

## TOA PASSWORD™ SERIES

# WIRELESS MICROPHONE SYSTEMS

### DESCRIPTION

TOA's Password Series is a VHF high-band wireless microphone system operable between 168MHz and 216MHz. The Password systems are uniquely suited for professional audio applications ranging from gymnasiums and houses of worship to classrooms, boardrooms, auditoriums, and live theater.

All four systems in the Password Series are equipped with TOA's proprietary double-squelch circuitry, consisting of a noise squelch and a tone-key circuit. The noise squelch automatically mutes signals at approximately 14dBμ (5μV) to prevent unwanted RF noise from being transmitted. The tone-key circuit is a high-frequency 32.768kHz side-band signal that is broadcast by the transmitter simultaneously with the audio signal. The receiver is designed to reject any RF Signal which does not have the tone-key present, especially when the transmitter is off. As a result, the receiver will not process any other audio signal which is nearby in frequency or location if the tone key is not present.

TOA's Password Series also features a compander circuit which compresses the audio signal within the transmitter at a ratio of 2 : 1. The signal is then expanded at the same ratio by the receiver. This boosts the dynamic range to better than 90dB. The original audio signal is unaltered throughout the entire compression/expansion process.

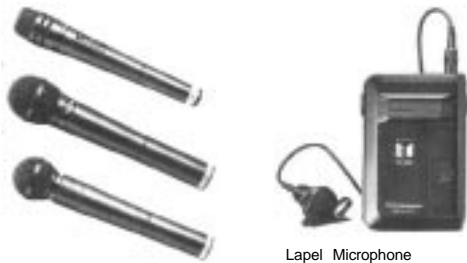
Four microphones are available with TOA's Password Series. Each mic transmitter will operate continuously on a single AA battery for more than 12 hours. For enhanced speech applications, TOA offers the WM-270 hand-held electret condenser microphone. The WM-280 is a hand-held dynamic microphone for vocal use. The WM-290, which includes a Shure SM-58 head, is also a hand-held dynamic microphone. The WM-370 is a unidirectional lapel condenser microphone with a body pack transmitter.

### PASSWORD™ SERIES MICROPHONES

WM-270  
Electret  
Condenser  
Microphone

WM-280  
Dynamic  
Microphone

WM-290  
Dynamic  
Microphone



Lapel Microphone

There are four systems that comprise TOA's Password Series. The 870 true diversity and 770 non-diversity wireless systems each consist of two-port modular receiver frames, which accept frequency-specific tuner modules. Occupying only a half-rack space, two receivers can be mounted side-by-side, yielding four frequencies in a single rack space. The modular design of both systems allow you to add or change frequencies in minutes.

TOA's 780 Scout is a single-channel, non-diversity wireless microphone system designed to deliver professional performance at an attractive price. Packaged in a compact case for placement flexibility, the Scout utilizes all the performance functions of TOA's 770 non-diversity system. The Scout includes a built-in telescoping antenna and an externally mounted AC power supply.

### PASSWORD™ SERIES RECEIVERS

WT-870 Dual-channel Diversity Receiver Frame



WT-770 Dual-channel Receiver Frame



WT-780  
Single-Channel  
Receiver



WTU-870  
True Diversity  
Tuner Module



WTU-770  
Non-diversity  
Tuner Module



The 600 series portable meeting amplifiers incorporate the Password System non-diversity wireless microphone into a compact, ruggedly portable PA system. The two models, WA-641 and WA-641C (with integrated cassette player), feature a 20-watt, two-way speaker/amplifier system, a wired low-impedance microphone input, an auxiliary input, and two non-diversity microphone receiver tuner module slots, along with a built-in telescoping antenna.

### 600 SERIES PORTABLE MEETING AMPLIFIERS



WA-641C  
(15W)  
with  
cassette

F/or added versatility, the Password Series includes an antenna distributor, model WD-770, which splits the input from a single antenna or a pair of antennas into eight separate frequencies. Ideal for use in non-diversity or diversity applications, the WD-770 eliminates the need to provide additional antennas when more than two frequencies are used within a wireless system.

With a single WD-770, one antenna can be utilized to manage up to eight non-diversity signals, while a pair of antennas working with two WD-770 units can supply input for up to eight separate diversity frequencies.

