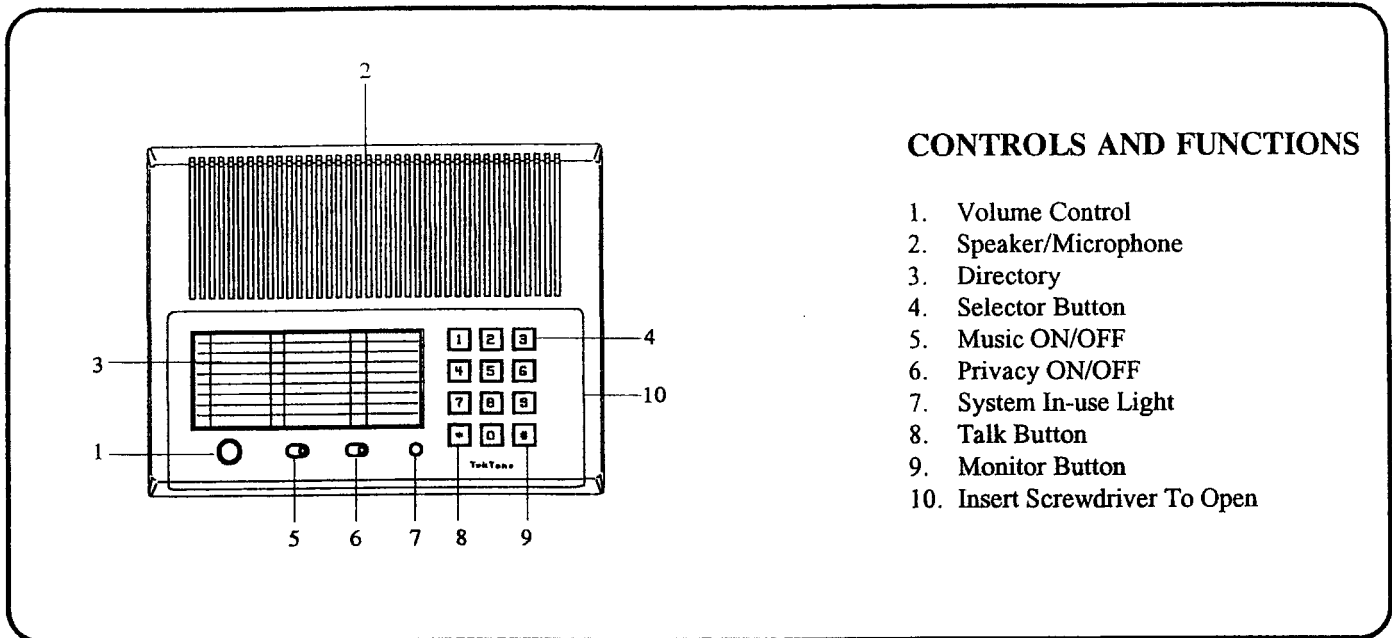# Installation Instructions

DM200 SERIES OFFICE INTERCOM

CONTROLS AND FUNCTIONS

1. Volume Control
2. Speaker/Microphone
3. Directory
4. Selector Button
5. Music ON/OFF
6. Privacy ON/OFF
7. System In-use Light
8. Talk Button
9. Monitor Button
10. Insert Screwdriver To Open

APPLICATION

The DM200 Intercom system provides communication for up to 28 master stations and is suitable for offices, homes, medical centers, warehouses and many other areas. Digital selection is provided along with tone call signaling and automatic call cancel. Privacy and music switches, volume control, system busy signal, "all call" and monitor functions are additional features.

PROCEDURE

1. Read installation instructions to determine equipment location and installation method.
2. Install housing and wiring.
3. Check wiring, connect and install station outlets.
4. Connect control unit and transformer.
5. Program and connect stations and check operation.

