



AIPHONE

INSTALLATION MANUAL-R128/A

RCX INTERCOM SYSTEM

For systems with up to 128 stations

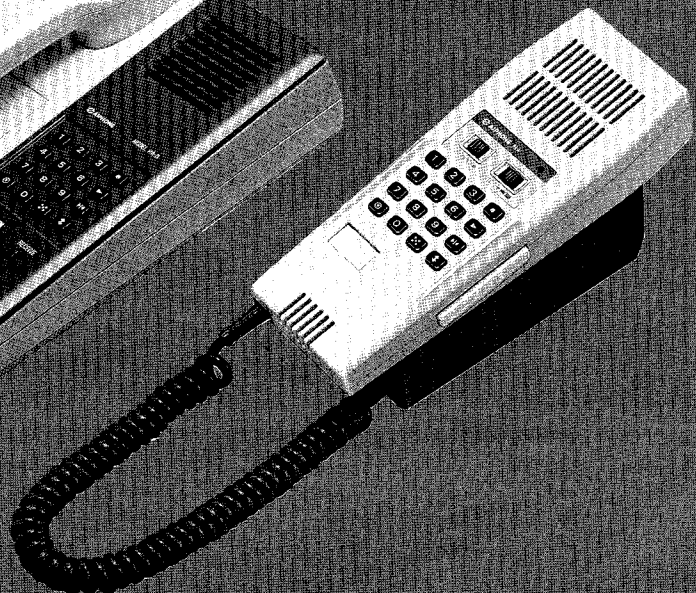
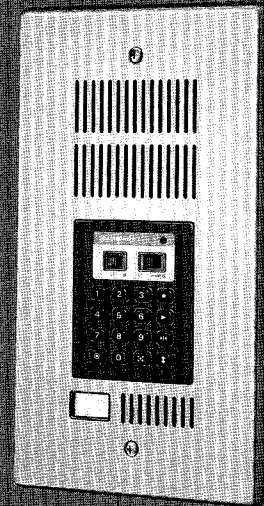
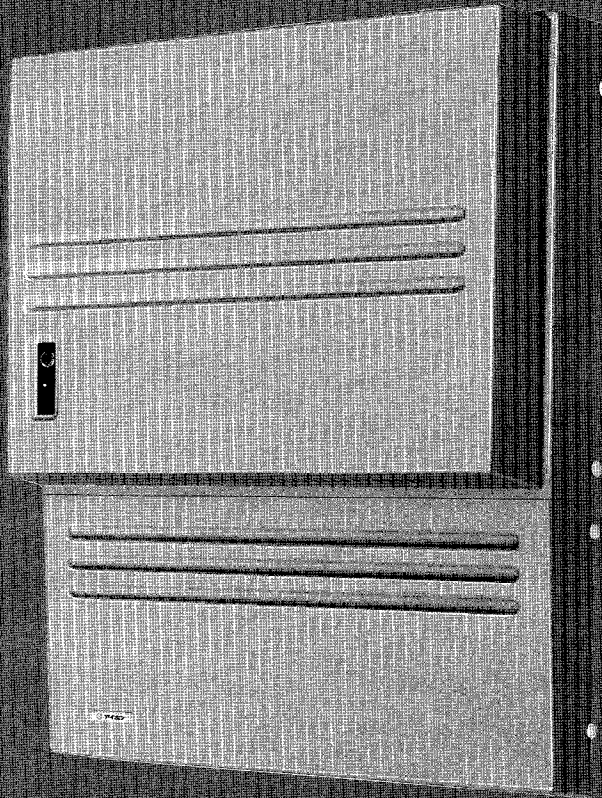


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I. Introduction

This manual presents information for installing the Aiphone RCX intercom system.

Included in this manual is information regarding;

- system features
- system design
- equipment requirements
- installation procedures
- specifications
- system testing

A careful study of this manual prior to RCX system installation is strongly recommended. A thorough reading and understanding can save time and money.

All the information contained in this manual is for system with RCX CEU Type A version and is subject to change without further notice.

II. RCX System Features and Functions

System Features

- * Fully electronic, microprocessor based system.
- * Three systems: up to 48, 88 and 128 stations.
- * 4 communication channels for 48-station system, 8 channels for 88-station system and 12 channels for 128-station system (8 additional communication channels with optional cards).
- * Total hands-free communication or telephone privacy.
- * Simultaneous duplex communication when either station uses handset.
- * Flush-mount sub station, allowing one touch calling.
- * Background music through station unit at user's option.
- * Wide range of standard communication functions, plus optional functions for specific requirements.
- * Three different types of master stations: (1) open voice, desk/wall mount, (2) flush wall-mount & (3) speaker-phone type, desk/wall mount.
- * Versatile system layout according to specific requirements: All-master system. One-master or Intermixed with any number of subs system permits by leaving those station numbers assigned for master vacant (Ex. In RCX-48/48 system, station No. 10 becomes master of all the connected stations if terminals Nos. 20, 30, 40 & 50 are left unconnected).
- * Page up to 4 individual zones with/without talkback through ceiling or horn speakers.
- * All page to 4 zones simultaneously (No talkback in all page mode).
- * Group call and/or All call through speakers of station unit, overriding any other functions.
- * Electret condensor microphones — superior voice fidelity.
- * Wall-mounted Central Exchange Unit, complete with terminal board and power supply.
- * Remote control for operation of external devices (Background music, internal/external lights, door release, etc.).
- * Quick simple home-run wiring from each station to Central Exchange Unit.
- * Two-twisted pairs per station.
- * Accepts background music through ceiling speaker with automatic cutout during paging.
- * Optional features may be included with additional card;
 1. Up to 2 door stations may ring up to 5 master stations each.
 2. Interconnect: Up to 12 telephone lines per RCX-128 system.
 3. Cascade: Up to 4 Central Exchange Units may be connected for maximum of 480-station system.
 4. Interface with pocket bell.
 5. Additional zones of paging and/or remote control, using up to 10 YAW adaptors.
 6. Speed dialing for both intercom and outside telephone calls.

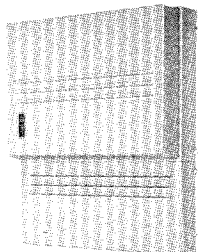
System Functions;

1. **Station call** User can call and receive from any other station in system.
2. **Camp-on Busy** User can leave a request for automatic call back from a busy station.
3. **Secretary transfer (station transfer)** Incoming calls can be routed to secretary or other designated station.
4. **Call transfer** User can transfer a call from one station to another.
5. **Call holding** User can place calling station on hold during his conversation with other station.
6. **Urgent message break-in signal and call** User can break in busy station by signal and by voice.
7. **All page** User can page all zones simultaneously.
8. **Zone page** User can page up to 4 zones individually.
9. **Talkback paging** User can page through speakers.
Person paged can respond directly from speakers (zone page only).
10. **Page with call back** User can page individual through speakers.
Person paged can respond from (nearest) station and will be automatically connected to paging party.
11. **All call** User can page through all stations simultaneously.
12. **All call with call back** User can page individual through all station speakers. Person paged can respond from nearest station and will be automatically connected to paging party.
13. **Group call** User can page through a group of station speakers.
14. **Group call with call back** User can page individual through a grouped station speakers. Person paged can respond from any station within the group and will be automatically connected to paging party.
15. **Privacy** User can place his station in Privacy mode.
16. **Temporary Privacy Release** User can release Privacy mode temporarily for reply.
17. **Master/Sub communication** User at master station can have his own sub station.
18. **Simplex communication** User can talk with a station in noisy area, pressing page button to talk, releasing to listen.
19. **Conference call** User can initiate conference among up to 6 stations.
20. **Absence Memory** User can program his station to remember who called during his absence.
21. **Memory call back** User can call back in sequence in which calls were received in his absence.
22. **Remote control operation** User can operate BGM turn on/off, turn lights on/off, etc. by dialing from his station.
23. **Clear memory** User can erase all memory functions and return station to normal operation mode.
24. **Background music through station** User can receive BGM at own station individually.

III. RCX System Design and Components

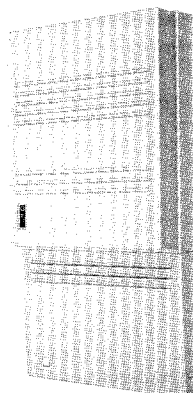
System Components

Central Exchange Unit



Model: RCX-48/n (Type A);

Central Exchange Unit for up to 48 stations. Includes central terminal board and power supply unit.

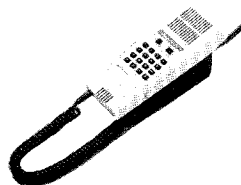


Models: RCX-88/n (Type A), RCX-128/n (Type A);

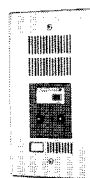
Central Exchange Unit for up to 88 and 128 stations. Includes central terminal board and power supply unit.

Note: 48, 88 and 128 in RCX-48/n (Type A), RCX-88/n (Type A), RCX-128/n (Type A) identify with station capacity each Central Exchange Unit can accommodate. Each Central Exchange Unit is available either with or without XC-092 subscriber card. One XC-092 can accommodate 8 intercom stations (Example: RCX-48/24 is a Central Exchange Unit for a 24-station system, expandable up to 48 stations).

Station Equipment



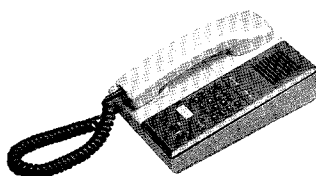
Model: RA-A, Open voice master station with handset communication capability. Desk/wall use.



Model: RA-C
Open voice sub station, flush mount (indoor use only).

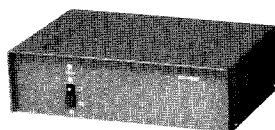


Model: RA-B, Open voice master station, flush mount (indoor use only).

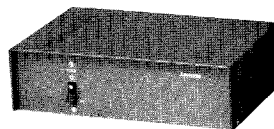


Model: RA-D
Speaker-phone type master, Desk/wall use.

Accessories available;



Model: PG-10B (10 watts), Standard Paging Amplifier, with 100V or 8 ohms output.



Model: PG-10A (10 watts), UL/CSA Approved Paging Amplifier with 25V and 70V output (available only in North America)



Model: MC-A
Paging Adaptor.



Model: PB-YKX
Talkback Adaptor.



Model: RC-A
Adaptor for paging amplifier power control.



Model: RC-B
Remote Control Adaptor for operating external devices.

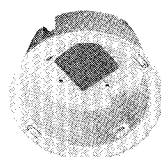


Model: SP-3NA
Standard 3 watt ceiling speaker with built-in line transformer.

Models: HR-10-12S (for 120V)
2J50-12S (for 220-240V)
Additional regulator unit for all call and BGM distribution from station speakers (for RCX-88/A & RCX-128)

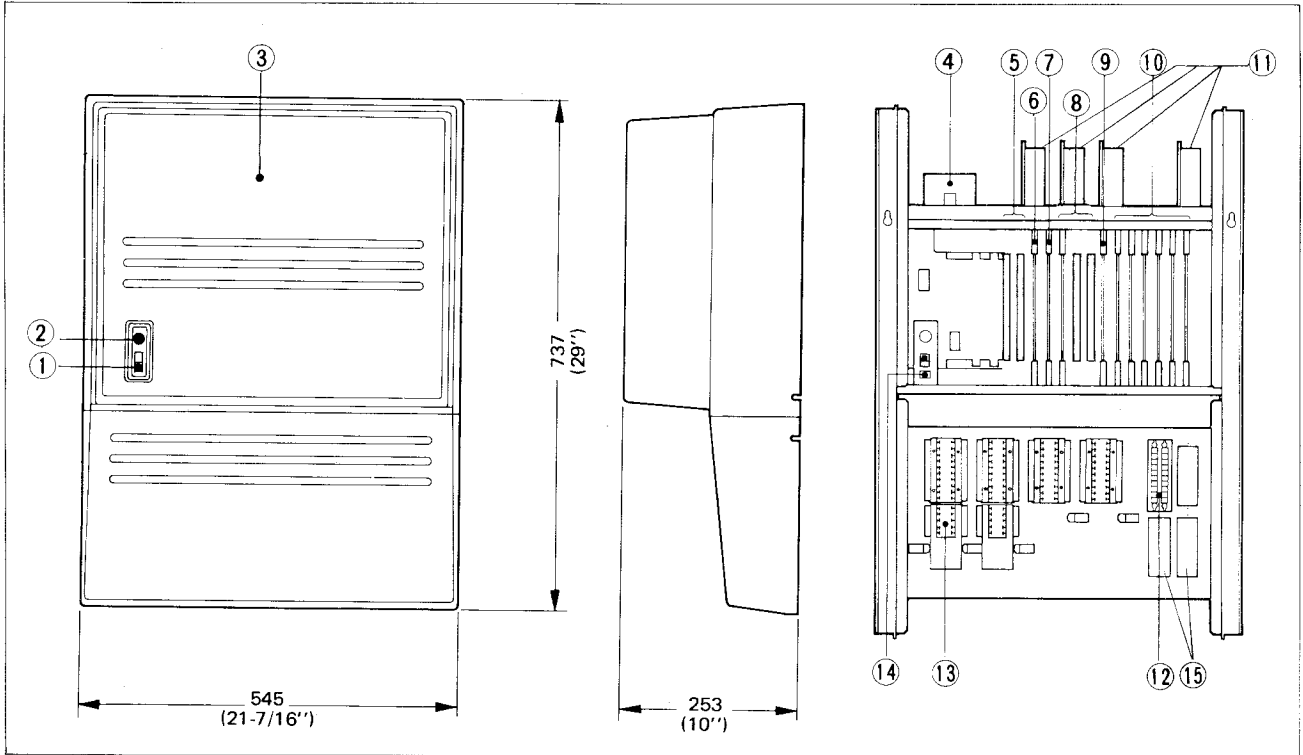


Model: NBZ-M
Square frame for flush-mounting of SP-3NA to ceiling.



