S Y S T E M S
WIRELESS
L I M I T E D

WBS-6 Wireless Intercom System

AIS-200/400 Modification
Users Guide

ver-3.5 10/26/99
ais-200/40

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Features and Capabilities

The AIS 200/400 modification from Systems Wireless is an enhancement to the Vega QX series wireless intercom system. The modification provides three features that greatly enhance performance.

The first feature is that it allows for a completely isolated intercom sub-circuit within the chassis to replace the factory interface. This eliminates the possible grounding problems that arise when audio and intercom ground signals tie together. The specification and performance is also superior to the original circuit.

The second feature provides tone encoded squelch protection on the receiver circuits. The factory design was simply carrier-controlled squelch, which allowed spurious and unwanted signal to be received and routed to the wired intercom system. The modification, in effect, breaks the connection from the receivers to the wired intercom until a valid tone is recognized.

The third feature is really an extension of the capabilities of the tone encoding scheme. The "ISO" function made popular by the original *Intercom Specialties* modification is included in the overall design of the modification. An additional intercom interface circuit is provided for the ISO channel to allow interconnection to either two-wire or four wire systems.

Looking beyond the factory concept, additional features have been added that are available in the AIS-400. These include the sensing of a low battery state in the user's wireless beltpack, and two additional audio paths from the user that are suitable for stage announce or other similar purposes.

Functions and Interfacing

Interfacing Options

1   CH-1 (main) two-wire Clear-Com or RTS mode

2   CH-1 (main) four-wire

3   CH-2 (ISO) two-wire Clear-Com or RTS mode

4   CH-2 (ISO) internal only

5   CH-2 (ISO) four-wire

6   Function 3 four-wire out balanced audio (AIS-400 Only)

7   Function 4 four-wire out balanced audio (AIS-400 Only)

To accommodate the options, additional connectors were needed.

1   DB-15 male for the 4 channel logic contact closures
          and function 3 and 4 audio outputs

2   Four-pin XLR female for the CH-2 (ISO) four-wire in and out

In addition, the functions of the factory LINK IN/OUT connectors now function as the CH-1 (Main) four-wire in and out.

Front panel indicators

The channel status LED will illuminate to 50% red when carrier is detected.
The LED will illuminate to 100% red when a CH-1 (Main) tone is detected
The LED will illuminate to 100% green when a CH-2 (ISO) tone is detected
(Because the carrier detect circuit is still active in the ISO decode mode, there will be 50% red illumination during ISO decode as well as green indication)

The I/C LED will illuminate to 50% when wet intercom voltage is present and powering the 2w-4w converter circuitry.
The indicator will illuminate to 100% when the front panel I/C button is depressed.

MON SEL Switch detail

Front Panel MON SEL Switch

>The ALL Position includes both intercom channels 2w and 4w plus all receivers post-enable and filtering
>The R1-R6 position monitors the RX signal from individual receivers pre-enable switch and filtering.
>The I/C position monitors only the MAIN intercom channel, both 2w and 4w inputs.
>The LINK position monitors the ISO intercom channel, both 2w and 4w inputs.

Rear Panel
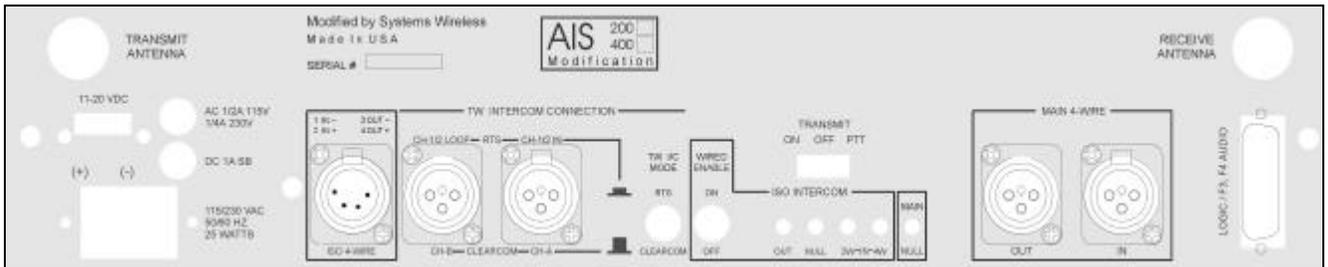
Rear Panel Controls

ISO INTERCOM WIRED ENABLE switch in the "IN" position will connect the ISO audio signal to the wired intercom system. In the "out" position, the wired intercom signal is disconnected. This switch effects the two-wire and four-wire connections.

The OUT adjustment changes the level of the 2w and 4w signals that feed the wired intercom system.

