

# SPIRIT<sup>®</sup> OPERATING TIPS

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***PROPRIETARY***

## **RINGING**

Telephone doesn't ring

- "DO NOT DISTURB" active.
- "DELAYED RINGING" on for that line.
- "ABBREVIATED RINGING" on for that line.
- Line set to "NO RINGING".
- User has "NO ACCESS" to the line.
- Telephone in use; receives one low-volume ring.
- Telephone involved in "ALL CALL PAGE".
- If the system is behind a PBX, call forwarding from the PBX may be active.

Intercom call doesn't ring

"DELAYED RING" or  
"ABBREVIATED RING" doesn't work

- "CALL FORWARD" is in effect.
- If the quiet part of CO ring cycle is longer than 5 seconds, SPIRIT treats each ring burst as a new call. A 4 sec interval is normal.
- If the system is behind a PBX, call forwarding from the PBX may be active.

Telephone rings but nobody there

- Someone else already answered call and/or automatic "PRIVACY" is active.
- Accidentally activated "LINE RESERVE".
- SPIRIT rings one more time than the CO.
- PBX feature call back.
- TRANSFERRED call is being returned but the calling party hungup already.
- If the system is behind a PBX, call forwarding from the PBX may be active.

Hear busy signal when trying to pickup  
call ringing on another station set

- User has no permission to access that line
- Other station is already on a call.  
"CALL PICKUP" can only be done for an idle station.
- Other station must be in the same group.

Station won't ring when "NIGHT SERVICE"  
(night ringing) is on

- Station has "NO ACCESS" to the lines.
- Lines set to "ABBREVIATED" or "DELAYED" ringing.
- Lines set to "NO RINGING".

***PROPRIETARY***

## CONFERENCING

Conference call disconnected when user hangs up

- When the originator of a conference call hangs up, the conference call will be disconnected.
- Conference call on hold does not have an originator, the first person to take the call off hold will become the originator. Thus when that person hangs up the call will be disconnected.

Can't "ADD" or "DROP" parties from a conference call

- Only the originator can add or drop parties from a conference call.
- Parties may not be added or dropped from a conference call that has been on hold unless the originator gets the call off HOLD.

Can't do a 4-way "INTERCOM" conference

- Only three SPIRIT stations may be involved in an intercom conference.

Can't "ADD" or "BRIDGE" a fifth party to a conference call

- The system only supports 4 party conference.

Can't do "INTERCOM"- "INTERCOM" conferencing

- Make sure second "INTERCOM" call is made on the unlit "INTERCOM" button.

Bridged call disconnected when conference is disconnected

- Conference overrides bridging, if a call was originally a bridged call, forming a conference from this call will cause the bridged call to be treated as a conference call.

Can't hear far end parties

- SPIRIT does not have a conference audio boosting circuit.

Two outside parties can't talk

- During a conference call involving two outside parties, the SPIRIT station must remain online, and should not be on "HOLD".

Far end parties can't hear each other

- Spirit does not have a conference audio boost circuit.
- Add one VFR5050 L1 Switched Gain Repeater per CO line. This is a way to 'fix' the problem. R-TEC Systems 817-540-8278

***PROPRIETARY***

## BRIDGING

Can't bridge onto a call

- "AUTOMATIC PRIVACY" is active.
- User has "NO ACCESS" to line.
- Tip/ring device plugged into "LINE AUX" jack has answered the call.
- Intercom bridging is prohibited.

Bridged call disconnected when conference is disconnected

- Conference overrides bridging, if a call was originally a bridged call, forming a conference from this call will cause the bridged call to be treated as a conference call.

## HOLD

Held call reminder sounds continuously

- No hold release on abandon, so if far-end party hangs up while on "HOLD", the Spirit still thinks the call is on hold.

Held call lost

- Someone else took call off "HOLD".
- Far-end party hung up; since no hold release on abandon, Spirit still thinks call is on hold.

Can't pick up held call at another station

- "EXCLUSIVE HOLD" is active.
- Station has "NO ACCESS" to that line.

Lines go on HOLD randomly

- Interference is being picked up by the station wiring. Install Z200A filters on the controller end of station wiring. You may need 451A adapters.

## REPERTORY SPEED CALLING

Can't program "PERSONAL SPEED CALL" numbers at station 10 (308/616)

- Administration switch on the controller is set to **ON**.

Can't reprogram "PERSONAL SPEED CALL" buttons (2448)

- A rep memory location can be associated with only one multi purpose button.

Press memory location and nothing happens

- Pressing an empty memory location will cause the telephone to go off-hook so the user hears dial tone, but nothing is dialed.
- User must be idle or connected to a line. If user is "HIGH AND DRY" and presses memory location, nothing will happen.

