⚙ **AIPHONE**

TB-M Series
INTERNAL TELEPHONE SYSTEM

Models: **TB-10M**
TB-20M

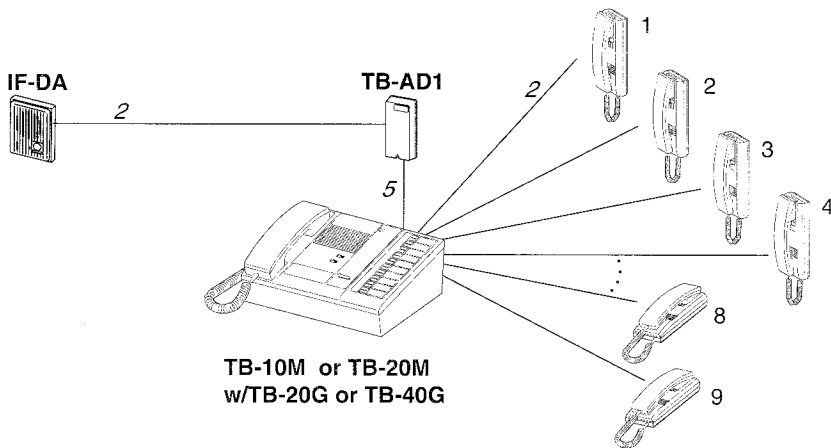### INSTALLATION & OPERATION MANUAL

CONTENTS

1 SYSTEM OUTLINE & COMPONENTS ─────────────────

▊ System outline
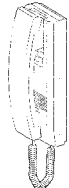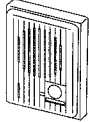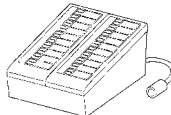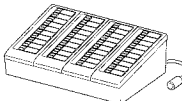
The TB-M is an internal telephone type system, expandable up to 60 subs and 2 masters.
Communicates with TB-SE handset subs and IE/IF door stations.

IF-DA   **TB-AD1**

TB-10M or TB-20M
w/TB-20G or TB-40G

▊ Package contents

① Master station (TB-10M or TB-20M)
② Directory card & cover
③ Screws-pack (2 types, ea. 4 pcs)
④ Wall-mount cradle
⑤ Installation & Operation Manual

▊ Components available

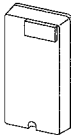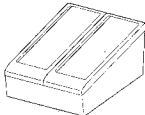| TB-SE	IF-DA, etc.	TB-AD1	TB-AD10	TB-20G	TB-40G
Sub station	IE/IF Series door station	1-call door station adaptor (up to 3)	10-call door station adaptor	20-call add-on selector	40-call add-on selector

TB-M components: TB-10M, TB-20M, TB-20G, TB-40G, TB-AD1 and TB-AD10 are **NOT** compatible with TB-10T and TB-20T.
TB-RC sub can be used with TB-M.

2 NAMES & FEATURES

■ Names & functions

TB-10M and TB-20M master station is streamline and modernly designed. The master console may be placed on desk or wall-mounted.

Power on switch
(on rear panel)

Power on &
in-use LEDs

Plug-in connector
(on the back)

Station-select or
call button with LED

Directory card
and cover

97 mm
3-13/16"

230 mm
9"

Receive & call tone
volume controls

405 mm
16"

Transfer switch
& LED

**TB-10M with
TB-20G add-on
selector**
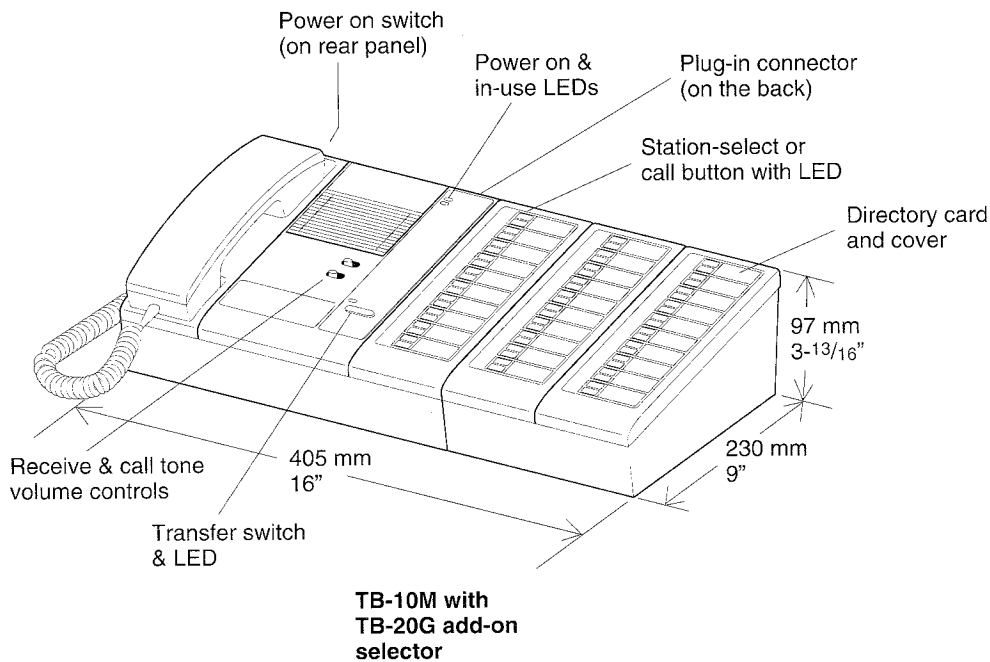
The selector switch bank is aligned vertically, with each station having its own directory. Station numbers count top to bottom 1 to 10 on first switch bank, and 11 to 20 on the second switch bank of TB-20M. The supplied directory card and cover can be attached from the left.

Features **Transfer switch** and LED in the center of front panel. Single transfer button automatically connects the master with the next TB-SE sub that has called (max. 2)

TB-20G or TB-40G add-on selector plugs into TB-M back panel, and can be placed on either side of master.

■ Features

- TB-20G or TB-40G add-on selector connects additional TB-SE subs, allowing system expansion.

- One or dual-master configuration.

- TB-AD1 adaptor connects TB-M with an IE/IF Series audio door station (up to 3).

