

 Master Format Specifications

Guide Specification

Wireless Infrared Hearing Assistance System

**SECTION 27 41 16.xx**

**RADIO COMMUNICATION SYSTEM & EQUIPMENT**

**WIRELESS INFRARED HEARING ASSISTANCE SYSTEM**

This document is intended to aid the specifier in developing a specification section for a Williams Sound Infrared Listening System for use in churches, schools, auditoriums, conference rooms, and theaters.

Edit this master specification to suit your project requirements. Modify or add items as necessary. Delete items, which are not applicable. Words and sentences within brackets [ ] reflect a choice to be made regarding inclusion or exclusion of a particular item or statement.

This guide specification is based on the Construction Specifications Institute (CSI), Section Format standards. References to section names and numbers are based on MasterFormat 2004.

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SPECIFICATIONs

PART 1 GENERAL

* 1. **SUMMARY**
1. Section Includes: Equipment for amplifying, transmitting and receiving sound signals for the hard of hearing, using infrared signal technology.
	1. **SUBMITTALS**
2. General: Submit in accordance with Section 01330.
3. Product Data: For each specific piece of equipment.
4. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, required clearances, method of field assembly, components, and location of each field connection.
5. Closeout Submittals: Submit following in accordance with Section 01780.
	1. Operation and Maintenance Data: For equipment.
	2. **QUALITY ASSURANCE**
6. Installer Qualifications: Experienced installer who is authorized representative of equipment manufacturer for both installation and maintenance of equipment required for this Section.
7. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.
8. Comply with NFPA 70.
9. Comply with UL 50.
	1. **WARRANTY**
10. Warrant system to be free of defects in operation for 5 years, including parts and labor. Warranty for cords, antennas, power supply, and accessories is 90 days.

