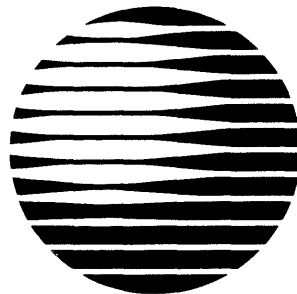


**SPIRIT™ 308/616**  
**COMMUNICATION SYSTEMS**

**Product Information Guide**



**AT&T**

**SERVICES DIVISION EDUCATION**

**MAY 1987**

**Select Code 999-903**

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**SPIRIT™ MODEL 308/616**  
**COMMUNICATIONS SYSTEM**  
**Product Information Guide**

AT&T Technical Training Services  
Dublin, Ohio

*First Edition*  
*February 1987*

Developed by  
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Printed in the United States of America.

## TABLE OF CONTENTS

	<b>Page</b>
OVERVIEW	1
SYSTEM CONFIGURATION	3
<i>SPIRIT</i> COMPETITION	5
SYSTEM DOCUMENTATION	5
GROUNDING REQUIREMENTS	6
INSTALLATION	7
<i>SPIRIT</i> WIRING PLAN	8
PIN ASSIGNMENTS	8
MODULAR WIRING	11
EXTERNAL PAGING EQUIPMENT	15
AUXILIARY LINES	15
EXTERNAL ALERT	17
MULTIFUNCTION STATION SETS	19
INITIAL SYSTEM TEST	20
FEATURE TONES AND RINGING	20
SPEEDCALLING	21
<i>SPIRIT</i> FEATURE ADMINISTRATION	23
SYSTEM MAINTENANCE	25
WARRANTY AND MAINTENANCE OPTIONS	26

## LIST OF FIGURES

FIGURE 1 - <i>SPIRIT</i> SYSTEM CONFIGURATION	2
FIGURE 2 - <i>SPIRIT</i> COMPETITION MATRIX	4
FIGURE 3 - TYPICAL <i>SPIRIT</i> WIRING PLAN	9
FIGURE 4 - MODULAR WIRING	10
FIGURE 5 - SBDS WIRING MATERIALS	13
FIGURE 6 - PAGING SYSTEM WIRING	14
FIGURE 7 - EXTERNAL ALERT INTERFACE	16
FIGURE 8 - 24-BUTTON MULTIFUNCTION STATION SET	18
FIGURE 9 - SYSTEM ADMINISTRATION OVERLAY MODEL 308/616	22
FIGURE 10 - HARDWARE REPLACEMENT INFORMATION	24

## SPIRIT™ MODEL 308/616 COMMUNICATIONS SYSTEM

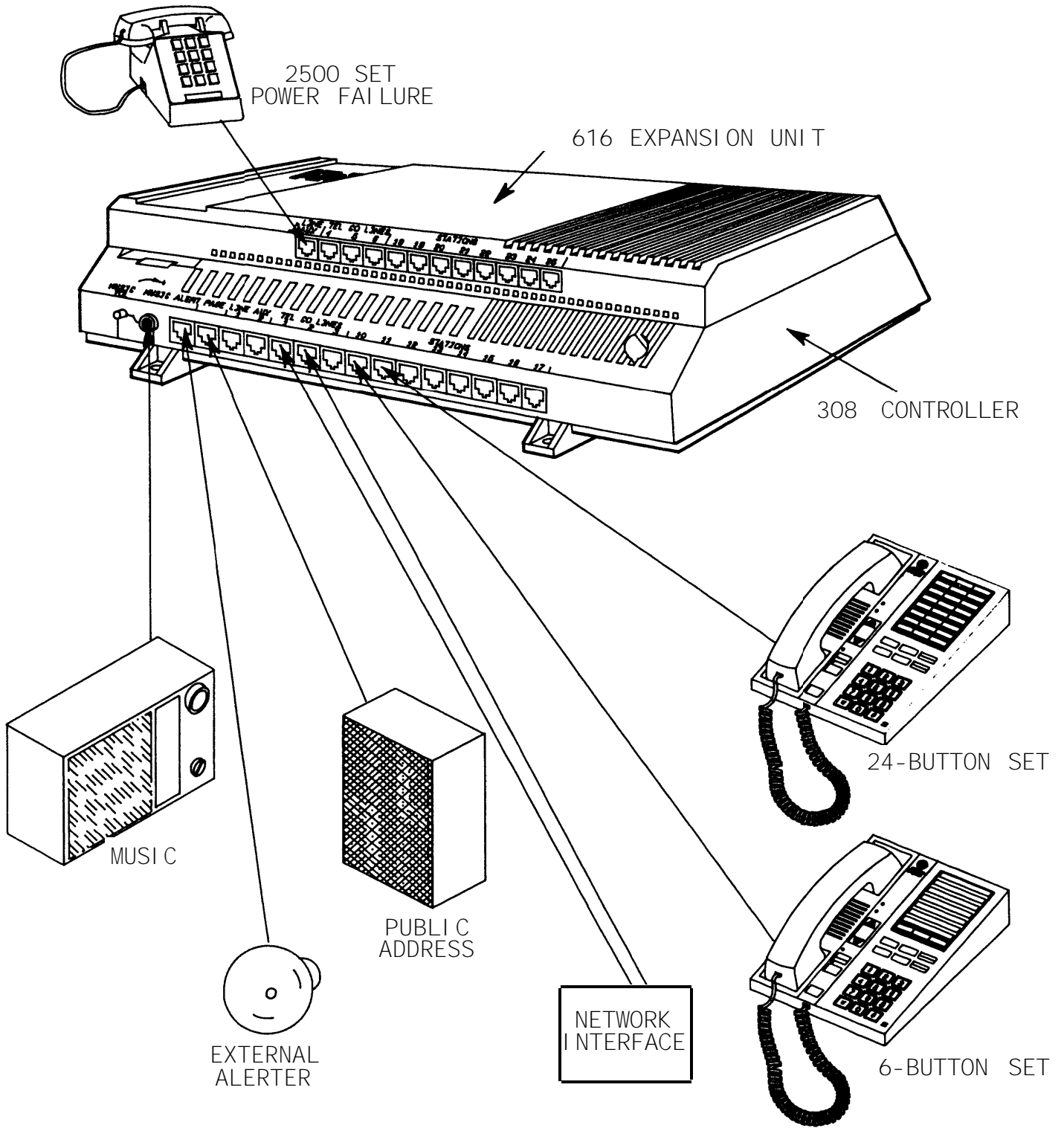
### OVERVIEW

The *SPIRIT* Model 308/616 CS is a low-cost, high-quality, high-reliability product with fixed features and modular equipment. AT&T is the **only** company offering a system with a full range of features and services in one package:

- Call Pick-Up
- Idle-Line Preference
- Hands-Free Answering Intercom
- Power Failure Operation

and many other features, providing a product without equal in the telecommunications marketplace.