- For 4 to max. 10 doors, use a TB-AD10 adaptor. Or alternatively, TB-ADM10 adaptor for max. 10 PanTilt door stations. Allows TB-M to communicate and monitor each MY door station audio-visually either selectively or all in succession. Refer to the TB-ADM10 Manual.

- Call extension IER-2 allows incoming call tone to be heard at a remote location.

- Master station can call sub by tone, and optional external buzzer.

③ PRECAUTIONS ON INSTALLATION & WIRING ──────────────

★ **Do not attempt to install or connect wires on TB-(10,20)M equipment while system's power supply is turned on.**

★ TB-(10,20)M masters, TB-SE subs, and related equipment, except door station, are designed for indoor use only. Do not install outdoors.

★ Do not connect any other power source than specified on terminals IN AC15–16V or DC18V. Doing so can damage the TB-M equipment.

★ Do not open any TB-(10, 20)M system components. Ask qualified personnel.

★ All the products of other manufacturers, power supply, buzzer, etc. used for TB-(10,20)M, are not within our warranty, and must be used under manufacturer or distributor's specifications and warranty.

★ Do not mount TB-(10,20)M equipment in the following places, as it may cause the system to malfunction:
  • High or extreme cold temperature areas: under direct sunlight, near equipment that varies in temperature, front of air-conditioner, inside refrigerating warehouse, etc.
  • Places subject to moisture or humidity extremes
  • Places subject to environmental conditions, such as iron dust, dust, oil, chemicals, etc.

★ TB-(10,20)M is an electrical appliance, which must not be subjected to water, or any other liquid.

★ Weather conditions, such as lightning storms, may cause damage to TB-M equipment. It is suggested to take protective measures as follows;

  • When an AC transformer is used

TB-10M
TB-20M

AC trans.

Install a surge-arrester
(discharging voltage: **100~180V**)
at a point close to the output,
taken to earth ground.

Surge-arrester

AC 15 – 16V
or DC 18V
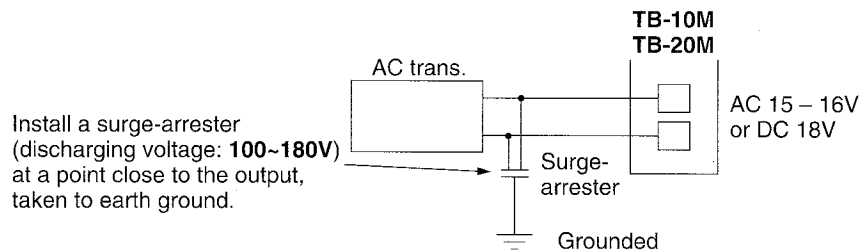
Grounded

  • When a DC power supply is used:
    On the power supply with grounding terminal, be sure to take the terminal to earth ground.
    In this case, it is not necessary to connect a surge-arrester.

    When using a power supply that has no grounding terminal, install a surge-arrester in the same manner as stated above. Surge-arrester SA-1 is available from Aiphone.

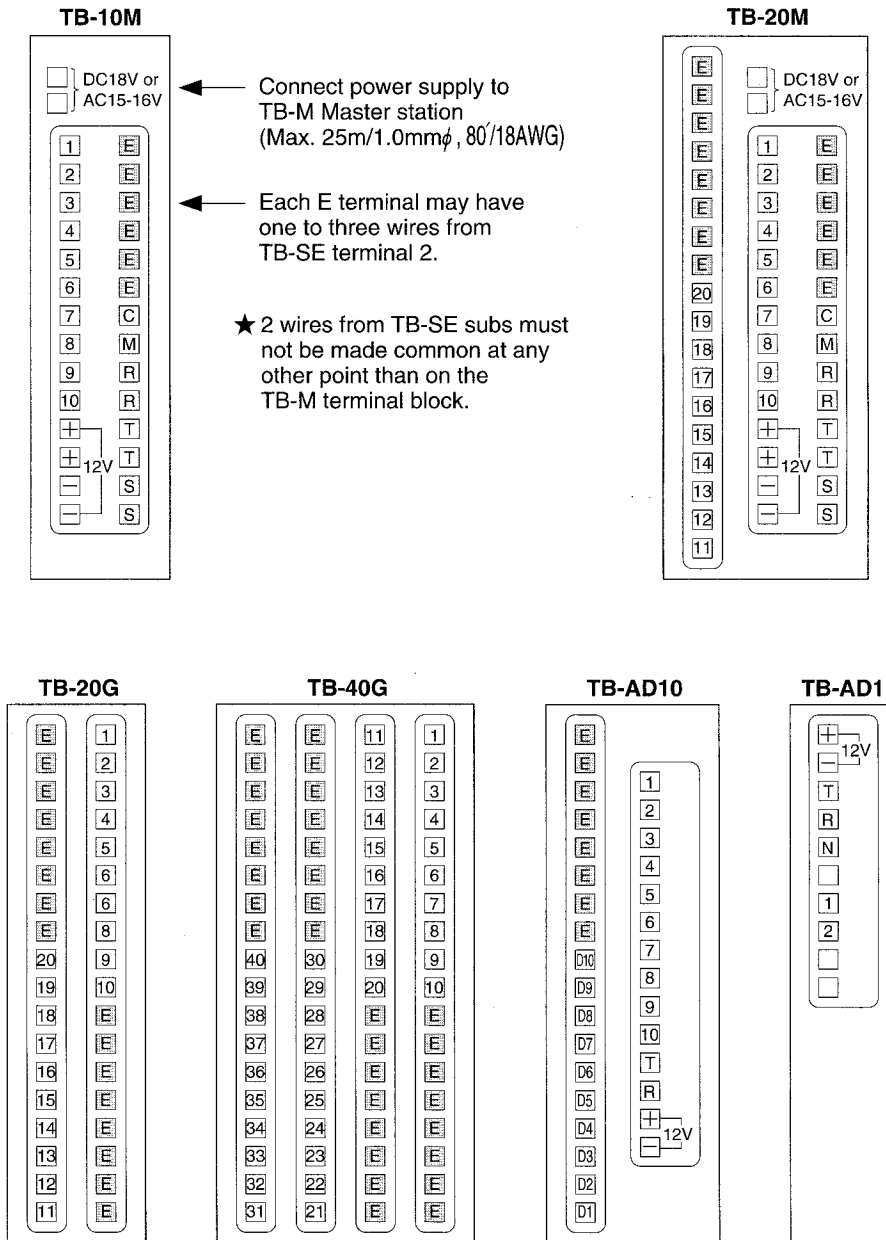■ **Cable requirements**

Use 2-conductor cable (twisted or non-twisted) homerun to each sub station (0.65 ~ 1.0mmϕ, 22 ~ 18AWG).