***PROPRIETARY***

Repertory dialer doesn't work

- Only SPIRIT compatible equipment can be supported. Non-SPIRIT items, such as repertory dialers cannot be plugged into the station set jacks.
- Some ancillary equipment will work when plugged into the AUX JACKS.

Can't dial "SYSTEM SPEED DIAL" numbers

- If station is "TOLL RESTRICTED", then it cannot dial toll numbers in the "RESTRICTED SPEED CALL" list, but can dial from "UNRESTRICTED SPEED CALL" list.
- If station is "OUTWARD RESTRICTED", then it can not dial any numbers in the "RESTRICTED SPEED CALL" list, but can dial from "UNRESTRICTED SPEED CALL" list.

Can't access TELEPHONE ANSWERING DEVICE remotely

- SPIRIT delivers a 75 mS Touch-Tone pulse. Even when manually dialing.
- TAD may require longer Touch-Tone pulse, rapid presses of the button may work, or try during quiet interval of message.

## GENERAL OPERATION

Controller software version numbers

- The LED patterns after a controller self test indicate software version numbers for the 308/616 and 1224/2448 controllers.

Version		MESS	HAFI	MUTE	SPKR	
Domestic	308	5.5	off	off	off	off
Hong Kong	308	1.1	off	off	on	off
Hong Kong	308	1.3	off	on	off	off
Hong Kong	308	1.5	off	on	on	off
Taiwan	308	1.1	off	off	on	on
Taiwan	308	1.2	off	on	off	on
Taiwan	308	1.3	off	on	on	on
Singapore	308	1.2	on	off	off	on
Thailand	308	1.2	on	off	on	off
Australia	308	1.1	on	off	on	on
Domestic	308	special	flash	flash	flash	flash
Domestic	2448	6.1	off	off	off	off
Domestic	2448	6.3	off	off	off	on
Hong Kong	2448	1.1	off	off	on	off
Taiwan	2448	1.0	off	off	on	on
Domestic	2448	special	flash	flash	flash	flash

Hear cross-talk during self-test

- Normal operation for self-test.

## ***PROPRIETARY***

Can't invoke controller self test

- All 48 button adjuncts must be disconnected.
- Must be using handset.
- All station sets must be idle.

"IDLE LINE SELECTION" does not choose line #1 (2448)

- This change was made in version 6.3 to prevent inadvertent answering of incoming calls on a hunt group.

Clear administration

- Enter administration mode - dial 009009  
This sets all **admin** to factory settings.

Clear Ram

- Enter administration mode - dial 85192#  
This will clear **everything** from memory, including **all** speedcall numbers.

Can't reprogram "MULTI PURPOSE BUTTONS" (1224/2448)

- Cannot program more than one button for the same feature at the same time.
- If a button is linked to a memory location, the memory location must be erased before the button can be used for other features.
- Administration must be changed to allow a line button to be programed for other uses.

Allow 800 numbers at toll-restricted set

- Store '1800' in an unrestricted(30-79) system speed call location. User can dial speed call location from restricted station, then the last 7 digits of the number.

Station Message Detail Recording (1224/2448)

- Use a serial printer set for 1200 baud, 1 stop bit, no parity.
- AUX JACK usage is printed by SMDR.

48 Button Adjunct (1224/2448)

- Provides Busy Lamp Field and DSS.
- 2448 will support as many as 24, each one must be paired with a station set.
- Must be unplugged during controller self test.

Going off hook causes a bee-beep sound

- The installer plugged the CO lines into the AUXILIARY jacks instead of the CO jacks.

No dial tone

- Lines set for "NO ACCESS".
- Lines set for "NOT ELIGIBLE" for "IDLE LINE PREFERENCE", user must first press a line button.
- All available lines are in use.
- Some lines have been administered as "NOT AVAILABLE".

***PROPRIETARY***

LEDs turn on and off randomly

- Interference is being picked up by the station wiring. Install Z200A filters on the controller end of station wiring. You may need a 451A adapter to use the filter.
- If unplugging / plugging a station set temporarily fixes the problem, the data pair has a loose connection on one of the wires.

Handset sidetone but no LEDs

- The data pair is reversed or one wire is broken.
- If unplugging / plugging a station set temporarily fixes the problem, the data pair has a loose connection on one of the wires.

Dialtone is weak and distorted on a station set

- One wire of the audio pair is broken or loose.

Busy tone on INTERCOM

- 308/616 has 2 intercom paths
- 1224/2448 has 6 intercom paths  
all paths are pooled under the buttons.

Off premise extensions

- SPIRIT does not support OPX.

Can't "MANUAL SIGNAL" or "TRANSFER" to telephone

- "DO NOT DISTURB" active.
- Other telephone is unplugged.

