

Dispatch Telephone System



GENERAL SYSTEM FEATURES

- An Electronic Key Telephone System (EKTS) specifically designed for PSAPs and dispatch centers.
- Handles from 9 to 99 lines, from 1 to 30 stations.
- Optional integrated TDD, Instant Recall Recorder and Caller ID capability.
- Interfaces to most E 9-1-1 ANI/ALI systems.
- Built-in interfaces to external recorders, TDDs and radio headsets.
- Meets or exceeds over 10 industry specifications including NENA-04-001 "Generic Standards for E 9-1-1 PSAP Equipment."

QUICK TO INSTALL

- Skinny wire station cable and absence of cross connects saves labor by making installation simple. Little knowledge of telephone systems is required.

ECONOMICAL UPGRADE

- Field expandable in 10-line increments without discarding existing hardware.

RELIABLE

- Fault-tolerant architecture minimizes the impact of a single failure.
- Line Check option immediately indicates loss of CO line continuity.

EASY TO USE

- Advanced features such as Priority Answer, Distinctive Ringing, 40 Character LCD, Supervisory Monitor, 320 Number Memory Dial Capacity, and Call Counters

INTRODUCTION

The Series 3100 Dispatch Telephone System is an Electronic Key Telephone System (EKTS) designed for use in critical applications such as public safety, utility and industrial dispatch centers. The Series 3100 utilizes a distributed architecture and digitally processed audio to provide an exceptional level of performance, flexibility, and reliability. The System can handle from 9 to 99 lines and from 1 to 30 stations (positions). When properly configured it is compliant with the *NENA Generic Standard for E 9-1-1 PSAP Equipment*, NENA-04-001.

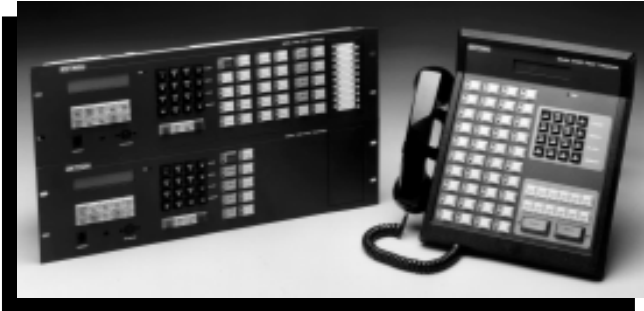
A number of unique standard features of the Series 3100 increase operator productivity while reducing workload, stress and fatigue. With additional options the Telephone Consoles can serve as an Instant Recall Recorder, TDD and Caller ID Display.

The System also provides a number of features for the installer and maintainer of the system; features which reduce installation labor and help to ensure low downtime. Reliability is a key theme of the Series 3100 Dispatch Telephone System.

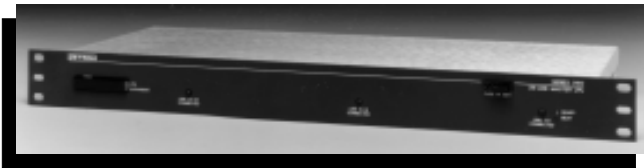
COMPONENTS

The Series 3100 Dispatch Telephone System consists of one or more Telephone Stations and a Key Service Unit (KSU).

Telephone Station Components



- **Telephone Consoles** - Currently, two 5.25" high x 19" wide rack or panel mount Telephone Consoles are available. The Model 3110R comes equipped with 9 line keys and the Model 3130R comes equipped with 29 line keys. Both models may be field expanded in increments of 10 lines for a maximum capacity of 99 lines each. The Model 3140D, a desktop telephone console equipped with 39 line keys (non-expandable), is also available.



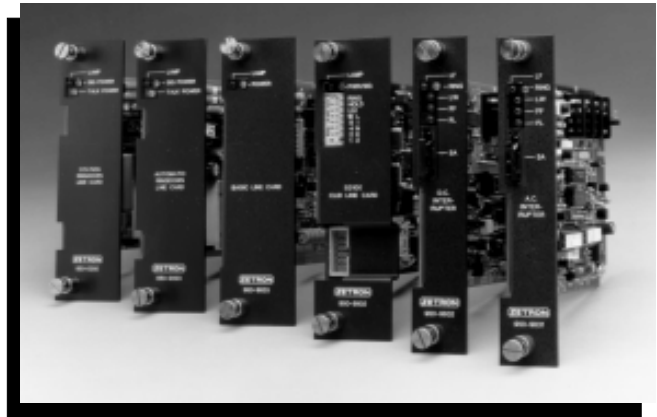
- **Line Pickup Units (LPUs)** - Each Telephone Console has one or more associated rackmount LPUs which are typically located near the KSU equipment. The LPUs are a switch matrix dedicated to each Telephone Console which prevents a failure of an LPU from affecting the rest of the system. A single LPU may support 9, 19 or 29 lines. Expander LPUs support an additional 10, 20 or 30 lines each. Multiple Expander LPUs may be added to a Telephone Console for a maximum capacity of 99 lines.