SYSTEM COMPONENTS

Model #	Description	Features
DM001	Control Unit	Provides operating voltage, one talk path, control and signaling circuits.
DM002	Remote Adapter	Provides for remotely located door speaker, connections for one or two speakers connected in parallel, plus one and two-tone chime calling for front and rear door.
DM228	Master Station	Privacy and music switches, volume control, selective call to 28 stations, "all call", monitor, desk cabinet, wall plug and cable.
DM228T	Master w/Handset	Master station with handset adaptation for added privacy. (Optional)
EK704A	AM/FM Radio	AM/FM/AUX selection, tone control and volume control.
JH002	Junction Box	Socket for station connection, screw terminals for cable connection. (Included w/master)
SS106	Transformer	16 V.A.C. 30 V.A.

Model #	Description	Used For
IH110R*	Flush Ring	DM001 and DM228 flush mounting
IH704	Flush Housing	EK704A flush mounting

* Remove desk cabinet for flush wall mounting.

PLANNING AND EQUIPMENT LOCATION

Control Unit: Locate the DM001 Control Unit near the center of the communication area in a place accessible for service. Control Unit should be located in an area free from static electricity and away from any source of heat or cold (above 90F or below 32F).

Stations: Locate DM228 Master where convenient for use. If wall mounted, install at convenient speaking height. Follow guidelines for Control Unit to select a safe location. In order to avoid acoustic feedback, Stations that may communicate with each other or that will originate an "all call" should not be installed near each other (separate rooms preferred). DO NOT locate flush mounted stations back-to-back on a common wall. DM228T Master Stations cannot be wall mounted.

Remote Adapter: Follow guidelines for Control Unit to select DM002 Remote Adapter location (near the Control Unit is recommended). NOTE: The maximum number of Remote Adapters permitted is two.

Transformers: The SS106 Transformer may be installed on the fuse panel or other accessible source of 117 volts A.C., but should be within 50 feet of the control unit. DO NOT locate Transformer within two feet of any Station.

Music System: The EK704A Music System should be located according to the instructions supplied with the unit. If any area requires music only (no intercom), such as a reception area, then the radio may be located in that area. If more than one area requires music only, then extension speakers may be connected to the radio to serve those areas. NOTE: If some other music source is to be used, it must be able to provide speaker level output into a 45 ohm load. (Use manufacturer's instructions for installation.)

WIRING

Stations (DM228): Stations are loop wired (all connected in parallel) using 4 twisted pair #18 shielded cable. (Telephone cable is not suitable.) Cable runs are limited in length and station capacity in accordance with the following table:

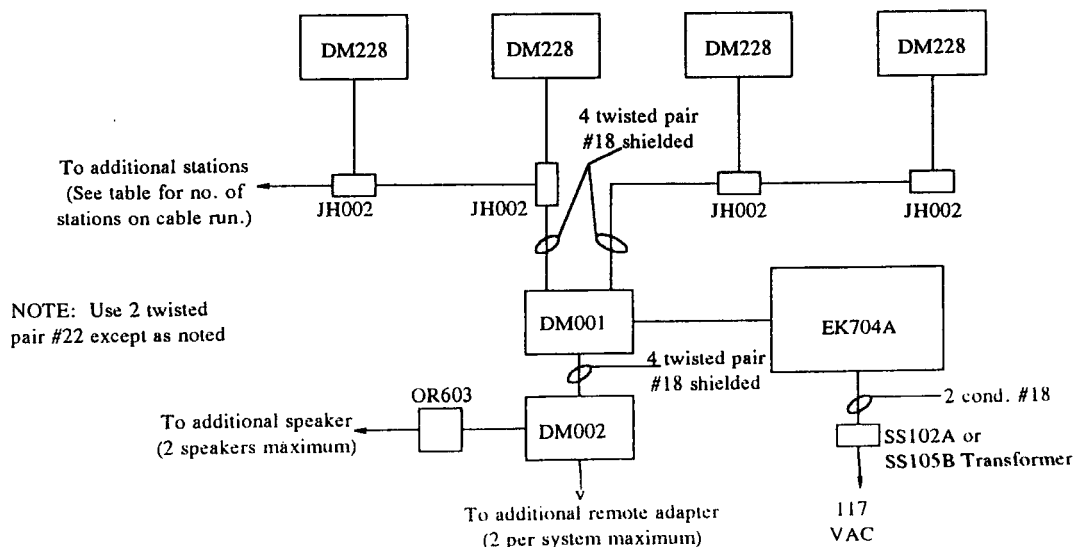| No. of Stations on Cable Run	Max. Cable Length (Feet)
2	1600
4	800
6	400
8	200

Use additional cable runs as needed. Run all cables directly to central equipment location. NOTE: Locate central equipment near center of cable run.