"LINE RESERVE" callback canceled

- Tip/ring device plugged into "LINE AUX" jack has answered the call.

"MUTE" indicator flashes

- "DO NOT DISTURB" is active.  
Turn it off with 'SPKR-INT-#-2'

Radio interference on the speaker or handset

- Need the latest version of station set.  
New 24b set is CS6502C01E.  
Comcode 105421937.  
New 6b set is CS6501C01E.  
Comcode 105421929.
- Another improvement in on-hook RFI operation was made after date code of '88200'.

Plugged station set in and "MESSAGE" light is on

- The system allows you to turn on the message light at an unplugged station port.

Sometimes the indicators for buttons 26 and 27 turn on (308/616)

- If buttons 26 or 27 have been programmed for "LOUDSPEAKER PAGING" or "ALL CALL PAGING", when those features are used by anyone in the system, those indicator lights will turn on.

## **VOLUME LEVELS**

### ***PROPRIETARY***



Can't set volume control

- Holding down the "VOLUME" control continuously changes the volume only one step. Press and release for each step you want to change.
- Volume control button is used for controlling the speaker, the handset, and the ringer.

Can't hear on handset

- Increase volume of handset by pressing and releasing the "VOLUME" control while on handset.
- System provides a total of 9.0DB of boost. This may not be enough for hard-of-hearing.
- Phone Center has 'INLINE AMPLIFIER' It provides hard-of-hearing capability. Comcode 405745084

Speakerphone has problems with background noise

- Need new version station set from maintenance. New 24b set is CS6502C01E. Comcode 105421937. New 6b set is CS6501C01E. Comcode 105421929.
- This may help, depending on the noise level.

Can't use acoustic coupler on modem

- Need to seat handset completely. The rubber cups must be flexible enough to fit the handset ends.
- A non-SPIRIT handset will **not** work.
- Adjust "VOLUME" control to mid-range.

Amplified Handset

- Most other amplified handsets will not work.
- Clamp on CP Portable Amplifier. \$25

Handset amplifier adjuncts

- Will work if powered by batteries or the AC power line.
- Phone Center Stores have one. \$34.95 SKU 59984 Comcode 405745084

## **SYSTEM SPECS**

INTERCOM Channels

- All paths are pooled under the buttons. 308/616 has 2 intercom paths 1224/2448 has 6 intercom paths
- A two station intercom call uses one path.
- A three station intercom call uses two paths.
- Station paging uses one intercom path.
- Transferred calls do not use a path.
- Conferenced CO calls do not use a path.

***PROPRIETARY***

- External Alert Jack Interface
- Max Relay Ratings - 10VA, 100V, 500mA resistive load.
  - Relay contacts connect pin 4 and 5 of a 6 conductor jack.
  - Three alert adapters can be paralleled at the controller ALERT JACK to drive more alerts.
- Paging Interface (308/616)
- Audio is on pins 3 and 4, relay contacts are on pins 2 and 5, of a six conductor jack.
  - Audio level is the same as on a CO port.
  - Max Relay Ratings - 10VA, 100V, 500mA resistive load.
  - Paging port does not support talkback on early units.
  - Talkback is supported on newer units with built-in lightning protection.
- LED Brightness
- Typically 15 milicandelas or 200 NITS.
- Reliability
- Calculated Mean Time Between Failure
 

308 controller	142 months
616 expansion	222 months
308/616 combination	87 months
1224 minimum config 408	135 months
1224 controller full	73 months
2448 controller full	41 months
6 btn station set	166 months
24 btn station set	125 months
308 with 5 stations	27 months
- Weights
- Weights of the controllers
 

308 controller	6 lbs, 12 oz
616 expansion	1 lb, 8 oz
308/616 combination	8 lbs, 4 oz
1224 controller full	9 lbs, 1 oz
2448 controller full	17 lbs, 15 oz
1224 power supply	3 lbs, 10 oz
- Power consumption
- 308 uses a max of 65 watts (.55A x 120V).
  - 616 uses a max of 95 watts (.8A x 120V).
  - 1224 uses a max of 200 watts (1.6A x 120V).
  - 2448 uses a max of 375 watts (3.1A x 120V).
- Power supplies
- Data is held for 3 days without power after unit has been powered for 2 days.
  - Uninterruptible power supplies.
    - SOLA model 400SPSA.
    - SOLA model SPS450A
    - TOPAZ model 84462.

***PROPRIETARY***

- SPIRIT can use most square wave units.

## ANCILLARY DEVICES

### Paging

- All paging equipment must be plugged into a 147A or equivalent for AC surge protection.
- 2448 may need Loop Start Trunk Adapter to simulate page port. PEC 53518
- Loop start trunk adapter needs external 24Volts when used with CPE.
- Any speakers that exit the building must have gas tube primary protectors installed on the wiring.
- Paging port does not support talkback on early units.
- Talkback is supported on units with built-in lightning protection.