■ **Before TB-(10,20)M is actually installed, the contents on pages 4 ~ 9 must be thoroughly read and understood.**

4 WIRING

■ Terminal-block layout

TB-10M

```
☐ } DC18V or
☐ } AC15-16V
```

```
[1]  [E]
[2]  [E]
[3]  [E]
[4]  [E]
[5]  [E]
[6]  [E]
[7]  [C]
[8]  [M]
[9]  [R]
[10] [R]
[⊞]─┐ [T]
[⊞]─┘12V [T]
[⊟]─┐ [S]
[⊟]─┘ [S]
```

← Connect power supply to
TB-M Master station
(Max. 25m/1.0mmφ, 80′/18AWG)

← Each E terminal may have
one to three wires from
TB-SE terminal 2.

★ 2 wires from TB-SE subs must
not be made common at any
other point than on the
TB-M terminal block.

TB-20M

```
[E]
[E]
[E]
[E]
[E]
[E]
[E]
[E]
[20]
[19]
[18]
[17]
[16]
[15]
[14]
[13]
[12]
[11]
```

```
☐ } DC18V or
☐ } AC15-16V
```

```
[1]  [E]
[2]  [E]
[3]  [E]
[4]  [E]
[5]  [E]
[6]  [E]
[7]  [C]
[8]  [M]
[9]  [R]
[10] [R]
[⊞]─┐ [T]
[⊞]─┘12V [T]
[⊟]─┐ [S]
[⊟]─┘ [S]
```

TB-20G

```
[E]  [1]
[E]  [2]
[E]  [3]
[E]  [4]
[E]  [5]
[E]  [6]
[E]  [6]
[E]  [8]
[20] [9]
[19] [10]
[18] [E]
[17] [E]
[16] [E]
[15] [E]
[14] [E]
[13] [E]
[12] [E]
[11] [E]
```

TB-40G

```
[E]  [E]  [11] [1]
[E]  [E]  [12] [2]
[E]  [E]  [13] [3]
[E]  [E]  [14] [4]
[E]  [E]  [15] [5]
[E]  [E]  [16] [6]
[E]  [E]  [17] [7]
[E]  [E]  [18] [8]
[40] [30] [19] [9]
[39] [29] [20] [10]
[38] [28] [E]  [E]
[37] [27] [E]  [E]
[36] [26] [E]  [E]
[35] [25] [E]  [E]
[34] [24] [E]  [E]
[33] [23] [E]  [E]
[32] [22] [E]  [E]
[31] [21] [E]  [E]
```

TB-AD10

```
[E]
[E]
[E]
[E]
[E]
[E]
[D10]
[D9]
[D8]
[D7]
[D6]
[D5]
[D4]
[D3]
[D2]
[D1]
```

```
[1]
[2]
[3]
[4]
[5]
[6]
[7]
[8]
[9]
[10]
[T]
[R]
[⊞]─┐
[⊟]─┘12V
```

TB-AD1

```
[⊞]─┐
[⊟]─┘12V
[T]
[R]
[N]
[☐]
[1]
[2]
[☐]
[☐]
```
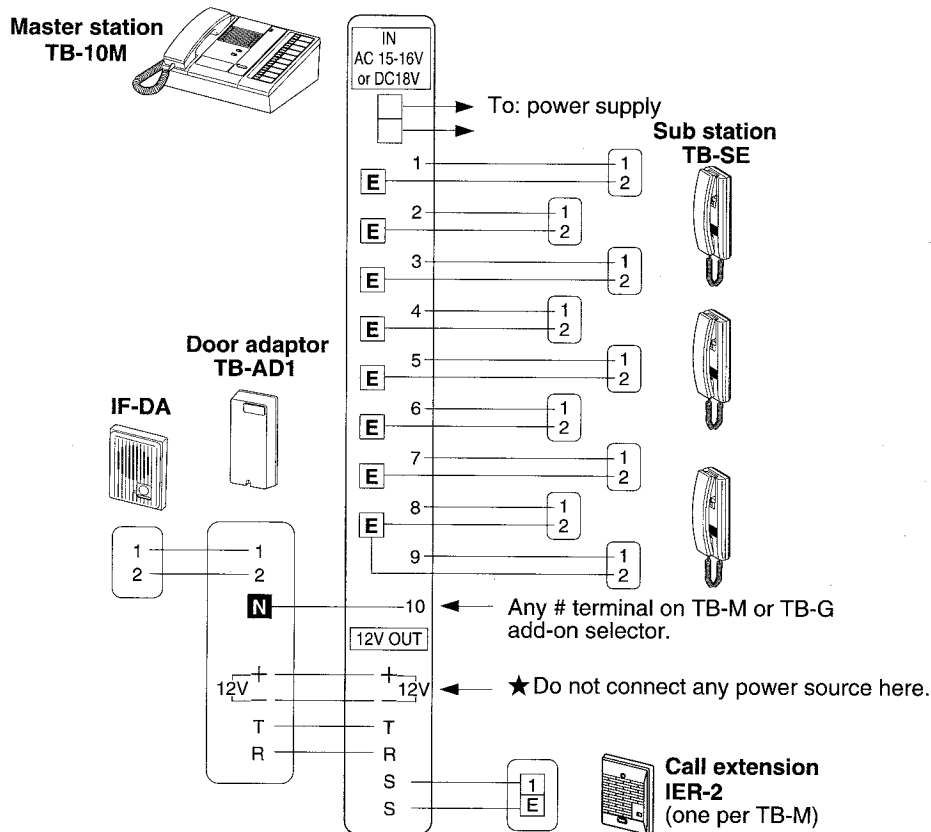
■ Meaning of terminal symbols

E terminal is common calling and communication line.
No. 1~40 terminals are selective station points, providing selective calling and communication.
C & M terminals are master-to-master communication.
R & T terminals are master-to-door adaptor transmit and receive lines.
S & S terminals are call tone output to IER-2 call extension speaker.

