement Parts

Replacement parts are available through the Uniden Parts and Service Division located in Fort Worth, Texas. When ordering, please use the complete identification number of the part. If the identification number is not known, the order should contain the Part Symbol Number, the Unit Model Number, and a description of the part so that the part may be properly identified.

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INTRODUCTION

1.0 GENERAL INFORMATION

If you are already familiar with the IMH4100DT and IMU3100KT models you won't need detailed information in regards to the way they operate. It would be very helpful to use the IMH/IMU service manuals along with the SR Series manual to obtain tuning procedures, schematics, parts lists, circuit descriptions and general information. The SR Series Manual will explain the repeater functions, logic board operation and programming instructions.

The SR Series Repeaters is comprised of four major circuits, transmitter, receiver, repeater control logic and power supply (see block diagram).

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        ┌──────┐   ┌────────────┐
        │ C    │───│    TX      │────▽
        │ O    │   └────────────┘
        │ N    │   ┌────────────┐
        │ T    │───│POWER SUPPLY│▽
        │ R    │   └────────────┘
        │ O    │   ┌────────────┐
        │ L    │───│    RX      │────▽
        └──────┘   └────────────┘
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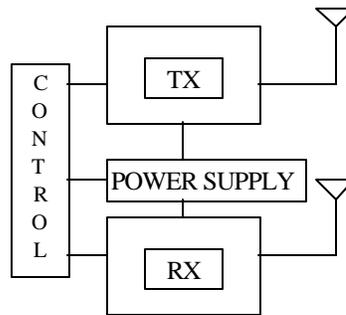
The SRH150DT contains two IMH4100D mobile radios, one for the transmit module and one for receive module. The SRU450KT is made up of two IMU3100K's. The AMX725Z logic board controls both transmit and receive functions. It also provides connections for an optional ARX700B interconnect. Both models are single user repeaters that can be programmed for either COS, (Carrier Operated Squelch), one CTCSS code, (Continuous Tone Controlled Squelch System), or one DCSS code, (Digital Controlled Squelch System).

The SR series repeaters can either be mounted in standard 19" racks or used as a desk top station. They operate from a self contained, state of the art AC power supply that automatically selects between 110 or 220 VAC, when you plug it in.

2.0 OPERATION

Refer to the front panel for the location of the controls and indicators on next page.

2.1 CONTROLS AND INDICATORS

Starting from left to right you have the:

MIC Connector: Allows you to transmit in either Local or Repeat mode. The repeater comes with the standard AMX100A microphone. You may also use the AMX151 optional desk microphone.

Volume Control: Rotate clockwise to increase audio level of received signal
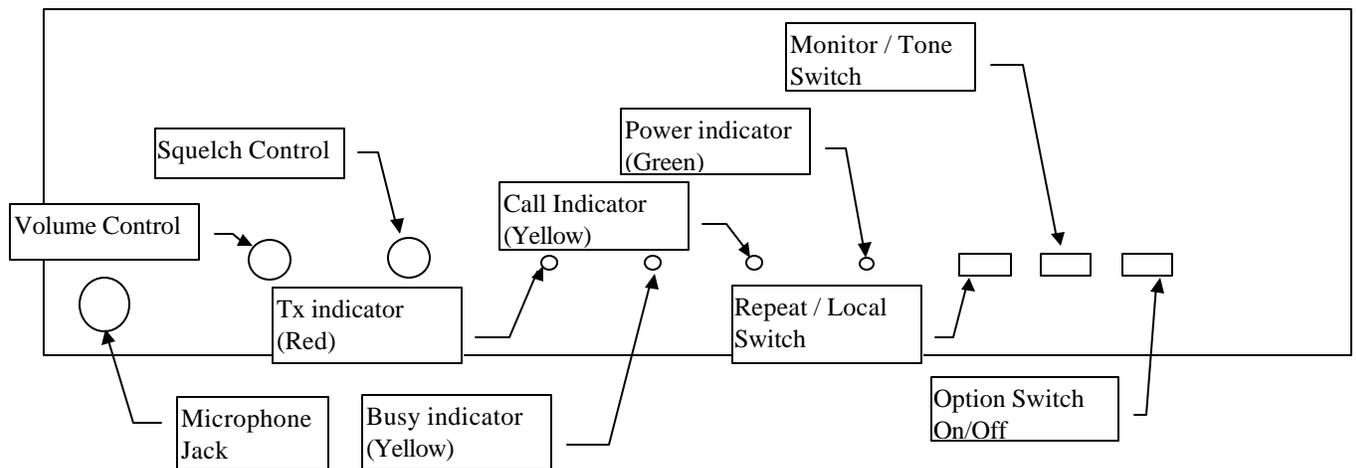
Squelch Control: Mutes the receiver audio until a carrier is detected. To adjust, make sure the Volume control is set half way then rotate squelch control fully counterclockwise. The Busy indicator will come on and you should hear receiver noise. Next, rotate clockwise until receive noise disappears. The Busy indicator should be off. *NOTE: This control does effect the repeat operation.*