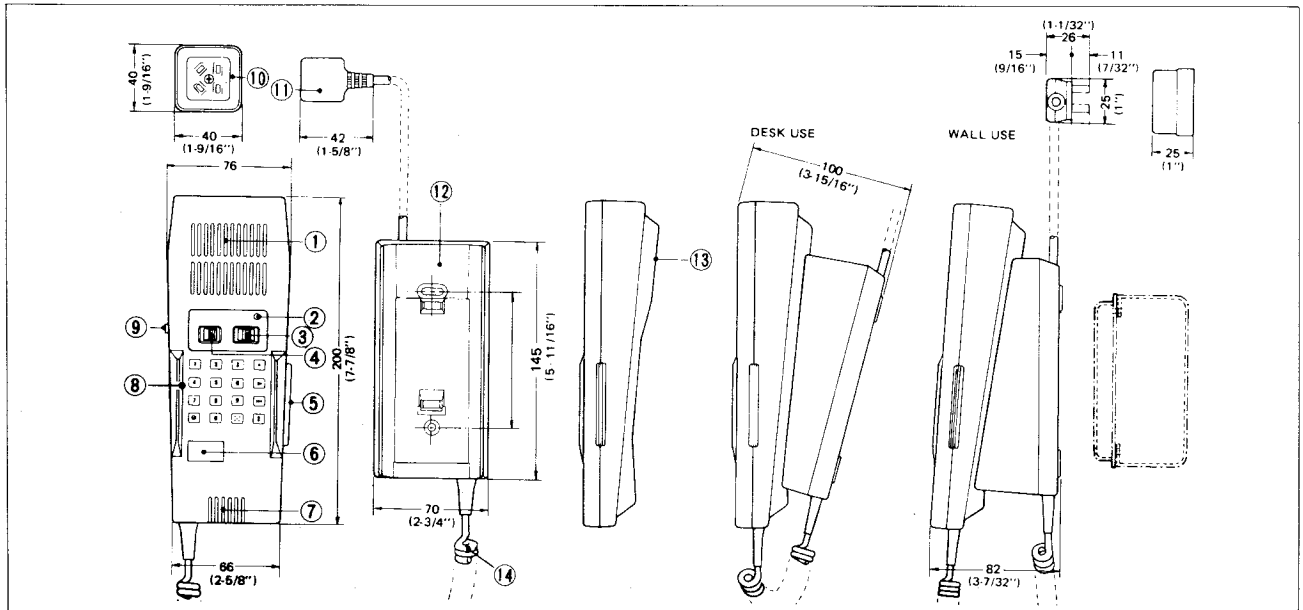
Model: N-EA
Round frame for surface-mounting of SP-3NA to ceiling.

DIMENSIONS AND PARTS IDENTIFICATIONS



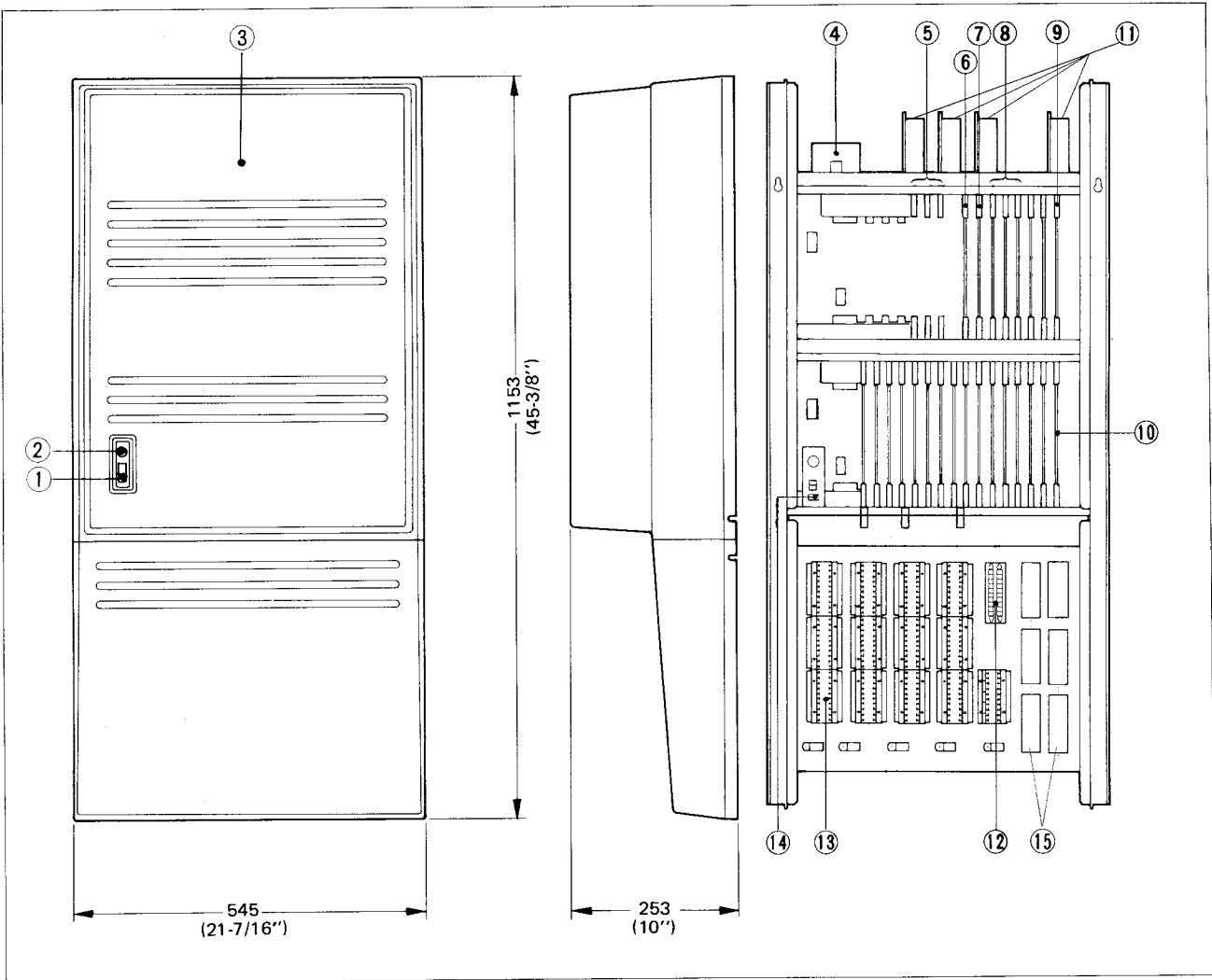
Model: RCX-48/n (Type A); Central Exchange Unit for up to 48 stations

- | | | |
|--------------------------------|------------------------------|---|
| 1. Power switch | 6. CPU card (XC-089) | 11. Regulator units |
| 2. Power lamp | 7. Network card (XC-090) | 12. Terminal section for paging |
| 3. Main front cover | 8. Duplex Link card (XC-091) | 13. Terminal section for intercom stations |
| 4. Noise filter | 9. Paging card (XC-093) | 14. Automatic cutoff switch (when cover is removed) |
| 5. Connectors for option cards | 10. Subscriber card (XC-092) | 15. Blank terminals for option card (x 3) |



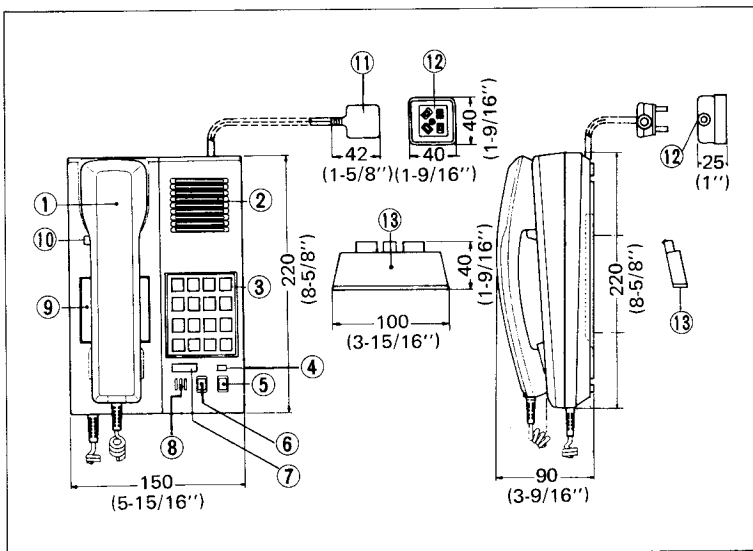
Model: RA-A, Open voice master station, Desk/Wall use

- | | | |
|---|---|--|
| 1. Open voice speaker | 6. Station No. plate | 10. DR-A receptacle |
| 2. Call lamp (also for secretary transfer & absence memory) | 7. Microphone | 11. 4P plug |
| 3. Volume control switch | 8. Dial key pad | 12. Pedestal (die cast) |
| 4. Privacy switch | 9. Talk button for paging/simplex communication | 13. Receiver for handset communication |
| 5. Bar switch for handset communication | | 14. Coil cord |



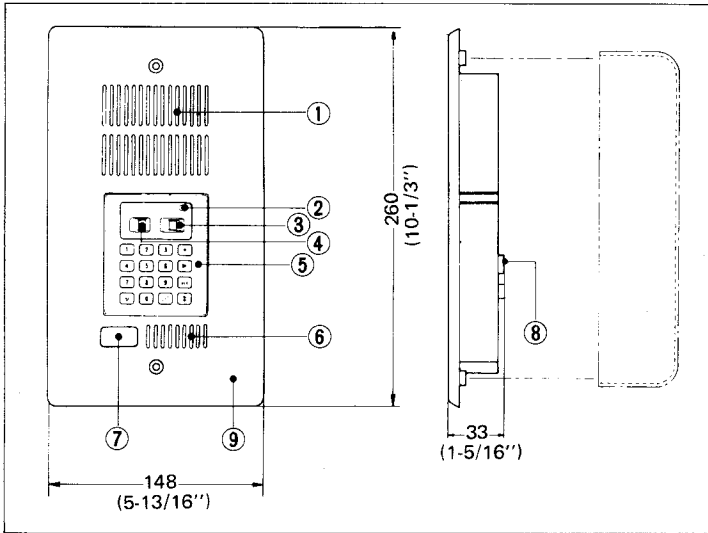
Models: RCX-88/n (Type A), RCX-128/n (Type A);

- | | | |
|--------------------------------|------------------------------|---|
| 1. Power switch | 6. CPU card (XC-089) | 11. Regulator unit |
| 2. Power lamp | 7. Network card (XC-090) | 12. Terminal section for paging |
| 3. Main front cover | 8. Duplex Link card (XC-091) | 13. Terminal section for intercom station |
| 4. Noise filter | 9. Paging card (XC-093) | 14. Automatic cutoff switch (when cover is removed) |
| 5. Connectors for option cards | 10. Subscriber card (XC-092) | 15. Blank terminals for option card (x 6) |



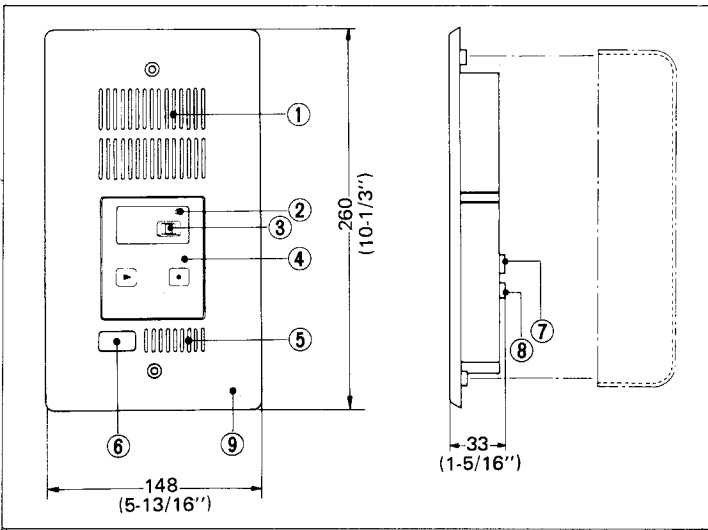
Model: RA-D (Speaker-phone type master)

1. Handset
2. Speaker
3. Dial key pad
4. Call LED (also for secretary transfer)
5. Volume control switch
6. Privacy switch
7. Station No. plate
8. Microphone
9. Directory card
10. TALK button
11. 4-pin plug w/2m (6') cord
12. Receptacle
13. Stand



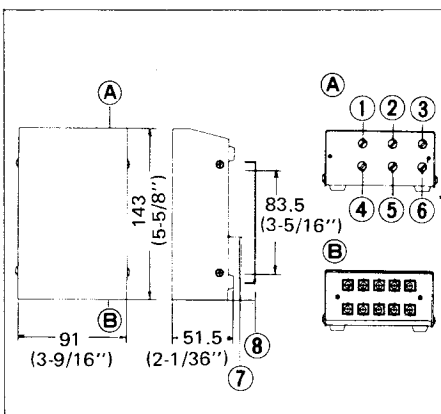
Model: RA-B (Open voice master station, flush mount)

1. Open voice speaker
2. Call lamp (also for secretary transfer)
3. Volume control switch
4. Privacy switch
5. Dial key pad
6. Microphone
7. Station No. plate
8. Terminals
9. Front panel (stainless steel)



Model: RA-C (Open voice sub station, flush mount)

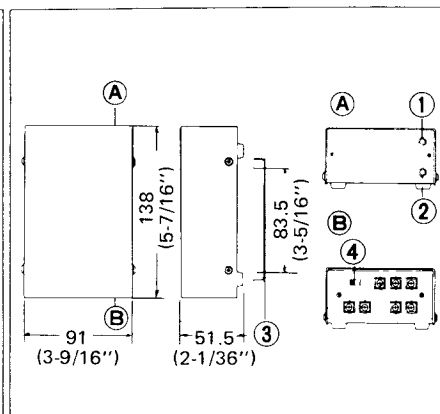
1. Open voice speaker
2. Call lamp
3. Volume control switch
4. Key pad
5. Microphone
6. Station No. plate
7. Terminals
8. Terminals for external switch
9. Front panel (stainless steel)