■ TB-10M single-master system with a door station
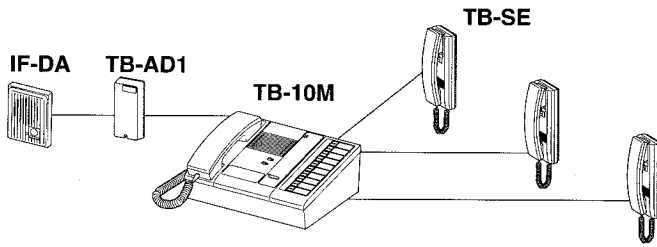
- The # terminals on the master station connect to terminal 1 on each TB-SE sub. These numbers become the sub's station number, numbered from the top on each 10-button row.

★ 2 parallel wires per TB-SE sub, nonpolarized. Be sure to run each pair of wires directly to TB-M master.
E line in each pair should not be connected at any other point of cable than E terminals on TB-M, which can accomodate 2 ~ 3 TB-SE subs.

IN AC 15-16V or DC18V

To: power supply

Any # terminal on TB-M or TB-G add-on selector.

★ Do not connect any power source here.

Call extension IER-2 (one per TB-M)

The master can select the door station for audio monitoring at any time. The call announce pretone is selectable.
Set the switch to ON position for pretone, removing the cover of front case.

■ Wiring distance

TB-M to TB-SE sub

Diameter	0.65mm	0.8mm	1.0mm
Distance	400m	600m	900m

AWG	22AWG	20AWG	18AWG
Distance	1,300'	2,000'	3,000'

TB-AD1 to audio door station

Diameter	0.65mm	0.8mm	1.0mm
Distance	150m	230m	360m

AWG	22AWG	20AWG	18AWG
Distance	500'	750'	1,200'

TB-M to TB-AD1

Diameter	0.65mm	0.8mm	1.0mm
Distance	65m	100m	150m

AWG	22AWG	20AWG	18AWG
Distance	210'	330'	495'

TB-AD1

DC12V input

Pre-tone sounds at door station when selected from TB-M master. The feature can be muted by switching to OFF.
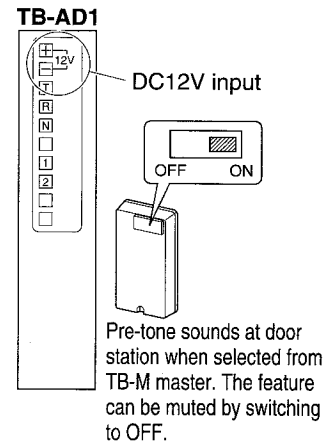
■ TB-10M single-master with TB-(20,40)G add-on selector

TB-SE

**IF-DA TB-AD1**

TB-10M TB-20G
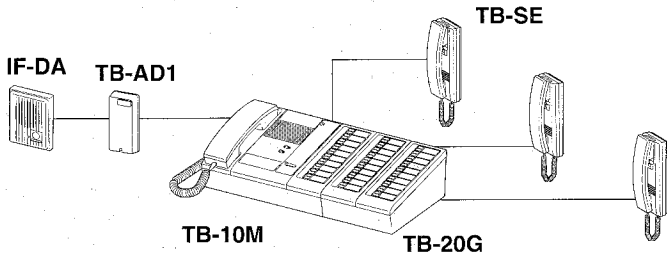
- TB-M master, with a TB-G add-on selector, expands its capacity up to 60 substations. Choose the master and add-on selector to meet your system's requirements.
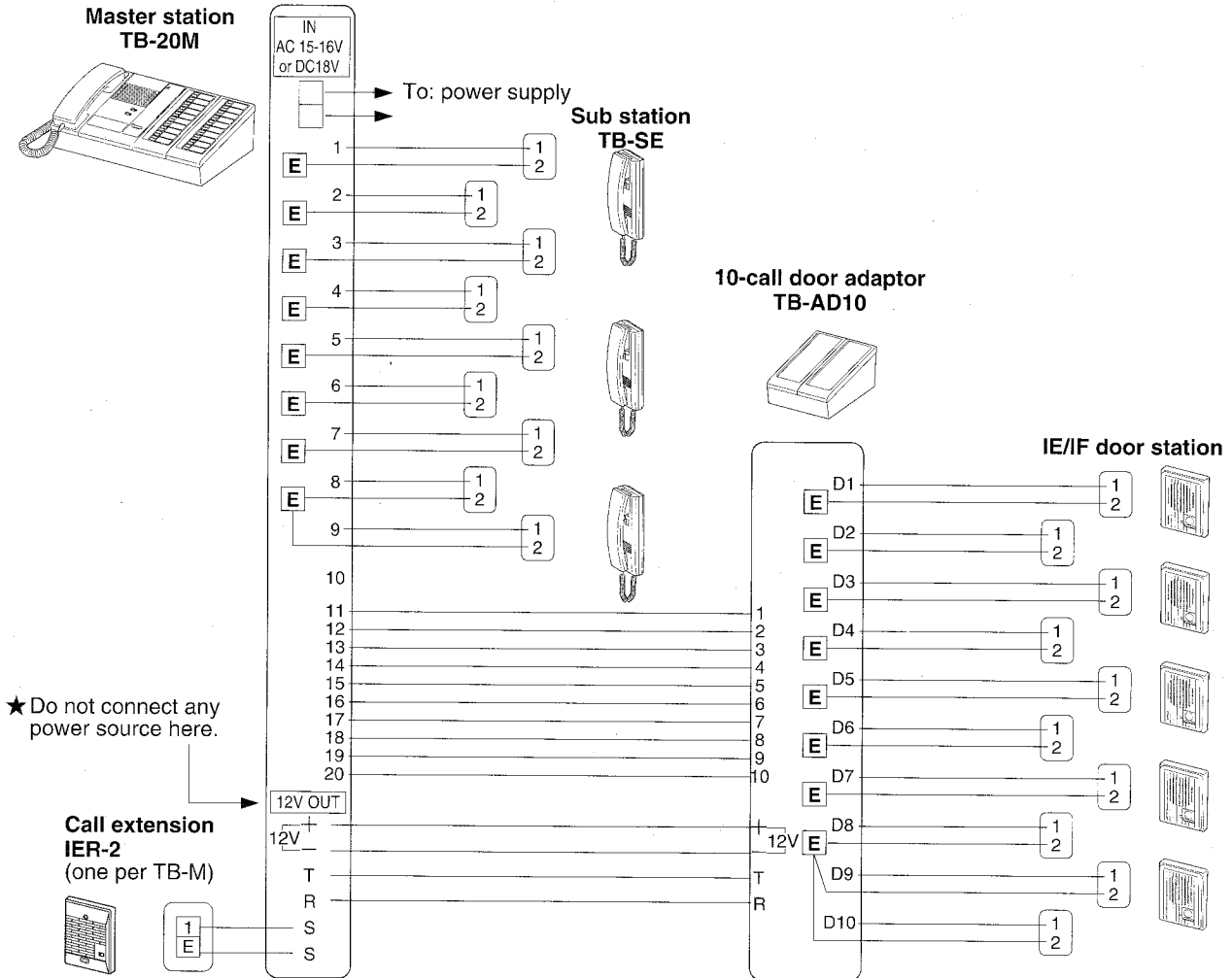
Master station
TB-10M