The NULL adjustment sets the balance of the internal 2w/4w interface. (since the received audio at the user's belt-pack will contain their voice at full volume from the base station transmitter, the NULL control will not completely remove a users voice from their earpiece without effecting the ability to hear other wireless users)

The 2W IN adjustment sets the level to the base station transmitter from the output of the internal 2W/4W interface. The 4W/pgm IN adjustment sets the level to the base station transmitter from the balanced line level input. (4-pin XLR pins 1,2)

The TW-MODE switch configures the male and female TW XLR connectors and the 2w-4w converter operating levels to be RTS or Clear-Com compatible. The "IN" position is for RTS, the out position is for Clear-Com. *To accommodate a situation when MAIN is used in a 4-wire mode and ISO is used in Clear-Com 2-wire mode, JP1 on the rear panel interface PCB must be moved to derive power from the Channel-B connector.*

Additional Rear Panel Connections

Four-Pin female XLR connector ISO 4-WIRE input and output
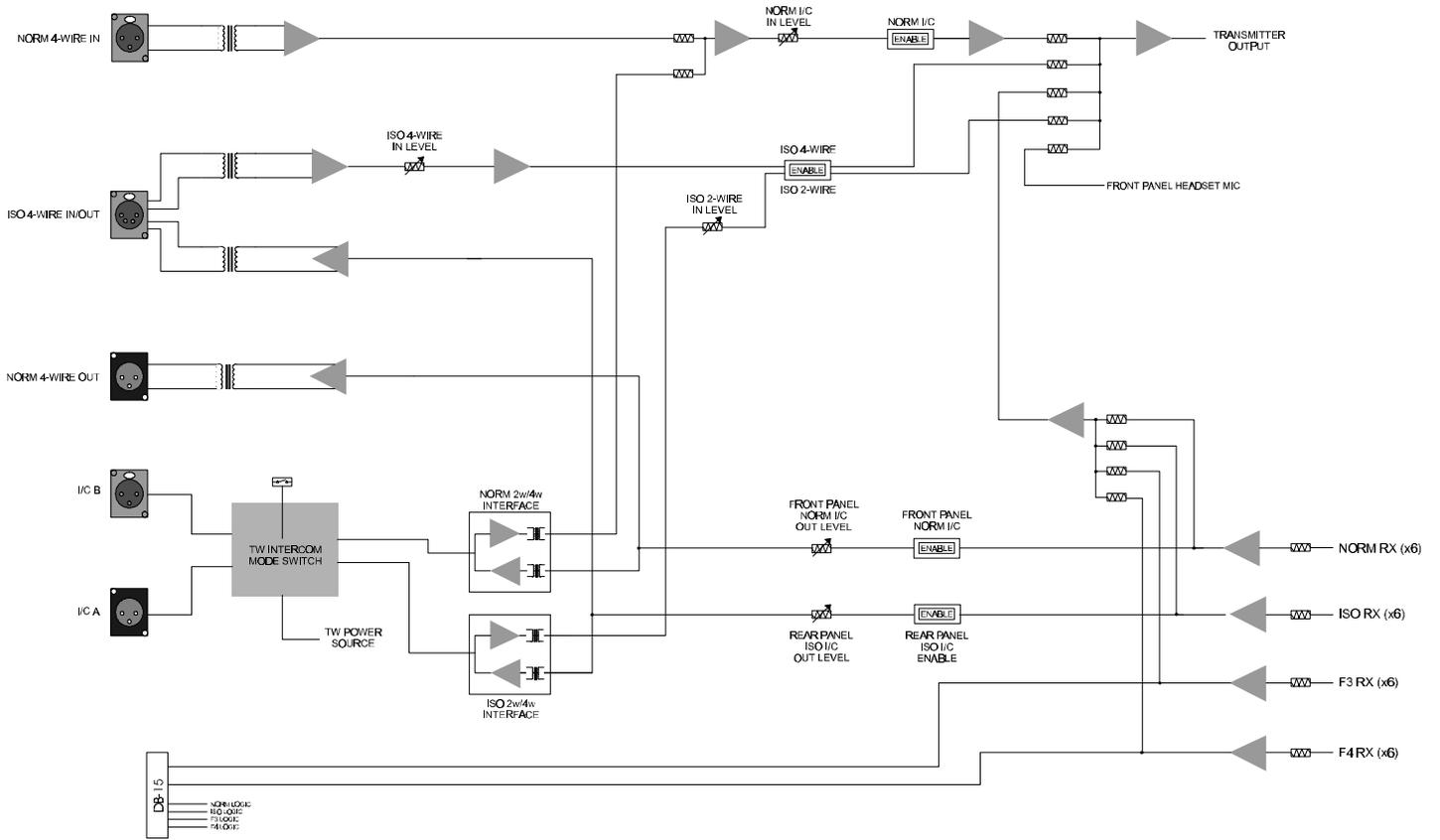Pin-1 4w in LO
Pin-2 4w in HI
Pin-3 4w out LO
Pin-4 4w out HI

D-SUB 15-pin female connects to the four logic signals and balanced audio for functions 3 and 4.