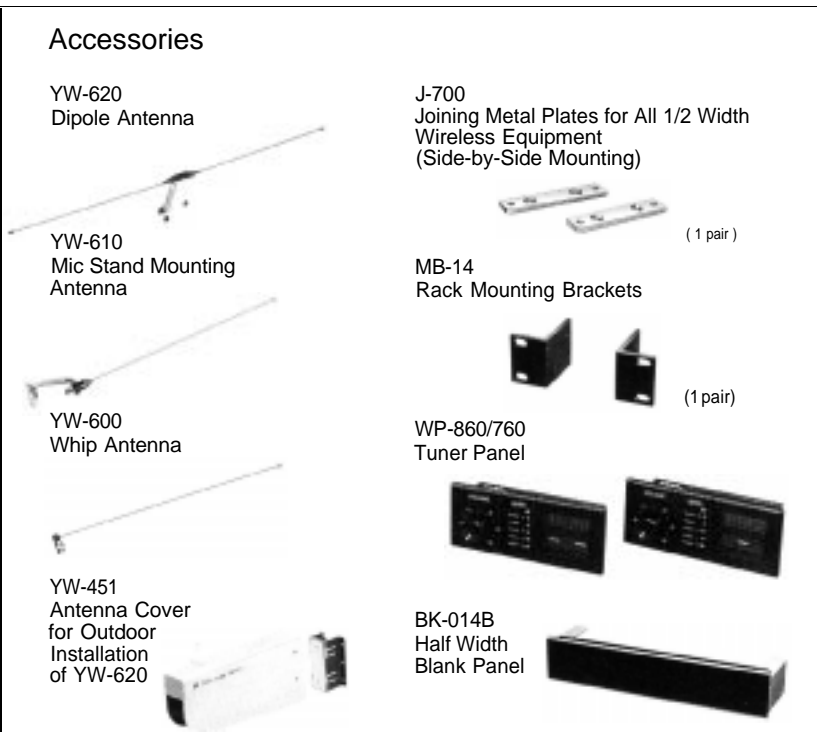
### ANTENNA DISTRIBUTOR



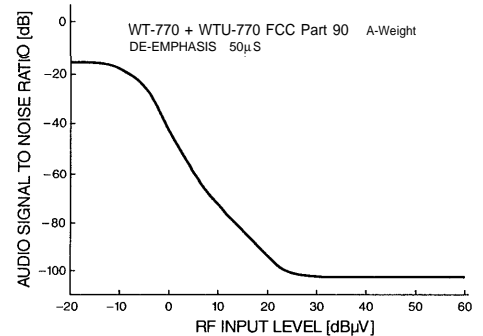
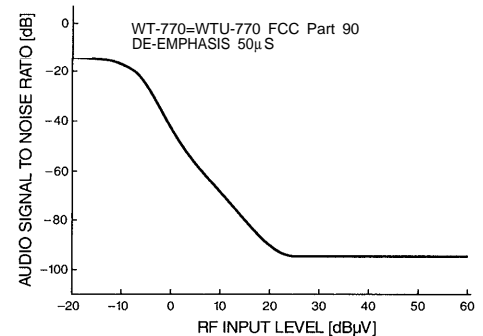
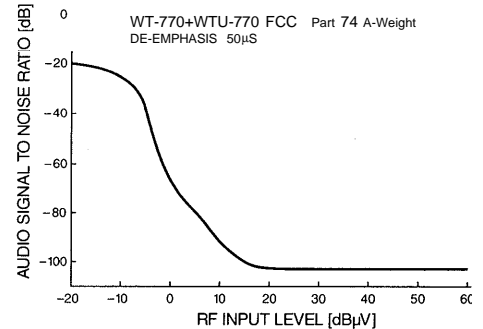
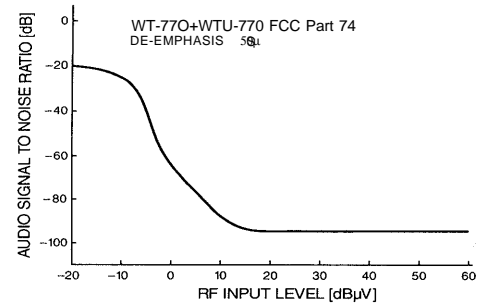
WD-770

## FEATURES

1. Modular design enables easy change or addition of frequencies (870 & 770 models).
2. Up to four separate frequencies available in one rack space (870 & 770 models).
3. 23 frequencies available, up to eight compatible channels in any geographical area.
4. FCC & UL approved.
5. Features VHF high-band operation from 168MHz to 216MHz.
6. Double squelch system combines noise squelch to eliminate ambient RF noise with tone-key circuitry to block out stray RF signals.
7. Compressor circuit guarantees better than 90dB dynamic range.
8. Four different microphones available, including a Shure SM-58.
9. 12 or more hours of continuous mic operation on one AA battery
10. LED low power indicator on transmitter activated at least 30 minutes before power fails.
11. WD-770 optional antenna distributor can be used with the 870 and 770 models to split the input from a single antenna or pair of antennas into eight separate frequencies.
12. Two year warranty.