You will become thoroughly familiar with these features, so you can teach your customers to use them when you install the system. You, the *Systems Technician*, are another aspect of our edge on the competition. By taking the time to study this INFORMATION GUIDE fully, and attending the hands-on session you are scheduled for in a few weeks, you will be able to install and maintain the *SPIRIT* system and teach your customers how to use it to the best advantage in their businesses. Your professional skills and familiarity with AT&T products return true value for our customers' service dollars.



217-3 2/87 1

**FIGURE 1 - SPIRIT SYSTEM CONFIGURATION**

## SYSTEM CONFIGURATION

The **308 SPIRIT CS** is the smallest configuration; it has up to three CO lines and eight station lines. Adding the optional expansion unit allows growth up to six CO lines and sixteen stations, yielding the 308/616 *Spirit* system.

The model 308 control unit consists of a textured, gray plastic housing and base, enclosing the PWB (printed wiring board) and power supply. The open grillwork on the control unit allows proper system ventilation. The control unit is approximately 16 inches wide, 8 inches high, and 5 inches deep. A fully equipped unit (308/616) weighs less than 10 pounds.

The system functions over 2-pair wiring and uses loop-start lines for the CO (central office) facilities. The *SPIRIT CS* can be configured behind another PBX or cross-connected directly to the CO. Stations cabled with tinsel cord, which does not have the twisted-pair structure required to transmit data, have to be within 25 feet of the controller to function properly. If stations are wired with twisted-pair solid-conductor cable, the working limits are 1000 feet from the controller.

The ALERT, PAGE, LINE AUX, TELCO LINES, and STATIONS connectors are positioned and labeled as shown in Figure 1. An RCA phono jack interfaces MOH (Music-On-Hold). The MOH volume control can be easily adjusted by hand.



FEATURE	AT&T <i>SPIRIT</i> 308/616	TIE ULTRACOM CKI	ITT ARIES 401	TOSHIBA STRATA VI
CO LINES	6	8	6	6
STATIONS	16	18	16	16
INTERCOM PATHS	2	0	3	2
SPEAKERPHONE	yes	yes	no	yes
CONFERENCE w/DROP	yes	no	yes	no
SYSTEM SPEEDCALL	70#	100#	yes	opt
PERSONAL SPEEDCALL	16#	14#	no	opt
DO NOT DISTURB	yes	yes	no	no
TRANSFER	yes	yes	no	yes
HFAI/DISABLE	yes	no	no	yes
STATION MSG ACTIVATION	yes	no	yes	opt
MUSIC-ON-HOLD INTERFACE	yes	opt	yes	opt
PAGING INTERFACE	yes	opt	yes	yes
PROGRAMMABLE FEATURES	yes	no	yes	yes
IDLE LINE PREFERENCE	yes	no	no	no
RINGING LINE PREFERENCE	yes	no	no	yes
DISTINCTIVE RINGING	yes	yes	no	yes
TOLL RESTRICTION	yes	yes	no	no
0/1 restrict	yes	no	yes	no
allowed list	yes	no	no	no
CALL PICKUP	yes	no	no	no
NIGHT SERVICE	yes	yes	no	yes
CENTRALIZED ADMIN	yes	no	no	yes
BRIDGING INDICATION	yes	no	no	no
PWR FAILURE OPERATION	yes	opt	no	no
PWR FAILURE PHONES	yes	opt	no	no
CUSTOMER INSTALLABLE	yes	opt	no	no

**FIGURE 2 - *SPIRIT* COMPETITION MATRIX**

## ***SPIRIT* COMPETITION**

The *SPIRIT CS* faces major competition for small business customers needing an electronic key telephone system. Three companies; TIE, ITT, and TOSHIBA, are top competitors with systems in that communications market. A feature-comparison matrix is shown on the opposite page.

## **SYSTEM DOCUMENTATION**

A complete set of documentation is included with this package. You will use it as part of your study material, and it is yours to keep for future reference. *SPIRIT CS* control unit documentation includes:

- **Administration Manual** - Provides detailed information on customizing the system.
- **Customer Installation Instructions** - Details the materials needed and instructions on cabling and wiring.

Station set documentation includes:

- **User Manual** - Details information about system features and operation of the station sets.
- **Quick Reference Chart** - A two page job aid outlining station set method-of-operation.
- **Designation Strips** - Used to designate the station and line appearance buttons on each station set.

## GROUNDING REQUIREMENTS

Proper grounding is fundamental as protection against lightning/power surges, power crosses on CO lines, and static discharge to equipment. The green-wire ground of the AC outlet is the **only** ground serving the *SPIRIT* system. It **must** be connected to the building ground. Use the following procedures to verify grounding:

1. Check the AC outlet wiring with an Ideal 61-035 tester or equivalent. The tester comes with instructions.
2. Visually inspect the telco protection bonding to the AC power ground. Ensure that local practices have been followed. To minimize costs, no more than 10 minutes are allowed for this inspection. If more than 10 minutes is required, do not complete the inspection.
3. If you find inadequate grounding/protection, and the the customer owns the equipment or has a sales-type lease, warn him/her that lightning and power-surge damage are excluded from warranty and contract coverage. Also tell the customer that the risk from operating equipment without adequate protection is quite high.
4. The customer can buy a TII1428 AC power line surge protector (PEC 8310-001). While surge protection purchase is not required when buying the system, remind the customer that lightning and power surge damage are excluded from **warranty and contract** coverage. Purchase of the surge protector is a way to reduce, but not eliminate, the customer's risk, If s/he is under a term plan, the surge protector can be installed at AT&T expense, if local practice calls for it.

