

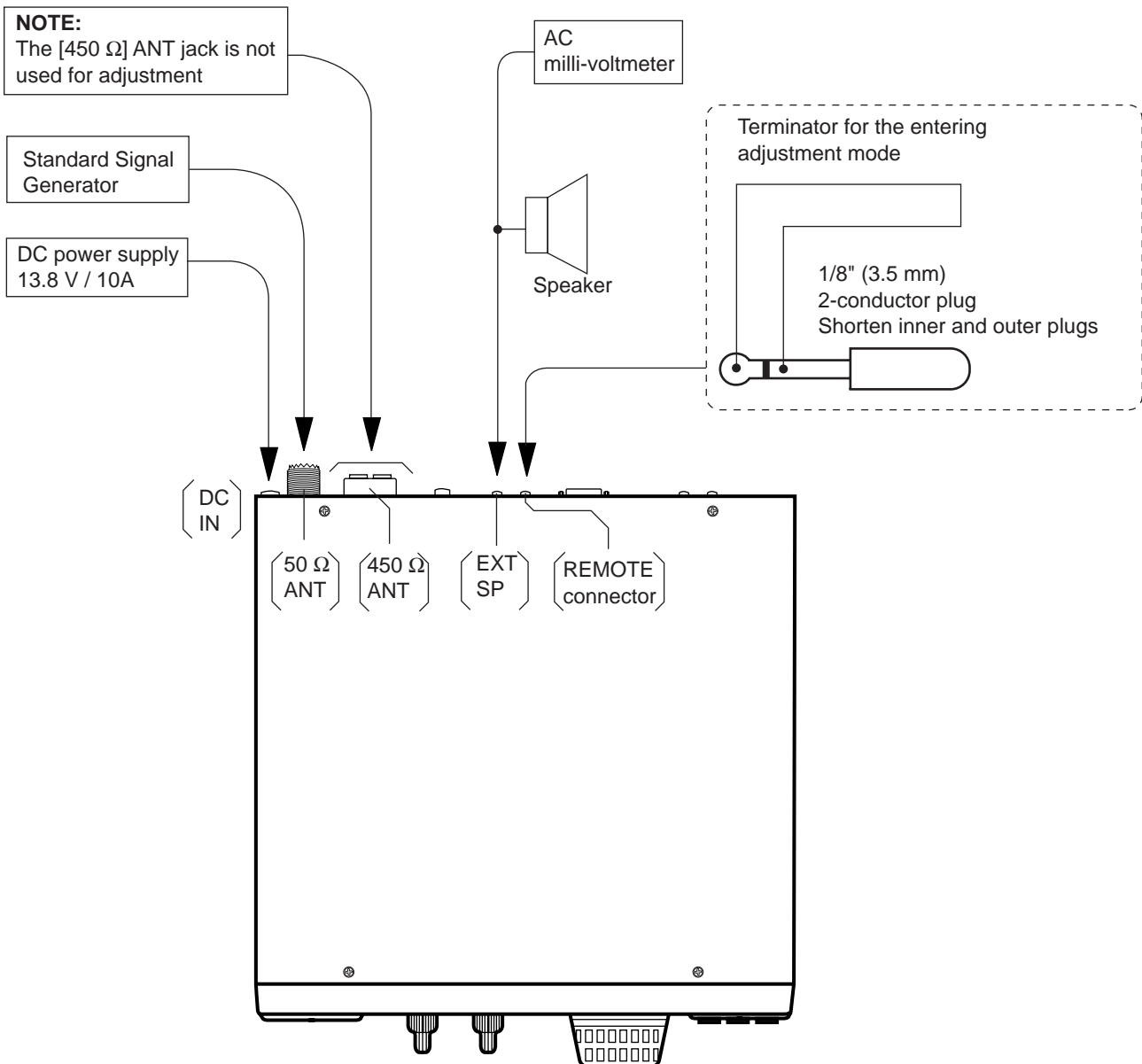
SECTION 4 ADJUSTMENT PROCEDURES

4-1 PREPARATION

■ REQUIRED TEST EQUIPMENT

| EQUIPMENT | GRADE AND RANGE | EQUIPMENT | GRADE AND RANGE |
|-------------------|--------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------------------------------------------------------------------|
| DC power supply | Output voltage : 13.8 V DC Current capacity : 2 A or more | Oscilloscope | Frequency range : DC–20 MHz Measuring range : 0.01–20 V |
| Frequency counter | Frequency range : 0.1–60 MHz Frequency accuracy : ± 1 ppm or better Sensitivity : 100 mV or better | AC millivoltmeter | Measuring range : 10 mV–10 V |
| Audio generator | Frequency range : 0.1–60 Hz Measuring range : 0.01–10 mV | External speaker | Input impedance : 8 Ω Capacity : 4 W or more |
| DC Voltmeter | Input impedance : 50 k Ω /V DC or better | Standard signal generator (SSG) | Frequency range : 0.1–300 MHz Output level : 0.1 μ V–32 mV (–127 to –17 dBm) |