Model: MC-A

(Paging Adaptor)

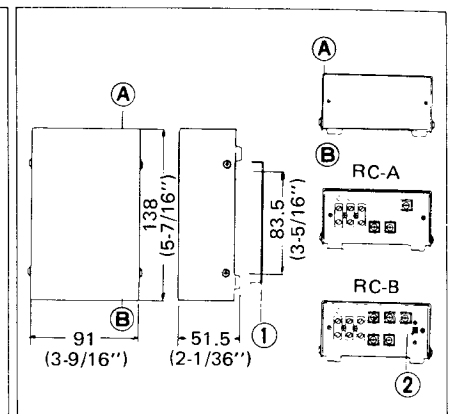
1. Music volume control
2. Music bass control
3. Music treble control
4. Paging volume control
5. Paging bass control
6. Paging treble control
7. Page pre-tone volume control
8. Wall mounting bracket



Model: PB-YKX

(Talkback Adaptor)

1. Receiving volume control
2. Noise control
3. Wall mounting bracket
4. System selector switch



Model: RC-A, RC-B

(Remote control adaptors)

1. Wall mounting bracket
2. Transfer switch for momentary or alternate operation (RC-B only)

IV. RCX System Equipment Requirements

The RCX System Design Table below is to assist in determining the mix and quantity of RCX system components.

| RCX SYSTEM DESIGN TABLE | | | | |
|--|---|--|----------------------|-----------------------|
| SYSTEM COMPONENTS | | QUANTITY OF COMPONENTS | | |
| | | RCX-48/n (Type A) | RCX-88/n (Type A) | RCX-128/n (Type A) |
| RCX-48/n (Type A) | Central Exchange Unit for up to 48 stations | 1 | | |
| RCX-88/n (Type A) | Central Exchange Unit for up to 88 stations | | 1 | |
| RCX-128/n (Type A) | Central Exchange Unit for up to 128 stations | | | 1 |
| STATION MODEL | | | | |
| RA-A | Open voice master station, with handset communication capability | max. 48 | max. 88 | max. 128 |
| RA-B | Open voice master station, flush-mount | | | |
| RA-D | Speaker-phone type master station | | | |
| RA-C | Open voice sub station, flush mount | | | |
| OPTIONAL ACCESSORIES | | | | |
| PG-B PG-10B | Standard amplifier (available except in N. America) 10W | Up to 4 separate zones either for <u>paging or remote control</u> Each zone requires 1 PG-A or PG-B amplifier, 1 MC-A adaptor and a required number of speakers. (Does not reduce station capacity) | | |
| PG-A PG-10A | UL/CSA approved amplifier (available only in N. America) 10W | | | |
| MC-A | Paging adaptor | | | |
| SP-3NA NBZ-M N-EA | Standard 3 watt ceiling speaker Square frame for SP-3NA. Round frame for SP-3NA. | | | |
| RC-A | Paging power control adaptor | | | |
| PB-YKX | Talkback adaptor | 1 for each paging zone where talkback is required. | | |
| RC-B | Remote control adaptor to be used in conjunction with external devices such as lights, background music, etc. | 1 for each zone where external device is located. | | |
| 2J50-12S (for 220-240V) HR-10-12S (for 120V) | Additional regulator unit | Required for all call and BGM distribution from station speakers. | | |
| Note: System may include total of four MC-A and or RC-B. | | | | |

V. Installation Guidelines

BE SURE TO TURN OFF RCX POWER SUPPLY BEFORE YOU OPEN THE UNIT OR MAKE WIRING CONNECTIONS.

Central Exchange Unit (CEU);

- * Select location for CEU that will facilitate ease of access to the unit itself.
- * Plug the power supply into a clear line. Interference on the power line may cause function error.
- * Select a location that:
 - has low humidity.
 - is free of dust.
 - is vibration free.
 - is free of static electricity.
 - is not near flammable or chemical product.
 - is not close to high voltage equipment.
 - is not within a strong magnetic field.
 - is not near heating or air conditioning outlets or equipment.
 - does not have direct sunlight.
 - does not have temperature extremes: below 0°C (+32°F) or above +40°C (+104°F)

Station;

- * Each station must be home run wired to the C.E.U. individually, and must have individual station numbers.
- * Follow location guidelines for the Central Exchange Unit when selecting station location.
- * Avoid locations where temperature dips below -10°C (+14°F) or exceeds +60°C (+140°F).
- * Select a most suitable type of station according to your communication requirements and environmental conditions.

Wiring;

- * Use 2 twisted pairs for each station.
- * Keep twisted pair cable well apart (over 50 cm or 20'') from other cables such as heavy duty power lines, telephone lines and/or paging amplifier output line (speaker line).

Installation;

- * In new construction, install single-gang box for RA-A or RA-D stations or 3-gang boxes where RA-B or RA-C stations are to be wall-mounted. The station will cover the hole, when installed.

VI. Wiring

There are two basic wiring methods for RCX system.

In either case, you must use two twisted pair per station.

METHOD 1: 2 twisted pair in home run manner from each station to RCX Central Exchange Unit.

METHOD 2: More than one station can be run in multiple twisted pair cable.

DO NOT RUN SPEAKER LINE IN MULTIPLE PAIR CABLE FOR STATIONS.

* A combination of the above methods may also be used.

Refer to the chart below and select wire gauge required for your installation;

| Wire size | 0.5 mm | 0.65 mm | 0.8 mm | 24AWG | 22AWG | 20AWG |
|--|---------|---------|---------|--------|--------|--------|
| Max. wiring distance from station to RCX CEU | 1,170 m | 2,000 m | 3,000 m | 3,800' | 6,500' | 9,800' |

PAGING/REMOTE CONTROL

The RCX system has the capacity of paging up to four separate zones and All Page.

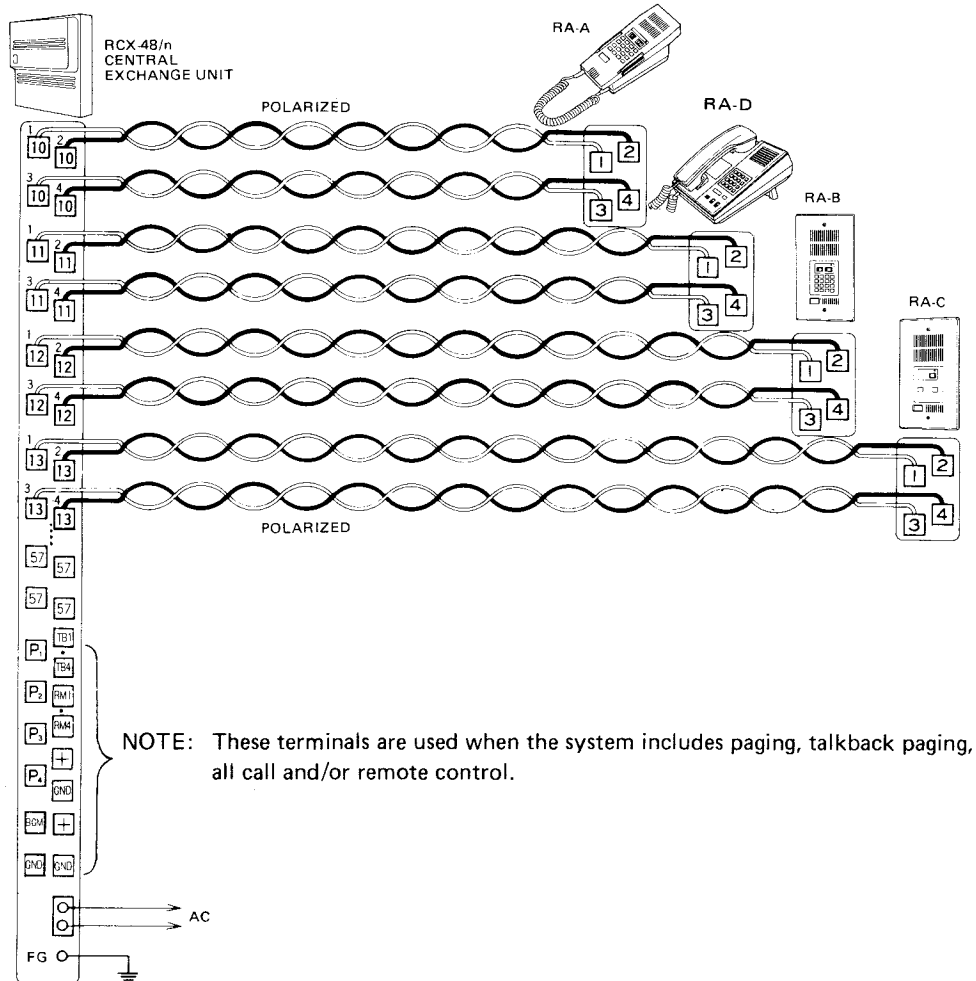
Each zone requires one paging adaptor Model: MC-A, one amplifier and proper number of speakers for the amplifier output (and one PB-YKX talkback paging adaptor is required for talkback). NOTE: All Page is a system function and does not require additional equipment or wiring.

- NOTES:**
1. If the system includes a remote control device, one paging terminal must be used for the RC-B remote control adaptor. This will reduce the number of paging zones to 3.
 2. Adding paging zones and/or remote control does not reduce the station capacity of the system (i.e. a 48-station system may have 48 stations plus 4 paging zones and/or remote control).

WIRING REQUIRED

- * 2 twisted pair cable or multiple twisted conductor cable must be used for connecting station to RCX terminal board Wiring is polarized in each twisted pair.
- * Connection to MC-A adaptor requires two common plus one individual conductors from CEU terminal board.
- * Regulator unit in CEU must be earth grounded.
- * Do not run speaker line in the same cable with station wires.

RCX SYSTEM DIAGRAM AND WIRING EXAMPLE



RCX system features master/sub communication in a group of up to 10 stations (one master and 9 subs).

Grouping can be made as follows;

- * First group: Station No. 10 through Station No. 19 (No. 10 is master & Nos. 11 through 19 are subs).
- * Second group: Station No. 20 through Station No. 29 (No. 20 is master & Nos. 21 through 29 are subs), etc.

Notes: 1. Either RA-A, RA-D or RA-B master with station No. like 10, 20, 30 ... 220 assigned is automatically set as master in master/sub communication.

2. RA-C sub must not be connected to station terminals 10, 20, 30 ... 220.

3. RA-A, RA-D and/or RA-B masters function as sub to one group master, when connected to station terminals with the first digit 1 through 9 (In the above diagram, both RA-D No. 11 and RA-B No. 12 are subs to the RA-A No. 10).

VII. RCX System Installation

(A) Mounting Central Exchange Equipment

* Be sure to turn off the power switch of the RCX C.E.U. before you open the unit OR make wiring connections.

** The location of Central Exchange Equipment must meet the following criteria;

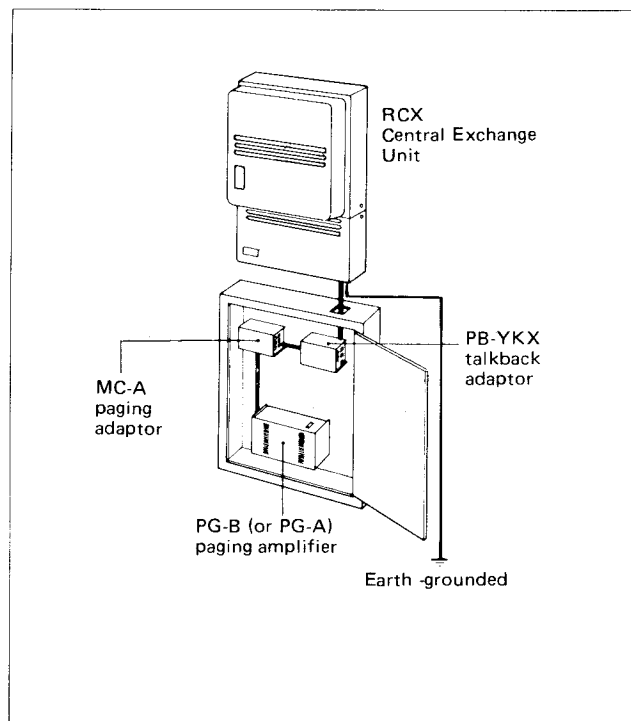
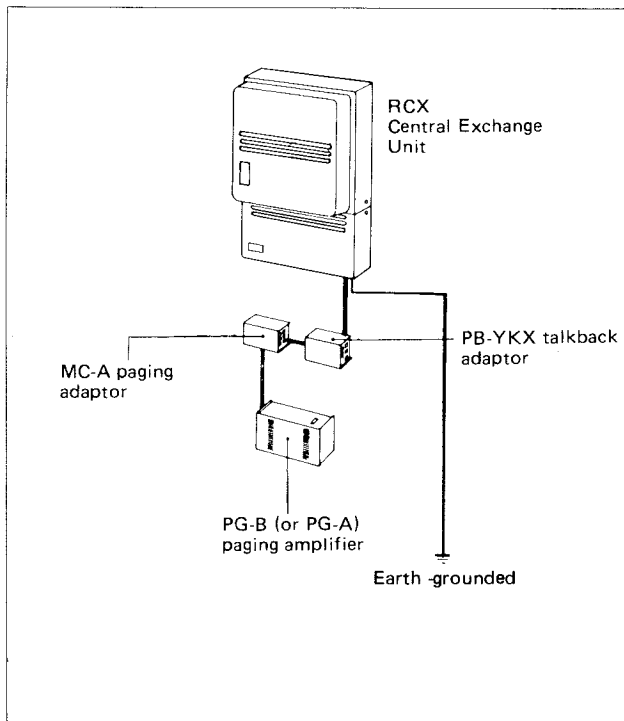
1. Ambient temperature range: 0°C to +40°C (+32°F to +104°F).
2. Area must be as dust free as possible, and not too dry or too humid.
3. Units must be wall mounted.
4. Avoid static electricity.