## INSTALLATION

The following procedures are required to install a *SPIRIT CS*, and the customer pays for them in the installation charge:

1. **Install the control unit** - Special consideration should be given to:
  - Local telco CO line terminations (within 25 feet)
  - Nearest AC outlet for the control unit (within 6 feet)
  - Access for administration, future growth, and changes
  - Allowing for proper ventilation (21 inches clearance)
2. **Install station wiring, connect and label sets** - Wiring plan same as MERLIN®CS.
3. **Administer system-level features** - Use the system planner and ensure that a copy is retained with the control unit for programming. The system must be reprogrammed if the control unit is replaced.
4. **Connect the system to the network interface** - Wire to the RJ connecting blocks at the demarcation point.
5. **Install auxiliary equipment** - Includes remote bell, music source, or paging system.
6. **Test the system** - Verify controller and set operation.
7. **Customer education** - The systems technician's responsibility; you will become familiar with the customer training outline in the User Training Manual. It will guide your presentation.

*At this point, take time to read the Customer Installation Instructions Manual in its entirety.*

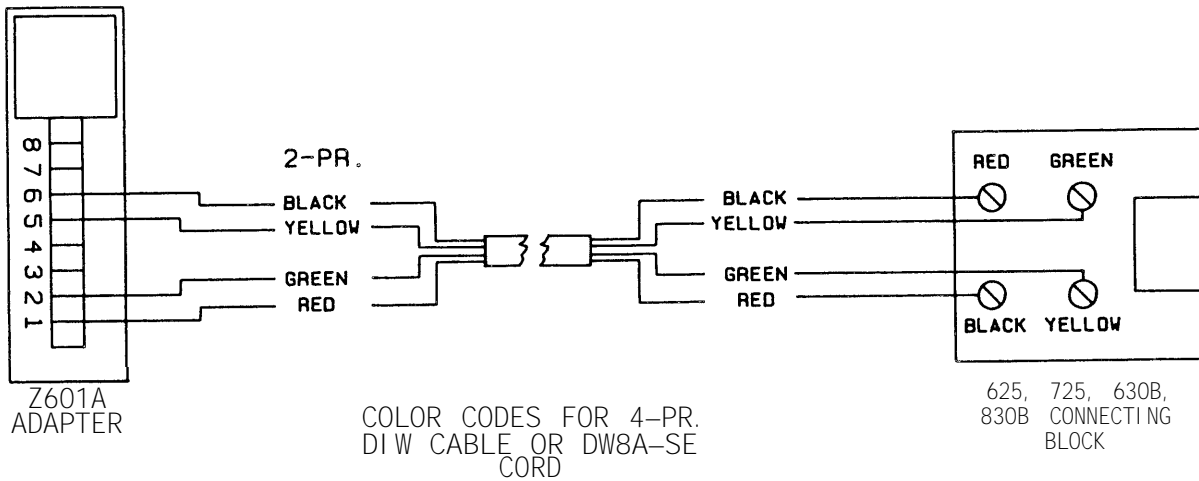
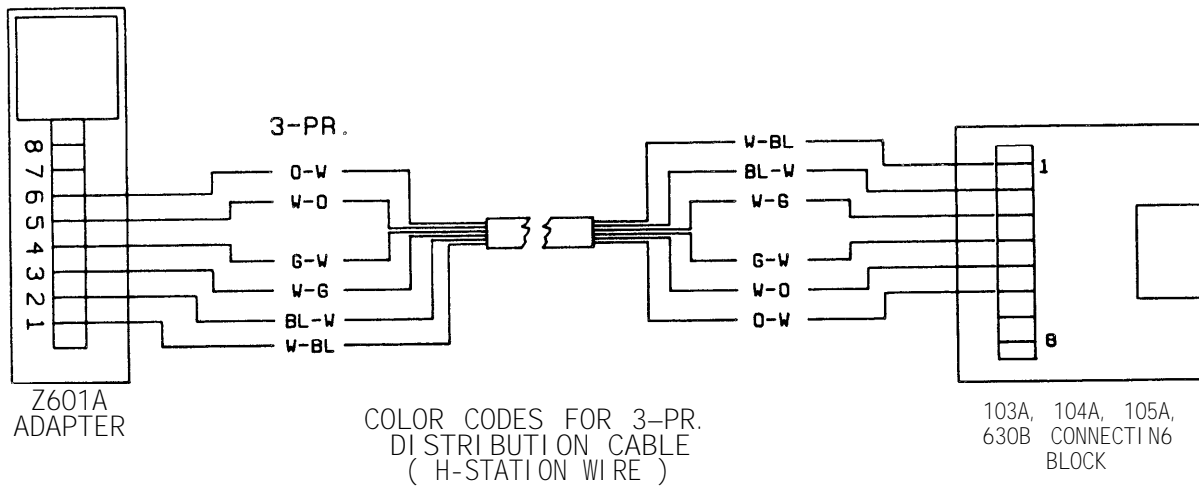
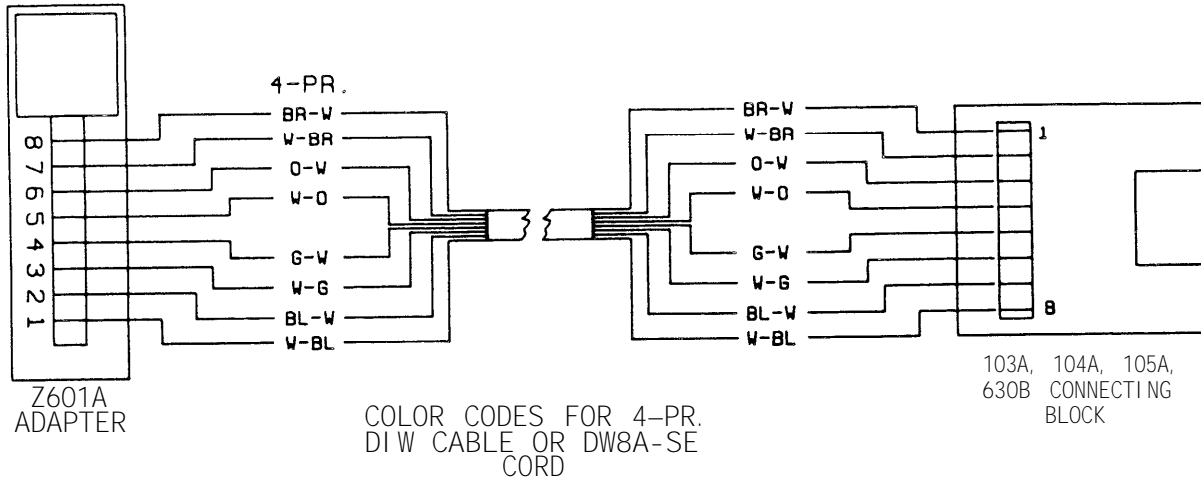
## ***SPIRIT* WIRING PLAN**

The SBDS (Small-Business Distribution System) wiring plan for the *SPIRIT* is the same plan used for the *MERLIN CS*. The *SPIRIT* system requires two-pair wiring, but four-pair wiring is used to facilitate migration to four-pair systems in the future. Unlike *MERLIN CS* control units, *SPIRIT* control units ship WITHOUT 267C adapters. If these are needed, you must provide them from your supply. Their cost is covered in the flat-rate wiring billed to the customer. Station sets ship WITH mounting cords.

