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| Ritron Model(s): | JBS 7-Series Base Radio |
| Current Firmware Revision: | 9s1N3712.s19 |
| Revision Update: | November 17, 2021 |

IMPORTANT! All 7-Series base radios with firmware revision 9s1N3707, 9s1N3708 or 9s1N3709 must be updated to revision 9s1N3710 or higher.

JBS 7-Series Base Radio firmware revision history:

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1. **9S1N3701** released: **11/08/2017**
- Release firmware 9s1N3701
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2. **9S1N3702** released: **01/04/2018**
- Improve scan operation with increased channel dwell time during scan and accepts any valid SQ open within the dwell time.
 - UHF WB SQ is improved by changing RDA register 8F programming from 3F84 to 3F85. This increases ADC gain at low RF levels.
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3. **9S1N3703** released: **01/26/2018**
- UHF NB RX sensitivity is improved by changing RDA register 32 programming from 7396 to 7415. This increases RX AGC Target Power and decreases AGC Loop Gain for UHF NB. This addresses isolated instances where UHF NB receiver would be erratically de-densed by >20dB at low RF levels.
 - Fix problem with UHF RDA register 34 where it is being initialized to 2986 and in a UHF radio is changed to 2988 for a narrowband channel but not changed back to 2986 when switched back to a wideband channel. RDA register 34 (4:0) sets AGC index change threshold (unit is 1dB), 6dB for UHF WB, 6dB for VHF WB & NB, 8dB for UHF NB.
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4. **9S1N3704** released: **04/04/2018**
- Add R-Series DoorCom functionality
 - Add R-Series DoorCom specific field programming options
 - Add "Sidetone Volume tracks volume control" option
 - Correct "Beep Volume tracks volume control" levels
 - Correct field programming error where code C0 "Remove Inband Encode" was setting DQC invert.
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5. **9S1N3705** released: **04/23/2018**
- Update programming of RDA register 5B for each CTCSS tone.
RDA register 5B sets the allowable frequency error for initial decoding, and the allowable frequency error once tone is decoded. DQC now uses value 0309 in RDA register 5B (previously DQC value was 0403).
 - Add programming of RDA register 5C for each CTCSS tone (previously set to 051D on all tones).
RDA register 5C sets the CTCSS phase threshold, error in and out threshold. DQC uses value 051D in RDA register 5C (same as it was).
 - Radio must successfully decode tone for 40mS before it is considered valid. This is to prevent false decode.
 - For tone frequencies 110.0Hz and below: Once successful decode is detected the radio must see 40mS of continuous no-decode before it is considered invalid.
For tone frequencies 110.0Hz and above: Once successful decode is detected the radio must see 250mS of continuous no-decode before it is considered invalid.
This is to prevent erratic decode and talkoff. As a result of this change the radio will not respond to tone reversal squelch tail elimination when using tones 110.9Hz and above. The user will experience a brief squelch tail when using tones 110.9Hz and above.
 - CTCSS tone 107.2Hz now uses the 110Hz LPF cutoff frequency instead of the 250Hz
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6. **9S1N3706** released: **03/19/2019**
- Increase DTMF encode from 7-digits to 9-digits maximum
 - Add provisions for model JBS-447D-CANADA-GMRS
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7. **9S1N3707** released: **01/27/2020 – NO NOT USE! UPDATE TO 9S1N3710**
- This firmware revision has squelch related problems.
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8. **9S1N3708** released: **02/12/2020 – NO NOT USE! UPDATE TO 9S1N3710**
- This firmware revision has squelch related problems.
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9. **9S1N3709** released: **03/17/2020 – NO NOT USE! UPDATE TO 9S1N3710**
- This firmware revision has squelch related problems.
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10. 9S1N3710 released: 03/27/2020

JBS 7-Series firmware update 37.10 includes changes from last good firmware 37.06 as follows:

- a. Remove pre-emphasis when encoding two-tone or Selcall. This will help other radios decode two-tone or Selcall sent from the JBS 7-Series base radio.
- b. Correct Selcall encode frequency calculation error.
- c. Change Selcall tone duration programming from 31.25mS increments to 1mS increments to support radios with tight decode timing.
 - EE location 0321 is programmed for Selcall duration of 9-255mS.
 - Values of 8 or less are multiplied by 31.25mS to allow previously programmed radios to operate without change. Default will remain 93.75mS (h03) so that updated radios can use existing programmer.
 - **This change will require a programmer update for full implementation.**
- d. Add 100mS hangtime after transmitting Selcall, DTMF or 2-Tone signals. This is for compatibility with new NT-Series portable radios.
- e. Disable MIC audio when transmitting any radio generated tone (Selcall, 2-Tone, DTMF, Call Tone, etc.)
- f. Change RDA registers 84, 85 and 86 to eliminate Squelch blocking in the presence of a high RF input signal.
 - 84 from 000C to 000A. This reduces ADC gain by 12dB.
 - 85 from 000C to 0002. This reduces ADC gain by 12dB and filter gain by 6dB.
 - 86 from 0014 to 0004 for VHF and UHF NB. This reduces filter gain by 6dB.
 - 86 from 001C to 0004 for VHF and UHF WB. This reduces filter gain by 18dB.
- g. Update radio to support 3.125 kHz channel steps.
 - If programmed frequency has MSB set then 3.125 kHz channel steps are used, otherwise 6.25 kHz (UHF) and 2.5 kHz (VHF) channel steps are used.
 - 3.125kHz VHF Frequency calculation = Dec2hex (((Frequency / 3.125 kHz) - 30,000) + 32768)
 - 3.125kHz UHF Frequency calculation = Dec2hex (((Frequency / 3.125 kHz) - 125,000) + 32768)
 - All default radio programming will remain at 6.25kHz (UHF) and 2.5kHz (VHF) so that updated radios can use existing programmer.
 - **This change will require a programmer update for full implementation.**
- h. Update TX power and RX squelch slope calculations when 3.125 kHz channel steps are used.
- i. Frequency Tables are updated as follows:
 - UHF Table Frequency 121 is invalid and no longer available
 - VHF Table Frequency 35 is added at 154.5475 MHz
 - VHF Table Frequency 36 is added at 152.9000 MHz
 - JBS 7-Series User Manual to be updated to reflect these changes.

11. 9S1N3711 released: 12/16/2020

Auctus Technologies has changed their chip packaging and testing plant for the RDA1846S (Ritron 315C0013). For compatibility with chips produced by the new and old packaging facilities the following change is made:

During the initialization of the boot register, add register 0x0F configuration of 0x8A24 (previous default 0x8824). This changes the "PLL_regbit_DIV2" parameter to compensate the performance of the PLL in high temperature environment and keep the locked state.

12. 9S1N3712 released: 11/17/2021

Due to the 2021 worldwide shortage of microcontrollers, a replacement part has been used on the JBS 7-Series Base radio. Firmware revision 9S1N3712 allows use of Ritron PN 314C0018 (MKL25Z128VFT4 48-PIN VFQFN) or 314C0019 (MKL27Z128VFT4 48-pin VFQFN).

- Once updated to 9S1N3712 the radio cannot be returned to 9S1N3711 or earlier.
 - Radios with 9S1N3712 firmware require JBS-PCPS ver. 1.0.4 or higher.
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