■ CONNECTION

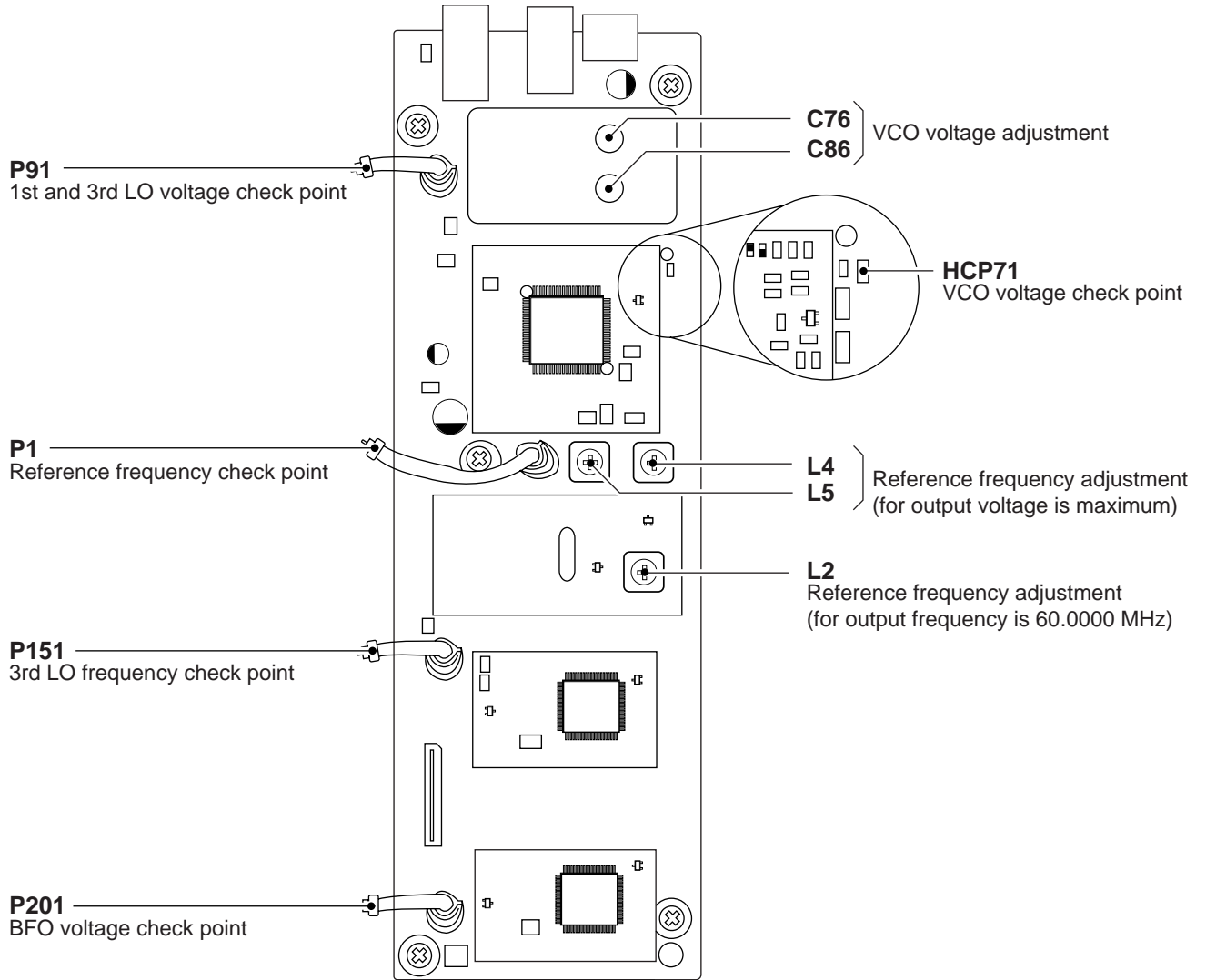


4-2 PLL ADJUSTMENT

| ADJUSTMENT | ADJUSTMENT CONDITION | MEASUREMENT | | VALUE | ADJUSTMENT POINT | |
|---------------------|-------------------------------------------------------------|-------------|----------------------------------------|-----------------------|------------------|--------|
| | | UNIT | LOCATION | | UNIT | ADJUST |
| REFERENCE FREQUENCY | 1 • Displayed frequency : 29.99999 MHz • Mode: USB | PLL | Connect the frequency counter to P1. | 60.00000 MHz | PLL | L2 |
| | 2 | | Connect the RF voltmeter to P1. | Maximum voltage | | L4, L5 |
| VCO VOLTAGE | 1 • Displayed frequency : 29.99999 MHz • Mode: USB | PLL | Connect the DC voltmeter to HCP71. | 4.0 V | PLL | C86 |
| | 2 • Displayed frequency : 0.03000 MHz • Mode: USB | | | More than 0.8 V | | Verify |
| | 3 • Displayed frequency : 60.00000 MHz • Mode: USB | | | 4.0 V | PLL | C76 |
| | 4 • Displayed frequency : 30.00000 MHz • Mode: USB | | | More than 0.8 V | Verify | |
| 1ST LO VOLTAGE | 1 • Displayed frequency : 30–60.00000 MHz • Mode: USB | PLL | Connect the RF voltmeter to P91. | More than 0.18 V | | Verify |
| 3RD LO VOLTAGE | 1 • Displayed frequency : 30–60.00000 MHz • Mode: USB | PLL | Connect the RF voltmeter to P91. | More than 0.022 V | | Verify |
| 3RD LO FREQUENCY | 1 • Displayed frequency : 9.4615 MHz • Mode: FM | PLL | Connect the frequency counter to P151. | 9.4614–9.4616 MHz | | Verify |
| BFO VOLTAGE | 1 • Displayed frequency : 14.100000 MHz • Mode: USB | PLL | Connect the RF voltmeter to P201. | More than 0.022 V | | Verify |
| | 2 • Displayed frequency : 14.100000 MHz • Mode: AM | | | Less than 280 μ V | | |

*This output level of the standard signal generator (SSG) is indicated as SSG's open circuit.