## **PIN ASSIGNMENTS**

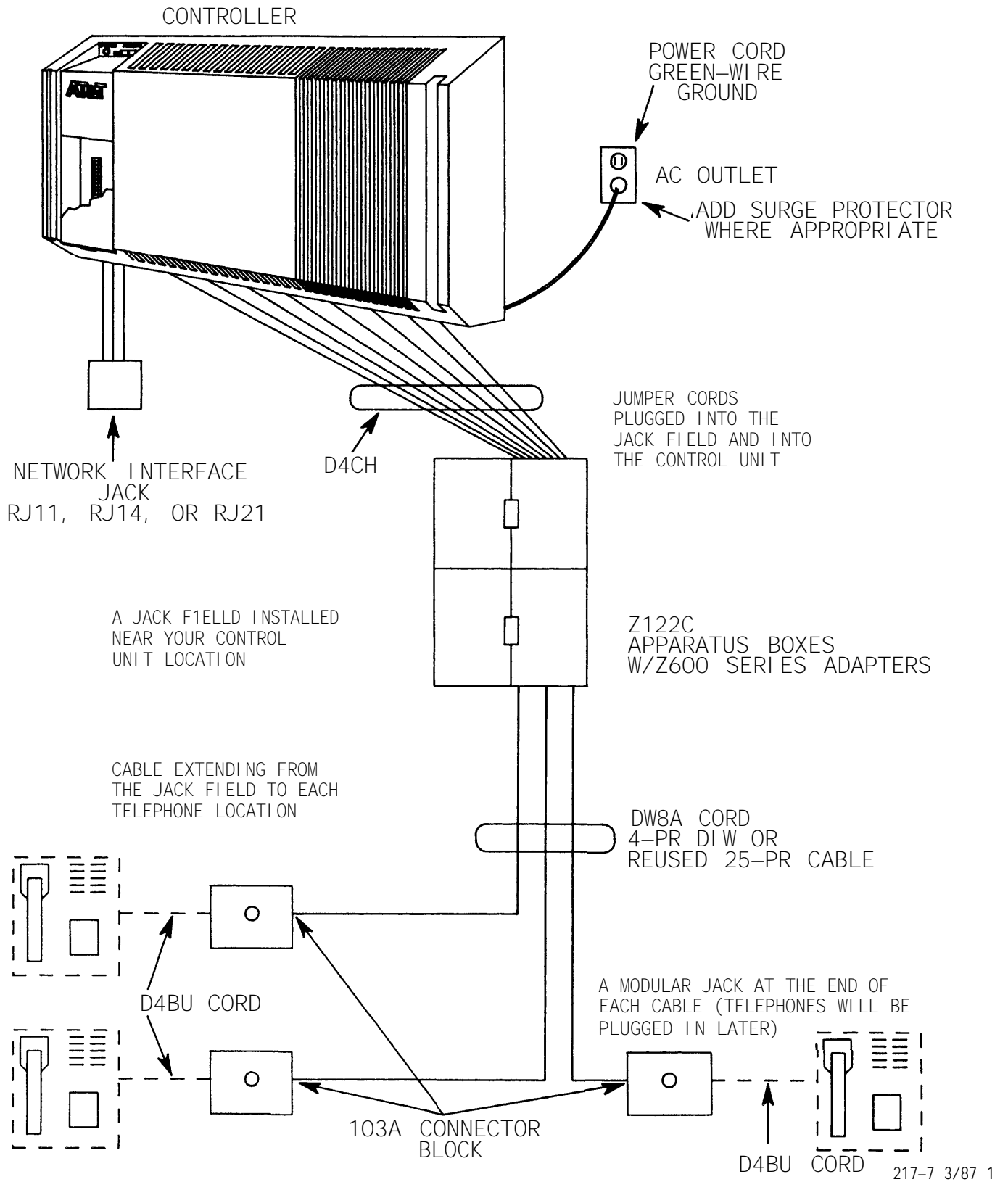
The modular pin assignments for the station jack on the control unit and station set are shown below:

<b>PIN NUMBER</b>	<b>CONTROLLER JACK 8-position</b>	<b>PIN NUMBER</b>	<b>STATION JACK 6-position</b>
1	No-connection		
2	No-connection	1	No-connection
3	Data/Ring	2	Data/Tip
4	Voice Ring	3	Voice Tip
5	Voice Tip	4	Voice Ring
6	Data/Tip	5	Data/Ring
7	No-connection	6	No-connection
8	No-connection		



217-8 3/87 .89

FIGURE 3 - TYPICAL SPIRIT WIRING PLAN



**FIGURE 4 - MODULAR WIRING**

## MODULAR WIRING

The method of connection depends on the building wiring termination. Use the following station and distribution wire:

- Tinsel Cord - A 2-pair double-ended modular cord used primarily for sets.
- D-Station Wire - A 22-gauge, two-pair distribution wire.
- H-Station Wire - A 24-gauge, three-pair distribution wire.
- D-Inside Wire - DIW is a 24-gauge, multiple-paired cable.