Remote Adapter (DM002): Run 4 twisted pairs #18 shielded cable directly to the control unit location. Run 2 twisted pairs #22 to each remote speaker (2 speakers maximum).

Transformers (SS106): Run 2 cond. #18 to the control unit location (maximum length 100 ft.) NOTE: The music source, if used, may require an additional transformer. See instructions supplied with music system.

Music Source (EK704A): Run 1 pair #22 to the control unit location (maximum length 100 ft.).

SYSTEM WIRING LAYOUT

CONNECTIONS

Important Note: The components of this system may be damaged by static electricity. To avoid such damage, it is necessary to use proper handling techniques. Before touching any part of the circuit, any static potential must be discharged by touching the grounded part of the assembly. The grounded part of each unit is listed as follows:

DM001   Terminal 1 (or aluminum heat sink bracket)
DM002   Terminal G
DM228   Speaker frame

Before touching any part of the circuit, touch the grounded part of the assembly listed above.

Stations (DM228/DM228T): Stations are provided with plug-in connections. All station outlets are connected in parallel. See connection diagram for method. Twisted wiring must be used. Pairs must be connected as shown. NOTE: Colors shown are the wire colors inside the JH002 junction box, and may not be the same color as the connecting wires used for installation.
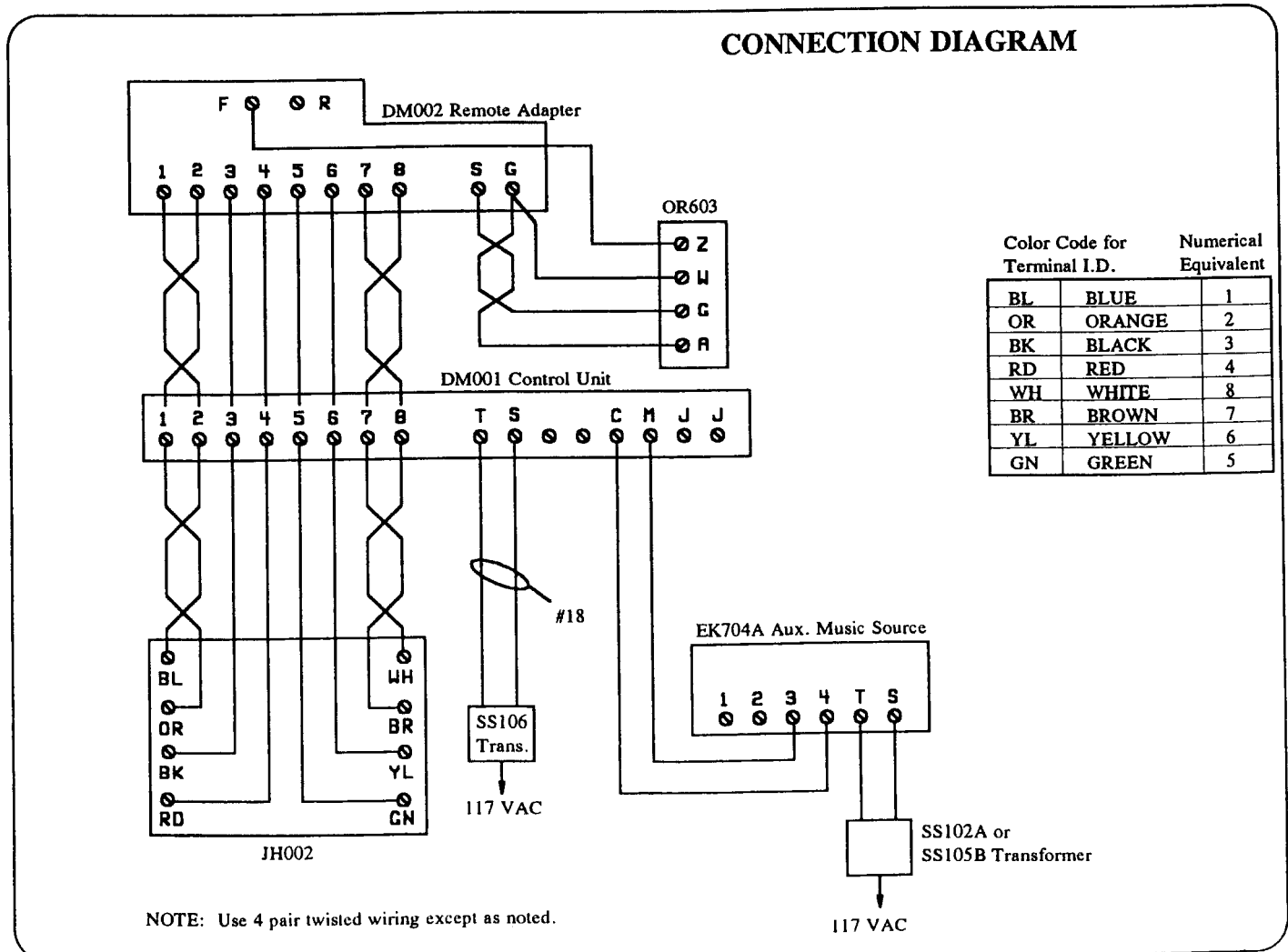
Remote Adapter (DM002): Connect 4 pair cable to common terminals. Do not reverse or interchange pairs. Connect remote speaker wires as shown in the connecting diagram.

