MIPRO®
MICROPHONE PROFESSIONALS

Wireless Microphone Systems

2015
General Catalog

The Relentless Pursuit of Innovation



Flawless' Performance
at the 27th The Southeast Asian Games

SEA GAMES MYANMAR NAY PYI TAW

www.mipro.com.tw

Company Profile

MIPRO was founded in November 1995 in Chiayi, Taiwan by founder K. C. Chang. Solomon Chang is the company president and leads MIPRO in developing and manufacturing wireless microphone and wireless PA systems. Our motto is “innovation, quality and satisfied users”.

At the beginning of 1996, MIPRO’s founder bought land in the Chaiyi, Taiwan urban area and started construction on a US$ multi-million, modern 5,000-square-meter production and office facility. Corporate headquarters in the new facility was completed and started running on 1st January 1997 and the Taipei showroom and office started operations in 1999. Since 2001, thanks to continued sales growth, the size of the headquarters was expanded twice to 13,000 square meters. In 2006 this expansion was completed to celebrate MIPRO’ s tenth anniversary. Furthermore, adjacent land and buildings were purchased to anticipate future sales growth and expansion needs. Today, the total corporate headquarters covers an area of more than 14,000 square meters.

With 50 years of accumulated wireless microphone know-how and expertise, the founder has nurtured a team of seasoned R&D engineers. Together they have developed hundreds of wireless microphone systems. MIPRO is ISO-9001 certified and has implemented quality assurance and efficient computerized production management systems. Mass-produced products are marketed worldwide under the MIPRO brand. After nearly twenty years of steady growth, MIPRO has over 80 distribution partners worldwide and has regional sales & service offices in China, Hong-Kong, United States, Germany, Austria and Hungary. MIPRO’s president, Solomon Chang, won the “National Executive Manager Award” in 2012 and MIPRO received the prestigious “Rising Star Award” from Taiwan’s Ministry of Economic Affairs in 2013.

MIPRO’s decision to found the company in Taiwan and manufacture all products in Taiwan has increased employment opportunities for local Taiwanese to contribute to the country’s economy. This effort has been recognized and MIPRO received the “2014 Financial Times-Standard Chartered Taiwan Business Awards-Economic Contribution Award”.



Solomon Chang, president



Corporate Headquarters



Groundbreaking in December, 1995



R & D



New Facility Completed on 1st January, 1997



Production Line

Founder Profile

K.C. Chang was born in 1937, during the Japanese colonial era, to a well-off family. He was nurtured on church music, classical music and Taiwanese and Japanese folk songs since he was a child and thus developed a keen interest in music and audio equipment. In his childhood, the phonograph was his favorite toy; vacuum tube and transistor radios were his pets. This hobby later became his motivation in manufacturing audio equipment and wireless microphones.

After World War II, his family's finances fell into decline. Though he was among the best in the primary and secondary schools, he had to give up his desire of entering the Department of Electrical Engineering at NTU because he couldn't afford the high college tuition. Fortunately, he had some talent in the fine arts and was finally admitted to the Department of Arts at Taiwan Normal University at public expense. While in the college, he still kept his interest in radio and took courses in radio science.

After graduating from the university in1960, he returned to his hometown as a teacher. He then started thinking about how to "get away from poverty and improve his living." With his expertise, he opened an electronics shop assembling, repairing and selling radios and audio equipment as his amateur business. After eight years, his financial situation was gradually getting better.

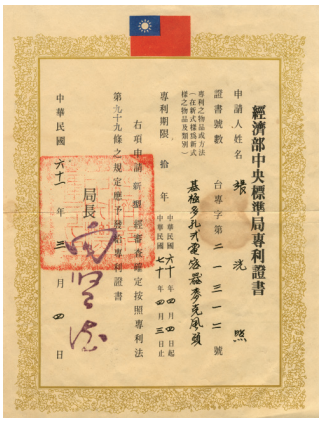
In 1970, he designed the first electret condenser microphone capsule and secured Taiwan's first patent for microphones. Taiwan's first FM wireless microphone system soon followed. In 1971, he passed the rigorous A-certified radio license and founded the first local manufacturer of wireless systems, Chiayo, with 5 friends.

He served as the chairman and chief engineer of the company and cultivated a strong lineup of engineers as well as developing many innovative products to sell to domestic and international markets. After 24 years of operation, the company was ranked among the 500 largest enterprises in Taiwan.

In 1995, in order to obtain ISO certification for the plant as well as CE certified products for export, he planned to expand the factory and improve the manufacturing standards. However, the shareholders, also his relatives, didn't support him. At last, for the sake of his sister's family's livelihood, he made a difficult decision, selling his shares and transferring the family business which was valued at hundreds of millions of dollars to his elder sister at a symbolic cost of only tens of millions. Although he lost several hundred million dollars, he never regretted his decision. At the age of 60, based on his technical expertise and his ambition to create a modern enterprise, he founded MIPRO and built a modern plant-office headquarters, which was completed and started running on 1st January 1997. For 18 years, he has increased employment opportunities for the local people and kept working to produce excellent wireless microphones and wireless PA systems. Through its superior engineering, MIPRO has created a number of record firsts, becoming a world-renowned brand whose innovative products are now closely watched by the industry.



Founder & CEO of MIPRO, K.C. Chang



Taiwan's First Patent for Microphones



Founder & president of Chiayo



MIPRO's Tenth Anniversary



National Chiayi Senior High School Distinguished Alumni Award



NTNU Distinguished Alumni Award

Brand Profile

MIPRO specializes in the designing and manufacturing of professional wireless microphone systems; founder K.C. Chang named the brand “MIPRO”, derived from the words “Microphone Professionals”. MIPRO’s products are marketed in 80 countries globally where it has become a well-known wireless microphone brand as well as the top wireless microphone brand in Taiwan.

MIPRO is well known for their innovatively designed products and has won a Taiwan Excellence award and is often nominated in the TEC awards’ Wireless Technology category. MIPRO attends tens of international professional audio trade shows and is devoted to enhancing their brand awareness. Gary Kayye, A/V consultant & educator, stated that MIPRO is one of the “Top Five New Companies to Watch”.

In 2011 MIPRO received the prestigious “First Brand” and “Taiwan Gold Medal Quality Product” awards. In recognition of MIPRO’s endeavors to develop innovative products and owning hundreds of patents, MIPRO was awarded the “National Invention and Creation Award”.

MIPRO’s mission is “to develop the best wireless microphone & wireless PA products and to create a world-class brand in the wireless microphone industry.” Their hope is that one day when worldwide professional audio customers purchase wireless microphones or wireless portable PA, they will give priority to MIPRO from Taiwan.

MIPRO® = MICROPHONE + PROFESSIONALS



Taiwan Excellence



Taiwan Business Award


Rising Star Award


National Invention & Creation Award


National Executive Manager Award


First Brand


Taiwan Gold Medal Quality Product



TEC Award



Received 2014 FT-Standard Chartered Taiwan Business Award



Received 16th Rising Star Award


25th Golden Melody Awards

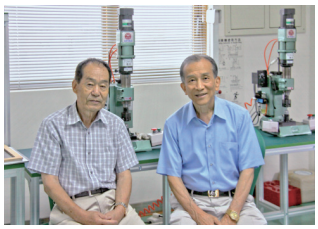

27th SEA Games

MU-series Microphone Capsule Modules

MIPRO's founder pioneered the development of electret condenser microphone technology and was the first to develop and patent the wireless condenser microphone in Taiwan. When the company was first established, the development of high quality microphone capsules was set as an important R&D goal because the microphone capsule is the heart of a microphone. From the beginning, MIPRO collaborated with RET Electronics, a historic Japanese manufacturer of electret condenser microphone (ECM) capsules developed for professional vocal applications. Due to this emphasis on quality, MIPRO has continuously enjoyed the praises and affirmations from audio professionals in both domestic and overseas markets.

In 2012, MIPRO's founder successfully developed a true condenser microphone (TCM) capsule and designed the modules to be interchangeable for its handheld transmitters. It is Taiwan's first wireless true condenser microphone for professional stage applications, solidifying MIPRO as one of the world-class microphone brands.

In 2013, MIPRO purchased RET and its ECM manufacturing technology. Integrating RET with MIPRO's own TCM technology, MIPRO then invested in the precision equipment to mass produce the capsule modules MU-90, MU-80 and MU-70.



Abe Takao & CEO



Electret Test



Diaphragm Production Equipment



Capsule Equipment

All these latest microphone capsule modules feature high stability, high sensitivity and dynamic range, low feedback and handling noise, superb directionality and wide frequency response. Thus they are ideal for vocals and live performances.

MU-90 : Premium Supercardioid ECM Capsule Module

MU-80 : Supercardioid ECM Capsule Module

MU-70 : Supercardioid ECM Capsule Module

As for dynamic microphone capsule modules, MIPRO added two upgraded models, MU-59 and MU-39. These capsules kept the excellent features of their predecessors and eliminated the handling noise. Their sound quality easily rivals the competition.

MU-59 : Premium Supercardioid Dynamic Capsule Module

MU-39 : Supercardioid Dynamic Capsule Module



MU-90



MU-80



MU-70



MU-59



MU-39

ACT-2400 2.4G Digital Wireless Microphone System

2.4GHz-ISM band (2.40 ~ 2.4835GHz) is one of the earliest free radio frequency resources and is ideal for a small area and low-power products. MIPRO had its own know-how to overcome the congestion and complexity in this band, and developed 2.4GHz wireless systems as an option to those systems operating under 1 GHz which are finding it more and more difficult to survive.

The MIPRO ACT-2400 series feature the most stable digital FSK modulation circuitry. With dual tuner true diversity receiving, the receiving distance is up to 100 meters (330 ft.) with no signal drop-out. With the FHSS frequency-hopping technique, each channel has 4 preset hopping frequencies. By adaptive tracking algorithm, it can skip the Wi-Fi frequency being used and effectively avoid interference from 2.4G communication products.







2015 New Products

TA-80 Rechargeable Digital Wireless Plug-on Transmitter

The MIPRO TA-80 is a digital miniature wireless plug-on transmitter with balanced XLR mic input jack. It allows condenser or dynamic wired microphones to become wireless and is compatible with ACT-8 series receivers for premium sound quality. The TA-80 has a compact, and ultra-thin rugged aluminum housing construction. The input jack is easy to install and remove, and can be screw-locked with the microphone. It provides phantom power of 5, 12, 48 V switchable levels for condenser microphones with up to 10mA current load. When the transmitter is connected to dynamic microphones, the phantom power can be turned off. A backlit LCD panel shows all operational parameters.

An ICR 18500 rechargeable lithium battery provides a minimum 12 hours of operation and can be recharged over 600 times. Even when set to 48V phantom power, it provides a minimum 5 hours of operation. Simply charge the transmitter in the charger after each use. It's also easy to remove and replace the battery or charge the battery in the charger.





ACT-80 Digital Wireless ENG Receiver

The MIPRO ACT-80 is a compact wireless receiver designed for professional camcorder applications. Waterproof, compact, and ultra-thin rugged aluminum housing construction equipped with digital graphic backlit LCD panel. Features are compatible with MIPRO ACT-8 series digital transmitters, as well as TA-80 digital wireless plug-on transmitter. Its wireless sound quality rivals cable transmission.





MES-100 WebMote Bridge

The MES-100 bridge server allows the MIPRO ACT-BUS interface, which is designed for monitoring ACT series receivers, to be remotely controlled via a WWW browser, through network cable or Wi-Fi. The MES-100 provides a solution for the incompatibility issues between the operating systems and monitoring software.





BC-100T Rechargeable Wired/ Wireless Conference Microphone

The BC-100T is a descendant model of the BC-100. Its housing encloses an ACT-32TC transmitter PCB while the operational controls and LCD are located on top for convenience, and a LED indicator is added for indicating TALK/MUTE status.

Powered by an ICR 18500 rechargeable lithium battery, the BC-100T has built-in charging circuitry for recharging the battery. The bottom pad can be removed for battery replacement and maintenance. It is compatible with ACT-3/5 series receivers for UHF wireless transmission or it can be used as a wired microphone.



GT-24 Digital Guitar Transmitter

The GT-24 is a digital 2.4GHz-ISM band transmitter designed for electric guitar, electric bass or electric piano. Integrated with a 3.5mm to 6.3mm threaded adaptor, it' s easy to use and the plug can be rotated up to 90 ° to suit users' preference. The included single ICR 18500 rechargeable lithium battery provides minimum 10 hours of operation per 4-hour full charge. The intelligent battery charger maintains a high charge capacity for up to 600 charge cycles. The battery can be easily replaced or recharge the GT-24 directly with an adaptor plug.

The GT-24 has digital FSK modulation circuit to eliminate the annoying compander noise that exists in analog systems. It is compatible with ACT-2400 series receivers and features the advantages of the digital wireless transmission for perfect sound reproduction.



ET-32 Erhu Microphone Set

The ET-32 erhu set is an EH-32 microphone clip integrated with T-32 transmitter module. It is easy to install and remove. Adjust the band to secure the EH-32 on the neck of the erhu. The ET-32 requires an ACT-series receiver or MA-series wireless PA system for premium sound quality and cable-free, truly wireless audio performance.



Contents

Wireless Microphones

8

Wireless IEM Systems

100

Microphone Capsule Modules

75

Wireless Tour Guide Systems

105

Wired Microphones

79

Interlinking Systems

113

Musical Instrument Microphones

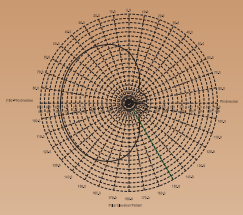
84

Antenna Systems

115

Portable ENG Receiver & Wireless Transmission Systems

93

Technical Knowledge

129

Wireless Microphones

Professional Digital Wireless Systems 9

Professional Analog Wireless Systems 21

Popular Wireless Systems 35

Fixed Frequency Wireless Systems 54

Conference Microphones 63

Accessories 65



Profile

Why Digital Wireless Systems?

1. Digital wireless systems provide perfect full-range sound quality, something that is difficult to achieve with analog systems.
2. Eliminate the inevitable high-low frequencies phase distortion and compander noise that exist in the analog systems.
3. Avoid the defects that the pre-emphasis and de-emphasis circuitry causes as the dynamic range declines and distortion increases at higher frequencies.
4. Unlike analog systems, the S/N ratio will not deteriorate as the signal weakens.
5. Signal will not deteriorate in long distance transmission.
6. Encryption provides secure audio transmission, preventing unauthorized listening.
7. Feature a superior sound quality that is equal to that of any wired cable system.

Why MIPRO Digital Wireless Systems?

Since 2006, MIPRO's industry-leading digital wireless systems feature an excellent quality that truly rivals any wired cable transmission. The handheld microphone transmitter is equipped with MIPRO's latest microphone capsules that deliver an exceptionally clear, accurate sonic image to the listener. They are ideal for broadcast, live sound production, conference and similar large venue applications.

ACT-8 Series: Digital Wideband Wireless Systems

MIPRO introduces an 8th year commemorative digital model, the ACT-828, an EIA standard 1U dual channel receiver with headphone connector added for monitoring. ACT-818 is a 1/2U single channel rack-mountable receiver with metal chassis. An improved full-color VFD (vacuum fluorescent display) provides clear viewing of all parameters. An expanded 64 MHz bandwidth ensures optimal flexibility, allowing more interference-free, compatible channels to select from. In addition to using 2AA alkaline batteries for ACT-80H & ACT-80T transmitters, the optional ACT-80HC & ACT-80TC rechargeable transmitters offer a rechargeable lithium-ion battery solution.

System Composition:

Receivers	Handheld Transmitters	Bodypack Transmitters	Transmitter Charger Station
ACT-828 ACT-818 	ACT-80H ACT-80HC 	ACT-80T ACT-80TC 	MP-80 

ACT-2400 Series: 2.4GHz Wireless Systems

2.4GHz-ISM band (2.40 ~ 2.4835GHz) wireless systems are ideal for a small area and low-power products. MIPRO developed its own know-how to overcome the congestion and complexity in this band, such as the most stable digital FSK modulation circuit and adaptive tracking algorithm, which effectively avoids interference from 2.4G communication products. This series has three receiver models: the ACT-2401 is a 1/2U single channel receiver, the ACT-2402 is a 1/2U dual-channel receiver, and the ACT-2412 is a 1U dual-channel receiver ~ all have a metal chassis. With dual tuner true diversity receiving, the receiving distance is up to 100 meters (330 ft.) with no signal drop-out. The matching ACT-24HC, ACT-24TC rechargeable transmitters with lithium battery and MP-80 charger station offer an affordable alternative to the consumer.

System Composition:

Receivers	Handheld Transmitters	Bodypack Transmitters	Transmitter Charger Station
ACT-2401 ACT-2402 ACT-2412 	ACT-24HC 	ACT-24TC 	MP-80 

ACT-8 Series: Digital Wideband Wireless Systems

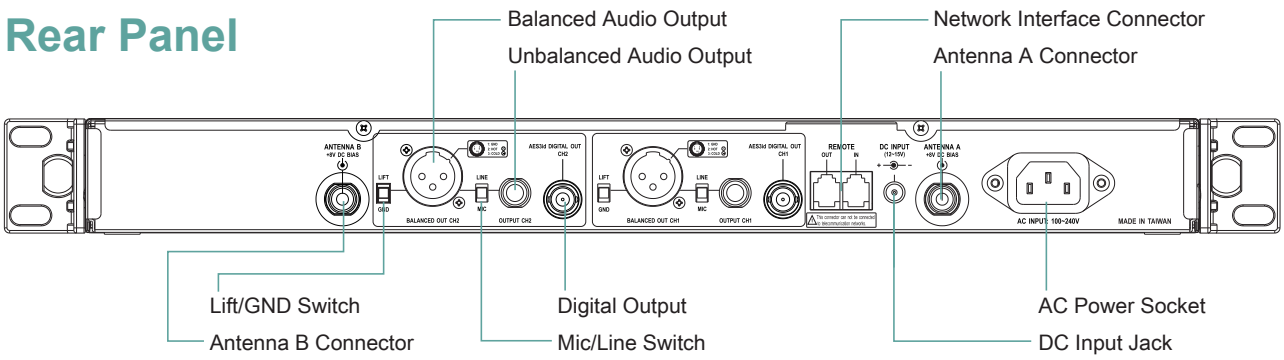
A. Receivers

ACT-828 Wideband Dual-Channel Digital Receiver

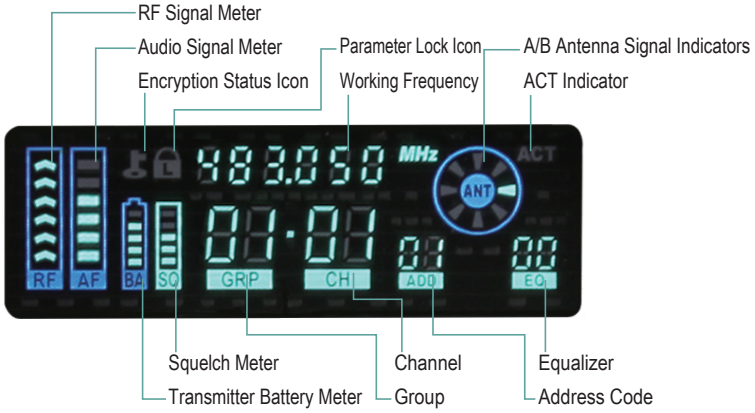
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Rear Panel



VFD Screen

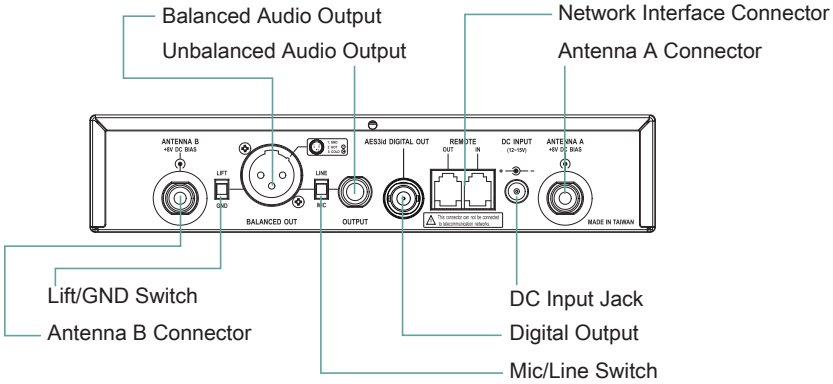


ACT-818 Wideband Single-Channel Digital Receiver



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Rear Panel



Features

1. The ACT-828 is an EIA standard 1U dual channel receiver and the ACT-818 is a 1/2U single channel rack-mountable receiver, both with metal chassis.
2. A full-color VFD (vacuum fluorescent display) provides clear viewing of all parameters. All controls are intuitive and easily accessible, allowing for quick and easy system setup via a single rotary control.
3. Enhanced RF circuitry improves anti-interference characteristics and system compatibility with a 64 MHz-wide bandwidth, allowing more interference-free channels to be selected.
4. New digital diversity receiving technology eliminates signal dropout and enhances receiving range.
5. Full-range sound quality is not affected by the strength of RF signals or operating distance.
6. Digitally-processed RF circuitry and DigitnamicPlus ™ technology eliminates compander noise, assuring a wireless sound quality that easily rivals cable transmission.
7. Improved proprietary Audio A/D Converter provides a true dynamic range of 115 dBA, T.H.D. < 0.03% at 1 kHz with < 2.7 ms latency.
8. AES3id Digital Audio Interface facilitates a direct connection to digital mixing consoles and transmits signal without distortion, ensuring a stable S/N ratio which will not deteriorate in long distance transmission.
9. Proprietary 256-bit encryption provides secure audio transmission, preventing unauthorized listening.
10. 10 built-in SmartEQ ™ presets and user-defined microphone capsule equalization allows faithful sound reproduction to suit artists' preferences.
11. 10 built-in digital anti-feedback SmartEQ ™ presets minimize feedback effectively without sacrificing sound quality.
12. Optional MIPRO RCS2.Net software allows real-time network remote-controlling and monitoring of 64 systems.

Specifications

Overall System		
Model	ACT-828	ACT-818
Frequency Range	480~544MHz (US & EU) 540~604MHz (US & EU) 636~700MHz (EU) 696~760MHz (EU) 760~824MHz	
Bandwidth	64MHz	
Preset Frequency	12 non-interference compatible frequencies in group 1-10. 16 non-interference compatible frequencies in group 11-16. 16 user-defined frequencies can be stored in group 18. 216 preset frequencies in total.	
Channel Grid	25 kHz	
Channel Set-up	Scan & ACT sync	
Audio Sampling	24-bit / 44.1 kHz Rate	
Audio Compression	2nd Generation DSP inertial coding	
Latency	< 2.7ms	
Frequency Response	20 Hz~20 kHz (-2dB)	
S/N Ratio (analog output)	> 115dB(A)	
T.H.D.	< 0.03 % @ 1 kHz	
Encryption	256 bit	

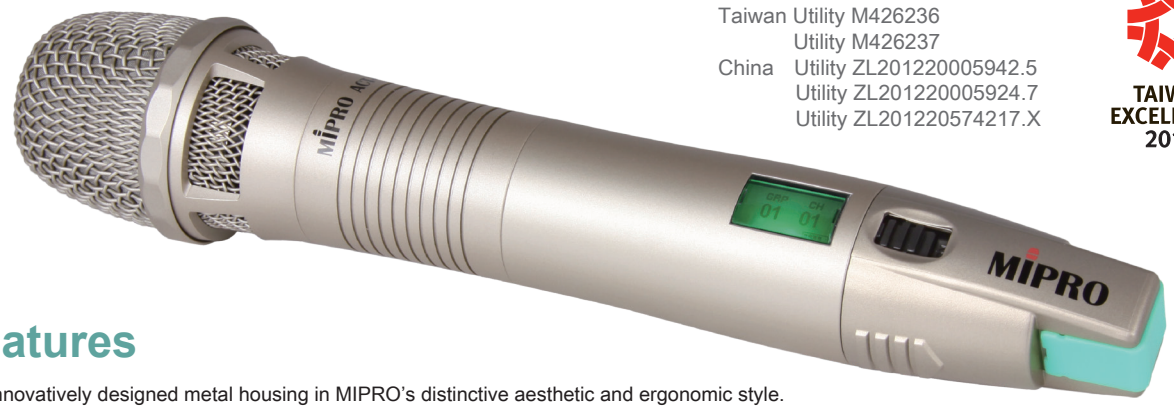
Receivers		
Model	ACT-828	ACT-818
Chassis / Channel	EIA Standard 19 " 1U, Dual	EIA Standard 19 " 1/2U, Single
Sensitivity	15 dB μ V at S/N ≒ 118 dBA	
Image and Spurious Rejection	> 85dB	
Receiving Mode	Digital diversity	
Analog Output	Balanced XLR × 2 Unbalanced 6.3 mm (1/4 ") × 2	Balanced XLR × 1 Unbalanced 6.3 mm (1/4 ") × 1
Analog Output Switch	Mic / Line × 2	Mic / Line × 1
Digital Audio Interface	AES3id output. BNC female × 2	AES3id output. BNC female × 1
Digital Equalizer	10 microphone capsule modeling presets	
Digital Anti-feedback Equalizer	10 anti-feedback microphone capsule modeling presets	
PC Interface	USB or RS-232 interface. Proprietary MIPRO ACT-BUS	
Display	Full-color VFD	
Battery Meter	Transmitter battery status	
Antenna Input	50 Ω TNC female connector × 2	
Power Supply	Built-in 100~240V AC switching power supply; Power Consumption: 15W	External AC power supply, 12~15V DC, 1A; Power Consumption: 7.5W
Dimensions (W × H × D)	420 × 44 × 245 mm / 16.5 × 1.7 × 9.6 "	210 × 44 × 230 mm / 8.3 × 1.7 × 9 "
Weight	Approx. 2.2 kg / 4.8 lbs	Approx. 1.1 kg / 2.4 lbs
Transmitter	ACT-80H / 80HC Handheld, ACT-80T / 80TC Bodypack & TA-80 Plug-on Transmitter	
Operating Temperature	-10~+60℃	
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.	

B. Transmitters

ACT-80H Wideband Digital Handheld Transmitter

Patents :
Taiwan Utility M426236
Utility M426237
China Utility ZL201220005942.5
Utility ZL201220005924.7
Utility ZL201220574217.X

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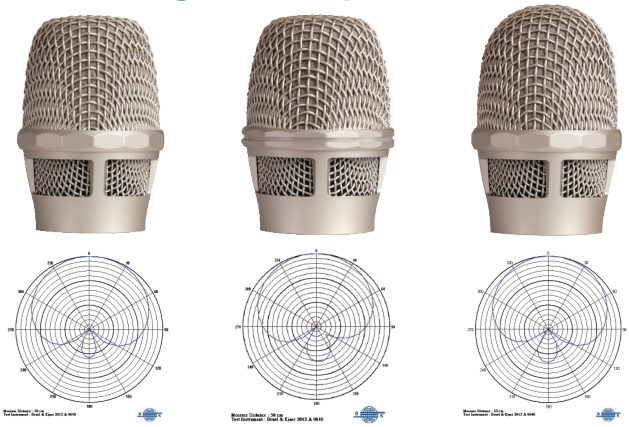
Features

1. Innovatively designed metal housing in MIPRO's distinctive aesthetic and ergonomic style.
2. Standard champagne-color housing. Optional custom-made colors are available.
3. Turn upper housing for 2 AA battery installation and replacement.
4. The unique multi-layered metal grille protects the capsule against impact, rolling and pop noise, ensuring clarity of sound.
5. Patented capsule suspension design virtually eliminates vibration and handling noises.
6. Interchangeable capsule module with premium condenser or dynamic options for easy and fast changeovers.
7. Premium condenser capsules exhibit high fidelity, wide dynamic range, fast transient responses, good feedback rejection, accurate sound image characteristics, transparent sound quality and withstand maximum SPL.
8. Backlit LCD displays all operational parameter information.
9. The bottom housing with built-in high-efficiency antenna features power switch, mute and setup buttons for programmable gain, limiter, low-cut and RF output power.
10. Patented end-cap cover with color-coded channel identification clips. Detach the end-cap cover for parameters set-up. Reversible end-cap allows shielding of power on/off or mute switches during performance.
11. Three selectable mute settings: Auto, Manual & Disabled. "Auto" mute activates automatically when handheld transmitter points down towards the ground.
12. Three selectable gain settings: 0 dB (same as microphone sensitivity), +3 dB, +6 dB.
13. Two selectable transmitter output power settings: HI (high-power) & LOW (low-power).
14. Stable PLL circuits. Automatically synchronized with the receiver's frequency by MIPRO's patented ACT ™ function.
15. High-efficiency circuitry design provides 10~13 hours of operation from 2 AA batteries (depending on the battery quality).

The capsule module is detachable from the upper housing



Interchangeable Capsule Modules



MU-90 MU-80 MU-59

Assembled



Color-coded ID Caps



ACT-80T Wideband Digital Bodypack Transmitter

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Patents :
Taiwan Utility M424706
Design D150218
China Utility ZL201120536034.4
Design ZL201130429380.8



Features

1. Ultra slim bodypack transmitter with sturdy magnesium alloy housing.
2. On the top features mute switch, mini-XLR connector and antenna.
3. Backlit LCD displays all operational parameter information.
4. Innovatively designed battery cover allows easy access to operate buttons and prevents accidental operation.
5. Mute button with remote-control jack for easy activation of mute function.
6. Stable PLL circuit. Automatically synchronized with the receiver's frequency by MIPRO's patented ACT ™ function.
7. Selection of polarization for audio input to match capsules of different polarizations.
8. Six selectable gain settings.
9. Mini-XLR input with secure screw lock connector for lavaliere / headworn mics and guitar.
10. Adjustable belt clip allows wearing transmitter in up or down position.
11. High-efficiency circuitry design provides 10~13 hours of operation from 2 AA batteries (depending on the battery quality).

Specifications

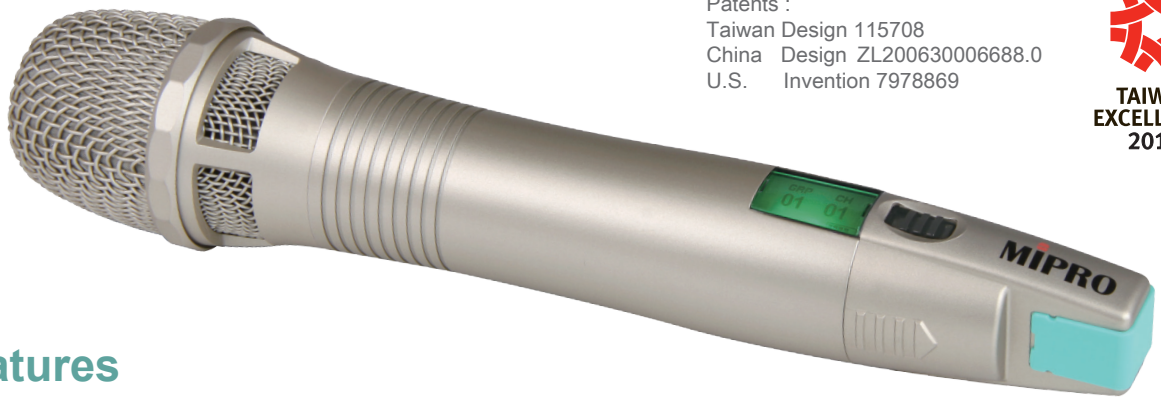
Model	ACT-80H	ACT-80T
Frequency Range	480~544MHz (US & EU) 540~604MHz (US & EU) 636~700MHz (EU) 696~760MHz (EU)	760~824MHz
Bandwidth	64 MHz	
Oscillation Mode	PLL Synthesized	
Channel Set-Up	ACT Sync	
RF Output Power	10 mW / 50 mW switchable (country dependent)	
Spurious Emissions	≦ -60dBc	
Modulation Type	New digital modulation	
Audio Compression	DSP Inertial coding	
LCD Display	Group, Channel, Frequency, AF gain, Low-cut, Limiter, Encryption status, RF power, Mute mode, Battery status & Error codes	Group, Channel, Frequency, AF gain, Low-cut, Limiter, Encryption status, RF power, Phase, Lock status, Mute mode, Battery status & Error codes
Gain Setting	+6 dB, +3 dB, 0 dB (3 settings). 0 dB = microphone sensitivity	+18 dB, +12 dB, +6 dB, 0 dB, -6 dB, -12dB (6 settings). 0 dB = microphone sensitivity
Mute Connector	N/A	Optional MJ-70 remote mute switch
Capsules	Interchangeable premium MU-90 / MU-80 ECM or MU-59 Dynamic	Headworn: MU-13 / MU-23 / MU-210 / MU-53HN / MU-55HN
Battery Type	2 AA alkaline	
Current Consumption	High Power: approx. 165mA ; Low Power: approx. 135 mA	
Dimensions	50 × 258 mm / 2 × 10.1 " (Ø × L)	63 × 70 × 25 mm / 2.5 × 2.7 × 1.0 " (W × H × D)
Weight	Approx. 292 g / 10.3 oz, excluding batteries	Approx. 78 g / 2.8 oz, excluding batteries
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.	

C. Rechargeable Transmitters

ACT-80HC Rechargeable Wideband Digital Handheld Transmitter

Patents :
Taiwan Design 115708
China Design ZL200630006688.0
U.S. Invention 7978869

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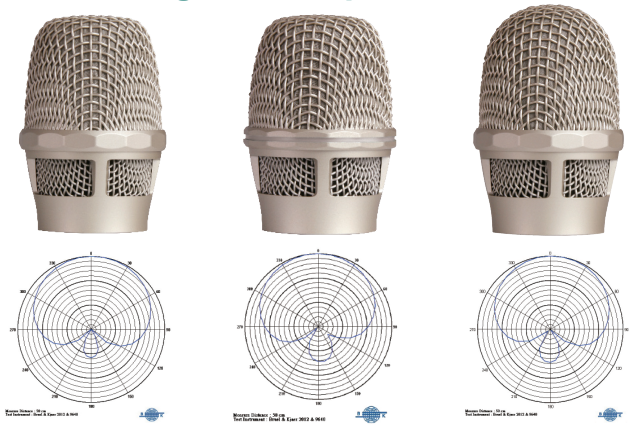
Features

1. Innovatively designed metal housing in MIPRO's distinctive aesthetic and ergonomic style.
2. Standard champagne-color housing. Optional custom-made colors are available.
3. Powered by a plug-n-play rechargeable lithium battery. Store the microphone in charger for charging when not in use.
4. Simply unscrew the grille to open the battery compartment to replace the lithium battery or charge it in the charger.
5. Transmitter has high-efficiency circuitry design. The included single rechargeable lithium battery can be easily removed or interchanged for charging. The intelligent battery charger maintains a high charge capacity for up to 600 charge cycles for cost saving and is environmentally friendly.
6. Other features are the same as the ACT-80H.

The rechargeable battery can be replaced easily



Interchangeable Capsule Modules



MU-90 MU-80 MU-59

Assembled



Color-coded ID Caps



ACT-80TC Rechargeable Digital Wideband Bodypack Transmitter

TAIWAN EXCELLENCE 2015

Patents :
Taiwan Utility M424706
Design D150218
China Utility ZL201120536034.4
Design ZL201130429380.8



Features

1. Ultra slim bodypack transmitter with sturdy magnesium alloy housing.
2. On the top features mute switch, mini-XLR connector and antenna.
3. Backlit LCD displays all operational parameter information.
4. Innovatively designed battery cover allows easy access to operate buttons and prevents accidental operation.
5. Mute button with remote-control jack for easy activation of mute function.
6. Stable PLL circuit. Automatically synchronized with the receiver's frequency by MIPRO's patented ACT ™ function.
7. Selection of polarization for audio input to match capsules of different polarizations.
8. Six selectable gain settings.
9. Mini-XLR input with secure screw lock connector for lavaliere / headworn mics and guitar.
10. Adjustable belt clip allows wearing transmitter in up or down position.
11. Transmitter has high-efficiency circuitry design. The included single rechargeable lithium battery can be easily removed or interchanged for charging. The intelligent battery charger maintains a high charge capacity for up to 600 charge cycles for cost saving and is environmentally friendly.

Specifications

Model	ACT-80HC	ACT-80TC
Frequency Range	480~544MHz (US & EU) 540~604MHz (US & EU) 636~700MHz (EU) 696~760MHz (EU)	760~824MHz
Bandwidth	64 MHz	
Oscillation Mode	PLL Synthesized	
Channel Set-Up	ACT Sync	
RF Output Power	10 mW / 50 mW switchable (country dependent)	
Spurious Emissions	≦ -60dBc	
Modulation Type	New digital modulation	
Audio Compression	DSP Inertial coding	
LCD Display	Group, Channel, Frequency, AF gain, Low-cut, Limiter, Encryption status, RF power, Mute mode, Battery status & Error codes	Group, Channel, Frequency, AF gain, Low-cut, Limiter, Encryption status, RF power, Phase, Lock status, Mute mode, Battery status & Error codes
Gain Setting	+6 dB, +3 dB, 0 dB (3 settings). 0 dB = microphone sensitivity	+18 dB, +12 dB, +6 dB, 0 dB, -6 dB, -12dB (6 settings). 0 dB = microphone sensitivity
Mute Connector	N/A	Optional MJ-70 remote mute switch
Capsules	Interchangeable premium MU-90 / MU-80 ECM or MU-59 Dynamic	Headworn: MU-13 / MU-23 / MU-210 / MU-53HN / MU-55HN
Battery Type	ICR 18500 rechargeable lithium battery × 1	
Current Consumption	High Power: approx. 125mA; Low Power: approx. 100mA	
Dimensions	50 × 250 mm / 2 × 9.8 " (Ø × L)	63 × 70 × 25 mm / 2.5 × 2.7 × 1.0 " (W × H × D)
Weight	Approx. 281 g / 9.9 oz, excluding batteries	Approx. 73 g / 2.6 oz, excluding batteries
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.	

MP-80 3-in-1 Transmitter Charger Station

Patents :
Taiwan Utility M477090
Design D163311

Profile

The MP-80 is a new generation of charging station designed exclusively for MIPRO rechargeable transmitters.

Each station has two charging slots. Each slot has a 3-in-1 charging design, enabling multiple charging options:

TAIWAN EXCELLENCE 2015

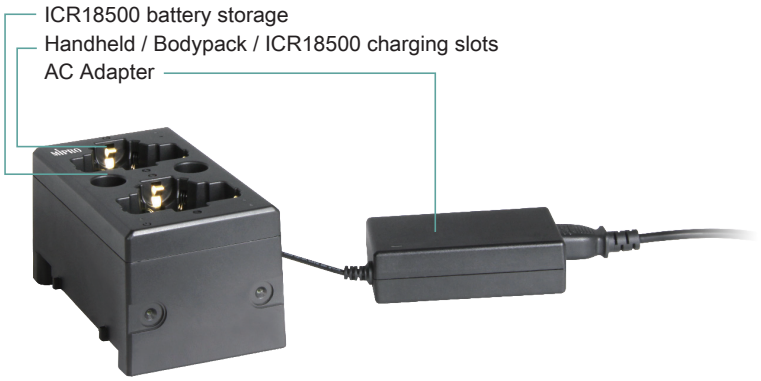
Features

1. Two charger slots provide convenient charging for MIPRO rechargeable handheld & bodypack transmitters and ICR18500 rechargeable batteries.
2. Intelligent charging circuitry provides efficient and safe charging.
3. Precise charging status with red (charging) & green (charged) indicators.
4. The reverse polarity protection circuit prevents charging errors.
5. Two spare ICR18500 battery storage slots.
6. Storage compartment for charging cable.
7. Two or more chargers can be easily interconnected for more charging options.

Specifications

Input Voltage Range	DC 10V~15V /1A
Battery Type	ICR18500 3.7V Li-ion Battery × 2
Charge Method	Termination by 20% regulation current
Charge Current	Approx. 500mA by regulation current
Current Consumption	Approx. 600mA/12V, for two batteries charging at the same time
Dimension (W × H × D)	92 × 78 × 158 mm / 3.6 × 3.1 × 6.2 "
Weight	Approx. 300 g / 10.6 oz
Environment Conditions	-10~+ 60 ℃

Parts



Interconnected Multiple Chargers



Charging Methods

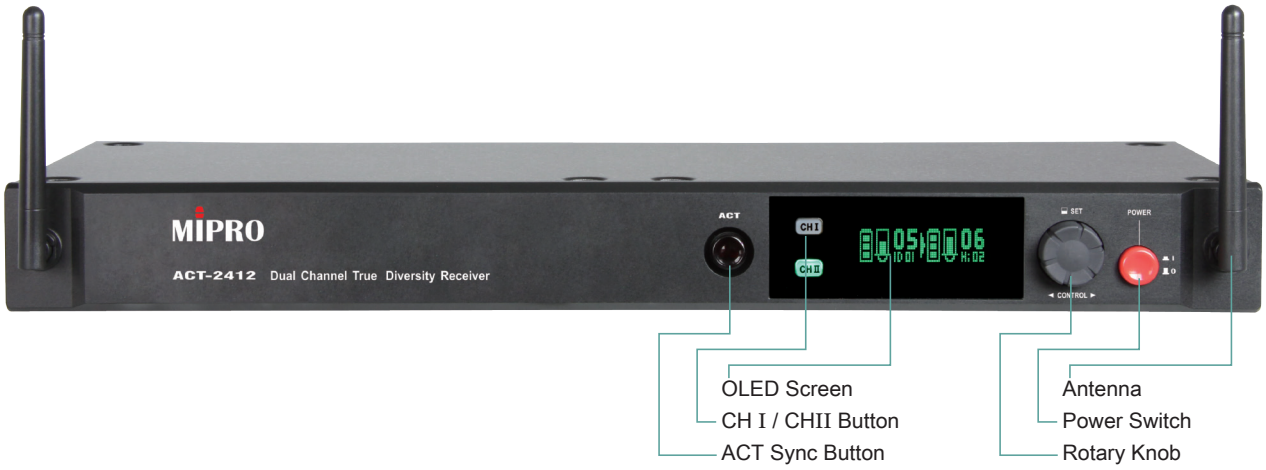


2 Handhelds | 1 Handheld + 1 Bodypack | 1 Handheld + 1 ICR18500 | 2 Bodypacks | 1 Bodypack + 1 ICR18500 | 2 ICR18500 | 2 ICR18500 Storage

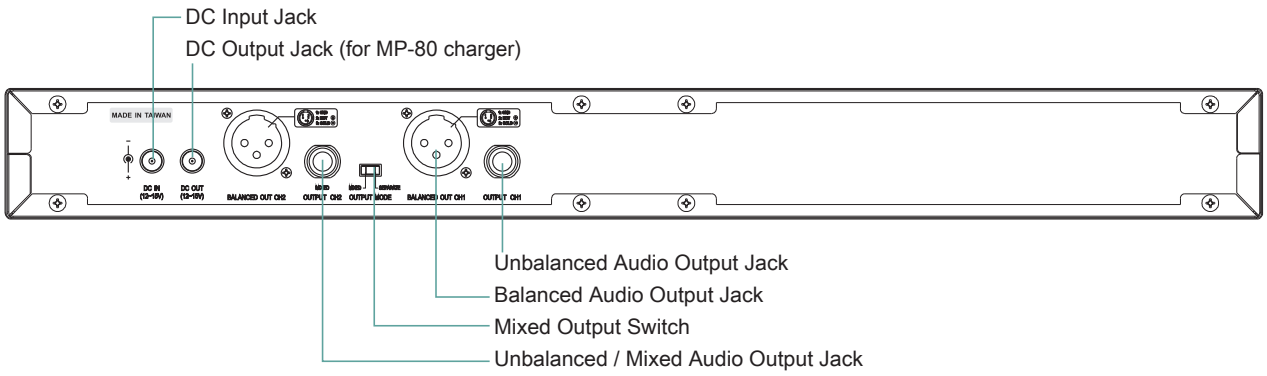
ACT-2400 Series: 2.4G Wireless Systems

A. Receivers

ACT-2412 1U Dual-Channel Digital Receiver NEW



Rear Panel



ACT-2401 NEW

1/2U Single-Channel Digital Receiver

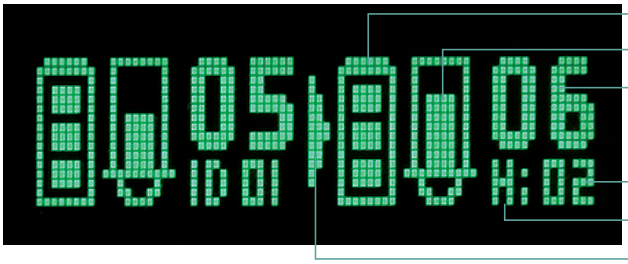


ACT-2402 NEW

1/2U Dual-Channel Digital Receiver



OLED Screen



Features

1. 2.4GHz-ISM band stable digital FSK modulation circuitry. All frequencies are located in this band.
2. With the FHSS frequency-hopping technique, each channel has 4 preset hopping frequencies.
3. By using an adaptive tracking algorithm, it can skip the Wi-Fi frequency in use and effectively avoid interference from 2.4GHz communication products.
4. The hopping frequencies skip most of the Wi-Fi frequencies.
5. With dual tuner true diversity receiving, the receiving distance is up to 100 meters (330 ft.) with no signal drop-out.
6. The precisely designed PCB is enclosed in a sturdy case.
7. The antennas are fixed at the left / right side of the front panel.
8. The transmitter has a high-efficiency circuitry design. The included single rechargeable lithium battery can be easily removed or interchanged for charging. The intelligent battery charger maintains a high charge capacity for up to 600 charge cycles for cost saving and is environmentally friendly.
9. An affordable price for entry-level consumers and the music instrument market.

Specifications

Overall System	
Frequency Range	2.400~2.4835 GHz
Preset Frequency	12 preset frequencies in total
Frequency-hopping	Each channel has 4 preset hopping frequencies.
Audio Sampling	24-bit / 44.1 kHz Rate
Latency	< 4 ms
Audio Frequency Response	20 Hz~20 kHz
S/N Ratio	> 115dB(A)
T.H.D.	0.1 % @ 1 kHz

Receivers			
Model	ACT-2401	ACT-2402	ACT-2412
Channel	Single	Dual	Dual
Chassis / Channel	EIA Standard 19 " 1/2U		EIA Standard 19 " 1U
Receiving Mode	Dual-tuner Digital Diversity		
Sensitivity	-95 dBm		
Audio Output Adjustment	0 dB (standard), -10~+20 dB adjustable range		
Output Connectors	Balanced XLR & Unbalanced 6.3 mm (1/4 ")		
Display	Graphic OLED		
Antenna	50 Ω fixed antenna × 2		
Power Supply	External AC Power Supply, 12~15V DC, 1A; Power Consumption: 1.6W @ 12V	External AC Power Supply, 12~15V DC, 1A; Power Consumption: 2.4W @ 12V	
Dimensions (W × H × D)	210 × 44 × 180 mm / 8.3 × 1.7 × 7.1 "		420 × 44 × 180 mm 16.5 × 1.7 × 7.1 "
Weight	Approx. 0.75 kg / 1.7 lbs	Approx. 0.8 kg / 1.8 lbs	Approx. 1.3 kg / 2.9 lbs
Transmitter	ACT-24HC Handheld & ACT-24TC Bodypack		
Operating Temperature	-10~+60℃		
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.		

B. Rechargeable Transmitters

ACT-24HC

Handheld Transmitter NEW



Features

1. Bright LEDs for battery status.
2. Patented design of the integrated grille and battery housing makes it easy to unscrew the grille to open the battery compartment to exchange the lithium battery or simply charge the transmitter in the charger.
3. The unique multi-layered metal grille protects the capsule against impact, rolling and pop noise and ensures sound clarity.
4. Proprietary capsule suspension design eliminates vibrations and touch noises for a true natural sound reproduction.
5. Interchangeable capsule module with premium condenser or dynamic options for easy and fast changeovers.
6. World's first ACT ™ function provides precise and rapid frequency sync to the receiver.
7. Transmitter has high-efficiency circuitry design. The included single rechargeable lithium battery can be easily removed or interchanged for charging. The intelligent battery charger maintains a high charge capacity for up to 600 charge cycles for cost saving and is environmentally friendly.