## QUIETING CURVE



## SPECIFICATIONS

### Microphones

Model No.	WM-280 (Dynamic Microphone)	WM-290 (Dynamic Microphone)	WM-270 (Electret Condenser Microphone)	WM-370 (Lapel Microphone)
Frequency Range	168MHz-216MHz			
Microphone Element	TOA original dynamic, cardioid	Shure SM58 dynamic, cardioid	TOA original electret, cardioid	TOA original electret, cardioid
Frequency Stability	±0.005% (for USA FCC part 90, 74) ±10kHz (for UK MPT1345), 0.002% (for Australia)			
RF Carrier Power	15mW (except UK MPT1345)			
Effective Radiated Power	Less than 2mW (for UK MPT1345 only)			
Maximum Input Level	144dBspl	144dBspl	127dBspl	115dBspl
Modulation (Max.)	± 15kHz deviation (for USA FCC part 90, Australia DOC 60) ±40kHz deviation (for USA FCC part 74, UK MPT1345)			
Tone Frequency	32.768kHz			
Controls	Power on/off, Variable sensitivity control			Power on/off
Battery	1 x LR6 (AA size) (1.5V) Alkaline			
Current Drain	90mA typical (1.5V)			
Battery Life	More than 12 hours			
Battery Indicator	Green and Red LEDs			
Antenna	Internal dipole	Internal dipole	Internal dipole	Internal loop
Ambient Temperature	14°F-122°F (-10°C-+50°C)			
Dimensions	∅ 1.97" x 8.86" (0 50 x 225 0mm)	2.01" x 9.37" (051 x 238.0mm)	1.50" x 8.76" (038 x 222.5mm)	2.44" x 3.86" x 0.81"(62 x 98 x 20.5mm)
Weight	0.859 lbs. (390g) with battery	0.859 lbs. (390g) with battery	0.594 lbs. (270g) with battery	0.198 lbs. (90g) with battery
Standard Accessories	1 x Microphone holder, 1 x Color identification label (6 colors)			1 x Costume clip

# SPECIFICATIONS

## Receiver Frames

Model No.	WT-870 (True diversity model)	WT-770 (Non-diversity model)
Power Requirements	AC mains or 12V-18V DC 400mA max.	AC mains, or 12V-16V DC, 250mA max.
Power Consumption	10W (when operating with two tuner modules)	8W (when operating with two tuner modules)
Antenna Input	75 ohms BNC, Phantom powering for antenna 9V DC, 30mA max.	
Audio Output	-60dBV, 600 ohms, trans. balanced, XLR 3-32 or equivalent	
Mixing Output	-60dBV 600 ohms unbalanced, for Mic output, 0dBV, 10k ohms, unbalanced, for line output, 1/4" phone jack	
Ambient Temperature	14°F-122°F (-10°C-+50°C)	
Dimensions	8.26" x 1.87" x 11.02" (210 x 47.5 x 280mm)	
Weight	Approx. 4.91 lbs. (2.2kg)	
Standard Accessories	1 x Power cable 1 x DC input connector 1 x Color identification label (6 colors)	

## Tuner Modules

Model No.	WTU-870 (True diversity model)	WTU-770 (Non-diversity model)
Power Supply	10V DC, 130mA	10V DC, 70mA
Receiving Circuit	Single superheterodyne circuit	
Squelch Sensitivity	14dB $\mu$ V	
Maximum Deviation	15kHz (for USA FCC part 90, Australia DOC 60), 40kHz (for USA FCC part 74, UK MPT1345)	
Dynamic Range (SNR)	Better than 90dB (102dB: A-weight) (60dB $\mu$ V, Deviation: 15kHz) Better than 95dB (102dB: A-weight) (60dB $\mu$ V, Deviation: 40kHz)	
Distortion	Less than 1%	
Dimensions	2.36" x 0.96" x 5.47" (60 x 25 x 139mm)	1.65" x 0.79" x 4.17" (40 x 20 x 106mm)
Weight	0.34 lbs (155g)	0.19 lbs. (85g)
Standard Accessory	1 x Frequency label	

