# Model 45B Z-Patch

SPEC SHEET

**The Zetron Model 45B is a microprocessor-based radio-to telephone interconnect. It's designed to provide flexible operation as a full-featured telephone patch with selective calling, ANI decode, and advanced airtime billing features.**

**The Model 45B interfaces a radio system to the public telephone system for interconnected conversations. It also provides selective calling of mobile radios and pagers from the telephone system or from other mobile radios. An RS-232 serial port allows on-screen manipulation of all system and user information. The system and user database can be "downloaded" and "uploaded" using a PC. Remote DTMF (Touch-Tone) programming is also supported.**

**The Model 45B is designed for radio common carriers, co-ops, utilities and private systems where a number of different users need to share the system yet receive different service and separate accounting.**

## User Identification

Every user on the system is given a unique user code. These codes refer to user records in the Model 45B's internal database. A user's record contains information about access privileges, selective call type, and other unique parameters assigned to that particular user. The record also accumulates the user's call statistics. People wishing to access the system identify themselves by entering their user codes on their DTMF radio keypads. Or, if the radios have DTMF ANI (automatic number identification), the codes are sent automatically. The Model 45B can also require a code to terminate a call.

## Calls From the Telephone System

A person at a telephone calls a mobile radio by dialing a regular seven-digit number. If the Model 45B answers with a dial tone, the person "overdials" the user number of the desired mobile radio. If the Model 45B is equipped with the voice prompts option, a recorded voice tells the person when and how to overdial. If the DID converter option is installed, overdial is not necessary.

The desired mobile radio is alerted with a distinctive ring-out tone and paging, CTCSS, or digital squelch code. To ensure the call is answered by the correct party a user code can be required to answer the line. A second telephone line can be dedicated for normal use or priority access (priority overrides calls in progress). If desired, both lines can automatically call a certain mobile in the absence of overdial.

## Calls From a Mobile

A person with a mobile radio can place calls only if his or her user record in the Model 45B internal database allows. A person places a call by keying a valid user code followed by a phone number. The user may be restricted to using only the nine speed-dial telephone numbers. The user can also be restricted from using certain PBX access codes, long distance or operator prefixes, or certain first and second digits. The Model 45B can still allow calls to 1-800, 1-888, and 9-1-1 even if other toll restrictions are in place

The Model 45B automatically dials into the telephone system using Touch-Tone or rotary pulses. If two outgoing lines are available, then the line into which the Model 45B dials depends upon how the owner configured the user's record. Or, the line can be user-selected, allowing toll-free calling over a wider area if the Model 45B straddles two adjacent service areas.

### FEATURES

- **Simplex, half- and full-duplex operation**
- **325 separate users**
- **Standard RS-232 serial port and internal modem**
- **Remote access from CRT, computer, phone, or radio**
- **Two telephone line inputs with auto-line select**
- **One local telephone input for local phone or DID**
- **Calling restrictions/privileges per user**
- **Compatible with rotary telephone (dial-click)**
- **User and system database in nonvolatile memory**
- **DTMF ANI decode and validation**
- **Seven ringing sounds for mobile alerts**
- **Nine system speed-dial numbers**
- **Regenerated DTMF (Touch-Tone) or pulse dialing**
- **Sense inputs for monitoring external equipment**
- **Relays for remote-control of external equipment**
- **Remote diagnostics via modem**
- **Options include paging formats, DID converter, call accounting, voice prompts, dial click decoder, and radio specific cables**

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## Programmable Features

### SYSTEM PROGRAMMING

**Mode of Operation:**

- Simplex VOX with digital voice delay or sampling
- Half- and full-duplex. Both types of radios can be supported on the same system

### USER CODES:

Owners are able to program a variety of mobile and telephone access sequences to meet different system requirements. DTMF ANI connect and disconnect codes may be up to 8 digits in length

**Telco Dialing:**
Pulse or regenerated DTMF dialing

**COR Programming:**
Variables include COR polarity, hold time, mobile activity time, channel busy, and others

**Morse Code ID:**
10-character Morse ID and interval

**Speed-Dial Numbers:**
Nine 16-digit telephone numbers and delay intervals

**Channel Ring-outs:**
Number of ring-outs sent to mobile radio

**Second Dial Tone Disconnect:**
Enable or disable

**Rings Before Answer:**
Number of rings from telephone system before call is processed

**Dial Tone Wait:**
Duration Model 45B waits for dial tone before dialing

**Repeat Audio:**
Enable/disable repeat audio for mobile-to-mobile conversations

### PER-USER PROGRAMMING

**Equipment Type:**
Full-duplex, half-duplex, tone-only pager, tone-and-voice pager, talk-back pager, direct air access

**ANI Code:**
Up to 8 DTMF digits if required. Different length ANIs are supported for different mobile radios. ANI can be required for disconnect. High speed ANI can be required for added security