### Doorphone unit

- Third party units are available for this.
- Algo Communication Prod. Ltd. 604-438-3333  
Doorphone Kit 90003-006 \$250  
will plug into a CO port and 'look / act' like a CO with a speakerphone at the door.  
Latch Driver 90003-106 \$65 will add TT control of a door latch.
- Viking Electronics, Inc. 715-386-8861  
W-1000 / W-2000 Handsfree Doorbox will plug into a CO port and 'look / act' like a CO with a speakerphone at the door.  
The RC-2A Touch Tone Controller will add TT control of a door latch.

### External Alerters

- Associated with CO lines, not stations.
- Any alerts that exit the building must have gas tube primary protectors installed.
- Alert Interface PEC 60314.
- Two types, same PEC code.  
The unit with screw terminals can damage the controllers, it should be replaced with the new correct interface.
- Correct interface WP-91683-L1.  
New unit Com Code 405712928.  
Has modular connectors for the alerter power and controller EXTERNAL ALERT jack connections. Drives 5 alerters.
- Three alert adapters can be paralleled at the controller alert jack to drive more alerters.
- Loud Station Alert Module (SAM) interface

**PROPRIETARY**

- 112B PEC 60315 Com-code 105675532  
Can be used as external alert interface.  
Must have a 'reversal' in the wiring, like standard mounting cord, between the alert interface and the EXTERNAL ALERT jack.
  - Only one SAM can be used in the EXTERNAL ALERT jack. Drives 3 alerters.
  - Alerters from source book, same as MERLIN.
    - Bell PEC 61212A
    - Horn PEC 61213A
    - Deluxe Chime PEC 61222A
    - Strobe PEC 61221A
    - Deluxe Horn PEC 61223A
- Station Alert Module
- 112B PEC 60315 Com-code 105675532  
Drives 3 alerters, available 4/89.  
Drives standard Merlin alerts.  
Plugs in series with the station set wiring.
  - Can also be used as external alert interface.  
Must have a 'reversal' in the wiring, like standard mounting cord, between the alert module and the EXTERNAL ALERT jack.
  - Any alerts that exit the building must have gas tube primary protectors installed on the wiring.
- Headset
- Cannot remote control the switch hook.
  - Star-mate E PEC 3122-304A
  - Much Better Headset KS 23529-L6  
PEC 3122-314 405693953  
Misty Cream in color, matches Spirit.  
Phone Center Stores also carry it. \$99.99  
SKU59994 405693987  
Gray in color.
- Long cords
- 25 foot mounting cords PEC 2725-025.
  - 12 foot handset cords PEC 2725-01L.
- SPIRIT stations in different building than the controller
- IROB PEC 31304 two sets needed per station run, one in each building. The 1000 ft range limit does not change.
- Surge protectors
- Built in lightning surge protection.  
4Q88 for 2448.  
1Q89 for 308/616.
  - Built in protection is indicated by the marking 'W/P' on the label.
  - Surge Protector PEC 8310-003, model 147A.  
Provides 2 AC outlets and 4 CO jacks.

***PROPRIETARY***

- Should only be used with controllers that do not have built in protection.
- Surge Protector PEC 83100, model 146A  
Up to 3 can be added to a 147A to provide protection for up to 16 CO lines.

## ORDERING INFORMATION

Domestic product

- CS308A1 Controller  
PEC 6030-308 103985396
- CS308E1 Controller  
PEC 6030-308 105441141  
Full lightning protection built in. avail 1Q89
- CS616A1 Expansion Controller  
PEC 60301 103985404
- CS616A1 Expansion Controller  
PEC 60301 105441158  
Full lightning protection built in. avail 1Q89
- CS1224A1 Controller  
PEC 60311 103985370
- CS1224A1 Controller  
PEC 60311 105468714  
Full lightning protection built in. avail 4Q88
- CS2448A1 Expansion Controller  
PEC 60311 103985388
- 1224A Apparatus Box 105342430  
Just the main card cage for repair stock.
- 2448A Apparatus Box 105380836  
Just the expansion card cage for repair stock.
- 1211A Power Unit 105341515  
1224/2448 Power Supply  
Repair stock.
- 1211B Power Unit 105468730  
1224/2448 Power Supply  
Full lightning protection built in. avail 4Q88
- D-181943 Kit of Parts 105452668  
1224/2448 circuit pack retainer bar.
- CCS1 Circuit Pack 103986352  
PEC 60312  
1224/2448 Line card for 4 CO lines.
- CCS3 Line Circuit Pack 105468722  
PEC 60313  
1224/2448 Line card for 4 CO lines.  
Full lightning protection built in. avail 4Q88
- CCR1 Circuit Pack 103986337  
1224/2448 Processor card.
- CCR2 Circuit Pack 103986345  
1224/2448 Station card for 8 stations.
- CS6501C01B Telephone Set