• PLL UNIT

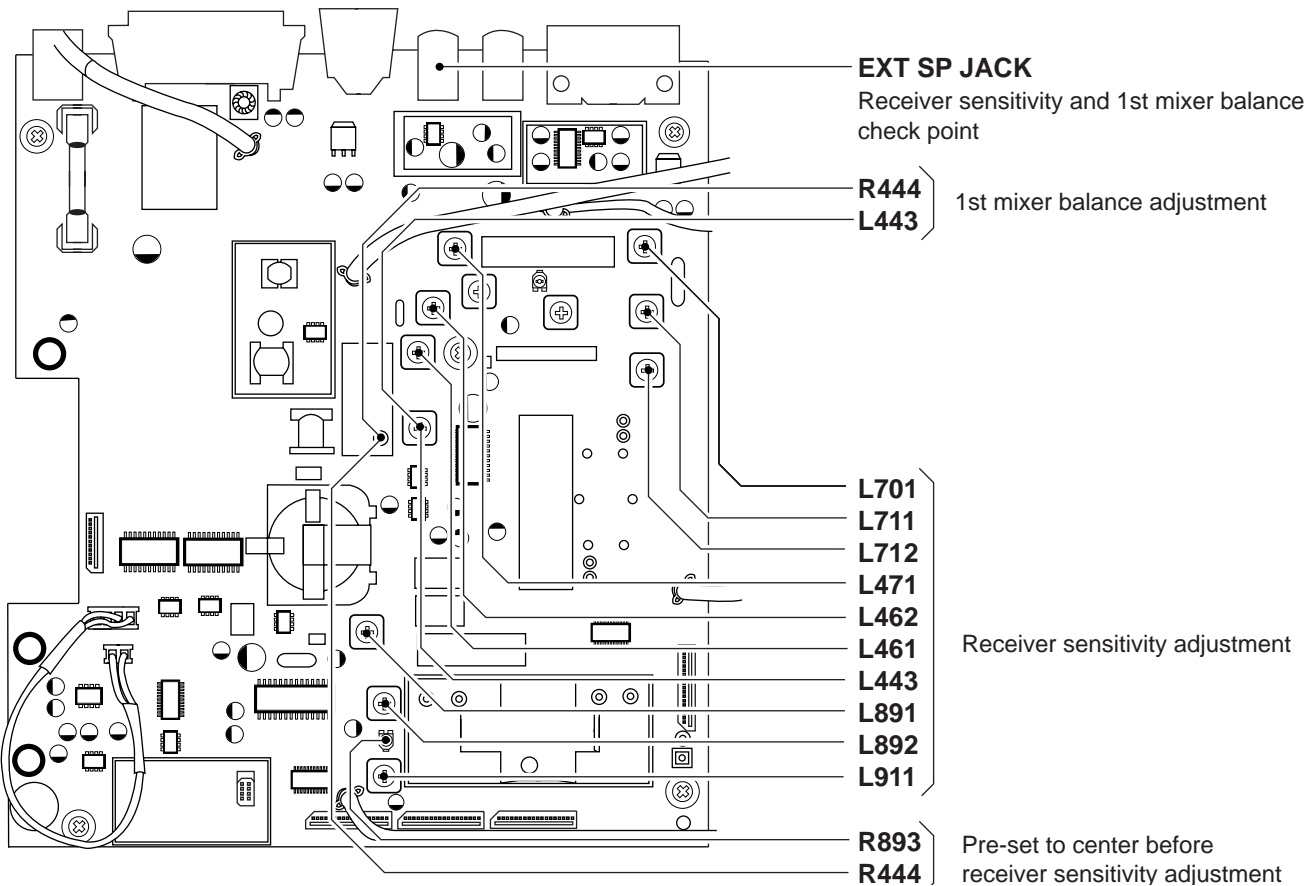


4-3 RECEIVER ADJUSTMENTS

| ADJUSTMENT | ADJUSTMENT CONDITION | MEASUREMENT | | VALUE | ADJUSTMENT POINT | | |
|----------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------------------------------------------------------------------|----------------------|--------|---------------------------------------------------------------------------------------|
| | | UNIT | LOCATION | | UNIT | ADJUST | |
| RECEIVER SENSITIVITY | 1 | <ul style="list-style-type: none"> • Displayed frequency : 14.10000 MHz • Mode : USB • PREAMP1 : ON • ANT select : ANT1 • AGC : FAST • NOISE BLANKER : OFF • RF/SQL : CENTER • PBT1/PBT2 : CENTER • IF FILTER1 : 2.4 kHz • IF FILTER2 : 2.4 kHz | Rear Panel | Connect the AC milli-volt meter to the [EXT SP] jack with an 8 Ω load. | Pre-set to center | MAIN | R444 R898 |
| | 2 | <ul style="list-style-type: none"> • Connect an SSG to the antenna connector1 and set as: Frequency : 14.10150 MHz Level : 22 μV* (-13 dBμ) Modulation : OFF • Receiving | | | Maximum output level | MAIN | L443, L461, L462, L471, L701, L711, L712, L891, L892, L911 |
| 1ST MIXER BALANCE | 1 | <ul style="list-style-type: none"> • Displayed frequency : 0.10000 MHz • PREAMP1 : OFF • set an SSG level as : OFF • Receiving | Rear panel | Connect an oscilloscope to the [EXT SP] jack with 8 Ω load. | Minimum noise level | MAIN | L443, R444 |