**PART 2 PRODUCTS**

1. **MANUFACTURERS**
	1. Acceptable Manufacturers:
		1. Williams Sound, Eden Prairie, MN.
2. **ACCEPTABLE PRODUCTS**
	1. Transmitters/Emitters/Modulators:
3. IR T1
4. IR T2
5. WIR TX 9 DC
6. WIR TX 90 DC
7. WIR TX 925 DC
8. MOD 232
	1. Receivers:
9. WIR RX 22-4
10. WIR RX 18
	1. Accessories:
		1. Earphones
11. EAR 008
12. EAR 013
13. EAR 014
14. EAR 022
15. EAR 042
	* 1. Headphones
16. HED 021
17. HED 026
18. HED 027
19. HED 040
	* 1. Neckloops
20. NKL 001
	* 1. Batteries
21. BAT 001-2
22. BAT 026-2
	* 1. Carry Cases
23. CCS 029
24. CCS 030 35
	* 1. Rack Mount Kits
25. RPK 005
26. RPK 006
	* 1. Chargers
27. CHG 3512
28. CHG 518
	1. **COMPONENT PERFORMANCE CRITERIA**
29. Transmitter: IR T1 [*select as needed*]
	1. Dimensions: Width: 5.65”(14.4 cm), Depth: 3.65”(9.3 cm), Height: 1.15”(2.9 cm)
	2. Weight: 8.3 oz (235 g)
	3. Color: Black
	4. Power Supply: TFP 055 – 100-240VAC 50/60Hz Input; 5VDC, 1A USB Output, Universal Supply with international adapters. Other USB Power Supply (must be at least 5VDC, 0.2A)
	5. Power Cable: USB to micro USB cable
	6. DC Power Input: Micro USB connector, 5VDC, 0.2A
	7. Power Indicator: Green LED
	8. Sleep/Power Save Mode: Shuts off carrier when no audio present for 12 minutes
	9. Modulation: FM Wideband, ±50 kHz deviation max, 50 μS pre-emphasis
	10. Carrier Frequencies: 2.3MHz (Ch 1) and 2.8MHz (Ch 2) Default at power on = carriers off. Carriers are automatically enabled upon presence of audio.
	11. Coverage Area: 1,000 sq. ft (93 sq. m.)
	12. Audio Inputs: 3.5mm stereo line level input jack, Ch 1 connected to tip, Ch 2 connected to ring, GND connected to sleeve
	13. Audio Indicators: One Yellow LED per channel, lights up and stays on steady with minimum audio level.
	14. Signal-to-Noise Ratio: 70 dB at onset of limiting
	15. Frequency Response: 100 - 12,000 Hz
	16. Operating Requirements: 32°-122°F (0-50°C)
	17. Mounting Kit: Optional: STD 008 TV Top Shelf Mounting Kit
		1. Optional: BKT 024 Omnidirectional mount for wall or ceiling mounting
	18. Compatible Receivers: WIR RX22-4, WIR RX18
	19. Warranty: 2 years
	20. Approvals/Regulatory Compliance: CE, RCM, FCC, Industry Canada, PSE, CUL, WEEE, RoHS, CB Scheme
30. IR T2 [*select as needed*]
	1. Dimensions: 9.0" W (229 mm) x 3.8" D (97 mm) x 1.4" H (36 mm)
	2. Weight: 0.84 lb. (0.38 kg)
	3. Color: Black
	4. Power Supply: TFP 057 Desktop style international certified power supply with IEC line cord, 100-240 VAC input, 50-60 Hz, 18 W; 48 VDC output
	5. DC Power Input: 2.1 mm ID barrel connector, 48 VDC, 0.2A, center positive
	6. Power Indicator: Green LED
	7. Sleep/Power Save Mode: Shuts off carrier when no audio present for 12 minutes
	8. Modulation: FM Wideband, ±50 kHz deviation max, 50 μS pre-emphasis
	9. Transmit Frequencies: 2.3, 2.8, 3.3, 3.8 MHz
	10. Coverage Area: Up to 18,000 sq. ft (1,673 sq. m) in single-channel mode with the RX22-4 receiver
	11. Audio Inputs: Line inputs: Phoenix style connector jack for Ch A and Ch B accept line level, balanced or unbalanced audio
	12. Audio Indicators: One yellow LED per channel. Lights up and stay on steady with minimum audio level.
	13. Signal-to-Noise Ratio: 70 dB (line input)
	14. Frequency Response:
		1. 95 Hz to 17.6 kHz, -3 dB re 1 kHz (line inputs);
		2. 125 Hz to 17.0 KHz, -3 dB re 1 kHz (microphone input)
	15. Operating Requirements: 32°-122°F (0-50°C)
	16. Mounting Kit: Wall or Ceiling mount: BKT 024 Omnidirectional mount
	17. Compatible Receivers: WIR RX22-4, WIR RX18, IR R1
	18. Warranty: 5 years
	19. Approvals/Regulatory Compliance: CE, FCC, Industry Canada, WEEE, RoHS, CB Scheme, RCM, PSE
31. Transmitter: WIR TX9 DC [*select as needed*]
32. Dimensions, Weight: 11.25” W x 6.25” H x 2.125” D (28.6 cm x 15.9 cm x 5.4 cm), 1.8 lbs (0.8 kg)
33. Color: Black with white legends, black acrylic lens (optional white enclosure available)
34. Power Supply: Desktop-style, universal power supply.
35. Input: 100-240 VAC, 50/60 Hz, 0.6A. Line cord specified by country of use.
36. Output: 24 VDC, 1.0 A, 25W. Barrel connector. 50 ft DC power supply extension cable available (WCA 123)
37. Carrier Frequency: Accommodates baseband sub carriers from 2.3-3.8 MHz
38. Emitter IR Power: 3.5 watts
39. Coverage Area:
40. 30,000 sq. ft. (2,787 sq. m) in single channel mode when using the RX22-4 Receiver
41. 19,000 sq. ft (1,765 sq. m) in two channel mode when using the RX22-4 Receiver
42. 11,000 sq. ft (1,022 sq. m) in four channel mode when using the RX22-4 Receiver
43. 3,350 sq. ft (311 sq. m) in single channel mode when using the RX18 Receiver
44. Baseband Indicator: Red LED
45. Power Indicator: Red LED
46. Auto Carrier Shut-Off: Turns off LEDs when no baseband is present
47. Power Input: 24 VDC, 0.8 A
48. Baseband Input: BNC, 50 Ω, for use with MOD 232, TX 90, TX 90 DC, TX 9 and TX 9 DC
49. Baseband Output: BNC, 50 Ω, for use with TX 9 or TX 9 DC only
50. Baseband Cable: RG 58 Coax, BNC Connectors, maximum 1,000 ft (300 m) length.
51. Operating Requirements: 32-122 °F (0-50 °C), ambient temperature, non-condensing, non-corrosive atmosphere
52. Mounting Kits: Wall or Ceiling Mount: BKT 024 Omnidirectional mount;