**Selective Call Format:**
2-tone, DTMF, CTCSS, digital squelch, 2805, 5/6 tone. Subaudible and digital squelch signaling can be sent for duration of call, duration of first page, or until mobile radio answers

**Ring-out Tone:**
Up to seven different sounds

**Toll Restriction:**
Restrict up to 4 digits for the first and second digit. Restrict number of dialed digits. 1-800, 1-888 and 911 not restricted

**Mobile Access To**

- Instant dial numbers (yes/no)
- Dial phone calls (yes/no)
- Receive telephone calls (yes/no)
- Mobile-to-mobile paging (yes/no)
- Dial out on line 1, line 2 or either

**Conversation Time**
Each user can be assigned one of two programmable time limits or no time limit

**Supervisory User Code:**
Supervisory code answers or disconnects any call

**DTMF Through:**
Allow DTMF dialing to phone line during call (yes/no)

## Options and Related Products

### PAGING FORMATS

Selective signaling of radios and pagers is available with optional signaling formats (2-tone, 5-tone, DTMF, 2805, CTCSS, DCS). This allows radios to be called selectively and equipment to be remote-controlled.

### DIGITAL VOICE DELAY

This option improves simplex VOX operation by delaying the phone-to-mobile audio from 0.15 to 0.80 seconds.

### DIAL CLICK DECODER

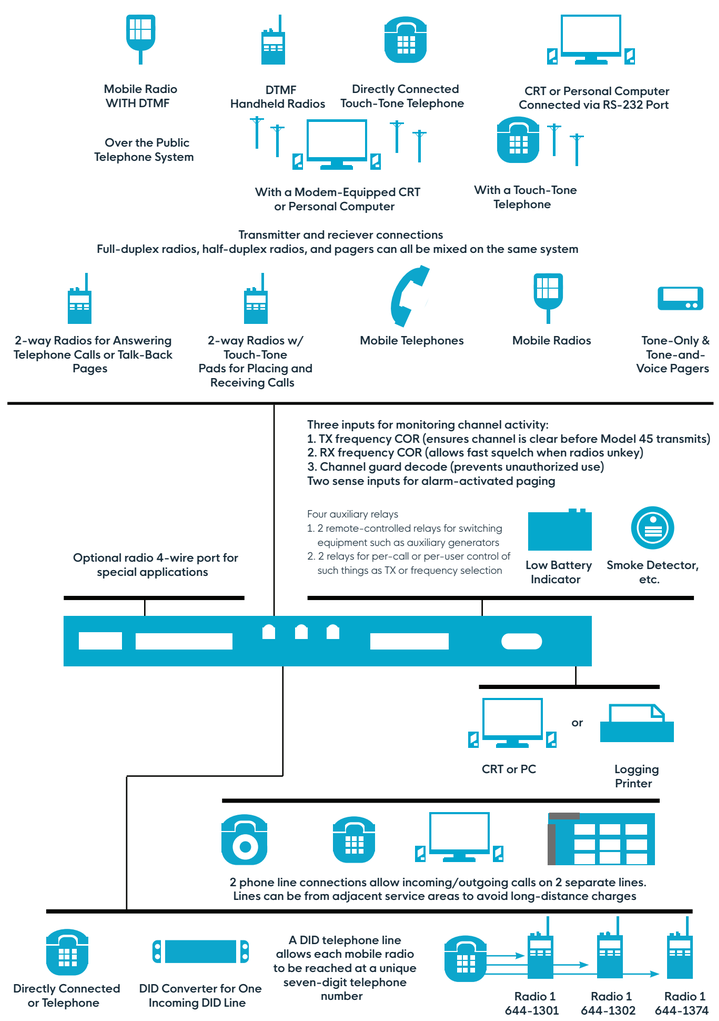
Rotary telephones can be used to call mobiles or pagers when DTMF phone service is not available.

### VOICE PROMPTS

The voice prompts option for the Model 45B allows the owner to record a series of greetings and instructions that are played to telephone callers. Callers already accustomed to the system can overdial the extra digits as soon as the prompt begins and the voice will shut off automatically. The voice prompts option is added to the Model 45B as a small circuitry card.