Specifications

Frequency Range	2.4~2.4835 GHz
Channel Set-Up	ACT Sync
RF Output Power	2 mW / 10 mW switchable (country dependent)
Transmitting Mode	Frequency hopping
Max. Audio Input	6.5 dBV
Battery Meter	4-level green/red LED display
Capsules	Interchangeable premium MU-90 / MU-80 / MU-70 ECM or MU-59 / MU-39 Dynamic
Battery Type	ICR 18500 rechargeable lithium battery × 1
Current Consumption	Approx. 138mA
Operating Time	A 25-minute fast charge provides up to 1 hour operation. Minimum 10 hours of operation per 4-hour full charge (depending on the battery quality).
Dimensions (Ø × L)	50 × 248 mm / 2.0 × 9.8 "
Weight	Approx. 255 g / 9 oz, excluding batteries
Patents & Approvals	Patented. Telecom and safety regulations approved.
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.

ACT-24TC

Bodypack Transmitter NEW



Features

1. Miniature, sturdy plastic compact design.
2. 3 LEDs indicate battery status and turn to red to indicate low battery.
3. Unique battery cover design provides easy access to operational controls and protects against accidental change of settings.
4. LED in the mute/AF button is lit or off to indicate AF status.
5. Connector for optional MJ-70 remote mute switch cable.
6. One-touch ACT syncs the transmitter and receiver frequency automatically.
7. Selectable impedance for microphone or guitar/line inputs.
8. Mini-XLR input with secure screw lock connector for lavaliere / headworn mics and guitar.
9. Transmitter has high-efficiency circuitry design. The included single rechargeable lithium battery can be easily removed or interchanged for charging. The intelligent battery charger maintains a high charge capacity for up to 600 charge cycles for cost saving and is environmentally friendly.

Specifications

Frequency Range	2.4~2.4835 GHz
Channel Set-Up	ACT Sync
RF Output Power	2 mW / 10 mW switchable (country dependent)
Transmitting Mode	Frequency hopping
Max. Audio Signal Input	6.5 dBV
Battery Meter	4-level green/red LED display
Impedance	1.0M Ω
Mute Connector	Optional MJ-70 remote mute switch
Capsules	Headworn: MU-13 / MU-23 / MU-210 / MU-53HN / MU-55HN Lavalier: MU-53L / MU-55L
Battery Type	ICR 18500 rechargeable lithium battery × 1
Current Consumption	Approx. 138mA
Operating Time	A 25-minute fast charge provides up to 1 hour operation. Minimum 10 hours of operation per 4-hour full charge (depending on the battery quality).
Dimensions (W × H × D)	63 × 70 × 25 mm / 2.5 × 2.8 × 1 "
Weight	Approx. 62 g / 2.2 oz, excluding batteries
Patents & Approvals	Patented. Telecom and safety regulations approved.
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.

Profile

1. MIPRO professional analog wireless systems features the latest wireless features and functions such as excellent multi-channel systems compatibility and RF stability.
2. Two series are available: wideband 72 MHz ACT-70 series and narrowband 24 MHz ACT-700 series.
3. Three receiver configurations for ACT-70 series are available: ACT-74 quad-channel, ACT-72 dual-channel, ACT-71 single-channel true diversity receivers.
4. Three receiver configurations for ACT-700 series are available: ACT-747B quad-channel, ACT-727B dual-channel, ACT-717B single-channel true diversity receivers.
5. Two types of transmitters are available: powered by AA batteries or powered by a lithium rechargeable battery.
6. Below are the ACT-70 series frequency codes:

USA Frequency Codes (MHz)

5UA	5UB	6UA
482~554	554~626	626~698

Europe Frequency Codes (MHz)

5UA	5UB	6UA	7UA
482~554	554~626	626~698	718~790

ACT-70 Series: Professional Analog Wideband Wireless Systems

System Composition:

Receivers	Handheld Transmitters	Bodypack Transmitters	Transmitter Charger Station
 ACT-72 ACT-74 ACT-71	 ACT-70H ACT-70HC	 ACT-70T ACT-70TC	 MP-80

ACT-700 Series: Professional Analog Narrowband Wireless Systems

System Composition:

Receivers	Handheld Transmitters	Bodypack Transmitters	Transmitter Charger Station
 ACT-727B ACT-747B ACT-717B	 ACT-72H ACT-72HC	 ACT-72T ACT-72TC	 MP-80

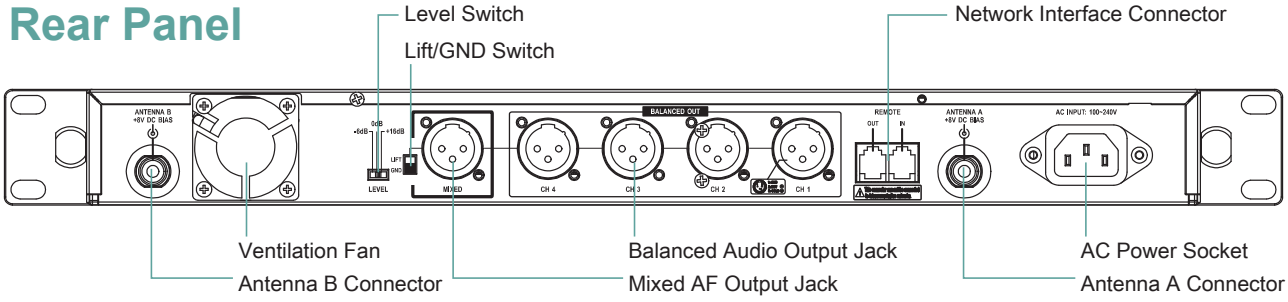
ACT-70 Series: Wideband Wireless Systems

A. Receivers

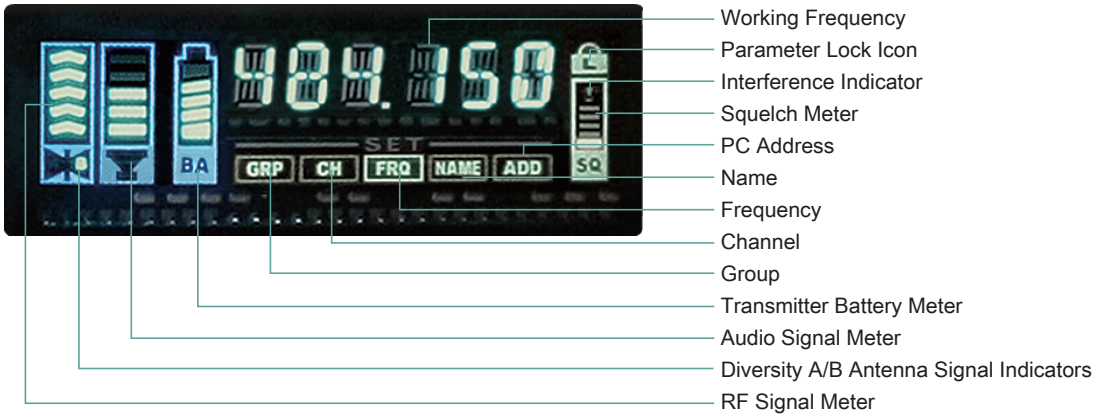
ACT-74 Wideband Quad-Channel True Diversity Receiver



Rear Panel



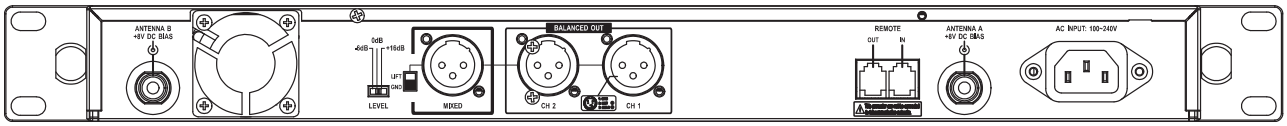
VFD Screen



ACT-72 Wideband Dual-Channel True Diversity Receiver



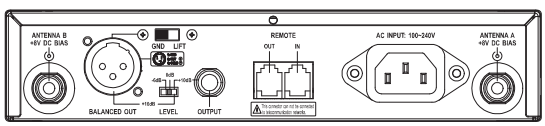
Rear Panel



ACT-71 Wideband Single-Channel True Diversity Receiver



Rear Panel



Features

1. The ACT-74 & ACT-72 receivers are EIA standard 1U rack-mountable; the ACT-71 receiver is EIA standard 1/2U rack-mountable, both with metal chassis for excellent heat dissipation & RF shielding.
2. UHF PLL synthesized circuit and advanced RF and IF circuitry to improve anti-interference characteristics and increase the number of interference-free channels available.
3. 400 preset channels with 1-set of user-defined group that saves up to 16 channels.
4. World's first ACT ™ function provides precise and rapid frequency sync to the transmitters.
5. True diversity receiving for best reception quality. Dual "PiloTone & NoiseLock" circuits minimize interference.
6. Industry's only full-color VFD screen delivers a bright, clear viewing in day or night environments with automatic bright (working) and dim (standby) displays during performance.
7. All controls are intuitive and easily set up via a single rotary knob.
8. Industry's only RF interference warning indicator for proper adjustments of the SQ level. Increase sensitivity to extend the receiving range; decrease the sensitivity to reduce interference.
9. Single channel or mixed output, switchable between three output levels for the best sound quality options.
10. High dynamic range and high fidelity characteristics for transparent audio performance.
11. Receiver provides bias voltage for MIPRO antenna systems to enhance reception range and signal stability.
12. MIPRO RCS.Net software allows real-time computer setup, control and monitoring.
13. Built-in 100~240V AC switching power supply ensures system safety and stability.

Specifications

Model	ACT-74	ACT-72	ACT-71
Channel	Quad	Dual	Single
Chassis	EIA-Standard 19 " 1U		EIA-Standard 19 " 1/2U
VFD Display	Frequency, Frequency code, RF/AF meters, Transmitter battery meter, Diversity signals, Interference warning indicator, Programmable user name, Group, Channel, Squelch meter, PC address and Lock status		
Frequency Range	UHF 482~698MHz (US) , UHF 480~874MHz (EU) (country dependent)		
Bandwidth	72MHz		
Preset Channels	400 preset channels Group 01~10: 16 compatible channels in each group Group 11~15: 48 compatible channels in each group Group 16: 16 channels can be saved & recalled (user-defined)		
Receiving Mode	True Diversity		
Oscillation Mode	PLL Synthesized. Frequency stability ≦± 0.005% (-10~+60℃)		
Sensitivity	6dB μ V, at S/N > 80dB		
S/N Ratio	>108dB (A)		
T.H.D.	<0.5% @ 1kHz		
Frequency Response	50 Hz~18 kHz, with high pass filter		
Squelch	"PiloTone & NoiseLock" dual-squelch circuits. Rotary control for squelch adjustment.		
Audio Output Adjustment	Output level accurately pre-adjusted to equal the microphone capsule sensitivity		
Max. Output Level	Balanced: +16dBV / 0dBV / - 6dB ; Unbalanced: +10dBV / 0dBV / - 6dB		
Output Connectors	Balanced XLR		Balanced XLR & Unbalanced
Output Switch	Single channel output or mixed output		Single channel output
Operation	Manual or PC remote control via optional software		
Power Supply	Built-in 100~240V AC switching power supply; Power Consumption: ACT-74: 24W | ACT-72: 15W | ACT-71: 8W		
Dimensions (W × H × D)	482 × 44 × 265 mm / 19 × 1.7 × 10.5 "		210 × 44 × 230 mm 8.3 × 1.7 × 9 "
Weight	Approx. 3.4 kg / 7.5 lbs	Approx. 3.0 kg / 6.6 lbs	Approx. 1.4 kg / 3.1 lbs
Transmitter	ACT-70H / 70HC Handheld & ACT-70T / 70TC Bodypack		
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.		

B. Transmitters

ACT-70H Wideband Handheld Transmitter

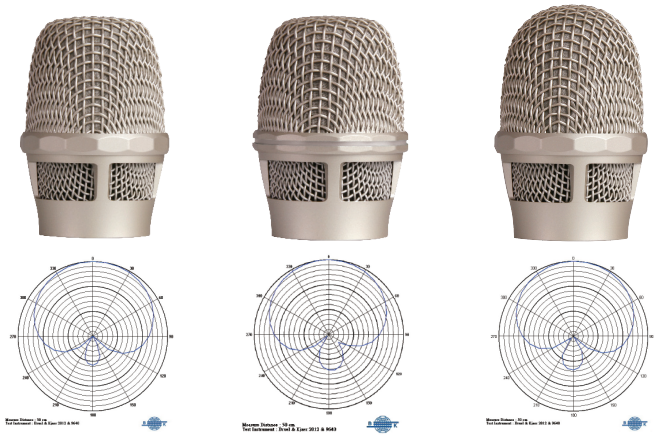
Patents :
Taiwan Utility M426236
Utility M426237
China Utility ZL201220005942.5
Utility ZL201220005924.7
Utility ZL201220574217.X



The capsule module is detachable from the upper housing



Interchangeable Capsule Modules



MU-90 MU-80 MU-59

Assembled Color-coded ID Caps



Features

1. Innovatively designed metal housing in MIPRO's distinctive aesthetic and ergonomic style.
2. Basic sterling gray color with other custom-made colors optional.
3. Turn upper housing for 2 AA battery installation and replacement.
4. Interchangeable capsule module with premium condenser or dynamic options for easy and fast changeovers.
5. The unique multi-layered metal grille protects the capsule against impact, rolling and pop noise, ensuring clarity of sound.
6. Backlit LCD displays all operational parameter information.
7. Five selectable gain settings with microphone input sensitivity of 0 dB.
8. Switchable Manual /Disable audio mute options.
9. Switchable High/Low power options.
10. The bottom housing with built-in high-efficiency antenna features power switch, mute and setup buttons for programmable gain, limiter, low-cut and RF output power.
11. Patented end-cap covers with color-coded channel identification clips. Detach the end-cap cover for parameter set-up. Reversible end-cap allows shielding of power on/off or mute switches during performance.
12. High-efficiency circuitry design provides 12~14 hours of operation from 2 AA batteries (depending on the battery quality).

ACT-70T Wideband Bodypack Transmitter

Patents :
Taiwan Utility M424706
Design D150218
China Utility ZL201120536034.4
Design ZL201130429380.8



Features

1. Ultra slim bodypack transmitter with sturdy magnesium alloy housing.
2. On the top features mute switch, mini-XLR connector and antenna.
3. Backlit LCD displays all operational parameter information.
4. Innovatively designed battery cover allows easy access to operate buttons and prevents accidental operation.
5. Mute button with remote-control jack for easy activation of mute function.
6. Stable PLL circuits. Automatically synchronized with the receiver's frequency by MIPRO's patented ACT ™ function.
7. Can directly match to high-low input impedance for microphone or guitar without switching.
8. The input sensitivity is adjustable with six selectable gain settings.
9. Mini-XLR input with secure screw lock connector for lavaliere / headworn mics and guitar.
10. Adjustable belt clip allows wearing transmitter in up or down position.
11. High-efficiency circuitry design provides 12~14 hours of operation from 2 AA batteries (depending on the battery quality).

Specifications

Model	ACT-70H	ACT-70T
Frequency Range	US Band : 482~698 MHz EU Band : 482~790 MHz	
Bandwidth	72 MHz	
Oscillation Mode	PLL Synthesized	
Channel Set-Up	ACT Sync	
RF Output Power	10 mW / 50 mW switchable (country dependent)	
Spurious Emissions	<-55dBc	
Gain Setting	+6dB, +3dB, 0dB, -3dB, -6dB (5 settings) 0 dB = input microphone sensitivity	+12dB, +6dB, 0dB, -6dB, -12dB, -18dB (6 settings) 0 dB = input microphone sensitivity
Max. SPL	142dB SPL	N/A
Max. Input Level	N/A	0dBV
Mute Connector	N/A	Optional MJ-70 remote mute switch
LCD Display	Group, Channel, Frequency, AF gain, Frequency band, RF power, Mute mode, Battery status and error codes	Group, Channel, Frequency, AF gain, Frequency band, RF power, Mute mode, Lock status, Battery status and error codes
Capsules	Interchangeable premium MU-90 / MU-80 ECM or MU-59 Dynamic	Headworn: MU-13 / MU-23 / MU-210 / MU-53HN / MU-55HN Lavalier: MU-53L / MU-55L
Battery Type	2 AA alkaline	
Current Consumption	High Power: approx. 161mA ; Low Power: approx. 120 mA	
Dimensions	50 × 258 mm / 2 × 10.1 " (Ø × L)	63 × 70 × 25 mm / 2.5 × 2.8 × 1.0 " (W × H × D)
Weight	Approx. 292 g / 10.3 oz, excluding batteries	Approx. 78 g / 2.7 oz, excluding batteries
Patents & Approvals	Patented. Telecom and safety regulations approved.	
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.	

C. Rechargeable Transmitters

ACT-70HC Rechargeable Wideband Handheld Transmitter

Patents :
Taiwan Design D115708
China Design ZL200630006688.0
U.S. Invention 7978869



The rechargeable battery can be easily replaced



Features

1. Innovatively designed metal housing in MIPRO's distinctive aesthetic and ergonomic style.
2. Basic sterling gray color with other custom-made colors optional.
3. Powered by a plug-n-play rechargeable lithium battery. Store the microphone in charger for charging when not in use.
4. Simply unscrew the grille to open the battery compartment to replace the lithium battery or charge it in the charger.
5. The unique multi-layered metal grille protects the capsule against impact, rolling and pop noise, ensuring clarity of sound.
6. Interchangeable capsule module with premium condenser or dynamic options for easy and fast changeovers.
7. Backlit LCD displays all operational parameter information.
8. Five selectable gain settings with microphone input sensitivity of 0 dB.
9. Switchable Manual / Disable audio mute options.
10. Switchable High / Low power options.
11. The bottom housing with built-in high-efficiency antenna features power switch, mute and setup buttons for programmable gain, limiter, low-cut and RF output power.
12. Patented end-cap cover with color-coded channel identification clips. Detach the end-cap cover for parameter setup. Reversible end-cap allows shielding of power on/off or mute switches during performance.
13. Transmitter has high-efficiency circuitry design. The included single rechargeable lithium battery can be easily removed or interchanged for charging. The intelligent battery charger maintains a high charge capacity for up to 600 charge cycles for cost saving and is environmentally friendly.

ACT-70TC Rechargeable Wideband Bodypack Transmitter



Patents :
Taiwan Utility M424706
Design D150218
China Utility ZL201120536034.4
Design ZL201130429380.8

Features

1. Ultra slim bodypack transmitter with sturdy magnesium alloy housing.
2. On the top features mute switch, mini-XLR connector and antenna.
3. Backlit LCD displays all operational parameter information.
4. Innovatively designed battery cover allows easy access to operate buttons and prevents accidental operation.
5. Mute button with remote-control jack for easy activation of mute function.
6. Stable PLL circuits. Automatically synchronized with the receiver's frequency by MIPRO's patented ACT ™ function.
7. Can directly match to high-low input impedance for microphone or guitar without switching.
8. The input sensitivity is adjustable with six selectable gain settings.
9. Mini-XLR input with secure screw lock connector for lavaliere / headworn mics and guitar.
10. Adjustable belt clip allows wearing transmitter in up or down position.
11. Transmitter has high-efficiency circuitry design. The included single rechargeable lithium battery can be easily removed or interchanged for charging. The intelligent battery charger maintains a high charge capacity for up to 600 charge cycles for cost saving and is environmentally friendly.

Specifications

Model	ACT-70HC	ACT-70TC
Frequency Range	US Band : 482~698 MHz EU Band : 482~790 MHz	
Bandwidth	72 MHz	
Oscillation Mode	PLL Synthesized	
Channel Set-Up	ACT Sync	
RF Output Power	10 mW / 50 mW switchable (country dependent)	
Spurious Emissions	<-55dBc	
Gain Setting	+6dB, +3dB, 0dB, -3dB, -6dB (5 settings) 0 dB = input microphone sensitivity	+12dB, +6dB, 0dB, -6dB, -12dB, -18dB (6 settings) 0 dB = input microphone sensitivity
Max. SPL	142dB SPL	N/A
Max. Input Level	N/A	0dBV
Mute Connector	N/A	Optional MJ-70 remote mute switch
LCD Display	Group, Channel, Frequency, AF gain, Frequency band, RF power, Mute mode, Battery status and error codes	Group, Channel, Frequency, AF gain, Frequency band, RF power, Mute mode, Lock status, Battery status and error codes
Capsules	Interchangeable premium MU-90 / MU-80 ECM or MU-59 Dynamic	Headworn: MU-13 / MU-23 / MU-210 / MU-53HN / MU-55HN Lavalier: MU-53L / MU-55L
Battery Type	ICR 18500 rechargeable lithium battery × 1	
Current Consumption	High Power: approx. 125mA; Low Power: approx. 100mA	
Operating Time	A 20-minute fast charge provides up to 1 hour operation. Minimum 13 hours of operation per 4-hour full charge.	
Dimensions	50 × 250 mm / 2 × 9.8 " (Ø × L)	63 × 70 × 25 mm / 2.5 × 2.8 × 1.0 " (W × H × D)
Weight	Approx. 276 g / 9.7 oz, excluding batteries	Approx. 73 g / 2.6 oz, excluding batteries
Patents & Approvals	Patented. Telecom and safety regulations approved.	
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.	

ACT-700 Series: Narrowband Wireless Systems

A. Receivers

ACT-747B Narrowband Quad-Channel True Diversity Receiver



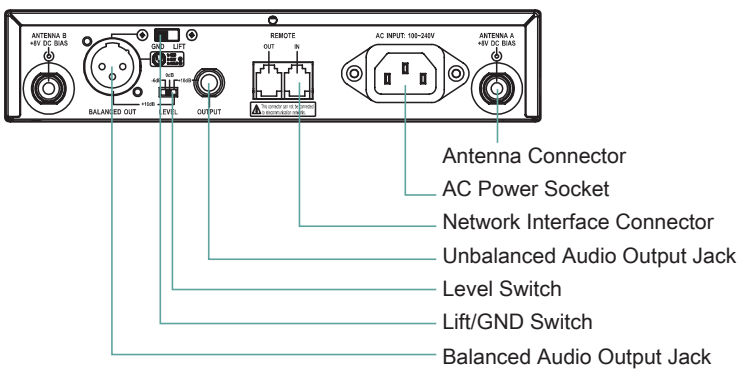
ACT-727B Narrowband Dual-Channel True Diversity Receiver



ACT-717B Narrowband Single-Channel True Diversity Receiver



Rear Panel



Features

1. The ACT-747B & ACT-727B receivers are EIA standard 1U rack-mountable; the ACT-717B receiver is EIA standard 1/2U rack-mountable, both with metal chassis for excellent heat dissipation & RF shielding.
2. UHF PLL synthesized circuit ensures high stability and low spurious emissions.
3. Enhanced RF circuitry greatly reduces interference and intermodulation.
4. MIPRO's 3rd generation advanced RF and IF circuitry to improve anti-interference characteristics and increase the number of interference-free channels available.
5. Auto Scan function allows quick search for an interference-free working channel from 104 preset channels under 10 groups.
6. World's first ACT ™ function provides precise and rapid frequency sync to the transmitters.
7. True diversity receiving for best reception quality. Dual "PiloTone & NoiseLock" circuits minimize interference.
8. Industry's only full-color VFD screen delivers a bright, clear viewing in day or night environments with automatic bright (working) and dim (standby) displays during performance.
9. All controls are intuitive and easily set up via a single rotary knob.
10. Industry's only RF interference warning indicator for proper adjustments of the SQ level. Increase sensitivity to extend receiving range; decrease the sensitivity to reduce interference.
11. Single channel or mixed output, switchable between three output levels for the best sound quality options.
12. High dynamic range and high fidelity characteristics for transparent audio performance.
13. Receiver provides bias voltage for MIPRO antenna systems to enhance reception range and signal stability.
14. MIPRO RCS.Net software allows real-time computer setup, control and monitoring.
15. Built-in 100~240V AC switching power supply ensures system safety and stability.

Specifications

Model	ACT-747B	ACT-727B	ACT-717B
Channel	Quad	Dual	Single
Chassis	EIA-Standard 19 " 1U		EIA-Standard 19 " 1/2U
VFD Display	Frequency, Frequency code, RF/AF meters, Transmitter battery meter, Diversity signals, Interference warning indicator, Programmable user name, Group, Channel, Squelch meter, PC address and Lock status		
Frequency Range	UHF 480~934 MHz (country dependent)		
Bandwidth	24MHz		
Preset Channels	104 preset channels. Group 1~6: 8 compatible channels in each group Group 7~8: 12 compatible channels in each group Group 9~10: 16 compatible channels in each group		
Receiving Mode	True diversity		
Oscillation Mode	PLL Synthesized. Frequency stability ≦± 0.005% (-10~+60℃)		
Sensitivity	6 dB μ V, at S/N > 80 dB		
S/N Ratio	> 105 dB(A)		
T.H.D.	< 0.5% @ 1kHz		
Frequency Response	50 Hz~18 kHz, with high pass filter		
Squelch	"Pilotone & NoiseLock" dual-squelch circuit. Rotary control for squelch adjustment.		
Audio Output Adjustment	Output level accurately pre-adjusted to equal the microphone capsule sensitivity		
Max. Output Level	Balanced: +16dBV / 0dBV / - 6dB ; Unbalanced: +10dBV / 0dBV / - 6dB		
Output Connectors	Balanced XLR		Balanced XLR & Unbalanced 6.3 mm (1/4 ")
Output Switch	Single channel output or mixed output		Single channel output
Operation	Manual or PC remote control via optional software		
Power Supply	Built-in 100~240V AC switching power supply; Power Consumption: ACT-747B: 24W | ACT-727B: 15W | ACT-717B: 8W		
Dimensions (W × H × D)	482 × 44 × 265 mm / 19 × 1.7 × 10.5 "		210 × 44 × 230 mm / 8.3 × 1.7 × 9 "
Weight	Approx. 3.4 kg / 7.5 lbs	Approx. 3.0 kg / 6.6 lbs	Approx. 1.4 kg / 3.1 lbs
Transmitter	ACT-72H / 72HC Handheld & ACT-72T / 72TC Bodypack		
Notes	Refer to actual product in the event of product discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.		

B. Transmitters

ACT-72H Narrowband Handheld Transmitter

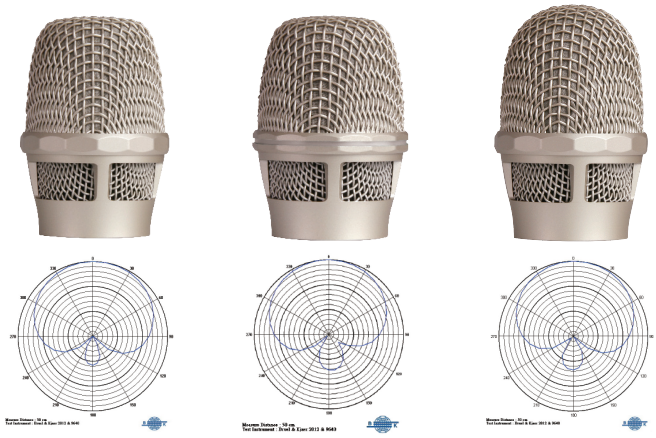
Patents :
Taiwan Utility M426236
Utility M426237
China Utility ZL201220005942.5
Utility ZL201220005924.7
Utility ZL201220574217.X



The capsule module is detachable from the upper housing



Interchangeable Capsule Modules



MU-90 MU-80 MU-59

Assembled Color-coded ID Caps



Features

1. Innovatively designed metal housing in MIPRO's distinctive aesthetic and ergonomic style.
2. Basic sterling gray color with other custom-made colors optional.
3. Turn upper housing for 2 AA battery installation and replacement.
4. Interchangeable capsule module with premium condenser or dynamic options for easy and fast changeovers.
5. The unique multi-layered metal grille protects the capsule against impact, rolling and pop noise, ensuring clarity of sound.
6. Backlit LCD displays all operational parameter information.
7. Five selectable gain settings with microphone input sensitivity of 0 dB.
8. Switchable Manual /Disable audio mute options.
9. Switchable High/Low power options.
10. The bottom housing with built-in high-efficiency antenna features power switch, mute and setup buttons for programmable gain, limiter, low-cut and RF output power.
11. Patented end-cap covers with color-coded channel identification clips. Detach the end-cap cover for parameter set-up. Reversible end-cap allows shielding of power on/off or mute switches during performance.
12. High-efficiency circuitry design provides 12~14 hours of operation from 2 AA batteries (depending on the battery quality).

ACT-72T Narrowband Bodypack Transmitter

Patents :
Taiwan Utility M424706
Design D150218
China Utility ZL201120536034.4
Design ZL201130429380.8



Features

1. Ultra slim bodypack transmitter with sturdy magnesium alloy housing.
2. On the top features mute switch, mini-XLR connector and antenna.
3. Backlit LCD displays all operational parameter information.
4. Innovatively designed battery cover allows easy access to operate buttons and prevents accidental operation.
5. Mute button with remote-control jack for easy activation of mute function.
6. Stable PLL circuits. Automatically synchronized with the receiver's frequency by MIPRO's patented ACT ™ function.
7. Can directly match to high-low input impedance for microphone or guitar without switching.
8. The input sensitivity is adjustable with six selectable gain settings.
9. Mini-XLR input with secure screw lock connector for lavaliere / headworn mics and guitar.
10. Adjustable belt clip allows wearing transmitter in up or down position.
11. High-efficiency circuitry design provides 12~14 hours of operation from 2 AA batteries (depending on the battery quality).

Specifications

Model	ACT-72H	ACT-72T
Frequency Range	480~934 MHz	
Bandwidth	24 MHz	
Oscillation Mode	PLL Synthesized	
Channel Set-Up	ACT Sync	
RF Output Power	10 mW / 50 mW switchable (country dependent)	
Spurious Emissions	<-55dBc	
Gain Setting	+6dB, +3dB, 0dB, -3dB, -6dB (5 settings) 0 dB = input microphone sensitivity	+12dB, +6dB, 0dB, -6dB, -12dB, -18dB (6 settings) 0 dB = input microphone sensitivity
Max. SPL	142dB SPL	N/A
Max. Input Level	N/A	0dBV
Mute Connector	N/A	Optional MJ-70 remote mute switch
LCD Display	Group, Channel, Frequency, AF gain, Frequency band, RF power, Mute mode, Battery status and error codes	Group, Channel, Frequency, AF gain, Frequency band, RF power, Mute mode, Lock status, Battery status and error codes
Capsules	Interchangeable premium MU-90 / MU-80 ECM or MU-59 Dynamic	Headworn: MU-13 / MU-23 / MU-210 / MU-53HN / MU-55HN Lavalier: MU-53L / MU-55L
Battery Type	2 AA alkaline	
Current Consumption	High Power: approx. 161mA ; Low Power: approx. 120 mA	
Dimensions	50 × 258 mm / 2 × 10.1 " (Ø × L)	63 × 70 × 25 mm / 2.5 × 2.8 × 1.0 " (W × H × D)
Weight	Approx. 292 g / 10.3 oz, excluding batteries	Approx. 78 g / 2.7 oz, excluding batteries
Patents & Approvals	Patented. Telecom and safety regulations approved.	
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.	

C. Rechargeable Transmitters

ACT-72HC Rechargeable Narrowband Handheld Transmitter

Patents :
Taiwan Design D115708
China Design ZL200630006688.0
U.S. Invention 7978869



The rechargeable battery can be easily replaced



Features

1. Innovatively designed metal housing in MIPRO's distinctive aesthetic and ergonomic style.
2. Basic sterling gray color with other custom-made colors optional.
3. Powered by a plug-n-play rechargeable lithium battery. Store the microphone in charger for charging when not in use.
4. Simply unscrew the grille to open the battery compartment to replace the lithium battery or charge it in the charger.
5. The unique multi-layered metal grille protects the capsule against impact, rolling and pop noise, ensuring clarity of sound.
6. Interchangeable capsule module with premium condenser or dynamic options for easy and fast changeovers.
7. Backlit LCD displays all operational parameter information.
8. Five selectable gain settings with microphone input sensitivity of 0 dB.
9. Switchable Manual / Disable audio mute options.
10. Switchable High / Low power options.
11. The bottom housing with built-in high-efficiency antenna features power switch, mute and setup buttons for programmable gain, limiter, low-cut and RF output power.
12. Patented end-cap cover with color-coded channel identification clips. Detach the end-cap cover for parameter setup. Reversible end-cap allows shielding of power on/off or mute switches during performance.
13. Transmitter has high-efficiency circuitry design. The included single rechargeable lithium battery can be easily removed or interchanged for charging. The intelligent battery charger maintains a high charge capacity for up to 600 charge cycles for cost saving and is environmentally friendly.

ACT-72TC Rechargeable Narrowband Bodypack Transmitter

Patents :
Taiwan Utility M424706
Design D150218
China Utility ZL201120536034.4
Design ZL201130429380.8



Features

1. Ultra slim bodypack transmitter with sturdy magnesium alloy housing.
2. On the top features mute switch, mini-XLR connector and antenna.
3. Backlit LCD displays all operational parameter information.
4. Innovatively designed battery cover allows easy access to operate buttons and prevents accidental operation.
5. Mute button with remote-control jack for easy activation of mute function.
6. Stable PLL circuits. Automatically synchronized with the receiver's frequency by MIPRO's patented ACT ™ function.
7. Can directly match to high-low input impedance for microphone or guitar without switching.
8. The input sensitivity is adjustable with six selectable gain settings.
9. Mini-XLR input with secure screw lock connector for lavaliere / headworn mics and guitar.
10. Adjustable belt clip allows wearing transmitter in up or down position.
11. Transmitter has high-efficiency circuitry design. The included single rechargeable lithium battery can be easily removed or interchanged for charging. The intelligent battery charger maintains a high charge capacity for up to 600 charge cycles for cost saving and is environmentally friendly.

Specifications

Model	ACT-72HC	ACT-72TC
Frequency Range	480~934 MHz	
Bandwidth	24 MHz	
Oscillation Mode	PLL Synthesized	
Channel Set-Up	ACT Sync	
RF Output Power	10 mW / 50 mW switchable (country dependent)	
Spurious Emissions	<-55dBc	
Gain Setting	+6dB, +3dB, 0dB, -3dB, -6dB (5 settings) 0 dB = input microphone sensitivity	+12dB, +6dB, 0dB, -6dB, -12dB, -18dB (6 settings) 0 dB = input microphone sensitivity
Max. SPL	142dB SPL	N/A
Max. Input Level	N/A	0dBV
Mute Connector	N/A	Optional MJ-70 remote mute switch
LCD Display	Group, Channel, Frequency, AF gain, Frequency band, RF power, Mute mode, Battery status and error codes	Group, Channel, Frequency, AF gain, Frequency band, RF power, Mute mode, Lock status, Battery status and error codes
Capsules	Interchangeable premium MU-90 / MU-80 ECM or MU-59 Dynamic	Headworn: MU-13 / MU-23 / MU-210 / MU-53HN / MU-55HN Lavalier: MU-53L / MU-55L
Battery Type	ICR 18500 rechargeable lithium battery × 1	
Current Consumption	High Power: approx. 125mA; Low Power: approx. 100mA	
Operating Time	A 20-minute fast charge provides up to 1 hour operation. Minimum 13 hours of operation per 4-hour full charge.	
Dimensions	50 × 250 mm / 2 × 9.8 " (Ø × L)	63 × 70 × 25 mm / 2.5 × 2.8 × 1.0 " (W × H × D)
Weight	Approx. 276 g / 9.7 oz, excluding batteries	Approx. 73 g / 2.6 oz, excluding batteries
Patents & Approvals	Patented. Telecom and safety regulations approved.	
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.	

Profile

1. Two series are available: ACT-5 series and ACT-3 series.
2. ACT-5 series has two true diversity receiver models: ACT-525B 1U dual-channel and ACT-515B 1/2U single-channel receivers. Instead of a low-cost plastic chassis and LED display, an EIA standard metal chassis and dual-color backlit LCD displays are utilized for a professional appearance.
3. ACT-5 series also has two diversity receiver models: ACT-52B dual-channel and ACT-51B single-channel receivers. EIA standard 1/2U metal chassis and full-color VFD displays are utilized for a professional appearance.
4. ACT-5 series compatible metal case transmitters are ACT-52H handheld and ACT-52T bodypack.
5. ACT-3 series has five diversity receiver models: ACT-312BT quad-channel, ACT-300B dual-channel, ACT-100B dual-channel in 1U, and ACT-312B dual-channel, ACT-311B single-channel in 1/2U~all have a metal chassis and backlit LCD displays.
6. ACT-3 series compatible metal case transmitters are ACT-32H handheld and ACT-32T bodypack, powered by AA batteries; Rechargeable ACT-32HC handheld and ACT-32TC bodypack, powered by a lithium rechargeable battery.

ACT-5 Series: Wireless Systems

System Composition:

True Diversity Receivers		Transmitters	
ACT-525B	ACT-515B	ACT-52H	ACT-52T
			

Diversity Receivers		Transmitters	
ACT-52B	ACT-51B	ACT-52H	ACT-52T
			

ACT-3 Series: Diversity Wireless Systems

System Composition:

Receivers	Transmitters	Transmitter Charger Station
ACT-312BT, ACT-300B, ACT-100B, ACT-312B, ACT-311B	ACT-32H ACT-32HC ACT-32T ACT-32TC	MP-80
		

ACT-5 Series: Wireless Systems

A. Receivers

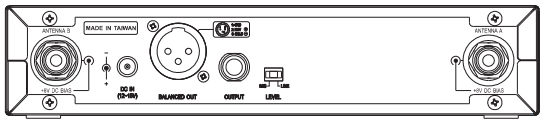
ACT-525B Dual-Channel True Diversity Receiver



ACT-515B Single-Channel True Diversity Receiver



Rear Panel

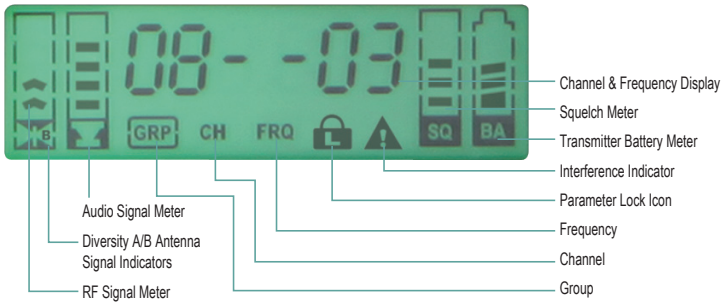


LCD Screen

Standby Mode (red)



Working Mode (green)



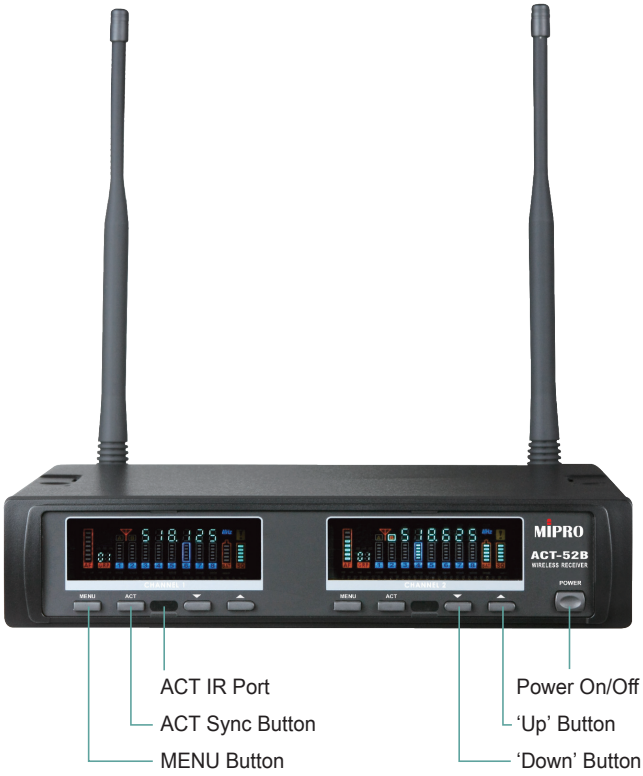
Features

1. The ACT-515B receiver is EIA standard 1/2U rack-mountable; the ACT-525B receiver is EIA standard 1U rack-mountable.
2. Stable PLL circuit. Auto Scan function allows quick search for an interference-free working channel from 80 preset channels under 10 groups. Up to 8 channels in group 11 can be saved and recalled within 961 user-defined frequencies.
3. World's first ACT ™ function provides precise and rapid frequency sync to the transmitters.
4. True diversity receiving for best reception quality. Dual "PiloTone & NoiseLock" circuits minimize interference.
5. Backlit LCD is lit in green when it detects an incoming signal or buttons are touched. Backlit LCD is lit in red when the receiver is idle for about 10 seconds. Easy to identify working mode (green) and standby mode (red) during performance.
6. Balanced XLR / unbalanced 1/4 " audio output jack, output level switch and DC input are on the rear panel.
7. Industry's only RF interference warning indicator for proper adjustments of the SQ level. Increase sensitivity to extend receiving range; decrease the sensitivity to reduce interference.
8. Receiver provides bias voltage for MIPRO antenna systems to enhance reception range and signal stability.

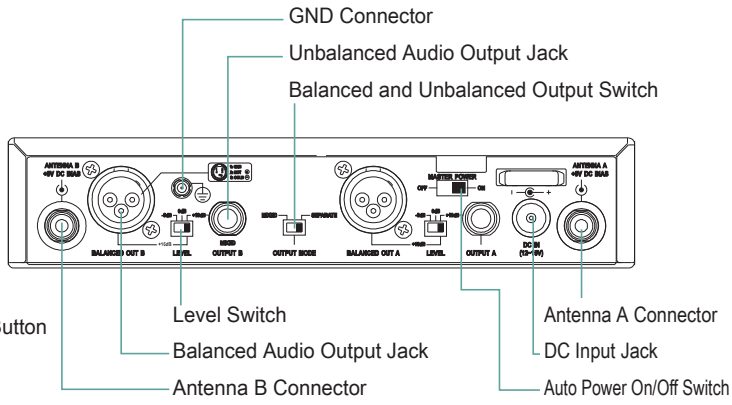
Specifications

Model	ACT-525B	ACT-515B
Channel	Dual	Single
Chassis	EIA Standard 19 " 1U	EIA Standard 19 " 1/2U
LCD Display	Group, Channel, Frequency, RF/AF meters, Transmitter battery meter, Diversity signals, Interference warning indicator and Lock status	
Frequency Range	480~934 MHz	
Bandwidth	24 MHz	
Preset Channels	80 preset channels. Group 1~10: 8 compatible channels in each group Group 11: Up to 8 user-defined channels can be saved & recalled.	
Receiving Mode	True diversity	
Oscillation Mode	PLL Synthesized. Frequency stability ≦± 0.005% (-10~+60℃)	
Sensitivity	6 dB μ V, at S/N > 80 dB	
S/N Ratio	> 106 dB(A)	
T. H. D.	< 0.5% @ 1 kHz	
Frequency Response	50 Hz~18 kHz, with high pass filter	
Squelch	"PiloTone & NoiseLock" dual-squelch circuits	
Audio Output Adjustment	Output level accurately pre-adjusted to equal the microphone capsule sensitivity	
Output Connectors	Balanced XLR & Unbalanced 6.3 mm (1/4 ")	
Max. Output Level	Balanced: +16 dBV / 0 dBV ; Unbalanced: +10 dBV / 0 dBV	
Power Supply	External AC adapter, 12~15V DC, 1A; Power Consumption: 6W	External AC adapter, 12~15V DC, 1A; Power Consumption: 3.6W
Dimensions (W × H × D)	420 × 44 × 180 mm / 16.5 × 1.7 × 7.1 "	210 × 44 × 180 mm / 8.3 × 1.7 × 7.1 "
Weight	Approx. 1.65 kg / 3.6 lbs	Approx. 0.85 kg / 1.9 lbs
Transmitter	ACT-52H / 32HC / 72HC Handheld & ACT-52T / 32TC / 72TC Bodypack	
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.	

ACT-52B Dual-Channel Diversity Receiver



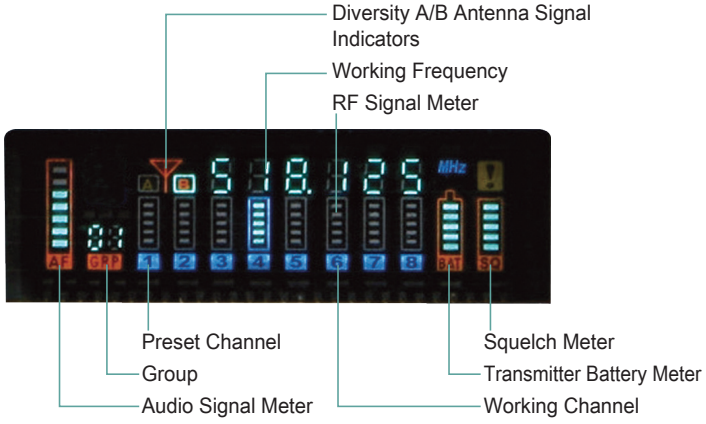
Rear Panel



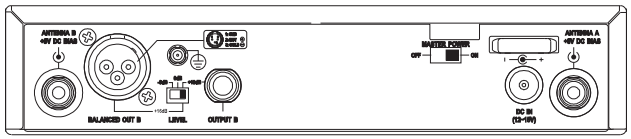
ACT-51B Single-Channel Diversity Receiver



VFD Screen



Rear Panel



Features

1. EIA standard 1/2U rack-mountable metal chassis.
2. All controls are intuitive and easily operated via electronic buttons, preventing accidental operation.
3. Full-color VFD (vacuum fluorescent display) displays all pertinent parameters on the same screen. Automatically dims for stand-by and brightens during performance.
4. Auto Scan function allows quick search for an interference-free working channel from 48 preset channels under 6 groups.
5. World's first ACT ™ function provides precise and rapid frequency sync to the transmitters.
6. Advanced diversity technology for optimum reception range reduces signal dropouts and the "PiloTone & NoiseLock" dual-squelch circuits prevent noise interference.
7. Three switchable output levels. Output level is accurately pre-adjusted to equal the microphone capsule's sensitivity, ensuring optimal performance.
8. Receiver provides bias voltage for MIPRO antenna systems to enhance reception range and signal stability.
9. Stable performance, easy installation and more non-interference channels make the ACT-52B/51B ideal for stage and PA applications.

Specifications

Model	ACT-52B	ACT-51B
Channel	Dual	Single
Chassis	EIA Standard 19 " 1/2U	EIA Standard 19 " 1/2U
Frequency Range	480~934 MHz	
Bandwidth	24 MHz	
Preset Channels	48 preset channels. Groups 1~6: 8 compatible channels in each group.	
Receiving Mode	Diversity	
Oscillation Mode	PLL Synthesized. Frequency stability ≦± 0.005% (-10~+60℃)	
Sensitivity	10 dB μ V, at S/N > 80 dB	
S/N Ratio	> 105 dB(A)	
T.H.D.	< 0.5% @ 1 kHz	
Frequency Response	50Hz~18kHz	
Squelch	"PiloTone & NoiseLock" dual-squelch circuit	
Audio Output Adjustment	Output level accurately pre-adjusted to equal the microphone capsule sensitivity	
Max. Output Level	3-Level Switch: +10 dBV / 0 dBV / -6 dBV	
Power Supply	External 100~240V AC switching power supply; Power Consumption: ACT-52B: 9W | ACT-51B: 5W	
Dimensions (W × H × D)	210 × 44 × 200 mm / 8.3 × 1.7 × 7.9 "	
Weight	Approx. 0.9 kg / 2 lbs	Approx. 0.7 kg / 1.5 lbs
Transmitter	ACT-52H / 32HC / 72HC Handheld & ACT-52T / 32TC / 72TC Bodypack	
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.	

B. Transmitters

ACT-52H Handheld Transmitter



Features

1. Rugged, ergonomically designed metal housing.
2. The unique multi-layered metal grille protects the capsule against impact, rolling and pop noise, ensuring clarity of sound.
3. Interchangeable capsule module with premium condenser or dynamic options for easy and fast changeovers.
4. Premium condenser capsules exhibit high fidelity, wide dynamic range, fast transient responses, good feedback rejection, accurate sound image characteristics, transparent sound quality and withstand maximum SPL.
5. Reversible end-cap allows shielding of power on/off switch to avoid accidental power-off during performance.
6. Impact-resistant battery compartment holds 2 AA batteries
7. Backlit LCD displays various parameters and status.
8. Stable PLL circuits. Automatically synchronized with the receiver's frequency by MIPRO's patented ACT ™ function.
9. Patented "built-in" antenna design.
10. Maximum 140dB SPL is achieved by the proprietary high dynamic range modulation circuitry.
11. High-efficiency circuitry design provides more than 16 hours of operation from 2 AA batteries (depending on the battery quality).