There are two basic methods (shown below) of mounting equipment.

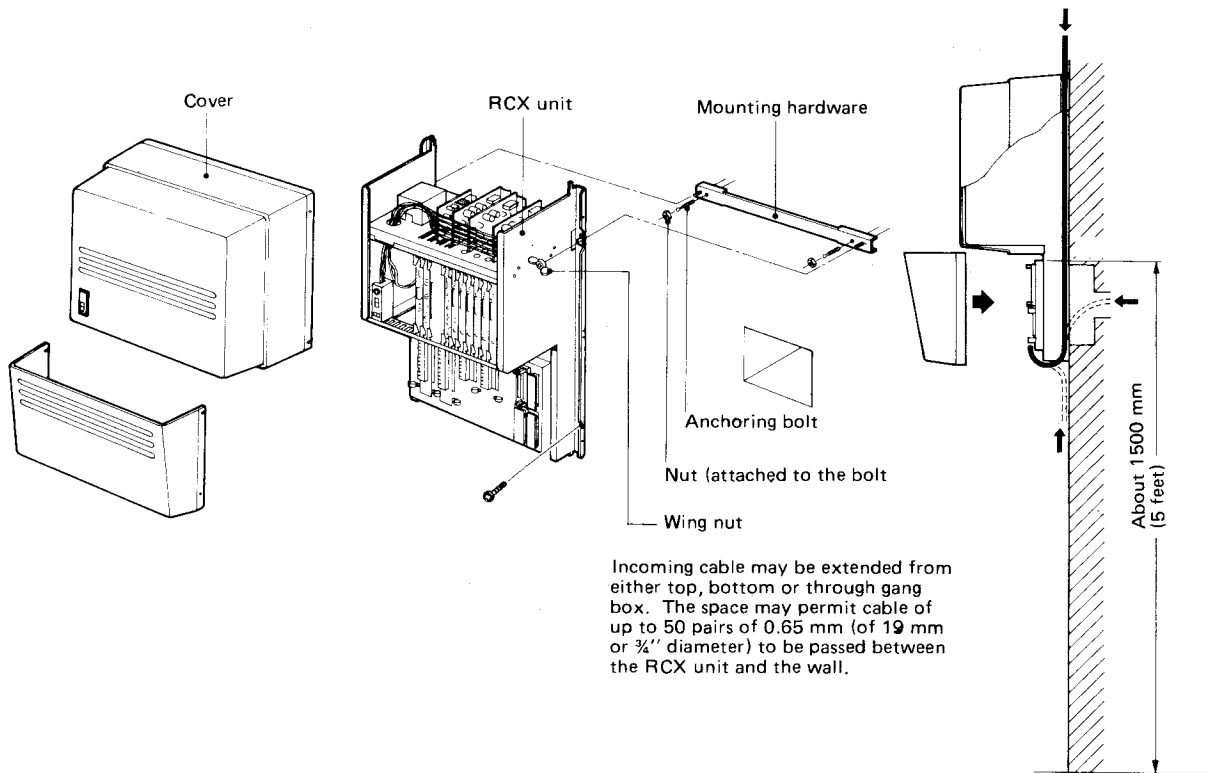
If the adaptor(s) and amplifier(s) must be located in an area exposed to people, use of a cabinet is recommended to reduce possibility of someone changing level controls, or damaging wiring.

NOTE: The Central Exchange Unit should not be installed inside of the cabinet, which could restrict ventilation.

If the equipment is to be installed in an electrical room or cabinet, it is recommended that a piece of 2.5 cm (1") plywood of adequate size be secured to the wall first and equipment then mounted to the plywood. This will insure adequate backing mounting screws, incoming cable distribution, and tie down.

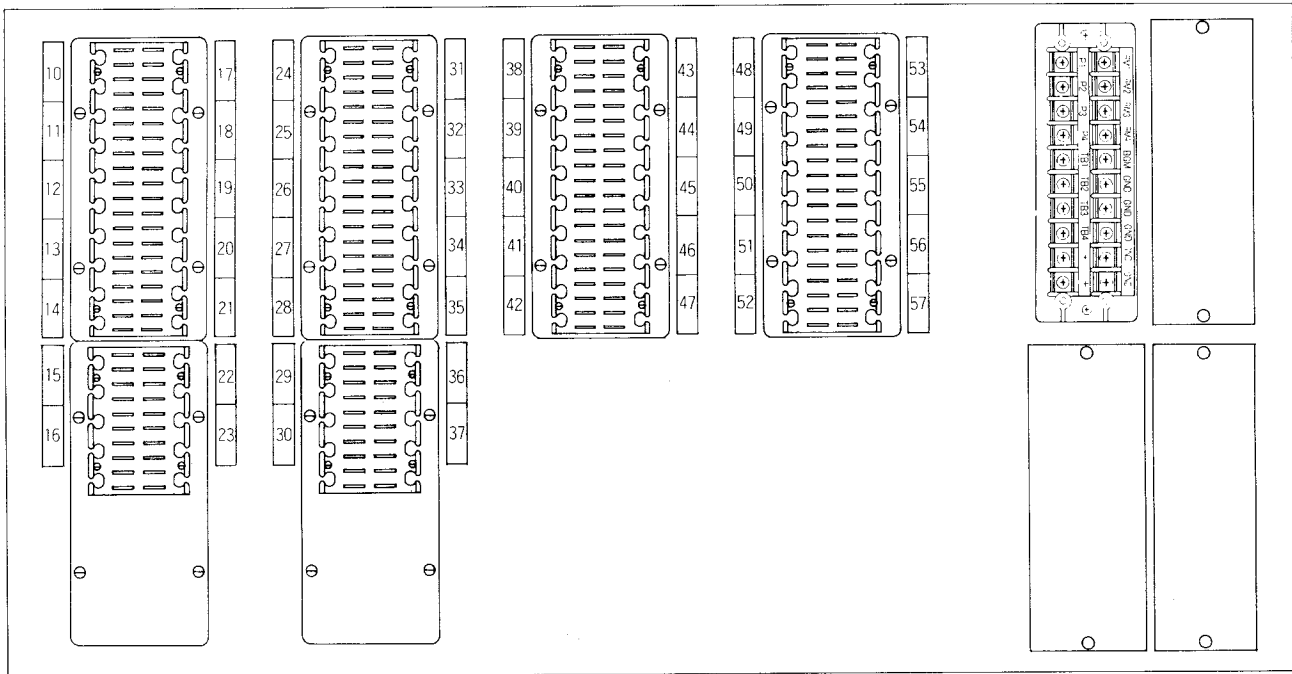


(B) RCX Central Exchange Unit Mounting Instructions



1. Central Exchange Unit shall be wall mounted approximately 1.5 m (5 feet) high from the floor.
2. Central Exchange Unit RCX-48/n weighs about 20 kg (44 lbs.) and RCX-128/n about 40 kg (88 lbs.)
The wall, therefore, has to be strong enough to secure the CEU firmly.
3. Attaching a template provided to wall, make a hole of 8.5 mm (1/8") diameter and 20 – 25 mm (3/4" – 1") deep in the wall.
4. Remove a nut from the anchoring bolt and drive in a wedge by hammer at 2 points.
5. Attach a mounting hardware to the bolts and secure firmly by the nuts.
6. Remove cover of the RCX unit and hook the RCX unit to the protruding bolts of the mounting hardware and secure firmly the RCX unit by wing nuts.
7. Connect wires. Please keep the intercom cable away from the AC power line.
8. Attach the cover to the RCX unit.

RCX-48/n (Type A) TERMINAL LOCATIONS

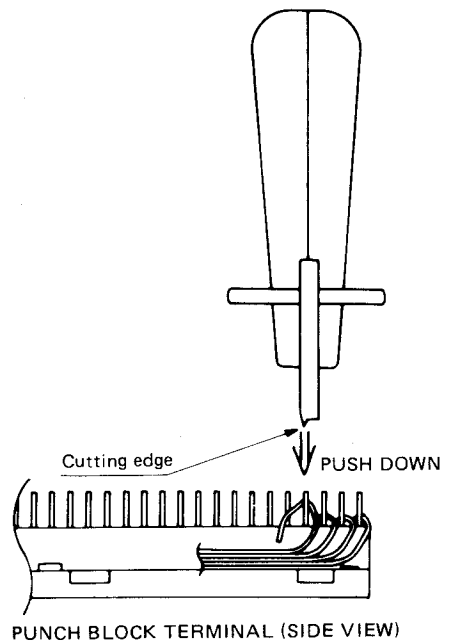
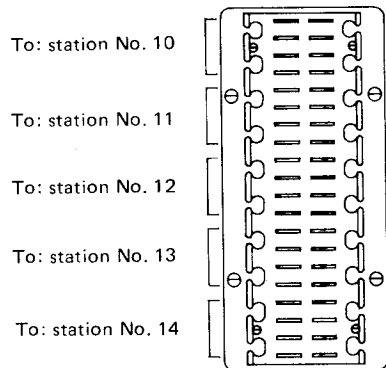


- 10 ~ 57** : Intercom station terminals
- P₁ , P₂ , P₃ , P₄** : Paging/remote control terminals
- TB₁ ~ TB₄** : Talkback terminals.
- RM₁ ~ RM₄** : Remote control output terminals.
- +** , **GND** : power terminals for adaptors: MC-A, PB-YKX, RC-A & RC-B
- BGM** , **GND** : BGM input terminals (for distribution through station speakers).

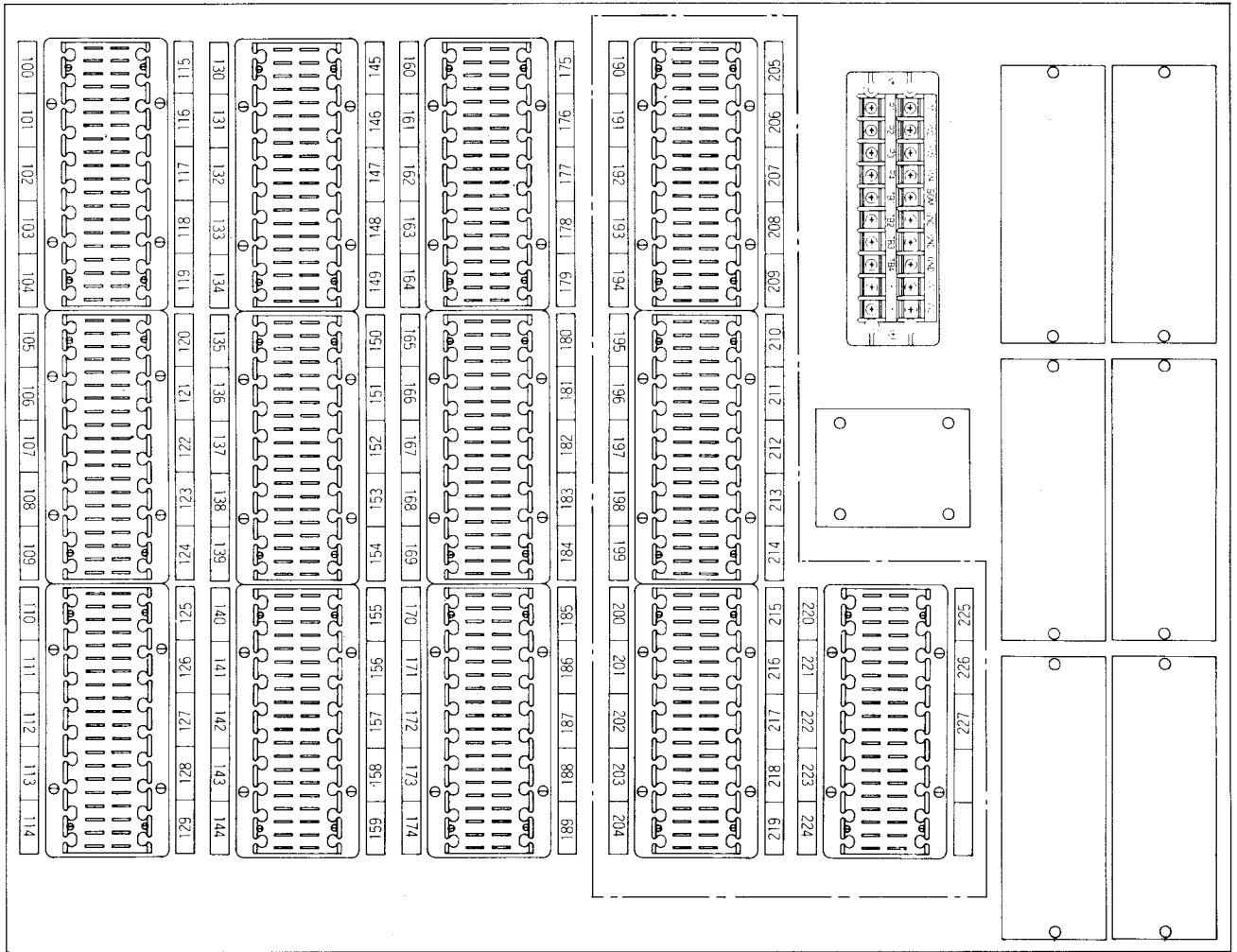
Before you start wiring, it is recommended to establish a system color code and continue this color code throughout the entire system. (example: No. 1 Black, No. 2 Red, No. 3 White, No. 4 Green).

A standard punch-on tool with a cutting edge will be required for connecting to the terminal board.

Select cable run for first station and using your color code connect to terminals 1, 2, 3 & 4 of stations No. 10 on punch block. You do not strip the wires, simply lay in notch of terminal and punch on with tool. This will make a good connection and cut off any surplus wire. Continue unit all station runs are connected.



