Technical Note TN-559

Tait Orca Performance Improvements

15 February 1999

Applicability

This Technical Note applies to all models of the Tait Orca series, except where specifically stated.

The solutions for these issues have been incorporated into Tait Orca product from serial number 14005817 onwards.

1. Introduction

This Technical Note summarizes 5 main performance issue improvements related to the Tait Orca series, detailing the initial problem issue, and the subsequent developed solution.

The performance issues are:

- CTCSS decode insensitivity on wideband radios.
- Receiver blocking.
- DCS noise breakthrough.
- De-sensing of squelch due to speech on WB channels.
- Loss of initial spoken syllables when TX keyed.

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2. Summary of performance issues.

1) CTCSS decode insensitivity on wideband radios.

Reason: Lack of level into CODEC below 300Hz, combined with need to keep mic sensitivity at a minimum, to ensure noise or voice doesn't cause false detects.

Solution: Filter values changed on CODEC input to give 2-4dB more level, as well as rejecting low frequency DCS energies. This solution now allows EIA specifications to be met.

2) Receiver blocking.

Reason: Lack of isolation from mixer back to VCO tank circuit, as well as poor matching into 1st IF.

Solution: Appropriate component values changed to improve match into 1st IF. This modification allows radios to operate in very close proximity to each other without blocking problems.

3) DCS noise breakthrough.

Reason: Saturation of the CODEC input due to low frequency input filter, in combination with high deviation levels.

Solution: Solution (1) above rectifies this problem. DCS clipping does not occur until much higher DCS deviation levels.

4) De-sensing of squelch due to speech on wideband channels. (applicable to 12.5/20/25Khz variant)

Reason: Wideband speech signals cause de-sensing of squelch, causing receive audio to become chopped by toggling squelch action.

Solution: Component values changed to increase squelch hysteresis, thus eliminating chopping of receive audio.

5) Loss of initial spoken syllables when TX keyed.

Reason: ALC circuit taking considerable time to recover when transmit mode initiated, causing initial TX audio level to be initially very low.

Solution: Component value changes ensure there are no lost syllables of initial transmit audio.

3. Issuing authority

Name and position of issuing officer Durham Sheriff
MRD Customer Services Engineer.