Specifications

Housing	Metal
Frequency Range	480~934 MHz
Bandwidth	24 MHz
Oscillation Mode	PLL Synthesized
Channel Set-Up	ACT Sync
RF Output Power	10~30mW (country dependent)
Spurious Emissions	< -55dBc
Max. SPL	140dB SPL
LCD Display	Group, Channel, Battery status & Error codes
Capsules	Interchangeable premium MU-90 / MU-80 / MU-70 ECM or MU-59 / MU-39 Dynamic
Battery Type	2 AA alkaline
Current Consumption	Approx. 92mA
Dimensions (Ø × L)	50 × 260 mm / 2 × 10.2 "
Weight	Approx. 282 g / 9.9 oz, excluding batteries
Patents & Approvals	Patented. Telecom and safety regulations approved.
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.

ACT-52T Bodypack Transmitter



Features

1. Lightweight, compact size with sturdy metal housing.
2. On the top features mute switch, mini- XLR connector and antenna.
3. Backlit LCD displays various parameters and status.
4. Innovatively designed battery cover allows easy access to operate buttons and prevents accidental operation.
5. Mute button with remote-control jack for easy activation of mute function.
6. Stable PLL circuits. Automatically synchronized with the receiver's frequency by MIPRO's patented ACT ™ function.
7. Can directly match to high-low input impedance for microphone or guitar without switching.
8. Mini-XLR input with secure screw lock connector for lavaliere / headworn mics and guitar.
9. Adjustable belt clip allows wearing transmitter in up or down position.
10. High-efficiency circuitry design provides 12~14 hours of operation from 2 AA batteries (depending on the battery quality).

Specifications

Housing	Composite of various metals
Frequency Range	480~934 MHz
Bandwidth	24 MHz
Oscillation Mode	PLL Synthesized
Channel Set-Up	ACT Sync
RF Output Power	10 mW / 50 mW switchable (country dependent)
Spurious Emissions	< -55 dBc
Max. Input Level	0dBV
Mute Connector	Optional MJ-70 remote mute switch
LCD Display	Group, Channel, Frequency, AF gain, Frequency band, RF power, Mute mode, Lock status, Battery status and error codes
Capsules	Headworn: MU-13 / MU-23 / MU-210 / MU-53HN / MU-55HN Lavalier: MU-53L / MU-55L
Battery Type	2 AA alkaline
Current Consumption	High Power: approx. 161mA ; Low Power: approx. 120 mA
Dimensions (W × H × D)	63 × 82 × 22 mm / 2.5 × 3.2 × 0.9 "
Weight	Approx. 98 g / 3.5 oz, excluding batteries
Patents & Approvals	Patented. Telecom and safety regulations approved.
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.

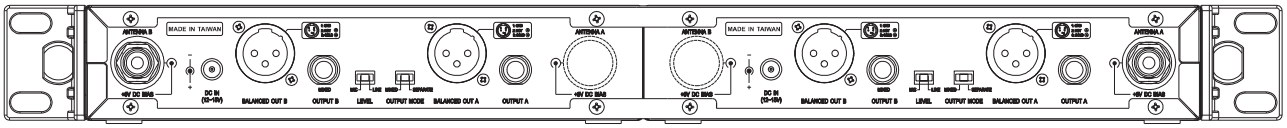
ACT-3 Series: Diversity Wireless Systems

A. Receivers

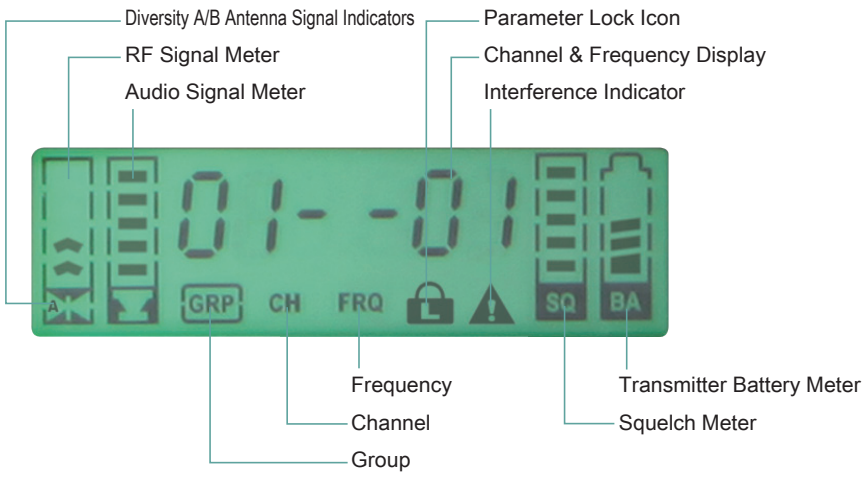
ACT-312BT Quad-Channel Diversity Receiver



Rear Panel



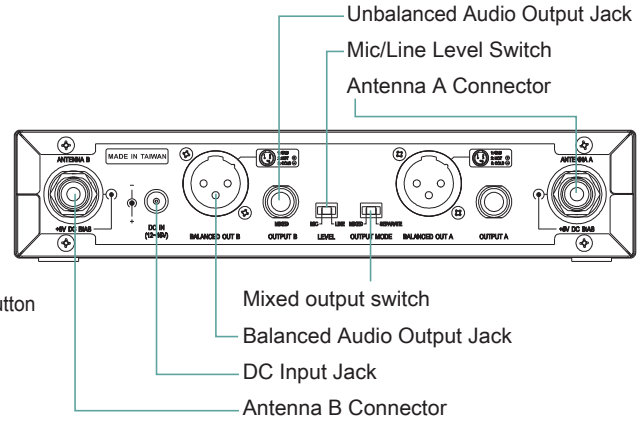
LCD Screen



ACT-312B Dual-Channel Diversity Receiver



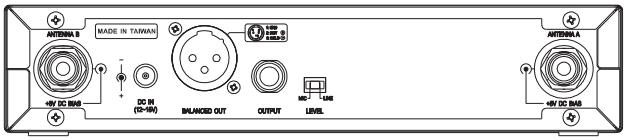
Rear Panel



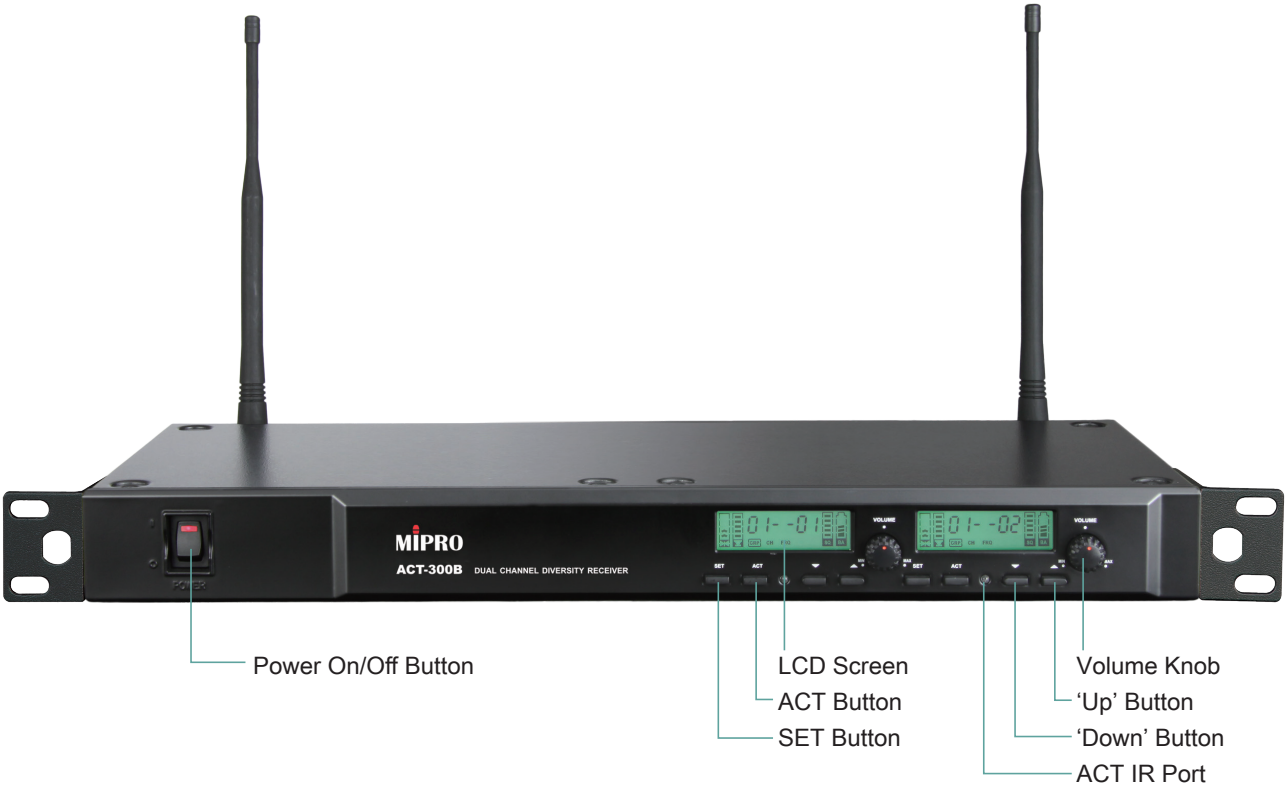
ACT-311B Single-Channel Diversity Receiver



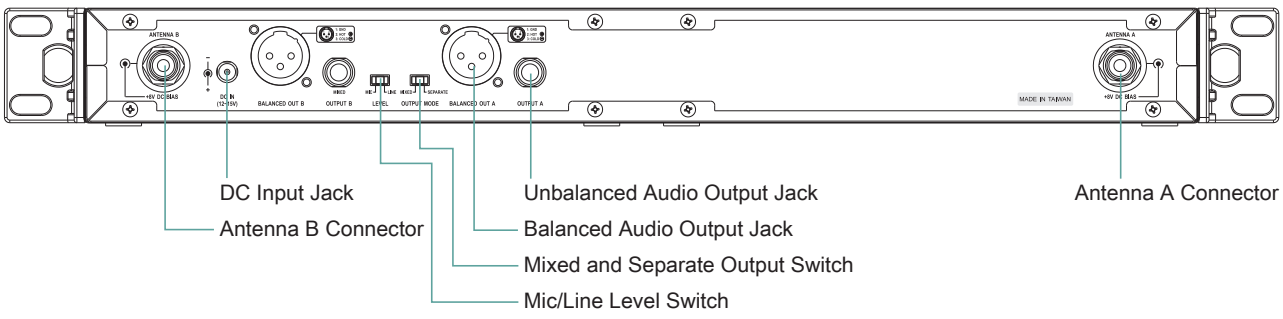
Rear Panel



ACT-300B Dual-Channel Diversity Receiver



Rear Panel



Features

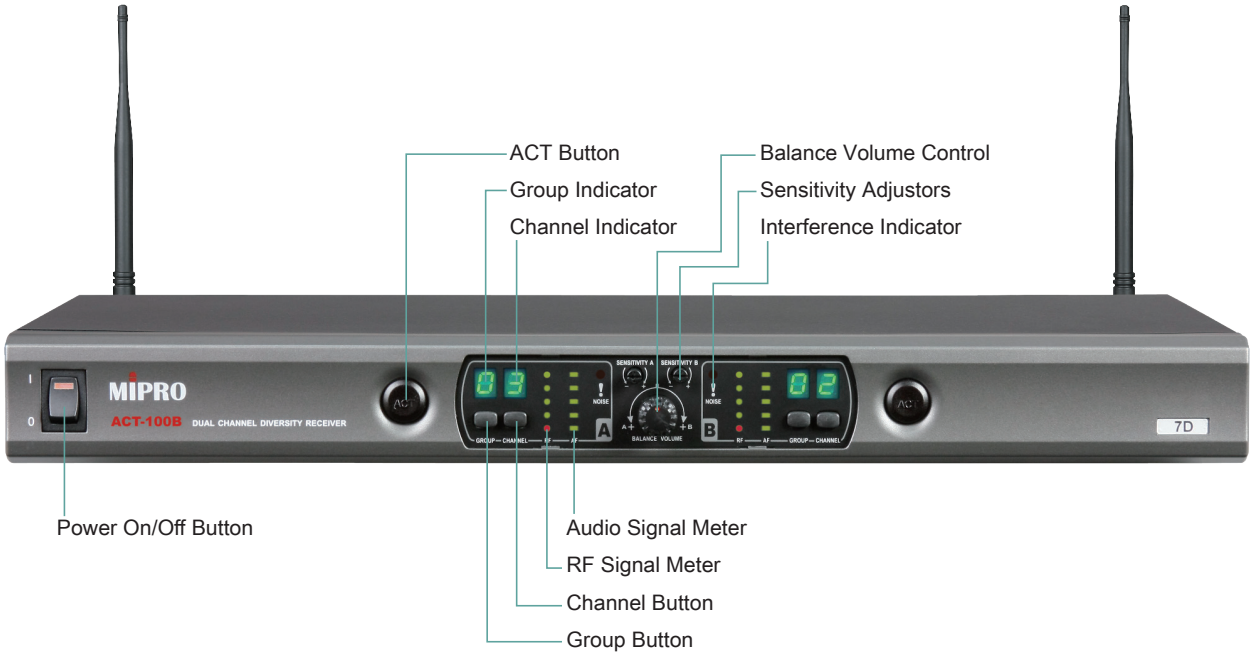
1. The ACT-311B & ACT-312B receivers are EIA standard 1/2U metal rack-mountable. The ACT-300B & ACT-312BT receivers are EIA standard 1U metal rack-mountable.
2. Stable PLL circuit. Auto Scan function allows quick search for an interference-free working channel from 112 preset channels under 10 groups. Up to 8 channels in group 11 can be saved and recalled within 961 user-defined frequencies.
3. World's first ACT ™ function provides precise and rapid frequency sync to the transmitters.
4. Advanced diversity technology for optimum reception range reduces signal dropouts and the "PiloTone & NoiseLock" dual-squelch circuits prevent noise interference.
5. Backlit LCD is lit in green indicates the receiver is in working mode when it detects an incoming signal or buttons are touched. The display dims automatically when the receiver is idle for about 10 seconds.
6. Balanced XLR / unbalanced 1/4 " audio output jack, output level switch and DC input are on the rear panel. One mixed-output switch is available for dual-channel receivers.
7. Industry's only RF interference warning indicator for proper adjustments of the SQ level. Increase sensitivity to extend receiving range; decrease the sensitivity to reduce interference.
8. Receiver provides bias for booster where MIPRO antenna systems can be added for extended receiving range and stability.
9. DC input jack accepts 12~15V power supply.

Specifications

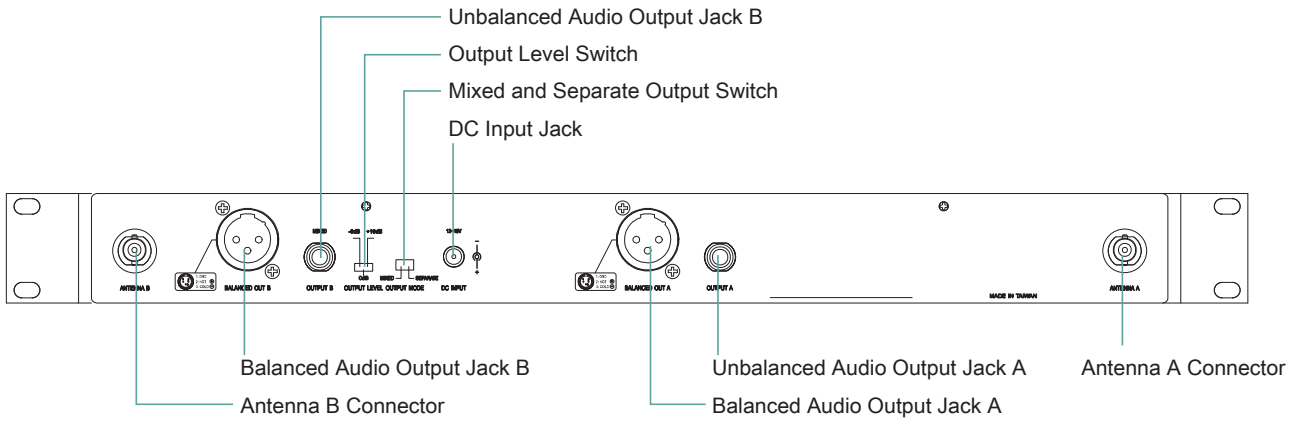
Model	ACT-311B	ACT-312B	ACT-312BT	ACT-300B
Channel	Single	Dual	Quad	Dual
Chassis	EIA-Standard 19 " 1/2U		EIA-Standard 19 " 1U	
LCD Display	Group, Channel, Frequency, RF/AF meters, Transmitter battery meter, Diversity signals, Interference warning indicator and Lock status			
Frequency Range	480~934 MHz (country dependent)			
Bandwidth	24 MHz			
Preset Channels	112 preset channels. Group 1-6: 8 compatible channels in each group. Group 7-10: 16 compatible channels in each group. Group 11: Up to 8 channels can be saved & recalled. 961 user-defined frequencies in group 11.			
Receiving Mode	Diversity			
Oscillation Mode	PLL Synthesized. Frequency stability ≦± 0.005% (-10~+60℃)			
Sensitivity	10 dB μ V, at S/N > 80 dB			
S/N Ratio	> 106 dB(A)			
T.H.D.	< 0.5% @ 1 kHz			
Frequency Response	50 Hz~18 kHz			
Squelch	"PiloTone & NoiseLock" dual-squelch circuit			
Audio Output Adjustment	Output level is accurately pre-adjusted to equal the microphone capsule sensitivity.			Each channel has an individual volume control.
Max. Output Level	2-Level Switch: Line & Mic			
Power Supply	External AC adapter, 12~15V DC, 1A; Power Consumption: ACT-311B: 3W | ACT-312B: 5.5W | ACT-312BT: 12W | ACT-300B: 5.5W			
Dimensions (W × H × D)	210 × 44 × 180 mm / 8.3 × 1.7 × 7.1 "		420 × 44 × 180 mm / 16.5 × 1.7 × 7.1 "	
Weight	Approx. 0.8 kg / 1.8 lbs	Approx. 0.95 kg / 2.1 lbs	Approx. 1.75 kg / 3.9 lbs	Approx. 1.4 kg / 3.1 lbs
Transmitter	ACT-32H / 32HC Handheld & ACT-32T / 32TC Bodypack			
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.			

ACT-100B Dual-Channel Diversity Receiver

Patents :
Taiwan Utility M334588



Rear Panel



Features

1. EIA standard 1U metal receiver.
2. MIPRO's 3rd generation advanced RF and IF circuitry to improve anti-interference characteristics and increase the number of interference-free channels available.
3. Auto Scan function allows quick search for an interference-free working channel from 102 preset channels under 10 groups.
4. World's first ACT ™ function provides precise and rapid frequency sync to the transmitters.
5. Advanced diversity technology for optimum reception range reduces signal dropouts and the "PiloTone & NoiseLock" dual-squelch circuits prevent noise interference.
6. Clear and bright LED control panel.
7. Industry's only RF interference warning indicator for proper adjustments of the SQ level.
8. Three switchable output levels. Output level is accurately pre-adjusted to equal the microphone capsule's sensitivity, ensuring optimal performance.
9. A balanced volume control enables users to adjust the mixed output volume of two wireless microphones.
10. Receiver provides bias for booster where MIPRO antenna systems can be added for extended receiving range and stability.
11. Increased number of interference-free channels available, ideal for large, multiple KTV rooms.

Specifications

Channel	Dual
Frequency Range	480~934 MHz
Bandwidth	24 MHz
Preset Channels	102 preset channels. Group 1~6: 8 compatible channels in each group. Group 7~8: 12 compatible channels in each group. Group 9~10: 15 compatible channels in each group.
Receiving Mode	CPU-controlled Diversity
Oscillation Mode	PLL Synthesized. Frequency stability ≦± 0.005% (-10~+60℃)
Sensitivity	10 dB μ V, at S/N > 80 dB
S/N Ratio	> 106dB(A)
T.H.D.	< 0.5% @ 1kHz
Frequency Response	50 Hz~18 kHz
Squelch	"PiloTone & NoiseLock" dual-squelch circuit
Audio Output Adjustment	Output level accurately pre-adjusted to equal the microphone capsule sensitivity
Max. Output Level	3-Level Switch: +10 dB / 0 dB / -6 dB
Power Supply	External AC Adapter, 12~15V DC, 1A
Dimensions (W × H × D)	420 × 44 × 204 mm / 16.5 × 1.7 × 8 "
Weight	Approx. 1.7 kg / 3.7 lbs
Transmitter	ACT-32H / 32HC Handheld & ACT-32T / 32TC Bodypack
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.

B. Transmitters

ACT-32H Handheld Transmitter



Patents
Taiwan Utility M478971
China Utility ZL201420051347.4

ACT-32HR Remote Volume Control Handheld Transmitter (for MA-708 & MA-808 portables)



Features

1. Robust, lightweight plastic housing.
2. The unique multi-layered metal grille protects the capsule against impact, rolling and pop noise, ensuring clarity of sound.
3. Interchangeable capsule module with premium condenser or dynamic options for easy and fast changeovers.
4. Premium condenser capsules exhibit high fidelity, wide dynamic range, fast transient responses, good feedback rejection, accurate sound image characteristics, transparent sound quality and withstand maximum SPL.
5. Reversible end-cap allows power on/off switch being locked to avoid accidental power-off during performance.
6. Impact-resistant battery compartment holds 2 AA batteries.
7. Backlit LCD displays various parameters and status.
8. Stable PLL circuits. Automatically synchronized with the receiver's frequency by MIPRO's patented ACT ™ function.
9. Patented "built-in" antenna design.
10. Interchangeable colored rings for microphone channel identification on stage.
11. Industry's only digital master control can be adjusted manually or wirelessly via new ACT-32HR handheld transmitter microphone. (for MA-708 & MA-808 portables)
12. High-efficiency circuitry design provides more than 16 hours of operation from 2 AA batteries (depending on the battery quality).

Specifications

Model	ACT-32H	ACT-32HR
Built-in Volume Control	N/A	Yes. For MA-708 & MA-808 portables installed with MRM-70B or MRM-72B receiver modules
Housing	Rugged Plastic	
Frequency Range	480~934 MHz	
Bandwidth	24 MHz	
Oscillation Mode	PLL Synthesized	
Channel Set-Up	ACT Sync	
RF Output Power	10~30 mW (country dependent)	
Spurious Emissions	< -55dBc	
Max. SPL	140dB SPL	
LCD Display	Group, Channel, Battery status & Error codes	
Capsules	Interchangeable premium MU-90 / MU-80 / MU-70 ECM or MU-59 / MU-39 Dynamic	
Battery Type	2 AA alkaline	
Current Consumption	Approx. 92mA	
Dimensions (Ø × L)	50 × 233 mm / 2.0 × 9.2 "	
Weight	Approx. 246 g / 8.68 oz, excluding batteries	
Patents & Approvals	Patented. Telecom and safety regulations approved.	
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.	

ACT-32T Bodypack Transmitter



Features

1. Lightweight, compact size with sturdy plastic housing.
2. On the top features mute switch, mini-XLR connector and antenna.
3. Backlit LCD displays various parameters and status.
4. Innovatively designed battery cover allows easy access to operate buttons and prevents accidental operation.
5. Mute button with remote-control jack for easy activation of mute function.
6. Stable PLL circuits. Automatically synchronized with the receiver's frequency by MIPRO's patented ACT ™ function.
7. Can directly match to high-low input impedance for microphone or guitar without switching.
8. Mini-XLR input with secure screw lock connector for lavaliere / headworn mics and guitar.
9. Adjustable belt clip allows wearing transmitter in up or down position.
10. High-efficiency circuitry design provides 12~14 hours of operation from 2 AA batteries (depending on the battery quality).

Specifications

Housing	Rugged Plastic
Frequency Range	480~934 MHz
Bandwidth	24 MHz
Oscillation Mode	PLL Synthesized
Channel Set-up	ACT Sync
RF Output Power	10 mW / 50 mW (switchable, country dependent)
Spurious Emissions	< -55dBc
Max. Input Level	0dBV
Mute Connector	Optional MJ-70 remote mute switch
LCD Display	Group, Channel, Frequency, AF gain, Frequency band, RF power, Mute mode, Lock status, Battery status and error codes
Capsules	Headworn: MU-13 / MU-23 / MU-210 / MU-53HN / MU-55HN Lavalier: MU-53L / MU-55L
Battery Type	2 AA alkaline
Current Consumption	High Power: approx. 161mA ; Low Power: approx. 120 mA
Dimensions (W × H × D)	63 × 82 × 22 mm / 2.5 × 3.2 × 0.9 "
Weight	Approx. 81 g / 2.9 oz, excluding batteries
Patents & Approvals	Patented. Telecom and safety regulations approved.
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.

C. Rechargeable Transmitters

ACT-32HC Rechargeable Handheld Transmitter

Patents :
Taiwan Design D115708
China Design ZL200630006688.0
U.S. Invention 7978869



The rechargeable battery can be easily replaced



Capsule Housing



Capsule Battery Cover Rechargeable Battery Housing

Features

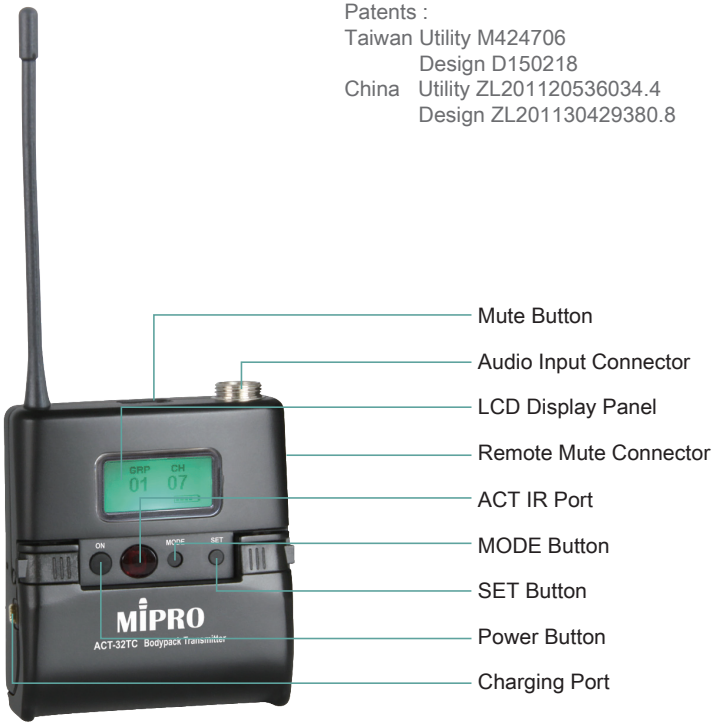
1. Robust, lightweight plastic housing.
2. The unique multi-layered metal grille protects the capsule against impact, rolling and pop noise, ensuring clarity of sound.
3. Interchangeable capsule module with premium condenser or dynamic options for easy and fast changeovers.
4. Proprietary condenser capsules exhibit high fidelity, wide dynamic range, fast transient responses, good feedback rejection, accurate sound image characteristics, transparent sound quality and withstands maximum SPL.
5. Proprietary lockable power on/off switch to avoid accidental power-off during performance.
6. Impact-resistant battery compartment holds an ICR 18500 rechargeable lithium battery.
7. Battery low LED indicator.
8. Stable PLL circuits. Automatically synchronized with the receiver's frequency by MIPRO's patented ACT ™ function.
9. Patented "built-in" antenna design.
10. Transmitter has high-efficiency circuitry design. The included single rechargeable lithium battery can be easily removed or interchanged for charging. The intelligent battery charger maintains a high charge capacity for up to 600 charge cycles for cost saving and is environmentally friendly.

Specifications

Housing	Rugged Plastic
Frequency Range	480~934 MHz
Bandwidth	24 MHz
Oscillation Mode	PLL Synthesized
Channel Set-Up	ACT Sync
RF Output Power	10~30 mW (country dependent)
Spurious Emissions	< -55dBc
Max. Input Level	140dB SPL
Display	LED Indicator
Capsules	Interchangeable premium MU-90 / MU-80 / MU-70 ECM or MU-59 / MU-39 Dynamic
Battery Type	ICR 18500 rechargeable lithium battery × 1
Current Consumption	High Power: approx. 125mA; Low Power: approx. 100mA
Operating Time	A 15-minute quick charge provides up to 1 hour usage. Minimum 15 hours of operation per 4-hour full charge.
Dimensions (Ø × L)	50 × 248 mm / 2.0 × 9.8 "
Weight	Approx. 249 g / 8.8 oz, excluding batteries
Patents & Approvals	Patented. Telecom and safety regulations approved.
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.

ACT-32TC Rechargeable Bodypack Transmitter

Patents :
Taiwan Utility M424706
Design D150218
China Utility ZL201120536034.4
Design ZL201130429380.8



Features

1. Lightweight, compact size with sturdy plastic housing.
2. On the top features mute switch, mini-XLR connector and antenna.
3. Backlit LCD displays various parameters and status.
4. Innovatively designed battery cover allows easy access to operate buttons and prevents accidental operation.
5. Mute button with remote-control jack for easy activation of mute function.
6. Stable PLL circuits. Automatically synchronized with the receiver's frequency by MIPRO's patented ACT ™ function.
7. Can directly match to high-low input impedance for microphone or guitar without switching.
8. Mini-XLR input with secure screw lock connector for lavaliere / headworn mics and guitar.
9. Adjustable belt clip allows wearing transmitter in up or down position.
10. Transmitter has high-efficiency circuitry design. The included single rechargeable lithium battery can be easily removed or interchanged for charging. The intelligent battery charger maintains a high charge capacity for up to 600 charge cycles for cost saving and is environmentally friendly.

Specifications

Housing	Rugged Plastic
Frequency Range	480~934 MHz
Bandwidth	24 MHz
Oscillation Mode	PLL Synthesized
Channel Set-up	ACT Sync
RF Output Power	10 mW / 50 mW (switchable, country dependent)
Spurious Emissions	< -55dBc
Max. Input Level	0dBV
Mute Connector	Optional MJ-70 remote mute switch
LCD Display	Group, Channel, Frequency, AF gain, Frequency band, RF power, Mute mode, Lock status, Battery status and error codes
Capsules	Headworn: MU-13 / MU-23 / MU-210 / MU-53HN / MU-55HN Lavalier: MU-53L / MU-55L
Battery Type	ICR 18500 rechargeable lithium battery × 1
Current Consumption	High Power: approx. 125mA; Low Power: approx. 100mA
Operating Time	A 20-minute fast charge provides up to 1 hour operation. Minimum 13 hours of operation per 4-hour full charge.
Dimensions (W × H × D)	63 × 70 × 25 mm / 2.5 × 2.8 × 1.0 "
Weight	Approx. 77 g / 2.7 oz, excluding batteries
Patents & Approvals	Patented. Telecom and safety regulations approved.
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.

Profile

1. This series has two true diversity receiver models: MR-818T 1U dual-channel and MR-818 1/2U single-channel receivers. Four diversity receiver models: MR-812T 1U quad-channel, MR-812 1/2U dual-channel, MR-811 1/2U single-channel and MR-823 1U dual-channel receivers.
2. PLL synthesized fixed frequency circuit for stability and effortless frequency setup.
3. RF and audio level indicators.
4. MH-80 handheld transmitter and MT-801a bodypack transmitter feature sturdy housing and brilliant sound quality.
5. Quick to install and easy to operate with high reliability and affordability.

Fixed Frequency True Diversity Wireless Systems

True Diversity Receivers	Transmitters

MR-818T



MR-818



MH-80



MT-801a



Fixed Frequency Diversity Wireless Systems

Diversity Receivers	Transmitters

MR-812T



MR-812



MR-811



MH-80



MT-801a



Diversity Receivers	Transmitters

MR-823



MH-80



MT-801a



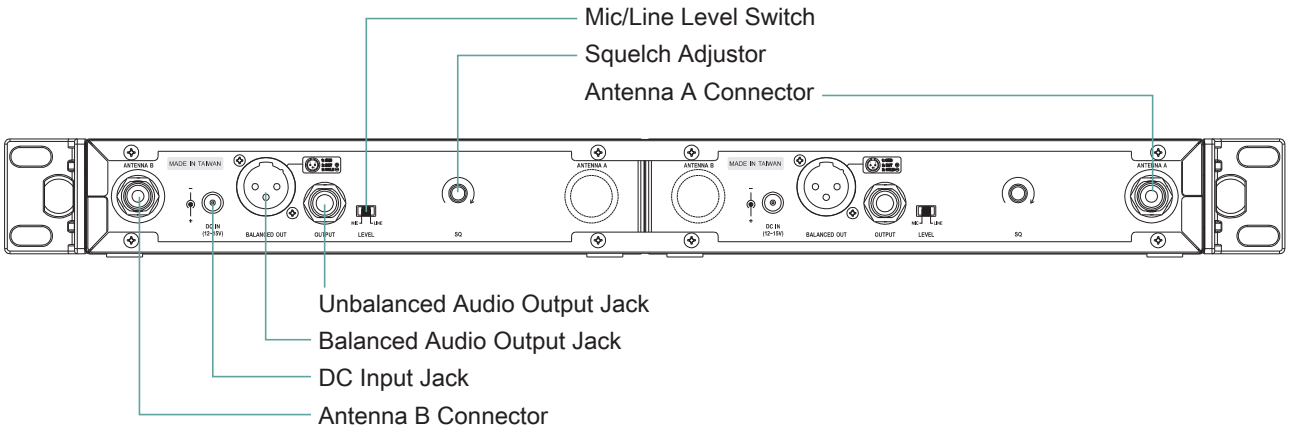
Fixed Frequency True Diversity Wireless Systems

A. Receivers

MR-818T Dual-Channel True Diversity Receiver



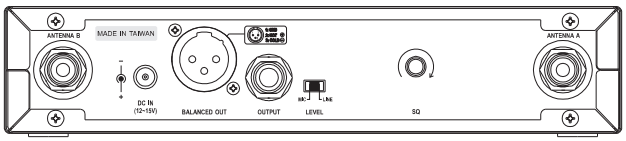
Rear Panel



MR-818 Single-Channel True Diversity Receiver



Rear Panel



Features

1. EIA Standard 19” metal housings improve heat dissipation and shielding from spurious interference.
2. MR-818 is a single-channel true diversity receiver. MR-818T is a dual-channel true diversity receiver.
3. PLL synthesized fixed frequency circuit for stability and effortless frequency setup.
4. Advanced true diversity technology ensures optimal reception range and eliminates signal drop-outs.
5. RF and audio level indicators.
6. Output level is accurately pre-adjusted to equal the microphone capsule sensitivity and ensures optimal performance.
7. Adjustable ‘SQ’ for increasing or decreasing sensitivity level for increased reception range or interference management.
8. Industry’s only RF interference warning indicator for SQ adjustment.
9. Up to 24 compatible channels can be used simultaneously at the same venue (country dependent).
10. New MH-80 handheld transmitter features sturdy housing, high-efficiency transmitting circuit, and brilliant sound quality.
11. Quick to install and easy to operate with high reliability and affordability.
12. Ideal for entry-level stage and PA applications.

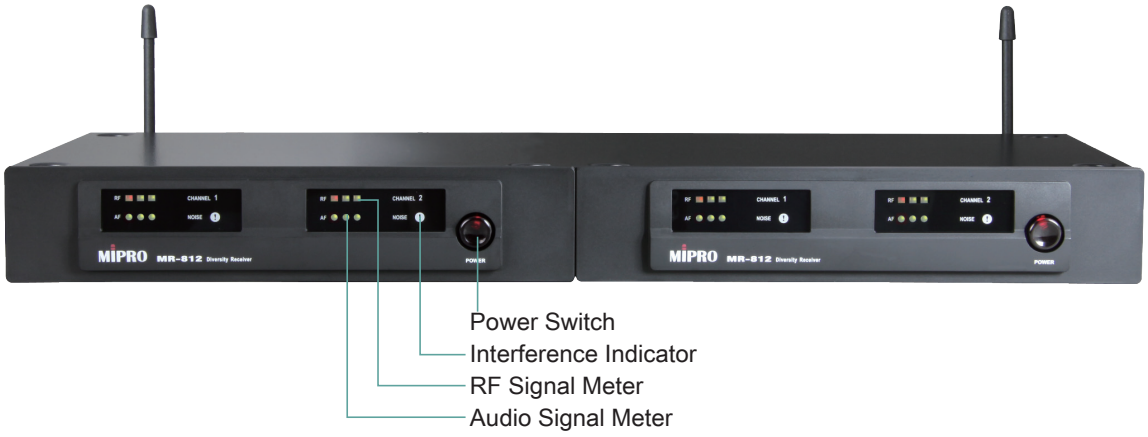
Specifications

Model	MR-818	MR-818T
Channel	Single	Dual
Chassis	EIA-Standard 19 " 1/2U	EIA-Standard 19 " 1U
Receiving Mode	True Diversity	
Frequency Range	780~930 MHz (country dependent)	
Antenna	Rear Panel. Detachable.	
Oscillation Mode	PLL Synthesized fixed-frequency; Frequency Stability ≦± 0.005% (-10~+60℃)	
Sensitivity	8 dB μ V, at S/N > 80 dB	
S/N Ratio	> 106 dB(A)	
T.H.D.	< 0.5% @ 1 kHz	
Frequency Response	50 Hz~18 kHz	
Squelch	“NoiseLock” squelch circuit	
Audio Output Adjustment	Output level accurately pre-adjusted to equal the microphone capsule sensitivity	
Max. Output Level	2-Level Switch: Line & Mic	
Power Supply	External AC Adapter, 12~15V DC, 1A; Power Consumption: 4W	External AC Adapter, 12~15V DC, 1A; Power Consumption: 8W
Dimensions (W × H × D)	210 × 44 × 180 mm / 8.3 × 1.7 × 7.1 "	420 × 44 × 180 mm / 16.5 × 1.7 × 7.1 "
Weight	Approx. 0.8 kg / 1.7 lbs	Approx. 1.6 kg / 3.5 lbs
Transmitter	MH-80 Handheld, MT-801a Bodypack	
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.	

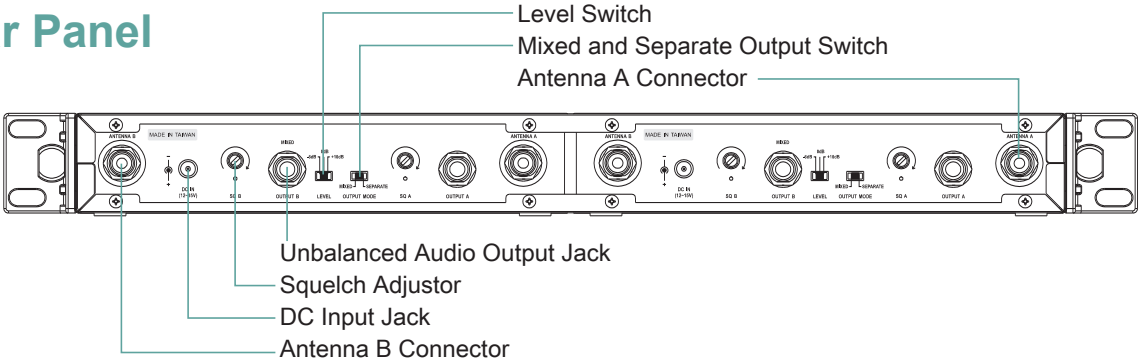
Fixed Frequency Diversity Wireless Systems

A. Receivers

MR-812T Quad-Channel Diversity Receiver



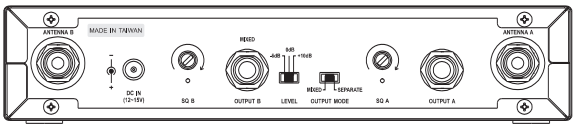
Rear Panel



MR-812 Dual-Channel Diversity Receiver



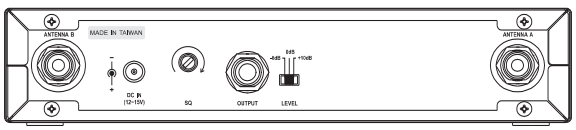
Rear Panel



MR-811 Single-Channel Diversity Receiver

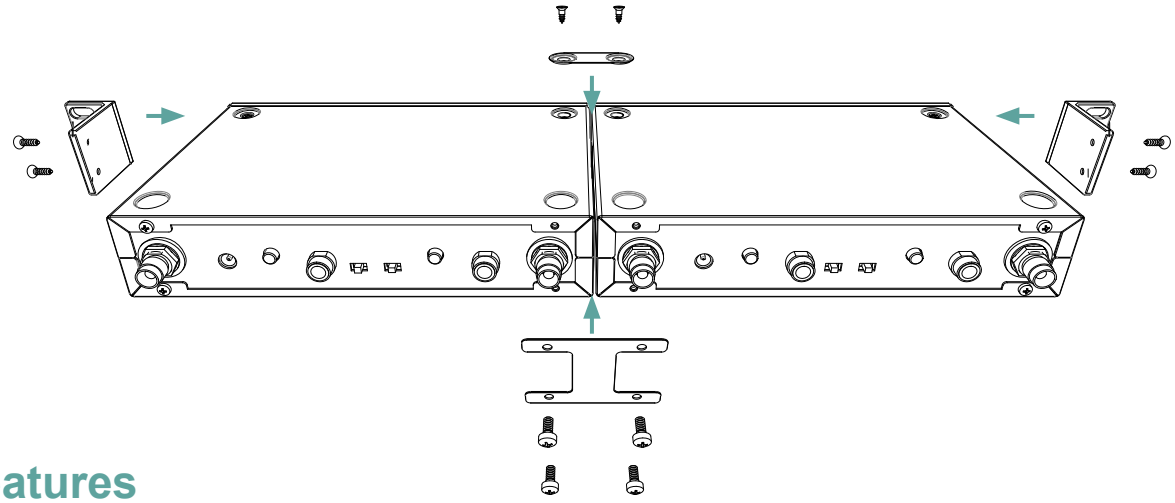


Rear Panel



Accessories for 2 half-rack receivers side by side assembly

Accessories and assembly figures for 2 half-rack receivers ACT-515B, ACT-311B, ACT-312B, MR-818, MR-811



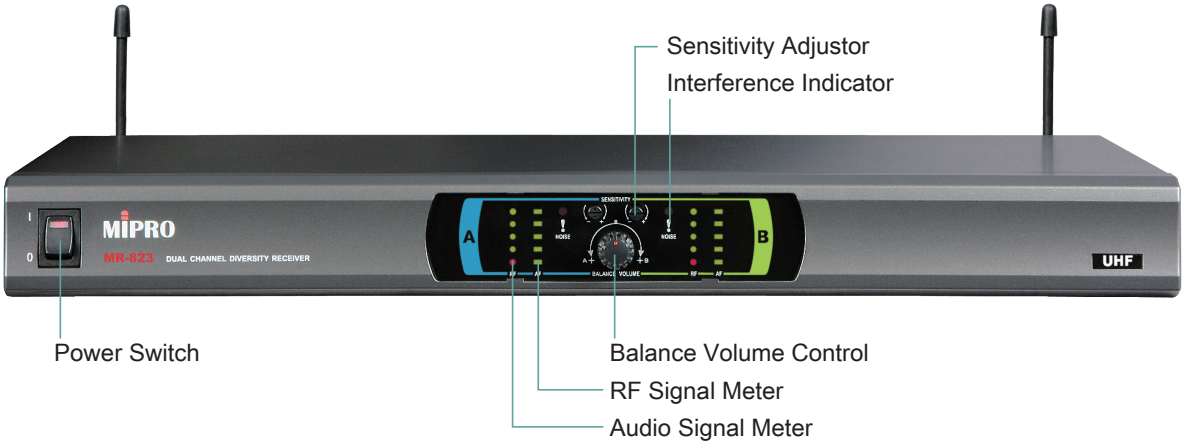
Features

1. EIA Standard metal housings improve heat dissipation and shielding from spurious interference.
2. MR-811 is a 1/2U single-channel diversity receiver. MR-812 is a 1/2U dual-channel diversity receiver.
3. MR-812T is a 1U quad-channel diversity receiver.
4. PLL synthesized fixed frequency circuit for stability and effortless frequency setup.
5. Advanced diversity technology ensures optimal reception range and eliminates signal drop-outs.
6. RF and audio level indicators.
7. Output level is accurately pre-adjusted to equal the microphone capsule sensitivity and ensures optimal performance.
8. Adjustable 'SQ' for increased or decreased sensitivity level for increased reception range or interference management.
9. Industry's only RF interference warning indicator for SQ adjustment.
10. Up to 24 compatible channels can be used simultaneously at the same venue (country dependent).
11. New MH-80 handheld transmitter features a sturdy housing, high-efficiency transmitting circuitry and brilliant sound quality.
12. Quick to install and easy to operate with high reliability and affordability.
13. Ideal for entry-level stage and PA applications.

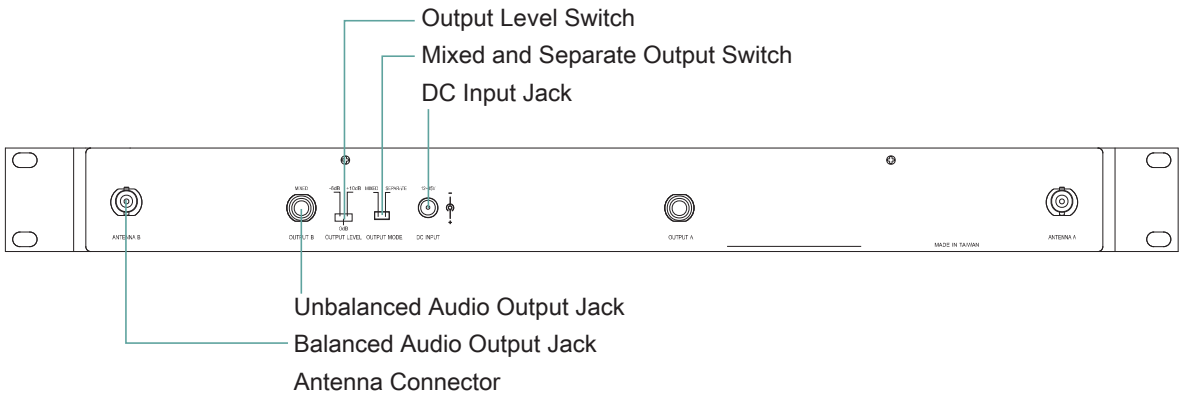
Specifications

Model	MR-811	MR-812	MR-812T
Channel	Single	Dual	Quad
Chassis	EIA-Standard 19 " 1/2U		EIA-Standard 19 " 1U
Receiving Mode	Diversity		
Frequency Range	480~934 MHz (country dependent)		
Antenna	Rear Panel. Detachable.		
Oscillation Mode	PLL Synthesized fixed-frequency; Frequency Stability ≦± 0.005% (-10~+60℃)		
Sensitivity	10 dB μ V, at S/N > 80 dB		
S/N Ratio	> 106 dB(A)		
T.H.D.	< 0.5% @ 1 kHz		
Frequency Response	50 Hz~18 kHz		
Squelch	"NoiseLock" squelch circuit		
Audio Output Adjustment	Output level accurately pre-adjusted to equal the microphone capsule sensitivity		
Max. Output Level	3-Level Switch: +10 dB / 0 dB / -6 dB		
Power Supply	External AC Adapter, 12~15V DC, 1A; Power Consumption: MR-811: 3W | MR-812: 6W | MR-812T: 12W		
Dimensions (W × H × D)	210 × 44 × 180 mm / 8.3 × 1.7 × 7.1 "		420 × 44 × 180 mm / 16.5 × 1.7 × 7.1 "
Weight	Approx. 0.8 kg / 1.7 lbs	Approx. 0.95 kg / 2.1 lbs	Approx. 1.75 kg / 3.8 lbs
Transmitter	MH-80 Handheld, MT-801a Bodypack		
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.		

MR-823 Dual-Channel Diversity Receiver



Rear Panel



Features

1. EIA Standard 19 " metal housings improve heat dissipation and shielding from spurious interference.
2. PLL synthesized fixed frequency circuit for stability and effortless frequency setup.
3. Diversity technology ensures optimal reception range and eliminates signal drop-outs.
4. RF and audio level indicators.
5. Increased bandwidth from 480~934 MHz.
6. Adjustable 'SQ' for increasing or decreasing sensitivity level for increased reception range or interference management.
7. Industry's only RF interference warning indicator for SQ adjustment.
8. Output level is accurately pre-adjusted to equal the microphone capsule sensitivity and ensures optimal performance.
9. A balanced volume control enables users to adjust the mixed output volume of two wireless microphones.
10. Ideal for entry-level stage and PA applications.