IN
AC 15-16V
or DC18V

→ To: power supply

Sub station
TB-SE

Add-on selector
TB-20G

Door adaptor
TB-AD1

IF-DA

Sub station
TB-SE

N —— 10 ◄— Designate any # terminal
for TB-AD1

12V OUT

12V ◄— ★Do not connect any
power source here.

T
R

Call extension
IER-2
(one per TB-M)

Connector
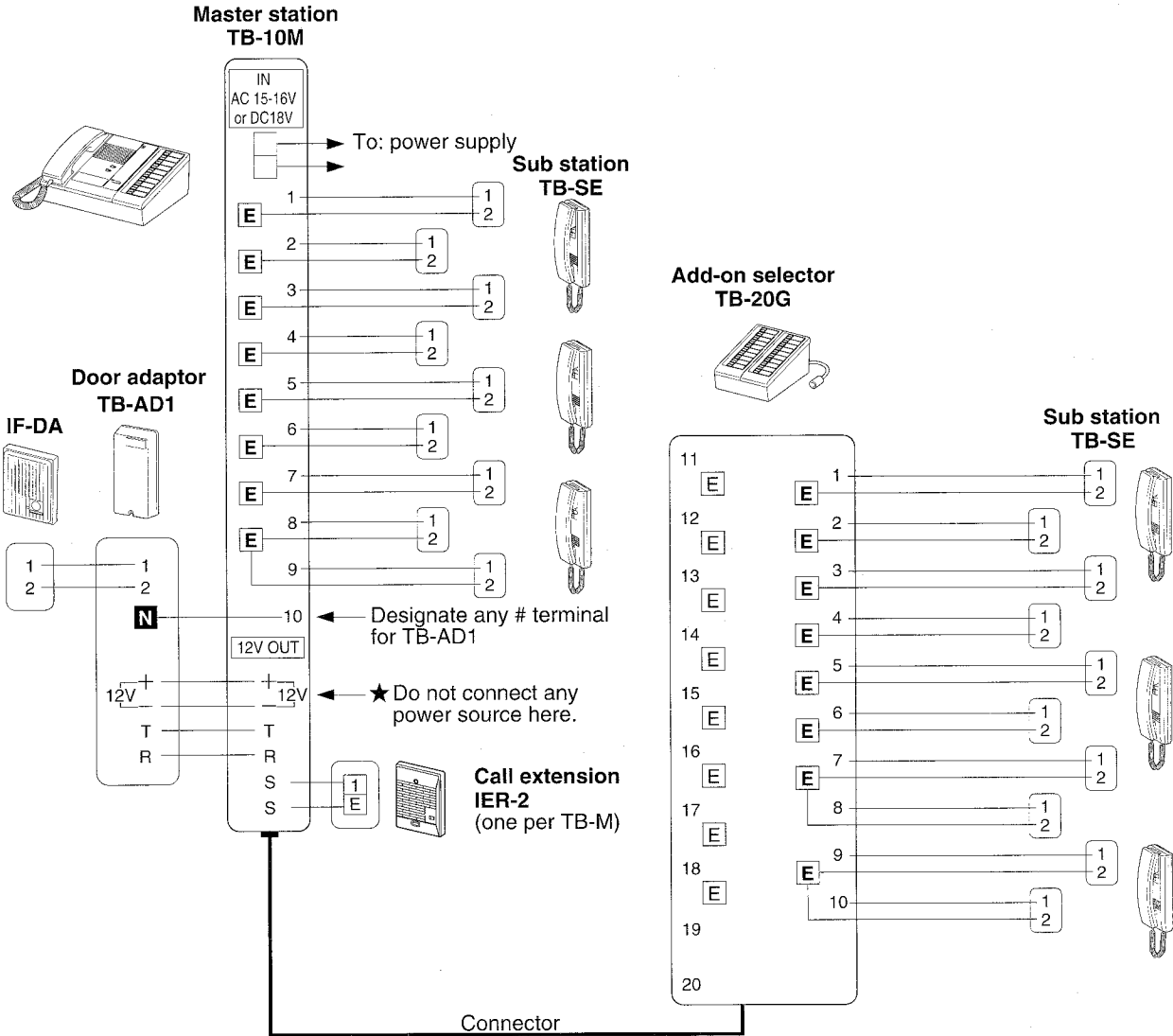
★ Up to 3 TB-AD1 door station adaptors per TB-M.
5 wires homerun to TB-M.

■ TB-20M single-master with up to 10 door stations
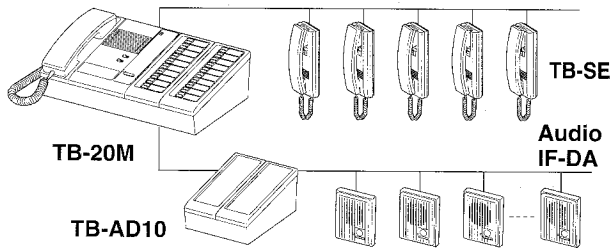
In place of TB-SE handset subs, TB-M master may have max. 10 door stations, by using a TB-AD10 adaptor.

TB-20M

TB-SE

Audio IF-DA

TB-AD10

Master station TB-20M

IN
AC 15-16V
or DC18V

To: power supply

Sub station TB-SE

10-call door adaptor TB-AD10

IE/IF door station

★ Do not connect any power source here.