## Receiver Frames equipped with Tuner Modules

Model No.	WT-870 and WTU-870	WT-770 and WTU-770
Receiving Frequency	168mHz-216mHz	
Receiving Sensitivity	Under 20dB $\mu$ V (S/N: 70dB/Deviation: 15kHz)	Under 20dB $\mu$ V (S/N: 80dB/Deviation: 40kHz)
Frequency Response	50Hz-15kHz	
Residual Noise	Less than 30 $\mu$ V (8 $\mu$ V A-weight)	

## Overall System Performance

Model No.	WT-870, WTU-870 and WM-280, WM-290	WT-770, WTU-770 and WM-270
Transmission Distance	100-330 feet (30-100m)	
Dynamic Range	Better than 90dB (102dB: A-weight) (60dB $\mu$ V, Deviation 15kHz) Better than 95dB (102dB: A-weight) (60dB $\mu$ V, Deviation 40kHz)	
Distortion	Under 1%	

## Wireless Meeting Amplifiers

Model No.	WA-641 (Wireless Meeting Amplifier)	WA-642C (Cassette-Equipped Wireless Meeting Amplifier)
Power Requirements	AC mains, 60Hz/DRY CELLS: 8 (R20P or "D" size)/EXTERNAL DC 10V-16V	
Rated Output	AC: 15W (max. 20W)/DC: 6W	
Power Consumption	AC: 44W/DC: 1.300mA	
Frequency Response	70-10,000Hz, 3dB deviation	
Total Harmonic Distortion	Less than 3%	
Inputs	Wired Mic: Mic 1,2 wired mic -54dBV, 600 ohms (Mic 1/2 are switchable with wireless microphone)/ Auxiliary -20dBV, 500k ohms	
S/N Ratio	Better than 70dB	
Ambient Temperature	AC 14°F-104°F (-10°C-+40°C)/DC: 32°F-104°F (0°C-+40°C)	
Dimensions	14.41" x 17.95" x 7.87" (366 x 456 x 200mm) (without handle and aerial)	
Weight	16.1 lbs. (7.3kg)	18.3 lbs. (8.3kg)
Finish	Light green (ABS resin)	

### TUNER SECTION (WTU-770)

Aerial System	ROD aerial	
Receiving Sensitivity	16dB $\mu$ V (at 30dB of S/N ratio)	
Squelch Sensitivity	15dB $\mu$ V (0dB=1 $\mu$ V)	
Receiving System	Superheterodyne System	
S/N Ratio	Better than 60dB (at 60dB $\mu$ V input)	

### CASSETTE SECTION

Track Format	2-track/1-channel (monaural)	
Recording System	AC bras	
Tape Speed	1.78ips	
Wow and Flutter	0.3% WRMS	
Fast Forward/Rewind Time	Within 100 seconds (C-60 tape)	

## SCOUT Receiver

Model No.	WT-780 (Non-diversity model)	
Power Requirements	AC mains	
Power Consumption	3W	
Receiving Frequency	168mHz-216mHz	
Receiving Sensitivity	Under 20dB $\mu$ V (S/N 75dB/Deviation: 15kHz) Under 20dB $\mu$ V (S/N 60dB/Deviation: 40kHz)	
Squelch Sensitivity	Approx. 14dB $\mu$ V	
Frequency Response	50Hz-15kHz	
Residual Noise	Less than 30 $\mu$ V (8 $\mu$ V: A-weight)	
Antenna	Telescopic antenna	
Audio Output	-10dBV, 10k ohms, unbalanced, 1/4" phone jack	
Ambient Temperature	14°F- 122°F (-10°C-+50°C)	
Dimensions	5.51" x 1.22" x 4.27" (140 x 31 x 108.4mm)	
Weight	Approx. 0.572 lbs. (260g)	
Standard Accessory	1 x AC/DC adaptor	

## Overall System Performance

Model No.	WT-780 and WM-270	
Transmission Distance	100-200 feet (30-60m)	
Dynamic Range	Better than 90dB (95dB: A-weight) (60dB $\mu$ V)	
Distortion	Under 1%	