Control Unit (DM001): Connect station cables to common terminals. Do not reverse or interchange pairs. Connect transformer wires to terminals T and S. NOTE: Heat sink on DM001 normally gets very warm. Make sure wiring into DM001 does not touch heat sink.

Transformer (SS106): For systems with 10 or less DM228 units, use 16 VAC connections on SS106 transformer to DM001 terminals T and S. Systems with more than 10 DM228/DM228T units use 24 VAC connections on SS106 transformer to DM001 terminals T and S. NOTE: Do not use this transformer for the music system or auxiliary devices.

Music System (EK704A): Connect music system according to instructions supplied with the unit. Connect music system output (4 - 45 ohms) to cable from control unit. See connection diagram for proper method. NOTE: If music is not used on system, jumper terminals C and M on DM001.

CONNECTION DIAGRAM

Color Code for Terminal I.D.		Numerical Equivalent
BL	BLUE	1
OR	ORANGE	2
BK	BLACK	3
RD	RED	4
WH	WHITE	8
BR	BROWN	7
YL	YELLOW	6
GN	GREEN	5

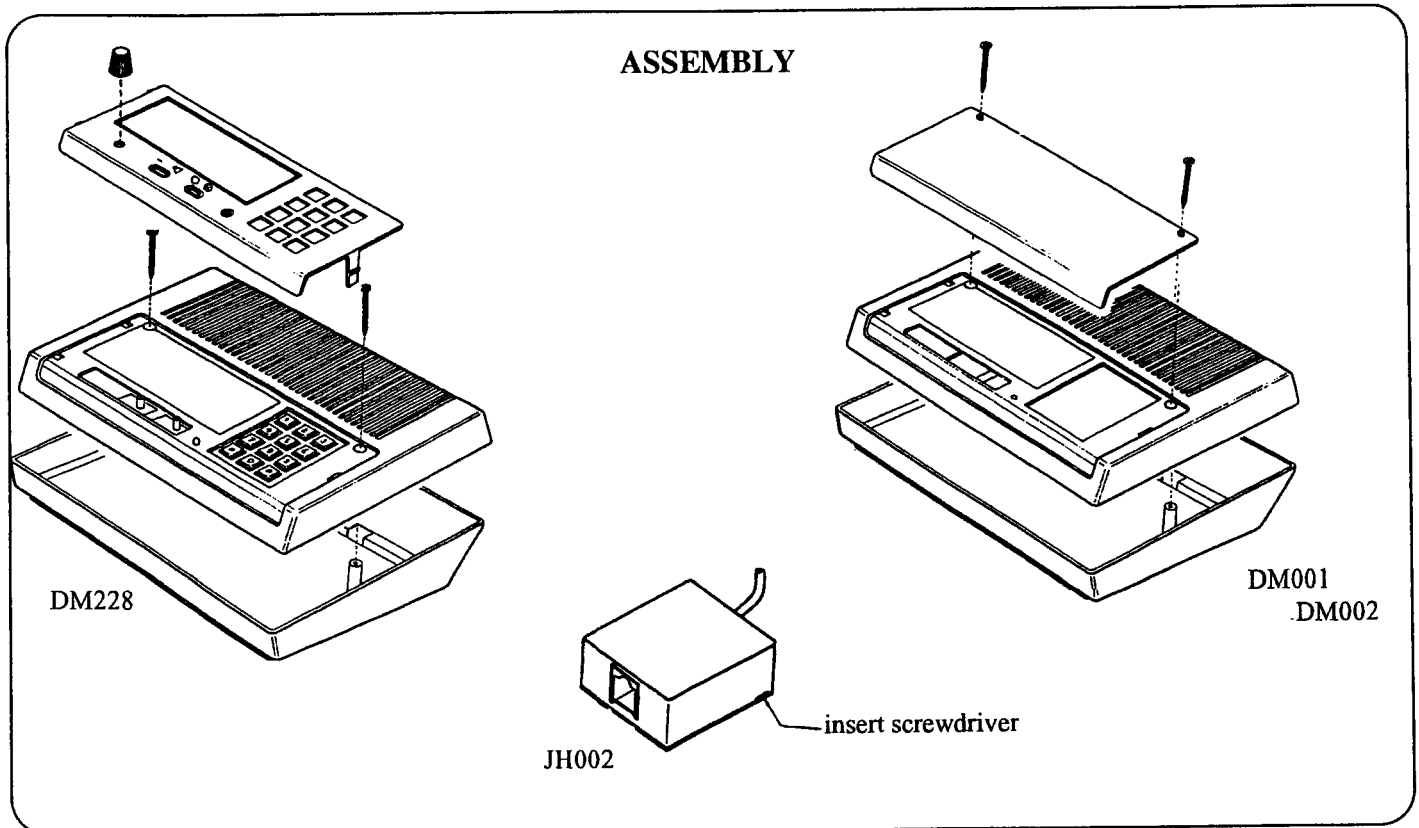NOTE: Use 4 pair twisted wiring except as noted.

PROGRAMMING

Programming Note: Before doing station programming, read note under CONNECTIONS concerning static electricity damage.

Station programming is needed to assign call codes to each station. There are two programming jacks located inside each DM228/ DM228T. The jack with the black wire selects the first digit of the call code; the jack with the white wire selects the second digit of the call code. The call code for any station can be any combination of two digits using the numbers from 1 to 7 