**PROPRIETARY**

- PEC 3130-006 105276968  
Six button station set.
- CS6501C01E Telephone Set  
PEC 3130-006 105421929  
New '4.8' six button version.
- CS6502C01B Telephone Set  
PEC 3130-024 105276885  
24 Button station set.
- CS6502C01E Telephone Set  
PEC 3130-024 105421937  
New '4.8' 24 button version.
- CS48A01 Expansion set  
PEC 60310 104372354  
1224/2448 Attendant adjunct.
- 112B Interface Unit (SAM)  
PEC 60315 105675532  
Provides LOUD STATION ALERTING  
or external alerter interface function  
with standard alerters.
- WP-91683 Alert Adapter  
PEC 60314 405712928  
External alerter interface for loud alerters.
- In-Line Handset Amplifier 405745084  
Phone Center Stores carry it. \$34.95  
SKU 59984
- Star-mate E Headset  
PEC 3122-304A
- Much Better Headset KS 23529-L6  
PEC 3122-314 405693953  
Misty Cream in color, matches Spirit.  
Phone Center Stores also carry it. \$99.99  
SKU59994 405693987  
Gray in color.
- Handset K2N2 103985701  
Misty Cream handset for Spirit
- Handset Cord H4DU-215 Misty Cream  
6 ft. Blister pack 105176648  
12 ft. Blister pack 105176655  
6 ft. Individual bagged 104211313  
12 ft. Individual bagged 104211339
- 451A Adapter 103768240  
Use with Z200A Filters at station sets.
- Z200A Filter 103965208  
For use on the station wiring to stop RFI.

***PROPRIETARY***

## GENERAL GUIDELINES

When installing a SPIRIT system in place of an existing telephone system that also has a paging system, there are several things that can help determine what type of interface exists:

### A. Type of Speaker Connection

If the wires leading to the speakers originate from within the telephone system controller box, then the PA system is probably integrated with the telephone system and a new PA system will have to be installed. If the speaker leads originate from a separate interface box, there is a **chance** that the present PA system can be used with SPIRIT 308/616.

### B. Type of Speakers Used

There are three types of speakers typically used:

1. VOICE COIL — This type of speaker usually looks like a regular speaker in an enclosure with a volume control. These **can be reused** with **most** PA systems.
2. 70 VOLT — This type of speaker looks like a regular speaker with a small transformer and volume control connected in the speaker wiring. These **can be reused** with **most** PA systems.
3. AMPLIFIED SPEAKER — This type of speaker is a voice coil speaker with a small amplifier built into the enclosure. This type of speaker does not need a PA amplifier, only a PA interface to the telephone system. This type of speaker system can be identified by the fact that there is a 24-volt power supply included in the speaker wiring.

### C. Type of User Access

If the user accesses the present PA system with a button that could also be a CO line button, the PA interface is probably a loop start system (type 3 above). SPIRIT 308/616 can be used in the loop start mode.

If the user accesses the present PA system with a special PAGE button or an intecom button, the PA interface is probably a page port system (type 2 above). SPIRIT 308/616 can be used in the page port mode.

### D. Number of Wires to a PA Interface

If the PA interface is connected to the telephone system with just two wires, it is probably a loop start interface and can be used with SPIRIT 308/616. If this type of PA interface is used with 308/616 the user must access the PA system via a line button instead of the intercom dial code.

If the PA interface is connected to the telephone system with four wires, it may be a page port type of interface. This interface can be used with SPIRIT 308/616 per interface type 2 above.

### E. Centrex Interface

If the present PA interface is being used on a Centrex system, the interface sometimes looks like a station set. This type of interface can **not** be used with the SPIRIT system.

**AT&T – PROPRIETARY**

Use pursuant to Company Instructions

# PAGING

The purpose of this package is to provide information to sales/services personnel regarding commercially available paging systems and their compatibility with SPIRIT 308/616. This is being done so that AT&T reps can assess the usefulness of systems for those customers who already have paging systems installed.

There are two basic types of information provided here:

- I. Guidelines on specific paging products that will likely work with SPIRIT 308/616.
- II. Guidelines on how to determine whether or not **any** paging product will likely work SPIRIT 308/616.

All of this information was compiled and developed by Ted Burger, of CP Labs in Indianapolis.