Optional: Tripod Stands: SS-11 or SS-6

1. Warranty: 5 years
2. Approvals: CE, FCC, RoHS, WEEE
3. Compatible Receivers:
	1. WIR RX22-4 Four-Channel Receiver
	2. WIR RX18 Two-Channel Receiver
4. Transmitter: WIR TX90 DC [*select as needed*]
5. Dimensions: 11.25 inch wide x 6.25 inch high x 2.125 inch deep.
6. Color: Black with white legends, black acrylic lens. Optional white enclosure available.
7. Power Supply: Desktop-style, universal power supply. Input: 100-240 VAC, 50/60 Hz, 0.6 A. Line cord specified by country of use. Output: 24 VDC, 1.0 A, 25 W. Barrel connector. 50 ft DC power supply extension cable available (WCA 123)
8. Modulation: FM wide band, 50 kHz deviation max, 50 uS pre-emphasis.
9. Carrier Frequency: Channel A: Selectable 2.3/2.8 MHz; Channel B: Selectable 3.3/3.8 MHz
10. Emitter IR Power: 3.5 W.
11. Coverage Area:
12. 30,000 sq. ft. (2,787 sq. m) in single channel mode when using the RX22-4 Receiver
13. 19,000 sq. ft (1,765 sq. m) in two channel mode when using the RX22-4 Receiver
14. 11,000 sq. ft (1,022 sq. m) in four channel mode when using the RX22-4 Receiver (22,000 ft2 with two TX9’s)
15. Signal to Noise Ratio: >75 dB, +/- 3 dB.
16. Frequency Response: 80 to 15 kHz
17. THD: Less than 0.2%, at 1 kHz.
18. Compression presets: Music 1:1; Voice 1.5:1; Hearing Assist 2:1
19. Auto Carrier Shut-Off: 20 minute timer shuts off carrier when no audio is present
20. Audio Volume Level Controls: Ch A and Ch B audio level, yellow LED, flashes
21. Audio Indicators: CH A and CH B Audio Level, yellow LED, flash
22. Carrier LEDs: 2 green LED carrier “on” indicators
23. Phones Output: 3.5mm TRS headphone jack. CH A tip, CH B ring on jack, 32 ohm headphone (min)
24. Application Preset: Music, Voice, Hearing Assist. Frequency response; Music: Flat; Voice: Mid-range boost; Hearing Assist: High frequency boost
25. Tone Control: Press to select, 21 dB adjustable range (1 kHz between low boost/hi-cut and low cut/hi boost).
26. Power Input: 24 VDC, 0.8 A, 25 W
27. Audio Input Connector: CH A and CH B, 3 wire Phoenix
28. Input Level: Balanced or unbalanced, 316 mVRMS (-10 dBV) nominal, 5.7 k Ω input impedance; max input (over volume range) -21 to +7 dBV.
29. Baseband Output: BNC, 50 Ω, for use with TX9 or TX9 DC only
30. Baseband Cable: RG 58 Coax, BNC connectors, maximum 1,000 ft. (300 m) length
31. Operating Requirements: 0-50º C (+32 °F to 122 °F) ambient temperature, non-condensing, non-corrosive atmosphere
32. Mounting Kits: Wall or Ceiling Mount: BKT 024 Omnidirectional mount; Optional: Tripod Stands: SS-11 or SS-6
33. Warranty: 5 years
34. Approvals: CE, FCC, RoHS, WEEE
35. Compatible Receivers:

WIR RX22-4 Four-Channel Receiver

WIR RX18 Two-Channel Receiver

1. Modulator: MOD 232: [*select as needed*]
	1. Dimensions: 8.5 inch wide x 8.2 inch deep x 1/7 inch tall.
	2. Power Supply: 24 V, 50-60 Hz; 15VA.
	3. Modulation: FM wide band, 50 kHz deviation max, 50 uS pre-emphasis.
	4. Carrier Frequency:
2. Ch A: Selectable 2.3/2.8/3.3/3.8 MHz.
3. Ch B: Selectable 2.3/2.8/3.3/3.8 MHz.
	1. Signal To Noise Ratio: >60 dB.
	2. Frequency Response: 30-16,000 Hz = 1 dB
	3. Total Harmonic Distortion: <.2% @ 1 kHz.
	4. Audio Processing:
		1. Compression Ratio 1:1 or 2:1
		2. Compression Gain: 16 dB or 33 dB
	5. Auto Shut-Off: 15 minute timer shuts off carrier when no audio is present.
4. Receiver (WIR RX-22-4) body pack, dual lens detector, lanyard: [*select as needed*]
	1. Dimensions: 4.5 inch long x 285. inch wide x 1.2 inch high.
	2. Case: Black shatter proof polypropylene.
	3. Weight: 4.6 oz. with batteries.
	4. Battery Type:
		1. Two (2) AA Alkaline non-rechargeable or
		2. Two (2) AA NiMH rechargeable
	5. Battery Life: 60 hrs Alkaline; 30 hrs NiMH
	6. Signal to Noise Ratio: 60 dB min
	7. Squelch: Receiver squelches at 40 dB SNR.
	8. Operating Frequencies:

 Channel 1: 2.3 MHz.