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• MAIN UNIT

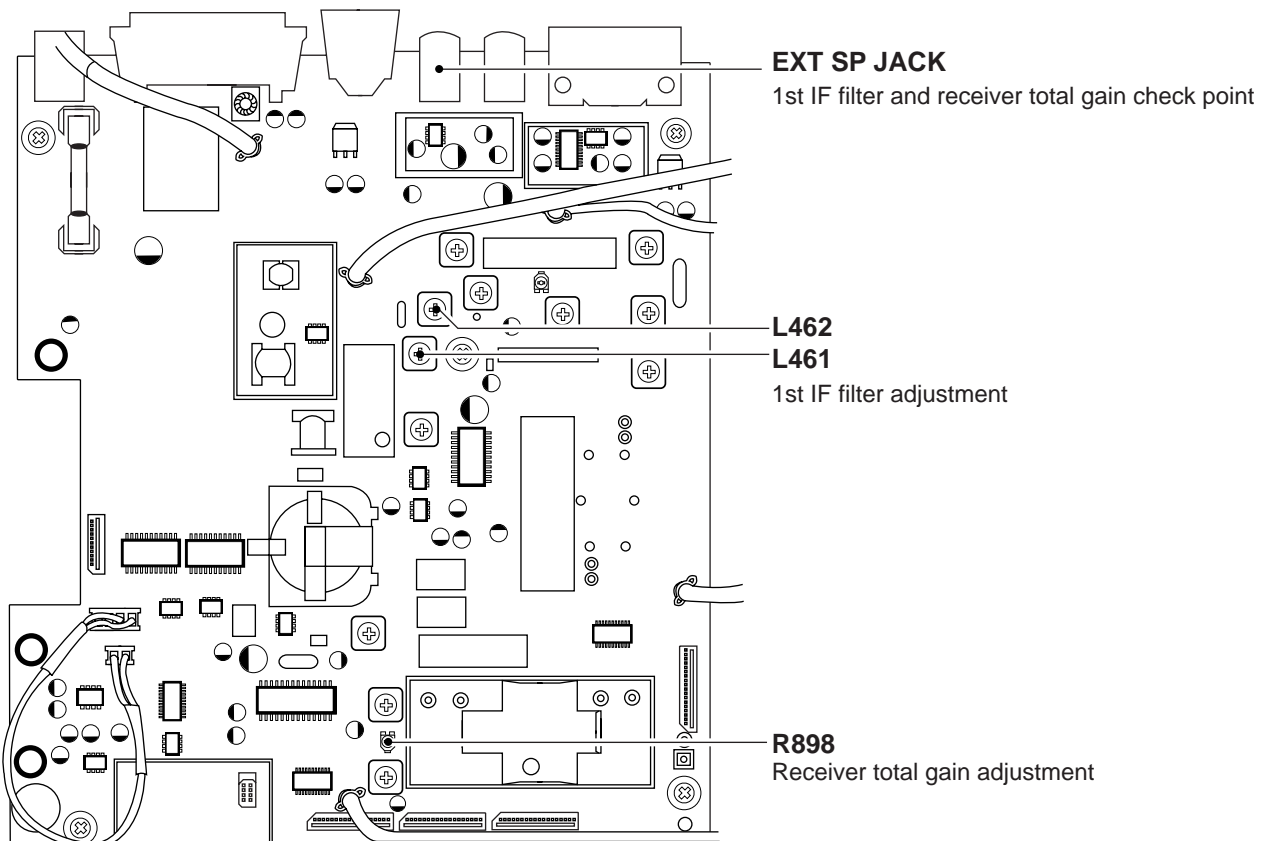


RECEIVER ADJUSTMENTS (continued)