- I. Ted reviewed literature on the most widely installed paging systems from the following manufacturers. Following is Ted's assessment of their compatibility with the SPIRIT 308/616 systems:

- Information on 2448 compatibility is available at National Technical Marketing

## BOGEN

Model PAM — This unit is an interface module for use between a telephone system and a paging amplifier or amplified speakers. It will require the dedication of a CO line jack for its use. This unit will work with SPIRIT 308/616. It must be used as a 'LOOP START' system, so it will not work with the page port. Set its ACCESS MODE SWITCH for manual operation.

To install:

- Connect pins 29-30 to an unused CO line port on the 308/616
- Connect pins 4-5 to PA amplifier/system
- Connect pins 18-19 to optional background source
- Do not use the SIGNAL (pin 23) connection
- Connect an external 24V power source

Model SAM — This unit will **not** work with the SPIRIT 308/616 system.

## DUKANE

Model 9A1565 — This unit is an interface module for use between a telephone system and a paging amplifier or amplified speakers. It will require the dedication of a CO line jack for its use. This unit will work with the SPIRIT 308/616. It must be used as a 'LOOP START' system, so it will not work with the page port. See its 'ACCESS MODE SWITCH' for manual operation.

To install:

- Connect pins 1-2 to an used CO line port on the 308/616
- Connect pins 11-13 to PA amplifier/system
- Connect pins 10-12 to optional background source
- Do not use the SIGNAL (pin 15) connection
- Connect an external 24V power source

Model 9A1571 — This unit will **not** work with the SPIRIT 308/616 system.



## HARRIS DRACON

Model PagePac 20 Power Mate — This unit consists of an integrated telephone system interface and PA amplifier. It can be used with a 'page port' interface and will work with SPIRIT 308/616. Interconnection of this unit is very straight-forward; simply plug the supplied cord into the page port on the 308/616 and into the Power Mate.

## VALCOM

Model V-1094 — This unit is an interface module for use between a telephone system and a paging amplifier or amplified speakers. This unit is intended to be used with a page port such as the one on SPIRIT 308/616, but the literature indicates that it does not have a dry contact interface control. If this is true, there may be noise on the PA system.

Model V-9940 — This unit will **not** work with the SPIRIT 308/616 system.

Model V-9941 — This unit is an interface module for use between a telephone system and a paging amplifier or amplified speakers. It will require the dedication of a CO line jack for its use. This unit will work with SPIRIT 308/616. It must be used as a 'LOOP START' system, so it will not work with the page port.

Model V-9937 — This unit is an interface module for use between a telephone system and a paging amplifier or amplified speakers. It is designed for use with a page port interface only. It will work with SPIRIT 308/616.

## WHEELLOCK

Model ZC-3 — This unit is an interface module for use between a telephone system and a paging amplifier or amplified speakers. It will require the dedication of CO line jack for its use. This unit will work with SPIRIT 308/616. It must be used as a 'LOOP START' system, so it will not work with the page port.

II. The following provides some guidelines on determining whether **any** paging (Public Address) system would likely work with SPIRIT 308/616.

There are four basic types of telephone/public address system interaction:

1. Internal systems where the PA (Public Address) amplifier is part of the telephone system.
2. External systems where the PA amplifier is connected to the telephone system by means of a special paging port. (308/616)
3. External systems where the PA amplifier is connected to the telephone system by means of a CO line port and used in the loop start mode. (308/616)
4. External systems where the PA amplifier is connected to the telephone system by means of a station port.

The SPIRIT 308/616 has a paging port interface for PA systems. This interface consists of a modular jack on the controller. The center two wires (red-green) of this jack carry the audio signal for the PA system. The next two wires (black-yellow) of this jack are connected to a normally open relay contact in the controller. When a user dials the code for PA access, the controller closes this relay contact providing a signal to the PA interface to activate the speaker system. Some PA systems may need additional dial codes to access their features.

Therefore the 308/616 can use either type 2 with its separate page port or type 3 with a CO jack.

CAN'T HEAR ON  
HANDSET

- INCREASE VOLUME OF HANDSET BY PRESSING AND RELEASING THE "VOLUME" CONTROL WHILE ON HANDSET.
- SYSTEM PROVIDES A TOTAL OF 9 ODB OF BOOST. THIS MAY NOT BE ENOUGH FOR HARD-OF-HEARING.
- PHONE CENTER HAS 'IN LINE AMPLIFIER'. IT PROVIDES HARD-OF-HEARING CAPABILITY. COMCODE 405745084

SPEAKERPHONE HAS  
PROBLEMS WITH  
BACKGROUND NOISE

- NEED NEWEST VERSION STATION SET FROM MAINTENANCE. 24B SET IS CS6502C01E. COMCODE 105421937. 6B SET IS CS6501C01E. COMCODE 105421929.
- THIS MAY HELP, DEPENDING ON THE NOISE LEVEL.