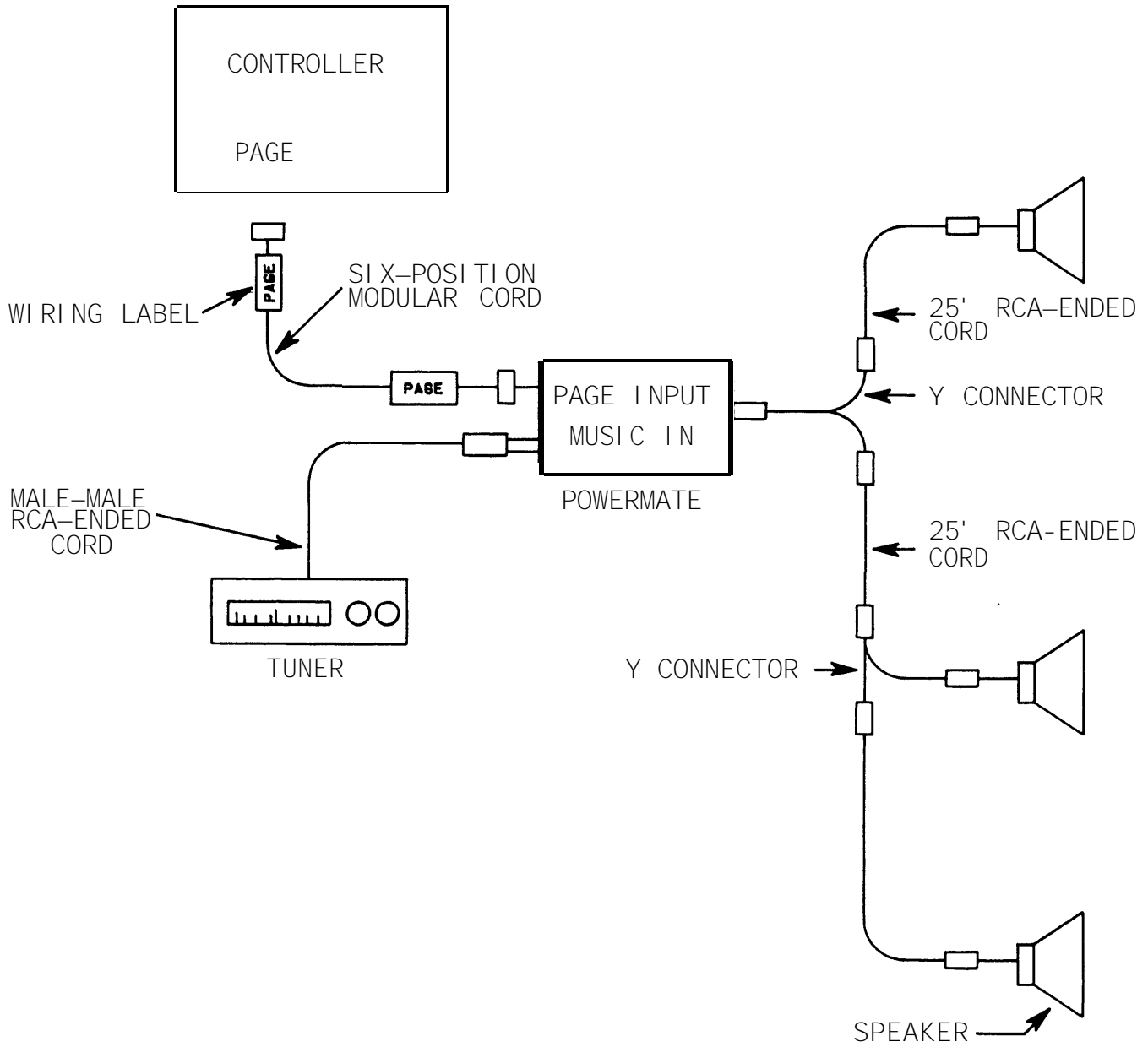
When reusing existing building wiring, adapters can be used but will require a Z122C apparatus box.



## NOTES

ITEM	DESCRIPTION	COMCODE
103A-50	Connecting Block	103104220
258A	25-pair to Mod. Adapter	102605136
D2R-29	Mounting Cord 7 foot	103732541
D2R-29	Mounting Cord 14 foot	103732566
D2R-29	Mounting Cord 25 foot	103732582
D4BU-29	Mounting Cord 7 foot	102479904
D4BU-29	Mounting Cord 14 foot	102479896
D4BU-29	Mounting Cord 25 foot	102479888
D4CE-50	Set Extension Cord 50 foot	103951570
DW8A-SE	Distribution Cord 100 foot	103895694
DW8A-SE	Distribution Cord 200 feet	103736138
D8W-87	Mounting Cord 2.5 feet	104160148
DIW	Inside Wire Spool 1000 feet	403101140
D-Station	2-Pair wire Ivory 600 feet	401836580
H-Station	3-Pair wire Gray 600 feet	401836598
Z122C	Apparatus Box	103980843
Z600A	Mod to Mod Adapter	103946646
Z601A	Mod to Cut-down Adapter	103946653
Z602A	Mod to 25-pair Adapter	103946661
Z610A	Cut-down to Mod Adapter	103950556