Transmit L.E.D.: This RED L.E.D. will illuminate when the transmitter is keyed.

Busy L.E.D.: This YELLOW L.E.D. indicates the presence of a carrier on the receive frequency, and shows the user that the channel is busy.

Call L.E.D.: This YELLOW L.E.D. will only illuminate if the correct CTCSS or DCS code is detected while the microphone is in a properly grounded hang-up bracket. The MON/TONE SQ switch must be engaged to enable this function. To reset the Call L.E.D., remove the Mic from the hang-up bracket or disengage the MON/TONE SQ switch.

Repeat / Local Switch: When this switch is disengaged, it places the unit into repeat mode. When a carrier is detected on the proper frequency and code, if necessary, the unit will automatically repeat the received audio. When the switch is engaged, repeat mode is disabled so you can only transmit when the PTT switch is pressed on the microphone.

Monitor/Tone SQ Switch: When this switch is engaged, the user can monitor all calls broadcast on their particular frequency. Disengaged, the user will only hear calls that have the proper CTCSS or DCS code. In repeat mode it doesn't matter if the microphone is in the hang-up bracket or not. But, when in Local mode the microphone must be placed in the grounded hang-up bracket.

Option Switch: This switch can be used to enable/disable any option. The Option Switch will primarily be used for turning on/off the ARX700B interconnect, which is optional.

On/Off Switch: (not shown) This switch is located on the rear panel and is used to apply AC power to the internal 13.8VDC power supply.

AC Line Fuse: (not shown) Access to the 3.5A fuse can be accomplished from the back panel. Push in and turn the cap counterclockwise, *(make sure AC cord is disconnected from AC outlet before attempting this procedure)* to gain access to the fuse.

2.2 LOCAL CONTROL REPEATER/BASE STATION OPERATION

1. Whenever the radio is operated in temperatures below 10°F (12°C), allow two minutes after the unit is powered-up before transmitting. This ensures that the unit is within FCC frequency specifications.
2. Place the REPEAT/LOCAL Switch in the LOCAL position.
3. Rotate the Squelch Control fully counterclockwise. The Busy L.E.D should be on and you should hear receiver white noise.
4. Adjust the Volume Control for a comfortable listening level.
5. Turn the Squelch Control clockwise until you no longer hear the receiver noise. The Busy L.E.D. should be off.
6. Use the MON/TONE SQ switch to eliminate unwanted conversations. **Note:** You can only do this if you have the repeater programmed for CTCSS or DCS operation otherwise this switch has no affect. The Call L.E.D. will illuminate to indicate contact was made. It will stay on until you reply or do a reset by removing the Mic off-hook or engaging the MON/TONE SQ switch. **Remember**: You must have the microphone placed properly in the hang-up bracket for this function to operate properly.
7. Before transmitting, monitor your channel to ensure that it is not busy. Taking the Mic off-hook will disengage the TONE SQ mode. The Busy L.E.D. will come on whenever you receive a signal.
8. To transmit, press the Push-To-Talk (PTT) switch on the side of the microphone. Hold the Mic 4-6" from your mouth and speak clearly. Release the PTT to listen.

2.3 REPEATER OPERATION

1. Remember: Whenever the radio is operated in temperatures below 10°F (12°C), allow two minutes after the unit is powered-up before transmitting. This ensures that the unit is within FCC frequency specifications.
2. Place the REPEAT/LOCAL Switch in the repeat position. Your unit will now repeat whenever the proper signals are received.
3. You may also transmit by using the microphone, if necessary.

(Note: Make sure that your unit is placed in a location out-of-arms-way to eliminate accidental changes to the switch settings.)
3.0 CIRCUIT DESCRIPTION

(Refer to you IMH4100 or IMU3100 service manuals for circuit descriptions to the TX and RX modules.)