CAN'T USE ACOUSTIC  
COUPLER ON MODEM

- NEED TO SET HANDSET COMPLETELY. THE RUBBER CUPS MUST BE FLEXIBLE ENOUGH TO FIT THE HANDSET ENDS.
- A NON-SPIRIT HANDSET WILL **NOT** WORK.
- ADJUST "VOLUME" CONTROL TO MID-RANGE.

AMPLIFIED HANDSET

- MOST OTHER AMPLIFIED HANDSETS WILL NOT WORK.
- CLAMP ON CP PORTABLE AMPLIFIER. \$25.

HANDSET AMPLIFIED  
ADJUNCTS

- WILL WORK IF POWERED BY BATTERIES OR THE AC POWER LINE.
- PHONE CENTER STORES HAVE ONE. \$34.95 SKU 59984 COMCODE 405745084.

## SYSTEM SPECS

RELIABILITY

- |  |            |
|--|------------|
| • CALCULATED MEAN TIME BETWEEN FAILURE | 142 MONTHS |
| 308 CONTROLLER                         | 222 MONTHS |
| 616 EXPANSION                          | 87 MONTHS  |
| 308/616 COMBINATION                    | 135 MONTHS |
| 1224 MIINIMUM CONFIG 408               | 73 MONTHS  |
| 1224 CONTROLLER FULL                   | 41 MONTHS  |
| 2448 CONTROLLER FULL                   | 166 MONTHS |
| 6 BTN STATION SET                      | 125 MONTHS |
| 24 BTN STATION SET                     | 27 MONTHS  |
| 308 WITH 5 STATIONS                    |            |

WEIGHTS

- |                              |               |
|------------------------------|---------------|
| • WEIGHTS OF THE CONTROLLERS | 6 LBS, 12 OZ  |
| 308 CONTROLLER               | 1 LBS, 8 OZ   |
| 616 EXPANSION                | 8 LBS, 4 OZ   |
| 308/616 COMBINATION          | 9 LBS, 1 OZ   |
| 1224 CONTROLLER FULL         | 17 LBS, 15 OZ |
| 2448 CONTROLLER FULL         | 3 LBS, 10 OZ  |
| 1224 POWER SUPPLY            |               |

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## POWER CONSUMPTION

- 308 USES A MAX OF 65 WATTS (.55A X 120V).
- 616 USES A MAX OF 95 WATTS (.8A X 120V).
- 1224 USES A MAX OF 200 WATTS (1.6A X 120V).
- 2448 USES A MAX OF 375 WATTS (3.1A X 120V).

## POWER SUPPLIES

- DATA IS HELD FOR 3 DAYS WITHOUT POWER AFTER UNIT HAS BEEN POWERED FOR 2 DAYS.
- UNINTERRUPTIBLE POWER SUPPLIES.  
SOLA MODEL 400SPSA.  
SOLA MODEL SPS450A.  
TOPAZ MODEL 84462.
- SPIRIT CAN USE MOST SQUARE WAVE UNITS.

## ANCILLARY DEVICES

### PAGING

- LOOP START TRUNK ADAPTER (PEC 53518) OR PAGE PAC PORT SAVER (PEC 53519) IS REQUIRED WHEN USING LINE PORT ON SPIRIT 2448.

### DOORPHONE UNIT

- A THIRD PARTY UNIT IS AVAILABLE FOR THIS. VIKING ELECTRONICS, INC. 715-386-8861 W-1000/W-2000 HANDSFREE DOORBOX WILL PLUG INTO A CO PORT AND 'LOOK/ACT' LIKE A CO WITH A SPEAKERPHONE AT THE DOOR. THE RC-2A TOUCH TONE CONTROLLER WILL ADD TT CONTROL OF A DOOR LATCH.

### EXTERNAL ALERTERS

- ASSOCIATED WITH CO LINES, NOT STATIONS. ALERT INTERFACE PEC 60314 (SPIRIT POWER SUPPLY) COMCODE 405712928. HAS MODULAR CONNECTORS FOR THE ALERTERS AND CONTROLLER EXTERNAL ALERT JACK. DRIVES 5 ALERTERS. TWO ALERT ADAPTERS CAN BE PARALLELED AT THE CONTROLLER FOR MORE ALERTERS.
- ASSOCIATED WITH CO LINES AND STATIONS. SPIRIT ALERT MODULE PEC 60315 COMCODE 105675532 DRIVES UP TO 3 STANDARD MERLIN ALERTS. PLUGS IN SERIES WITH THE STATION SET WIRING. MUST HAVE A 'REVERSAL' IN THE WIRING, LIKE STANDARD MOUNTING CORD, BETWEEN THE ALERT MODULE AND THE EXTERNAL ALERT JACK.
- ALERTERS FROM SOURCEBOOK, SAME AS MERLIN.  
BELL  
HORN  
DELUXE CHIME  
STROBE  
DELUXE HORN

PEC 61212A  
PEC 61213A  
PEC 61222A  
PEC 61221A  
PEC 61223A

### LONG CORDS

- 25 FOOT MOUNTING CORDS PEC 2725-025.
- 12 FOOT HANDSET CORDS PEC 2725-01L.

