

6 ALIGNMENT

Note

Only RELM authorized service technicians should perform the alignment to the transceiver. The transceiver is pre-aligned from the factory and should not require alignment after being shipped from the factory.

6.1 Test Equipment Required

- ◆ Communication Test Set: HP8920A service Monitor or equivalent
- ◆ RF Generator: HP8640 or equivalent if Service Monitor is not used.
- ◆ RF Power Meter: HP435B with 30 dB pad or equivalent if Communication Test Set is not used
- ◆ Digital Multimeter: Fluke 8012A or equivalent
- ◆ Computer: IBM PC or compatible
- ◆ PC Cable: PCRP
- ◆ Editor software: RESRP16

6.2 UUT Set-Up

A typical test set-up for checking the alignment of the RP unit is shown in Figure 13. The alignment verification cannot be made while the PC programming cable is connected to the unit. The programming cable must be removed and the following interconnection should be made. The alignment should be checked before and after adjustments are made.

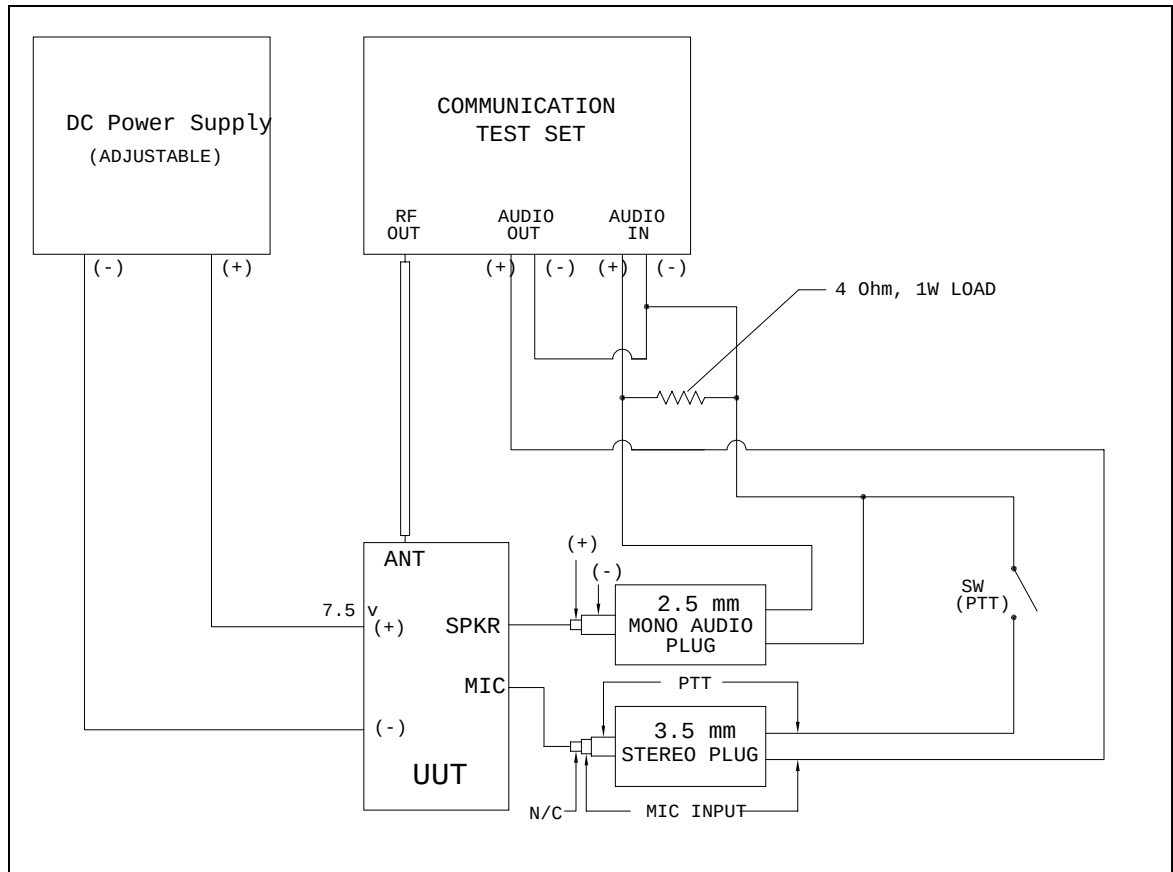


Figure 13 – Typical RP Test Set-Up

6.3 Software Set-Up

6.3.1 Placing the Radio in Alignment Mode

1. From the “Radio Model” dialog box, select the pull down menu [▼] and select the radio model. See Figure 8.
2. From the main menu, select [Editor] [Tune]. Make sure the radio is connected to the PC cable and that the radio is switched “on” before proceeding.
3. At the Password dialog box, enter the password and select [OK]. See Figures 14 and 15.

Note

The default password is null data, no password, as shown in Figure 14. Select [OK] to enter Alignment mode. You must be in the Alignment mode to set or change the password. See Section 7 to set or change the password.