Call extension IER-2 (one per TB-M)

12V OUT

TB-AD10, 10-call door adaptor may be wired to any # terminal on TB-M or TB-G add-on selector, connecting max. 10 IE/IF door stations. Features two-way calling and communication with door station, including optional pretone. Set the switch to ON position, if pretone to door is required.

TB-AD10

ON
OFF

■ Wiring distance:

TB-M to TB-AD10

Diameter	0.65mm	0.8mm	1.0mm
Distance	65m	100m	150m

AWG	22AWG	20AWG	18AWG
Distance	210'	330'	495'

TB-AD10 to audio IF-DA

Diameter	0.65mm	0.8mm	1.0mm
Distance	150m	230m	360m

AWG	22AWG	20AWG	18AWG
Distance	500'	750'	1,200'

■ TB-M dual-master system

Single-pair, nonpolarized | TB-SE

IF-DA TB-AD1 TB-10M

2-pairs polarized | TB-SE
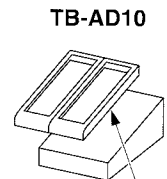
TB-10M
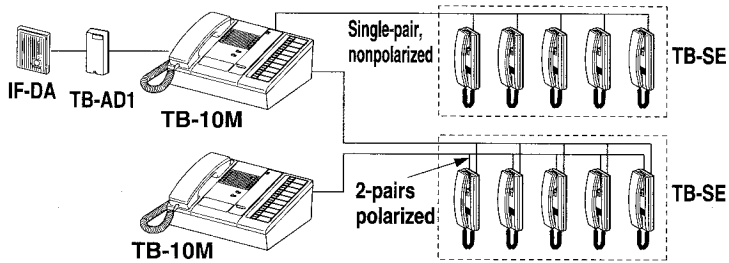
- Common TB-SE sub rings two TB-M Masters.
- Each master can call TB-SE sub selectively.
- Master-to-master communication.

Master station
TB-10M

IN
AC 15-16V
or DC18V

To power supply

Sub station (common)
TB-SE

Polarized

Master station
TB-10M

IN
AC 15-16V
or DC18V

To power supply

Door adaptor
TB-AD1

IF-DA

Polarized

Polarized

Sub station
TB-SE

Designate any # terminal
for TB-AD1

★The number terminal
jumpered to "M" at each
master establishes master
-to- master communication.

★Do not connect
any power source

Call extension
IER-2

Call extension
IER-2

★IMPORTANT

Do not use the following wiring methods. They will cause the system to malfunction:

NEVER
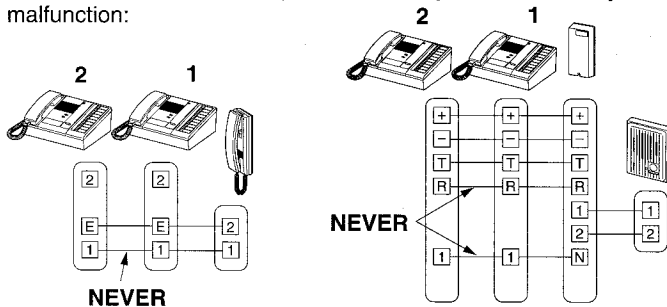
Do not parallel sub station wires between TB-M master stations. Wiring from TB-SE must be homerun to EACH master station.

NEVER

Door adaptor TB-AD1(10) can only be wired to one master. Doors cannot call both master stations.

■ Wiring distance:
Between TB-M masters

Diameter	0.65mm	0.8mm	1.0mm
Distance	200m	300m	480m

AWG	22AWG	20AWG	18AWG
Distance	650'	1,000'	1,570'

■ Connecting a buzzer at a TB-SE sub

When called by TB-M master, buzzer is activated and on TB-SE sub, call tone sounds at reduced volume.
TAR-3 relay activates an AC-operated buzzer: AC 240V, 0.3A. DC-operated buzzer must be mechanical type: DC 24V, 1.0A.
Do not use DC electronic buzzer.
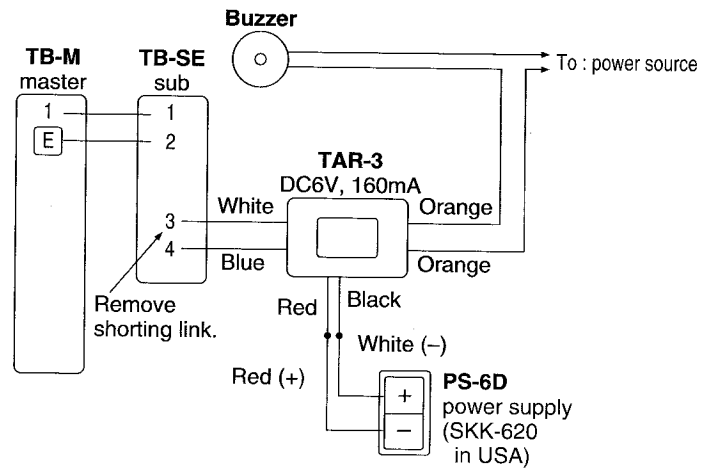
5 MOUNTING

■ TB-(10,20)M with TB-(20,40)G

Remove 2 screws on front panel, removing the cover on upper end and area/section plate. Lift off front case holding sides at top. Disconnect the intercom by unplugging the connector.
Open a cable inlet hole (rubber part) on bottom of chassis. Pull in cable(s), and make wire terminations. Use attached cable clamps(s) for neat and secured connection. Reconnect and mount front case to chassis, attaching the cover and plate in place.