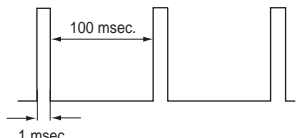
| ADJUSTMENT | ADJUSTMENT CONDITION | MEASUREMENT | | VALUE | ADJUSTMENT POINT | |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------|----------------------|------------------|-------------------|
| | | UNIT | LOCATION | | UNIT | ADJUST |
| 1ST IF FILTER | 1 <ul style="list-style-type: none"> • Displayed frequency : 14.10000 MHz • Mode : FM • PREAMP1 : ON • IF FILTER1 : 15 kHz • IF FILTER2 : 6 kHz • set an SSG as <ul style="list-style-type: none"> Frequency : 14.10000 MHz Level : 0.32 μV* (-10 dBμ) Deviation : \pm3.5 kHz Modulation : 1 kHz • Receiving | Rear panel | Connect the AC milli-volt meter to the [EXT SP] jack with an 8 Ω load. | Maximum output level | MAIN | L461, L462 |
| RECEIVER TOTAL GAIN | 1 <ul style="list-style-type: none"> • Displayed frequency : 14.10000 MHz • Mode : USB • PREAMP1 : OFF • IF FILTER1 : 2.4 kHz • IF FILTER2 : 2.4 kHz • Set an SSG as <ul style="list-style-type: none"> Frequency : 14.10150 MHz Level : 500 μV* (54 dBμ) Modulation : OFF | Rear panel | Connect the AC milli-volt meter to the [EXT SP] jack with an 8 Ω load. | 0 dB (1.0 V) | Front panel | [AF GAIN] control |
| | 2 <ul style="list-style-type: none"> • Set an SSG level as : OFF • Receiving | | | -30 dB (10 mV) | | MAIN |

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• MAIN UNIT

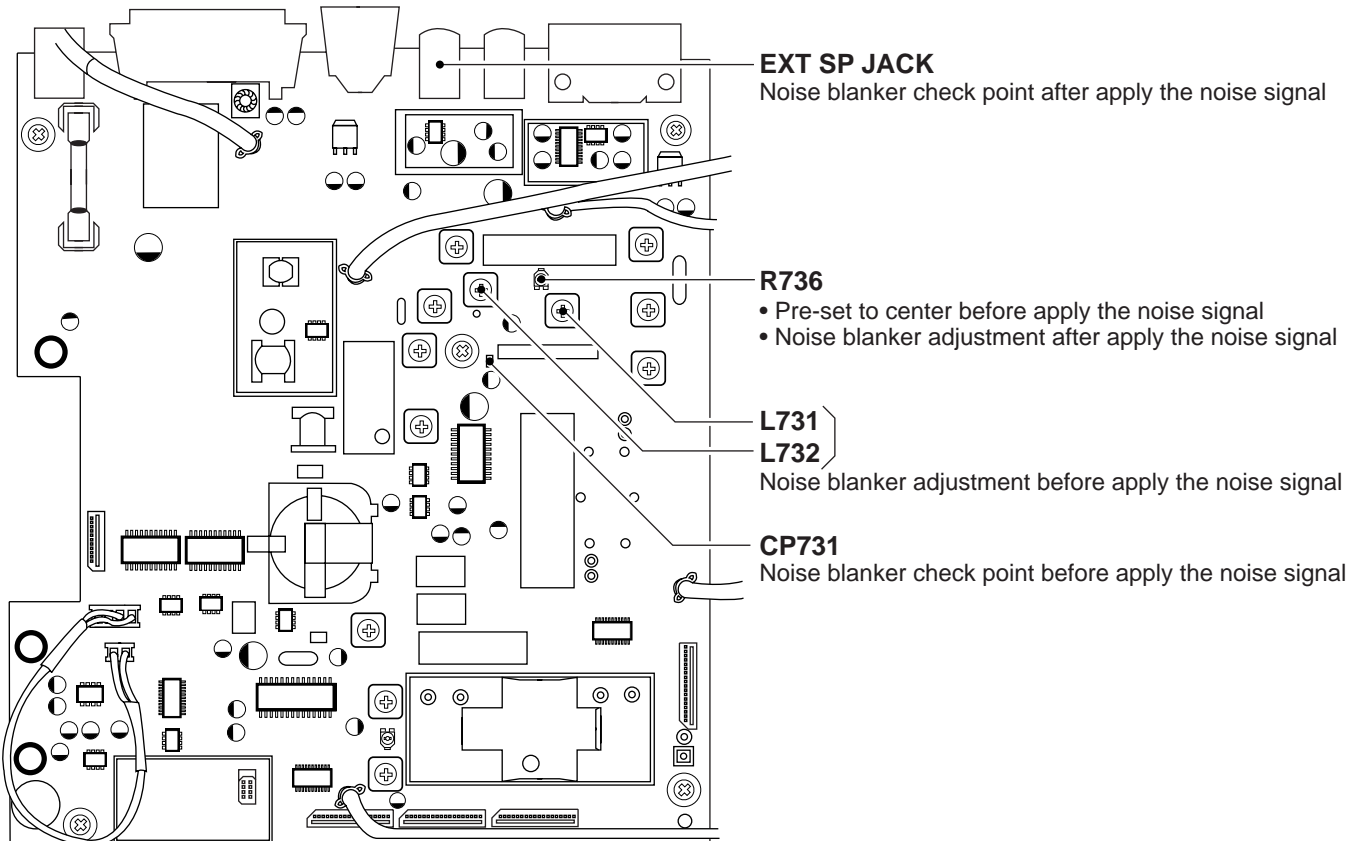


RECEIVER ADJUSTMENTS (CONTINUED)

