

## IMPEDANCE METER

Operating Instructions

### ZM-104

#### ■ GENERAL DESCRIPTION

The TOA ZM-104 IMPEDANCE METER can be easily measured the impedance of the speaker lines in the same manner as with a tester (a circuit meter).

#### ■ CAUTION

- 1) If the measuring leads of the ZM-104 are connected when a voltage (AC or DC) is across the circuit measured, the ZM-104 will break down. Be sure to connect them after satisfying yourself that no voltage is across the circuit to be measured. Place new batteries correctly seeing polarity marks. Misplaced batteries may cause trouble.
- 2) When the ZM-104 is not used, be sure to push the OFF button on the push switch to turn power OFF. While any of the range buttons (X1, X10, X100) is not turned power OFF, and will be consumed batteries.

#### ■ HOW TO USE

- 1) Before use, insert the measuring leads supplied into the terminals ZX, and set the range selector switch to X1, X10, X100 as required.
- 2) For 0 Ω adjustment, depress the 0 Ω PUSH switch, and turn the 0 Ω ADJUSTOR VOLUME control to bring the meter reading to 0 Ω.  
Each time the range selector switch is transferred, this 0 Ω adjustment is necessary. (Depress the 0 Ω PUSH switch to short the terminals ZX to each other. This saves time to short the circuit using the measuring leads.)
- 3) Before measurement, first be sure that no voltage (AC or DC) is across the speaker circuit or the circuit to be measured, then bring the measuring leads into secure contact with the circuit to be measured.
- 4) Since the meter reading gives the impedance value of the circuit measured, multiply the meter reading by the factor of the measuring range. For example, if the meter reading is 50, 50 Ω (X1), 500 Ω (X10), or 5k Ω (X100) can be obtained.
- 5) Measure the circuit with the ZM-104 held in either a horizontal or a vertical position.
- 6) Renew the batteries before indicator comes not to point to 0 Ω when the ADJUSTOR VOLUME control is fully turned after 0 Ω adjustment.

#### ● Impedance measuring method at the 3-wire system :

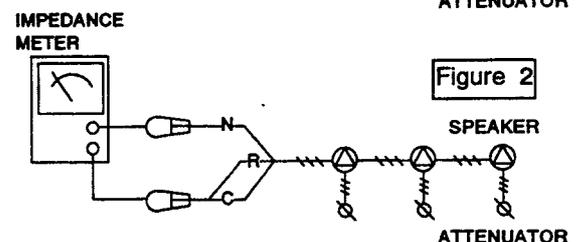
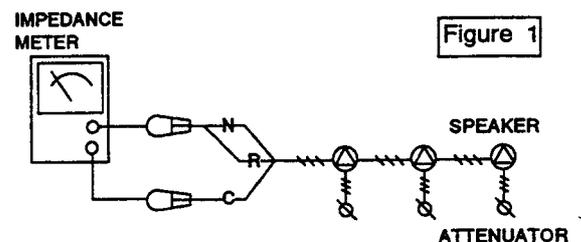
- 1) Maximum load impedance of speaker lines can be measured. (In the status that either All-call or an emergency broadcasting is made.)

In case of completion of the wire arrangement at site, measure the load impedance with this method. (Figure 1)

\*Indication of the ZM-104 is shown constant value regardless of the attenuator operation.

- 2) The impedance can be measured in the status that the attenuators of speaker lines are being activated. (Figure 2)  
It is very convenient to check working status of attenuators and all the speaker lines before connecting speaker lines to the amplifier.

\*Indication of the ZM-104 is changed according to the attenuator operation.



#### ■ SPECIFICATIONS

Type	Portable	Oscillation frequency	1,000Hz ± 10%
Reading	Direct (indicated ohms on meter)	Power supply	Four R6P batteries (6V)
Measurement range	X1 range 5 Ω ~1k Ω	Battery life, when continuously used	X1 range : 30 hours
	X10 range 50 Ω ~10k Ω		X10 range / X100 range : 60 hours
	X100 range 500 Ω ~100k Ω	Dimensions	115(W) x 55(H) x 186(D) mm
Accuracy	± 10%	Weight (with batteries)	950g

\* Specifications are subject to change without notice.

- #### ■ HOW TO OPEN THE BATTERY COVER :
- See the reverse side for Japanese manual.

#### ■ COMPONENT & ACCESSORIES

ZM-104 unit ....1, Carrying case....1, Measuring leads....1 set and R6P batteries....4