Specifications

Chassis	EIA-Standard 19 " 1U
Frequency Range	480~934 MHz (country dependent)
Receiving Mode	Diversity
Oscillation Mode	PLL Synthesized fixed-frequency; Frequency Stability ≦± 0.005% (-10~+60℃)
Sensitivity	10 dB μ V, at S/N > 75 dB
S/N Ratio	> 105 dB(A)
T.H.D.	< 0.5% @ 1 kHz
Frequency Response	50 Hz~18 kHz
Squelch	"NoiseLock" squelch circuit
Audio Output Adjustment	Output level accurately pre-adjusted to equal the microphone capsule sensitivity
Max. Output Level	3-Level Switch: +10 dB / 0 dB / -6 dB
Power Supply	External AC Adapter, 12~15V DC, 1A; Power Consumption: 6W
Dimensions (W × H × D)	420 × 44 × 204 mm / 16.5 × 1.7 × 8 "
Weight	Approx. 1.7 kg / 3.7 lbs
Transmitter	MH-80 Handheld, MT-801a Bodypack
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.

B. Fixed Frequency Transmitters

MH-80 Handheld Transmitter



Features

1. Fixed frequency with PLL synthesized technology ensures no need for frequency setup.
2. Innovatively designed housing in MIPRO's distinctive aesthetic and ergonomic style.
3. The unique multi-layered metal grille protects the capsule against impact, rolling and pop noise, ensuring clarity of sound.
4. Interchangeable capsule module with premium condenser or dynamic options for easy and fast changeovers.
5. Proprietary lockable power on/off switch to avoid accidental power-off during performance.
6. Impact-resistant battery compartment holds 2 AA batteries.
7. LED indicator for power-on and low-battery.
8. Interchangeable colored rings for microphone channel identification on stage.
9. Maximum 140dB SPL is achieved by the proprietary high dynamic range modulation circuitry.
10. High-efficiency circuitry design provides more than 17 hours of operation from 2 AA batteries (depending on the battery quality).

Specifications

Housing	Plastic
Frequency Range	480~934 MHz
Bandwidth	24 MHz
Oscillation Mode	PLL Synthesized fixed-frequency
RF Output Power	10~30 mW (country dependent)
Spurious Emissions	< -55dBc
Max. SPL	140dB SPL
Display	Power on & Battery status LED indicator
Capsules	Interchangeable premium MU-90 / MU-80 / MU-70 ECM or MU-59 / MU-39 Dynamic
Battery Type	2 AA alkaline
Current Consumption	Approx. 84mA
Dimensions (Ø × L)	50 × 233 mm / 2.0 × 9.2 "
Weight	Approx. 245 g / 8.6 oz, excluding batteries
Patents & Approvals	Patented. Telecom and safety regulations approved.
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.

MT-801a Bodypack Transmitter



Features

1. Lightweight, compact size with sturdy plastic housing.
2. Fixed frequency with PLL synthesized technology ensures no need for frequency setup.
3. High dynamic range modulation circuit sustains high SPL without distortion.
4. Mini-XLR input with secure screw lock connector for lavaliere / headworn mics and guitar.
5. High-efficiency circuitry design provides more than 17 hours of operation from 2 AA batteries (depending on the battery quality).

Specifications

Housing	Plastic
Frequency Range	480~934 MHz
Bandwidth	24 MHz
Oscillation Mode	PLL Synthesized fixed-frequency
RF Output Power	10~30 mW (country dependent)
Spurious Emissions	< -55 dBc
Max. Input Level	0 dBV
Capsules	Headworn: MU-13 / MU-23 / MU-210 / MU-53HN / MU-55HN Lavalier: MU-53L / MU-55L
Battery Type	2 AA alkaline
Current Consumption	Approx. 84mA
Dimensions (W × H × D)	63 × 105 × 21 mm / 2.5 × 4.1 × 0.8 "
Weight	Approx. 90 g / 3.2 oz, excluding batteries
Patents & Approvals	Patented. Telecom and safety regulations approved.
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.

BC-100 Wireless Boundary Microphone NEW

Gooseneck Mic Installation



Boundary Mic Installation

MM-202/Boundary Switch



Wireless Mic Installation



Installed with MM-202C/MM-202/202B/202A mic

Features

1. The BC-100 can be fitted with a MIPRO ACT-Series bodypack transmitter to form a wireless boundary microphone or connected with any of four gooseneck microphones.
2. The back panel has a balanced XLR connector with a switch to select the audio source from either the wireless boundary microphone or the optional gooseneck microphone.
3. A built-in MIPRO ECM (electret condenser microphone) provides excellent sensitivity and clear, highly intelligible sound reinforcement.
4. This built-in unidirectional microphone is used as a desktop interface microphone. The BC-100 also accepts the optional longer gooseneck MM-202C/ MM-202/ MM-202B microphones or the shorter MM-202A.
5. Simply plug the mini XLR into a MIPRO bodypack transmitter connector and insert the transmitter into the BC-100 base for an easy to use wireless conference system.
6. TALK/MUTE button provides easy speaking or mute option; a LED indicates status.
7. Ideal solution for boardrooms and conference centers.

Specifications

Built-in Microphone	Input Microphone Sensitivity: 50 Hz~20 kHz, Uni-directional (hypercardioid) Frequency Response: 50 Hz~20 kHz Maximum SPL: 132 dB SPL (1% T.H.D@1 kHz)
Power Supply	Built-in transmitter provides 12~48V DC phantom power
Input Connector	Mini TA4F XLR-4pin (male) × 1
Output Connector	Balanced XLR
TALK/MUTE Button	Mechanical PUSH-HOLD switch, with LED status indicator
Color	Black
Dimensions (W × H × D)	100 × 55 × 150 mm / 4 × 2.2 × 6 "
Weight	Approx. 170 g / 6 oz
Note	Refer to actual product in the event of product description discrepancy.

MD-101 Bodypack Transmitter Holder Base





Bodypack fitted with MM-202A

Features

1. The MD-101 is a holder base for most MIPRO bodypack transmitters.
2. Connects to MM-202C, MM-202, MM-202B or MM-202A gooseneck microphones for installation at podiums, lecterns, conference tables.
3. No set-up or power required. Simply insert the bodypack transmitter into the MD-101 base.

Specifications

Dimensions (W × H × D)	92 × 61 × 120 mm / 3.6 × 2.4 × 4.7 "
Weight	221 g / 7.8 oz
Color	Black
Note	Refer to actual product in the event of product description discrepancy.

BC-100T Rechargeable Wired/Wireless Conference Microphone

NEW



Front



Back



The BC-100T can be fitted with optional MM-202C/MM-202/202B/202A mics

Features

1. Operational controls and LCD display of operating parameters are conveniently located on top of housing which encloses an ACT-32TC transmitter PCB.
2. TALK/MUTE button provides easy speaking or mute option; a LED indicates status.
3. A gooseneck microphone installed on the BC-100T can be used either as a wired or wireless microphone.
4. The BC-100T accepts the optional longer gooseneck MM-202C/ MM-202/ MM-202B microphones or the shorter MM-202A; their cardioid ECM (electret condenser microphone) provides excellent sensitivity and clear, highly intelligible sound reinforcement.
5. Powered by an ICR 18500 rechargeable lithium battery, the BC-100T has built-in charging circuitry for recharging the battery.

Specifications

Power Supply	External 5V/1A power supply or lithium battery. Wired use requires external cable to provide 12~48V DC phantom power for microphone.
Input Connector	Mini TA4F XLR-4pin (male) × 1
Output Connector	Balanced XLR
TALK/MUTE Button	Mechanical PUSH-HOLD switch, with LED status indicator
Color	Black
Dimensions (W × H × D)	100 × 58 × 150 mm / 4 × 2.3 × 6 "
Weight	Approx. 670 g / 23.6 oz
Note	Refer to actual product in the event of product description discrepancy.

MES-100 WebMote Bridge NEW

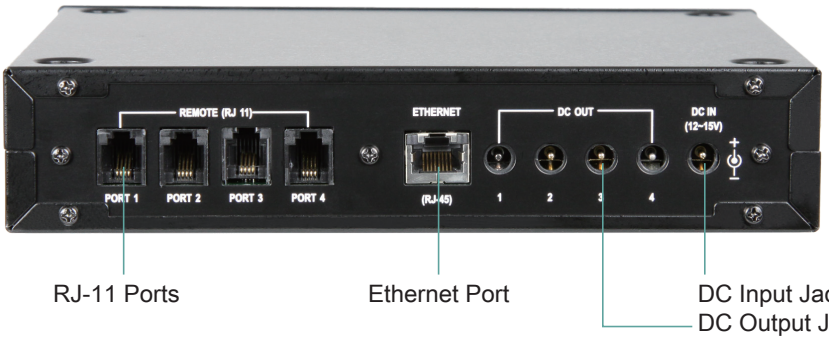
Profile

The MIPRO ACT-BUS interface allows for remote monitoring of ACT series receivers and can now be connected to the newly developed MIPRO MES-100 bridge server, providing remote monitoring and control using any internet browser.

The MIPRO MES-100 supports web-based monitoring and remote control for smartphones, tablets, PCs and laptops over a variety of operating systems, such as Windows, iOS, Android or Linux, etc. without the need for special software to remotely monitor and control all parameters. The MES-100 provides a solution for the incompatibility issues between the operating systems and monitoring software.

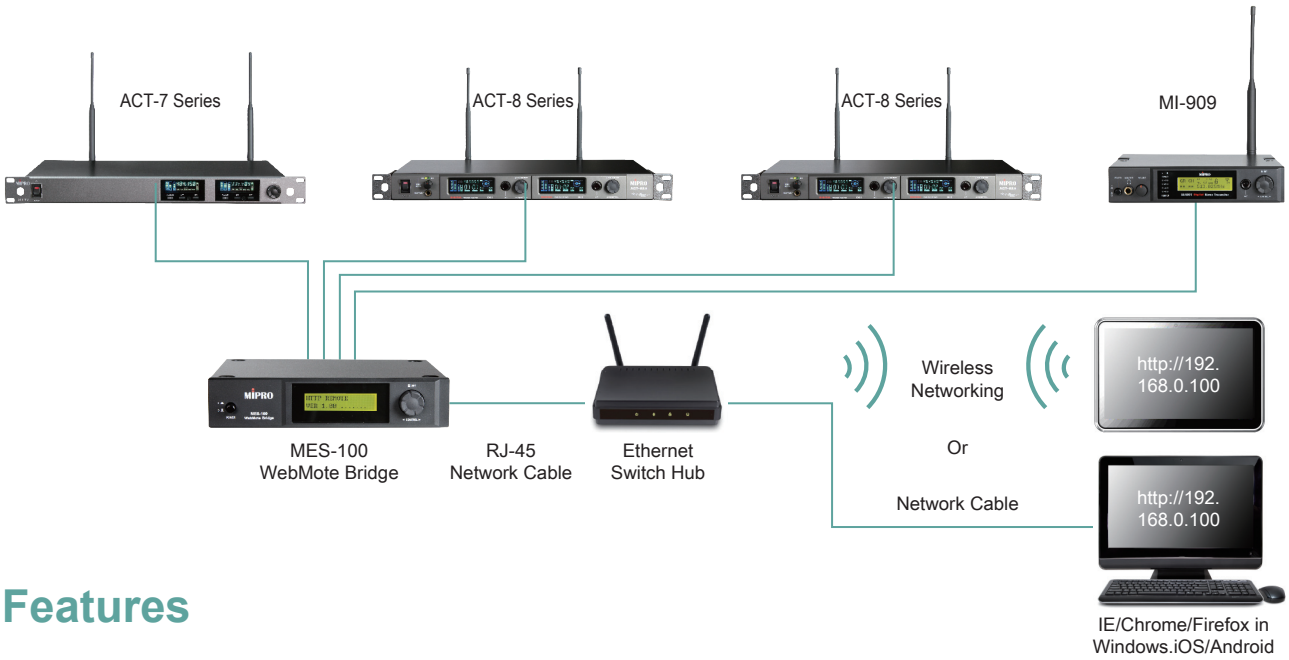


Rear Panel



MIPRO WebMote System Configurations

To remotely monitor and control all parameters of MIPRO wireless microphone systems, simply connect the MES-100 bridge server to the Ethernet switch hub. Users do not need to install any software and can directly use a browser (IE/Chrome/Firefox) in any operating system (Windows/iOs/Android) to link to the WebMote page via RJ-45 network cable, wireless LAN card or Wi-Fi.



Features

1. To Improve the Transmission Efficiency of ACT-BUS

Since Ethernet cable provides a 100Mbps data transfer rate, nearly 1,000 times faster than the ACT-BUS of 110 Kbps, the MES-100 uses four RJ-11 Ethernet interfaces to split the high-speed bandwidth to improve the speed of ACT-BUS devices. In the past, one RJ-11bandwidth of 110 Kbps had to be shared by 64 devices. Now, because the MES-100 provides four parallel RJ-11 ACT-BUS interfaces, the bandwidth is shared by only 16 devices and data transmission efficiency improves dramatically.

2. WebMote Interface, Software Installation is Not Required

WebMote (Web Remote Control Interface) is an interface provided by the MES-100 bridge server for remote monitoring. The interface shows a variety of MIPRO systems to choose from: Simply click on the appropriate receiver and the MES-100 will search the device connected to the RJ-11 socket and then lock onto its panel, allowing the user to monitor the status or change the parameters on the monitoring page.

The WebMote monitoring page is written in HTML5. Since browsers today can be compatible with any operating system, the user is able to connect to WebMote through the web to monitor any MIPRO products which are connected to the MES-100. In addition, since the WebMote monitoring page exists in the MES-100 bridge server, users don't have to pre-install any software, no matter whether they are using smart phones, tablets or computers. Internet accessibility is the only requirement.

3. Wirelessly Remote Control via Wi-Fi

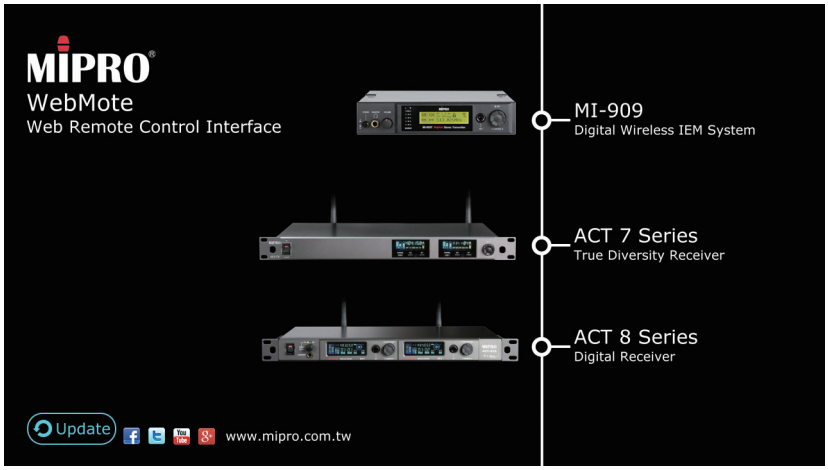
In addition to wired access, the MES-100 provides Ethernet, which can be connected to the switch hub as a wireless base station, thus allowing the users to wirelessly access the device through Wi-Fi.

Specifications

- Ethernet 10/100Mbps RJ-45 × 1
- MIPRO ACT-BUS RJ-11 × 4
- 12V/ 4A DC-Input × 1
- 12V/ 0.5A DC-Output × 4
- Backlit 16 × 2 LCD
- Rotary Control Knob
- Automatic / Manual IP set up
- Lock function
- Standard Internet Protocol IEE-802.3
- Dimensions: EIA-standard half 19" ; 210 × 44 × 180 mm / 8.3 × 1.7 × 7.1 " (W × H × D)

WebMote Remote Control Interface

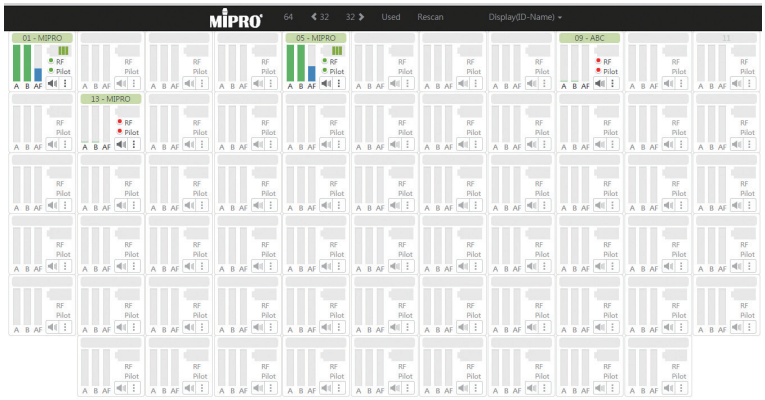
- Webpage Language: HTML5
- Homepage



- MI-909 Page

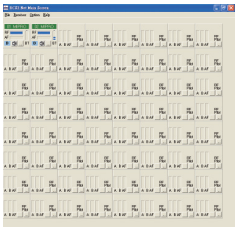


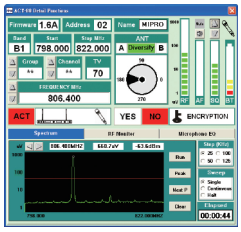
- ACT-7 Series Page

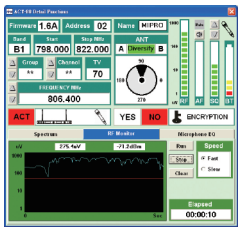


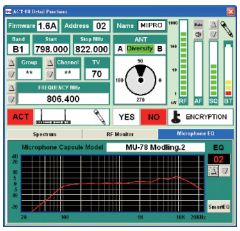


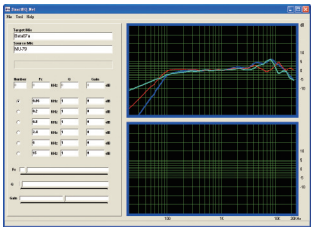
ACT-8D Digital Receivers PC Management Software


Master Window


Frequency Scanner Window

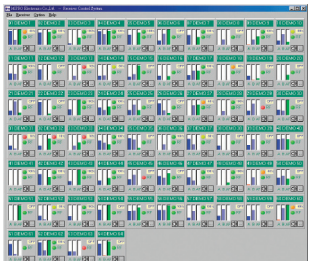

RF Signal Strength Window

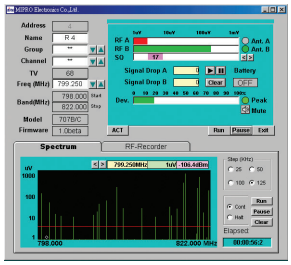

Frequency Response Window


Smart EQ Window

ACT-707SD Analog Receivers PC Management Software


Control & monitor up to 64 receiver channels.


Master Window


Detailed Channel Window

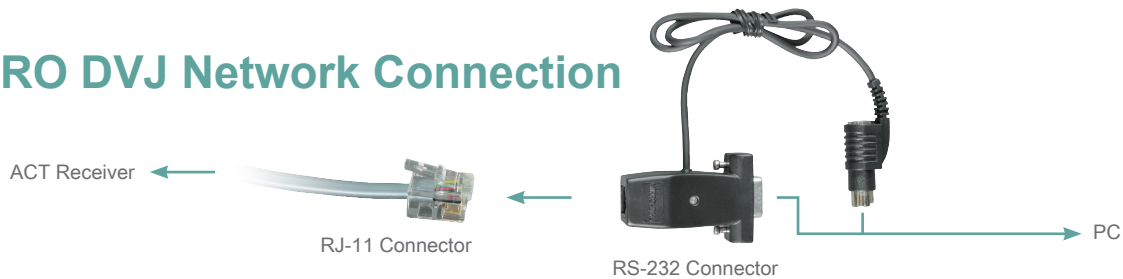
Features

This software is an advanced and user-friendly PC interface management program. The interface uses a MIPRO DVU USB connector or DVJ RS-232 connector to link an IBM-compatible PC to the receiver. The interface provides real time monitoring and remote control of up to 64 receiver modules simultaneously from distances of up to 300 meters away from the PC. The management software has a built-in high performance spectrum analyzer which allows direct setup of non-interference channels and monitors the wireless environment for all operating channels and interference signals.
The software is also capable of monitoring transmitter battery status, AF/RF & Antenna A/B strength. Additional features include a signal dropouts recording system where the history of the signal path can be reviewed for analysis, real-time program editing, multi-function and status display for your convenience.

MIPRO DVU Network Connection



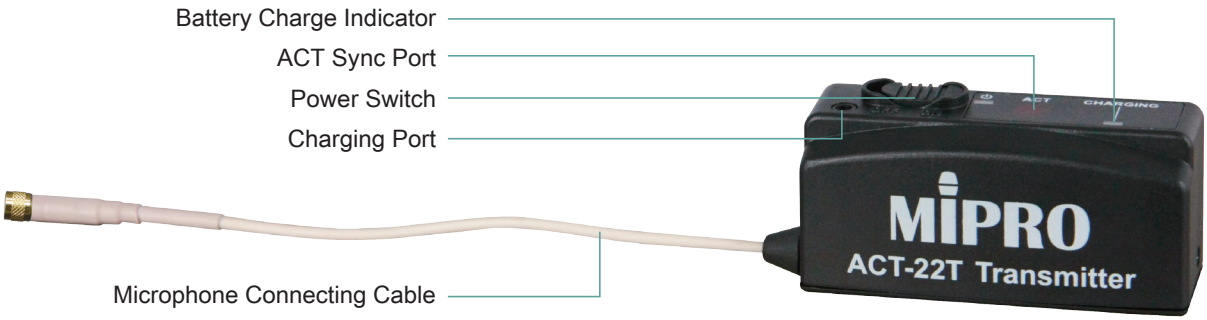
MIPRO DVJ Network Connection



Network Cable



ACT-22T Miniature Headworn Transmitter



Profile

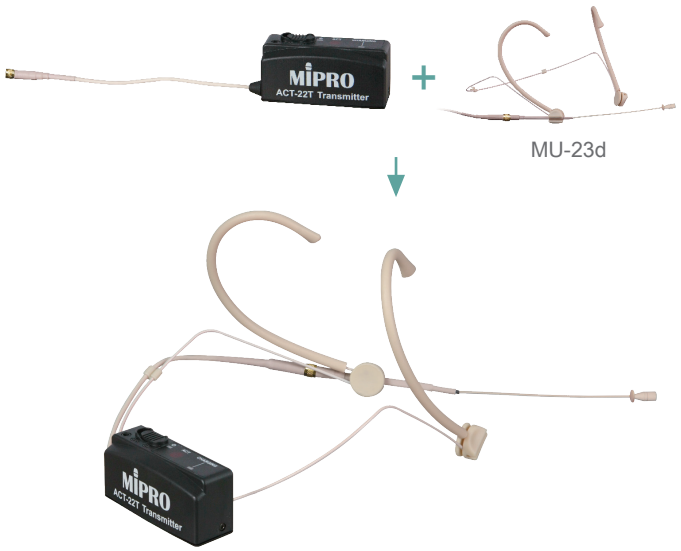
MIPRO introduces the ACT-22T, a compact, miniature transmitter. It allows complete freedom of mobility when connected with a headworn microphone with no bodypack and no cable. This true wireless solution offers a hands-free operation without cable entanglement and poor connection problems.

The ACT-22T utilizes PLL synthesized technology for increased RF stability and is packed into a lightweight, miniature housing so the transmitter can rest comfortably and securely, unobtrusive behind the head of the performer.

Featuring a built-in rechargeable lithium battery with a quick charger for extended battery hours, the transmitter' s patented ACT sync enables fast and easy transmitter setup with any MIPRO receiver.

The ACT-22T can be connected to a MU-210d or MU-23d headworn microphone. The ACT-22T is easy to use and ideal for education, theater, aerobics/fitness, houses of worship applications and anywhere true wireless freedom is desired.

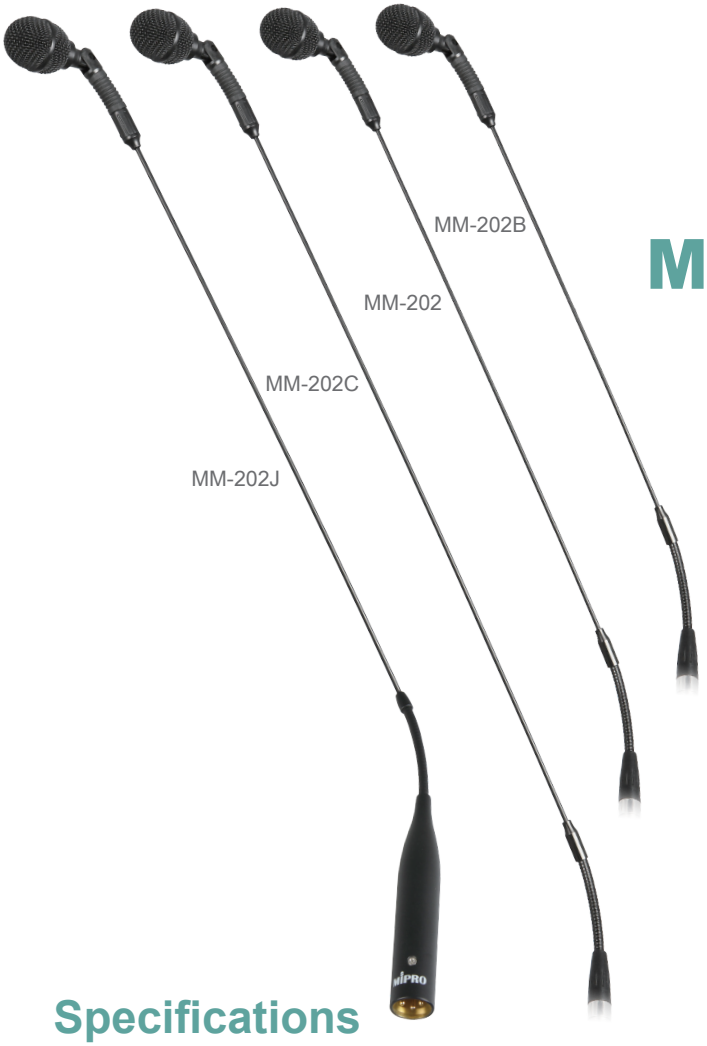
Assembled with MU-23d Headworn Microphone



Specifications

Oscillation Mode	PLL Synthesized
Frequency Range	480~934 MHz (country dependent)
Bandwidth	24 MHz
Channel Set-up	ACT Sync
RF Output Power	10~30 mW (country dependent)
Spurious Emissions	< -55 dBc
Battery Type	Built-in rechargeable lithium battery
Operating Time	Min. 4 hours
Headset Mics	MU-23d / MU-210d
Dimensions (W × H × D)	57 × 28 × 20 mm / 2.2 × 1.1 × 0.8 "
Weight	Approx. 38 g / 1.3 oz, rechargeable battery included
Patent & Approvals	Patented. Telecom and safety regulations approved.
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.

MM-202J
MM-202C
MM-202
MM-202B
Gooseneck Microphone



MM-202A Gooseneck Microphone



Patents :
Taiwan Utility M393930
China Utility ZL201020281130.4

MM-202S Gooseneck Microphone



MM-202P Gooseneck Microphone



Features

1. Ultra slim profile design for podiums, pulpit and lectern applications.
2. Proprietary microphone mount design allows 110 ° up/down and 300° left/right angle adjustments.
3. Shock isolation mount design minimizes handling and vibration noise.
4. Multi-layered microphone grill minimizes pop noise.
5. Can be connected to a MJ-53 Condenser Microphone Adaptor, provides 48V phantom power and can be used as a desktop gooseneck microphone.
6. Unmatched high fidelity sound reproduction.
7. MM-202P is designed to fit the MTG-100T or MTG-100Ta digital miniature transmitters and can be used as a handheld microphone for either tour guides or language interpretation applications.

Specifications

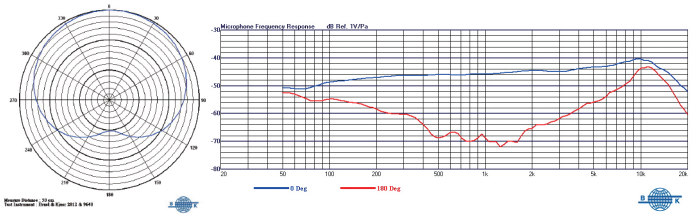
Model	MM-202J	MM-202C	MM-202	MM-202B	MM-202A	MM-202S	MM-202P
Capsule Module	10 mm Ø uni-directional condenser microphone						
Frequency Response	50Hz~18kHz						
Sensitivity	-46 ± 3dBV/Pa(0dB=1V/Pa)						
Max. SPL	142dB(Typical , 1%THD)						136dB(Typical, 1%THD)
Capsule Boom Holder	N/A						
Plug	XLR male	TA4F 4 PIN					3.5 mm Ø mini jack
Color	Black						
Length	545 (21.5 ") / 445 (17.5 ") mm	600 mm (23.6 ")	470 mm (18.5 ")	370 mm (14.5 ")	130 mm (5.1 ")	130 mm (5.1 ")	136 mm (5.3 ")
Weight	Approx. 125 g (4.4 oz) / 120 g (4.2 oz)	Approx. 38 g (1.3 oz)	Approx. 36 g (1.3 oz)	Approx. 34 g (1.2 oz)	Approx. 27 g (1 oz)	Approx. 27 g (1 oz)	Approx. 22 g (0.8 oz)
Note	Refer to actual product in the event of product description discrepancy.						

MU-210
Dual-Sided Headworn Microphone



Fixed Connector

MU-210 Polar Pattern / Frequency Response



MU-210d
Dual-Sided Headworn Microphone

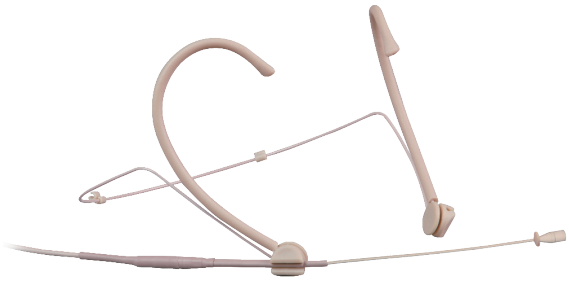


Detachable Connector



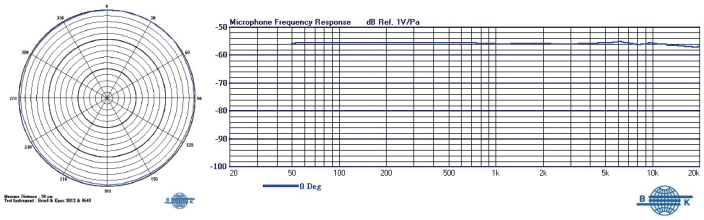
MU-2FL MU-2FM MU-2FS

MU-23
Dual-Sided Headworn Microphone

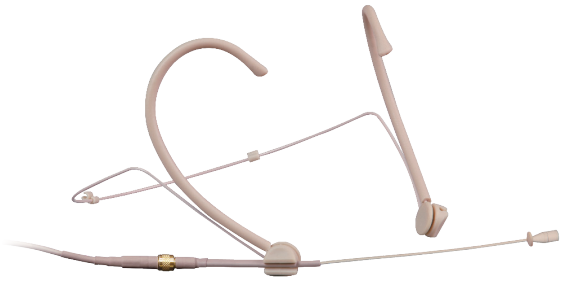


Fixed Connector

MU-23 Polar Pattern / Frequency Response



MU-23d
Dual-Sided Headworn Microphone



Detachable Connector

Features

1. Compact ear-hook design for a secure, ultra comfortable fit.
2. Supplied in three ear-hook sizes for ideal fit.
3. Detachable boom can be worn on left or right & detached for replacement or servicing.
4. MU-210/210d features a 10mm uni-directional capsule.
5. MU-23/23d features a 3mm omni-directional capsule.
6. Resistant to moisture, perspiration and salts.
7. Detachable or fixed microphone boom options.
8. Soft yet flexible thin boom bends 120 ° and holder can be rotated for an ideal fit.
9. Ideal for speech and vocal applications.

Specifications

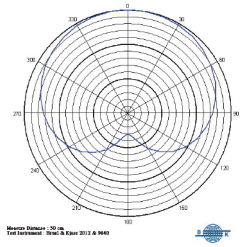
Model	MU-210 / MU-210d	MU-23 / MU-23d
Capsule Module	10 mm Ø uni-directional condenser microphone	3 mm Ø omni-directional condenser microphone
Frequency Response	50Hz~18kHz	40Hz~20kHz
Sensitivity	-46 ± 3dBV/Pa(0dB=1V/Pa)	-56 ± 3dBV/Pa(0dB=1V/Pa)
Max. SPL	142 dB (1%THD typical)	138 dB (1%THD typical)
Microphone Holder	Can be installed on right or left side.	
Plug	4-pin mini XLR (screw-lock)	
Color	Beige	
Cable Length	150 cm (59.1 ")	
Weight	Approx. 27 g (1.0 oz)	Approx. 22 g (0.8 oz)
Note	Refer to actual product in the event of product description discrepancy.	

MU-53L / MU-53LS
Uni-Directional Lavalier Microphones

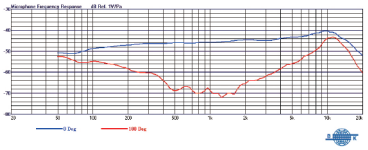


MU-53L MU-53LS

Polar Pattern



Frequency Response



Features

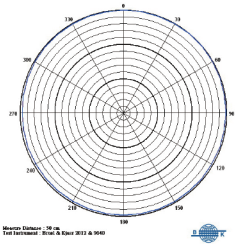
1. MU-53 features high dynamic range characteristics and sustains up to 142 dB SPL with 1% T.H.D.
2. Miniature MU-55 is inconspicuous, lightweight and waterproof.
3. Supplied with 4-pin mini XLR and fits all MIPRO bodypack transmitters.
4. Featuring a smooth, warm, natural sound.
5. Available in black or beige colors.
6. Ideal for theater, houses of worship and educational applications.

MU-55L / MU-55LS
Omni-Directional Lavalier Microphones

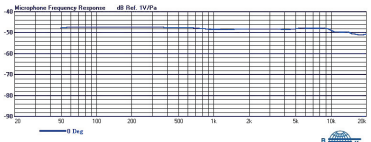


MU-55L MU-55LS

Polar Pattern



Frequency Response



Specifications

Models	MU-53L / MU-53LS	MU-55L / MU-55LS
Capsule Module	10 mm Ø uni-directional condenser microphone	4.5 mm Ø omni-directional condenser microphone
Frequency Response	50Hz~18kHz	40Hz~20kHz
Sensitivity	-46 ± 3dBV/Pa(0dB=1V/Pa)	-49 ± 3dBV/Pa(0dB=1V/Pa)
Max. SPL	142dB(Typical , 1%THD)	135dB(Typical , 1%THD)
Plug	4-pin mini XLR or TA4F	
Color	Black or Beige	
Cable Length	150 cm (59 ")	
Weight	Approx. 19 g (0.7 oz)	Approx. 14 g (0.5 oz)
Note	Refer to actual product in the event of product description discrepancy.	

MJ-53 Condenser Microphone Adaptor

MJ-53 enables a condenser microphone with mini XLR plug to connect directly to the XLR jack input of a mixer which provides 12~48V DC phantom power. The high output impedance of a condenser microphone will be transformed to low output impedance at about 200 Ohms.





Input



Output



Connected

Features

1. Balanced output for wide frequency response.
2. Suitable for any mixer input due to constant output impedance.
3. High S/N ratio prevents noise interference in long distance transmission.
4. High dynamic range ensures accurate output level.
5. No overload distortion under high SPL input.
6. Mini XLR connector for input and XLR connector for output.
7. Belt clip for easy wearing.
8. Rugged metal housing ensures a long operating life.

Specifications

Frequency Response	80 Hz (-3 dB) ~ 20 kHz (0 dB) @ 94 dB SPL
Output Impedance (Balanced)	200 Ohms @ 1V/1kHz
Max. Output Voltage	2.52V @ 1.0% THD 1kHz
Dynamic Range	120dB (A-weighting)

Power Supply	Phantom Power: 12~48V DC Current Drain: 2.0 mA
Dimensions (Ø × L)	19 × 902 mm (0.7 × 35.5 ")
Weight	Approx. 72 g (2.5 oz)
Note	Refer to actual product in the event of product description discrepancy.

TC-18
Transmitter Shielding Case

Profile

TC-18 is an important accessory case for large-scale wireless microphone applications. During setup and frequency coordination, it allows the convenient storage of up to 18 powered-on handheld or bodypack transmitters where it acts as an ideal shielding solution while testing for intermodulation interference, ensuring reliable RF transmission during performance.



Features

1. Rugged and durable carrying case.
2. Specialized shielding material protects the transmitters from scratches and impact damage.
3. Ideal shielding solution prevents intermodulation interference and ensures reliable RF transmission during performances.
4. Divided storage spaces for fast and easy access to transmitters.

Specifications

Storage	Up to 18 handheld or bodypack transmitters
Intermodulation Attenuation	> 40 dB
Dimensions (W × H × D)	52 × 37 × 30 cm (20 × 14.6 × 11.8 ")
Weight	12.6 kg (27.8 lbs)

MS-80
Microphone Tripod Stand



MS-50
Desktop Mic Stand



Features

Robust design with stable base. Heights and angles adjustable. Durable, dependable performance.

MS-20
Desktop Mic Stand

MD-20 is required for operation.



MD-20
Microphone Holder

MS-20 or any microphone stand is required for operation.



FB-10 Rack Mount Kit

Fits 1 MR-823, MR-812T, MR-818T receiver alone.



FB-30 Front Antenna Rack Mounting Kit

Fits 1 MR-823, MR-812T, MR-818T receiver alone.



FB-70 Front-to-Rear Antenna Kit



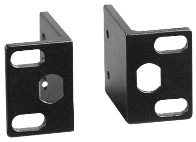
FB-71 Rack Mount Kit

Fits 1 ACT-311B, ACT-312B, ACT-515B, ACT-51B, ACT-52B, ACT-71, ACT-818 receiver alone.
Fits 1 MR-811, MR-812, MR-818 receiver alone.
Fits 1 MI-808T,MI-909T, MT-92A, MTS-100, AD-90S, AD-90A, AD-808.



FB-72 Rack Mount Kit

Fits 2 ACT-71, ACT-51B, ACT-52B, ACT-311B, ACT-312B receivers side-by-side.
Fits 1 ACT-300B, ACT-312BT, ACT-515BT, ACT-828 receivers.



FBC-71 Rear-to-Front Cables

Fits FB-71, FB-72, FB-10 rack mount kits (1-pair).



MU-40G Instrument Cable

Fits all MIPRO bodypack transmitters.
For guitar or bass.



MJ-70 Remote Mute Switch

Fits ACT-32T, ACT-32TC, ACT-52T, ACT-70T, ACT-70TC, ACT-72T, ACT-72TC, ACT-80T, ACT-80TC bodypack transmitters.



ASP-10 Neoprene Sports Pouch

Fits all MIPRO bodypack transmitters.



ASP-30 Neoprene Sports Pouch

Fits all MIPRO bodypack transmitters.



RH-77a Multi-Colored Rings

Fits ACT-32H, ACT-32HR, MH-80 handheld transmitters. (set of 10 colors)



RH-87 Multi-Colored Rear Clips

Fits ACT-80H, ACT-80HC, ACT-70H, ACT-70HC, ACT-72H, ACT-72HC handheld transmitters. (set of 10 colors)



SW-20 Foam Windscreens

Fits all MIPRO handheld transmitters.
5 colors option.
(set of 10 same colors)



PC-11 Controller

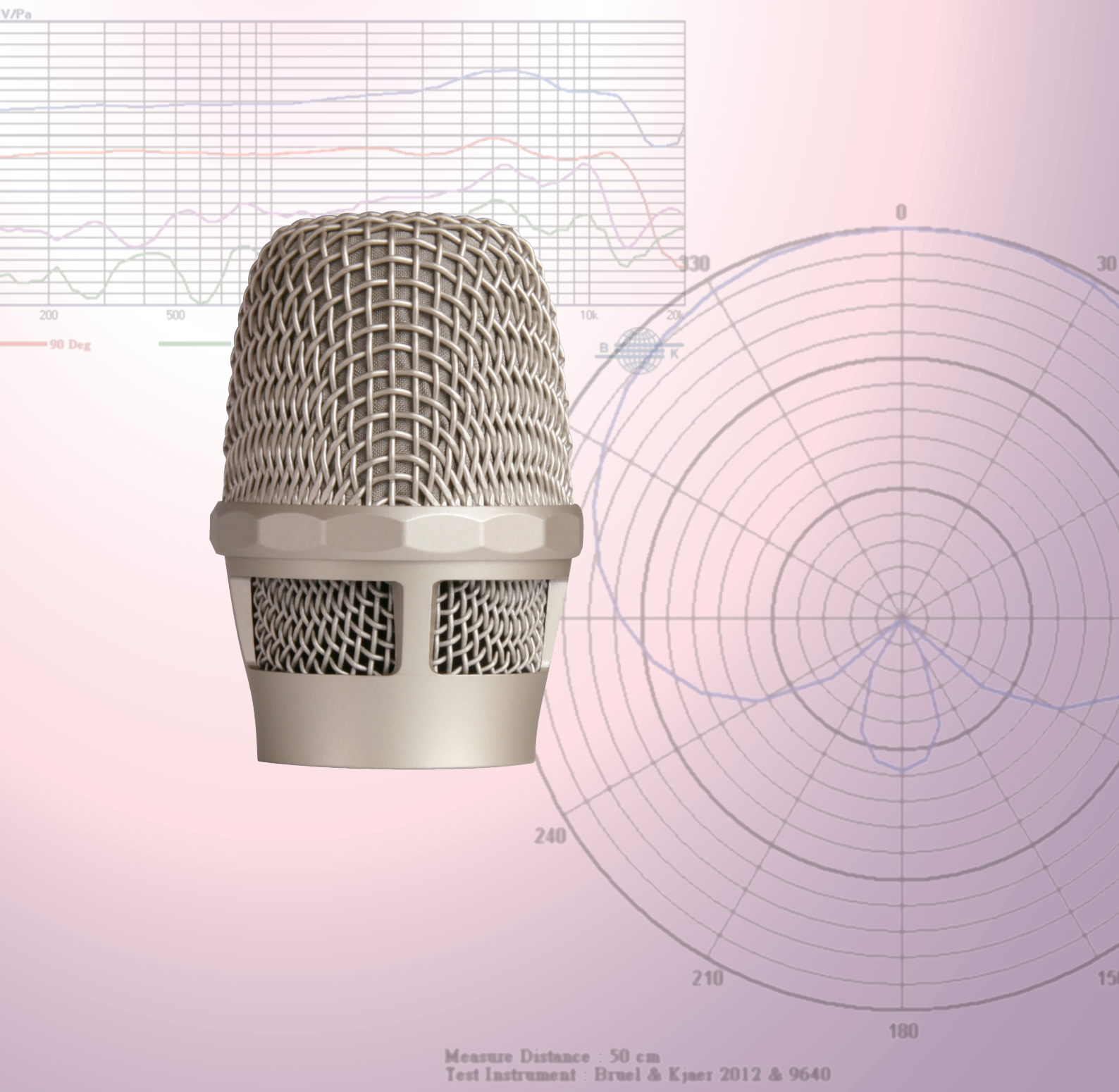


Microphone Capsule Modules

Electret Condenser Microphone Capsule Modules 76

Electret Condenser Microphone Capsule Modules for Instrument Microphones 77

Dynamic Microphone Capsule Modules 78

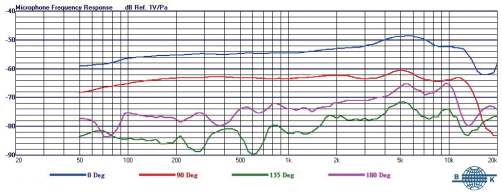


MU-90 ECM Capsule Module NEW

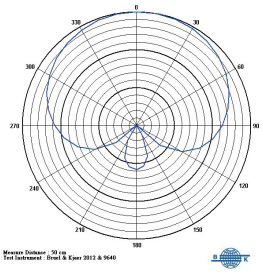
The MU-90 is a new premium condenser microphone capsule module from MIPRO which is encapsulated by a 20mm Ø CNC-lathed copper grille housing and assembled on a unique shock absorber. Its multi-layered anti-pop metal grille features full-range supercardioid directionality, high-fidelity and a wide frequency response. With a high dynamic range, rapid transient response, low feedback and low handling noise, the MU-90 has truly accurate sound reproduction characteristics.



Frequency Response



Polar Pattern



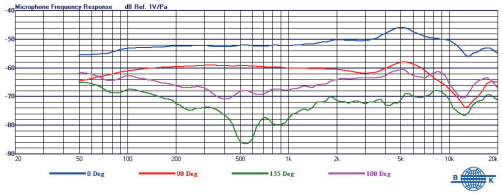
Taiwan Utility M403863
Utility M408201
China Utility ZL201020608625.3
Utility ZL201120072749.9
Germany Utility 202011000597.6

MU-80 ECM Capsule Module NEW

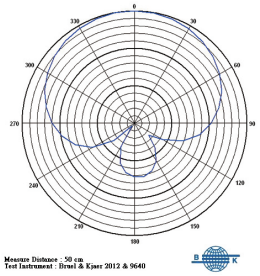
The capsule unit of the MU-80 is encapsulated by a 20mm Ø CNC-lathed aluminum grille housing and assembled on a unique shock absorber. Its multi-layered anti-pop metal grille features full-range supercardioid directionality, high-fidelity and a wide frequency response. With a high dynamic range, rapid transient response, low feedback and low handling noise, the MU-80 provides truly accurate sound reproduction.



Frequency Response



Polar Pattern



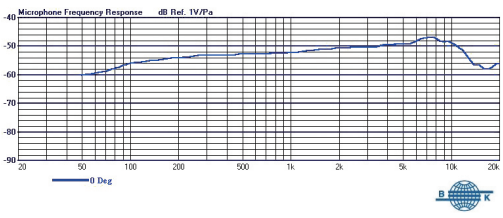
Taiwan Utility M403863
Utility M408201
China Utility ZL201020608625.3
Utility ZL201120072749.9
Germany Utility 202011000597.6

MU-70 ECM Capsule Module NEW

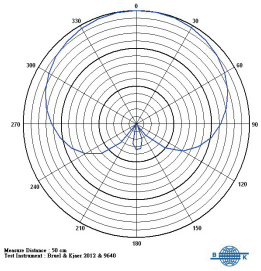
The capsule unit of the MU-70 is encapsulated by a16mm Ø CNC-lathed aluminum grille housing and assembled on a unique shock absorber. Its multi-layered anti-pop metal grille features full-range supercardioid directionality, high-fidelity and a wide frequency response. With a high dynamic range, rapid transient response, low feedback and low handling noise, the MU-70 has truly accurate sound reproduction characteristics.



Frequency Response



Polar Pattern



Taiwan Utility M403863
Utility M408201
China Utility ZL201020608625.3
Utility ZL201120072749.9
Germany Utility 202011000597.6

Specifications

Model	MU-90	MU-80	MU-70
Operating Principle	ECM		
Polar Pattern	Supercardioid		
Frequency Response	50Hz~20kHz		
Sensitivity	-52dB		
Max. SPL	150dB	149dB	

Profile

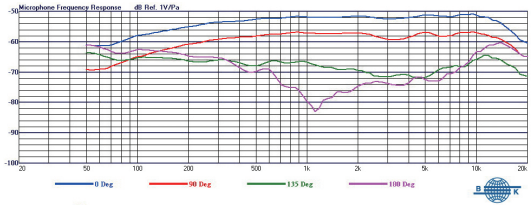
The MU-10, MU-16 and MU-20 detachable capsule modules are compatible with the SM-32 saxophone & wind instrument microphone and T-32 transmitter to suit various wind instruments and preferences. When the T-32 is correctly placed in position on these instruments, it captures the accurate sound of the instrument.

The three capsule modules are newly developed ECM capsule modules featuring full-range superb directionality, wide frequency response, high dynamic range, rapid transient response and low feedback characteristics.