KSU Components



- **Line Card Shelves** - One or more Shelves are required. The first Shelf has provisions for 9 Line Cards. Subsequent Shelves have provisions for 10 Line Cards. Up to ten Shelves may be combined for a maximum capacity of 99 lines. Each Shelf also has provisions for an Interrupter Card.

- **Line Cards** - Each telephone line connected to the KSU requires a Line Card. Line Cards plug into the Line Card Shelf. Several types of Line Cards are available from Zetron: the Basic Line Card for standard loop-start (POTS) lines, the Caller ID Line Card for Caller ID equipped loop-start lines, the Manual Ringdown Line Card for AC signaled point-to-point lines, the Automatic Ringdown Line Card for DC signaled point-to-point lines, and the Station Ringdown Line Card for applications such as door intercoms. The Caller ID Line Card has a Line Check feature which monitors the associated CO or PBX line for continuity and indicates a continuity problem immediately.



- **Interrupter Cards** - These Cards generate the interrupted line status signals required by the Line Cards and the Telephone Stations. A minimum of one Interrupter Card is required for every three Line Card Shelves. However, for greatest fault tolerance an Interrupter Card for each Line Card Shelf is recommended. Interrupter Cards are available for either AC or DC power supplies.



- **Power Supplies** - The Power Supplies generate the voltages required by the KSU and LPUs. Currently a 120 Vac, UL-listed Power Supply is available. This AC Supply will provide enough power for up to three Line Card Shelves. However, for greatest fault tolerance a Power Supply for each Line Card Shelf is recommended.

Incoming Calls

Each line of the System is assigned a priority of high, medium or low. Independent of priority, the line may also be assigned to one of eight ring groups and programmed with one of twelve distinctive ringing tones.

When an incoming call is received, the ring tone cues the operator as to which line or class of line the call is coming in on. If, prior to the first call being answered, a second or third call comes in, the ring tone presented will be that of the highest priority line.

To answer the call, the operator presses the **“Answer”** key, which causes the highest priority, longest ringing line to be picked-up. While the operator is off-hook with the call, ring tones associated with subsequent calls on other lines can either be muted or enabled based upon the programming of that line.

When a line is picked-up, one, two or neither of the Console’s two relay contacts are closed depending upon the programming for that line. This may be used to cause certain lines (such as 9-1-1 lines) to be recorded while other lines (such as admin. lines) are not recorded.

The Series 3100 also provides a useful feature for managing related groups of lines. In a multi-station installation, each operator may be responsible for a single region although the lines for other regions are also available at their Telephone Console. Lines may be assigned to one of eight unique groups corresponding to different regions. When all positions are staffed, a function key on each Console disables the rings for all groups except the one that the Station’s operator is responsible for. During periods of lesser activity when it is desirable to reduce staffing, multiple groups can be enabled at one Station to allow full coverage with a single operator.

Operators or supervisors may remotely monitor a call in progress by depressing the **“Monitor”** key and selecting the line of interest. In this mode, the original line volume is maintained and the transmitter of the monitoring Console is disabled to prevent introduction of extraneous noise. To preclude unauthorized monitoring of certain lines (e.g. a supervisor’s admin. line), any line at a Console may be programmed as **“private.”**

For use with an adjacent radio console, the Telephone Console provides an **“off-hook”** contact closure to switch a radio console’s headset between radio and telephone. If a handset is plugged into the Telephone Console’s front panel jack, the contacts will open, dedicating the radio console’s headset to radio traffic only, while the handset provides telephone traffic.

Outgoing Calls

Outgoing calls may be dialed either manually or using one of these three methods:

1. Press the **“Redial”** key on the keypad to call the most recently dialed number or, with the Caller ID option, to call back the most recently answered call.
2. Press the **“Memory”** key followed by two digits (00-99) corresponding to the desired speed dial number.
3. Press a key programmed as an Auto Dial key corresponding to a desired name/number. A second number can be accessed from a single Auto Dial key if the phone is programmed to include a **“Shift”** key. This feature is particularly useful in situations where an individual has two telephone numbers (e.g. home and cellular).