## Antenna Distributor

Model No.	WD-770 (Antenna Distributor)	
Power Requirements	DC 12V-18V or DC 24V ( $\pm$ 10%), under 100mA	
Frequency	168mHz-216mHz	
Gain	3dB $\pm$ 3dB	
Noise Index	Less than 10dB	
Maximum Input Voltage	100dB $\mu$ V	
Inputs	2.75 ohms, BNC (Antenna power supply 8V DC, 35mA max.)	
Outputs	4.75 ohms, BNC	
Ambient Temperature	14°F-122°F (-10°C-+50°C)	
Finish	Panel Aluminum, black Case Steel, dark gray	
Dimensions	8.26" x 1.81" x 11.02" (210 x 46 x 280mm)	
Weight	Approx. 0.81 lbs. (1.8kg)	
Standard Accessory	1 x AC/DC adaptor	

## Antennas

Model No.	YW-600 (Whip Antenna)	
Receiving Frequency	168mHz-216mHz	
Dimensions	Antenna element length 14.57" (370mm) Maximum connector diameter 0.59" (15mm)	
Weight	Approx. 0.048 lbs. (22g)	
Finish	Antenna element Stainless steel Resin part: Polyacetal Other part Nickel plating	

Model No.	YW-610 (Mic Stand Mounting Antenna)	
Receiving Frequency	168mHz-216mHz	
Output Impedance	75 ohms	
Output Connector	BNC jack	
Dimensions	Antenna element & base: 19.29" (490mm) Stand mounting bracket: 1.18" x 3.54" x 1.69" (30 x 90 x 43mm)	
Weight	Approx. 0.32 lbs. (145g)	
Finish	Antenna element Stainless steel Resin part Polyacetal Antenna base Off-white paint Other part Nickel plating	
Standard Accessory	1 x Bracket mounting screw	

Model No.	YW-620 (Dipole Antenna)	
Receiving Frequency	168mHz-216mHz	
Power Supply	9V DC, (Supplied from WT-770 or WT-870)	
Current Consumption	Less than 22mA	
Output Impedance	75 ohms	
Recommended Cable	RG-59/U, or RG-6/U	
Dimensions	Antenna element 15.75" x 2 (400mm x 2) Main Body: 1.3" x 3.6" x 7.9" (32 x 90.5 x 200mm)	
Weight	Approx. 0.44 lbs. (200g)	
Finish	Antenna element Stainless steel Resin part: ABS Antenna base Off-white paint Other part Nickel plating	
Standard Accessories	1 x RG-59/U sleeve, 2 x Wood screw, 2 x Machine screw	

Specifications are subject to change without notice.

## ARCHITECT'S AND ENGINEER'S SPECIFICATIONS

### TOA Password 870 True Diversity, 780/770 Non-Diversity Wireless System/600 Series Portable Meeting Amplifier

The wireless system shall include a transmitting system consisting of a battery powered transmitter integral to a hand-held microphone or body-pack plus lapel microphone and a receiving system consisting of an AC powered receiver unit and associated antenna. All receiver units, except the 780, shall have two ports to accept plug-in receiver modules for up to two channels of operation. The 780 shall include a single integral receiver. System configurations shall be as detailed below. Nominal transmitter RF output level shall be a minimum of 15mW from 168mHz to 216mHz, FM, at better than  $\pm 0.005\%$  frequency stability.

23 different operating frequencies shall be available for the 168mHz to 216mHz range. Companding circuitry with a 2 : 1 ratio shall be utilized with signal dependent attack and release times. The receiving system shall have an RF squelch sensitivity preset to 14dB $\mu$  (5 $\mu$ V) and a separate muting circuit that will deactivate only while a 32.786kHz tone is being received. The sensitivity of the receiving system shall be less than 20dB $\mu$  (10 $\mu$ V) for 70dB quieting. At 60dB $\mu$  (1mV) received signal, system dynamic range shall be better than 90dB (102dBA). Distortion for the combined transmitting and receiving system shall be less than 1% THD.

The 87-0 receiving system shall utilize diversity circuitry whereby the receiver module continually compares the received signal strength of the two antennas connected to the receiver frame and automatically uses the one with the strongest signal. RF carrier presence indicators shall show which antenna has been selected by the diversity circuitry.