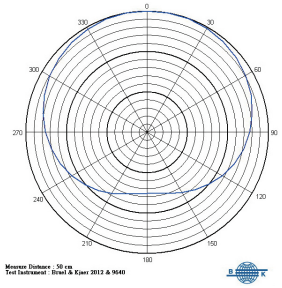
MU-10 ECM Capsule Module



Frequency Response



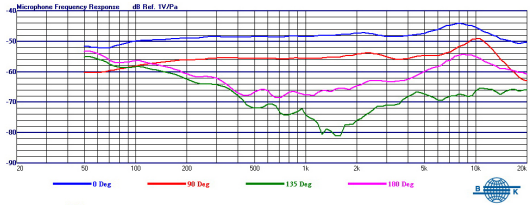
Polar Pattern



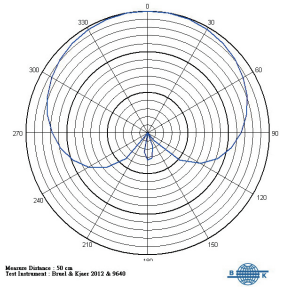
MU-16 ECM Capsule Module



Frequency Response



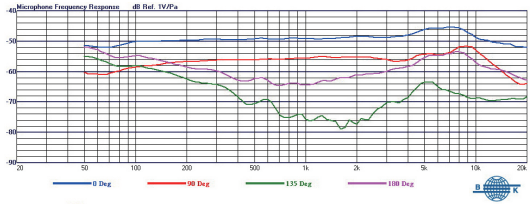
Polar Pattern



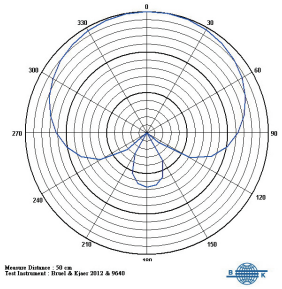
MU-20 ECM Capsule Module



Frequency Response



Polar Pattern



Specifications

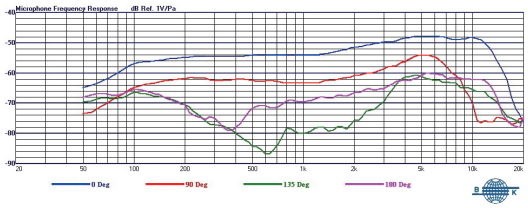
Model	MU-10	MU-16	MU-20
Operating Principle	ECM		
Microphone Capsule	10mmØ	16mmØ	20mmØ
Polar Pattern	Cardioid	Supercardioid	Supercardioid
Frequency Response	50Hz~20kHz		
Sensitivity	-49dB		
Max. SPL	142dB		

MU-59 Dynamic Capsule Module NEW

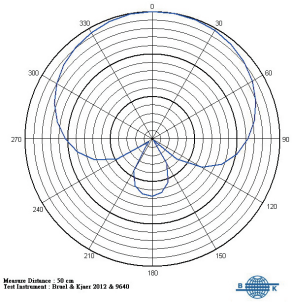
The MU-59 is a premium dynamic capsule module with steel air chamber which is integrated with the shock absorber for anti-shock and low handling noise. With a multi-layered anti-pop metal grille, it features superb directionality, high-fidelity, wide frequency response, high dynamic range and low feedback characteristics.



Frequency Response



Polar Pattern

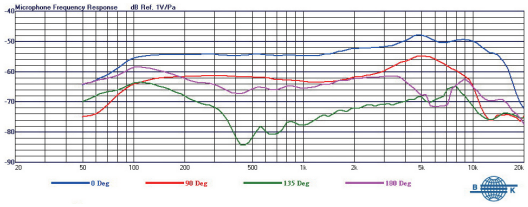


MU-39 Dynamic Capsule Module NEW

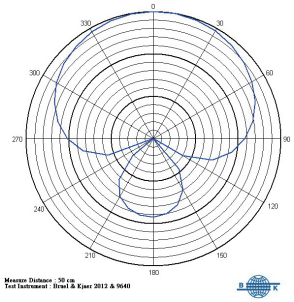
The MU-39 is a premium dynamic capsule module with steel air chamber which is integrated with a unique shock absorber for anti-shock and low handling noise. With a multi-layered anti-pop metal grille, it features superb directionality, high-fidelity, wide frequency response, high dynamic range and low feedback characteristics.



Frequency Response



Polar Pattern



Specifications

Model	MU-59	MU-39
Operating Principle	Dynamic	
Polar Pattern	Supercardioid	
Frequency Response	50Hz~18kHz	
Sensitivity	-54dB	

Wired Microphones

Condenser Microphones 80

Dynamic Microphones 82



Profile

Equipped with a cardioid microphone capsule, condenser microphones present a clear, crisp and detailed sound that is extremely close to the natural sound, making them the ideal choice for capturing both vocals and acoustic instruments. Especially ideal for percussion instruments and high-pitched orchestral instruments, condenser microphones are a must for places with low background noises such as concert halls, theaters and recording studios where the best sound quality is desired.

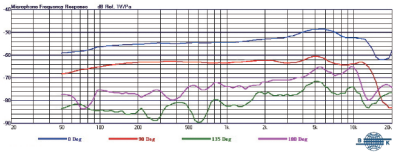
MM-90

Vocal Condenser Microphone

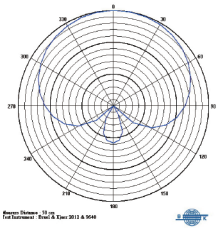


NEW

Frequency Response



Polar Pattern



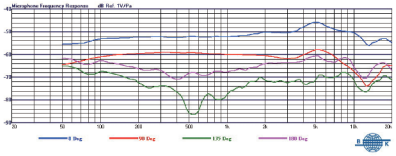
MM-80

Vocal Condenser Microphone

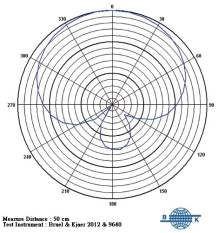


NEW

Frequency Response



Polar Pattern

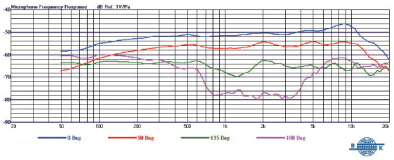


MM-707B

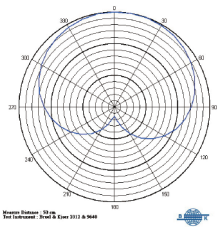
Vocal Condenser Microphone



Frequency Response



Polar Pattern



MM-90 Features

The MM-90 is fitted with a MU-90 capsule module. The exterior multi-layer metal grille protects the capsule to prevent impact pop noise. MM-90 requires external 12~48V DC phantom power to achieve accurate sensitivity. It provides superb directionality and feedback suppression for a bright and detailed sound quality while their proprietary capsule suspension design eliminates vibrations and touch noises for a true natural sound reproduction. It is ideal for vocal, stage, broadcast, studio and music hall applications.

MM-80 Features

The MM-80 is fitted with a MU-80 capsule module. The exterior multi-layer metal grille protects the capsule to prevent impact pop noise. MM-80 requires external 12~48V DC phantom power to achieve accurate sensitivity. It provides superb directionality and feedback suppression for a bright and detailed sound quality while their proprietary capsule suspension design eliminates vibrations and touch noises for a true natural sound reproduction. It is ideal for vocal, stage, broadcast, studio and music hall applications.

MM-707B Features

The MM-707B is fitted with a premium cardioid condenser capsule module. It provides superb directionality and feedback suppression for a bright and detailed sound quality. It features wide dynamic range, smooth frequency response and low touch noise. For speech application, it has minimum “box tone” effect and clear sound quality. It’ s ideal for percussion musical instruments or high frequency wind or string instruments.

Includes a built-in AA battery that lasts over 5,000 operating hours.

Specifications

Model	MM-90	MM-80	MM-707B
Capsule	MU-90	MU-80	EU-16
Housing	Die-cast zinc alloy housing		
Polar Pattern	Supercardioid		Cardioid
Sensitivity	-52 ± 1 dBV / Pa (0dB=1V Open-circuit voltage)		
Frequency Response	50Hz~20kHz (94dB SPL)		50Hz~18kHz (94dB SPL)
Self-Noise	<21dB SPL (Typical, A-weighted)		<25dB SPL (Typical, A-weighted)
S/N Ratio	> 72 dB @ 94dB SPL (1 Pa)		> 69 dB @ 94dB SPL (1 Pa)
Max. Input SPL	149dB (Typical, 1% T.H.D.)	147dB (Typical, 1% T.H.D.)	≧ 135 dB (1.5V battery) ≧ 145 dB (3.6V battery)
Dynamic Range	126dB		≧ 110 dB (1.5V battery) ≧ 120 dB (3.6V battery)
Power Supply	External phantom power 12~52V DC		AA × 1
Current Consumption	2.0mA		
Output Impedance	200 Ω		600 Ω
Dimensions (Ø × L)	51 × 200 mm / 2 × 7.9 "		51 × 190 mm / 2 × 7.5 "
Weight	Approx. 369 g / 13 oz	Approx. 364 g / 12.8 oz	Approx. 265 g / 9.3 oz
Note	Refer to actual product in the event of product description discrepancy.		

Profile

Equipped with a supercardioid microphone capsule, dynamic microphones present a softer, mellower and misty sound quality. They are ideal for rock-and-roll singers or outdoor venues that have loud background noises and violent acoustic effects.

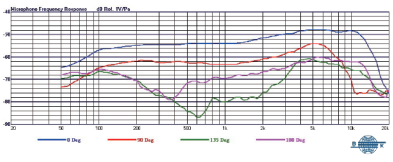
MM-59

Vocal Dynamic Microphone

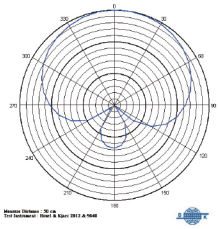


NEW

Frequency Response



Polar Pattern



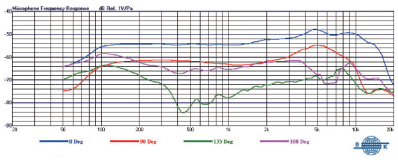
MM-39

Vocal Dynamic Microphone

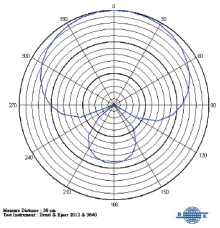


NEW

Frequency Response



Polar Pattern

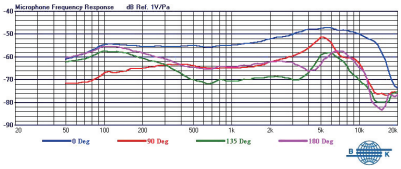


MM-107

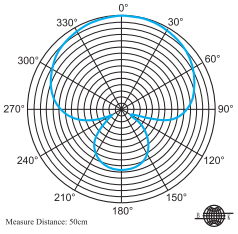
Vocal Dynamic Microphone



Frequency Response



Polar Pattern



MM-59 Features

- Fitted with interchangeable MU-59 supercardioid capsule module.
- The exterior multi-layer metal grille protects the capsule to prevent impact and pop noise.
- Focuses on the main sound source and minimizes background noise and feedback.
- Soft and mellow sound quality; Rich high and low-frequency presence.
- Sustains high SPL without distortion.
- Low handling noise.

MM-39 Features

- Fitted with interchangeable MU-39 supercardioid capsule module.
- The exterior multi-layer metal grille protects the capsule to prevent impact and pop noise.
- Focuses on the main sound source and minimizes background noise and feedback.
- Soft and mellow sound quality; Rich high and low-frequency presence.
- Sustains high SPL without distortion.
- Low handling noise.

MM-107 Features

- Fitted with MU-29 supercardioid capsule module.
- Focuses on the main sound source and minimizes background noise and feedback.
- Smooth sound quality and wide frequency response.
- Sustains high SPL without distortion.

Specifications

Model	MM-59	MM-39	MM-107
Capsule	MU-59 Dynamic (interchangeable)	MU-39 Dynamic (interchangeable)	MU-29 Dynamic
Housing	Die-cast zinc alloy		
Directionality	Supercardioid		
Sensitivity	-54 dBV/Pa (0dB=1V Open-circuit voltage)		
Frequency Response	50Hz-18kHz		
Output Impedance	400 Ω± 30%		
Dimensions (Ø × L)	51 × 204 mm / 2 × 8 "	51 × 198 mm / 2 × 7.8 "	51 × 178 mm / 2 × 7 "
Weight	Approx. 379 g / 13.4 oz	Approx. 363 g / 12.8 oz	Approx. 235 g / 8.3 oz
Note	Refer to actual product in the event of product description discrepancy.		

Dynamic and Condenser Microphones Comparison Chart

Item	Dynamic Microphone	Condenser Microphone
Design Principle	Based on the principle of an electromagnetic generator, a voice coil is attached to a thin plastic diaphragm in the magnetic field of the magnet. When the diaphragm picks up sound, the voice coil indirectly converts the sound into an electrical signal.	Based on the charging/discharging principle of a capacitor, it employs an extremely thin metal or metal-coated plastic diaphragm. Sound pressure changes a static electric voltage between two poles and converts it directly into an electrical signal.
Diaphragm	A dynamic microphone's diaphragm has to bear the weight of the voice coil, which is a hundred times more than itself, so the diaphragm cannot be too thin. The total weight of its vibration system is 1000 times more than a condenser's.	The diaphragm is 1/10 the thickness and 1/1000 the weight of a dynamic capsule's. Utilizing this extremely thin and light diaphragm to pick up sound pressure directly ensures excellent performance in frequency response, transient response, sensitivity, and touch noise.
Voice Coil	The voice coil is the main component that converts sound pressure on the diaphragm into an electrical signal.	No voice coil is required.
Signal Output	The output is either directly from the voice coil or through a coupling transformer.	The output signal is coupled by vacuum tube or FET.
Frequency Response	Due to the thickness of the diaphragm and heavy weight of the voice coil, the high-frequency response cannot be expanded; moreover, the low-frequency response drops rapidly because the impedance of the voice coil grows weaker as the frequency decreases.	Because the diaphragm is extremely thin and light, it can directly convert sound into signal output. Hence, its frequency response can be expanded from ultra-low frequencies to ultrasonic in a flat and wide response.
Sensitivity	Limited by the thick diaphragm and the number of voice coil turns, sensitivity to weak sounds is compromised.	Diaphragm does not carry any voice coil and is extremely thin; hence, it is very sensitive to even the weakest sound.
Touch Noise	The thick and heavy diaphragm and voice coil make it hard to overcome the touch noise problem, thus adversely affecting sound quality.	Because its diaphragm is extremely light and thin, it has the advantage of extremely low touch noise.
Durability	Since the capsule is large and heavy, it has a high failure rate if accidentally dropped.	The capsule itself is very light, so chances of accidental damage by dropping are very slim.
Dimension & Weight	Large size and heavy weight limits uses.	Advantage of miniature size.
Phantom Power	No phantom power is required.	Phantom power is required
Transient Response	Transient response is slow due to the much heavier diaphragm and voice coil. Thus, the response to the sound is just like a fully loaded truck that responds slowly when accelerating and braking.	Because the diaphragm is very thin and light, the transient response is fast. The sound pickup is just like a sport car that can accelerate and brake very quickly.
Sound Quality	Due to a slow transient response, these capsules present a softer, mellower and misty sound.	With its rapid transient response, these capsules present a clear, crisp and detailed sound that is extremely close to the natural sound.

Musical Instrument Microphones

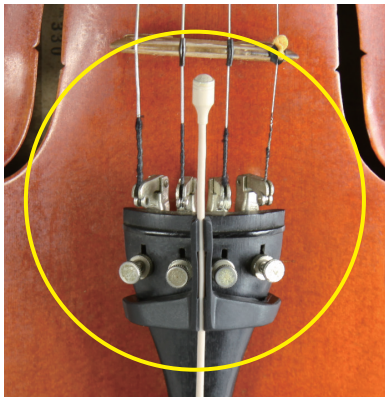
Violin Microphones	85
Guitar Transmitter	87
Saxophone & Wind Instrument Microphones	88
Erhu Microphones	91



VM-22 Violin Microphone Set

The MIPRO VM-22 violin set has been designed after years of collaborating with professional musicians. It fits snugly, is easy to install and remove and protects these expensive instruments from surface scratches. It can be strategically placed in positions that pick up the accurate sound of the instrument while minimizing handling noise during performance. Each set includes the following components.



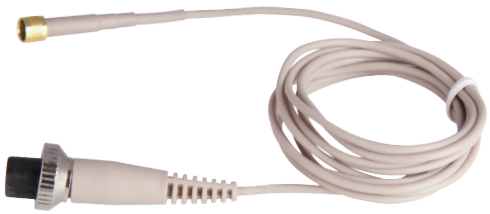


Installation on Violin

Patents :
Taiwan Utility M431407
China Utility ZL201220047110.X

VC-22 Violin Microphone Cable

For audio output, connect the VM-22 with a VC-22 cable.
Two connecting methods:



(1) Wireless: Connect the VM-22 with a VC-22 cable to any MIPRO ACT-series bodypack transmitter for wireless transmission to a matching receiver hooked up to a PA system.



VC-22 VM-22 Receiver PA system

(2) Wired: Connect the VM-22 with VC-22 to a MJ-53 condenser microphone adaptor and plug into a PA system.



VC-22 VM-22 MJ-53 Mixer

VT-22 Wireless Violin Set

The VT-22 wireless violin set is designed for a cable-free, truly wireless violin audio performance. No external connecting is required. Simply integrate the miniature, lightweight T-22 transmitter to its proprietary violin mount. This attaches snugly to violins and is easy to install and remove while protecting these expensive instruments from surface scratches. Strategically placed in flexible positions, they will not interfere during performances.

Patents :
Taiwan Utility M431407
China Utility ZL201220047110.X



VT-22



Front





ACT-series receivers

or



Wireless PAs

GT-24 Digital Guitar Transmitter NEW

Profile

The GT-24 is industry's first miniaturized digital transmitter with an integrated 3.5mm to 6.3mm threaded adaptor, designed for electric guitar, electric bass or electric piano. It is compatible with ACT-2400 series receivers. Simply plug it into the input of the instrument, providing a true wireless audio performance with no cables or bodypacks.



Ø3.5mm



Ø6.3mm Phone Jack



The GT-24 can be recharged by the MP-80 charger



Compatible with ACT-2400 series receivers

Features

1. Easy to use and the plug can be rotated up to 90° .
2. 2.4G-ISM band stable digital FSK modulation circuit. All frequencies are located in this band.
3. FHSS frequency-hopping technique and adaptive tracking algorithm, which effectively avoids interference from 2.4G communication products.
4. With dual tuner true diversity receiving, the receiving distance is up to 100 meters (330 ft.) line-of-sight with no signal drop-out.
5. Eliminate the annoying compander noise that exists in analog systems.
6. Transmitter has high-efficiency circuitry design. The included single rechargeable lithium battery can be easily removed or interchanged for charging. The intelligent battery charger maintains a high charge capacity for up to 600 charge cycles for cost saving and is environmentally friendly.
7. Easily replaceable battery or recharge the GT-24 directly with an adaptor plug.

Specifications

Frequency Range	2.4~2.4835GHz
RF Output Power	2 mW / 10 mW switchable (country dependent)
Audio Sampling	24-bit / 44.1 kHz Rate
Frequency Response	20Hz~20kHz
Latency	< 4.0ms
Impedance	1.0 M Ω
Connector	3.5mm to 6.3mm threaded adaptor
Battery Type	ICR 18500 rechargeable lithium battery × 1
Current Consumption	138mA
Operating Time	A 25-minute quick charge provides up to 1 hour usage. Minimum 10 hours of operation per 4-hour full charge.
Dimensions (W × H × D)	84 × 42 × 31 mm / 33.1 × 16.5 × 12.2 "
Net Weight	Approx. 52 g / 1.8 oz., excluding battery
Note	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.

Saxophone Playing



SM-32

Saxophone & Wind Instrument Microphone Set

The MIPRO SM-32 saxophone set has been designed after years of collaborating with professional musicians. Three detachable wide dynamic range condenser microphone capsules, MU-10, MU-16 and MU-20, together with a gooseneck clip, offer optimal flexibility for performers and instruments. A shock-proof suspension microphone module is connected to a gooseneck for minimizing handling and hitting noises. Simply connect the SM-32 to the SH-32 and strategically place in a position that is not obstructive to performances. The SM-32 is easy to use, install or remove, and is ideal for saxophone performers.



SH-32

Saxophone Microphone Clip

SM-32 or T-32 saxophone transmitter fits snugly and easy to remove and protects the expensive instruments from surface scratches.



SC-32

Saxophone Microphone Cable

For audio output, connect the SM-32 with SC-32 to a transmitter or a PA system. Two connecting methods:



(1) Wireless Transmission:

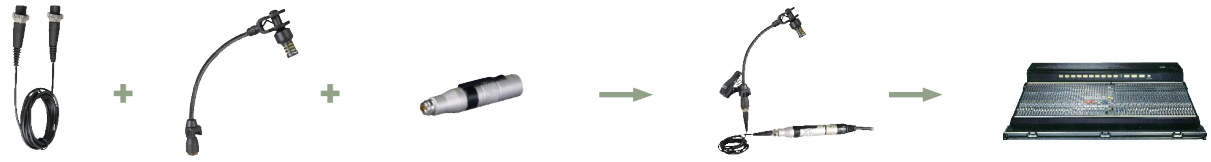
Connect the SM-32 with SC-32 to any MIPRO ACT-series bodypack transmitter with matching receiver hooked up to a PA system.



SC-32 SM-32 Receiver PA system

(2) Wired Transmission:

Connect the SM-32 with SC-32 to an optional MJ-53 condenser microphone adaptor and plug into a PA system.



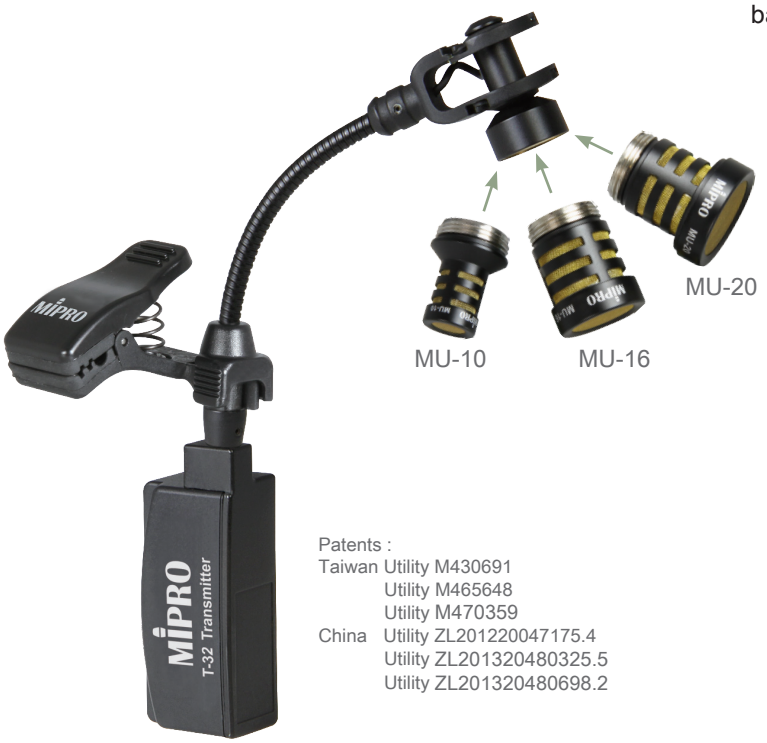
SC-32 SM-32 MJ-53 Mixer

ST-32

Wireless Saxophone & Wind Instrument Set

The ST-32 saxophone set is a SH-32 integrated with a T-32 transmitter for a cable-free, truly wireless audio performance ~ simply clamp the ST-32 snugly to a saxophone or other wind instrument. The ST-32 is easy to install and remove, protecting these expensive instruments from surface scratches.

As with any wireless performance, the ST-32 requires an ACT-series receiver or MA-series wireless PA system to complete the system.



ST-32

Patents :
Taiwan Utility M430691
Utility M465648
Utility M470359
China Utility ZL201220047175.4
Utility ZL201320480325.5
Utility ZL201320480698.2

T-32

Gooseneck Microphone Transmitter

The T-32 is a SM-32 saxophone microphone set integrated with a transmitter, without connecting cable.

The T-32 is powered by a built-in, high performance rechargeable lithium battery, enabling up to 6 hours of performance per full charge. A 10-minute quick charge provides up to 40 minutes usage. It is good practice to have an additional charged T-32 available as a standby backup transmitter during performances.



T-32 Receiver



PA system

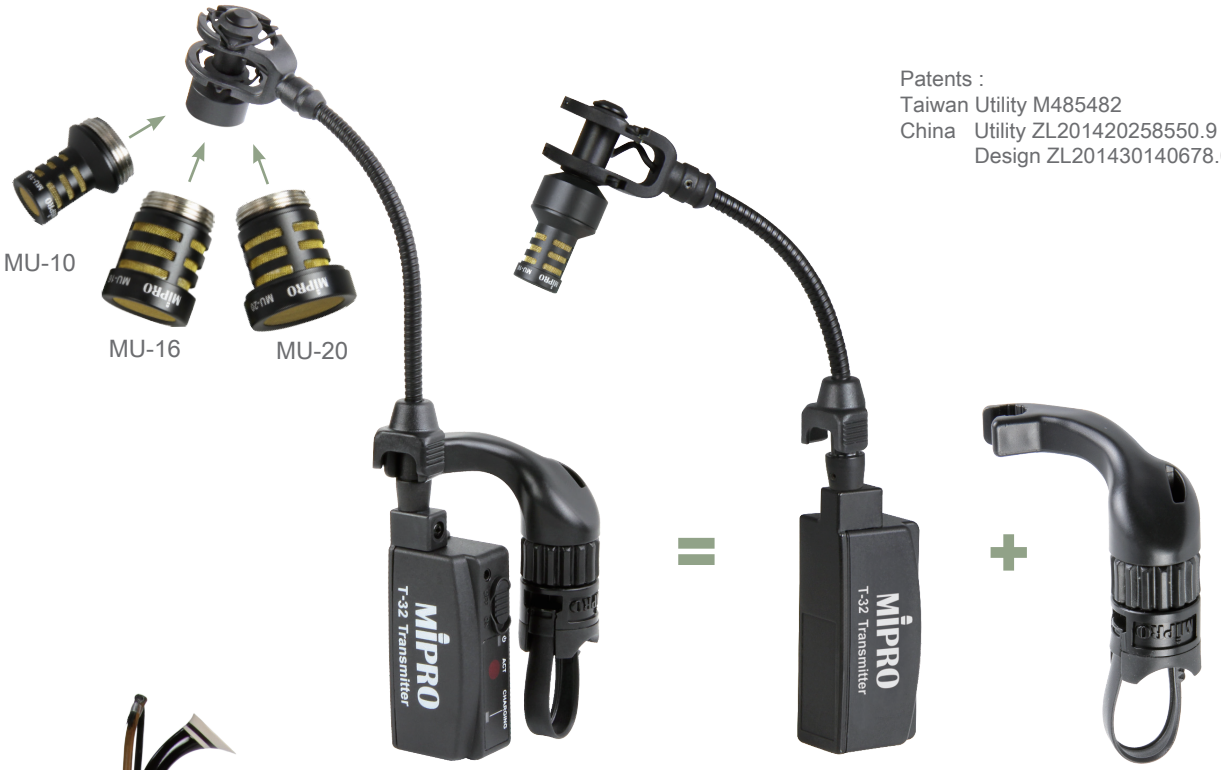
Specifications

Frequency Range	480~934 MHz
Bandwidth	24 MHz
Oscillation Mode	PLL Synthesized
Channel Set-up	ACT Sync
RF Output Power	10~30 mW (country dependent)
Spurious Emissions	<-55 dBc
Battery Type	Built-in rechargeable lithium battery
Operating Time	Up to 4 hours. 10-minute quick charges will provide up to 40 minutes operation
Dimensions (W × H × D)	57 × 28 × 20 mm / 2.2 × 1.1 × 0.8 "
Weight	Approx. 38 g / 1.3 oz, battery included
Microphone Module	MU-10, MU-16 or MU-20
Accessory	SH-32 Microphone Clip
Receiver	MIPRO ACT-series receivers
Patent & Approvals	Patented. Telecom and safety regulations approved.
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.

Erhu Playing



ET-32 Erhu Microphone Set NEW



ET-32 T-32 EH-32

Patents :
Taiwan Utility M485482
China Utility ZL201420258550.9
Design ZL201430140678.0



Features

1. The ET-32 erhu set is an EH-32 microphone clip integrated with a T-32 transmitter module for a cable-free, truly wireless audio performance.
2. Adjust the band to secure the EH-32 on the neck of the erhu. It is easy to install and remove for convenience.

Specifications

Model	ET-32
Dimensions (Ø × L)	22 × 60 mm / 0.9 × 2.4 "
Weight	Approx. 16 g / 0.56 oz
Matching Transmitter Module	T-32 Gooseneck Transmitter Module
Accessory	EH-32 Microphone Clip



Receiver

or



PA system

Portable Wireless Transmission Systems

Digital Wireless ENG Receiver 94

Wireless ENG Receiver 96

Rechargeable Digital Wireless Plug-on Transmitter 99



ACT-80 Digital Wireless ENG Receiver NEW

Profile

The MIPRO ACT-80 is a compact wireless receiver designed for professional camcorder applications. Matched with MIPRO ACT transmitters to achieve natural sound reproduction, the receiver eliminates the need for microphone cables during recording, ensuring safe and agile operation of camcorders. The ACT-80 is the ideal portable receiver, convenient for use in any wireless audio transmission system.



Matching Transmitters



ACT-80H Handheld Transmitter



ACT-80T BodypacTransmitter

Accessories



MJ-90 Power Cord for SONY Camcorders

Features

1. Waterproof, compact, and ultra-thin rugged aluminum housing construction.
2. Various interface socket modules can be easily detached and installed to work with different camcorders, active speakers and other audio equipment.
3. UHF PLL synthesized circuit and dual-antenna true diversity technology for best reception quality.
4. Enhanced RF circuitry improves anti-interference characteristics and system compatibility with a 64 MHz-wide bandwidth, allowing more interference-free channels to be selected.
5. Full-range sound quality is not affected by the strength of RF signals or operating distance.
6. Digitally-processed RF circuitry and DigitnamicPlus ™ technology eliminates compander noise, assuring a wireless sound quality that easily rivals cable transmission.
7. Improved proprietary Audio A/D Converter provides a true dynamic range of 115 dBA, T.H.D. < 0.03% at 1 kHz with < 3 ms latency.
8. Proprietary 256-bit encryption provides secure audio transmission, preventing unauthorized listening.
9. World's first ACT ™ (Automatic Channel Targeting) provides precise and rapid frequency sync to the transmitters.
10. Digital graphic backlit LCD panel.
11. Control panel has setup buttons for SCAN, ACT, SQUELCH, LOCK and AF functions, allowing easy and error-free setup.
12. Electronic power switch eliminates popping noise during power on/off.
13. Precision SMA antenna connectors with removable soft antennas.
14. Features are compatible with MIPRO ACT-8 series digital receivers.

Specifications

Overall System	
Frequency Range	470~937MHz
Bandwidth	64MHz
Preset Frequency	12 non-interference compatible frequencies in group 1-10. 16 non-interference compatible frequencies in group 11-16. 16 user-defined frequencies can be stored in group 18. 216 preset frequencies in total.
Channel Grid	25kHz
Channel Set-up	Scan & ACT sync
Audio Sampling	24-bit / 44.1 kHz Rate
Audio Compression	2nd Generation DSP inertial coding
Latency	< 3ms
Frequency Response	20 Hz~20 kHz (-2dB)
S/N Ratio (analog output)	> 115dB(A)
T.H.D.	< 0.03 % @ 1 kHz
Encryption	256 bit

Receiver	
Oscillation Mode	PLL Synthesized
Frequency stability	± 0.005% (-10~+60℃)
Image and Spurious Rejection	> 85dB
Receiving Mode	Dual antenna digital diversity
Analog Output	Balanced XLR
Display	Digital illustrated backlit LCD
Battery Meter	Transmitter battery status
Antenna Input	50 Ω SMA female connector × 2
Power Supply	External AC power supply, 12~15V DC, 1A
Dimensions (W × H × D)	73.5 × 120 × 28 mm / 2.9 × 4.7 × 1.1 "
Weight	Approx. 220 g (7.7 oz)
Transmitter	ACT-80H / 80HC Handheld & ACT-80T / 80TC Bodypack
Operating Temperature	-10~+60℃
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.

MR-90B Wireless ENG Receiver

Profile

The MIPRO MR-90B is a compact wireless receiver designed for professional camcorder applications. Matched with MIPRO ACT transmitters to achieve natural sound reproduction, the receiver eliminates the need for microphone cables during recording, ensuring safe and agile operation of camcorders. Furthermore, the MR-90B can also be installed on an active PA speaker via ACT transmitters or a MT-92A wireless interlinking transmitter of a MA-909 wireless mixer to turn active speakers into a wireless system.



Matching Transmitters



ACT-72H Handheld Transmitter



ACT-72T BodypacTransmitter



MT-92A Wireless Interlinking Transmitter

Accessories



MJ-90 Power Cord for SONY Camcorders

Features

1. Waterproof, compact, and ultra-thin rugged aluminum housing construction.
2. Various interface socket modules can be easily detached and installed to work with different camcorders, active speakers and other audio equipment.
3. Detachable battery pack accessory needs only two AA batteries to provide at least 8 continuous hours of operation, eliminating the need for external power.
4. UHF PLL synthesized circuit and dual-antenna true diversity technology for best reception quality.
5. 100 preset channels in each 24 MHz band can be easily auto-scanned for a clear, interference-free frequency.
6. 16 Channel presets specifically for wireless interlinking transmitter.
7. World's first ACT ™ (Automatic Channel Targeting) provides precise and rapid frequency sync to the transmitters.
8. LCD panel shows frequency, RF and AF meters, diversity signals, and transmitter battery meter.
9. Control panel has setup buttons for SCAN, ACT, SQUELCH, and LOCK functions, allowing easy and error-free setup.
10. High fidelity and dynamic compander circuit provides balanced, high-gain audio signal output.
11. Electronic power switch eliminates popping noise during power on/off.
12. Working voltage is 6.5~12V DC and the efficient power-saving design makes current consumption lower than 70 mA.
13. Precision SMA antenna connectors with removable soft antennas.

Specifications

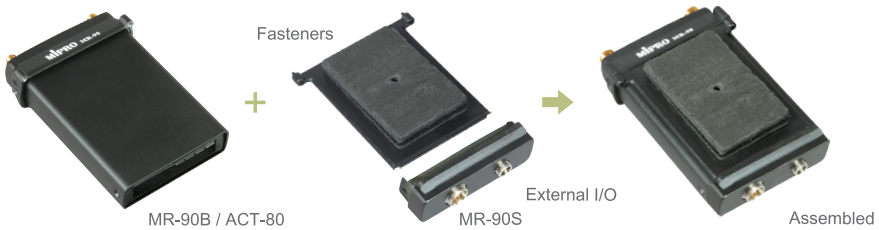
Frequency Range	480~937.5 MHz (country dependent)
Bandwidth	24 MHz
Preset Channels	100 selectable channels
Receiving Mode	Dual antenna true diversity
Oscillation Mode	PLL Synthesized
Frequency stability	± 0.005% (-10~+60℃)
Channel Set-up	AutoScan
Sensitivity	S/N > 76 dB at 6 μ V input
Frequency Response	80 Hz~18 kHz (low frequency filter characteristics)
Spurious Rejection	> 80 dB
T.H.D.	< 0.15% (at 1 kHz, deviation at 15 kHz)
Squelch Level	Adjustable range: 6 dBuV to 40 dBuV at 5 dB steps

Max. S/N Ratio	107dBA
Max. Output Level	Balanced 2.2V rms open (T.H.D.=1%)
LCD Display	Frequency, RF / AF meters, Diversity signals and transmitter battery meter
Power Supply	6.5~12V DC
Current Consumption	Approx. 70 mA
Dimensions (W × H × D)	73.5 × 120 × 28 mm / 2.9 × 4.7 × 1.1 "
Weight	Approx. 220 g / 7.7 oz
Transmitter	ACT-72H / ACT-52H / ACT-32H handheld & ACT-72T / ACT-52T / ACT-32T Bodypack
Operating Temperature	-10~+60℃
Note	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.

Key Accessories and Functions

1. MR-90S Standard Package (Included with MR-90B)

This package includes Velcro fasteners, an external I/O module, signal output cable and power cable; ideal for other camcorders, active speakers and interfacing with other audio equipment.



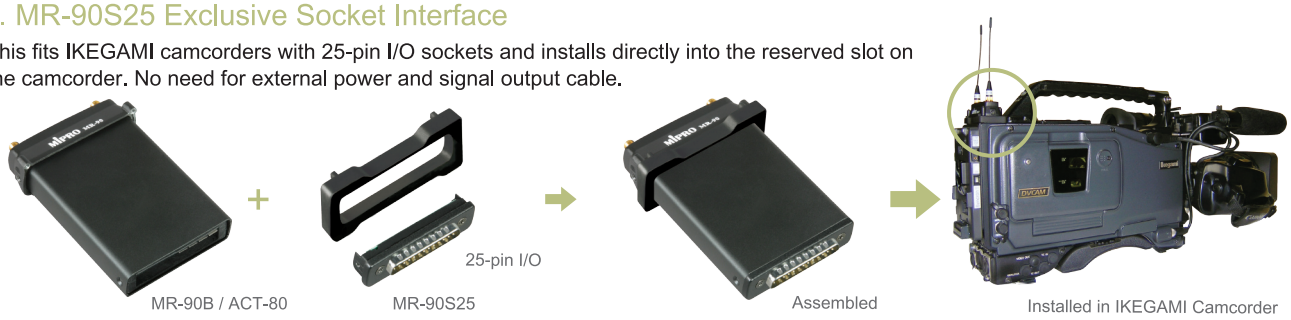
2. MR-90S15 Exclusive Socket Interface

This fits SONY Betacam camcorders with 15-pin I/O sockets and installs directly into the reserved slot on the camcorder. No need for external power and signal output cable.



3. MR-90S25 Exclusive Socket Interface

This fits IKEGAMI camcorders with 25-pin I/O sockets and installs directly into the reserved slot on the camcorder. No need for external power and signal output cable.



4. MR-90SB Built-in Battery Pack

Ideal for other camcorders, active speakers and interfacing with other audio equipment, the MR-90SB requires two AA-sized batteries, eliminating the need for an external power source.



5. MR-90SC Mounting Fasteners

No need for Velcro fasteners - these connect directly to the accessory shoe of many miniature camcorders.



TA-80 Wireless Plug-on Transmitter

NEW





The TA-80 can be recharged by the MP-80 charger



Shotgun microphone with TA-80 installed



Compatible with ACT-8 series receivers

Features

The MIPRO TA-80 is a digital miniature wireless plug-on transmitter with balanced XLR mic input jack, designed for professional interview applications. It allows condenser or dynamic wired microphones to become wireless and is compatible with ACT-8 series receivers for premium sound quality.

The TA-80 has a compact and ultra-thin rugged aluminum housing construction. The input jack is easy to install and remove, and can be screw-locked with the microphone. It provides phantom power of 12, 48 V switchable levels for condenser microphones with up to 10mA current load. When the transmitter is connected to dynamic microphones, the phantom power can be turned off. A backlit LCD panel shows all operational parameters.

An ICR 18500 rechargeable lithium battery provides a minimum 12 hours of operation and can be recharged over 600 times. Even when set to 48V phantom power, it provides a minimum 5 hours of operation. Simply charge the transmitter in the charger after each use. It's also easy to remove and replace the battery or charge the battery in the charger.

Specifications

Housing	Aluminum alloy
Frequency Range	470~934 MHz
Oscillation Mode	PLL Synthesized. Frequency stability ≦± 0.005% (-10~+60℃)
RF Output Power	10 mW / 50 mW switchable (country dependent)
Spurious Emissions	≦ -60dBc
Antenna	Internal
Modulation Type	New digital modulation
Audio Compression	DSP Inertial coding
LCD Display	Group, Channel, Frequency, AF gain, Low-cut, Limiter, Encryption status, RF power, Phase, Lock status, Mute mode, Battery status & Error codes
Gain Setting	+24 dB, +18 dB, +12 dB, +6 dB, 0 dB, -6 dB, -12dB , -18dB (8 settings). 0 dB = microphone sensitivity
Phantom Power	12V / 48V switchable. 48V provides up to 10mA current load. Phantom power is not required for dynamic microphones.
Mic Input	Balanced XLR
Battery Type	ICR 18500 rechargeable lithium battery × 1
Current Consumption	Approx. 120 mA (Low Power, phantom power off)
Operating Time	Minimum 10 hours of operation (Low power, phantom power off)
Dimensions (W × H × D)	44 × 114 × 37 mm / 1.7 × 4.5 × 1.5 "
Weight	Approx. 165 g / 5.8 oz, excluding battery
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.

Wireless IEM Systems

Digital Wireless IEM System 101

Analog Wireless IEM System 103



MI-909 Digital Stereo IEM System

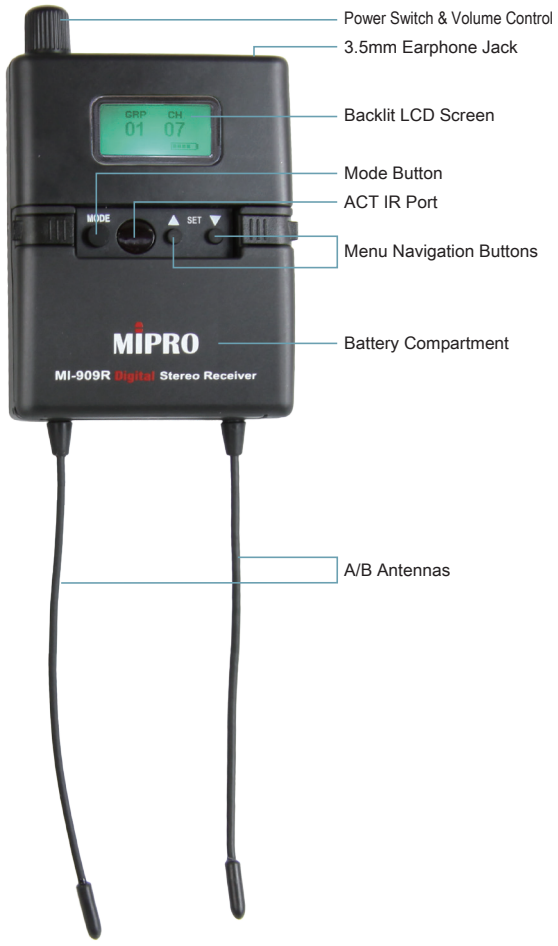
Profile

MI-909 is an industry first, professional quality digital wireless stereo IEM system. Featuring digitally encrypted technology with unparalleled digital audio performance and transmission reliability, the superior frequency response characteristics of the MI-909 from 20Hz to 15 kHz clearly exceed those of analog systems. Combining DSP & digital diversity technologies, this upgraded MI-909 system has advanced features and functions that supersede its competitors.

The key components of the MI-909 IEM system include the MI-909R ultra-compact bodypack receiver and MI-909T rack transmitter.

MI-909R Digital Stereo Bodypack Receiver

The MI-909R operates in a wide 64 MHz bandwidth and it has easy to use controls and indicators with a backlit LCD screen. Advanced dual-antenna diversity design eliminates signal dropouts and enhances signal stability. Featuring a lightweight, exceptionally durable magnesium alloy bodypack case, the MI-909R is ideal for professional installations and live applications. Proprietary digital encryption provides secure audio transmission, preventing unauthorized listening in conferences, meetings and language interpretation applications.



Features

1. Industry's most compact and smallest housing.
2. Featuring a lightweight, yet rugged, magnesium & glass-fiber reinforced plastic case for stage applications.
3. Backlit LCD screen with superior features and advanced function settings.
4. Dual-antenna diversity design enhances RF signal stability and extends transmission range.
5. Dual unbreakable soft antennas.
6. Selectable stereo, balanced, mono & mixed output modes.
7. Selectable EQ settings.
8. Fast and easy menu controls and indicators accessed by three buttons.

Specifications

Frequency Range	480~824 MHz (country dependent)
Bandwidth	64 MHz
Channel Grid	25 kHz
Preset Frequency	12 non-interference compatible frequencies in group 1-10. 16 non-interference compatible frequencies in group 11-16. 16 user-defined frequencies can be stored in group 18. 216 preset frequencies in total.
Receiving Mode	Digital diversity receiving
Oscillation Mode	PLL Synthesized
Frequency Stability	± 0.005% (-10~+60°C)
Channel Set-Up	ACT Sync
Modulation Type	Digital modulation
Sensitivity	10 μ V input level, S/N > 90dB (stereo)
Spurious Emissions	< 4 nW
T.H.D	0.1% @ 1 kHz
Max. S/N ratio	95 dBA
Frequency Response	20 Hz ~ 15 kHz (stereo)
Stereo Separation	> 95 dB
Volume Control	126 dB (1dB step)
LCD Display	AF/RF meters, Battery status, Group & Channel, R/L balance
Output Jack	3.5 mm Ø stereo earphone jack
Output Power	Left/Right × 120 mW @ 16 Ω
Earphone Impedance	≧ 16 Ω
Battery Type	2 AA alkaline
Current Consumption	Approx. 170 mA
Operating Time	Approx. 8 hours (moderate volume)
Dimensions (W × H × D)	63 × 82 × 23 mm / 2.6 × 3.2 × 0.9 "
Net Weight	Approx. 98 g / 3.5 oz
Transmitter	MI-909T
Operating Temperature	-10~+60°C
Note	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.

Illustrations



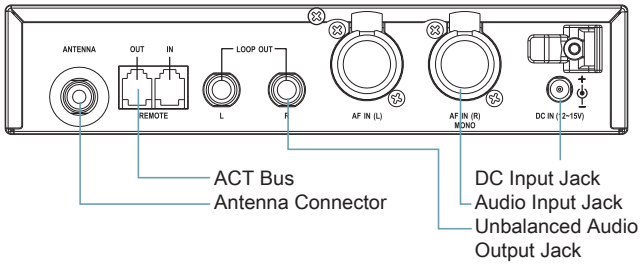
MI-909T Digital Stereo Transmitter

Profile

The MI-909T is a rugged digitally-encrypted rack transmitter. It operates in a 64 MHz wide bandwidth and allows multiple preset compatible channels operation. Delivering up to 100mW output power, it has high dynamic range stereo audio inputs and is able to withstand professional audio mixers' maximum output levels. Menu settings allow input sensitivity, encryption, EQ DSP processors to be set-up via a rotary control knob. A built-in Scan function enables auto-scanning for an open, interference-free frequency and, once selected, that frequency can sync with the bodypack receiver with a simple push of the ACT button. The MI-909T is ideal for both live applications and professional installations such as language interpretation.



Rear Panel



Features

1. EIA-standard half-rack 19" metal case, LCD screen display, rotary control knob for advanced menu settings and dual audio LED indicator lockable front panel.
2. Up to 16 compatible channels within the same frequency group.
3. Selectable encryption keys with scroll or static setting for single or multiple receivers.
4. Selectable HI, LOW or OFF (mute) output power.
5. High dynamic range, stereo audio inputs and able to withstand the maximum output levels of professional audio mixers.
6. Built-in DSP 3 band ± 9 dB EQ settings for audio modifications.
7. Free Scan selects an open, interference-free transmitter frequency and ACT syncs the transmitter and receiver frequencies automatically.
8. Ideal for professional multi-language interpretation system and installation applications.

Specifications

Frequency Range	470~664 MHz, 672~960 MHz (country dependent)
Bandwidth	64 MHz
Oscillation Mode	PLL Synthesized
Channel Grid	25 kHz
Frequency Stability	± 0.005% (-10~+60℃)
Modulation Type	Digital modulation
Output Power	Low <10 mW ｜ High <100 mW switchable (country dependent)
Spurious Rejection	< 4 nW
Frequency Response	20 Hz ~ 15 kHz (stereo)
T.H.D.	< 0.1% (at 1 kHz)
ADC Dynamic Range	112 dBA
Stereo Audio Input	6.3 mm Ø Phone Jack × 2, XLR, 6.3 mm Ø Combo Jack
Max. Input	> +26 dBu, Selectable Line / Mic level
Audio Input Adjustment	0~-30 dB, 3 dB step
Earphone Output	6.3 mm Ø Stereo Phone Jack with volume control
Earphone Output Impedance	≧ 16 Ω
Network Interface	RJ-11 × 2, proprietary MIPRO ACT-BUS
Antenna Connector	TNC (50 Ω impedance)
Power Supply	DC 12~15V
Dimensions (W × H × D)	210 × 44 × 206 mm / 8.3 × 1.7 × 8.1 "
Weight	Approx. 1.1 kg / 2.4 lbs
Note	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.