Volume Control

Programming permits each line to have its own default gain characteristics to help ensure consistent volume level during a call. However, should a caller be soft spoken the operator may double or quadruple the receive volume by pressing the **“Receive Amplify”** key. Likewise, if a caller is hard of hearing the operator may double or quadruple the transmit volume of their voice by pressing the **“Transmit Amplify”** key. Transmit amplification is a recommendation of the ADA. At times when the operator does not want to be heard by the caller they may press the **“Mute”** key. In addition to these keys, the headset jack accessory has a receive volume knob.

Conferencing

The Series 3100 Telephone Console supports a 5-way conference (4 lines and the operator). This is accomplished by establishing a call with each desired party and placing them on hold. Next, press the **“Add-On”** key and then select the lines to be part of the conference. At this point all parties may converse with one another.

Call Counters

The Telephone Consoles contain a **“mini-MIS”** system that may be used to monitor and track telephone utilization on a station by station basis. By depressing and holding the **“Release”** key, the LCD will indicate the following:

- Total time off-hook in minutes
- Number of incoming calls taken
- Number of outgoing calls placed
- Elapsed time since the counters were last cleared

Typically, the counter values are recorded at the end of each shift then cleared by the supervisor.

Instant Recall Recorder (IRR)

Completely self-contained within the Telephone Console, the IRR option records and plays back 8 minutes of conversation and up to 20 calls. Recording can be enabled on a line-by-line basis using the PPS software, and includes selectable recorder beeps and a beep notch filter to eliminate unnecessary tones in the operator’s headset. Controls for the IRR include IR Play, IR Record Enable, IR Forward and IR Reverse.

The “**IR Forward**” and “**IR Reverse**” keys may be used to sequentially search through the recorded calls. During the search the LCD shows the time and duration of each call. If equipped with the Caller ID option, the LCD also shows the recorded caller’s number or name. While playing a recorded call these keys may be used to fast forward or fast reverse through the call to find a particular segment.

The “**IR Record Enable**” key allows the operator to selectively enable or disable the recording feature. Disabling prevents recorded calls from being erased.

When a Telephone Console is equipped with the Monitor Speaker, playback can be directed to the speaker for group monitoring, otherwise playback audio is routed to the operator’s headset or handset. Any playback in progress is automatically terminated when a live call is connected.

Telecommunications Device for the Deaf (TDD/TTY)

The TDD option provides a compact, integrated solution to ADA compliance for emergency dispatch centers and PSAPs. Operation has been optimized to minimize user workload and training requirements. The TDD supports both communications modes; Baudot at 45.45 baud and ASCII at 300 baud. Up to 20 user defined messages of 36 characters each may be pre-programmed into the keys of the Telephone Consoles.

When silent calls are interrogated, the Console attempts to establish communications using ASCII. If no ASCII carrier is detected, the Console automatically switches to Baudot to send the interrogating message. If no response is received within a user defined interval, the Console will automatically return to voice mode.

When TDD tones are detected the Console notifies the operator with a beep and enters the TDD mode showing the dialogue on the LCD. While in TDD mode the Console’s transmitter is disabled to prevent interference to the TDD tones, and the Console’s receiver is partially muted to soften the loudness of the TDD tones while retaining the ability to perceive voice.

The Americans with Disabilities Act (ADA), Title II, Section 35.162 gives specific regulations for emergency telephone operations regarding direct access by hearing and speech impaired individuals using TDDs/TTYs. Obtain a copy by calling the Dept. of Justice ADA hotline at 1-800-514-0301.

Following establishment of communications, free text dialogue can be entered into the TDD using a separately supplied keyboard which plugs into the front panel of the Telephone Console. The TDD option also includes provisions for hearing and voice carry-over (HCO/VCO). The Console is equipped with an RS-232 serial port which may output the TDD dialogue data. This port may be connected to a large display, such as the Zetron Model 3010, or to a serial printer, such as the Zetron Model 3031. When equipped with either accessory the TDD option is compliant with the TDD requirements of NENA-04-001.

Alias Dial

The Alias Dial option associates a name up to 20 characters long with each of the 320 memory dial locations within the Telephone Console. Keys on the front of the Console permit a search of the name list in an alphabetically ascending or descending order. By plugging in the keyboard which is included with the option, the operator may type the first few characters of the name until the full name appears in the Console’s LCD. Once the desired name appears a press of the “**Alias Dial**” key dials the associated number using the selected line.