When wall-mounting, separate the front panel from chassis, as explained above. Install the chassis upside down on the wall, onto a single-gang or two-gang box.
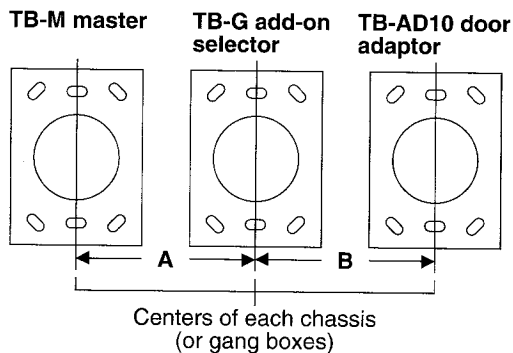
Desk-top mounting
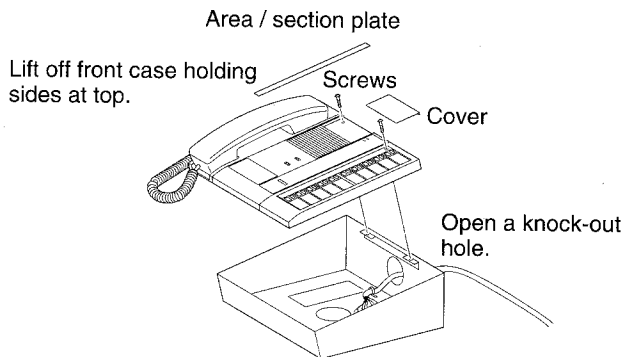
Wall-mounting
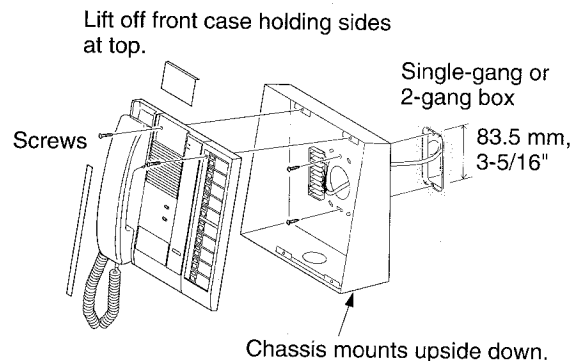
★ TB-M master wall-mounts with TB-G (and TB-AD10) attached.

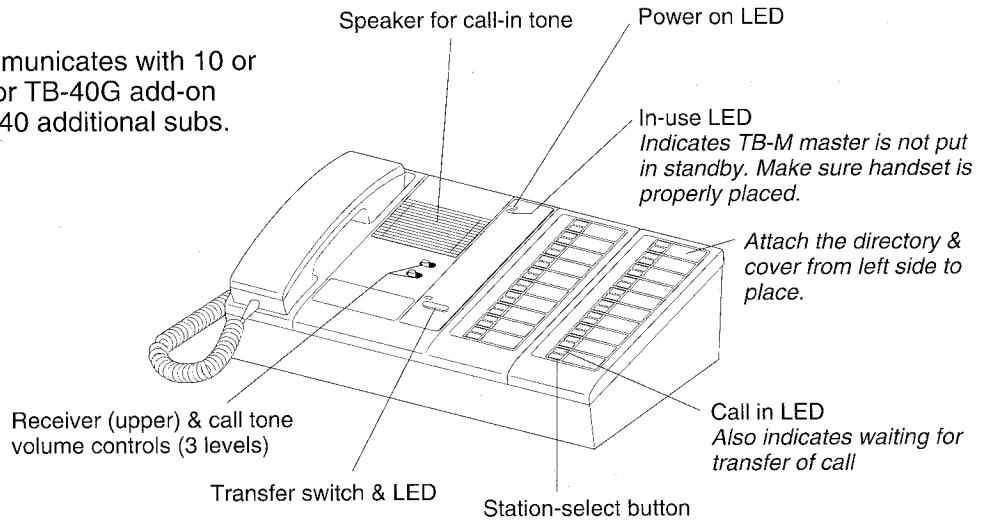Decide the exact location of TB-M master, and use the following measurements to mount the add-on components.

Centers of each chassis
(or gang boxes)

Wall-mounting guide

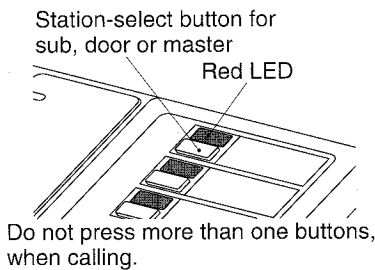| Master	Attached	Guide A	Attached	Guide B
TB-10M	TB-20G	202.5, 8"	TB-AD10	150.0, 6"
	TB-40G	277.5, 11"	TB-AD10	225.0, 9"
	TB-AD10	202.5, 8"	—	—
TB-20M	TB-20G	240.0, 9-1/2"	TB-AD10	150.0, 6"
	TB-40G	315.0, 12-1/2"	TB-AD10	225.0, 9"
	TB-AD10	240.0, 9-1/2"	—	—

■ Single TB-M system

TB-(10, 20)M master communicates with 10 or
20 TB-SE subs. TB-20G or TB-40G add-on
communicates with 20 to 40 additional subs.

Speaker for call-in tone

Power on LED

In-use LED
*Indicates TB-M master is not put
in standby. Make sure handset is
properly placed.*

Attach the directory &
cover from left side to
place.

Receiver (upper) & call tone
volume controls (3 levels)

Transfer switch & LED

Station-select button

Call in LED
*Also indicates waiting for
transfer of call*

■ TB-M single-master system

Calling and receiving

Station-select button for
sub, door or master

Red LED

Do not press more than one buttons,
when calling.

To call a TB-SE sub, the other master or audio door station pick up
handset and depress a station-select button. When called by
tremolo tone, pick up and depress the LED-lit select button. LED
remains on while in communication. Communicating TB-M is
notified of a call with a lit LED only. The audible call tone will
resume when the handset is hung up.

Receiving a call from audio IE/IF door station

IF-DA   TB-AD1   OFF   ON
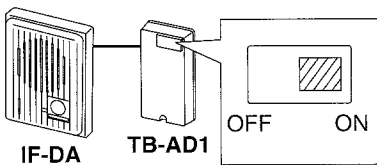
When the door station places a call with call button, a tremolo tone
is activated on the TB-M, which stays on approx. 40 seconds. The
master replies by selecting the station button that is lit. At the door
station, when selected, a pretone is heard, unless it is muted at the
TB-AD1, 10 adaptor.

"Transfer" allows two TB-SE subs to communicate with each other

Transfer switch & LED
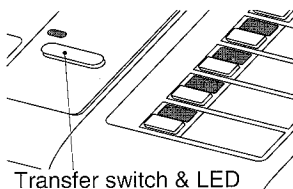
When a master receives a call from sub A, requesting transfer of
call, TB-M leaves sub A waiting, pressing a sub B select button.
When sub B picks up the call (sub A hears a busy tone), TB-M
depresses Transfer switch.
TB-M then reselects waiting sub A with red LED on. Three parties
are on the line, and TB-M may hang up.
★ Door-to-master or master-to-master calls are not transferrable.
★ If transfer LED is lit when a transfer is not being made, it can be
cleared by pressing "transfer" switch.