SPIRIT STATIONS IN  
DIFFERENT BUILDING  
THAN THE CONTROLLER

- IROB PEC 31304 TWO SETS NEEDED PER STATION RUN, ONE IN EACH BUILDING.

SURGE PROTECTORS

- ALL NEW 2448 INCLUDE BUILT IN LIGHTNING SURGE PROTECTION.
- 3Q89 FOR 308/616.
- SURGE PROTECTOR PEC 8310-003, MODEL 147A. PROVIDES 2 AC OUTLETS AND 4 CO JACKS. SHOULD ONLY BE USED WITH CONTROLLERS THAT DO NOT HAVE BUILT IN PROTECTION.
- SURGE PROTECTOR PEC 83100. MODEL 146A UP TO 3 CAN BE ADDED TO A 147A TO PROVIDE PROTECTION FOR UP TO 16 CO LINES.

## ORDERING INFORMATION

DOMESTIC PRODUCT  
PEC/COMCODE

- CS308A1 CONTROLLER  
PEC 6030-308 103985396
- CS308E1 CONTROLLER  
PEC 6030-308 105441141  
FULL LIGHTNING PROTECTION BUILT-IN AVAILABLE 3Q89.
- CS616A1 EXPANSION CONTROLLER  
PEC 60301 103985404
- CS616E1 EXPANSION CONTROLLER  
PEC 60301 105441158  
FULL LIGHTNING PROTECTION BUILT-IN AVAILABLE 3Q89.
- CS1224E1 CONTROLLER  
PEC 6031-408 105468714  
INCLUDES FULL LIGHTNING PROTECTION.
- CS2448E1 EXPANSION CONTROLLER  
PEC 60311 105468896
- 1224A APPARATUS BOX 105342430  
JUST THE MAIN CARD CAGE FOR REPAIR STOCK.
- 2448A APPARATUS BOX 105380836  
JUST THE EXPANSION CARD CAGE FOR REPAIR STOCK.
- 1211B POWER UNIT 105468730  
1224/2448 POWER SUPPLY LIGHTNING PROTECTION  
BUILT IN.
- CS704A POWER UNIT (DS250) 105512081  
1224/2448 POWER SUPPLY  
INTERCHANGEABLE WITH 1211B POWER UNIT. LIGHTNING  
PROTECTION BUILT IN.
- CCS3 LINE CIRCUIT PACK 105468722  
PEC 60312  
1224/2448 LINE CARD FOR 4 CO LINES. LIGHTNING  
PROTECTION BUILT IN.

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• CCR1 CIRCUIT PACK 1224/2448 PROCESSOR CARD.	103986337
• CCR2 CIRCUIT PACK PEC 60313 1224/2248 STATION CARD FOR 8 STATIONS.	103986345
• CS6501C01B TELEPHONE SET PEC 3130-006 SIX BUTTON STATION SET.	105276968
• CS6501C01E TELEPHONE SET PEC 3130-006 '4.8' SIX BUTTON VERSION.	105421929
• CS6502C01B TELEPHONE SET PEC 3130-024 24 BUTTON STATION SET.	105276885
• CS6502C01E TELEPHONE SET PEC 3130-024 '4.8' 24 BUTTON VERSION.	105421937
• CS48A01 EXPANSION SET PEC 60310 1224/2448 ATTENDANT ADJUNCT.	104372354
• SPIRIT ALERT MODULE PEC 60315 PROVIDES LOUD LINE OR STATION ALERTING	105675532
• WP-91683 SPIRIT POWER SUPPLY PEC 60314 EXTERNAL ALERTER INTERFACE FOR LOUD LINE ALERTING.	405712928
• IN-LINE HANDSET AMPLIFIER PHONE CENTER STORES CARRY IT. \$34.95 SKU 59984	405745084
• STAR-MATE E HEADSET PEC 3122-304A	405693987
• HEADSET WITH IMPROVED AUDIO	103985701
• HANDSET K2N2 MISTY CREAM HANDSET FOR SPIRIT	
• HANDSET CORD H4DU-215 MISTY CREAM 6 FT. BLISTER PACK	105176648
12 FT. BLISTER PACK	105176655
6 FT. INDIVIDUAL BAGGED	104211313
12 FT. INDIVIDUAL BAGGED	104211339
• 451A ADAPTER USE WITH Z200A FILTERS.	103768240
• Z200A FILTER FOR USE ON THE STATION WIRING TO STOP RFI.	103965208

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