Busy L.E.D. -The Busy L.E.D. is controlled by the receiver. When a carrier is detected, the receiver will send a data stream to U9 on the control board, causing the Busy L.E.D. to illuminate.

Noise Detection - Carrier is detected by the absence of noise. When noise is present it is amplified by U2A, which charges C4. When C4 is fully charged, pin 3 of U10A is high, preventing repeater transmission.

Repeater Transmission - With the REPEAT/LOCAL Switch in the REPEAT position, the transmitter will key when noise is not detected and the receiver has detected a carrier with the correct CTCSS/DCS tone/code causing pin 11 of U3D to go high an pin 10 of U3C to go low.

Call L.E.D..- When the receiver is not in monitor mode, pin 8 of U5C is low. When a call with the correct CTCSS/DCS tone/code is received, pin 4 of U5B goes low causing pin 10 of U5C to go high and the Call L.E.D. to illuminate. Resetting the Call L.E.D. can only be accomplished by taking the receiver out of monitor mode forcing pin 8 of U5C high.

Power L.E.D. - The Power L.E.D. will only illuminate when DC power is applied to the control board, and Q3 and Q5 are biased on.

Time-Out-Timer (T.O.T.) - The T.O.T. is used when repeater action is selected. It's purpose is to limit the length of transmission to the repeater. When a call exceeds the selected maximum length, pin 8 of U8 goes low causing pin 4 of U10B to also go low thus unkeying the transmitter. Switches 1, 2, 3 and 4 of SW2 control selection of the call length time. Switches 1, 2 and 3 change the call length by increasing or decreasing an RC time constant. Switch 4 is used to disable the timer. See the chart for switch settings.

SETTINGS	*SW2-1	SW2-2	SW2-3	SW2-4
1 MINUTE	ON	ON	ON	ON
3 MINUTE	OFF	OFF	OFF	ON
10 MINUTE	OFF	OFF	ON	ON
DISABLE	X	X	X	OFF

*SW2 is located on the solder side of the AMX725Z logic board.

Drop-Out-Timer (D.O.T.) - After a call is finished and a carrier is no longer detected, the D.O.T. will start and keep the transmitter keyed for the selected amount of time (1 to 10 seconds), provided repeater action is selected.

SETTINGS	SW2-5	SW2-6
1 SECOND	ON	ON
3 SECONDS	OFF	ON
10 SECONDS	OFF	OFF

Option Switch - The Option Switch is a DPDT panel switch that directly connects to J1 and J2 located at the top edge of the AMX725Z PCB. Connections to J1 are for power (1A max.), and connections to J2 are for low power signals.

4.0 AMX725Z ADJUSTMENT PROCEDURES

Tx Repeat Audio Adj - Adjust R2, located on solder side next to P1, for the proper level when repeater action is selected. With a 1kHz tone applied to the receiver at 3kHz deviation, set R2 for a repeat audio level of 3.7kHz.

NOTE: For Tx and Rx adjustments refer to the IMH/IMU service manuals.

5.0 PROGRAMMING

You must have the latest Unipro conventional software program, AMX793, along with the program adapter, AMX501. First select Conventional for the Band to program in. Then select Radio Model IMH4100 if you are programming the SRH150DT. Use IMU3100 when programming the SRU450KT. Each radio must be correctly programmed before use. Plug the programming cable from the AMX501 into the microphone jack. Power must be applied to the repeater (just as if you were programming a mobile unit).

Program the Rx frequency for <u>1 channel Rx only on Ch 1</u>. Do not program a Tx frequency. To program the Rx unit, move the slide switch SW1, located on the solder side of the AMX725Z logic board, all the way to the right (toward the Tx unit). Enter along with your Rx frequency the selected CTCSS tone or DCS code or select Carrier. Press Program.

Program the Tx frequency for 1 channel only. First slide SW1 all the way to the left (toward the Rx unit). You must program a dummy Rx frequency, preferably something other than the actual repeater frequency, which is needed to allow the Tx unit to transmit. Then enter your CSQ, CTCSS or DCS mode. Press Program. After both Tx and Rx units have been programmed move SW1 to the center position for operation.

NOTE: Make sure that you have the same CTCSS, DCS or CQS on both Tx and Rx units.