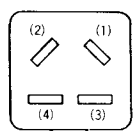
RCX-88/n (Type A), RCX-128/n (Type A) TERMINAL LOCATIONS



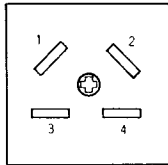
- 100 ~ 187 : Intercom station terminals on RCX-88/n (Type A).
- 100 ~ 227 : Intercom station terminals on RCX-128/n (Type A).
- P₁ , P₂ , P₃ , P₄ : Paging/remote control terminals
- TB₁ ~ TB₄ : Talkback terminals.
- RM₁ ~ RM₄ : Remote control output terminals
- + , GND : Power terminals for adaptors: MC-A, PB-YKX, RC-A & RC-B.
- BGM , GND : BGM input terminals (for distribution through station speakers).

(C) Connecting Station Unit

RA-A, RA-D

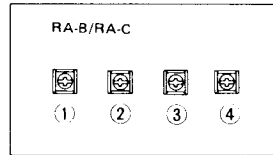


4P plug



Receptacle

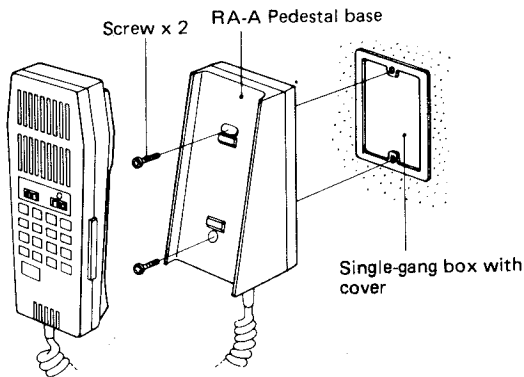
RA-B, RA-C



1 , 2 , 3 , 4 : Connect to each number terminal assigned on the Terminal section of the Central Exchange Unit.

- * 4P plug Plug into the receptacle.
- * Receptacle Connect to Terminal section of the Central Exchange Unit.
- * 1 , 2 , 3 , 4 Connect to each number terminal assigned on the Terminal section of the Central Exchange Unit.

(D) RA-A Wall Mounting Installation

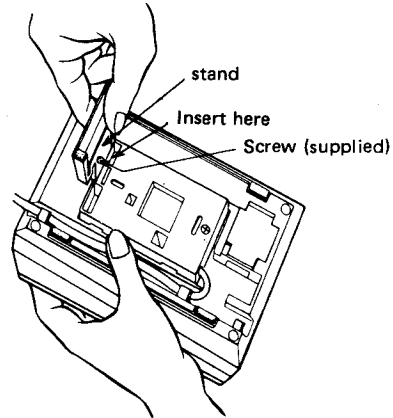
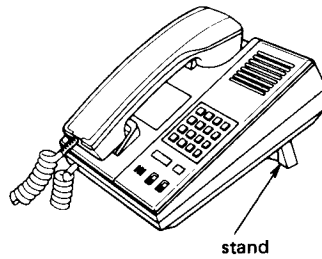


1. Unscrew the RA-A pedestal base and separate the cover from the chassis.
2. Reversely replace the cover to the chassis and mount the RA-A pedestal base to single-gang box with cover or to wall with the provided screws.

(E) RA-D Mounting Instructions

* For desk top use

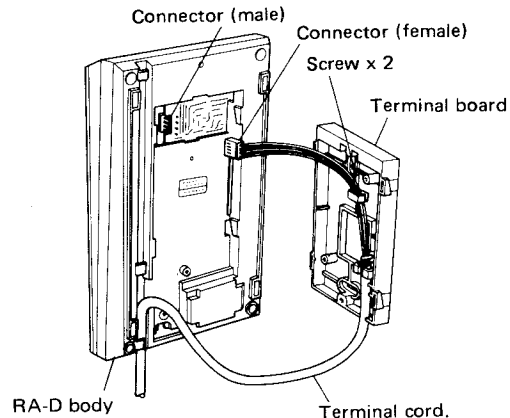
As shown, just insert the stand and fix with a screw provided.



* For wall mounting

RA-D is primarily designed for desk top use, but may practically be used for wall mount (surface mount). Remove a screw fixing terminal board. Slide down terminal board, pull off 4P connector and separate terminal cord from the chassis.

Attach terminal board to the wall with two screws. As shown, pull out terminal cord either from top or bottom of the unit. Attach connector and fit the unit onto the terminal board.

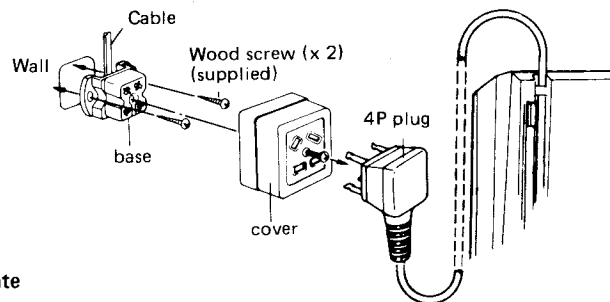


Receptacle installation

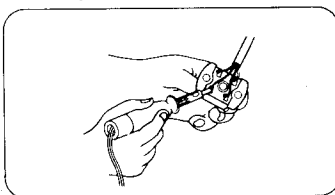
RA-A and RA-D have terminal cord of 2 m long (6-1/2'), male plug and shipped complete with female receptacle. When desk mounting where cable must be run surface on the wall, fix the female receptacle to proper location and just plug in the male plug.

1. Mount the receptacle to wall as shown below.
2. When mounting the receptacle to flush plate, drill three holes on the flush plate and attach the receptacle with the screws provided.

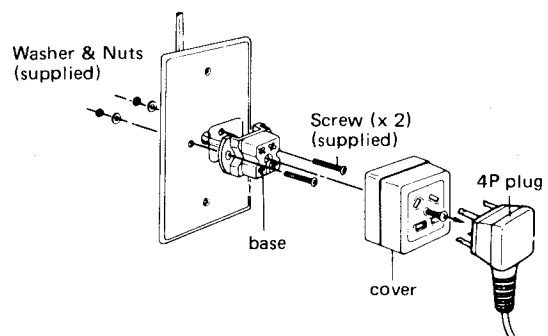
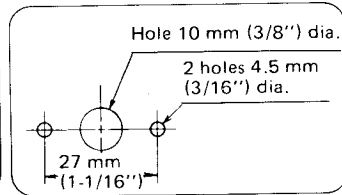
* Be careful not to install receptacle base upside down.



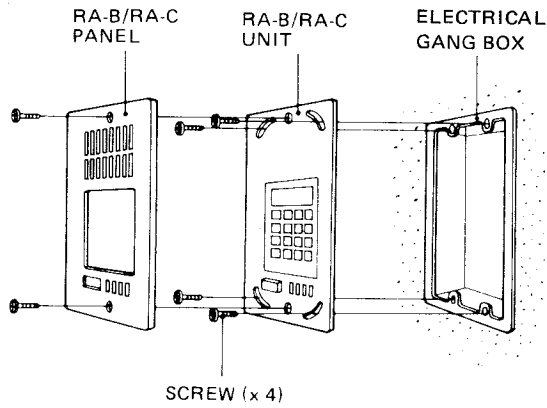
■ Connecting wires on receptacle base



■ Drilling holes on flush plate



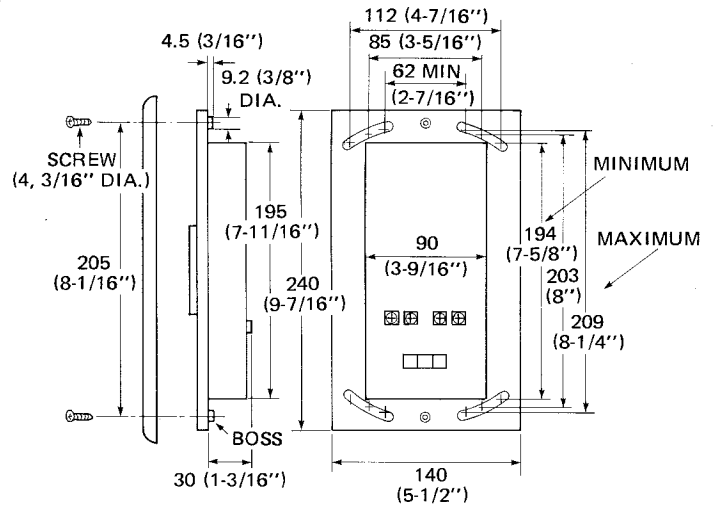
(F) RA-B and RA-C Flush Mount Installation



1. Separate the RA-B/RA-C panel from the RA-B/RA-C unit.
2. Attach the RA-B/RA-C unit to electrical box with the supplied screws.
3. Replace the RA-B/RA-C panel to the unit with the 2 screws.

In N. America, please specify either BOWERS 703-SPL, RACO 952, APPLETON 3G-5075 or equivalent.

RA-B/RA-C FLUSH-MOUNTING GUIDE



RA-B/RA-C SIDE & BACK VIEW

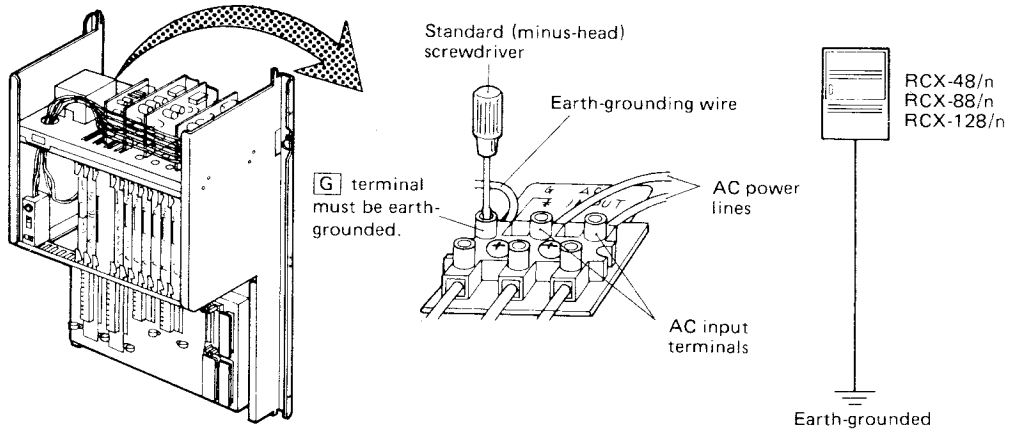
When RA-B/RA-C are flush-mounted to wall, be sure that two holes be opened for the bosses of 9.2 (3/8") diameter and protruding 4.5 mm (3/16").

Notes on installing station units;

- (1) Avoid locating the station unit in places closely surrounded by walls or other things, which may interfere with voice-switching.
- (2) Keep the station unit away from the paging speakers to avoid acoustic feedback in paging mode.

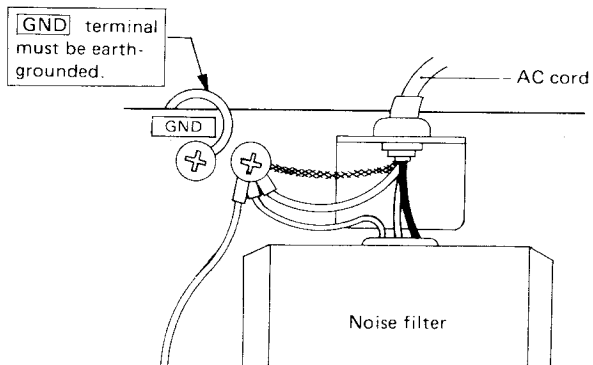
(G) Connecting AC Power Line and Grounding Wire

As shown below, using standard screwdriver, connect AC power line to **AC INPUT** terminals, and earth-grounding wire to **G** terminal.



* In U.S.A., Central Exchange unit is shipped complete with 3-conductor AC cord.

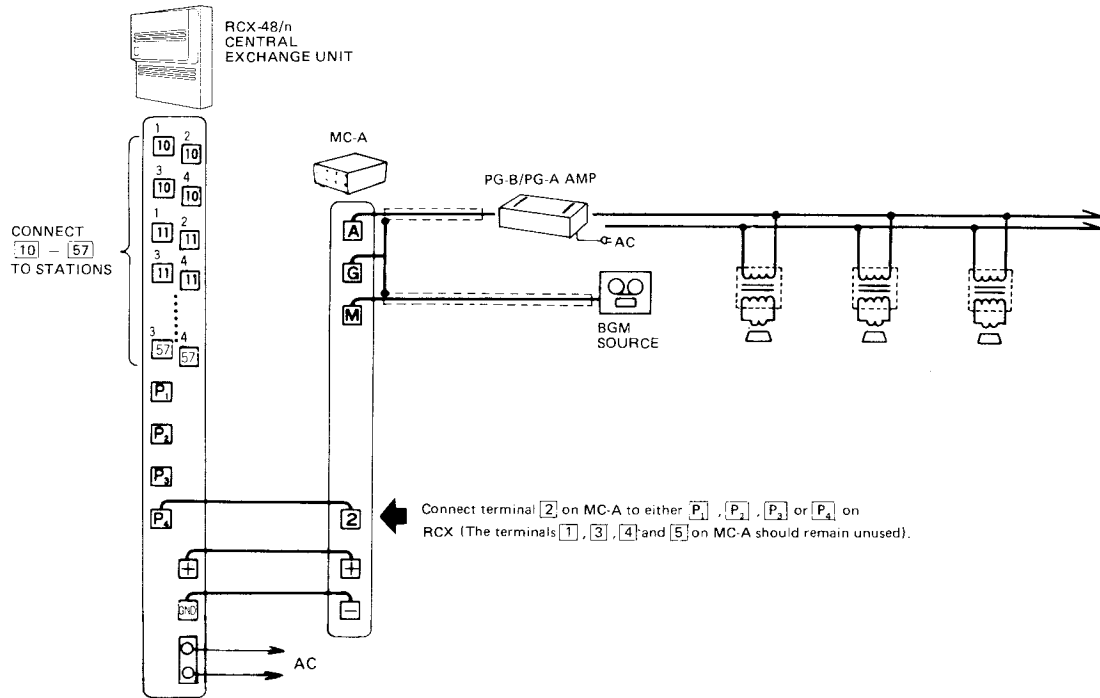
Be sure to extend an earth-grounding wire from GND terminal.