High Performance Isolation Earphones

E-8S Standard Earphones

New E-8S earphones provide outstanding sound quality and excellent isolation to suppress high ambient noise levels. They feature an 8 mm dynamic driver with a 20 Hz ~ 20 kHz frequency response and can be fitted with any of the three provided earbud covers for a custom fit and comfort.



1. 8 mm high efficient driver.
2. In-ear, closed-back design with S/M/L earbud covers.
3. 1.5 meter rugged cable.
4. 3.5 mm Ø gold-plated stereo connector.
5. 106 dB SPL/mW.
6. 16 Ω @ 1 kHz nominal impedance.
7. 20 Hz ~ 20 kHz frequency response.
8. Noise isolation > 25 dB.
9. Approx. 16 grams (0.5 ounce) cable included.
10. Operating temperature -15° C to +60° C.

E-8P Professional Earphones

The E-8P professional earphones are designed for stage monitoring. They deliver full-range sound and are ergonomically built with an adjustable ear hook design for a comfortable, personalized fit and invisibility.



1. Ear canal design for easy earplug placement.
2. Subminiature balanced armature drivers.
3. 1.5 meter ultra durable cable and exterior in beige.
4. 3.5 mm Ø gold-plated stereo connector.
5. Sensitivity >116 dB (1 kHz).
6. 125 dB SPL (1 kHz).
7. 30 Ω @ 1 kHz nominal impedance.
8. 35 Hz ~ 20 kHz frequency response.
9. Noise isolation > 23 dB.
10. Approx. 18 grams (0.6 ounce) cable included.
11. Operating temperature -15° C to +60° C.

MI-808 Stereo IEM System

Profile

The MI-808 is an IEM system designed for stage performance and broadcasting. It can also serve as a simultaneous language interpretation system. It is frequency-agile over a 24 MHz bandwidth with 16 selectable frequencies. Advanced dual-antenna true diversity technology eliminates signal dropouts and enhances signal stability. High S/N ratio and dynamic range ensures optimal audio quality.

MI-808R Stereo Bodypack Receiver



Features

1. UHF PLL Synthesized circuit.
2. 16 preset channels in 24 MHz band, selectable via one button.
3. Industry's only dual-antenna true diversity technology for optimal reception.
4. Dynamic expander circuitry delivers a S/N ratio greater than 90 dB.
5. Mono and Stereo operating modes.
6. Numeric LED with auto power saver.
7. POWER on/off and RF signal indicators.
8. 2 AA batteries and high efficiency circuitry for long continuous use.
9. Compact and durable magnesium alloy housing.
10. Unbreakable soft antennas.
11. Multi-language interpretation system application has simple interface for easy operation.

Specifications

Frequency Range	620~874 MHz (country dependent)
Bandwidth	24 MHz
Channel Grid	25 kHz
Receiving Mode	Diversity receiving
Oscillation Mode	PLL Synthesized
Frequency Stability	± 0.005% (-10~+60℃)
Channel Set-Up	ACT Sync
Modulation Type	FM Stereo Modulation
Sensitivity	S/N > 58 dB (mono) @ 2 μ V input level
Squelch Level	2~100 μ V
T.H.D.	< 0.5% @ 1 kHz
Max. S/N Ratio	94 dBA
Frequency Response	80 Hz~15 kHz
Stereo Separation	≧ 45 dB @ 1 kHz
Output Jack	3.5 mm Ø stereo earphone jack
Output Power	Left/Right × 50 mW @ 32 Ω , 1 kHz (T.H.D. 3%)
Earphone Impedance	≧ 16 Ω
Battery Type	2 AA alkaline
Current Consumption	Approx. 130 mA (moderate volume)
Operating Time	Approx. 8 hours (moderate volume)
Antenna	Fixed 1/2 λ × 2
Dimensions (W × H × D)	65 × 105 × 25.5 mm / 2.6 × 4.1 × 1 "
Net Weight	Approx. 128 g / 4.5 oz
Transmitter	MI-808T
Operating Temperature	-10~+60℃
Note	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.

Illustrations

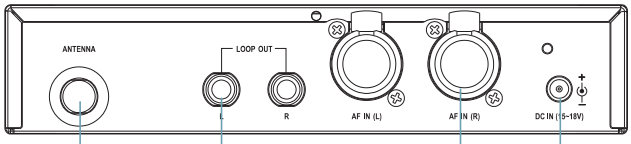


MI-808T Stereo Transmitter



Volume Control
Earphone Jack
Power Switch
Function Key
LCD Screen
Audio Input and Limiter Indicator

Rear Panel



Unbalanced Audio Output Jack
Antenna Connector
DC Input Jack
Audio Input Jack

Features

1. Multi-function LCD panel.
2. EIA standard 1/2U half-rack 19" metal case.
3. Balanced and unbalanced combo jack.
4. Mono and Stereo operating modes.
5. UHF PLL Synthesized circuit.
6. 16 preset channels in 24 MHz band.
7. Dynamic compander circuitry delivers S/N ratio greater than 90 dB.
8. Built-in level limiter prevents distortion at the maximum input level.
9. Monitoring headphone jack.
10. Multi-language interpretation system application through a simple interface for easy operation.

Specifications

Frequency Range	620~874 MHz (country dependent)
Bandwidth	24 MHz
Oscillation Mode	PLL Synthesized
Channel Grid	25 kHz
Frequency Stability	± 0.005% (-10~+60°C)
Modulation Type	FM stereo modulation
Output Power	Low <10 mW | High <100 mW switchable (country dependent)
Spurious Rejection	< 4 nW
Frequency Response	80 Hz ~ 15 kHz
T.H.D.	< 1% (at 1 kHz)
Audio Input	Line Level × 2, XLR, 6.3 mm Ø Combo Jack
Audio Output	6.3 mm Ø Phone Jack × 2
Earphone Output	6.3 mm Ø Stereo Phone Jack with volume control
Earphone Output Impedance	≧ 16 Ω
Amplifier Gain	N/A
Antenna Connector	TNC (50 Ω impedance)
Power Supply	DC 12~15V
Dimensions (W × H × D)	210 × 44 × 206 mm / 8.3 × 1.7 × 8.1 "
Weight	Approx. 1.1 kg / 2.4 lbs
Note	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.

High Performance Isolation Earphones

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6. 16 Ω @ 1 kHz nominal impedance.
7. 20 Hz ~ 20 kHz frequency response.
8. Noise isolation > 25 dB.
9. Approx. 16 grams (0.5 ounce) cable included.
10. Operating temperature -15° C to +60° C.

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6. 125 dB SPL (1 kHz).
7. 30 Ω @ 1 kHz nominal impedance.
8. 35 Hz ~ 20 kHz frequency response.
9. Noise isolation > 23 dB.
10. Approx. 18 grams (0.6 ounce) cable included.
11. Operating temperature -15° C to +60° C.

Wireless Tour Guide Systems

Rechargeable Battery	107
Disposable Battery	108
Accessories	110



Profile

The MTG-100 is an innovative digital wireless tour guide system. It is ultra compact, lightweight and easy to use. Its digital design provides crystal-clear audio quality, secure and reliable transmission and is insensitive to interference -- attributes that are unmatched by simple analog design systems.

It operates in the license-free 865 & 928 MHz ISM bands. The ISM band requires no user licensing; thus, no worries about changing groups and channels when operating in multiple countries. Each band is preset with 16 switchable frequencies and ensures that several different tours or groups can be operated at the same venue without interfering with each other.

This system is comprised of two power models: a rechargeable battery system and a disposable battery system. The rechargeable battery system is comprised of a MTG-100R receiver, MTG-100T transmitter and a MTG-100C-12 or MTG-100C-28 storage and charger carry case. A built-in lithium polymer rechargeable battery is used to resolve the trouble of changing batteries, saving you a significant amount of money for years to come.

The disposable battery system is comprised of a MTG-100Ra receiver and MTG-100Ta transmitter and is powered by 2 AA batteries for convenient personal usage.

This system is ideal for small to large, indoor or outdoor applications for guides, interpreters or presenters to communicate effectively to a group of people, rejecting irritating surrounding noise.

Manufacturers Comparison

Item	MTG-100	Other Brands
Modulation	Digital Narrow Band	Analog or Digital Wide Band
Frequency Range	UHF 865 & 928 MHz ISM band	VHF, UHF or 2.4 GHz industry band
Certification	No user licensing required	Only 2.4 GHz requires no licensing
Anti-Interference	Insensitive to Wi-Fi, Bluetooth and 2.4 GHz interference	2.4 GHz is susceptible to Wi-Fi, Bluetooth interference
Transmission Stability	True diversity design for reliable transmission, preventing signal dropouts	Non-diversity design is susceptible to interference and signal dropouts
Encryption	Digital transmission prevents unauthorized listening	Analog transmission is susceptible to unauthorized listening
Operating Range	Approx. 100 m (line-of -sight)	Approx. 15~30 m (2.4 GHz)
RF Output Power	Switchable (High, Mid or Low)	Fixed
Audio Quality	16-bit Hi-Fi audio quality	Analog communication voice quality
System Channel Setting	MIPRO's proprietary ACT ™ sync function: Synchronize all receivers and transmitters channel with a touch of the 'Sync' button	Manual Setting
Operating Display	Backlit LCD displays parameters	LCD is available for higher-end systems
System Management	Ethernet interface allows system setting and management	Manual management
Dimensions & Weight	Compact and lightest	Bulky and heavier
Power Supply	High capacity lithium polymer rechargeable battery or 2 AA batteries options	Regular disposable or lower quality rechargeable battery
Auto Shut-Off Time	Yes. To reduce battery consumption.	No
Affordability	Best Price / Quality ratio	Lower Price / Quality ratio
Country of Origin	100% designed & made in Taiwan.	Taiwan or other OEM manufacturers

MTG-100R Digital Receiver (Rechargeable Battery)

Patents :
Taiwan Utility M393932
China Utility ZL201020281127.2
Germany Utility 202010012684.3





MTG-100T Digital Transmitter (Rechargeable Battery)





MTG-100Ra Digital Receiver (AA Battery)

Patents :
Taiwan Utility M393932
China Utility ZL201020281127.2
Germany Utility 202010012684.3





MTG-100Ta Digital Transmitter (AA Battery)



MTG-100Ha Handheld Transmitter



Features

	MTG-100R/T	MTG-100Ra/Ta
1	Built-in rechargeable lithium battery for longer continuous use.	AA batteries for convenient personal use. Easy to carry and replace.
2	PC controllable Channel-Lock to prevent accidental change.	N/A
3	Convenient 12 or 28-slot storage and charger carry case for easy charging, storage and inventory management.	N/A
4	Ethernet interface allows system setting and management.	N/A
5	Operates on user license-free ISM bands: EU 863~865 MHz and USA 926~928 MHz.	
6	Up to 100 m (330 ft) line-of-sight reception range.	
7	Interference-free from Bluetooth, Wi-Fi and 2.4 GHz wireless transmission.	
8	Digitally encrypted technology enables secure audio transmission, preventing unauthorized listening.	
9	Digital technology ensures crystal-clear audio quality, giving listeners the best tour experience.	
10	Industry's only true diversity technology for exceptional reception quality.	
11	Durable, ultra-lightweight and pocket-sized portable receiver and transmitter. Incredibly easy to set-up and use.	
12	Industry's only auto shut-off timer for reducing power consumption to extend the operating time.	
13	Backlit LCD screen displays all relevant parameters.	

Specifications

Model	MTG-100R	MTG-100T	MTG-100Ra	MTG-100Ta	MTG-100Ha
Frequency Range	CEPT/EU: 863~865 MHz | USA: 926~928 MHz				
Oscillation Mode	PLL Synthesized				
Preset Channels	16				
Switching Bandwidth	2 MHz				
Channel Grid	125 kHz				
RF Output Power	N/A	< 10 mW (Low / Mid / High, switchable)	N/A	< 10 mW (Low / Mid / High, switchable)	
Sensitivity	Approx. -90 dBm	N/A	Approx. -90 dBm	N/A	
Operating Range	Up to 100 meters (330 feet) line-of-sight				
Frequency Response	50 Hz~10 kHz				
Battery Type	Built-in high capacity li-poly rechargeable battery		2 AA alkaline		
Operating Time	> 12 hours				
Automatic Shut-Off Time	10 minutes~42 hours (programmable)		6 hours		N/A Mute button
Dimensions	45 × 84 × 21 mm / 1.8 × 3.3 × 0.8 " (W × H × D)		45 × 84 × 28 mm / 1.8 × 3.3 × 1.1 " (W × H × D)		50 × 258 mm / 2 × 10.1 " (Ø × L)
Weight	Approx. 65 g / 2.3 oz, Li-poly battery included		Approx. 72 g / 2.5 oz, excluding AA batteries		Approx. 250 g / 8.8 oz, excluding AA batteries
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.				

MTG-100C-28

28-Slot Storage and Charger Carry Case



Features

1. The protective case provides a convenient way to charge, carry and store your entire system.
2. Quick-charge in less than 4 hours.
3. Each charging slot has separate “red” charging and “green” ready indicator.
4. Innovative “Sync” button for automatic frequency synchronization from master to all MTG-100R receivers.
5. Built-in certified 100~250V AC switching power supply with well-vented design.
6. Organizes 24 earphones and 2 headset microphones neatly in one case.(MTG-100C-28)
7. Organizes 10 earphones and 2 headset microphones neatly in one case. (MTG-100C-12)

Specifications

Model	MTG-100C-28	MTG-100C-12
Charge Systems	28 (portable receivers and transmitters)	12 (portable receivers and transmitters)
Charge Time	< 4 hours	< 4 hours
Max. Power Consumption	80 W	26 W
Dimensions (W × H × D)	530 × 190 × 330 mm / 20.9 × 7.5 × 13 "	403 × 133 × 306 mm / 15.9 × 5.2 × 12 "
Weight	< 9 kg / 20 lbs	< 6 kg / 13 lbs
Ethernet Networking Interface	Yes	No
ACT-BUS static IP set up interface	Yes	No
Note	Refer to actual product in the event of product description discrepancy.	

MTG-100C-12

12-Slot Storage and Charger Carry Case



MTG-100C-4

4-Slot Charger



Features

1. 4-slot convenient charging for up to 4 portable receivers or transmitters.
2. Quick-charge in less than 4 hours.
3. Each charging slot has separate "red" charging and "green" ready indicator.
4. Battery charging via DC output, 8V/0.75A power supply.

Specifications

Charge Systems	4 (portable receivers and transmitters)
Charge Time	< 4 hours
Max. Power Consumption	< 6 W
Dimensions (W × H × D)	112.5 × 85 × 158.5 mm / 4.4 × 3.3 × 6.2 "
Weight	408 g / 14.4 oz
Power Supply	DC 8~15V max 0.75A
Note	Refer to actual product in the event of product description discrepancy.

MTG-100R / MTG-100Ra Receiver Accessories



MTG-100T / MTG-100Ta Transmitter Accessories



MM-10
Mini-gooseneck Microphone



Capsule Module	4.5 mm Ø omni-directional condenser microphone
Frequency Response	40 Hz~20 kHz
Maximum SPL	135 dB (Typical, 1% T.H.D.)
Sensitivity	-49 dBV ± 3 dB at 1 kHz (0 dB=1V/Pa)
Plug	3.5 mm Ø mini jack screw-lock
Length	11 cm / 4.3 "
Weight	Approx. 8 g / 0.3 oz
Note	Refer to actual product in the event of product description discrepancy.

MM-202P
Mini-gooseneck Microphone



Capsule Module	10 mm Ø uni-directional condenser microphone
Frequency Response	50 Hz~18 kHz
Maximum SPL	136 dB (Typical, 1% T.H.D.)
Sensitivity	-46 dBV ± 3 dB at 1 kHz (0 dB=1V/Pa)
Plug	3.5 mm Ø mini jack screw-lock
Length	13.6 cm / 5.4 "
Weight	Approx. 22 g / 0.8 oz
Note	Refer to actual product in the event of product description discrepancy.

MU-101P
Headworn Microphone



Capsule Module	10 mm Ø uni-directional condenser microphone
Frequency Response	50 Hz~18 kHz
Maximum SPL	135 dB (Typical, 1% T.H.D.)
Sensitivity	-49 dBV ± 3 dB at 1 kHz (0 dB=1V/Pa)
Plug	3.5 mm Ø mini jack screw-lock
Cable Length	150 cm / 59.1 ", cable only
Weight	Approx. 24 g / 0.8 oz
Note	Refer to actual product in the event of product description discrepancy.

MU-53HNP
Headworn Microphone



Capsule Module	10 mm Ø uni-directional miniature condenser microphone
Frequency Response	50 Hz~18 kHz
Maximum SPL	136 dB (Typical, 1%THD)
Sensitivity	-46 dBV ± 3 dBV at 1 kHz (0 dB=1V/Pa)
Plug	3.5 mm Ø mini jack screw-lock
Cable Length	150 cm / 59.1 ", cable only
Weight	Approx. 30 g / 1.1 oz
Note	Refer to actual product in the event of product description discrepancy.

MU-23P
Headworn Microphone



Capsule Module	3 mm Ø omni-directional condenser microphone
Frequency Response	40 Hz~20 kHz
Maximum SPL	138 dB (Typical, 1% T.H.D.)
Sensitivity	-56 dBV ± 3 dB at 1 kHz (0 dB=1V/Pa)
Plug	3.5 mm Ø mini jack screw-lock
Cable Length	150 cm / 59.1 ", cable only
Weight	Approx. 22 g / 0.8 oz
Note	Refer to actual product in the event of product description discrepancy.

E-5S
Stereo Earphones



Driver Unit	24 mm Ø
Frequency Response	100 Hz~20 kHz
Sensitivity	108 dB ± 3 dB at 1 mW
Max. Input Power	100 mW
Impedance	32 ± 15% Ω at 1 kHz 1 mW
Plug	3.5 mm Ø stereo mini jack
Cable Length	120 cm / 47.2 "
Weight	Approx. 10 g / 0.35 oz, cable included
Note	Refer to actual product in the event of product description discrepancy.

E-10S
Stereo Earphones



Driver Unit	10 mm Ø
Frequency Response	20 Hz~15 kHz
Sensitivity	103 dB ± 3 dB at 1 mW
Max. Input Power	20 mW
Impedance	16 Ω at 1 kHz 1 mW
Plug	3.5 mm Ø stereo mini jack
Cable Length	R side: 40 cm + 55 cm / 15.7 " + 21.7 " L side: 10 cm + 55 cm / 3.9 " + 21.7 "
Weight	Approx. 20 g / 0.7 oz, cable included
Note	Refer to actual product in the event of product description discrepancy.

E-20S
Stereo Headphones



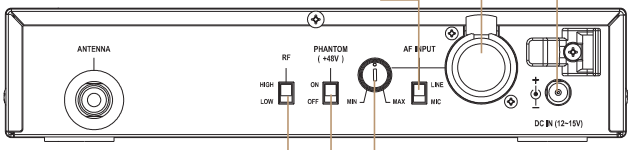
Driver Unit	30 mm Ø
Frequency Response	20 Hz~20 kHz
Sensitivity	105 dB ± 3 dB at 1 mW
Max. Input Power	100 mW
Impedance	24 Ω at 1 kHz 1 mW
Plug	3.5 mm Ø stereo mini jack
Cable Length	120 cm / 47.2 "
Weight	Approx. 80 g / 2.8 oz, cable included
Note	Refer to actual product in the event of product description discrepancy.

MTS-100 Digital Stationary Transmitter



Audio Signal Meter
Power Switch
Transmitter Module
RF Signal Indicators

Rear Panel

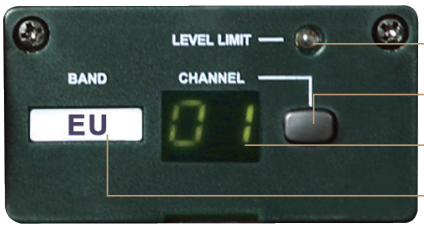


AF Level Switch
Combo Jack Connector
DC Input Jack
AF Level Knob
+48V Phantom Power Switch
RF Output Switch

Features

1. Modular design for easy set-up, operation and maintenance.
2. Preset with 16 selectable channels.
3. Bright LED channel display.
4. Direct output for low level or switch to wideband amplifier for high level output.
5. Selectable input audio signal level for optimal modulation index.
6. Audio input and RF output LED indicators.
7. 48V phantom power for condenser microphones.

Wireless Transmitter Module Controls and Indicators



Volume Limiter Indicator
Channel Button
LED Screen
Frequency Code Sticker

Specifications

Frequency Range	794~928 MHz (country dependent)
Oscillation Mode	PLL Synthesized
Frequency Stability	± 0.005% (-10~+60℃)
Preset Channels	16
Modulation Type	2FSK
Bandwidth	2 MHz
Channel Grid	125 kHz
RF Output Power	Low: < 10 mW, High: < 50 mW (country dependent)
Operating Range	> 100 meters (High setting)
Spurious Emissions	< 250nW @> 1GHz
Frequency Response	50 Hz ~10 kHz
Max. AF Input Level	< 15V rms (Line In)
Audio Input	XLR & 6.3 mm Ø Combo Jack
Input Level Switch	Mic / Line level
Input Level Adjustment	Adjustable VR
Phantom Power Switch	ON / OFF
Panel Display	AF Meter, AF Limit, RF Hi/Low Power indicators, numeric channel
Antenna Connector	TNC × 1 (50 Ω)
Power Supply	12~15V DC
Dimensions (W × H × D)	210 × 44 × 206 mm / 8.3 × 1.7 × 8.1 "
Weight	Approx. 1.1 kg / 2.4 lbs
Notes	Refer to actual product in the event of product description discrepancy. Frequency range and maximum deviation comply with the regulations of different countries.

Optional Accessories

MJ-53



MM-202



MU-210



MU-53L



MT-92A Wireless Interlinking Transmitter



Features

1. Modular design for easy installation and maintenance.
2. 16 selectable channels available by a push of a button.
3. Numeric LED clearly indicates working channel.
4. High/Low power output selectable.
5. LED indicators for RF and audio signal strength.
6. Supplies +48V phantom power for true condenser microphone.
7. Compatible with ACT-717B, ACT-727B, ACT-747B & MR-90B receivers.

Specifications

Frequency Range	620~934 MHz
Bandwidth	24 MHz
Oscillation Mode	PLL Synthesized
Frequency Stability	± 0.005% (-10~+60℃)
Channel Grid	25 kHz
Modulation Type	FM modulation
RF Power Output	Low: < 100 mW, High: < 500 mW (country dependent)
Spurious Emissions	< 4 nW
Frequency Response	80 Hz~15 kHz
T.H.D.	< 0.5% (at 1 kHz, max. deviation)
Audio Input	XLR / 6.3mm Ø Combo Jack

Input Level Switch	Mic / Line level
Input Level Adjustment	Adjustable VR
Phantom Power Switch	ON / OFF
Panel Display	AF Meter, AF Limit, RF Hi/Low power indicators, numeric channel
Antenna Connector	TNC × 1 (50 Ω)
Power Supply	12~15V DC
Dimensions (W × H × D)	210 × 44 × 206 mm / 8.3 × 1.7 × 8.1 "
Weight	Approx. 1.1 kg / 2.4 lbs
Note	Refer to actual product in the event of product description discrepancy.

PC-11 Frequency Programmer



How to modify frequency

1. After power is on, use ▲ ▼ function keys and switch to OLD mode.
2. Use keypad to dial 6 digits (omit decimal point). For example, for frequency of 810.000 MHz, dial 810000 and push ENT button when numbers are entered.

Antenna Systems

Antennas	116
Antenna Divider / Booster	124
Antenna Splitters & Amplifiers	126
Antenna Combiner	127
Applications	128



Profile

MIPRO complete antenna systems include antennas, antenna dividers, antenna combiners, antenna boosters, booster relay power supplies and front mount antenna brackets.

Antennas: Fit MIPRO wireless receivers.

Antenna Divider: Allows up to 4 UHF receivers to operate from a single pair of antennas or allows a single transmitter to operate via multiple antennas which greatly reduces intermodulation distortion, increasing antenna efficiency and reception range.

Antenna Combiner: Allows up to 4 wireless transmitters to operate via 1 single antenna to eliminate spurious interference and simplify antenna installation ~ ideal for professional stage applications.

Antenna Booster: Amplifies the antenna signal to increase signal strength and transmission range, improving the S/N ratio and signal stability.

AT-10 Whip Antenna

The AT-10 is a 1/4 wave single rod antenna featuring wider band, omni-directional reception and a 50 Ω impedance. Directly mounts on the antenna connectors of a receiver to become a monopole antenna for adequate sensitivity and operating range.



AT-20 Coaxial Antenna

The AT-20 is a 1/2 wave coaxial antenna that functions like a dipole antenna, featuring 2.15 dBi gain, 50 Ω impedance, and omni-directional reception. Directly mounts on the antenna connectors of a receiver for adequate sensitivity and operating range.



AT-70 Ground Plane Antenna

The AT-70 is a UHF antenna that stabilizes signal receiving and prevents impedance interference from nearby objects because its vertical 1/4 wave antenna is surrounded by horizontal antennas set at a 45 ° degree angle, causing a 1/2 wave dipole antenna effect. The AT-70 has higher positive gain than a 1/4 wave single rod antenna and smoother impedance within the 620~960 MHz band. Therefore, the length of the antenna does not need to be adjusted while receiving and the antenna is able to reduce interference by filtering signals outside the optimal range. Its 50 Ω impedance matches with regular 50 Ω impedance antenna cables. It is suggested it should be installed at the central location of a hall, on the wall, inverted on a ceiling, or mounted on a tripod (MS-30).



Specifications

Frequency Range	620~960 MHz
Impedance	50 Ω
Connector	TNC Male
Dimensions (L × Ø)	165 × 150 mm / 6.5 × 5.9 "
Weight	Approx. 142 g / 5 oz
Note	Refer to actual product in the event of product description discrepancy.

AT-100a Wideband Circularly Polarized Antenna NEW





Patents :
Taiwan Design D150421
China Design ZL201230113513.5

Profile

1. Patented in Multiple Countries. Distinctive Appearance

Providing an optimized solution for both transmitting and receiving RF signals throughout the UHF bandwidth, the AT-100a has a distinctive appearance and is patented in multiple countries.

2. Main Features

The front area is the main focus of antenna direction for either vertical or horizontal polarization.

The AT-100a circularly polarized antenna can effectively reduce the polarization loss of the antenna to improve signal strength. It is the optimum solution for the 470~1,000 MHz bandwidth with 6~8 dBi antenna gain and is certified to meet the latest CE/FCC new telecom regulations.

3. Results

The AT-100a is an ideal antenna system for utmost signal stability. Antenna features affect transmission range, stability and anti-interference performance. Therefore, the antenna is a vital component in any system installation, especially in complicated and demanding RF environments for wireless microphones and wireless monitoring systems. It greatly improves signal stability and reduces interference and signal drop-outs caused by polarization problems.

4. Built-in Connectors

The AT-100a has two built-in signal connectors: “TX/RX” connector can be connected to a transmitter or receiver, however, connection to a short coaxial cable is recommended when connected to a receiver. “RX” connector (cannot be connected to a transmitter) has a built-in 12 dB gain controllable booster and thus provides extended reception range and compensates the signal loss of coaxial cable to improve reception range and signal quality.

The power of gain controllable booster can be provided by a MIPRO AD-708 antenna divider or any MIPRO ACT-series receivers which provides bias by adding an adjustor on their antenna connectors.

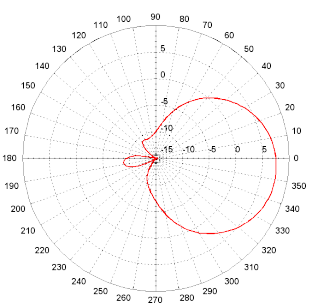
5. Waterproof

Waterproof and weather resistant, the AT-100a is Ideal for both outdoor and indoor applications.

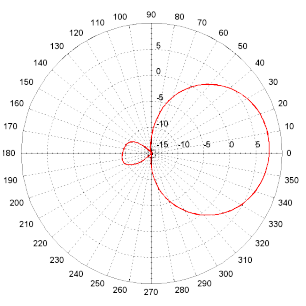
Specifications

Frequency Range	470~1,000 MHz
Antenna Gain	6~8 dBi
Polarization	Circular polarization
3-dB Beam Width	72°
Booster Gain	RX Connector: 0~12 ± 1 dB gain controllable; TX/RX Connector: 0 dB
VSWR	< 2:1
Power Consumption	RX Connector: 1.3W / 8V DC or 8~15V DC; TX Connector: 0 mW
Impedance	50 Ω
Connector	TNC Female x 2
Dimensions (W × H × D)	350 × 350 × 225 mm / 13.8 × 13.8 × 8.8"
Weight	1.5 kg / 3.3 lbs
Note	Refer to actual product in case of product description discrepancy

Antenna Pattern



Vertical

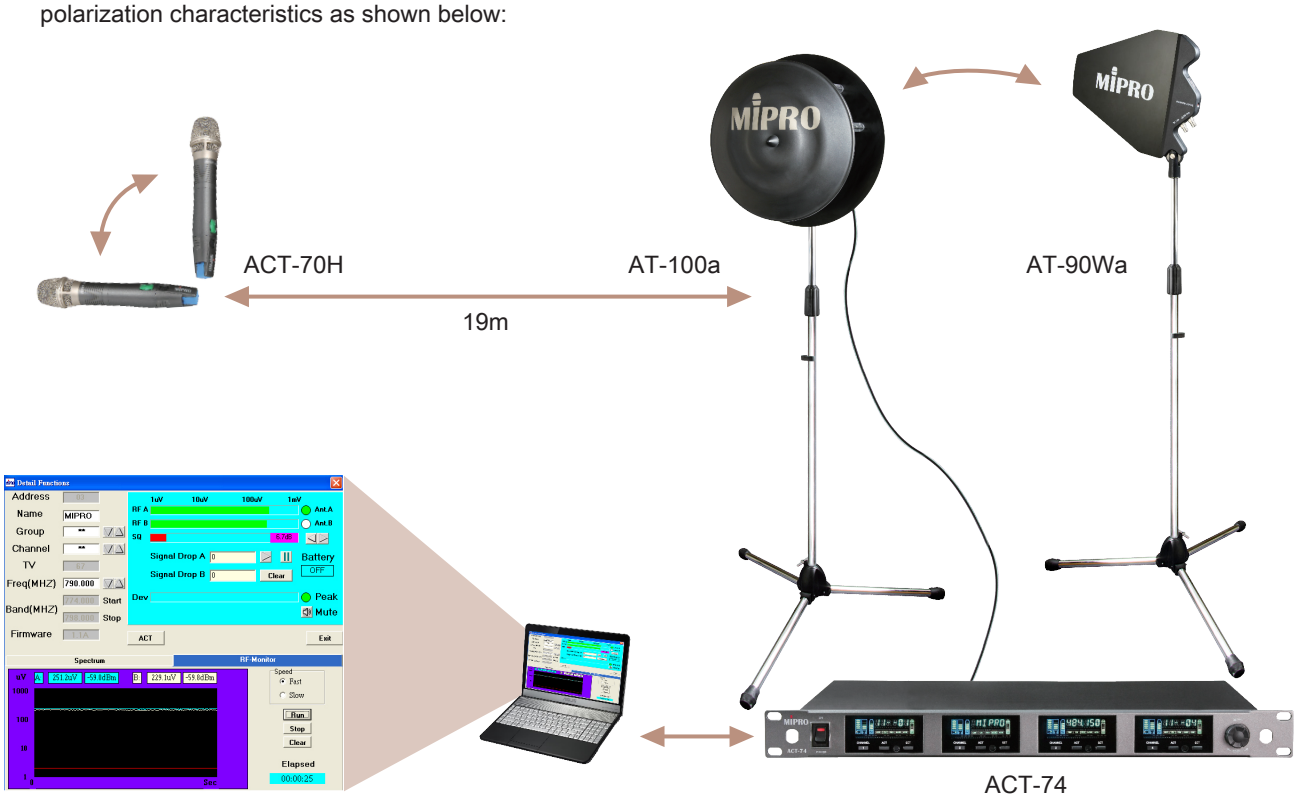


Horizontal

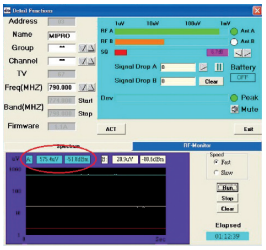
AT-100a and AT-90Wa (or other directional antenna) Comparison Chart

1. Static Measurement of Antenna Polarization Loss:

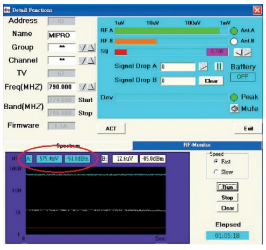
These antenna observation statistics were taken of the MIPRO RCS2.Net 2.6 monitoring software connected to an ACT-74 receiver with the signal transmitted by an ACT-70H handheld transmitter. The AT-100a and AT-90Wa directional antennas were connected to the same antenna input port at the receiver, measuring differences to antenna polarization characteristics as shown below:



AT-100a Measurement Result



Vertical Position

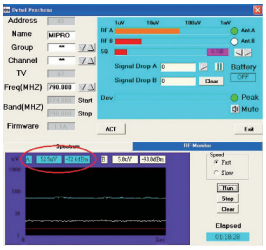


Horizontal Position

AT-90Wa Measurement Result



Vertical Position



Horizontal Position

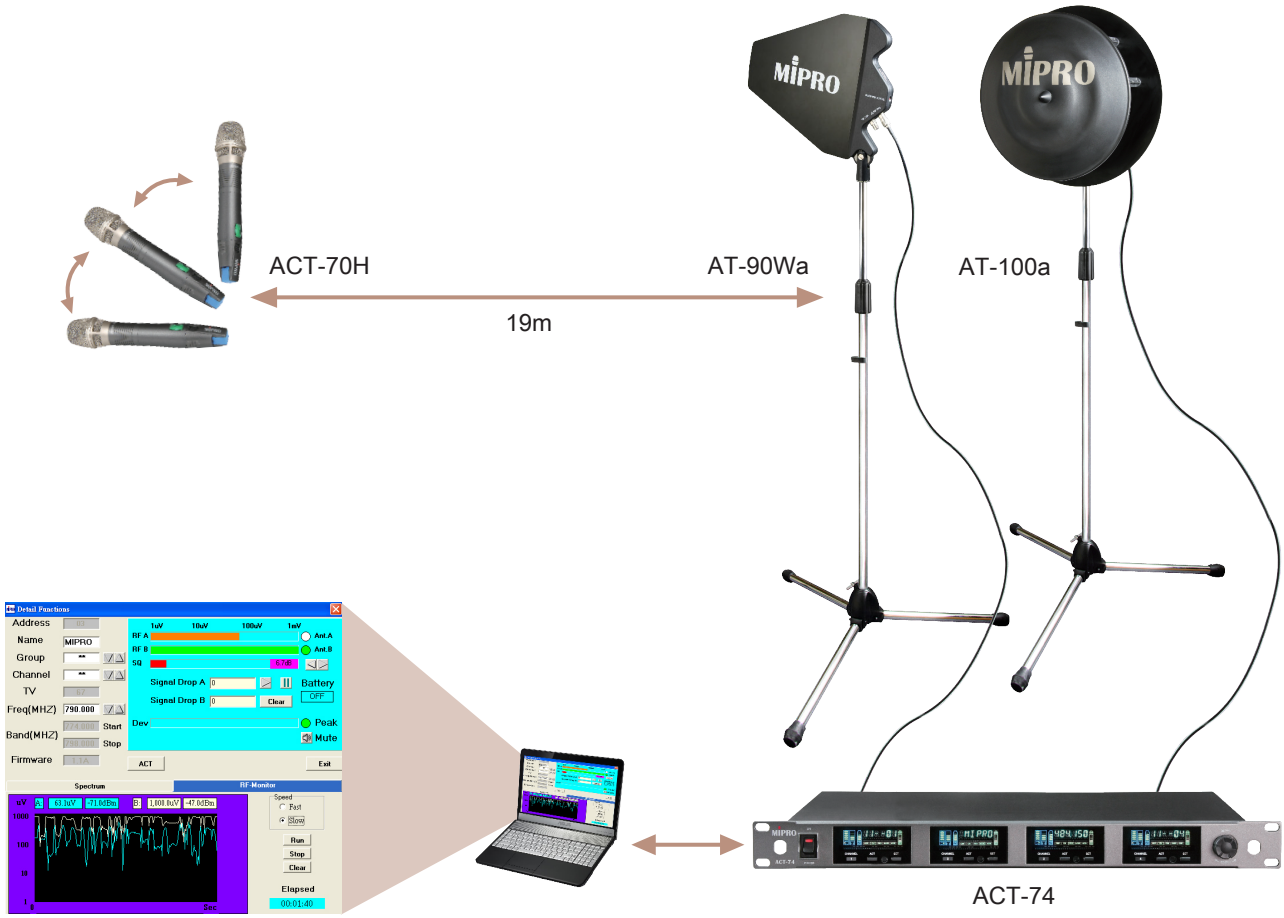
Measurement Result Clearly Indicated

Model	RF Received Signal Strength (dBm)	
	Vertical Position of Microphone	Horizontal Position of Microphone
AT-100a	-51.8	-51.8
AT-90Wa	-53.0	-72.6

Due to the low polarization loss of the AT-100a circularly-polarized antenna, the received signal strengths are almost the same and stable when the transmitting microphone is in both vertical and horizontal positions. On the contrary, due to the large polarization loss of the linearly-polarized AT-90Wa antenna, the received signal strengths indicate a difference of 19.6 dB when the transmitting microphone is in vertical versus horizontal positions.

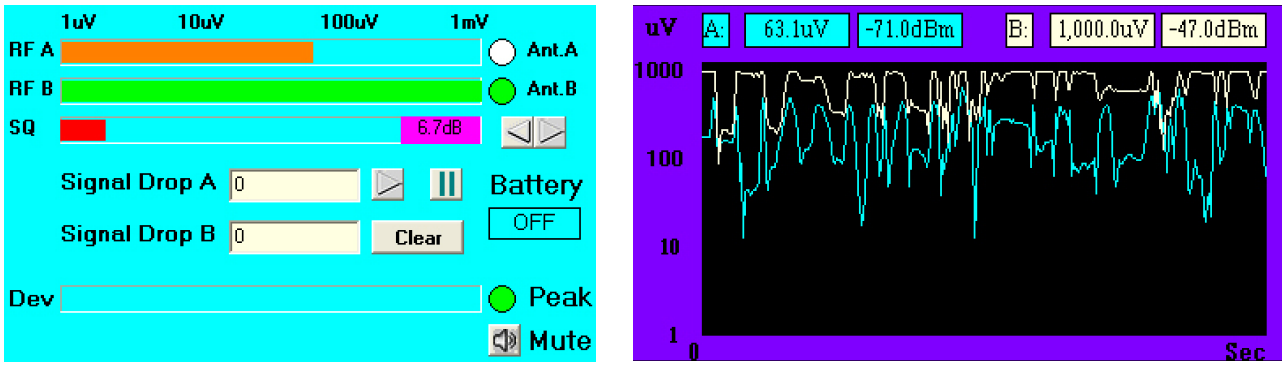
2. Antenna Dynamic Measurements with Polarization Loss Experiments

These antenna observation statistics were taken of the MIPRO RCS2.Net 2.6 monitoring software connected to an ACT-70H receiver with the signal transmitted by an ACT-70H handheld transmitter. The AT-100a and AT-90Wa were connected to the ACT-74 receiver input "B" and "A" terminals, respectively. The measuring differences to antenna polarization characteristics are as shown below:



Test Result

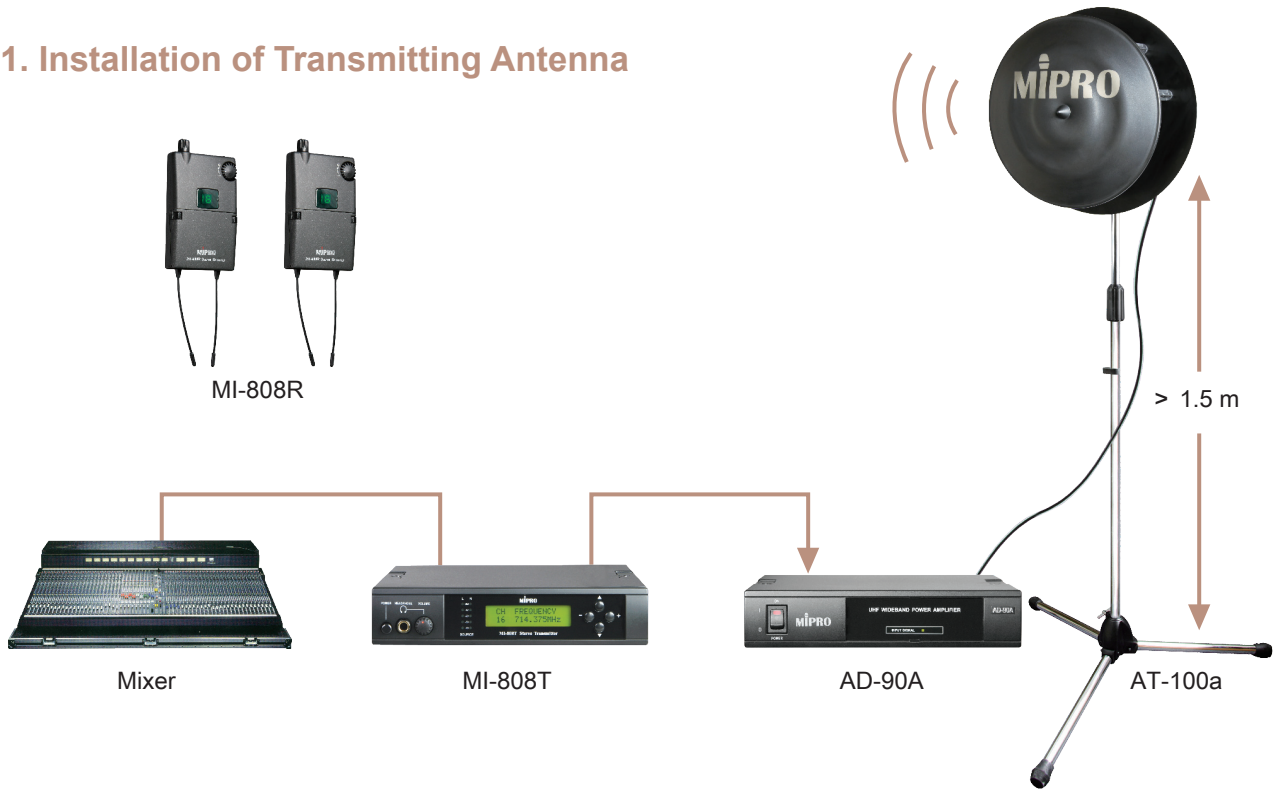
Below diagram clearly indicated that AT-100a circularly polarized antenna has improved performance than AT-90Wa in terms of received signal strengths and signal stability.



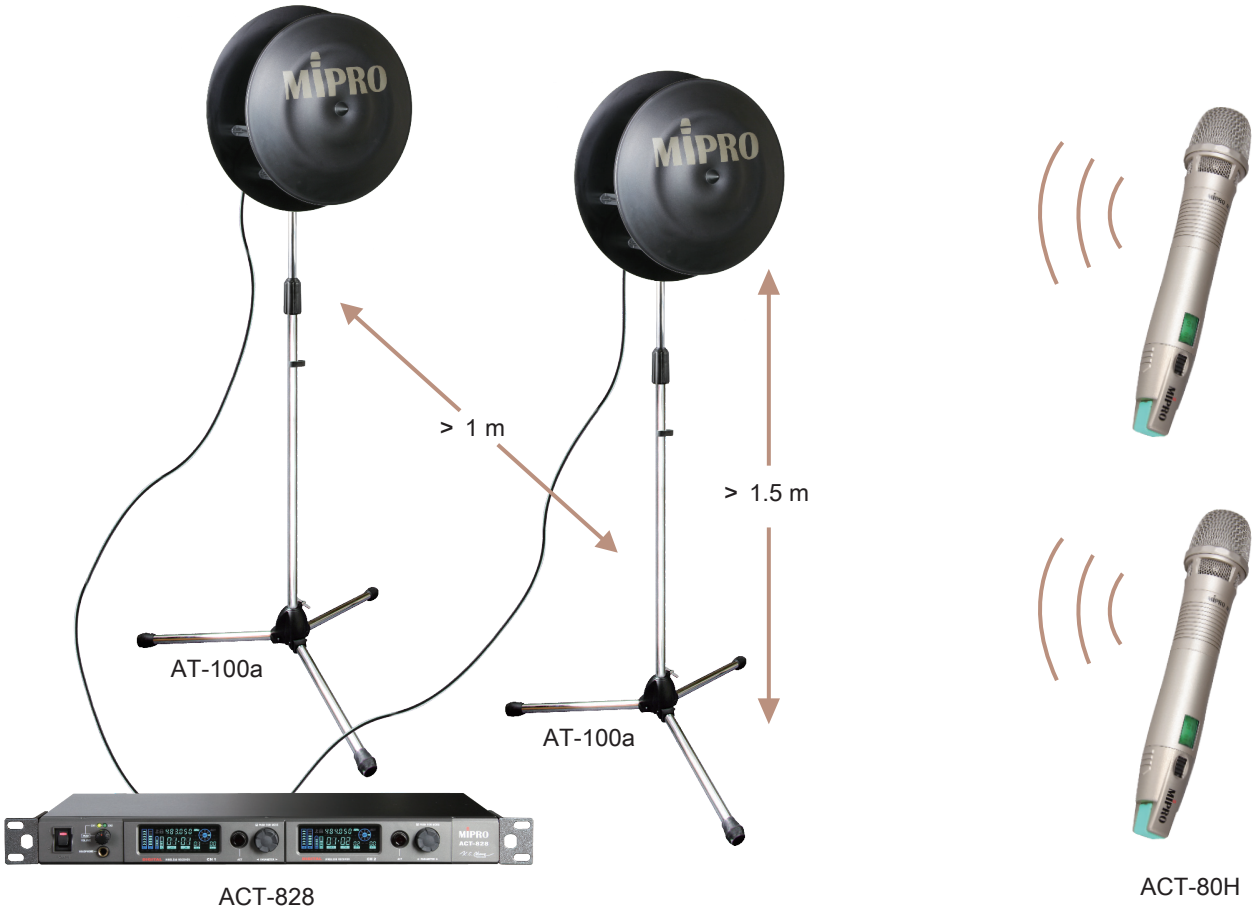
Computer Monitoring Graphs

Correct Antenna Installations

1. Installation of Transmitting Antenna



2. Installation of Receiving Antenna for Directional Stage Performances



Installed Venues and Mounting Methods

Stages



Convenient MS-30 mic stand.

Ceiling Mounting-Vertical Position



Convenient MS-90 ceiling mount.

Wall Mounting-Horizontal Position



Convenient MS-90 wall mount.

Outdoor Installation



Convenient MS-90 mount.

Built-in Booster Usage

1. Optimal signal quality through proper booster usage

Coaxial cable loss reduces signal receiving distance and stability. A booster must be connected to improve the antenna gain in order to compensate for this signal loss. However, too much antenna gain in the booster causes unnecessary interference from intermodulation distortion, resulting in deterioration of the received signal quality.

The AT-100a has two connectors. The one marked RX (receiver only) has a built-in 12dB gain controllable booster, which can be used effectively to compensate for the signal loss from extended cable transmission.

2. Calculation in selection of appropriate cable size and length to match the booster

Please refer to the Technical Knowledge section of the catalog for “How to Design Transmission Cable and Booster for Antenna Systems”.

AT-90Wa Wideband Transmitting and Receiving Log Antenna

NEW



Profile

The AT-90Wa is a bi-functional log antenna for professional receiving and transmitting applications. Optimized for 470~1000 MHz, it is compatible with US and EU new telecom regulations. It has a 4~6 dBi gain which is ideal for any installation requiring specific directionality. The wideband ACT-90Wa can be easily distinguished from its predecessor, the AT-90, by its new"W-Shaped" design.

The AT-90Wa has two input connectors: "TX/RX" connector can be connected to a transmitter or receiver, however, connection to a short coaxial cable is recommended when connected to a receiver. "RX" connector (cannot be connected to a transmitter) has a built-in 12 dB gain controllable booster and thus provides extended reception range and compensates the signal loss of coaxial cable to improve reception range and signal quality.

The power of gain controllable booster can be provided by a MIPRO AD-708 antenna divider or any MIPRO ACT-series receivers which provides bias by adding an adjustor on their antenna connectors.