### INTERNAL MEMORY BUFFER

This option stores detailed data about each call in a batterybacked memory for later retrieval by CRT or computer. Up to 999 transactions can be logged. Data includes user, date, time of day, duration, type of call, and number dialed. Data may be sent out of the serial port to a line printer or data recorder at the end of each call.




## Specifications

### GENERAL

| | |
|---|---|
| Power: | 100-130V AC, 60 Hz, 7 watts or 12-15V DC, 600 mA |
| Temperature: | 0 to 65 degrees Celsius |
| Size: | 19" W x 7.25" D x 1.75" H, 19" rack-mount |
| Weight: | 7 pounds |

### INTERCONNECT CAPACITY

| | |
|---|---|
| Database: | 325 subscribers, up to 999 call detail records |
| ANI Length: | 1 to 8 DTMF digits |
| ANI Speed: | Up to 14 digits per second |

### SIGNALING SPECIFICATIONS

| | |
|---|---|
| Freq range: | 67 to 3500 Hz |
| Freq accuracy: | 0.1% |
| Freq stability: | 0.0005% |
| Distortion: | 2% nominal |
| Two-Tone Sequential: | Motorola/GE all tone groups, code plans, and capcodes |
| DTMF: | 1 to 7 digits per subscriber |
| 2805: | 1 to 7 digits per subscriber |
| Five/Six-Tone: | EIA, ZVEI, CCIR single or dual address |
| CTCSS: | 38 standard EIA tones |
| Digital Squelch: | 104 Codes |

### TELEPHONE INTERFACE SPECIFICATIONS

| | |
|---|---|
| Phone Jacks: | Two end-to-end (B1) phone lines, one local phone |
| Connector: | RJ11-C modular jack |
| Mode: | Full duplex operation, hybrid with fixed-null |
| Call progress tones: | Dial tone, ringing, interrupted ringing, busy, and reorder |
| Dial tone detection: | Single tone, adjustable, preset to 440 Hz |

### END-TO-END

| | |
|---|---|
| FCC Registration: | EYB5Q5-15387-OT-T |
| Incoming call: | Ring detection on tip-ring pair or dry contact closure to ground. Programmable number of rings to answer |
| Call answer: | Off-hook, tip-ring current draw or darlington output (wet) |
| Call disconnect: | Second dial tone for 2 seconds (440 Hz), busy tone (0.5 Hz, 50% duty cycle |

### LOCAL PHONE

| | |
|---|---|
| Incoming call: | Loop start or dry contact closure, immediate dial |
| Call answer: | Darlington output (wet) |
| Call disconnect: | Local phone on-hook (For connection to 2500 deskset or DID converter) |

### RADIO INTERFACE SPECIFICATIONS

| | |
|---|---|
| PTT: | 100-130V AC, 60 Hz, 7 watts or 12-15V DC, 600 mA |
| COR: | Noise detector, VOX detector or voltage change |
| Subaudible output: | -40 to +6dBm. Hi/Lo Selector. 600 ohm output |
| Tx audio: | -40 to +6 dBm. Hi/Lo Selector. 1K ohm output |
| Rx audio: | -40 to +10 dBm. Hi/Lo Selector. 50K ohm input. 25 mV to 6 V P-P |
| Direct modulation: | CTCSS/Digital squelch, bipolar adjustable |
| System relays: | 2 each, remotely toggled by DTMF code from phone or mobile, form A relay closures to ground |
| User relays: | 2 each, programmable per user to automatically latch for duration of call, form A relay closures to ground |
| Sense inputs: | 2 each, Form-A relay closures input |
| Channel busy input: | Closure input from secondary receiver COR. |
| COR validation input: | Closure input to disable COR operation |

### ADDITIONAL SPECIFICATIONS

| | |
|---|---|
| Modem: | 300 baud Bell 103J or 1200 baud Bell 212 |
| Indicators: | Line 1, Line 2, Local, VOX, DTMF, Carrier, CTCSS, Transmit, Page, Power |
| Switch: | Connect/disconnect |
| Station ID: | Morse code, fixed 1200 Hz frequency and selectable call sign |
| Operating modes: | Half-duplex and full-duplex, simplex VOX, simplex sampling, digital voice delay, per user |
| Equipment types: | Tone-only pager, Tone+Voice pager, Talkback pager, Mobile, Direct air |
| Prompt tones: | Progress tones, error tones, and warning tones sent to phone or mobile |
| Programming: | Programmable via DTMF phone, DTMF mobile, RS-232 or phone modem |
| Data retention: | Internal battery - backed |
| Secondary protection: | Telco high-voltage clamps with protective fusing elements |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005-0046-02