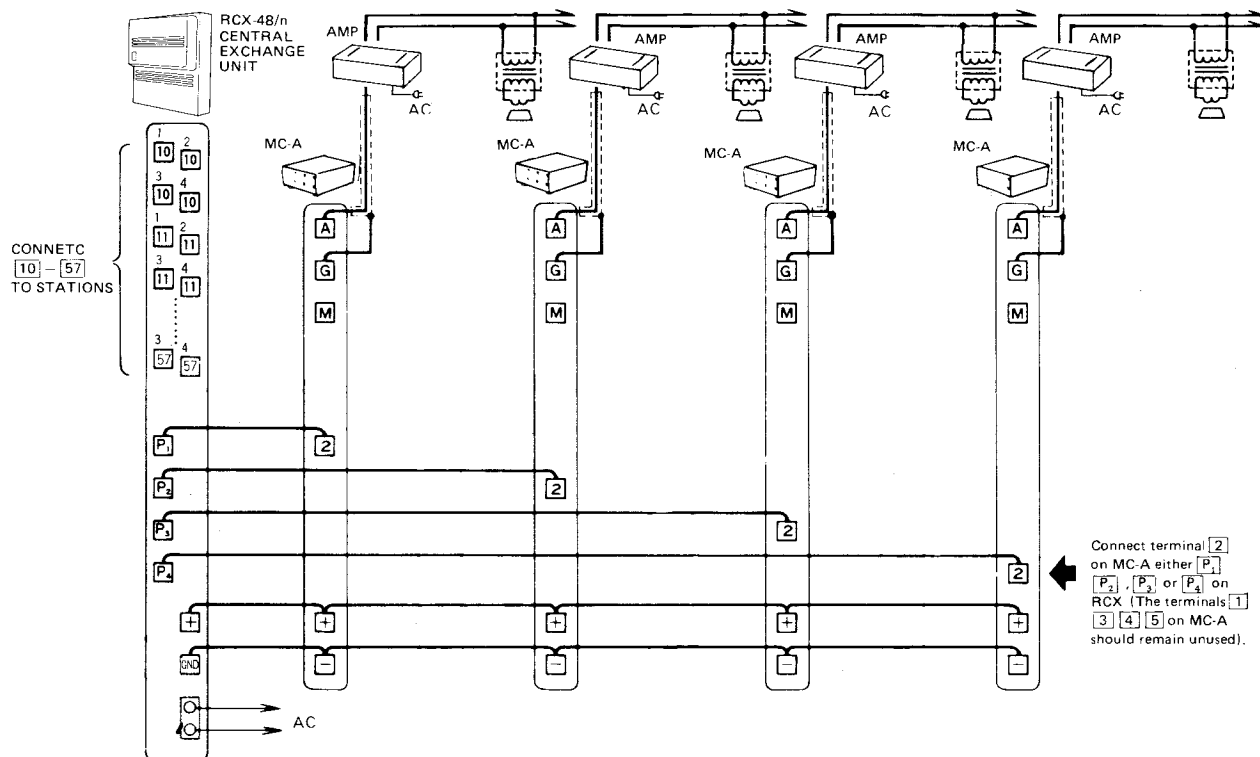
(H) Connecting Paging Equipment

PAGING – ZONE PAGE APPLICATION WITHOUT TALKBACK

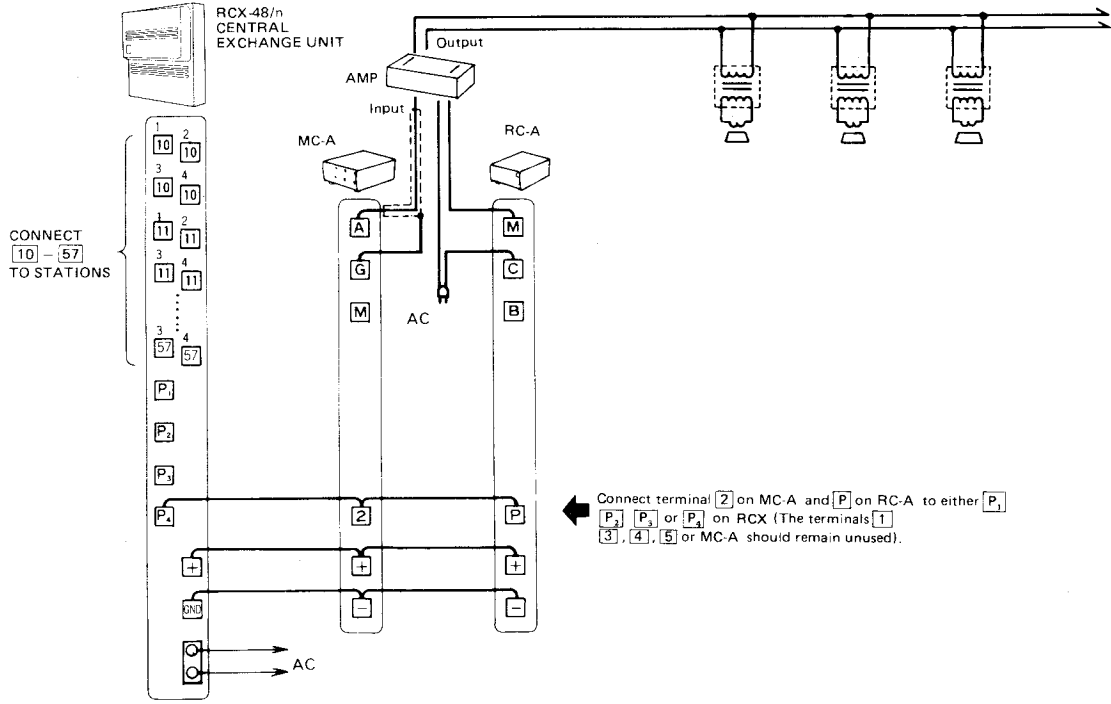
① PAGING TO ONE ZONE (WITH BACKGROUND MUSIC)



② PAGING TO 4 ZONES (WITHOUT BACKGROUND MUSIC)

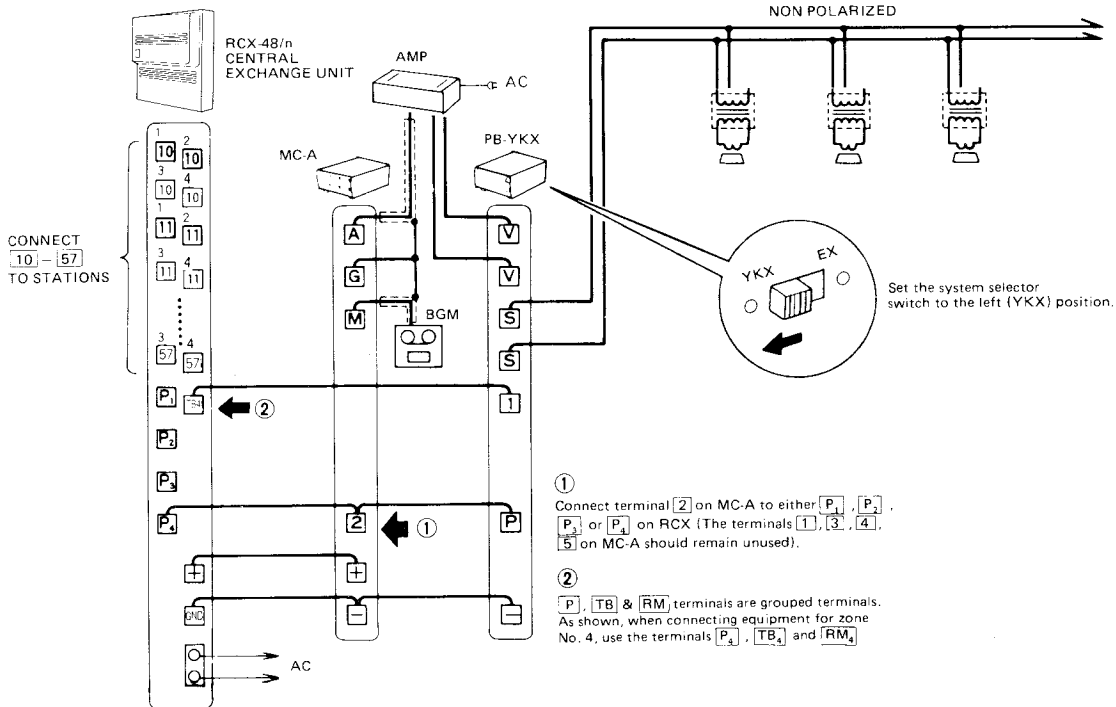


③ PAGING TO ONE ZONE, WITH REMOTE OPERATION OF POWERING AMPLIFIER ON WHEN PAGING, USING RC-A ADAPTOR

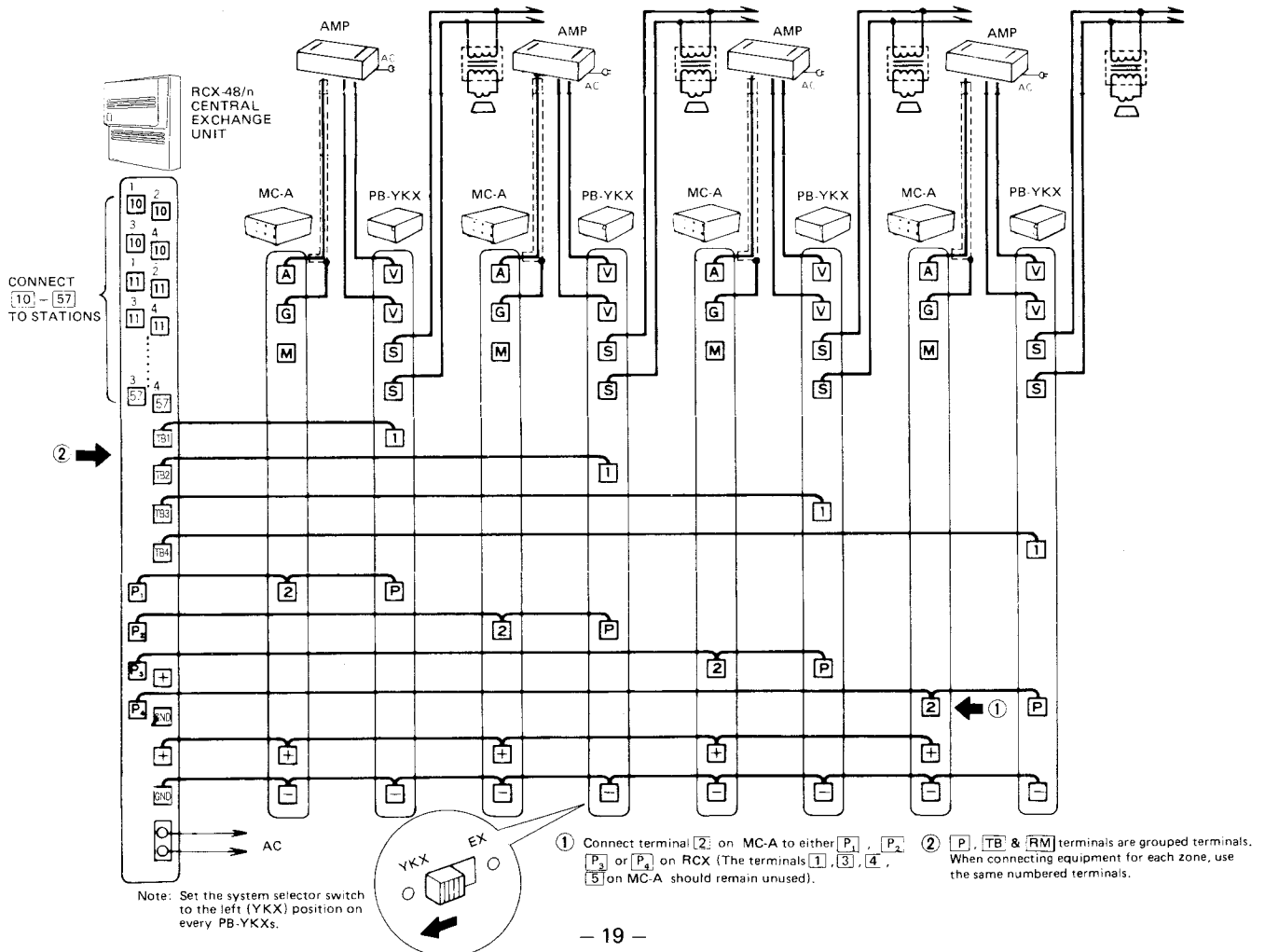


(I) Connecting Talkback Paging Equipment

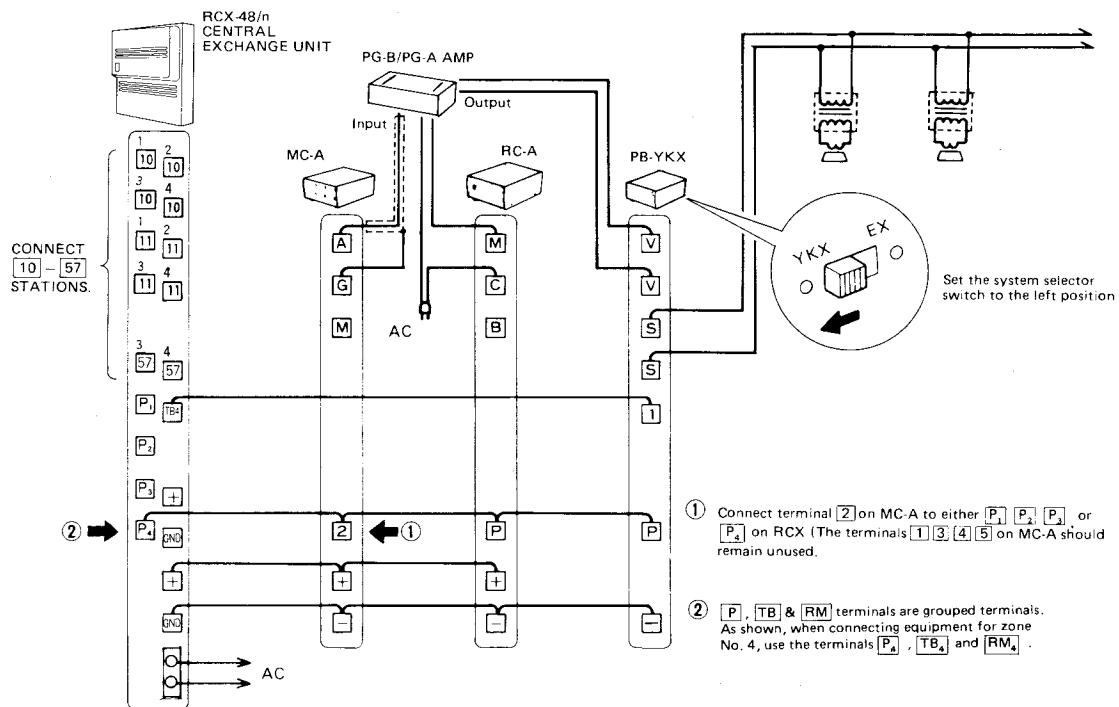
① PAGING TO ONE ZONE WITH TALKBACK (WITH BACKGROUND MUSIC)