Specifications

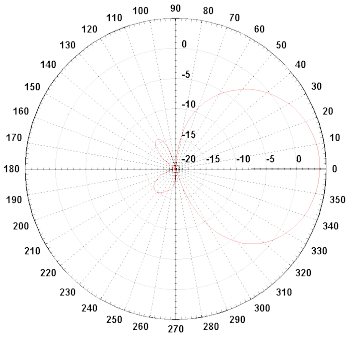
Frequency Range	470~1000 MHz
Antenna Gain	4~6 dBi
Booster Gain	RX Connector: 0~12 ± 1 dB gain controllable; TX/RX Connector: 0 dB
VSWR	≦ 2:1
3-dB Beam-width	75° Vertical; 130° Horizontal
Power Consumption	RX Connector: 1.3W / 8V DC or 8~15V DC; TX Connector: 0 mW
Impedance	50 Ω
Connector	TNC Female × 2
Dimensions (W × H × D)	319 × 270 × 25 mm / 12.5 × 10.6 × 1 "
Weight	Approx. 430 g / 15.2 oz
Note	Refer to actual product in the event of product description discrepancy.

MS-90 Wall Mount

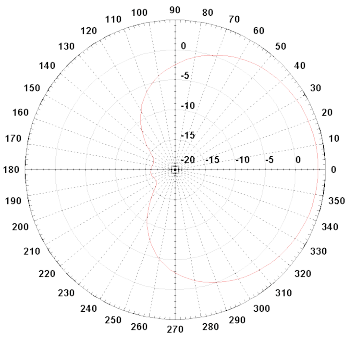
Wall mount for AT-70Wa, AT-90Wa, AT-100a.



Antenna Pattern



Vertical



Horizontal

AT-70Wa

NEW

Wideband Transmitting and Receiving Omni-directional Antenna



Profile

AT-70Wa is a bi-functional omni-directional antenna for professional receiving and transmitting applications. It is optimized for 470~1000 MHz, which is fully compatible with US and EU new telecom regulations. It has a 2~4 dBi gain which is ideal for any specific installation requiring full directionality. It can be easily distinguished by its new “W-Shape” appearance.

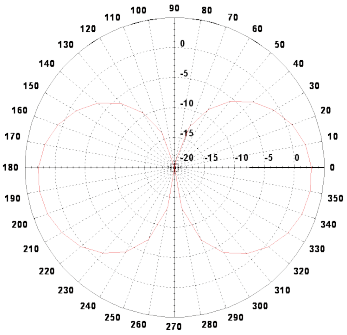
The AT-70Wa has two input connectors: “TX/RX” connector can be connected to a transmitter or receiver, however, connection to a short coaxial cable is recommended when connected to a receiver. “RX” connector (cannot be connected to a transmitter) has a built-in 12 dB gain controllable booster, and thus provides extended reception range and compensates the signal loss of coaxial cable to improve reception range and signal quality.

The AT-70Wa offers users the options of transmitting or receiving based on their actual application. The power of gain controllable booster can be provided by a MIPRO AD-708 antenna divider or any MIPRO ACT-series receivers which provides bias by adding an adjustor on their antenna connectors.

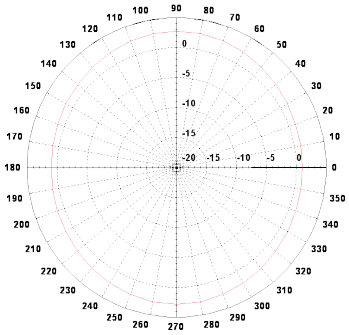
Specifications

Frequency Range	470~1000 MHz
Antenna Gain	2~4 dBi
Booster Gain	RX Connector: 0~12 ± 1 dB gain controllable; TX/RX Connector: 0 dB
VSWR	≦ 2:1
Power Consumption	RX Connector: 1.3W / 8V DC or 8~15V DC ; TX Connector: 0 mW
Impedance	50 Ω
Connector	TNC Female × 2
Dimensions (W × H × D)	120 × 261 × 32 mm / 4.7 × 10.3 × 1.3 "
Weight	Approx. 200 g / 7 oz
Note	Refer to actual product in the event of product description discrepancy.

Antenna Pattern



Vertical



Horizontal

FB-70 Front Mount Antenna Bracket



Ideal for installation into an EIA-standard 19" rack case.

AD-708 Wideband 4-channel Auto Gain-Control Antenna Divider



Profile

The AD-708 is MIPRO's innovative antenna divider which works with the MPB-30 gain-controlled antenna booster. It can detect the signal loss of the cables between the divider and the booster to control the gain level of the MPB-30 booster or AT-70Wa / 90Wa / 100a automatically. The AD-708 can compensate for the signal loss precisely, thereby solving antenna system installation issues to achieve optimal receiving performance. (See Technical Knowledge section, number 6)

Features

1. Equipped with an automatic signal loss detector, the AD-708 is designed to work with an MPB-30 gain-controllable antenna booster. It can control and compensate for the signal loss of antenna cables precisely and automatically in order to avoid the intermodulation caused by the higher gain supply from the booster.
2. It shares the same features with the AD-707a wideband antenna divider and is compatible with the MPB-20 to compensate for the signal loss of cables, but cannot change the gain of the boosters themselves.
3. The AD-708 is housed in an EIA-Standard 1U metal case with a bright LED indicator to identify antenna cable signal loss as well as the booster compensation status.
4. It makes it fast and easy to install antenna systems without worrying about the calculations of signal loss of antennas and cables or booster specifications.

Specifications

Antenna Splitter	2 sets of 1-to-4 active divider output, 2 sets of 1-to-1 active output
Frequency Range	470~850 MHz
IIP3	+32 dBm
Detection of Signal Loss from Cable	Detects the signal loss of cables automatically to control the gain of MPB-30 or AT-70Wa / 90Wa / 100a
RF Output Gain	+1.0 dB ± 1 dB
Input/Output Gain	+1.0 dB ± 1 dB
Output Port Isolation	>18 dB at 400~1000 MHz
Filter Selection	Low sideband ≧ 35dB ; High sideband ≧ 30dB
Impedance	50 Ω
Connector	TNC Female
Antenna Input Power Supply	Antenna A/B input port supplies bias 8.3 V DC , 230 mA max. to booster
Power Supply	12~15V DC
Current Consumption	Approx. 242 mA at 12V DC Input
Dimension (W × H × D)	420 × 44 × 180 mm / 16.5 × 1.7 × 7.1"
Weight	Approx.1.5 kg / 3.3 lbs
Note	Refer to actual product in the event of product description discrepancy

MPB-30 Gain-Controllable Antenna Booster



Profile

The MPB-30 antenna booster is equipped with variable gains to work with the AD-708 antenna divider to detect and automatically compensate for the signal loss of antenna cables to obtain optimal signal outputs.

Features

1. Optimized in the 470~960 MHz frequency range, it works with the AD-708 antenna divider to detect and automatically compensate for the signal loss of cables by controlling the built-in variable 0~14dB ± 1dB gain.
2. With an external power supply, the MPB-30 provides power independently to the internal antenna booster. This allows complicated external antenna dividing systems to work efficiently and independently so that longer antenna cables can be connected with more boosters.
3. Without an external power supply, the MPB-30 works by the 8V DC power provided from MIPRO ACT Series receivers to ensure normal operation.
4. Its aluminum casing provides superb heat dissipation characteristics and a constant output voltage of 8V DC.

Specifications

Frequency Range	470~960 MHz
Gain	Variable 0~14 dB ± 1 dB (work with AD-708)
Noise Figure	< 2.5 dB (center band)
IIP3	+18 dBm (center band)
Impedance	50 Ω
Input Power	12~24V DC (min. 350mA)
Regulated Power Output	8V DC (max. 250mA)
Current Consumption	Approx. 77mA at 12V DC
Connectors	TNC × 2, 2.0 mm DC Jack × 1
Dimensions (W × H × D)	90 × 25 × 55 mm / 3.5 × 1 × 2.2 "
Weight	Approx. 100 g / 3.5 oz
Note	Refer to actual product in the event of product description discrepancy.

AD-707a UHF Wideband 4-channel Antenna Divider



Features

1. Optimized for the 470~850 MHz carrier frequency range, the AD-707a is fully compatible with US and EU telecom regulations.
2. Allows 2~4 sets of UHF diversity receivers to operate from a pair of antennas, greatly simplifying antenna installation and increasing reception range and efficiency.
3. Built with the latest high dynamic-range components and wideband microstrip circuit design, it features ultra-low intermodulation distortion, and eliminates spurious interference in multiple system usage. System output gain approximately equals to 1.
4. Output connectors provide bias for a ground plane antenna with antenna booster and a wideband receiving log antenna with built-in booster.
5. It has 2 sets of 4-channel antenna output connectors for direct connection to 4 sets of diversity receivers.
6. It provides 2 sets of antenna input and output connectors.
7. The output connector can be linked to the input connector of another antenna divider.
8. Booster power indicators assist with identifying the booster linkage.

Specifications

Antenna Splitter	2 sets of 1-to-4 active divider outputs; 2 sets of 1-to-1 active divider outputs.
Frequency Range	470~850 MHz
IIP3	+32 dBm
RF Output Gain	+1.0 dB ± 1 dB
Input/Output Gain	+1.0 dB ± 1 dB
Output Port Isolation	> 18 dB at 400~1000 MHz
Filter Selection	Low sideband ≧ 35 dB; High sideband ≧ 30 dB
Impedance	50 Ω
Connector	TNC Female
Antenna Input Power Supply	Antenna A/B input port supplies bias 8.3V DC, 230 mA max. to booster.
Power Supply	12~15V DC
Current Consumption	Approx. 190 mA at 12V DC
Dimensions (W × H × D)	482 × 44 × 190 mm / 19 × 1.7 × 7.5 "
Weight	Approx.1.5 kg / 3.3 lbs
Note	Refer to actual product in the event of product description discrepancy.

MPB-20 Antenna Booster with Built-in Power Supply



Features

1. Optimized in the 470~960 MHz frequency range, the MPB-20 offers 13 dB gain to compensate for signal loss due to long antenna cables, thereby enhancing signal stability and increasing reception range.
2. With an external power supply, the MPB-20 provides power independently to the internal antenna booster. This allows complicated external antenna dividing systems to work efficiently and independently so that longer antenna cables can be connected with more boosters.
3. Without an external power supply, the MPB-20 can work properly on the 8V DC power provided by MIPRO ACT receivers to offer a stable 13 dB gain.
4. Its aluminum casing provides superb heat dissipation characteristics and a constant output voltage of 8V DC.

Specifications

Frequency Range	470~960 MHz
Gain	13 ± 1 dB
Noise Figure	< 2.5 dB (center band)
IIP3	+18 dBm (center band)
Impedance	50 Ω
Input Power	12~24V DC (min. 350 mA)
Regulated Power Output	8V DC (max. 250 mA)
Current Consumption	Approx. 32 mA at 12V DC
Connectors	TNC × 2, 2.0 mm DC Jack × 1
Dimensions (W × H × D)	90 × 25 × 55 mm / 3.5 × 1 × 2.2 "
Weight	Approx. 100 g / 3.5 oz
Note	Refer to actual product in the event of product description discrepancy.

AD-90S UHF 4-channel Wideband Power Splitter





Features

1. The AD-90S is a UHF 4-channel power antenna splitter with a maximum output level of +26 dBm (0.4 W), allowing one transmitter to connect to 4 transmitting antennas.
2. Primarily operates with 4 MI-909T/MI-808T in-ear monitoring transmitters or 4 MT-92A wireless interlinking transmitters to send signals through 4 channels with reliable signal transmission and larger signal coverage in multiple directions. Note that the AD-90S is not designed for receivers.
3. Each channel of the AD-90S can be connected to an AD-90A UHF wideband power amplifier to increase signal output power and transmission range when the antenna is installed in complex terrain or a large building with many partitions.

Specifications

Bandwidth	UHF 470~960 MHz
Full System Gain	0~2 dB
VSWR Input / Output	≦ 1.5:1
Max. Output Connectors	4
Input Signal Indicator Threshold	+3 dBm
Max. RF Power Output	+26 dBm
Power Supply	12~15V DC
Current Consumption	Approx. 760 mA
Input / Output Connectors	TNC Female (1 input, 4 output)
Dimension (W × H × D)	210 × 44 × 206 mm / 8.3 × 1.7 × 8.1 "
Weight	Approx. 1.1 kg / 2.4 lbs
Operating Temperature	-10~+60℃
Note	Refer to actual product in the event of product description discrepancy.

AD-90A UHF Wideband High Power Amplifier





Features

1. The AD-90A is a professional UHF 470~960 MHz wideband power amplifier with maximum output power of +30 dBm (1 W).
2. The AD-90A is designed to operate with a MIPRO MI-909T/MI-808T stereo transmitter, a MT-92A wireless linking transmitter, and an AD-90S UHF wideband power splitter as an end-amplifier to boost signal strength for longer signal transmission distance and reduce signal dropout in extremely complicated environments.
3. Ideally suited for large outdoor installation sites requiring wireless transmission to remote powered active speakers.
4. The AD-90A's output can be connected to an AT-90W UHF wideband antenna to complete a highly efficient long distance transmission.

Specifications

Bandwidth	UHF 470~960 MHz
Full System Gain	8 ± 1 dB
VSWR Input/Output	≦ 2:1
Input Signal Indicator Threshold	+6 dBm
Max. RF Power Output	1 W
Power Supply	12~15V DC
Current Consumption	Approx. 370 mA
Connectors	TNC Female (1 input, 1 output)
Dimension (W × H × D)	210 × 44 × 206 mm / 8.3 × 1.7 × 8.1 "
Weight	Approx. 1.1 kg 2.4 lbs
Operating Temperature	-10~+60℃
Note	Refer to actual product in the event of product description discrepancy.

AD-808 UHF 4-channel Active Antenna Combiner





Features

1. Wideband frequency range from 470~960 MHz.
2. Operates with up to 4 transmitters.
3. Input signal indicator (threshold above +6 dBm).
4. Maximum RF input power +20 dBm (100 mW).
5. Ideal intermodulation characteristics (3rd order IM<-57 dBc under full band performance +15 dBm two-tone test).

Specifications

Frequency Range	470~960 MHz
Full System Gain	0 ± 2 dB
VSWR Input / Output	≦ 1.5:1
Max. RF Input Power	+20 dBm
Input Signal Indicator Threshold	+6 dBm
Power Consumption	9.12 W (12V, 760 mA)
Input / Output Connectors	TNC Female (4 input, 1 output)
Dimension (W × H × D)	210 × 44 × 206 mm / 8.3 × 1.7 × 8.1 "
Weight	Approx. 1.1 kg / 2.4 lbs
Note	Refer to actual product in the event of product description discrepancy.

AD-12 Passive Antenna Divider / Combiner



Features

1. The AD-12 can either divide a RF signal into 2 signal outputs or combine 2 signals into 1 signal output. Simultaneously, it transmits bias voltage to the boosters. The AD-12 is an ideal accessory when setting up antenna systems.
2. The AD-12 utilizes an isolated grounding design to avoid electrical noise from multi-receiver operations.

Specifications

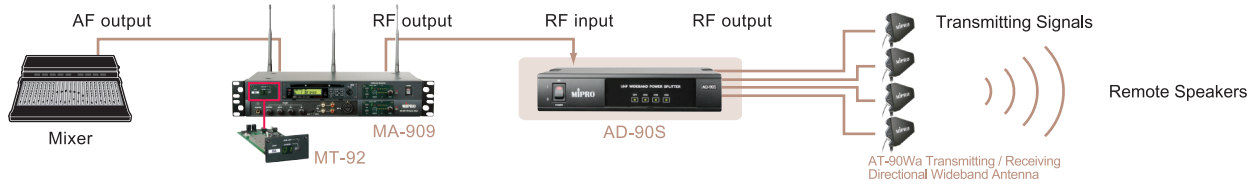
Frequency Range	470~1000 MHz
Attenuation	3.5 dB (typ.)
Isolation	20 dB (typ.)
Impedance	50 Ω
Max. Volt / Current	50V DC / 1.5A
Connectors	TNC × 3
Dimension (W × H × D)	90.3 × 25 × 55.4 mm / 3.5 × 1 × 2.2 "
Weight	Approx. 105 g / 3.7 oz
Note	Refer to actual product in the event of product description discrepancy.

AD-90S Application

Application of AD-90S with MI-808T Stereo Transmitter & AT-90Wa Passive Directional Antenna

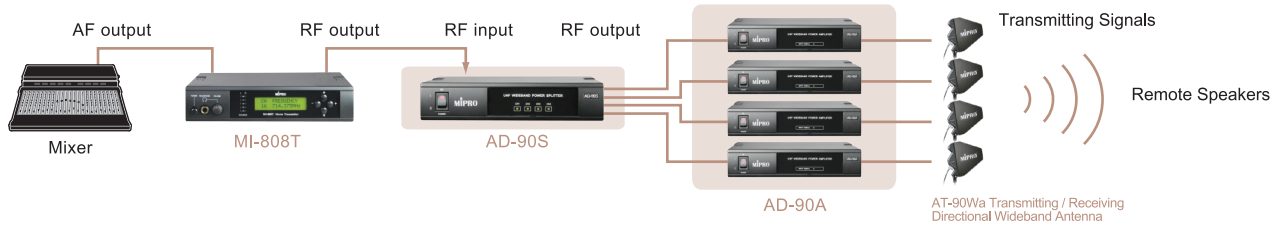


Application of AD-90S with MT-92 Wireless Interlinking Transmitter & AT-90Wa Passive Directional Antenna

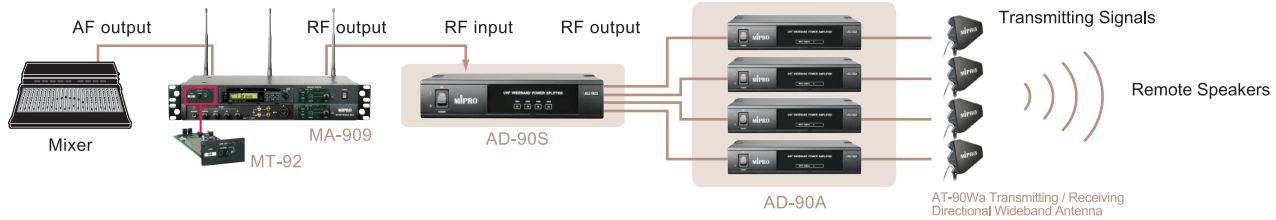


Transmission Enhancement Application

Application of AD-90S with MI-808T Stereo Transmitter & AD-90A Wideband High Power Amplifier



Application of AD-90S with MT-92 Wireless Interlinking Transmitter & AD-90A Wideband High Power Amplifier



AD-90A Application

Application of AD-90A with MT-92 Wireless Interlinking Transmitter & AT-90Wa Transmitting / Receiving Directional Wideband Antenna

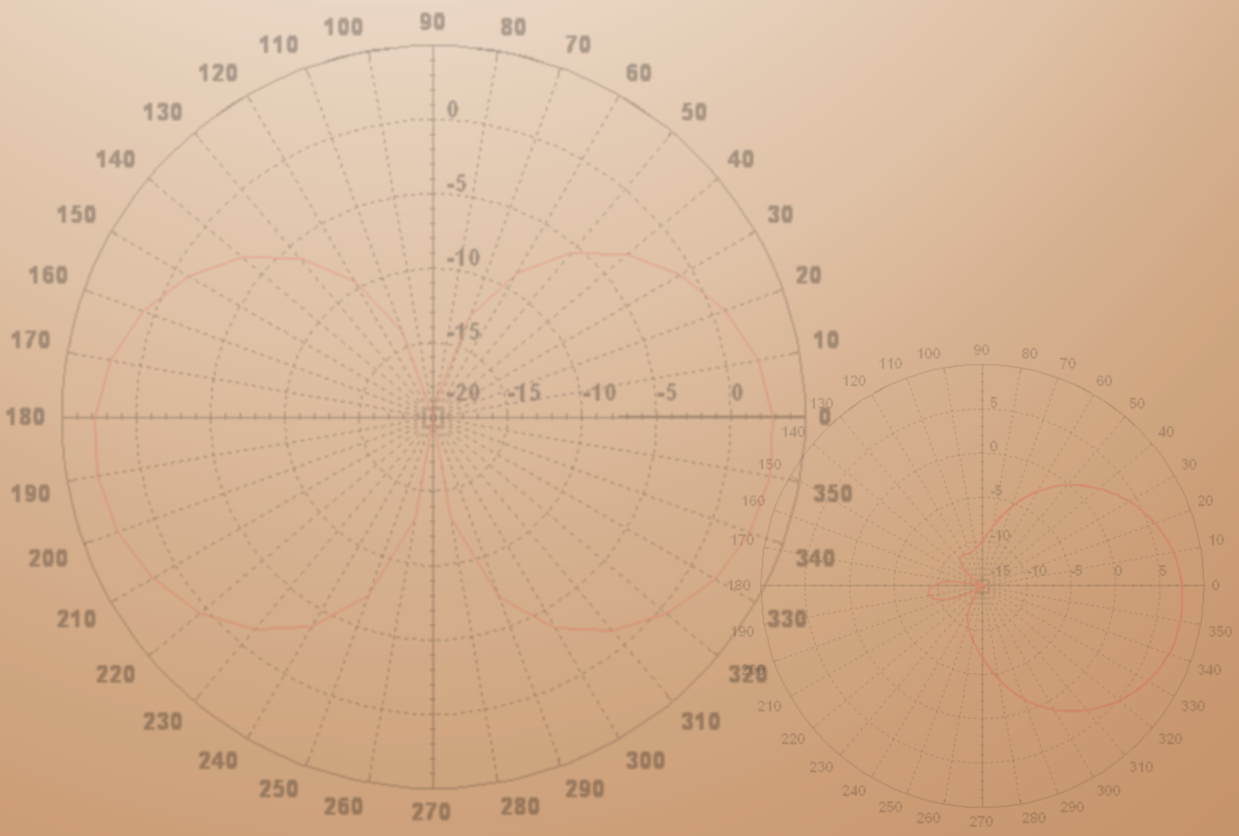


Application of AD-90S with MI-808T Stereo Transmitter & AT-90Wa Transmitting / Receiving Directional Wideband Antenna



Technical Knowledge

1. Is It Better to Have More Switchable Channels in a PLL Receiver? 130
2. Why Is A True Diversity Receiver Required for Professional Performance? 131
3. The Proximity Effect of Multiple Antennas 133
4. How to Improve the Transmission Distance and Signal Quality in a Wireless Microphone System 135
5. How to Design Transmission Cable and Booster for Antenna Systems 139
6. How to Use the MIPRO Auto Gain-Control Antenna Systems 141
7. Discussion on 2.4GHz Wireless Microphone Systems 143
8. The Best Solution for Multi-Channel Receiving Antenna Installation 145
9. Color VFD Display is MIPRO Professional Receiver's Distinction 150



1. Is It Better to Have More Switchable Channels in a PLL Receiver?

• Difference between "switchable channels" and "switchable interference-free channels"

A quartz-controlled receiver can receive only a single fixed channel signal, while a PLL receiver adopts a frequency synthesizer circuit design that can receive a particular frequency band and can freely switch to any desired working channel within that frequency band.

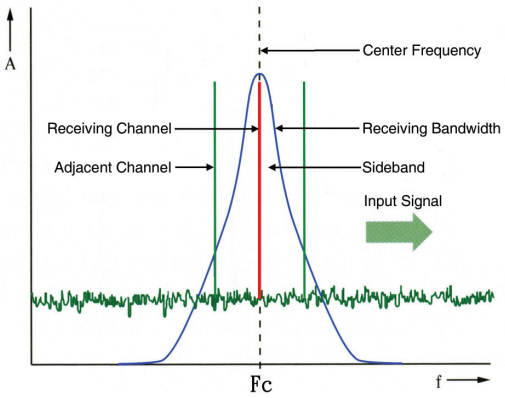


Figure 1: A Quartz-Controlled Receiver receives a fixed frequency signal only.

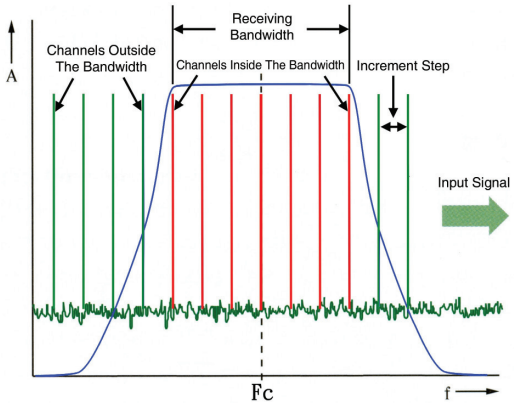


Figure 2: A PLL Receiver is able to switch channels within a receiving frequency band.

The numbers of switchable channels in a PLL receiver depends on the receiving frequency bandwidth and the switchable channel' s interval step. The wider the bandwidth, the smaller the interval step is, and the more switchable channels will be available. For example, for a PLL receiver with a 25MHz bandwidth where each channel switches by 1MHz interval steps, then only 26 (25+1) channels will be available. If the interval step changes to 125kHz, then the switchable channels will increase to a total of 201(25 ÷ 0.125+1). Similarly, if the interval step is changed to 25kHz, then 1001 channels are generated. For the same reason, the smaller the interval step is, the more switchable channels there will be, but is it really better to have more switchable channels available in a PLL receiver?

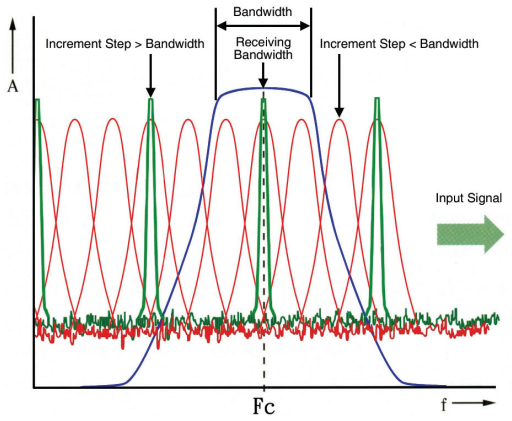


Figure 3: If the incremental step of switchable channels for a PLL receiver is smaller than the signal of the bandwidth, sideband interference occurs.

• Is it better to have more switchable channels in a PLL receiver?

Since the receiving channel of a PLL receiver has a fixed bandwidth, if the interval step of switchable channels is smaller than the receiving bandwidth, its center frequency will still cover within the sidebands of the receiving bandwidth and cause interference. For example, if a receiver has a 250kHz receiving bandwidth and switches channel by incremental steps of 25kHz, then 11 switchable incremental channels are available, but since all are included within the receiving bandwidth, sideband interference will occur. Consequently, it will be practical only if the interval step of adjacent switchable channels is wider than the receiving bandwidth. In other words, it is redundant to switch to an incremental channel of an interval step smaller than the receiving bandwidth.

• How to choose an advanced PLL receiver

When multiple channels are used simultaneously, it's not easy to select the non-interference ones. Not only does each channel's own multi-harmonic waves interfere with each other, but the receiver's selectivity and sensitivity and squelch threshold are factors that can also affect potential interference. As a result, for a more advanced PLL receiver, it is not desirable to have as many switchable channels as possible, but rather to design a selected group of preset non-interference channels chosen from the switchable ones available within a certain bandwidth. This helps users rapidly switch to another "interference-free working channel" by choosing only from these pre-selected channels.

All of the preset channels for MIPRO's ACT series receivers are precisely selected, so that, with the unique ACT function, just one press of a button will make the receiver automatically and rapidly scan and lock on an interference-free channel within a set of preset channels. Additionally, it will skip any channels having interference and then lock onto an interference-free channel, thus solving the biggest problem for users when setting up multi-channel systems. Therefore, the best design for PLL receivers should not be determined by the numbers of switchable channels available, but by the numbers of switchable interference-free channels that can be utilized.

Writer Profile: K.C. Chang, MIPRO CEO, 50 years in R&D of wireless microphone systems.

2. Why A True Diversity Receiver is Required for Professional Performance

Before choosing the professional wireless receivers for live performances, please study the following issues:

• Why signal drop-out and noise occurs during the usage of wireless microphone systems:

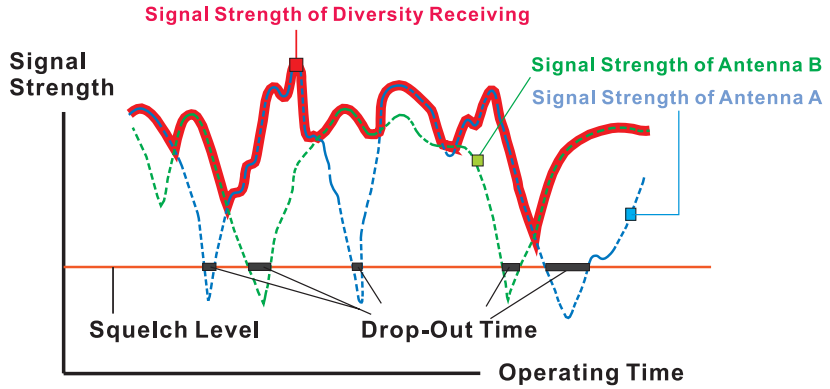
When the antenna of a receiver receives the direct signal from the transmitter, it also receives an indirect signal reflected by the surrounding environment at the same time. Since these two signals are out-of-phase, the signal strength may be canceled out; when the signal strength drops lower than the receiver's muting threshold, the output of the receiver may produce a signal drop-out and noise caused by this "dead point". The weaker the signal, the greater the noise.

•How to prevent signal drop-out and noise problems in wireless microphone systems

1. Using Switching Diversity Receiving mode to resolve reception problems:

In order to overcome the defect of signal drop-out and noise in single antenna receiving systems, the "Automatic Switching Diversity Receiving" design has been developed to solve these problems .The design employs two antennas set at different locations to receive the signal from one wireless microphone transmitter, which then automatically switches to the one which is receiving the stronger signal.

With this reception mode, when receiving weak signals, the probability of signal drop-out is about five times lower than with a single antenna; while the signal intensity is increased about three times (10dB). The probability can be improved to about 45 times and there's almost no signal drop-out in short operating distances. The higher the sensitivity of the receiver, the longer the reception distance and the less signal dropout and noise will be experienced, even when the signal strength drops close to the receiver's muting threshold.



2. Switching Diversity Receiving Categories:

Using a single antenna to directly connect to the tuner is known as "Non-Diversity Receiving", as shown in Figure 1. The Automatic Switching Diversity Receiving has two modes: "Dual Antenna Diversity Receiving" (Ant-Diversity) and "True Diversity Receiving" (True-Diversity).

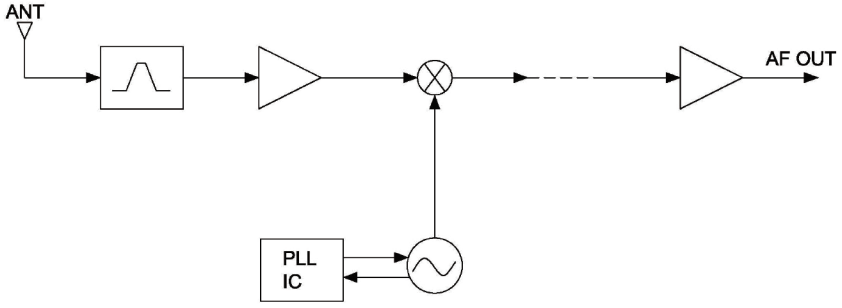


Figure 1 : Non-Diversity Receiving

Dual antenna diversity reception or “Predictive diversity reception” employs two antennas in different locations. A specially designed CPU control circuit automatically switches to the antenna which is receiving a stronger signal and connects its signal to the tuner. The output signal of the demodulator provides a control voltage to the CPU control unit to quickly determine whether to switch to the other antenna or not, in order to achieve the best antenna connection. This allows the receiver to always keep on the antenna which has the stronger signal, thus eliminating the signal drop-out and instability caused by the “dead point”. As shown in Figure 2.

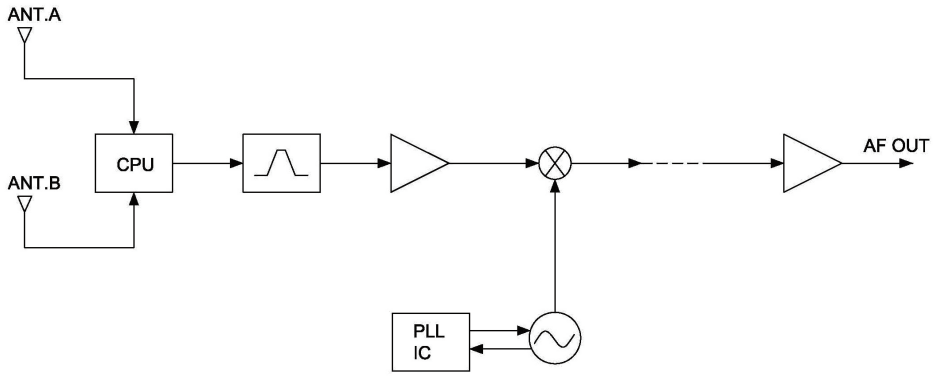


Figure 2：Dual antenna diversity (Predictive-Diversity Receiving)

True-Diversity also employs two antennas in different locations connecting respectively to dual tuners which have the same characteristics. The output signals are demodulated from the tuner and connected to the comparator and switching circuit for fast switching to the stronger audio signal output. This receiving mode perfectly prevents the signal drop-out and instability caused by the receiving “dead point”. As shown in Figure 3.

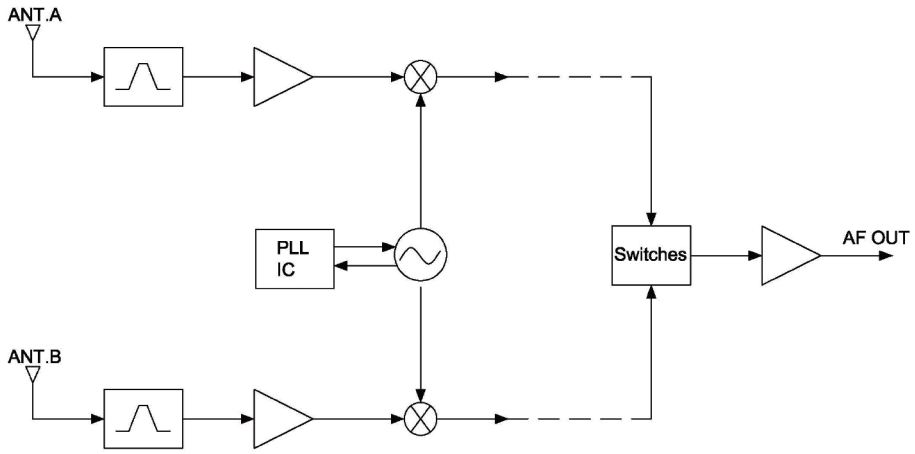


Figure 3：True-Diversity Receiving

3. The advantages and disadvantages of Antenna Diversity and True-Diversity:

To lower cost, many wireless microphone manufacturers employ the dual-antenna diversity receiving design. Though two antennas are applied to prevent signal drop-out, the result is not ideal because only one tuner is used. Therefore, it will not perfectly resolve the signal drop-out and signal instability issue, especially under complex reception environments and when longer distance operation is required.

The True-Diversity receiving design utilizes two antennas connecting to two tuners respectively. The output signals from the demodulator are connected to the comparator, and its output signal is always switched immediately to the better quality signal. Although the cost of this true diversity receiving mode is greater, it improves the quality of signal reception, free from signal dropout and noise interference.

4. Select "True Diversity" receivers to ensure wireless microphone perfect sound quality!

The true diversity wireless receiver eliminates signal dropout and signal shift during performances. The choice of a “True Diversity” receiver meets the audio quality requirements of professionals. Although it is more expensive, it is the only choice for professional stage and live performances to ensure perfect sound quality!

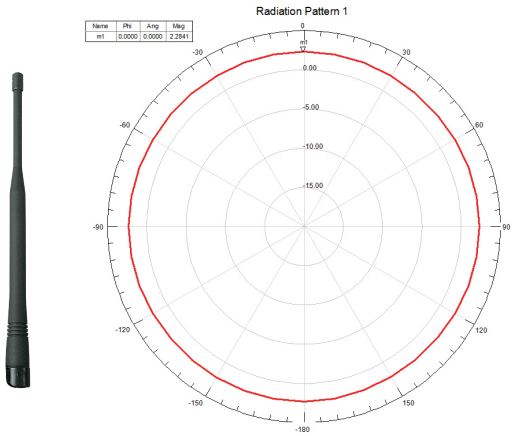
Writer Profile: Andy Yeh, over 30 years in R&D of wireless microphone systems. Currently R&D Engineer of MIPRO, primarily responsible for wireless receiver development.

3. The Proximity Effect of Multiple Antennas

During multi-channel operation, receivers are usually stacked up where antennas of each receiver are very close to each other. However, many people neglect the problem of how such arrangements will affect antenna efficiency. In fact, reduction of antenna efficiency greatly affects both the stability of signal reception and the operating distance. Hence, the calculation of cable loss, antenna angles and the distance of each antenna are critical conditions to be taken into consideration. The following provides a variety of antenna installation examples, and their advantages and disadvantages:

• Case 1: Single Dipole Antenna :

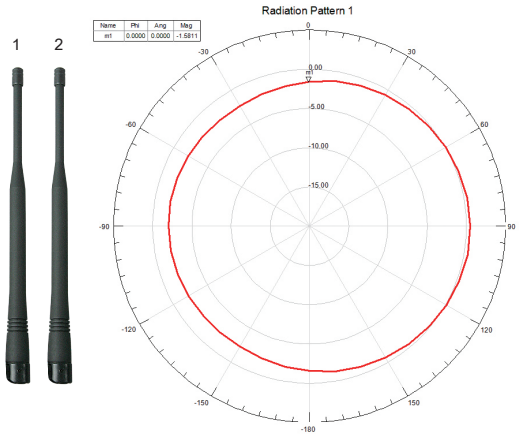
Antenna Pattern (Top View)



1. Antenna Gain: 2.3 dBi @ 0 degree
2. Antenna Efficiency: ~ 100%
3. Impedance Matching Loss: 0.16 dB
4. Total Antenna Gain (Antenna Gain - Impedance Matching Loss): 2.14 dBi @ 0 degree

• Case 2: Dual Dipole Antennas (Distance between Antennas: 20 mm)

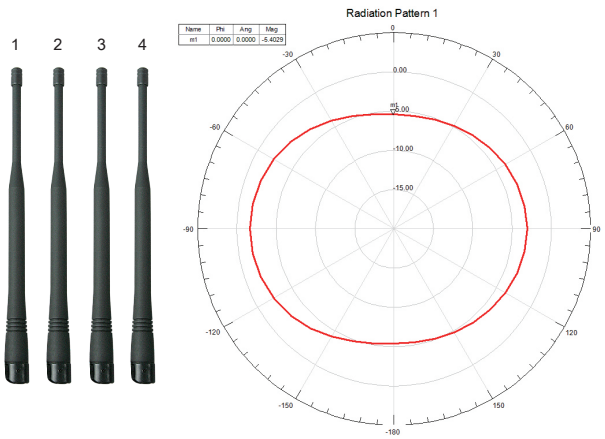
Antenna Pattern (z-axle)



1. Antenna Gain: -1.6 dBi @ 0 degree
2. Antenna Efficiency: 46%
3. Impedance Matching Loss: 0.29 dB
4. Total Antenna Gain (Antenna Gain - Impedance Matching Loss): -1.89 dBi @ 0 degree

• Case 3: Four Dipole Antennas (Distance between Antennas: 20 mm)

Antenna Pattern (z-axle)



1. Antenna Gain: -5.4 dBi @ 0 degree
2. Antenna Efficiency: 25 %
3. Impedance Matching Loss: 1.25 dB
4. Total Antenna Gain (Antenna Gain - Impedance Matching Loss): -6.65 dBi @ 0 degree

• Measurement Data of the Proximity Effect of Multiple-Antenna Installation (Distance: 1/20λ)

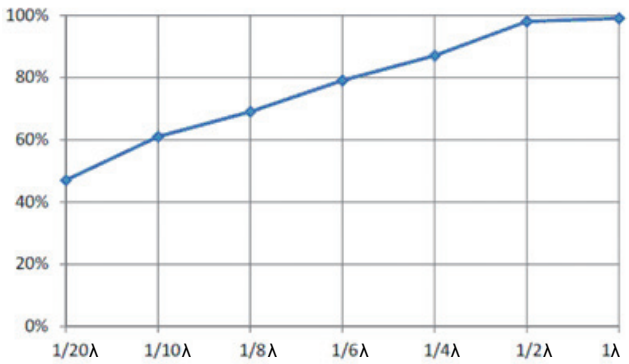
Antenna	Numbers of Antenna Used	1 pc	2 pcs	3 pcs		4 pcs	
	Antenna No.	1	1、2	1、3	2	1、4	2、3
Antenna Efficiency		100 %	46 %	41 %	29 %	42 %	25 %
Total Receiving Efficiency (incl. Impedance Matching Loss)		96 %	43 %	36 %	23 %	38 %	19 %
Antenna Gain Loss Compare to Single Antenna		0 dB	-3.53 dB	-4.27 dB	6.2 dB 1	-4.03 dB	-7.04 dB
Antenna Pattern		Very Evenly Radiated	Close to Evenly Radiated	Unevenly Radiated	Close to Evenly Radiated	Extremely Unevenly Radiated	Unevenly Radiated

• Discussion about the Proximity Effect of Multiple Antennas

From the above chart, we can see antenna efficiency drops from 100% to 19% when the total antenna count increases from 1 antenna to 4 antennas and results in an additional 7 dB of gain loss. A 6 dB gain loss means the operating distance is shortened by half and a 7 dB loss means that the operating distance is shortened from 100 meters to 45 meters due to the additional installation of antennas. Hence, the proximity effect of multi-antenna installations greatly affects the receiving efficiency and should not be neglected.

• How to Keep an Ideal Interval between Antennas

The chart of interval and gain loss between 2 antennas (λ = wavelength)



As shown in the above chart, if the interval between the antennas is more than 1/4 λ , efficiency can reach more than 80%, and the interacting effect can be ameliorated. However, if the interval can be extended to 1/2 λ , the efficiency can reach 90%.

• 1/4λ Interval of Each Frequency Band

When installing antennas, the minimum interval between antennas varies. Please refer to the chart below for recommendations on the minimum interval between antennas under each frequency band. However, if an installation requires a mixture of various frequency bands, always refers to the minimum interval between antennas of the lowest frequency band.

Frequency (MHz)	500 MHz	600 MHz	700 MHz	800 MHz	900 MHz
1/4 λ Distance (cm)	About 15 cm	About 12.5 cm	About 10 cm	About 9.4 cm	About 8.3 cm

Writer Profile: Michael Tsai, VP R&D of MIPRO. Over 30 years in research and development of wireless microphone systems.

4. How to Improve the Transmission Distance and Signal Quality in a Wireless Microphone System

• Antennas determine the actual reception distance and quality of reception

Wireless transmission distance is mainly determined by the sensitivity of the receiver and the power of the transmitter. It can be improved by directly increasing the transmitting power or receiving sensitivity. However, these two characteristics are determined by the manufacturer and cannot be changed arbitrarily by the user. In particular, increasing a transmitters' power is not only limited by telecom regulations, but multi-channel signal interference can be a more serious consequence of doing so. Furthermore, the power consumption will increase, considerably reducing the battery life.

The other option is to increase the sensitivity of the receiver. In theory, increasing the sensitivity by 6dB will give twice the receiving distance, but in fact, it is not easy for a user to change the sensitivity. In actual practice, the signal is received via the receiver's antenna, so the best way to improve the transmission efficiency of the overall system is through improving the characteristics of antennas and the antenna installations.

• The characteristics of antennas

In a wireless microphone system, the signal is transmitted via the transmitting antenna of the transmitter, and is received via the receiving antenna of the receiver. Therefore, the antenna is the passageway for transmitting and receiving the wireless signals, and its functionality directly affects the signal transmission range and stability.

The detachable antenna design of MIPRO receivers allows users to choose different types of antennas to install for optimal reception.

The main characteristics of the antenna below are as follows:

1. Frequency :

To choose the correct antenna to be installed on a wireless microphone receiver, we must first identify its frequency range. The antenna usually has the frequency range code on it. To select an antenna, we should make sure the frequency range is within the frequency range of the receiver, so that the signals received by the antenna can be delivered effectively to the receiver. Frequency is inversely proportional to the length of the antenna, thus the antenna of a VHF system is significantly longer than those of a UHF system.

2. Impedance :

In general, the antenna impedance has two categories: 50 Ω and 75 Ω . MIPRO receiver antenna input impedance is designed with 50 Ω , so you must select an antenna with 50 Ω impedance to match perfectly to the receiver. Its specification is generally labeled with an input reflection coefficient or Voltage Standing Wave Ratio (VSWR). A good antenna generally has the input reflection coefficient less than -10dB or VSWR less than 2:1.

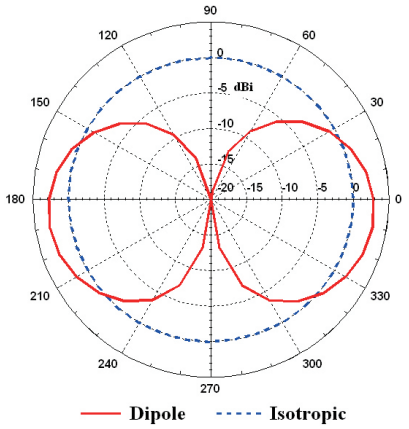


Figure 1: The vertical radiation pattern of a dipole antenna.

3. Antenna Gain :

Antenna gain indicates the signal transmitting or receiving ability. The gain value is relative to an isotropic radiator, shown in dBi units, in which "i" represents the isotropic radiator, a virtual sphere in which the signals can transmit or receive towards all directions. As shown in Figure 1, the theoretical maximum gain value of a dipole antenna is about 2.15dBi. As the gain is usually designed to be concentrated to some degree, a value > 0dBi is obtained. If the gain is designed to be concentrated toward one direction only, the antenna is called a "Directional Antenna." The narrower the angle is, the higher the gain value; meanwhile, the gain of other directions will decline. Therefore, when users are installing antennas, close attention should be paid to the signal directionality.

4. Antenna Polarization :

In actual use, the antenna polarization is an easily neglected character. Depending on the ratio of the electric field distribution, polarization can be divided into "linear polarization" and "circular polarization." Linear polarization can be divided into horizontal or vertical polarization, according to different placements, while circular polarization can be divided into clockwise or counter-clockwise circular polarization, depending on the rotation direction of the electric field. Most of the antennas are of the linear polarization type, such as a single-pole antenna, coaxial antenna, AT-70, AT-70Wa and AT-90Wa. Circularly polarized antennas, in fact, are more like "Elliptical polarization" in their characteristics. The MIPRO AT-100a is representative of this kind.

The polarized relationship between the receiving and transmitting antennas will directly affect the quality of the signal. As shown in Figure 2 and Figure 3, if the wireless microphone receiver antenna is fixed to vertical polarization, and users swing the transmitter to the horizontal position, the signal will decline greatly and may result in unstable reception quality. Especially in far and wide environments, the decline will be larger and may cause a brief signal drop-out. In this case, if the circularly polarized antenna is used, the vertical or horizontal polarization signals can maintain stable reception, so the signal will not significantly decline when the transmitter's position is changed.



Figure 2: How the signal quality is presented between the linearly polarized antennas.



Figure 3: How the signal quality is presented between the linear and the circular polarization antennas.

5. Antenna Radiation Pattern :

In a listing of the complete specifications of an antenna, the antenna radiation pattern is indispensable. It helps users to recognize the antenna gain at the Null as well as the angle & direction of the Main Beam. As shown in Figure 4 and 5, antenna pattern diagrams include vertical pattern and horizontal patterns, providing important reference for antenna installation.

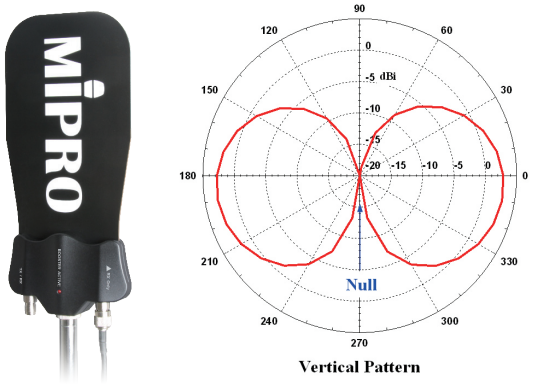


Figure 4: Vertical pattern for AT-70Wa antenna.