| ADJUSTMENT | ADJUSTMENT CONDITION | MEASUREMENT | | VALUE | ADJUSTMENT POINT | |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------|----------------------------------------------|------------------|-----------------------|
| | | UNIT | LOCATION | | UNIT | ADJUST |
| NOISE BLANKER | 1 <ul style="list-style-type: none"> • Displayed frequency : 14.10000 MHz • Mode : USB • Noise Blanker : OFF • PREAMP1. : ON • Set an SSG as <ul style="list-style-type: none"> Frequency : 14.10000 MHz Level : 18 μV* (25 dBμ) Modulation : OFF | MAIN | Connect the oscilloscope to the check point CP731. | Pre-set to center Minimum voltage | MAIN | R736 L731, L732 |
| | 2 <ul style="list-style-type: none"> • Apply the following signal to the [ANT1] connector  | Rear Panel | Connect the oscilloscope to the [EXT SP] jack with an 8 Ω load. | Noise is blanked when the [NB] switch is ON. | MAIN | R736 |

*This output level of the standard signal generator (SSG) is indicated as SSG's open circuit.

• MAIN UNIT



4-4 SET MODE ADJUSTMENT

| ADJUSTMENT | ADJUSTMENT CONDITION | DISPLAY | OPERATION |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ENTERING ADJUSTMENT SET MODE | <ul style="list-style-type: none"> • Turn power OFF • Connect a terminator to the [REMOTE] connector on the rear panel. • While pushing “SET[ANT] and “CLOCK” keys, and turn power ON. | | <ul style="list-style-type: none"> • When success entering adjustment set mode, shown “PBT SET” on the display. • Then advance to the following setting, or push “UP” key to scroll the display. |
| PBT VOLUME | 1 <ul style="list-style-type: none"> • Connect an SSG to the antenna connector¹ and set as: Frequency : 14.15150 MHz Level : 50 mV* (−13 dBm) Modulation : OFF • Preset both the inner and outer “TWIN PBT” controls to 12 o'clock position. • Receiving | | <ul style="list-style-type: none"> • Push “SET[ANT]” key to set the PBT level. • When the PBT level is true, shown “GOOD” on the display. |
| S-METER | 1 <ul style="list-style-type: none"> • Set an SSG level as : OFF | | <ul style="list-style-type: none"> • When S0 level of S-meter adjustment mode entering, displayed “S0 LV”. • Push the “SET[ANT]” key to set the S0 level. |
| | 2 <ul style="list-style-type: none"> • Set an SSG level as : 35 μV* (31 dBμ) | | <ul style="list-style-type: none"> • When S9 level of S-meter adjustment mode entering, displayed “S9 LV”. • Push the “SET[ANT]” key to set the S9 level. |
| | 3 <ul style="list-style-type: none"> • Set an SSG level as : 28 mV* (89 dBμ) | | <ul style="list-style-type: none"> • When +60 dB level of S-meter adjustment mode entering, displayed “+60 LV”. • Push the “SET[ANT]” key to set the 60 dB level. |
| | 4 <ul style="list-style-type: none"> | | <ul style="list-style-type: none"> • When the S-meter adjustment is end, displayed “END”. |
| FILTER CALIBRATION | 1 <ul style="list-style-type: none"> • Set an SSG level as : 10 μV* (20 dBμ) | | <ul style="list-style-type: none"> • When filter calibration adjustment mode entering, displayed “FIL CAL”. • Push the “SET[ANT]” key to set the filter calibration. • Emit to the beep audio. |
| | 2 <ul style="list-style-type: none"> • Turn power OFF to exit the adjustment set mode. | | |

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