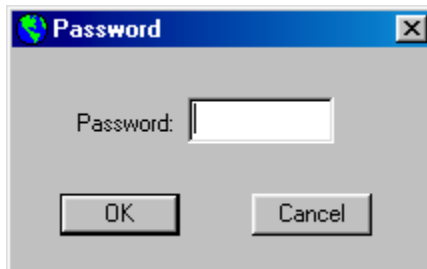


Figure 14 – Password Dialog Box

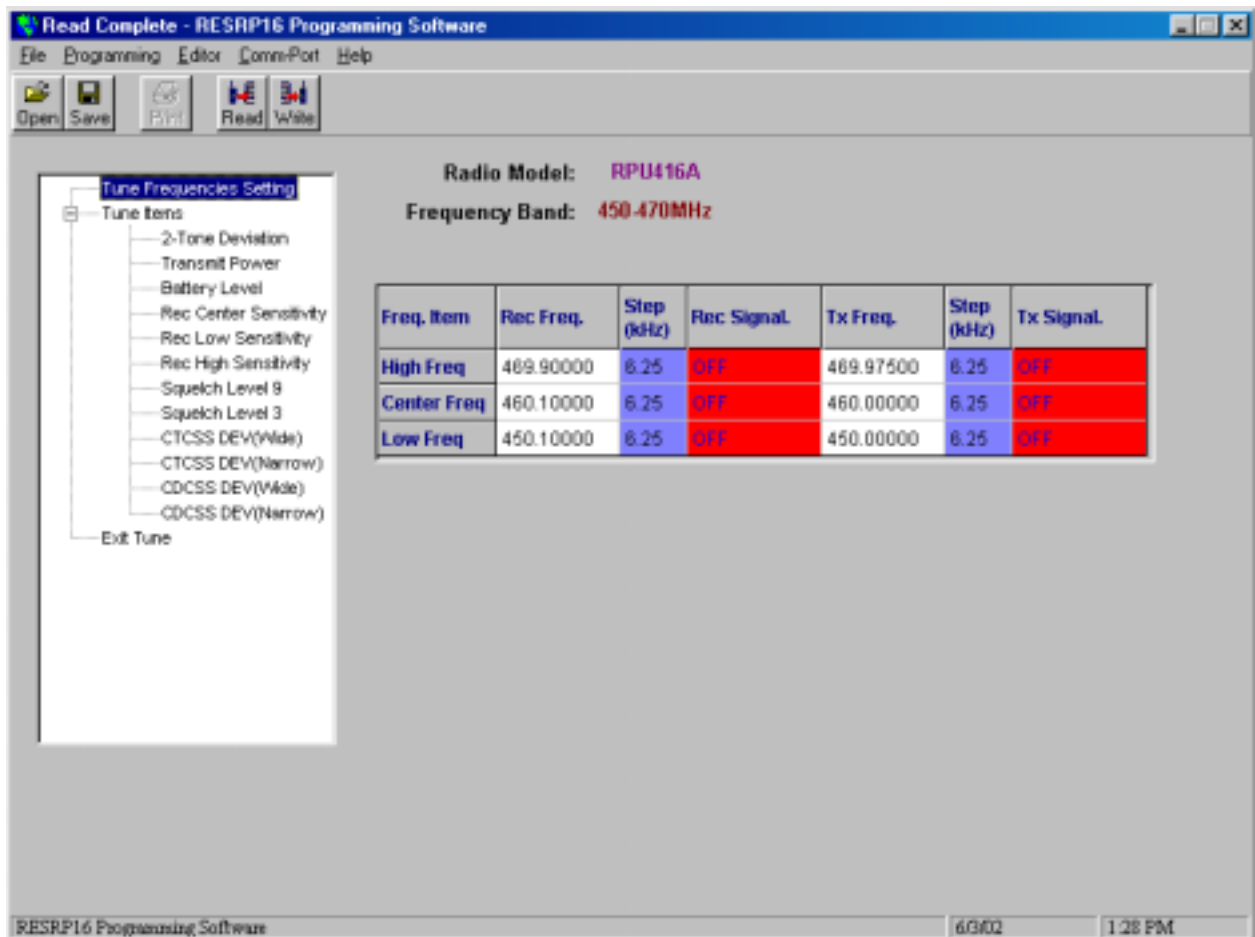


Figure 15 – Alignment Window

6.3.2 Setting the "Tune Frequencies"

It is recommended to keep the default "tune frequencies" as shown in Figure 14. However, the frequencies can be changed should you desire to do so. The RX and TX frequency fields can be edited as described in sections 5.5.1.1 and 5.5.1.2.