inclusive. (NOTE: Call codes 41 and 42 are reserved for Remote Adapters, if used.) The selection is made by pushing the jack onto the selection pin numbered as desired. NOTE: If the call code has two digits the same, the jack with the white wire should be connected to the R terminal. After programming, the station should be plugged into the station outlet and tested.

Master stations are equipped with a monitor function that permits continuous listening to any Master Station in the system. In order to use this function, it is necessary to enable it as follows:

a) At the DM001 Control Unit, connect the two J terminals together. This disables the automatic call cancel for monitoring.

b) At any Master that must be monitored (listened to by others), cut the wire jumper on the circuit board at the location marked A. Position the cut wires in such a way that they cannot touch each other or any circuit board connection. System will now monitor that station only. NOTE: Monitor function can only be canceled at monitoring station or at station being monitored.

ASSEMBLY

DM228

JH002

insert screwdriver

DM001
DM002

TEST AND CHECK-OUT

1. Set controls on all Masters as follows:
   Privacy -   OFF
   Volume -   LOW
   Music -   OFF

2. Operate all stations according to operating instructions and check for operation as indicated.

3. If the desired operation is not achieved, stop testing and remove power from the system.

4. After the test is complete, on one station only call another station. Do not use the TALK button and do not cancel the call. After one minute, the call should be automatically canceled.