**FIGURE 5 - SBDS WIRING MATERIALS**



217-9 3/87 1

**FIGURE 6 - PAGING SYSTEM WIRING**

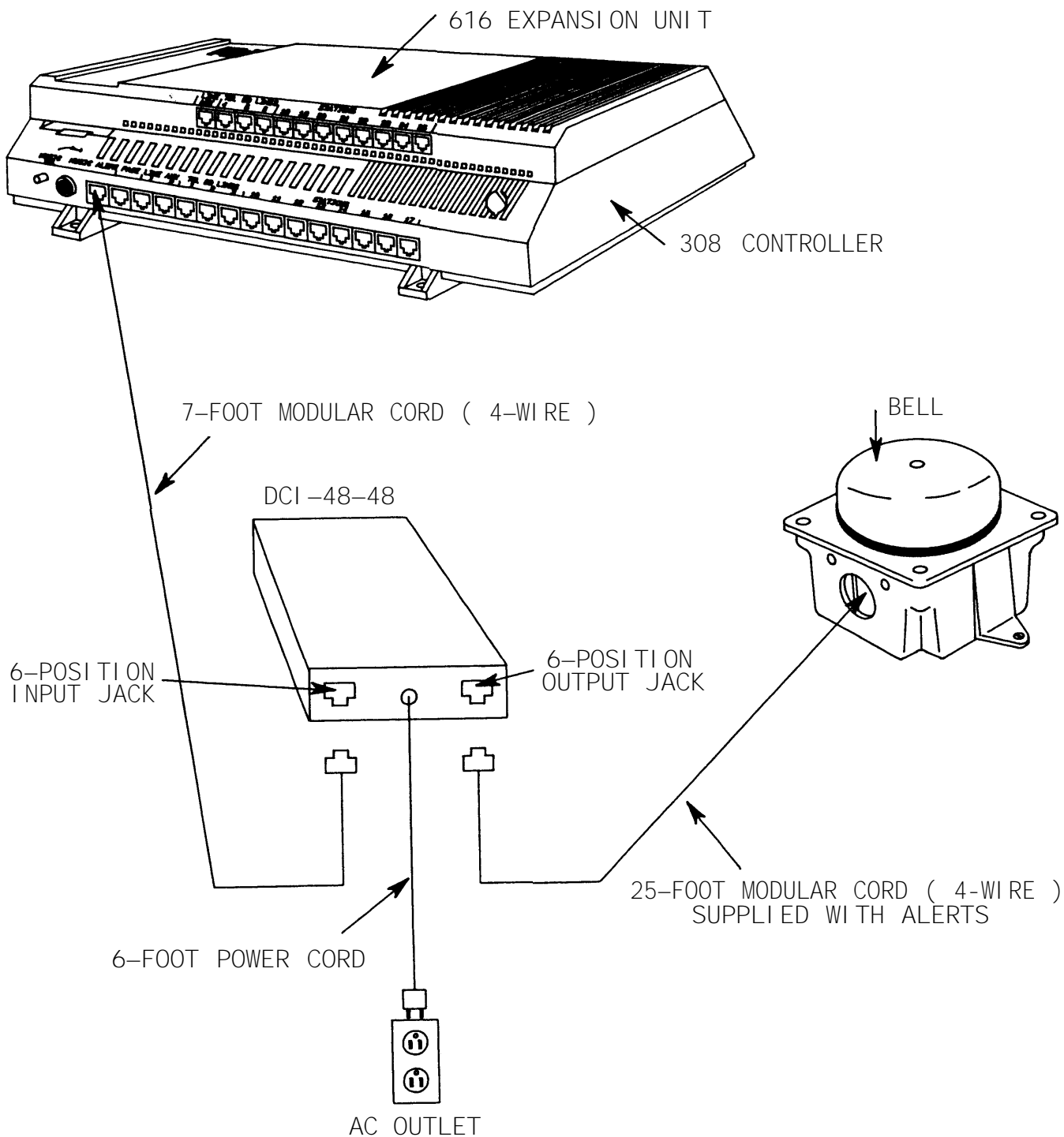
## EXTERNAL PAGING EQUIPMENT

The PagePac 1 (for systems with optional public address system) is a loudspeaker paging system with 1-way transmission. **Answerback paging is not supported by the SPIRIT CS.** Typical hardware provided with the system is a PowerMate amplifier, speakers and wiring. The amplifier connects to the control unit via a 4-conductor, 6-position modular cord. We recommend a direct connection from the control unit whenever possible. The speakers connect through 2-conductor, RCA-jack ended cords. The PowerMate is supplied with six 24-foot cords, "Y" adapters and three speakers.

## AUXILIARY LINES

There are two LINE AUX jacks on the 308 controller, and one on the 616 expansion unit. The jacks bridge the CO lines at the control unit, and are the connection to an outside line during a power failure. A standard (tip/ring) 2500 set or equivalent must be used for power-failure telephones. In the event of a commercial power failure, programmed system information will be retained in memory indefinitely.

The jacks are also useful as dedicated lines for answering machines, facsimile machines, and modems. If an answering machine is cabled to LINE AUX jack 1 on the 308 and is in-use (off-hook), the incoming line 1 button appearance cannot be accessed at the station set. LINE AUX jack 2 on the 308 control unit bridges line 2, and the LINE AUX jack on the 616 expansion unit bridges incoming line 4.