 Channel 2: 2.8 MHz.

 Channel 3: 3.3 MHz.

 Channel 4: 3.8 MHz.

* 1. Receiver Antenna: Integral with unit.
	2. Input Connector: 3.5 mm mono phone jack.
	3. Compatible Headphone/Earphone: Mono or stereo, 8-32 ohms, 3.5 mm plug.
	4. Freq Response: 25 Hz - 16 KHz, ±3dB
	5. Audio Out Pwr: 15 mW max at 32 Ω.
	6. Acoustic Output: 125dB SSPL90 with HED002; 110dB SSPL90 with EAR 013.
	7. THD: <1%
	8. Controls: On-Off-Volume thumbwheel and channel selector.
	9. Indicators: Red LED “ON” indicator; flashes to indicate low battery.
1. Receiver WIR RX-18, under-the-chin receiver: [*select as needed*]
	1. Case: ABS plastic, black and grey.
	2. Weight: 2.1 oz. with battery.
	3. Battery Type: NiMH rechargeable.
	4. Battery Life: 6 hours
	5. Operating Range: 3,063 sf when used with TX9 or TX90, single channel mode.
	6. Signal to Noise Ratio: 58 dB at 10m
	7. Modulation Freq: 2.3 MHz, 2.8 MHz.
	8. Receiver Antenna: Integral with unit.
	9. Freq Response: 200 Hz to 8 KHz, +/-5dB.
	10. Acoustic Output: 112 dB max
	11. Controls: On-Off-Volume thumbwheel and channel selector switch.
	12. Power Switch: Built-into receiver arms.
	13. Ear Pads: Uses EAR 031 foam cushions.

C. Accessories: [*select as needed*]

* + - 1. Earphones
	1. [Wide Range: Model EAR 008]
	2. [Single Mini Earbud: Model EAR 013]
	3. [Dual Mini Earbud: Model EAR 014]
	4. [Surround Earphone: Model EAR 022]
	5. [Dual, in-ear, isolation: Model EAR 042]
1. Headphones
	* 1. [Folding: Model HED 021]
		2. [Rear-wear, Mono: Model HED 026]
		3. [Heavy-duty, Folding, Mono: HED 027]
		4. [Protector, Dual-Earmuff: Model HED 040]
2. Neckloop
	1. [18in cord, 3.5mm plug: Model NKL 001]
3. Batteries
	1. [AA Alkaline: BAT 001-2]
	2. [AA NiMH: BAT 026-2]
4. Carry Cases
	1. [Small Briefcase for accessories: CCS 029]
	2. [Large 35-slot Case: Model CCS 030 35]
5. Rack Mounts (use for MOD 232)
	1. [Single Rack Mount Kit for Half Rack Space Products: Model RPK 005]
	2. [Dual Rack Mount Kit for Half Rack Space Products: Model RPK 006]
6. Chargers
	1. [5-Bay Unit for RX-18: Model CHG 518]
	2. [2-Bay Unit for RX 22-4: Model CHG 3502]
	3. [12-Bay Unit for RX 22-4: Model CHG 3512]

**PART 3 EXECUTION**

1. **INSTALLATION**
	1. Install equipment to comply with manufacturer’s recommendations.
	2. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with typical service loops, no excess. Use lacing bars in cabinets.
2. **GROUNDING**
	1. Ground cable shields and equipment to eliminate shock hazard and to minimize ground loops, common-mode returns, noise pickup, cross talk, and other impairments.
3. **FIELD QUALITY CONTROL**
	1. Operational Test: Perform tests that confirm proper operation of system and proper coverage in area where equipment will be used.
4. **DEMONSTRATION**
	1. Demonstration and Instruction of Owner’s Personnel: Provide in accordance with Section 01800. Engage factory-authorized service representative to train Owner’s maintenance personnel to adjust, operate, and maintain equipment as specified.

**END OF SECTION**

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