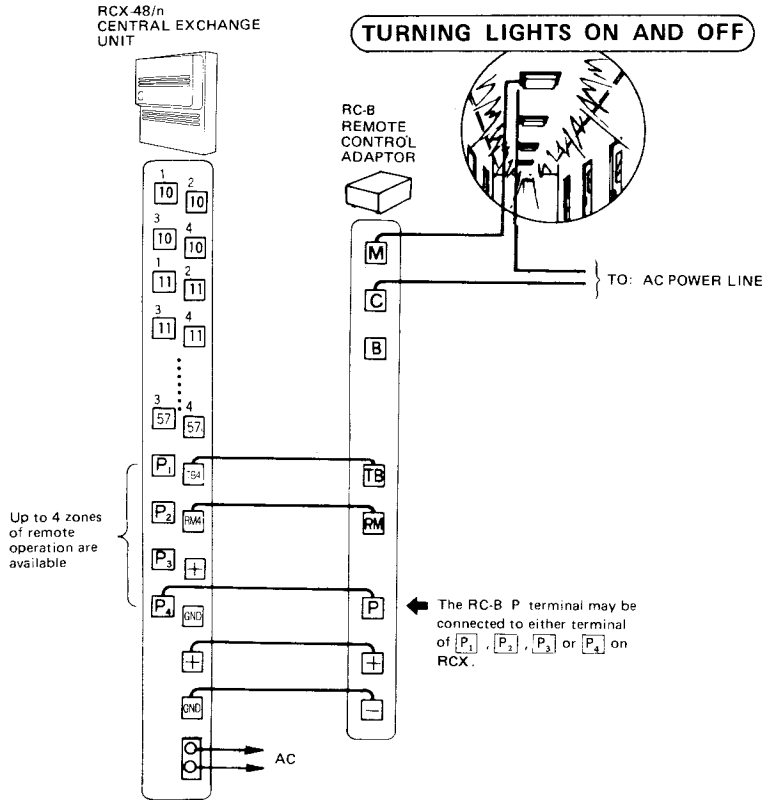
② PAGING TO 4 ZONES WITH TALKBACK (WITHOUT BACKGROUND MUSIC)



③ TALKBACK PAGING BY REMOTE OPERATION OF POWERING AMPLIFIER ON WHEN PAGING, USING RC-A ADAPTOR



(J) Connecting Remote Control Equipment, using the RC-B adaptor



NOTES:

- (1) Wiring method is the same for either momentary or alternate operation, except for setting the selector switch as below.
- (2) When the RCX power supply is turned off, the entire system becomes inoperative, including remote operations.
- (3) One remote control reduces one paging zone.
- (4) When connecting RC-B for zone No. 4, use the **P**, **TB** & **RM** each numbered 4.

METHOD #1 ALTERNATE OPERATION

Example: Turning lights ON and OFF

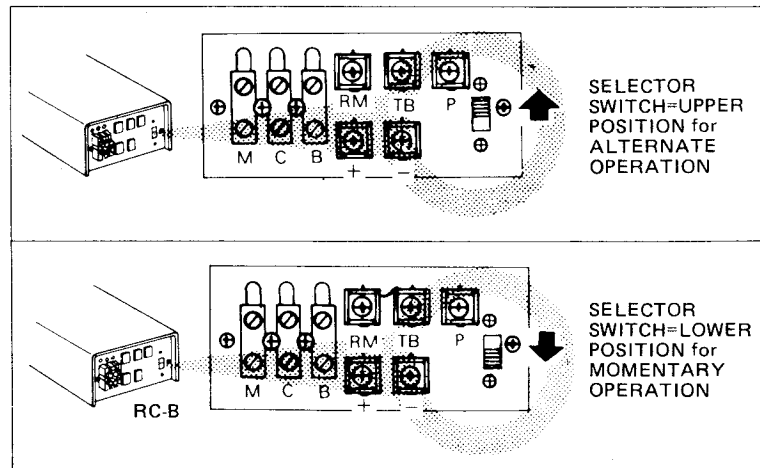
- Operation: 1. Press **☼** (PAGE) button and zone number button (**1**, **2**, **3** or **4**).
2. Momentarily depress **↓** (TALK) button. If you hear continuous tone, it means lights are in OFF position. If you hear intermittent tone, the lights are ON.
3. Momentarily depress **0** button, to reverse ON/OFF mode. Press **•** (OFF) button or hang up handset in RA-D.

NOTE: Remote control continues to be working, if station is in standby mode when remote control is in operating mode (in alternate operation)

METHOD #2 MOMENTARY OPERATION

Example: Opening electric door release.

- Operation: 1. Press **☼** (PAGE) button and zone number button (**1**, **2**, **3** or **4**).
2. Momentarily depress **↓** (TALK) button. You will hear a continuous tone through handset (door release is not activated).
3. Press and hold **0** button down, and electric door release is activated. Door will open. Press **•** (OFF) button or hang up handset in RA-D.

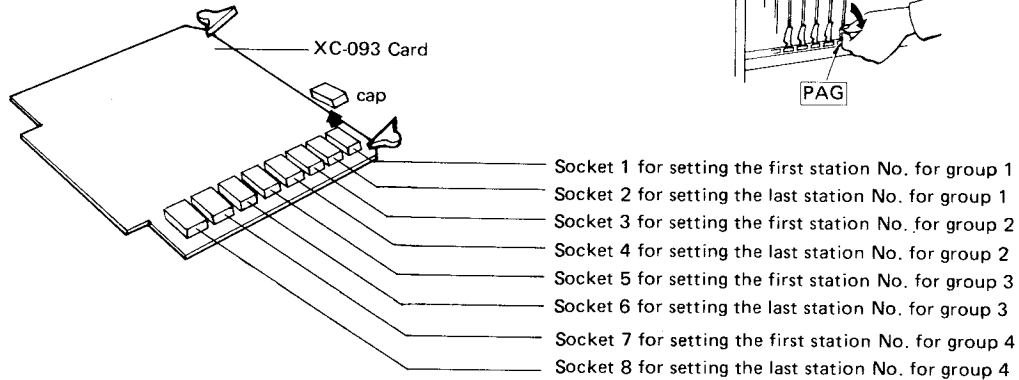
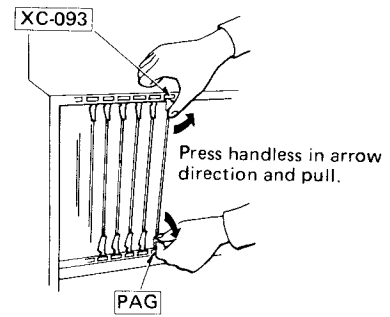


(K) Group Call Programming.

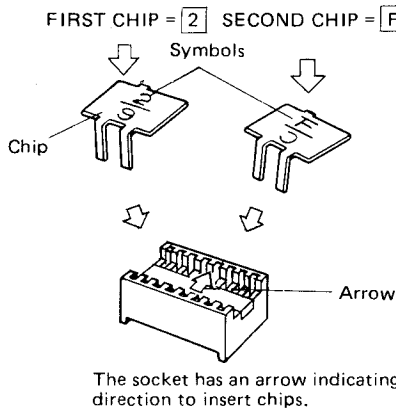
The RCX system has a programmable Group Call. Up to 4 groups of not more than 32 stations per group can be programmed.

How to program Group Call;

1. Turn off power switch of RCX Central Exchange Unit.
2. Remove main & sub front covers.
3. Remove XC-093 card from Central Exchange Unit.
4. Remove the covers of block-addressing sockets on XC-093.



Included with each Central Exchange Unit are 8 pieces of numbered aluminum plates for programming group call. Each strip consists of 8 separable chips.



Setting the first & the last stations of group 1. Refer to the chart below left. To program station No. 10 as the first station of group 1, find No. 10 and you get the symbol 1 for the first chip. Then go down from No. 10 to find the symbol 0 for the second chip. Put the first chip 1 into the socket 1 on left side while it is not necessary to put any chip for 0 on right side. Replace cap and the first station of group 1 is now programmed.

Proceed with setting the last station of group 1 in the same way as above. You get the symbol 2 for the first chip and the symbol F for the second chip. Put each chip into the socket 2 correctly, as shown in illustration.

Insert the XC-093 card into the right position. Reattach front covers. Turn on the power switch of the Central Exchange Unit.

NOTE: When you get chip symbol "0", you do not have to insert the chip.

GROUP CALL PROGRAMMING CHART FOR RCX-48

| STATION NUMBERS OF EACH GROUP | | | | | | | | | | | | | | | | Symbol of first chip | | | | | | | | | | | | | | | |
|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 1 | 2 | | | | | | | | | | | | | | |
| 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 3 | | | | | | | | | | | | | | | |
| 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |

(for up to 48-station system)

GROUP CALL PROGRAMMING CHART FOR RCX-88 & RCX-128

| STATION NUMBERS OF EACH GROUP | | | | | | | | | | | | | | | | Symbol of first chip | | | | | | | | | | | | | | | |
|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 1 | | | | | | | | | | | | | | | |
| 116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 2 | | | | | | | | | | | | | | | |
| 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 3 | | | | | | | | | | | | | | | |
| 148 | 149 | 150 | 151 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | 159 | 160 | 161 | 162 | 163 | 4 | | | | | | | | | | | | | | | |
| 164 | 165 | 166 | 167 | 168 | 169 | 170 | 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 5 | | | | | | | | | | | | | | | |
| 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 6 | | | | | | | | | | | | | | | |
| 196 | 197 | 198 | 199 | 200 | 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 | 211 | 7 | | | | | | | | | | | | | | | |
| 212 | 213 | 214 | 215 | 216 | 217 | 218 | 219 | 220 | 221 | 222 | 223 | 224 | 225 | 226 | 227 | 8 | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |

(for up to 128-station system)

VIII. Operations

OPERATIONS

1. Calling & Communication (RA-A, & RA-D)

Press two-digit or three-digit buttons of desired station (i.e. for station #10, or for station #100).

Note: Station numbers available: from to for RCX-48/n system,
from to for RCX-88/n system,
from to for RCX-128/n system.

The line is established when a short tone sounds as well as call LED gets illuminated, and talk handsfree. After communication, press (OFF) button or hang up handset in RA-D.

When busy tone is heard; Short intermittent tone means called station is occupied.

You may press (OFF) button or hang up handset in RA-D to disconnect OR press button to leave request for automatic call back (camp-on busy). You will be automatically connected as soon as called station completes conversation.

If your message is urgent; You may break in on the called station's conversation by pressing button, and call by voice by depressing button. Called station will receive signal and may reply by placing present conversation on hold.
(Urgent message break in signal and call)

When Privacy Tone is heard; Longer intermittent tone indicates called station is in Privacy Mode. You may wait for station to release from Privacy Mode, as call tone will signal at the station in Privacy Mode for about 4 seconds.

When Absence Tone is heard; Short but higher intermittent tone means called station is set for Absence Memory. You may press (OFF) button or hang up handset in RA-D to disconnect OR press button to leave request for automatic call back (camp-on absence). You will be automatically connected as soon as called station presses button upon his return.

2. Receiving a call (RA-A, RA-B, RA-D & RA-C)

An incoming call is annunciated by a short tone and call LED illumination. Reply handsfree.

In RA-A, you may pick up the unit and depress and hold the bar switch and in RA-D, pick up handset for private handset simultaneous communication. When both stations are picking up handset, communication is completely simultaneous. After communication, press (OFF) button at either station or hang up handset in RA-D.

Urgent Message Break-in Signal; A short tone, like the call tone, received during a conversation indicates another station is trying to reach you with an urgent message. Press button to place present call on hold and automatically connect you to the calling station. Touch (OFF) button or hang up handset in RA-D to restore connection to station on hold and resume conversation.

Privacy;

To block out incoming calls and prevent monitoring, slide PRIVACY SWITCH to the right position.

An incoming call is annunciated by longer intermittent tone signalling about 4 seconds.

Press button to reply handsfree or, in RA-A, pick up the unit and hold the bar switch or, in RA-D, pick up handset to reply. After communication, press (OFF) button or hang up handset in RA-D and the station automatically returns to Privacy mode.

Note: Setting or releasing from Privacy mode must be made while your station is in standby mode.

3. Master/Sub Communication;



For communication between a paired master & sub stations, simply press button from sub to call master. Press and sub number (~) from master to call each sub.