Caller ID

With this option the Telephone Console’s LCD may show a caller’s name or number as the call is answered. This caller ID information is available under the following conditions:

1. The line on which the call is being answered is equipped with a Zetron Caller ID Line Card.
2. The line is equipped by the telephone company with Caller ID service.
3. The caller has not blocked Caller ID delivery.

Keys on the Telephone Console allow the operator to review the Caller ID information of the most recent calls answered at their Console. Also, the operator may use a key to toggle between displaying caller name and caller number. The operator may call back the displayed caller by selecting a line and pressing the “**Redial**” key. If the call is placed on hold and picked-up by another operator the Caller ID information will follow the call to the answering Console. If the caller abandons the call before it is answered the ID may be viewed by connecting to the line of the abandoned call.

Unattended Conference

The Unattended Conference option permits the operator to create a conference (up to 5-way). Once established the operator may depart from the conference and handle other calls. An optional Speaker permits the operator to monitor the conference so that they can terminate the conference when done.

COMPATIBILITY

For conventional lines (loop-start or POTS) the System may be connected directly to a Central Office or behind a PBX fitted with analog station ports.

For 9-1-1 compatibility the System interfaces to all independent E 9-1-1 ANI/ALI controllers, including those from Lucent, Nine One One Inc., Plant Equipment, Positron and Proctor and Associates. The System also has interfaces to external voice recorders, TDDs and radio console headsets.

The Series 3100 is also 1A2 compatible permitting the use of standard 18 or 20 pin 1A2 line cards for special line interfaces (such as ring-down or tie lines) and permitting the use of 1A2 telephone sets as low-featured stations.

SYSTEM INSTALLATION

The design of the Series 3100 greatly simplifies installation and reduces the need to be familiar with telephone systems. Except for the CO or PBX connections, no punch blocks are required. All connections are through screw terminals and plug-in connectors. This means that the labor intensive cross-connect wiring normally associated with a key system is eliminated. Wiring from the KSU to the Telephone Console is reduced to a skinny 3-pair. Telephone Consoles are delivered from the factory preprogrammed and labeled further reducing field labor. All equipment associated with the KSU may be mounted in 19" racks, or in 23" racks if adapters are used.

SYSTEM UPGRADES

The Series 3100 is easy to upgrade in the field. The System supports growth in 10 line increments without discarding any existing hardware. When lines or new features are added the Windows™-based Phone Programming System (PPS) may be used to assign functions to the new keys. The key tops are removable and clear tops permit custom legends. The Telephone Consoles are equipped with Flash ROM permitting field installation of newly developed software features without removal of equipment.

SYSTEM MAINTENANCE

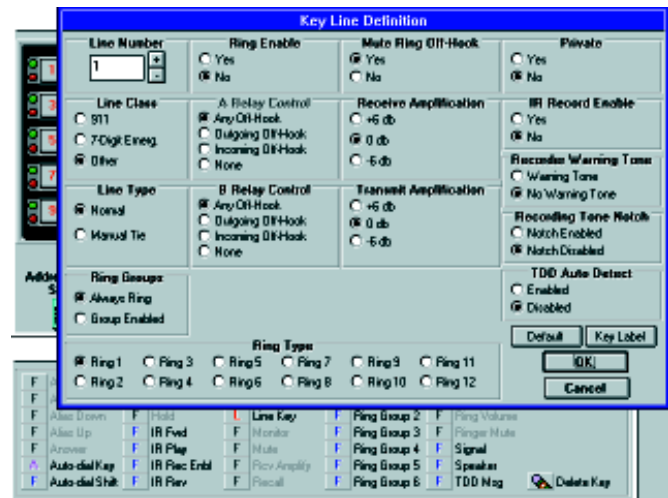
The System is designed for fault tolerance so that a single failure will have minimal impact. A failure of a Telephone Station or Line Card will affect only one Station or one Line. A blown Shelf fuse will affect only those Line Cards contained on that Shelf. A Power Supply failure will affect only those Line Card Shelves connected to the Supply. Card Shelf cards have mechanical fasteners to eliminate unseating due to vibration. Thus when properly configured the Series 3100 will meet the reliability requirements of NENA-04-001.

Should a failure occur, the System is also designed for quick repair. KSU indicating fuses are alarmed and placed on the front of the equipment for easy viewing and replacement. Power and status LEDs are prevalent for quick isolation of problems. All components are connectorized and cards use quick release fasteners for quick replacement with power applied.