6.4 Aligning the Radio

6.4.1 Setting 2-Tone Deviation

1. From the main window, select “2-Tone Deviation” from under “Tune Items” of the browser index tree.
2. Using the [◀] and [▶] buttons, adjust the “Tune Value”. As the tune value increases, the 2- Tone Deviation level setting increases.
3. Select [OK].
4. Verify the 2-Tone Deviation is set to 3.3 kHz (wide) and 2.5 kHz (narrow). Repeat steps 1 – 4 as necessary.

6.4.2 Setting Transmit Power

1. From the main window, select “Transmit Power” from under “Tune Items” of the browser index tree.
2. Using the [◀] and [▶] buttons, adjust the “Tune Value”. As the tune value increases, the Transmit Power level setting increases.
3. Select [OK].
4. Verify the Transmit Power is **x** Watts, +/- 0.5 dB. Repeat steps 1 – 4 as necessary.

Model	X (Watts)
RPV516	5
RPU416	4

6.4.3 Battery (Cut-Off) Level

1. From the main window, select “Battery Level” from under “Tune Items” of the browser index tree.
2. Using the [◀] and [▶] buttons, adjust the “Tune Value”. As the tune value increases the Battery Cut-Off setting increases.
3. Select [OK].
4. Verify the Battery Cut off voltage is set between 5.8 – 6.0 V. Repeat steps 1 – 4 as necessary.

6.4.4 RX Center (Frequency) Sensitivity

1. From the main window, select “RX Center Sensitivity” from under “Tune Items” of the browser index tree.

2. Using the [◀] and [▶] buttons, adjust the “Tune Value”.
3. Select [OK].
4. Verify the Sensitivity is $\leq 0.25\mu\text{V}$. Repeat steps 1 – 4 as necessary.

6.4.5 RX Low (Frequency) Sensitivity

1. From the main window, select “RX Low Sensitivity” from under “Tune Items” of the browser index tree.
2. Using the [◀] and [▶] buttons, adjust the “Tune Value”.
3. Select [OK].
4. Verify the Sensitivity is $\leq 0.25\mu\text{V}$. Repeat steps 1 – 4 as necessary.

6.4.6 RX High (Frequency) Sensitivity

1. From the main window, select “RX High Sensitivity” from under “Tune Items” of the browser index tree.
2. Using the [◀] and [▶] buttons, adjust the “Tune Value”.
3. Select [OK].
4. Verify the Sensitivity is $\leq 0.25\mu\text{V}$. Repeat steps 1 – 4 as necessary.

6.4.7 Squelch Level 9 (Tight Squelch)

1. From the main window, select “Squelch Level 9” from under “Tune Items” of the browser index tree.
2. Using the [◀] and [▶] buttons, adjust the “Tune Value”. As the tune value increases, the squelch level setting becomes “tighter”.
3. Select [OK].
4. Verify the tight squelch opens between 5 – 10 dB above the level required to produce 12dB SINAD. Repeat steps 1 – 4 as necessary.

6.4.8 Squelch Level 3 (Threshold Squelch)

1. From the main window, select “Squelch Level 3” from under “Tune Items” of the browser index tree.
2. Using the [◀] and [▶] buttons, adjust the “Tune Value”. As the tune value increases, the squelch level setting becomes “tighter”.
3. Select [OK].

4. Verify the SINAD level is less than 8 dB when squelch opens. Repeat steps 1 – 4 as necessary.

6.4.9 CTCSS Deviation (Wide)

1. From the main window, select “CTCSS DEV (Wide)” from under “Tune Items” of the browser index tree.
2. Using the [◀] and [▶] buttons, adjust the “Tune Value”. As the tune value increases, the CTCSS Deviation level setting increases.
3. Select [OK].
4. Verify the deviation is ≈ 750 Hz. Repeat steps 1 – 4 as necessary.

6.4.10 CTCSS Deviation (Narrow)

1. From the main window, select “CTCSS DEV (Narrow)” from under “Tune Items” of the browser index tree.
2. Using the [◀] and [▶] buttons, adjust the “Tune Value”. As the tune value increases, the CTCSS Deviation level setting increases.
3. Select [OK].
4. Verify the deviation is ≈ 375 Hz. Repeat steps 1 – 4 as necessary.

6.4.11 CDCSS Deviation (Wide)

1. From the main window, select “CDCSS DEV (Wide)” from under “Tune Items” of the browser index tree.
2. Using the [◀] and [▶] buttons, adjust the “Tune Value”. As the tune value increases, the CDCSS Deviation level setting increases.
3. Select [OK].
4. Verify the deviation is ≈ 750 Hz. Repeat steps 1 – 4 as necessary.

6.4.12 CDCSS Deviation (Narrow)

1. From the main window, select “CDCSS DEV (Narrow)” from under “Tune Items” of the browser index tree.
2. Using the [◀] and [▶] buttons, adjust the “Tune Value”. As the tune value increases, the CDCSS Deviation level setting increases.
3. Select [OK].
4. Verify the deviation is ≈ 375 Hz. Repeat steps 1 – 4 as necessary.

When alignment is complete, select “Exit Tune” from the browser index tree.