Audio Path Block Diagram

NORM 4-WIRE IN

NORM I/C
IN LEVEL

NORM I/C
ENABLE

TRANSMITTER
OUTPUT

ISO 4-WIRE
IN LEVEL

ISO 4-WIRE IN/OUT

ISO 4-WIRE
ENABLE
ISO 2-WIRE

FRONT PANEL HEADSET MIC

ISO 2-WIRE
IN LEVEL

NORM 4-WIRE OUT

I/C B

TW INTERCOM
MODE SWITCH

NORM 2w/4w
INTERFACE

FRONT PANEL
NORM I/C
OUT LEVEL

FRONT PANEL
NORM I/C
ENABLE

NORM RX (x6)

I/C A

TW POWER
SOURCE

ISO 2w/4w
INTERFACE

REAR PANEL
ISO I/C
OUT LEVEL

REAR PANEL
ISO I/C
ENABLE

ISO RX (x6)

F3 RX (x6)

DB-15

NORM LOGIC
ISO LOGIC
F3 LOGIC
F4 LOGIC

F4 RX (x6)

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Connector Pin-out Detail

DB-15 Female

1	F3 AUDIO OUT +
2	F4 AUDIO OUT +
3	F1 LOGIC
4	F2 LOGIC
5	F3 LOGIC
6	F4 LOGIC
7	
8	
9	F3 AUDIO OUT -
10	F4 AUDIO OUT -
11	F1 LOGIC
12	F2 LOGIC
13	F3 LOGIC
14	F4 LOGIC
15	

Main 4-wire input:

Pin-1 Floating (internally jumper selectable to be audio ground)
Pin-2 signal in HI
Pin-3 signal in LO

Main 4-wire output:

Pin-1 Floating (internally jumper selectable to be audio ground)
Pin-2 signal in HI
Pin-3 signal in LO

Four-Pin female XLR connector ISO 4-WIRE input and output:

Pin-1 4w in LO
Pin-2 4w in HI
Pin-3 4w out LO
Pin-4 4w out HI

TW-INTERCOM CONNECTION:

\Female (CLEAR-COM Mode)   Female (RTS Mode) Input
Pin-1   Intercom ground   Pin-1   Intercom ground
Pin-2   DC power in   Pin-2   Channel-1 audio (MAIN) + 30vdc in
Pin-3   Channel-A (MAIN) audio   Pin-3   Channel-2 audio (ISO)

Male   (CLEAR-COM Mode)   Male (RTS Mode) Loop
Pin-1   Intercom ground   Pin-1   Intercom ground
Pin-2   DC power in   Pin-2   Channel-1 audio (MAIN) + 30vdc in
Pin-3   Channel-B (ISO audio)   Pin-3   Channel-2 audio (ISO)

Specifications

Logic closures

500mA 30vdc relay form "A" contacts normally open

4-WIRE Output level   +9.3dBv Clip
4-WIRE Input level   +23dBv clip
All 4-wire inputs and outputs are transformer isolated and DC voltage protected to 50vdc.

PL tone Frequencies

F1 (Main)   83.85Hz
F2 (ISO)   78.355Hz
F3   89.95Hz
F4 (Low Battery)   33.5Hz

PL tone residual   -38dBv

FAQ and Quick Set-up Guide

1   Select TW mode using the MODE switch on the rear panel
2   Connect either RTS or Clear-Com type TW partyline to the TW connector on thje rear panel
3   Using the same headset for all six beltpacks, adjust the six front panel RX level trim pots for uniform level from each beltpack.
4   Adjust the amplitude of the RX audio to the MAIN wired channel using the front panel "TO I/C" trim pot.
5   Adjust the amplitude of the wired intercom heard in the wireless headset using the front panel "FROM I/C" trim pot.
5   Adjust the balance between a wired talker and a wireless talker using the rear panel "MAIN NULL" trim pot.
6   Adjust the amplitude of the RX audio to the ISO wired channel using the rear panel "OUT" trim pot.
7   Adjust the amplitude of the wired intercom heard in the wireless headset using the rear panel "2W IN" trim pot.
8   Adjust the balance between a wired talker and a wireless talker using the rear panel "ISO NULL" trim pot.

For either intercom channel, changing the level to or from the wired system will change the balance between the wired and wireless signals heard in the wireless headset. If the levels are changed, you must re-adjust the NULL trim pot to maintain the desired balance.

FAQ

"Can the MAIN 4W in be used as a program audio input?"
Yes, however, the front panel "I/C IN" trim pot will effect the level of the audio.

"Does the TW Mode switch effect the main and ISO channels?"
Yes, it is not possible to have one channel connected to RTS and the other to Clear-Com

"Can the TW connection be dry, as in no-voltage?"
No, the intercom line powers the TW interface circuitry. Even if the AC power is turned off, the TW circuitry is still powered.

"How do I link two base stations together now that the LINK IN/OUT connectors are gone.?"
In the RTS TW mode, loop out of the first base station into the input of the second base station with a single XLR cable.
        If you are using Clear-Com, two "Y" cable adapters are required to split the Channel-A and Channel-B circuits to each base. Also, the gender of Channel-B requires a female-female XLR adapter.
        For 4-wire connections, the signal feeding the 4w-in can be split with a "Y" cable, the 4w-out should be combined with a mixer, but since the outputs are transformer isolated, they could be combined with an additional "Y" cable.