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APPENDIX 6

TRANSMITTER ALIGNMENT

ONE (1) PAGE ALIGNMENT PROCEDURES FOLLOW THIS SHEET

ALIGNMENT PROCEDURE

The SP200 U/V Receiver is designed for broad band covering UHF(440 to 470 MHz) and VHF(148-174MHz) and should require no special alignment, unless repairs are performed on the receiver portion.

The only alignment normally required is to squelch circuit, Apply a signal that produes 10dB SINAD, reduce the input to -130dBm, close the squelch control(RV2,RV4) until the receiver mutes.
Increase the signal to 10dB SINAD reading reference level and adjust RV2 or RV4 until the squelch opens. In high noise environment, some users may prefer to have the squelch opening set somewhat tighter, e.g.:12 to 14dB SINAD.

Should repairs be required, the following procedures should be applied:

VCO

1. Set the unit to the lowest transmitter frequency, 440MHz(UHF), 148MHz(VHF) and adjust the VCO L203 to 3 volts.
2. Set the unit to the highest transmitter frequency, 470MHz(UHF), 174MHz(VHF) and check that the VCO voltage is below 11 volts. Adjust L203 for 3.0 volts.
3. Set the unit to the lowest receiver frequency, 440MHz(UHF), 148MHz(VHF) and adjust the VCO C208 to 2 volts.
4. Set the unit to the highest receiver frequency 470MHz(UHF), 174(VHF) and check that the VCO voltage is below 11 volts. if voltage is above 11volts, adjust C208 for 11volts or less.

* Note : use TP1 to measure the voltage.

Transmitter

Connect the unit to a Service Monitor with the power meter setting to the 5 W scale (or autorange)

TCXO

Set the channel selector to the mid-range frequency 455 MHz, adjust CT1, for a reading of 445 MHz +/- 200Hz. For the VHF data radio, adjust the CT1 and set the frequency within the required range.

APC

1. Adjust RV1 for fixing up High Power(5W)
2. Adjust RV3 for fixing up Low Power(1W)

APPENDIX 7

CIRCUITS AND DEVICES TO STABILIZE FREQUENCY

A 12.8 MHz referenced TCXO PLL circuit establishes and stabilizes output frequency.

APPENDIX 8

CIRCUITS TO SUPPRESS SPURIOUS RADIATION, LIMIT MODULATION AND CONTROL POWER

TRANSMITTER STAGE HARMONIC FILTER

L7, L8, L11, C73, C74, C75 and C76 form a 7th order Chebyshev low pass filter. Unwanted harmonics are reduced by -65 dBc.

AUTOMATIC POWER CONTROL

The APC circuit consists of the R109, variable resistor RV1, IC3, and transistor Q19, Q21, and Q22. The supply current is monitored by difference voltage on R109 (0.1 ohm) which is through for it. If the current is varied by RF power output or other reasons, it produces some bias voltage by IC3A and Q19. The differential signal at the output of IC3 is passed to Q21 and Q22 that produces a constant power output to the antenna. RV1 is used to adjust the RF power level.

MICROPHONE AUDIO CIRCUIT

The TX audio from the internal mic or external mic is applied to ASIL (Audio Signal Processor) IC406 that performs the audio gain limiter and low-pass filter functions.