For the 870/770, there shall be a power on/off switch and power-on indicator for the receiver frame. The receiver frame shall have two front ports for easy installation and removal of the receiver modules and their associated tuner panels. The 870/770 tuner panels shall have peak audio and carrier presence indicators and an audio volume control. The receiver rear panel shall have the following: male XLR connector for each channel's nominal -60dBV transmitter balanced audio output, a 1/4" phone jack (tip/sleeve) for an unbalanced summed output of the two channels; a switch to select the summed output level. -60dBV or 0dBV; one BNC type connector

for each (870) receiving antenna, or each channel's (770) receiving antenna, and one DC input connector.

Models 870 and 770 shall be capable of operating with TOA antenna distributor model WD-770. The antenna distributor shall convert input from a single antenna or pair of antennas into eight separate frequencies to eliminate the need to provide additional antennas when more than two frequencies are used within the system.

The 780 receiver shall have peak audio, RF carrier presence and power-on indicators; an audio volume control, a 1/4" phone jack (tip/sleeve) for the nominal -10dBV unbalanced audio output, and a DC input connector. The receiving antenna shall be a replaceable telescoping whip.

For the 600 Series, the two models WA-641 & WA-641C (with Integrated cassette player) shall feature a 20-watt, two-way speaker/amplifier system, a wired, low-impedance microphone input, an auxiliary input, and two non-diversity microphone receiver tuner module slots, and a built-in telescoping antenna.

The systems shall comply with parts 74 and 90 of FCC Regulations. Power for the 870 receiver module shall be supplied by the receiver frame. Power consumption for the receiver frame with two receiver modules installed shall be eight watts AC or 250mA at 12V to 18V DC from an external DC power source.

Power for the 770 receiver module shall be supplied by the receiver frame. Power consumption for the receiver frame with two receiver modules installed shall be ten watts AC or 400mA at 12V to 18V DC from an external DC power source.

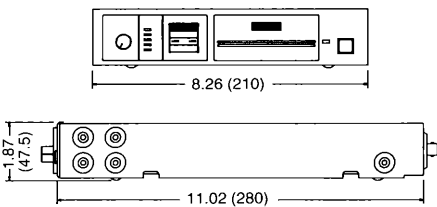
Power for the 780 receiver shall be three watts AC mains using a supplied AC mains to DC adapter or 110mA at 12V DC.

The 600 Series units shall be capable of being operated with AC mains (35W), eight "D" batteries, or an external DC power supply of 1,200mA, 12V at full output

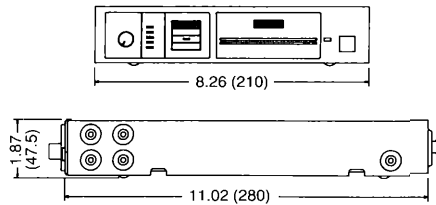
Note: 0dB=0.775V RMS, 0dB  $\mu$  = 1 $\mu$  V RF

## DIMENSIONAL DIAGRAM

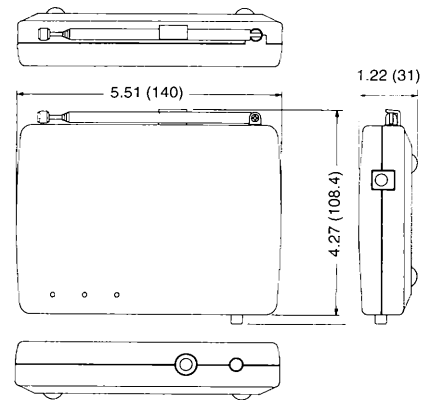
WT-870  
Dual-channel Diversity Receiver Frame



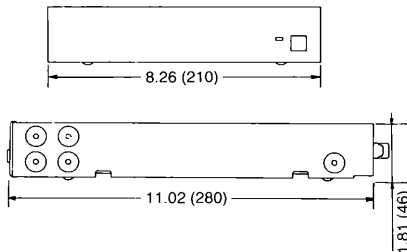
WT-770  
Dual-channel Receiver Frame



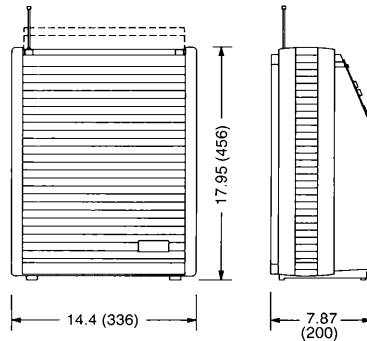
WT-780  
Single-channel Receiver



WD-770  
Antenna Distributor



WA-641/WA-641C  
600 Series Portable Meeting Amplifiers



Unit: inch (mm)