PROGRAMMABILITY

A wide variety of the Series 3100 Telephone Console's functional characteristics are software programmable to meet the user's requirements. As requirements change, the administrator can modify the functionality of the System using the Phone Programming System (PPS) software provided with the System. PPS is a Windows™-based program with an easily learned "point and click" user interface. The administrator can specify any one of the following attributes for each line key:

- Line Type (normal, ring-down)
- Line Priority (high, medium, low)
- Ring Type (1 through 12)
- Ring Group Membership (1-8)
- Ring Enable and Mute Ring While Off-Hook
- Private
- State of Off-Hook Relays
- Transmit & Receive Amplification
- IRR, beep and beep filter enable
- TDD enable



NENA Generic Standards for E 9-1-1 PSAP Equipment (NENA-04-001) is an industry recommendation jointly developed by telephone companies and equipment manufacturers. It covers interfaces, features, power requirements, environmental requirements, quality and reliability. To obtain a computer copy visit the National Emergency Number Association website at "http://www.NENA9-1-1.org". For an item-by-item comparison of how the Series 3100 meets the NENA Standard ask Zetron for the Dispatch Telephony Engineering Analysis.

ACCESSORIES

- **Headset Jack** - A miniature dual-prong receptacle with receive volume knob ideal for mounting in the knee well of furniture.
- **10-Key Module** - A set of keys with LEDs useful for feature keys or line keys. For rackmount phones.
- **20-Key Module** - A compact set of keys without LEDs useful for Auto Dials and TDD messages. For rackmount phones.
- **Monitor Speaker Module** - Useful for monitoring a call or IRR playback without using a handset or headset. Also used for monitoring an unattended conference.
- **Expansion Rack** - Holds up to 8 modules for expanding rackmount telephones (not shown).
- **Alarm Monitor** - Monitors the KSU power supply and fuses. Provides and audible and visual indication of problems. Designed to mount on wall of call-taking room.



- **TDD printer** (Model 3031) - 24 column, thermal printer for printing TDD dialogue in a form directly readable from the operator's chair (shown in center).
- **ALI Display** (Model 3010) - A 32 x 16 line RS-232 terminal with LCD useful as a large screen TDD display or E 9-1-1 ALI display (not shown).

- **Mini Keyboard** - Plugs into phone when needed either for TDD dialogue or for Alias Dial entry (included with Alias Dial option). (not shown)
- **Motorola Centracom II Radio Headset Interface** - provides mute of phone's ringer while radio console is transmitting. For rackmount phones (not shown).

SPECIFICATIONS

PHYSICAL

	HXWXD, WGT
Model 3110R/3130R	5.25" x 19" x 4", 6.5 lb
Model 3140D	12" x 12" x 5", 5 lb
Line Pickup Unit	1.75" x 19" x 9", 5 lb
Line Card Shelf	5.25" x 19" x 10", 6.5 to 15 lb
AC Power Supply	7.5" x 19" x 6", 14 lb

ELECTRICAL

Power	100 to 134 Vac, 57 to 63 Hz KSU: 200 Watts/3 Shelves Stations: 36 Watts each. Power Supplies UL Listed.
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COMPLIANCES

FCC	CFR 47 Parts 15 and 68, Docket 6787
Industry Canada	CS-03
EIA/TIA	RS-310, 478, 487, 574, PN-1663
Bellcore	TR-NWT-000030 & 001188
NENA	NENA-04-001

LINE INTERFACES

Connectors	RJ21 male plug for each Line Card Shelf
Line Types	Loop-start (POTS), loop-start w/ Caller ID, Manual and automatic ring-down (tie), station intercom

TELEPHONE CONSOLE PORTS

Recorder Infc	Common Tip/Ring plus Contact Closure
Radio Headset Infc "RS-232" Port	Handset Port plus Contact Closure DE-9S (female) wired as DCE (EIA-574), Async, 9600 baud, 8 bits, no parity.
Contact Closures	Two sets of dry contacts rated at 28 VA, 600 V isolation, 5 ohm max. closed, 5 Mohm min. open.
Common Tip/Ring	RJ11 carrying metallic connection of selected line from CO/PBX.

Handset/Headset Port

Connector	Two standard 4-pin modular handset jacks; one front, one rear.
Freq. Response Transmitter	200 to 3400 Hz -3/+1 dB 500 ohm input impedance, carbon compatible. Biased from 12 V via 1 Kohm. Bias must flow for transmit audio to function.
Receiver	100 ohm output impedance

ENVIRONMENTAL

Operating Temp	0 to 50°C (5 to 37°C for power supply)
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