OPERATING INSTRUCTIONS

To Call (Masters only):
1. Determine number of desired station from station directory.
2. Check in-use light to see if the system is busy. If the system is in use, wait until the light goes out.
3. Push numbered call buttons in sequence corresponding to the desired station number. Example: To call station 31, first push button 3 and then push button 1.
4. A single call tone indicates connection to the called station. No call tone indicates that a non-existent number was called.

To Reply: If the station is in privacy mode, push * (TALK) button once, then reply. If the station is non-private, then reply is made hands free.

Talking:
1. If no sound is heard from the called station, the station is in the privacy mode. Wait for privacy to be released OR talk as in Step 2.
2. Push the * (TALK) button and hold the button down while talking toward the station in a normal voice. Release the * button to hear the reply.

Cancel: Push 0 button to cancel the call. NOTE: The call may be canceled by either the called or calling party.

All Call:
1. Push the 9 button. A short two-tone call signal will be heard at all stations.
2. Push * to talk; release button to listen.

To Answer All Call: Push * (TALK) button. Your station will be connected to the calling station and all other stations will be disconnected.

Privacy: Slide switch to (X) for privacy. Slide switch to 0 for non-private operation.

Temporary Privacy: Push button marked 3 and hold until you wish to resume regular conversation.

Privacy Override: Push * (TALK) button to answer a call while in privacy mode. The station will remain non-private until the # button is pushed or until the conversation is completed and privacy is automatically restored.

Music:
1. Slide switch to ⊄ to hear the background music.
2. Slide switch to - to turn the music off.

Volume: Adjust volume control as needed, as it affects incoming sound only. If the volume is set too low in a noisy location, calls may not be heard.

Monitor:

At the location to be listened to:
a) Make certain that the privacy switch is in the non-private (0) position.
b) Check in-use light. If the system is in use, wait until the light goes out.
c) Push # (MONITOR) button twice. In-use light will stay dimly lit to indicate monitor use.

At the listening location:
a) At monitoring station, select the station number of the master in the area to be monitored.
b) If desired that all stations listen in to monitored station, depress 9 on the monitored station. All other stations will now be listening. NOTE: This monitoring feature can be canceled from any station in the system.

To Cancel The Monitor Function:
a) If system is not in use, push the * (TALK) button.
b) Sliding the privacy switch to the (X) (PRIVATE) position will also cancel the monitor function at any time.

DM228T Handset Operation:
a) Lift handset from cradle. Press pushbutton located on handset to talk and release to listen. It is not necessary to cancel the privacy mode to answer a call using the handset.
b) Replace handset on cradle. Failure to do so may result in missing incoming calls.

TROUBLESHOOTING

If the system fails to operate as indicated, check the following points:

ENTIRE SYSTEM DEAD: Check for 16 volts A.C. at transformer secondary and at Control Unit terminals T1 and
                                T2. Check for 15 volts D.C. at Control Unit terminals 1 and 8. Loss of D.C. (if A.C. is
                                present) may be due to wrong wiring or defective Control Unit or Station.

IMPROPER OPERATION
AT ALL STATIONS: Check wiring.

UNABLE TO CALL 1 STATION: Check station code assignment. See programming section.

CALL 2 STATIONS AT ONCE: Check stations code assignments. See programming section.

UNSUITABLE TONE LEVEL: See adjustments section.

DISTORTION ON MUSIC: Music volume may be too high. See adjustment section.

FEEDBACK OR HOWLING: Stations may be installed too close to each other. See equipment location section.

UNABLE TO MONITOR: Monitor function may not be enabled. See programming section. Station may have
                                privacy selected. System in-use may be on before #(MONITOR) is pushed.

ADJUSTMENTS

Control Unit: The Control Unit has an internal screwdriver adjusted control for tone level. This is factory preset; but may be changed, if necessary.

Music: Adjust music system volume as needed. NOTE: Setting volume too high may result in distortion or unreliable intercom operation.

WARRANTY INFORMATION

TekTone* warranty is void if this system is installed or used in any manner other than described in this manual. See price list for complete warranty information.