### TB-M places a buzzer-activating call to a TB-SE sub

Buzzer sounds continuously at TB-SE sub, in addition to ordinary tremolo. Pick up on the TB-SE station, that the buzzer is connected to.

Adjusting receive and call tone volume

Receive

Call tone
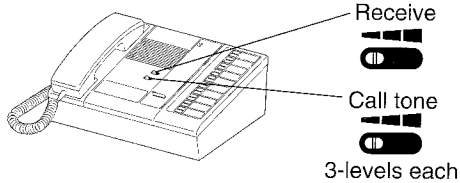
3-levels each

Upper control adjusts handset receiver volume, when TB-M does not hear a TB-SE sub clearly. Tone control adjusts ringing tremolo, 3 levels.

■ TB-M dual-master system

TB-M 1

TB-M 2

Common TB-SE(s)
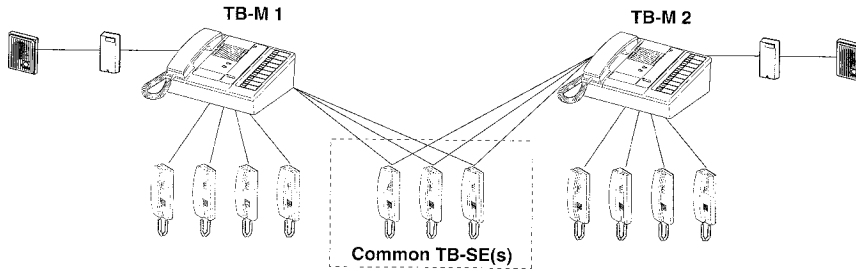
Two masters call and communicate with each assigned select button. Transfer of a sub's call to another on the other master is not possible.
A call from TB-SE subs that are connected to two masters activates tremolo tone at both masters. When the controlling TB-M is busy, the other TB-M may pick up. In this case, the sub hears both tremolo and busy tones.

★ Dual-master has an operation that, when TB-M1 places a call to either TB-M2 or a common TB-SE that is already in communication, the talk line is connected among 3 parties. It reduces communication volume. One party should hang up to restore normal volume.

■ TB-SE sub operation

Speaker for call tone
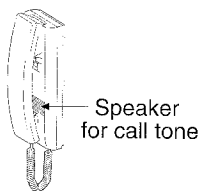
To call TB-M master, simply pick up and it rings TB-M with tremolo tone, which continues ringing until the call is answered. Intermittent tone means the master is occupied. Hang up or continue to hold. When called by tremolo tone, simply pick up.

7 TECHNICAL PRECAUTIONS

★ The power switch is located on back panel of TB-M console, which should be placed ON, except for special occasions. If the system malfunctions, turn off and on TB-M master, by which the system may reset itself. Possible causes are; power supply is unplugged, connecting wires are loosened or shorted. Do not attempt to open TB-M equipment nor change wiring. Ask qualified personnel.

★ At end of each communication, be sure to place handset in cradle properly. If not, TB-M master or TB-SE sub will not hear the call tone.

★ The TB-M is rated to operate at temperatures between 0°C ~ +40°C (32°F ~ 104°F).

★ Clean the TB-M equipment with a soft cloth dampened with neutral household cleanser. Never use any abrasive cleaner or cloth.

8 SPECIFICATIONS

Power source DC18V, 350mA max. or AC 15 – 16V, 50/60Hz. 750mA max.
Power consumption 6W max. 3W (standby)

Capacity 60 stations max., TB-SE or door stations incl.
One add-on selector TB-20G or TB-40G per TB-M. 1 to 3 TB-AD1 door adaptors or one TB-AD10 only alternatively, or one TB-ADM10 only.

Calling TB-SE sub's call-in is annunciated with intermittent tremolo tone and LED,lighting in red, both of which are held (approx. 40 seconds for IE/IF door stations).

Station-select button calls each TB-SE with intermittent tone. Corresponding LED is lit to indicate which sub is called. Master can call IE/IF door station by voice, with or without pretone (selectable).

Communication Both stations communicate simultaneously via handset.

Wiring

> 2 conductors (parallel) or a pair in multi-cond. cable TB-M to ea. TB-SE
> 5 conductors TB-M to TB-AD1
> 14 conductors max TB-M to TB-AD10
> 3 conductors between TB-M's

★ In TB-M dual-master system, two parallel conductors cables are required for each common TB-SE sub.

Wiring distance

	0.65mmϕ	0.8mmϕ	1.0mmϕ	22AWG	20AWG	18AWG
TB-M to TB-SE	400m	600m	900m	1,300'	2,000'	3,000'
TB-M to TB-M	200m	300m	480m	650'	1,000'	1,570'
TB-M to TB-AD1	65m	100m	150m	210'	330'	495'
TB-M to TB-AD10						
TB-AD1(10) to IE/IF door	150m	230m	360m	500'	750'	1,200'

Compatibility TB-M system components: TB-(10,20)M, TB-(20,40)G & TB-AD(1,10), cannot be intermixed with TB-(10,20)T masters, while TB-RC handset sub can be used with TB-M system.

Dimensions & weight

Model	Height Width Depth	Height Width Depth	Weight
TB-10M	117 mm x 255 mm x 230 mm	4-5/8" x 10" x 9"	1.8 kg (3.97 lbs.)
TB-20M	117 mm x 330 mm x 230 mm	4-5/8" x 13" x 9"	2.3 kg (5.07 lbs.)
TB-20G	97 mm x 150 mm x 230 mm	3-13/16" x 6" x 9"	1.0 kg (2.20 lbs.)
TB-40G	97 mm x 300 mm x 230 mm	3-13/16" x 11-13/16" x 9"	1.9 kg (4.19 lbs.)
TB-AD10	97 mm x 150 mm x 230 mm	3-13/16" x 6" x 9"	1.1 kg (2.43 lbs.)
TB-AD1	140 mm x 74 mm x 42 mm	5-1/2" x 3" x 1-5/8"	160 g (0.35 lbs.)