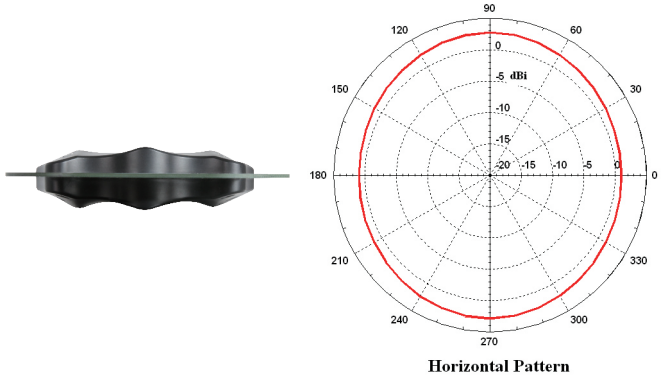


Figure 5: Horizontal pattern for AT-70Wa antenna.

From the radiation pattern diagrams, we can perceive the difference between the omni-directional and directional antennas. The omni-directional antenna has 360 degrees of reception angle and doesn't require adjusting the angle of the antenna, as shown in Figure 6. The directional antenna with 3dB beam width provides a more focused reception where the range of antenna gain is dependent on the angles and the directionality, attenuating from the maximum to 3dB, as shown in Figure 7. Users can select the proper antenna according to the environment. For example, when there's no particular direction between the microphone and the receiver, and at short distances, the MIPRO omni-directional antenna is recommended. For live stages which need long-distance reception in a particular direction, a MIPRO directional antenna is usually selected to get better signal quality and prevent interfering signals coming from other directions.

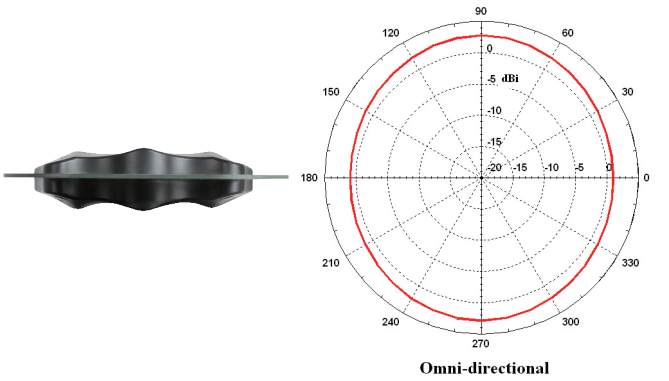


Figure 6: Horizontal pattern for AT-70Wa antenna.

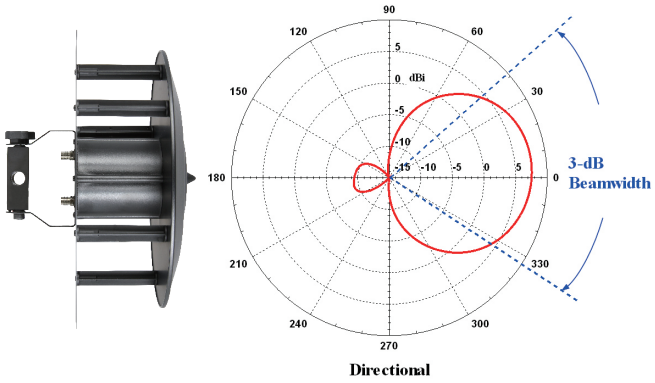


Figure 7: Horizontal pattern for AT-100a antenna.

• Select different types of MIPRO receiving antennas to get the optimal reception quality :

MIPRO antenna systems have the most complete product line, providing multi-channel wireless microphone systems with better long-distance transmission and improved signal quality as well as simplifying antenna installation.

MIPRO has the following types of receiving antennas:

1. AT-10 Whip Antenna :

The AT-10 is a 1/4 wave single rod antenna featuring a wider band, omni-directionality and 50 Ω impedance. It mounts directly on the antenna connectors of a receiver to become a monopole antenna for adequate sensitivity and operating range.



Figure 1

2. AT-20 Coaxial Antenna :

The AT-20 is a 1/2 wave coaxial antenna that functions like a dipole antenna, featuring 2.15 dBi gain, 50 Ω impedance, and omni-directional reception. It mounts directly on the antenna connectors of a receiver for adequate sensitivity and operating range.



Figure 2

3. AT-70 UHF Ground Plane Antenna :

The AT-70 is an UHF antenna that stabilizes signal reception and prevents impedance interference from nearby objects because its vertical 1/4 wave antenna is surrounded by horizontal antennas at a 45 ° degree, causing a 1/2 wave dipole antenna effect. This gives the AT-70 a higher positive gain than a 1/4 wave single rod antenna and smoother impedance within the 620~960 MHz band. Therefore, the length of the antenna does not need to be adjusted while receiving. The antenna is able to reduce interference by filtering signals outside the range. It is suggested for installation at the central location of a hall, on the wall, inverted on a ceiling, or mounted on a tripod (MS-30).



Figure 3

4. AT-70Wa Wideband Transmitting and Receiving Omni-directional Antenna:

The AT-70Wa is optimized for 470~1000 MHz and has a 2~4 dBi gain which is ideal for any specific installation requiring full signal directionality. The AT-70Wa has 2 input connectors, the "TX/RX" which can be connected to the transmitter or receiver directly and the "RX Only" connector which has a 12 dB gain controllable booster, specifically enabling receivers for long distance reception.



Figure 4

5. AT-90Wa Wideband Transmitting and Receiving Log Antenna:

The AT-90Wa is optimized for 470~1000 MHz and has a 4~6 dBi gain which is ideal for any installation requiring specific directionality. The AT-90Wa has 2 input connectors, the “TX/RX” which can be connected to the transmitter or receiver directly and the “RX Only” connector which has a built-in 12 dB gain controllable booster, specifically enabling receivers for long distance reception.



Figure 5

6. AT-100a Wideband Circularly Polarized Antenna:

The AT-100a is optimized for 470~1000 MHz and has a 6~8 dBi gain which is ideal for any installation requiring specific directionality. The AT-100a has two built-in signal connectors: “TX/RX” connector can be connected to a transmitter or receiver, however, connection to a short coaxial cable is recommended when connected to a receiver. “RX” connector (cannot be connected to a transmitter) has a built-in 12 dB gain controllable booster and thus provides extended reception range and compensates the signal loss of coaxial cable to improve reception range and signal quality.



Figure 6

• The receiver must be equipped with the right antenna system to get optimal reception quality :

1. The receiver is operated in indoor / outdoor location with short-distance reception:

For karaoke, small conference rooms, small concerts or other small-scaled environments, just mount a pair of single pole antenna or standard coaxial antenna directly on the antenna input connector of the receiver and then screw-lock tightly. Even for short distances, the receiver still must keep a stable reception free from interference. When using a single-pole antenna, due to the metal chassis being a part of the ground element of the antenna, you should keep the antenna vertical to the receiver chassis. The receiving antenna should be far away from metal obstructions and noise interference sources in order to get optimal reception.

2. The receiver is operated in indoor / outdoor location with long-distance reception:

In live stage or other long-distance reception venues, a professional true diversity receiver is required. In addition, installation of the proper antenna system is more important.

Mounting an AT-70 or AT-70Wa omni-directional antenna on a stand or upside down on the ceiling, then connecting it directly to the antenna input port of the receiver with a coaxial cable will increase the receiver’s reception range and quality. However, since the antenna is installed at a great distance from the receiver, connecting with a long coaxial cable will cause some signal loss. The user should choose a cable with lower loss based on the distance, or else add an AT-70B or MPB-30 antenna booster to compensate for the cable signal loss.

For long-distance reception in a high signal interference environment, the better choice is to use an AT-90Wa wideband log antenna. Set it on the stand vertically and adjust the polarity direction toward the wireless microphones’ operating position. Since the log antenna has directivity and higher gain, it gets better reception quality. Alternatively, in the same high-interference operating environment, the best option is to use the AT-100a wideband circularly polarized antenna to eliminate possible signal dropouts and insure more stable reception quality. (Refer to the AT-100a catalogue).

3. Use the antenna divider for two or more receivers to simplify the antenna installation:

When two receivers need an external antenna to increase reception distance, you can use the AD-12 Passive Antenna Divider/ Combiner to simplify the installation.

When three or more receivers need an external antenna to increase reception distance, you can use the AD-708 UHF 4-channel antenna divider to simplify and improve reception quality. For five or more receiving systems, you can use two or more AD-708.

4. Antenna systems for extremely long distances:

In some large-scale professional stages requiring long-distance receiving operation, where the antenna system requires long cable connections, you must install an AT-70B or MPB-30 booster or an AT-90Wa or AT-100a directional antenna with built-in booster, to compensate for the cable loss in order to get optimal reception.

5. An example of a 16-channel wireless system antenna installation for long-distance reception:

In professional live stage, auditorium and similar long-distance reception venue applications requiring up to 16 channels to be operated simultaneously, use 4 sets of ACT-74 quad-channel true diversity receivers and one AD-708 wideband antenna divider, connecting with a pair of AT-100a UHF circularly polarized wideband directional antennas. This package is the most economical combination, providing optimal performance with easy operation and requiring minimal installation space.

Writer Profile: Harry Hsiao, received his M.S.E.E. degree from National Chung Cheng University. His research topics focus on RF electric circuit and IC design. Currently R&D Engineer of MIPRO. Primarily responsible for research and development of antenna system products.

Reference: J. D. Kraus and R. J. Marhefka, Antennas: for All Applications, 3rd Edition, McGraw-Hill, 2003.

5. How to Design Transmission Cable and Booster for Antenna Systems

1. First, estimate the distance between the antenna and the receiver as well as the frequency of transmitting signals. Then, find a suitable cable specification according to the tolerance of the receiving system.

2. Classifications of tolerance range on receiver system's signal loss:

   - Wider tolerance on signal loss : < -10dB~-6dB
   - Acceptable tolerance on signal loss : -6dB~-2dB
   - Narrower tolerance on signal loss : < -2dB

3. Greater cable signal loss will decrease the receiving distance and system stability, so a booster must be added to offer enough gain to make up the loss. However, the booster should not offer excessive gain as it will cause receiver intermodulation distortion and create unnecessary interference, thus affecting receiving quality.

4. The following chart gives specifications of cables, suitable antennas and boosters needed based on transmitting distance and tolerance range of signal loss.

	Distance			
Combination	<10m	<20m	<50m	<100m
<-6dB	Use 3D-2V cable and require no booster	Use 3D-2V cable with AT-90Wa	Use 5D-2V cable with booster	Use 5D-SFA cable with booster
<-2dB	Use 3D-2V cable with AT-90Wa	Use 3D-2V cable with booster	Use 5D-2V cable with AT-90Wa	Use 5D-SFA cable with AT-90Wa

5. Below is the formula to calculate the antenna gain:

   System Gain of antenna system = antenna gain - signal loss of coaxial cable + booster gain.

   Below is an example of calculating the gain of an antenna system transmitting on an 800 MHz frequency based on the components of 1/2 wavelength antenna, MPB-20 booster and 50 meters of 5D-2V coaxial cable.

   A. From Chart A, the gain of a 1/2 wavelength antenna and a MPB-20 booster is 2 dBi and 12 dB.
   B. From Chart B, signal loss of a 5D-2V cable=3.8 db / 10m @ 1 GHz
   C. Hence, total signal loss of a 50 meter cable = 3.8 dB X 5 = 19 dB
   D. Put A, C into the formula. Total gain of antenna system = 2 dB (Antenna) - 19 dB (Coaxial cable) + 12 dB(Booster) = -5 dB.
   E. Refer to #2 tolerance of signal loss. Above design can be classified as 2B (see above)
   F. When making antenna cables, please use genuine connectors. For VHF band, select BNC connectors. For UHF band, it would be better to use TNC connectors.

Chart A: Gain specification of MIPRO's antenna and booster

Type	1/2 wavelength antenna	AT-90Wa antenna	MPB-20 booster
Gain	2dBi	5dBi	12dB

Chart B: General specifications of 50 Ω coaxial cable

Cable Type	Signal Loss (dB/10m)				Outer Diameter (mm)
	10MHz	100MHz	200MHz	1.0GHz	
1.5D-2V	0.85	2.95	4.15	10.5	2.9
3D-2V	0.33	1.5	2.1	5.2	5.7
5D-2V	0.026	1.1	1.5	3.8	7.5
8D-2V	0.02	0.54	0.9	2.2	11.6
5D-SFA				1.8	7.5
8D-SFA				1.2	11.6
RG-58A/V	0.427	1.74	2.3	5.83	5.0
RG-174/U		2.9	4.0	10.0	2.24
RG-188/U		3.8	4.73	10.33	2.06

Remark: Characteristics of above coaxial cables are industry standard. Signal loss might vary depending on each brand' s specifications. Hence, for the most accurate calculation, please always refer to the specifications provided by the manufacturers.

Writer Profile: Michael Tsai, VP R&D of MIPRO. Over 30 years in research and development of wireless microphone systems.

6. How to Use the MIPRO Auto Gain-Control Antenna Systems

In a wireless microphone system installation, the correctness of the antenna system installation greatly affects the quality of the received signal. Especially in long-distance receiving, the specifications of antenna, coaxial cable and booster must be considered carefully. In order to get the best reception, it is important to properly calculate the gain of the antenna system. If the gain of the system is insufficient, it will reduce the receiving distance and stability; if the gain is too high, it will cause inter-modulation interference in the receiver and result in poor reception quality.

In order to solve this problem, MIPRO developed the AD-708 UHF Auto Gain-Control Antenna Divider and MPB-30 UHF Gain-Controllable Antenna Booster with built-in power supply. These two units can detect the cable signal loss between the divider and the booster, automatically adjusting the proper gain of the booster to compensate for the cable loss, and providing the receiver with a stable receiving signal of sufficient strength.

The application of MIPRO auto gain-control antenna systems are as follows:

• Installation Instructions:

1. The coaxial cable length does not exceed the limit of acceptable line signal loss in table A:

As shown in Figure 1, the AD-708 can detect the signal-loss of the cables between antennas and automatically control the gain of gain controllable booster to compensate the signal loss precisely. Therefore, the AD-708 can be used with all MIPRO antenna products which have a built-in gain controllable booster. Connect the cable to the “RX” connector of the antenna to obtain sufficient and stable signal strength.



Figure 1: The system cable length does not exceed the limit of maximum acceptable line signal loss. (Connected to RX connector of the antenna)

2. The coaxial cable length exceeds the maximum limit of acceptable cable signal loss in table A:

It is necessary to use two cables to connect the system. One cable is connected between the AD-708 and MPB-30. The cable length must not exceed the maximum length limit. The other cable is connected between the MPB-30 and the antenna. As shown in Figure 2A, when the other cable length is less than one-third of the maximum acceptable limit length, you can directly connect the cable to the TX/RX connector of MIPRO’s antenna and thus the signal loss of the cable can be compensated precisely by the auto gain-control system to get the proper noise figure and inter-modulation interference of the system. The cable loss of the receiving system will then be controlled within an acceptable range.

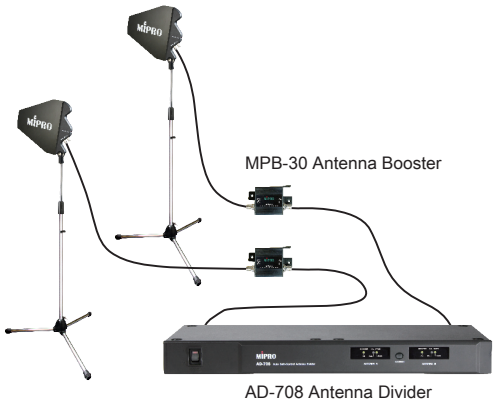


Figure 2A: The system cable length exceeds the maximum length of adequate limit. (Connected to TX/RX connector of the antenna)

When the other cable is longer than one-third of the maximum length of the acceptable limit, you have to connect the cable to the RX Only connector on the antenna (as shown in Figure 2B). The built-in booster of the antenna can compensate the signal loss to obtain sufficient and stable signal strength. At the same time, the cable loss of the receiving system will be controlled within an acceptable range.

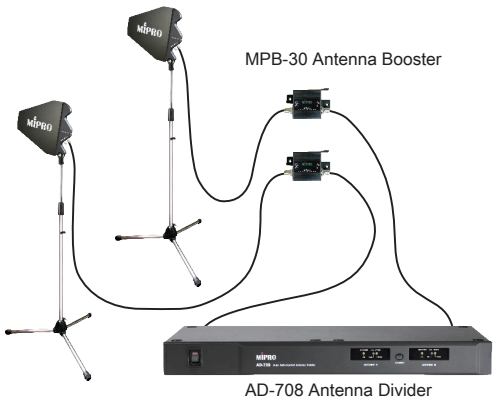


Figure 2B: The system cable length exceeds the maximum length of adequate limit. (Connected to RX Only connector)

3. AD-708 can be directly connected to MIPRO's antennas:

The AD-708 can also be connected directly to all of MIPRO's new antennas which have the gain controllable booster and those antennas which don't have. It provides four channel signals for four receivers and supplies the booster bias. The AD-708 may be connected to the additional fixed-gain booster, such as MPB-20, to compensate the signal loss, but there is no automatic variable gain-controlled function in this configuration.

• Operating Instructions:

After the antenna system is installed, turn on the AD-708. As shown in Figure 3, the AD-708 divider will identify whether the antenna input port A and B are connected to the MPB-30 booster. If the front panel "BOOSTER ON" LED lights, the booster is already working properly. Otherwise, the cable should be checked for a possible improper connection or lack of bias. If the latter, you must add an external power supply to the booster. Next, press the "CALIBRATE" button. The divider will automatically detect the cable loss of antenna port A and B and adjust the gain of the system. Then, if the front panel "PASS" LED lights are on, it indicates the gain adjustment has been completed, and the system can be used normally. If "FAIL" LED lights are on, it indicates the cable loss exceeds the range for which the booster is able to compensate and you must check whether the cable is too long or the connector has not been perfectly locked, causing the RF signal loss. After checking and making adjustments, press the "CALIBRATE" button again; the divider will once again quickly detect the cable loss and make the gain adjustment.

Notice! When the "BOOSTER ON" LED does not light up, the cable loss detection and gain adjustment functions will not be activated, "PASS" and "FAIL" LEDs will remain off.



Figure 3A: Booster is working



Figure 3B: Calibration is completed



Figure 3C: Cable loss is overload

• The coaxial cable list for reference:

According to the variable gain range of the MPB-30, Table A lists several available cable specifications. Cable length can be used normally within the maximum acceptable length limit, and the maximum acceptable loss of the receiving system is controlled to less than 3dB.

Table A: General 50Ω coaxial cable specifications

Models	Attenuation (dB/10m)		Maximum length limit (m)
	200MHz	1.0GHz	
RG-58A/V	2.3	5.8	30
3D-2V	2.1	5.2	33
5D-2V	1.5	3.8	45
8D-2V	0.9	2.2	80
5D-SFA		1.8	95
8D-SFA		1.2	140

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7. Discussion on 2.4GHz Wireless Microphone Systems

• Introduction:

The technology and reliability of 2.4GHz wireless transmission have improved in recent years, yet the wireless regulations of each country on the UHF (below 1GHz) band are becoming more and more strict. Hence, the wireless microphone industry has been gradually paying more attention to the development of wireless microphone systems on the 2.4GHz band, formerly belonging in the ISM (Industrial Scientific Medical) band. However, the efficiency of 2.4GHz systems is limited due to their physical characteristics and they cannot be made better than the UHF systems. In this discussion, we will describe the characteristics of a 2.4GHz wireless microphone system, analyzing the advantages and disadvantages and comparing them with UHF systems.

• Characteristics of the 2.4GHz band

The 2.4GHz band is one of the special ISM bands reserved internationally for use in industrial, scientific and medical applications. The carrier ranges from 2,400 MHz to 2,483 MHz, which has a bandwidth of 83MHz. While the definition of the ISM band in each country is not always the same, the 2.4GHz band is internationally accepted.

Depending on the difference in modulation methods such as ASK, FSK and, QAM, the modulation bandwidth of the 2.4GHz band can be from 250kHz to 44MHz, which is wider than that of UHF under the wireless regulations.

Since the 2.4GHz band is in the ISM band, various transmission protocol standards have been developed. However, there are a huge number of users coexisting in the bandwidth of 83MHz on the 2.4G band, making interference a particularly serious issue. To solve this problem, a frequency hopping spread spectrum approach is often taken to reduce this interference.

Since the wavelength of the 2.4G band is about 1/3 (or less) of the UHF (below 1GHz) band, the reflection effect is noticeable and signal penetration is poor. Due to the above mentioned characteristics, a 2.4GHz band system operating in a location with many obstacles may easily have a signal that is occasionally missing or dropping-out. A more technical system design such as signal re-transmission or multi-transmission technology is needed to overcome this problem.

• Transmission distance:

Compared with the 2.4GHz band, the signal of a UHF band has a better rate of penetration through obstacles and the transmission distance will not decay as much, whether used outside or indoors. The transmission distance will be substantially attenuated under the same conditions when using a 2.4GHz system. Recently, the transmission distance and reliability of a 2.4G wireless microphone system has significantly improved through research on signal fading compensation, frequency hopping, re-transmission and other technologies.

• Audio latency:

In a 2.4GHz system, the audio signal is maintained with no interruption by using a re-transmission technique to prevent transmission signal loss. However, the re-transmission technique is compromised by a signal delay in which the audio latency of a 2.4GHz system is larger than that of a UHF system. When numbers of 2.4GHz systems are used in the same space, errors and missing signals are increased due to the larger number of interferences. This requires even more signal latency for re-transmission in order to provide a reliable, high quality audio.

• Number of compatible channels:

Theoretically, the 2.4GHz system with a bandwidth of 83MHz can provide a large number of compatible channels. However, due to the huge number of users, the interference in a 2.4GHz system with the frequency hopping technique is still worse than that in a UHF band. A system providing 12 compatible channels has been developed in recent years, but it is still much more problematic than high-density UHF systems in the same bandwidth.

• The advantages and disadvantages of a wireless microphone system based on a 2.4G wireless standard protocol:

Since many standard wireless transmission protocols in the 2.4G band have been developed, there are many hardware and software resources available, making it easy to develop a 2.4GHz system. As a result, some wireless microphone systems using these protocols have been developed. However, a wireless microphone system must have a sound quality with low latency and a reliable, uninterrupted signal. Systems based on the standard 2.4GHz transmission protocol are unable to overcome the long latency and missing signal issues. The 2.4GHz wireless microphone systems based on the hardware and software resources of the standard protocols provide a speech sound quality but are not suitable for the requirements of professional performances. Many chip manufacturers have developed the single-chip specifically for home entertainment, but, at present, there is no single-chip that completely meets the needs of professional applications. As a result, these 2.4GHz systems are not yet able to meet the quality requirements of stage and professional audio performances.

• The development status of the industry

Generally, the consumer-grade 2.4GHz wireless microphone system is usually developed with the integrated chip (RF + base-band) with MCU, but the issues of latency, signal drop-out and more compatible channels still need to improve.

The professional system is developed by some commercial single-chips or a customer defined base-band processing chip. These improve the signal drop-out and penetration distance performance close to that of a UHF system, but the compatible channel issue is not yet breaking through.

• Summary:

At present, a 2.4GHz wireless microphone system with reliable performance in the current market is more expensive than a UHF system. However, the UHF band is now getting increasingly crowded since it is limited by the new wireless regulations; as a result, the 2.4G wireless microphone systems still have the potential for development.

Comparison of 2.4G and UHF wireless microphone systems

Band	2.4G wireless microphone system	UHF wireless microphone system
Frequency range	2,400MHz~2,483MHz	300MHz~1,000MHz
Diffraction characteristics	Serious multi-path effect, poor range and prone to signal dropout.	Excellent range and stable RF transmission.
Hardware integration	RF+ base-band chip+ packet processing chip.	Discrete element.
Modulation bandwidth	Depending on standard, maximum 44MHz.	<200kHz
Distance under same power (without any signal processing)	1/3	1
Audio quality	Digital CD quality	Analog or Digital CD quality
Audio latency	>5ms	Depending on modulation and hardware
Application	Home entertainment, KTV	Unlimited
Congestion and interference	Bluetooth, Wi-Fi and various wireless standards protocols use the same frequency band; vulnerable to interference	Significant bandwidth available, country-dependent.
Using status in industry	Consumer electronics and applications; poor choice for professional venues	Unlimited; usually preferred for professional stage and audio applications.
Number of compatible channels available	less	many

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8. The Best Solution for Multi-Channel Receiving Antenna Installation

Antenna installation is the most important factor affecting the transmission distance and signal quality of wireless microphone systems. Therefore, for multi-channel wireless microphone systems, it is necessary to know how to effectively simplify the large number of antennas to obtain efficient and stable reception quality as well as savings on installation costs.

The following provides a variety of antenna installation examples, and their advantages and disadvantages:

• Antenna mounted directly on each receiver :

If you want to set up an 8-channel wireless microphone system, you can choose four dual-channel receivers (e.g., MIPRO ACT-72) or two quad-channel receivers (e.g., MIPRO ACT-74), then directly mount each antenna on the receiver as shown in Figure 1. This installation is simple and economical, but each antenna is so close that it inevitably will produce “The proximity effect of multi-antennas and worsen the reception quality. (See 5. The Proximity Effect of Multiple Antennas, Technical Knowledge)



Figure 1A: Antenna installation with four dual-channel receivers.



Figure 1B: Antenna installation with two quad-channel receivers.

From Figure 2, we can see the variation of the antenna receiving pattern and efficiency. The horizontal radiation pattern of antenna 1 presents a very uneven distribution, and the overall antenna efficiency decreases greatly to 42%! This setup method may result in different receiving signal strengths for each channel, and may affect the signal stability. This method would be the most simple and economical installation for a short-distance reception that does not demand efficiency.

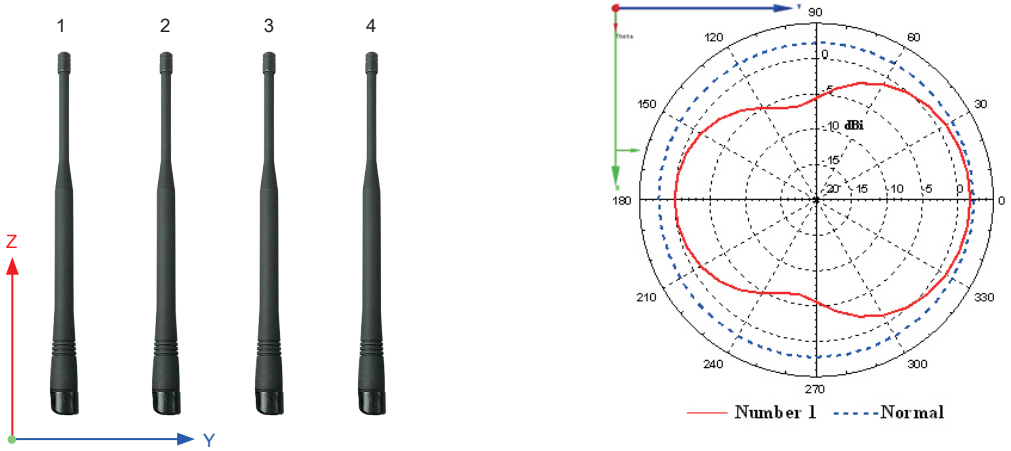


Figure 2: Horizontal radiation pattern of Antenna 1.

• Daisy chain antenna divider

To avoid “The proximity effect of multi-antennas” caused by the antennas directly installed on the stacked up receivers, you can use an external or built-in daisy-chain antenna divider to share one pair of antennas, and simplify the system installation.

As shown in Figure 3, the input signal of the antenna connected to the MIPRO AD-12 is divided into two signal outputs and these two outputs directly connect to the receiver’s antenna inputs. This setup method is used for two receivers being stacked up.

However, although the 1-to-2 passive antenna divider simplifies the installation of antennas and avoids the “The proximity effect of multi-antennas”, the cascaded divider would weaken the receiving signal strength, increase the noise figure and decrease the sensitivity. Thus, the number of cascaded dividers must be as few as possible.



Figure 3: MIPRO AD-12 passive antenna divider.

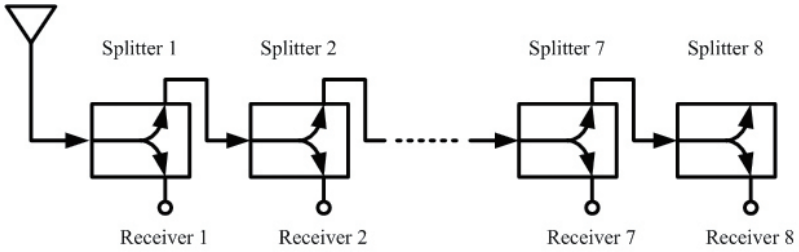


Figure 4: 1-to-8 active daisy-chain antenna divider.

In order to solve the problem of the signal attenuation caused by the cascaded passive antenna dividers, a booster must be added to the divider to make it an active divider, so as to compensate for the signal attenuation.

Figure 4 shows a 1-to-8 active “daisy-chain” antenna divider. Ideally, the active daisy-chain antenna divider with a booster can compensate for signal attenuation. However, in a cascade of multiple receiver antenna systems, the noise figure of the divider will cause deterioration of the sensitivity.

As shown in Figure 5, assuming the noise figure of an active daisy-chain antenna divider is 5dB, the gain is 0dB, and the noise figure of the receiver is 7dB. If there are eight dividers cascaded, the system noise figure of the eighth receiver will become 13dB, that is, the noise figure is 6dB worse than the first one.

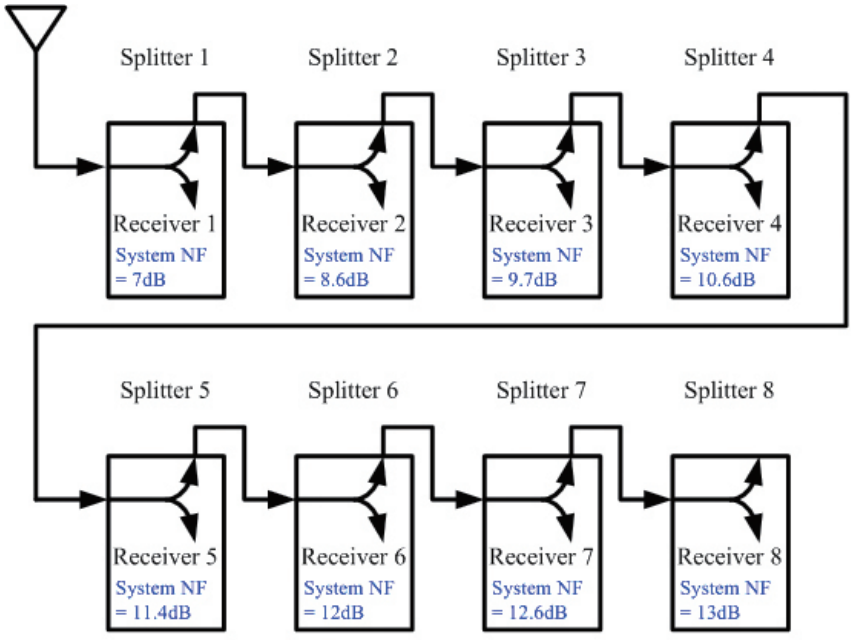


Figure 5: The noise figure of a 1-to-8 active daisy-chain antenna divider.

• Parallel antenna divider

To avoid the disadvantages of the daisy-chain antenna divider, and to simplify the antenna installation by sharing a pair of antennas, the best method is to use the “parallel” antenna divider.

As shown in Figure 6, the MIPRO AD-707a is an active parallel antenna divider. It has 1-to-4 outputs with a booster circuit to compensate for the signal loss, also an active output for connecting to another divider input port, so as to meet the needs of more than four receivers.

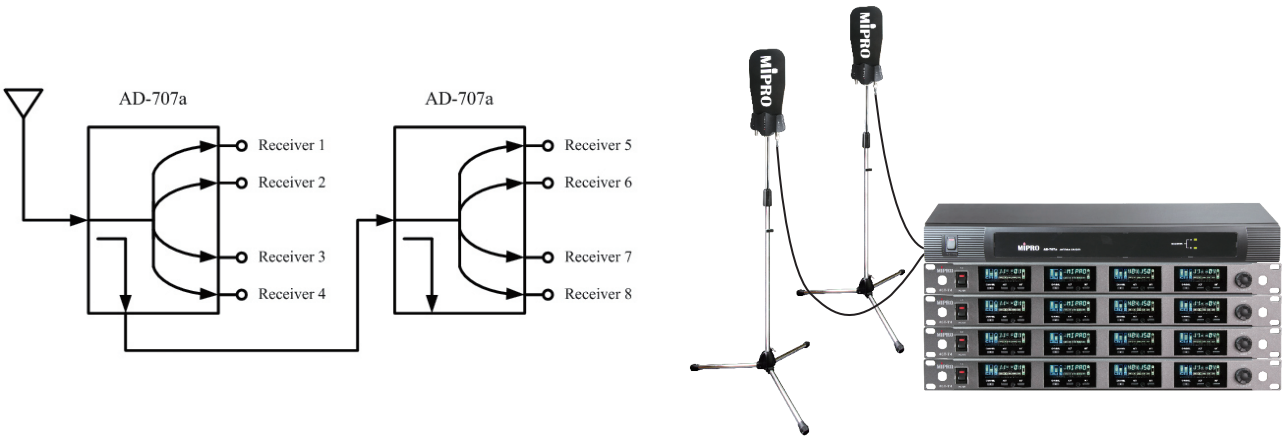


Figure 6: One AD-707a active parallel divider connected to four receivers; can be cascaded to another divider.

For installations with eight receivers, assuming the noise figure of an active parallel antenna divider is 5dB, the gain is 0dB, and the noise figure of the receiver is 7dB. The noise figure is estimated as shown in Figure 7A, the noise figure of the system is 8.6dB (Receiver 1~4) and 9.7dB (Receiver 5~8). Compared to the noise figure of the original receiver, the differential can be controlled within 3dB. Under the same conditions, the active daisy-chain antenna divider can connect only up to three receivers, as shown in Figure 7B.

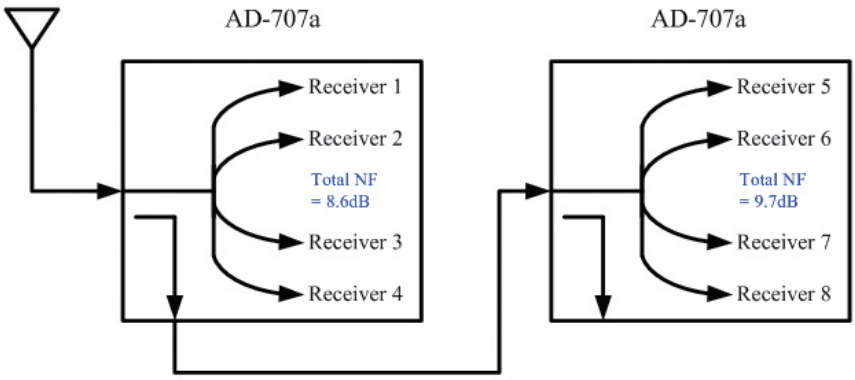


Figure 7A: The noise figure of two 1-to-8 MIPRO AD-707a wideband antenna dividers.

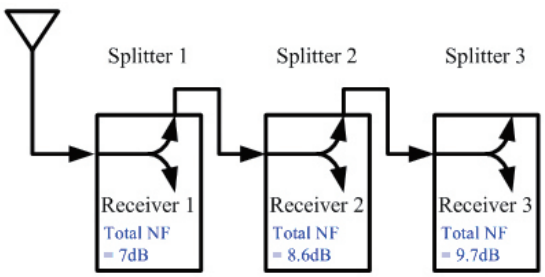


Figure 7B: For the same noise figure in an active daisy-chain antenna divider system, only three receivers can be cascaded.

● MIPRO's multi-channel receiver antenna system is the best solution

Some brands design their receivers with a built-in active daisy-chain antenna divider to simplify the antennas installation. In fact, the sensitivity of the receiver would decrease as the number of cascaded units are added. The MIPRO receiver with a built-in or external active "parallel" divider is designed to completely solve the above disadvantages. Studying the following cases will help you understand further.

1. 4-channel wireless microphone system :

If you choose other brands, you must stack up two dual-channel receivers, and the sensitivity will decrease more than 1.6dB, as shown in Figure 8A.

If you choose a MIPRO ACT-74 or ACT-747 quad-channel receiver, only one pair of antennas is required as both of these receivers have a built-in premium quality active parallel divider with an ultra-low noise figure and high dynamic input characteristics. Without any cascade, the quad-channel receiver provides maximum sensitivity. This is the simplest, most effective and cost-saving professional multi-channel system, as shown in Figure 8B.

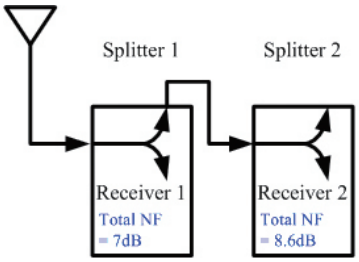


Figure 8A: Two dual-channel receivers with built-in active daisy-chain divider.



Figure 8B: MIPRO ACT-74 quad-channel receiver, with built-in active divider, shows the highest sensitivity.

2. 8-channel wireless microphone system :

If you choose other brands, you must stack up four dual-channel receivers and connect the antenna input and output of each receiver in order to share one pair of antennas. The result is the sensitivity will decrease more than 3.6dB, as shown in Figure 9A.

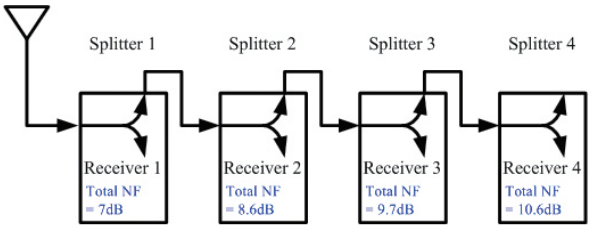


Figure 9A: Four dual-channel receivers with built-in active daisy-chain divider.

Four MIPRO ACT-72 or ACT-727 dual-channel receivers, as shown in Figure 9B, or two MIPRO ACT-74 or ACT-747 quad-channel receivers, as shown in Figure 9C, require only one AD-707a wideband antenna divider to share a pair of antennas. Due to the low noise figure of the divider, the receiving sensitivity has almost no attenuation.



Figure 9B: Four MIPRO ACT-72 dual-channel receivers installed with an AD-707a wideband antenna divider.



Figure 9C: Two MIPRO ACT-74 quad-channel receivers installed with an AD-707a wideband antenna divider.

3. 16-channel wireless microphone system :

If you choose other brands, you must stack up eight dual-channel receivers and connect the antenna input and output of each receiver in order to share one pair of antennas. The result is the sensitivity will decrease more than 6dB (cable loss is not included), as shown in Figure 10A.

If you choose four MIPRO ACT-74 or ACT-747 quad-channel receivers, only one AD-707a wideband antenna divider is required to share a pair of antennas. As shown in Figure 10B.

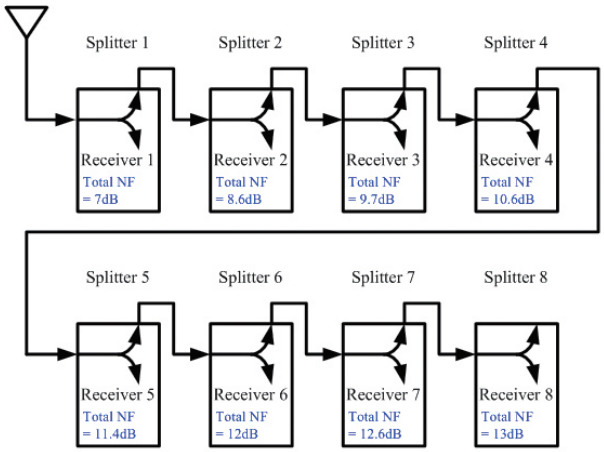


Figure 10A: Eight dual-channel receivers with built-in active daisy-chain divider.



Figure 10B: Four MIPRO ACT-74 quad-channel receivers installed with an AD-707a wideband antenna divider.

4. 32-channel wireless microphone system :

It is not recommended to choose dual-channel receivers with built-in active daisy-chain divider of other brands for such large installations.

Use eight MIPRO ACT-74 or ACT-747 quad-channel receivers and two AD-707a wideband antenna dividers (one AD-707 for four receivers) to share a pair of antennas, as shown in Figure 11. The result is the sensitivity of each receiver is averaged and attenuation is limited to within 3dB.



Figure 11: Two AD-707a wideband antenna dividers with eight quad-channel receivers to form a 32-channel system.

5. Conclusion :

Using the antenna divider in the antenna installation for multi-channel receivers not only reduces the number of receiving antennas but also simplifies the installation. Most important of all, the antenna short-distance coupling effects can be avoided, maintaining the original antenna radiation pattern and reception efficiency. From the information in this article we know that regardless of the use of internal or external daisy-chain antenna dividers, the number of cascades should be as few as possible to avoid the issue of sensitivity attenuation. Using the parallel antenna divider to avoid the shortcomings of the daisy-chain divider is the best solution for multi-channel receiver antenna installations.

The MIPRO AD-707a wideband antenna divider utilizes ultra-high dynamic, low noise active components and wideband microstrip circuit design, featuring ultra-low intermodulation distortion and signal loss. In parallel mode, it permits four antenna diversity receivers to share a pair of antennas. This can eliminate spurious interference and its output gain is equal to 1. Without any external booster, it can keep the sensitivity of each receiver and its daisy-chain output port allows more channels to be operated. Moreover, the output connectors provide bias for an external booster, making it easy to connect a variety of MIPRO antenna systems for long-distance transmission. Each divider output port has individual characteristics and does not affect the others. To sum up, choosing the AD-707a for a multiple system antenna installation is the best solution.

Writer Profile: Harry Hsiao, received his M.S.E.E. degree from National Chung Cheng University. His research topics focus on RF electric circuit and IC design. Currently R&D Engineer of MIPRO. Primarily responsible for research and development of antenna system products.

9. Color VFD Display is MIPRO Professional Receiver's Distinction

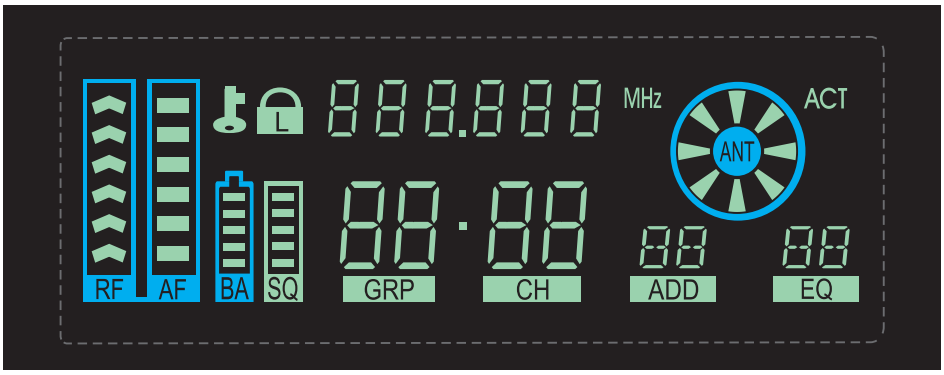
Electronic product displays have evolved from black & white to colors in recent years. In the past, a monochromatic black & white display in high-end automobiles or audio equipment was considered professional. However, currently, professional designers have deviated from the monochrome black & white into gray and from gray into full color displays to fulfill the preferences of the modern user.

MIPRO's CEO holds a degree in Fine Arts and has incorporated colors into his product visualization. Deviating from the monochromatic black & white into a full color style to conform to the evolutionary trend was a natural for him.

MIPRO receiver panel displays have evolved from an LED in the beginning to back-lit LCD to color LCD and now, a full-color VFD, so all pertinent parameters are displayed clearly in the same screen for easy viewing.

The increased display parameters in professional receivers have resulted in viewing in multiple pages due to limited space and complex setting procedures. To combat these problems, MIPRO has utilized a single display using multiple colors to identify parameter sections.

For over a decade, MIPRO has sold the professional color VFD receivers to AV system integrators, contractors, audio engineers and rental & production companies in Europe, North America and Asia, including Taiwan. Their advanced designs have been widely accepted by the audio professionals and color VFD receivers have become the distinction for MIPRO's professional models.





Writer Profile: K.C. Chang, MIPRO CEO, 50 years in R&D of wireless microphone systems.

Products Index

A	
ACT-100B	46
ACT-22T	69
ACT-2401	18
ACT-2402	18
ACT-2412	18
ACT-24HC	20
ACT-24TC	20
ACT-300B	44
ACT-311B	43
ACT-312B	43
ACT-312BT	42
ACT-32H	48
ACT-32HC	51
ACT-32HR	48
ACT-32T	50
ACT-32TC	53
ACT-51B	38
ACT-515B	36
ACT-52B	38
ACT-525B	36
ACT-52H	40
ACT-52T	41
ACT-70H	25
ACT-70HC	27
ACT-70T	26
ACT-70TC	28
ACT-707SD	68
ACT-71	23
ACT-717B	29
ACT-72	23
ACT-727B	29
ACT-72H	31
ACT-72HC	33
ACT-72T	32
ACT-72TC	34
ACT-74	22
ACT-747B	29
ACT-80	94
ACT-80H	13
ACT-80HC	15
ACT-80T	14
ACT-80TC	16
ACT-818	11
ACT-828	10
ACT-8D	68
AD-12	127
AD-707a	125
AD-708	124
AD-808	127
AD-90A	126
AD-90S	126
ASP-10	74
ASP-30	74
AT-10	116
AT-100a	117
AT-20	116
AT-70	116
AT-70Wa	123
AT-90Wa	122
B	
BC-100	63
BC-100T	64
E	
E-5S	112
E-8S	102
E-10S	112
E-20S	112
E-8P	102
EH-32	92
ET-32	92
F	
FB-10	74
FB-11	74
FB-12	74
FB-30	74
FB-70	74
FB-71	74
FB-72	74
FBC-71	74
G	
GT-24	87
M	
MD-101	63
MD-20	73
MES-100	65
MH-80	61
MI-808R	103
MI-808T	104
MI-909R	101
MI-909T	102
MJ-53	72
MJ-70	74
MM-10	112
MM-107	82
MM-202	70
MM-202A	70
MM-202B	70
MM-202C	70
MM-202J	70
MM-202P	70
MM-202S	70
MM-39	82
MM-59	82
MM-707B	80
MM-80	80
MM-90	80
MPB-20	125
MPB-30	124
MP-80	17
MR-811	57
MR-812	57
MR-812T	57
MR-818	55
MR-818T	55
MR-823	59
MR-90B	96
MS-20	73
MS-50	73
MS-80	73
MS-90	122
MT-801a	62
MT-92A	114
MTG-100Ha	108
MTG-100R	107
MTG-100Ra	108
MTG-100T	107
MTG-100Ta	108
MTG-100C-28	110
MTG-100C-12	110
MTG-100C-4	110
MTS-100	113
MU-10	77
MU-16	77
MU-101P	112
MU-20	77
MU-210	71
MU-210d	71
MU-23	71
MU-23d	71
MU-23P	112
MU-39	78
MU-40G	74
MU-53L / LS	72
MU-53HNP	112
MU-55L / LS	72
MU-59	78
MU-70	76
MU-80	76
MU-90	76
P	
PC-11	114
R	
RH-77a	74
RH-87	74
S	
SC-32	89
SH-32	89
SM-32	89
ST-32	90
SW-20	74
T	
T-32	90
TA-80	99
TC-18	73
V	
VC-22	85
VM-22	85
VT-22	86

Recipient of the prestigious “Financial Times-Standard Chartered 2014 Taiwan Business Awards”

MIPRO president, Solomon Chang, received the “Economic Contribution Award”



Benjamin Hung, Chief Executive Officer, Greater China, Standard Chartered Bank (left) and David Pilling, Asia Editor, Financial Times (right)

MIPRO has won the Economic Contribution Award for small to medium enterprises at the 2014 Financial Times-Standard Chartered Taiwan Business Awards. The event was held during the Financial Times-Standard Charted Taiwan Economic Summit, which took place on 3rd July, 2014. The Taiwan Business Awards have been designed to highlight achievements by Taiwanese companies and entrepreneurs in innovation, sustainable development and competitiveness and recognizes their contribution to the Taiwan economy. MIPRO was the only SME enterprise to win the Economic Contribution Award, which recognizes companies that are making an outstanding contribution to the country’s economy.

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