After communication, press (OFF) button at either station.

4. Call Holding;


To place present communication on hold, press button. Press (OFF) button or hang up handset in RA-D to restore connection to station on hold and resume conversation.



5. Call Transfer;

To transfer a call from one station to another, press  button, number of station where call is to be transferred and, after communication line is established, press  button.


Note: When you have no reply, press  button and resume the initial communication.

6. Secretary Transfer (Station Transfer);

To have any incoming call to you answered by your secretary, press  button and station number buttons to have your calls answered in your absence by your secretary or another person you want to receive your calls. → Call LED flickers.


To cancel Secretary Transfer mode, press  and  buttons.

7. Simplex Communication;








When you communicate with a station situated in a noisy area, you may press  button to talk and release to listen.


8. All Page;




To page all zones in your system through speakers, press  button,  button (and  button, if call back is required), and then depress and hold down  button and page. TALKBACK IS NOT AVAILABLE IN ALL PAGE MODE. The paged person may reply to the paging person from nearest station by pressing   buttons.

Press  (OFF) button or hang up handset in RA-D when page message is completed.





9. Zone Page;



To page one selected zone in your system through paging speakers, press  button, zone number (, ,  or ) button (and  button, if call back is required), and then depress and hold down  button and page.

When talkback is included, release  button to reply.


When talkback is not included, the paged person may reply from the nearest station in the zone by pressing  and  buttons. Press  (OFF) button or hang up handset in RA-D when communication is completed.

10. All Call;








To page through all intercom stations, press   buttons (and  button, if call back is required) and make announcement by depressing and holding  button.



The person paged can go to the nearest station, press  and  buttons and can reply to the All Call.

The All Call Call Back Automatic Connection is valid for about 40 seconds, after the announcement is completed.


Press  (OFF) button or hang up handset in RA-D when communication is completed.

11. Group Call;






To page through a group of intercom stations, press  and group number (, ,  or ) button (and  button, if call back is required). Make announcement while depressing and holding  button.

The person paged can go to the nearest station in the group, press  and  buttons and can reply to the Group Call.



The Group Call Call Back Automatic Connection is valid for about 40 seconds, after the announcement is completed.


Press  (OFF) button or hang up handset in RA-D when communication is completed.


12. Conference Call;



To initiate a conference call, press number button of each station to be included and  button after each (up to 5 stations). Initiator depresses and holds down  button and begin conversation. The called stations must depress and hold down  to respond. The called stations press  (OFF) button or hang up handset in RA-D to get out of the conference. At conclusion of the conference, initiator must press  (OFF) button or hang up handset in RA-D.

13. Absence Memory;



To program your station to remember who called during your absence, press  and  buttons. Upon your return, flashing red light indicates that you have calls in your station's memory bank.

* Absence Memory Call Back; Press  button to connect you with station(s) that called in your absence.


Press  (OFF) button or hang up handset in RA-D at completion of your conversation. Repeat process until red light stops flashing, and all calls have been answered.

To cancel Absence Memory, press  and  buttons to restore your station to normal operation.

14. Memory Clear;

To erase all memory functions except privacy, i.e. Camp-on busy, Camp-on absence, Absence memory and Secretary transfer, press  and  button and your station returns to normal operation.

* OPERATIONAL NOTES:

- (1) For handset communication, hold the RA-A button side to your ear and keep the bar switch in depressed position.
- (2) Communication should be made within an operable distance. In RA-A & RA-D talk toward the microphone from the front for best results.
- (3) Do not put papers or books near RA-A and RA-D units to ensure best performance.
- (4) In RA-D, TALK button in handset works for  (TALK) button on the dial key pad.

IX. RCX System Specifications

1. Central Exchange Unit: RCX-48/n (Type A), RCX-88/n (Type A), RCX-128/n (Type A):

| | |
|-----------------------------|---|
| * Power source | AC 110-125V, AC220-240V, 50/60Hz. |
| * Power consumption | Maximum 260W, 60W in standby mode (RCX-128/n) Maximum 260W, 46W in standby mode (RCX-88/n) Maximum 230W, 36W in standby mode (RCX-48/n) |
| * Station capacity | 128 in RCX-128/n (n = 8 ~ 128 in 8-line steps) 88 in RCX-88/n (n = 8 ~ 88 in 8-line steps) 48 in RCX-48/n (n = 8 ~ 48 in 8-line steps) |
| * Trunkage capacity | 12 channels plus 8 channels with 2 XC-091 added (RCX-128/n) 8 channels plus 8 channels with 2 XC-091 added (RCX-88/n) 4 channels plus 8 channels with 2 XC-091 added (RCX-48/n) each including paging and/or remote control. |
| * Dialing | Mono Frequency-duty modulation |
| * Line scanning | Voltage level detection by time sharing |
| * Internal network | PAM time sharing multi-network |
| * Line impedance | 600 ohm for transmission 200 ohm for reception |
| * Permitted line resistance | 220 ohm (loop) |
| * Wiring | Home run CEU – RA-A 2 twisted pairs CEU – RA-B 2 twisted pairs CEU – RA-D 2 twisted pairs CEU – RA-C 2 twisted pairs CEU – MC-A 3 wires CEU – PB-YKX 3 wires CEU – RC-A 3 wires CEU – RC-B 5 wires |
| * Ambient temperature | 0°C (+ 32°F) ~ 40°C (+ 104°F) |
| * Ambient humidity | Under 80% (yearly average) |
| * Installation | Wall mount (including terminal board, power supply unit) |

2. Open voice station, with handset communication capability: RA-A (Desk/Wall use)

Speaker-phone type station: RA-D (Desk/Wall use)

| | |
|-----------------------|--|
| * Power source | DC 24V supplied by Central Exchange Unit. |
| * Current consumption | DC 10mA (maximum) |
| * Communication | Loudspeaking voice-actuated. Voice-actuated with handset. |
| * Calling | Pre-tone and call LED illumination |
| * Key pad | 16 touch key buttons |
| * Station selection | 2-digit dial (<input type="text" value="10"/> – <input type="text" value="57"/>), 3-digit dial (<input type="text" value="100"/> – <input type="text" value="227"/>) |
| * Mounting | Desk/Wall use |

3. Open voice station: RA-B (Flush-mount)

| | |
|-----------------------|--|
| * Power source | DC 24V supplied by Central Exchanger Unit. |
| * Current consumption | DC 100mA (maximum) |
| * Communication | Loudspeaking voice-actuated |
| * Calling | Pre-tone and call LED illumination |
| * Key pad | 16-touch key buttons |
| * Station selection | 2-digit dial (<input type="text" value="10"/> – <input type="text" value="57"/>), 3-digit dial (<input type="text" value="100"/> – <input type="text" value="227"/>) |
| * Mounting | Flush-mount to wall |
| * Front panel | Stainless steel |

4. Open voice sub station: RA-C (Flush-mount)

| | |
|-----------------------|---|
| * Power source | DC 24V supplied by Central Exchange Unit. |
| * Current consumption | DC 10mA (maximum) |
| * Communication | Loudspeaking voice-actuated |
| * Calling | Pre-tone and call LED illumination |
| * Key pad | 2-touch key buttons |
| * Station selection | 1 button (<input type="text" value="▶"/>) |
| * Mounting | Flush-mount |

5. Paging adaptor: MC-A

- * Power source DC 24V supplied by Central Exchange Unit
- * Current consumption Maximum 20mA in standby mode
Maximum 50mA (max.) in paging mode

6. Talkback adaptor: PB-YKX

- * Power source DC 24V supplied by Central Exchange Unit.
- * Current consumption Maximum 2mA in standby mode
Maximum 40mA (max.) in talkback paging mode

7. Remote control adaptor: RC-A, RC-B

- * Power source DC-24V supplied by RCX Central Exchange Unit
- * Current consumption Maximum 40mA (max.)
- * Permitted contact capacity Maximum AC 120V, 3A
Maximum DC 24V, 3A
Minimum applicable load: DC 5V, 100mA

PERMITTED LINE DISTANCE

| | 0.5 mm | 0.65 mm | 0.8 mm | 24 AWG | 22 AWG | 20 AWG |
|--------------------------------------|---------|---------|---------|--------|--------|--------|
| RCX CEU – RA-A, RA-C RA-B RA-D | 1,170 m | 2,000 m | 3,000 m | 3,800' | 6,500' | 9,800' |
| RCX CEU – MC-A RC-A RC-B | 90 m | 150 m | 230 m | 300' | 500' | 800' |
| RCX CEU – PB-YKX | 530 m | 890 m | 1,350 m | 1,800' | 3,000' | 4,500' |

X. Post Installation System Testing

Once installation is finished, testing is recommended prior to indoctrination of user personnel regarding operation of the system.

Proper installation of the RCX system, and its full range of communication functions, can be tested with three simple steps.







Step 1: Checking Station-to-Station Communication

- Select one station as the key station. Label is "S-1". Label remaining stations "S-2" through "S-n".
- Call S-2 from S-1 and confirm communication.
- Call S-1 from S-2 and confirm communication.
- Repeat process from S-1 to S-n until each station in the system has been tested.

Step 2: Checking Busy Tone Signal

- Using three stations (S-1, S-2 and S-3)
- Call S-1 from S-2.
- While S-2 is calling S-1, call S-2 from S-3 to confirm that Busy tone signal is heard.

Step 3: Checking Paging Function (If applicable)

Using S-1, page each zone (touch  and 1, 2, 3 or 4), then depress  Talk button to confirm paging is transmitted to selected zone. (If talkback function is included, release  Talk button to confirm talkback). To check remote control operation, touch  and zone number button connected to the external devices, and momentarily depress  Talk button in handset. Depress  button to confirm either continuous or intermittent tone.

Upon completion of the above tests, if any of the remaining communication functions are found not to work as prescribed in the Operations Manual, the cause is not due to improper installation. Rather, the Central Exchange Unit must be checked. If this is the case, an Aiphone Specialist must be consulted.

XI. User Indoctrination

Upon completion of post installation testing and confirmation of the system being fully operable, used personnel should be indoctrinated as to how to use the system.

The Operation Manual clearly describes all of the communication features of the system. A complete understanding of the operation of the system by those who will be using it will avoid post installation call backs and related service.

* Special Instructions:

- (1) Please turn on the power switch on the RCX C.E.U. after all the equipment wiring is completed.
- (2) Do not make temporary operation of turning ON and OFF power switch again and again. At least 3 seconds have to elapse between ON and OFF operations.

XII. Servicing

1. Be sure to turn off power switch on RCX C.E.U., before you remove the cover of Central Exchange Unit.
2. Removing the cover of the Central Exchange Unit will automatically activate the cutoff switch, shutting off the power. When the system has to be powered for testing, the automatic cutoff switch must be in a depressed position.
3. As the printed circuit boards in the Central Exchange Unit employ MOS-ICs, do not touch the printed circuit boards. Doing so may damage the printed circuit boards with static electricity discharged from your fingers.
4. Before removing the printed circuit board: XC-092 (subscriber card), wait until all three (3) LEDs go out on the mother board (XC-095 or XC-097) after the power is off.
5. Before replacing any station, be sure to turn off the power supply.
6. When your RCX system includes paging amplifier(s) or remote control devices, turning on and off will cause noise through paging speakers and switchover of the remote control ON/OFF mode of the remote control devices. This is not due to equipment failure but occurs when the power supply is turned on or off.
7. When replacing Cards, locate the Card in the right position by matching the Card number with that on the chassis.

XIII. Trouble Shooting Guide

| LOOK FOR TROUBLE MODES | OPEN (The lines of the below terminals are disconnected) | | | | | | |
|---------------------------|--|-----------------------------|---------|--------|----------------------|----------------------|---------------|
| | 1 and 2 | 1 or 2 | 3 and 4 | 3 or 4 | 1 and 3 (1 and 4) | 2 and 4 (2 and 3) | 1, 2, 3 and 4 |
| No LED is lit. | ● | | ● | | | | |
| No dial tone. | ● | | ● | | | | |
| Cannot call. | ● | Note 1 | ● | | Note 3 | Note 3 | |
| Cannot be called. | ● | | ● | | | | |
| Cannot communicate. | ● | Only receiving is possible. | ● | Note 2 | Note 2 | | |
| Cannot end communication. | ● | | ● | | | | |

- Notes 1 : Can call, but dialling phase is reversed.
 2 : Cannot communicate if incoming voice level is high.
 3 : With higher volume, cannot call. → Dialling phase is reversed.

| LOOK FOR TROUBLE MODES | SHORT (The lines of the below terminals are shorted) | | | | | | |
|---------------------------|--|--------|--------------------------------|--------|----------------------|----------------------|---------------|
| | 1 and 2 | 1 or 2 | 3 and 4 | 3 or 4 | 1 and 3 (1 and 4) | 2 and 4 (2 and 3) | 1, 2, 3 and 4 |
| No LED is lit. | | — | | — | ● | ● | ● |
| No dial tone. | ● | — | | — | ● | ● | ● |
| Cannot call. | ● | — | | — | ● | ● | ● |
| Cannot be called. | | — | ● | — | ● | ● | ● |
| Cannot communicate. | Only receiving is possible. | — | Only transmission is possible. | — | ● | ● | ● |
| Cannot end communication. | | — | | — | ● | ● | ● |

| LOOK FOR TROUBLE MODES | WIRE CROSSED | | | | | |
|---------------------------|--------------|---------|---------|---------|---------|--------------------|
| | 1 and 2 | 1 and 3 | 1 and 4 | 2 and 3 | 2 and 4 | 1 and 3 2 and 4 |
| No LED is lit. | | ● | ● | ● | ● | ● |
| No dial tone. | | ● | ● | ● | ● | ● |
| Cannot call | Note 1 | ● | ● | ● | ● | ● |
| Cannot be called. | | ● | ● | ● | ● | ● |
| Cannot communicate. | | ● | ● | ● | ● | ● |
| Cannot end communication. | | ● | ● | ● | ● | ● |