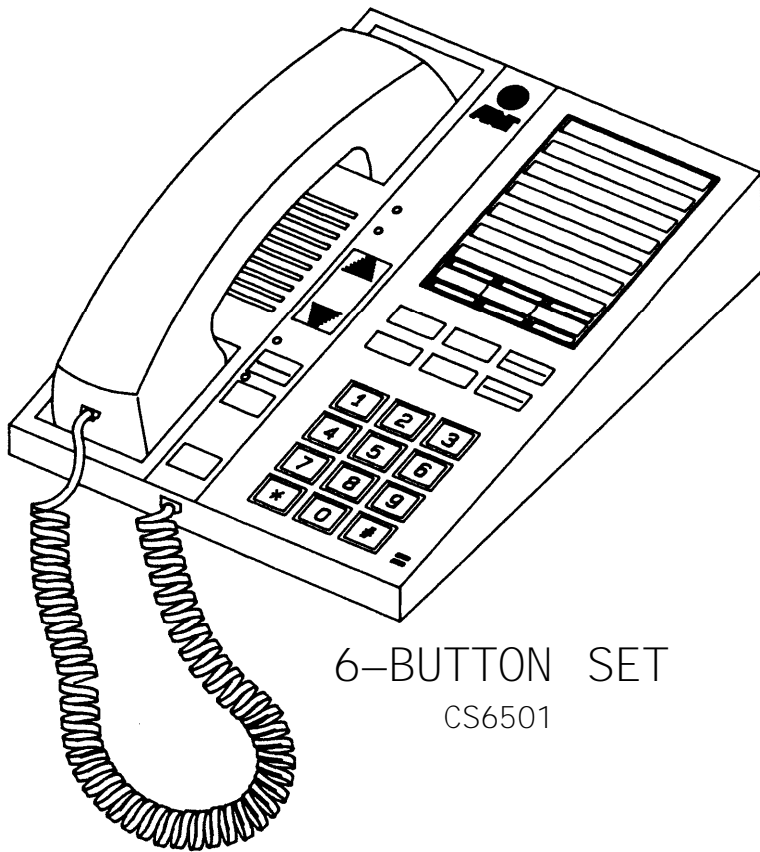
217-5 3/87 1

**FIGURE 7 - EXTERNAL ALERT INTERFACE**

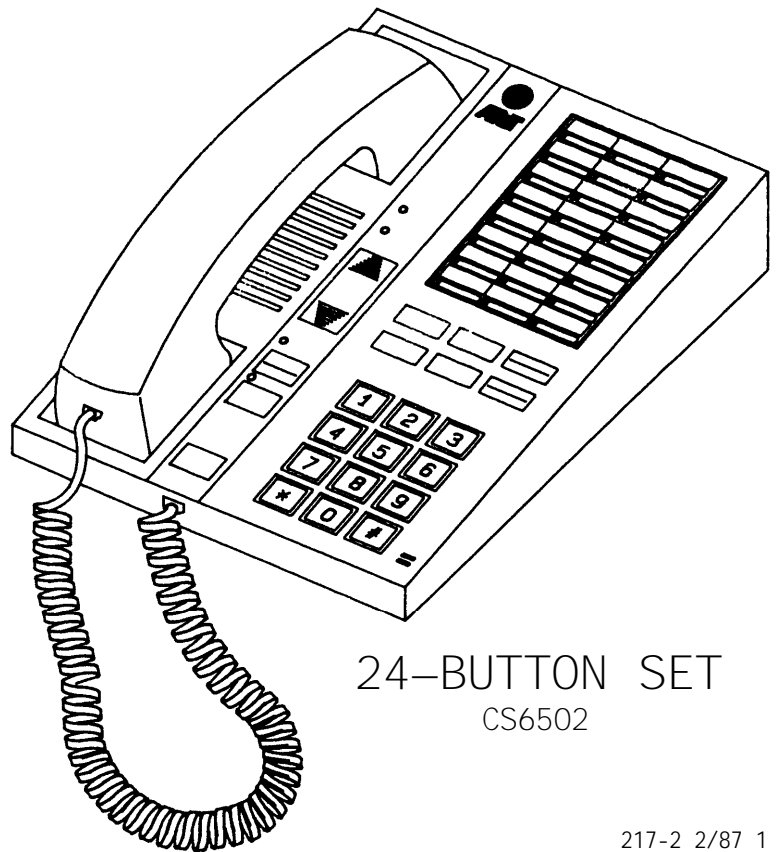
## EXTERNAL ALERT

The Wheelock DCI-48-48 is an interface unit for powering 48 V DC telephone bells, chimes, horns, strobes, and other external alerts for electronic key systems. The 6-position modular INPUT connects to the control unit ALERT jack while the 6-position OUTPUT connects to the alert device.

The DCI-48-48 should be wall-mounted within seven feet of the control unit and within six feet of the AC outlet. This unit should use the same AC duplex outlet as the control unit, to ensure that the ground wire is common to both units.



6-BUTTON SET  
CS6501



24-BUTTON SET  
CS6502

217-2 2/87 1

**FIGURE 8 - 24-BUTTON MULTIFUNCTION STATION SET**

## MULTIFUNCTION STATION SETS

The first six buttons on the 6-button and the 24-button sets correspond to the control unit TELCO LINE jacks.

Buttons labeled 10 through 25 correspond to the sixteen control unit STATION jacks. These buttons are used for autodialing the 2-digit extension numbers on the 24-button set. The numbers 7, 8, and 9 are omitted, since they have no meaning in the system.

Buttons 26 and 27 of the 24-button set are user-programmable buttons for Loudspeaker Paging, Paging to all extensions, or for Manual Signaling others in the system. These two buttons cannot be used for speedcalling.

Station set volume control adjustments affect three modes:

1. Speakerphone - can be changed when the speaker is ON.
2. Ringer - can be changed when the set is ringing, or when the set is on-hook and the speaker is OFF.
3. Receiver (handset) - can be changed when the set is off-hook and the speaker is OFF. (The K2N2 handsets are clearly marked and are usable *ONLY* on the *SPIRIT* station sets).

The system software remembers the last volume level set for each mode.

*Refer to the SPIRIT User Manual, Pages 2 and 3, for a complete description of the control keys and LEDs on the station sets.*



## INITIAL SYSTEM TEST

Power is applied to the control unit through a line cord plugged into a standard 110 V AC outlet. A lighted green LED, visible in the upper left corner of the control unit, serves as the **POWER ON** indicator. The control unit software checks all its common hardware immediately after the powerup. At this point, test the CO lines and stations at the controller.

## FEATURE TONES AND RINGING

*Refer to User's Manual, Page 4, for information on distinctive ringing and the meaning of various LED patterns.*

Seven distinctive **tones** interact with system features:

1. Intercom dial
2. Central office dial
3. Splash
4. Busy
5. Intercept or error
6. Confirmation
7. Manual signaling

Distinctive **ringing** allows you to identify:

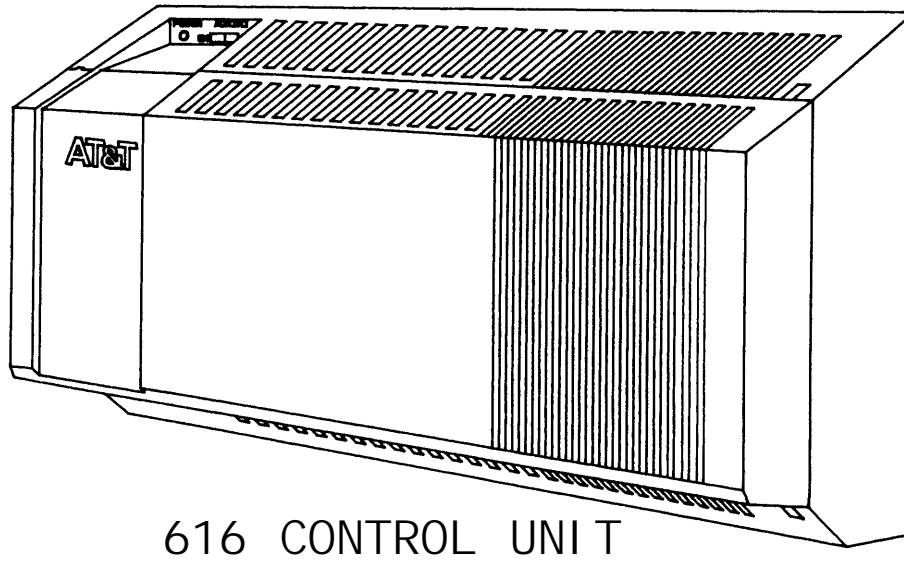
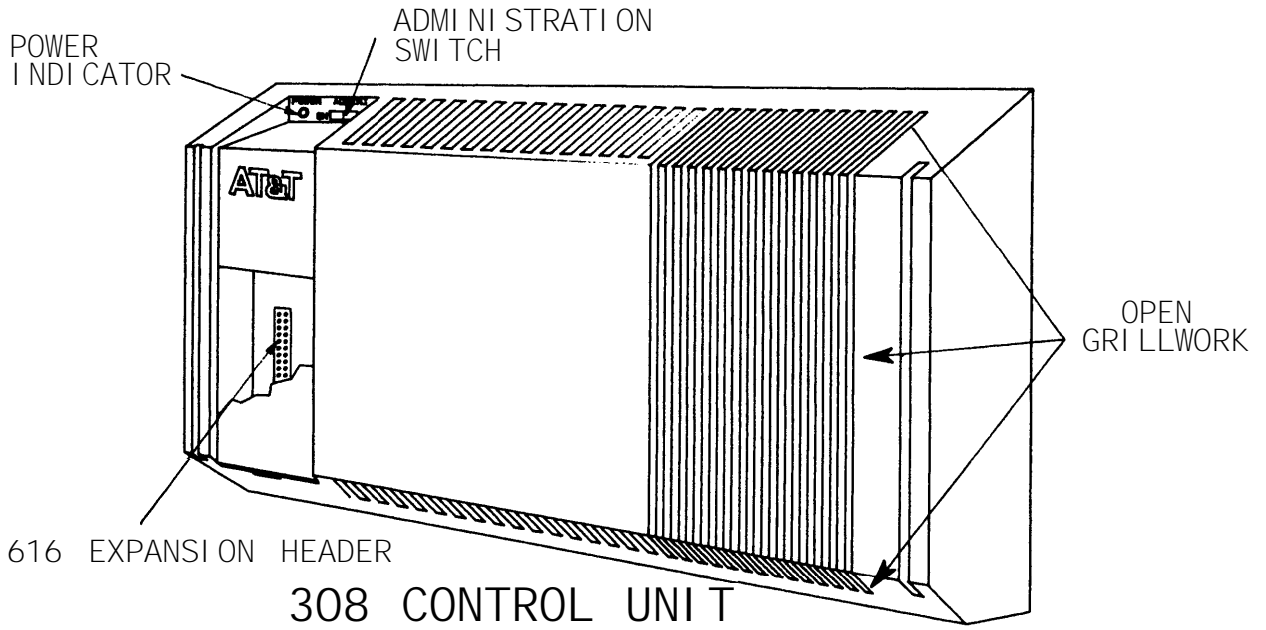
1. One ring as an inside or intercom call.
2. Two rings as a call from outside the system.
3. One short and one long ring as call transfer.
4. Three rings as line reserve or returned transfer.
5. One short, low volume ring as incoming call when station is busy.

## SPEEDCALLING

All speedcall numbers are assigned a 2-digit dial access code. There are two kinds of speedcall numbers:

1. **Personal** numbers are assigned by individual station users, and are accessed with digits 10 through 25. Each user may store 16 speedcall numbers.
2. **System** numbers are stored in the system memory and are accessed by all users. A maximum of 70 system numbers can be assigned; 50 unrestricted and 20 restricted.

*Refer to the System Administration Manual, Pages 24 and 25, for storing and erasing speedcall numbers.*



217-4 3/2 1

**FIGURE 9 - SYSTEM ADMINISTRATION OVERLAY MODEL  
308/616**

## ***SPIRIT* FEATURE ADMINISTRATION**

The system will function with the assigned default values when power is applied. Changes may be administered to system features affecting each CO line appearance or each station set. If choices for programmable features are administered, each feature should be tested to assure proper operation.

*SPIRIT* CS administration may be carried out from either a 6-button or a 24-button set. Three important steps are required for entering the administration mode:

1. The control unit ADMIN switch must be ON.
2. The administration overlay must be in place on station 10.
3. The set must be plugged into control unit jack 10 (**call processing is interrupted only at station 10**).

*Take time now to read Pages 4 through 17 of the Administration Manual. Pay special attention to the flowchart on Page 9; it is an excellent 1-page reference when you are administering a system. You will practice administration when you attend the class.*

---

<b>COMMON DESCRIPTION</b>	<b>MANUFACTURER'S DESCRIPTION</b>	<b>COMCODE</b>	<b>PEC CODE</b>
308 CONTROLLER	CNTRL-CS308A1	103985396	6030-308
616 EXPANSION UNIT	CNTRL-CS616A1	103985404	60301
6-BUTTON SET	SET TEL-CS6501C01A-215	104372339	3130-006
24-BUTTON SET	SET TEL-CS6502C01A-215	104372347	3130-024
HANDSET	K2N2-215 HANDSET	103985701	
6' HANDCORD	H4DU-215	104211305	
12' HANDCORD	H4DU-215	104211339	
WHEELLOCK DCI-48-48	EXTERNAL ALERT INTFC	405291568	60314

**FIGURE 10 - HARDWARE REPLACEMENT INFORMATION**

## SYSTEM MAINTENANCE

*Read Pages 17 and 18 of the Customer Installation Instructions. You will have a hands-on exercise to try these tests when you attend class.*

**CAUTION:** Initiating system self-test interrupts call-processing.

Control unit self-tests are made at connector location 10 from the ADMIN mode.

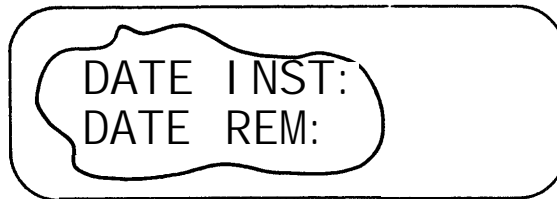
Software changes/corrections cannot be made in the field: all software-related problems are cleared by hardware replacement.

The programmable memory in the *SPIRIT* system is NOT replaceable. Therefore, replacement of the control unit requires readministration of the system. A copy of the customer **SYSTEM PLANNER** form (from the Administration Manual) **MUST** be retained at the control unit.

## WARRANTY AND MAINTENANCE OPTIONS

Maintenance options include on-premises service with business-day and 24-hour choices, with depot service as a secondary choice. Maintenance contracts cover the entire system, not just parts of it. During the ONE-YEAR warranty period or the term plan, business-day coverage is included in the purchase or term plan price, and 24-hour coverage, on-premises service is offered as an option. Post-warranty maintenance options include on-premises service with business-day, 24-hour coverage or depot service.

Station sets are shipped from the factory with information stickers affixed to each set. For tracking, note the installation date, and if a defective set is returned for repair, enter that date on the sticker.



Attach the AT&T Information Hotline sticker to the control unit where it is visible, to provide important information to the customer.

### EXAMPLE – STICKER

