Spec Sheet Model 38 Repeater Panel

FEATURES

- Full remote control of repeater system
- All 38 CTCSS tones / 22 digital codes standard
- ToneLock ultra high performance tone decoding
- Simple installation and programming
- Efficient management of repeater system
- Remote control by radio or telephone line
- Programmable per user features
- Automatic Morse code ID
- Zetron performance, quality construction, and long term reliability

INTRODUCTION

The Zetron Model 38 Repeater Panel is a flexible, remotely programmable repeater tone panel that converts any station capable of duplex operation into a full featured repeater. The Model 38 is an ideal replacement for older card-per-user tone panels, eliminating time consuming trips to remote repeater sites as well as the high cost of individual tone cards for each customer.

With a Zetron Repeater Panel, a system operator can add or remove customers without traveling to the repeater site. Up to 60 different customers or user groups can be accommodated by a single Model 38. (With the 50 CTCSS/18 DCS option, up to 68 users can be accommodated.) The Zetron Model 38 is an ideal choice for retrofitting existing repeaters or developing new shared systems.

PERFORMANCE FEATURES

ToneLock, a Zetron exclusive, eliminates repeater talkdown or dropout resulting from weak, fading signals, high modulation levels, or poorly processed mobile transmitter audio. A ToneLock equipped Model 38 will recognize a CTCSS tone or digital code with a receiver quieting level of 3 dB SINAD.

Typical programmable tone panels require a minimum of 8 dB SINAD before reliable tone decoding occurs. The Model 38 can even out perform traditional reed type decoders. The Model 38 will not false on adjacent tones, even when receiving CTCSS tones transmitted with a phase reversal.

The Model 38 is available at no extra charge with 50 CTCSS tones and 18 digital squelch codes. This special software permits the use of the Model 38 in radio systems that use non-EIA CTCSS tones. This makes the Model 38 ideal for older radio systems that may use non-EIA tones.

The Audio Quality of the Model 38 is immediately obvious when upgrading older repeater panels or replacing other programmable panels.

POLITE OPERATION FEATURES

Courtesy Beeps tell users exactly when to begin talking. Tailbips (one beep per second) can occur during the repeater hold time.

The Morse Code ID means that users don't have to worry about providing station identification at regular intervals. The Morse code ID feature automatically transmits a user's call sign at the beginning of a transmission and at programmed intervals. An individual ID may be programmed for each user or a single system ID may be programmed for private carrier or cooperative applications.

Squelch Tail Elimination removes the long noise burst that can occur when a user unkeys. The Model 38 generates squelch tail elimination when the received signal drops or, if CTCSS/DCS is programmed for encoding during the transmitter hold time, immediately before the repeater transmitter unkeys. Squelch tail elimination mutes the CTCSS decoders of all listening radios preventing the irritating squelch crash heard when using other repeater tone panels. The Model 38 also recognizes when a mobile, control station, or portable radio generates a phase reversal, ensuring silent repeater receiver muting.

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CUSTOMER MANAGEMENT FEATURES

The Airtime Keeper keeps track of all system use for customer billing purposes. Airtime totals can be retrieved by Morse code or by using compers. Airtime data may also be retrieved with a directly connected RS-232-equipped terminal, or computer.

The Airtime Hog feature penalizes long winded talkers on a per user basis. If a user exceeds a preprogrammed time limit, the user is prohibited from using the repeater for the programmed penalty period. Warning tones are transmitted when a penalty is imminent.

The Prepaid Airtime feature allows a customer to purchase a block of airtime in advance. As the customer uses the repeater, the amount of unused airtime decreases. When the supply of prepaid airtime is nearly gone, the customer hears a warning tone whenever a radio unkeys. If the customer does not purchase additional airtime, the customer's tone reverts to reserved status when the original block of time runs out. This permits the system operator to pre-bill problem customers.

The Privacy Mode feature prevents users on different CTCSS tones or digital codes from assuming control of the repeater until after the transmitter hold-time expires. This reduces or eliminates repeater barge-ins.

The Anti-Kerchunker Filter cancels the transmit hold-time and drops the repeater transmitter immediately if a mobile transmission lasts less than one second. This prevents prolonged repeater transmissions due to momentary mobile key-ups.

The Stuck Mic feature identifies which radio fleet has locked up the repeater. When the repeater times out, the Model 38 transmits a two-digit DTMF sequence corresponding to the programmed user number. This helps identify the source of intentional or accidental repeater jamming.

SPECIAL SYSTEM FEATURES

The Reserved User feature prevents a co-channel system operator from commandeering a temporarily unused tone or code. The Model 38 reserves a tone or code by transmitting an alert signal and muting repeat audio when it detects the tone or code.

The Site Alarm transmits a DTMF page and audible alert when the alarm input to the panel detects activity. The DTMF page may also be programmed to be accompanied by a CTCSS tone or digital squelch code. The alarm may be used to alert the system operator via a radio equipped with a DTMF decoder.

The Auxiliary Relay Option provides a set of contacts that can be programmed to close whenever a specific CTCSS tone or DCS code is received by the Model 38. Any individual tone/code or group of tones/codes may be programmed to activate the auxiliary relay.

The Remote PTT Input feature lets the Model 38 generate a preprogrammed CTCSS tone or DCS code when activated by a signal from the PTT circuit in a remote termination panel. This feature works with tone, DC, or extended local remote controls and permits a community repeater to be used as a base/repeater station with wireline dispatch control. When the remote termination panel in the base/repeater is keyed by an attached remote, the Model 38 encodes the correct CTCSS tone or DCS code.

Cross Tone, Cross Code, and Tone Code Encoding allow users to talk to mobiles on different CTCSS tones or codes. This feature also permits multiple repeaters at different locations to be placed on a single frequency. Mobiles may roam between two or more systems, accessing each individual repeater with a different tone or code, and receiving on a common tone. The system manager can also temporarily initiate or defeat cross encoding by entering a short DTMF code.

DTMF Regeneration Mode permits reliable mobile to mobile DTMF paging, ensures reliable operation of control station telephone interconnects, and allows secure DTMF remote control of equipment.

Easy Setup and Installation ensures that a technician can install a Model 38 in nearly any repeater or duplex station. Local programming using any DTMF equipped radio, computer or dumb terminal, simplifies installation and programming (see diagram). The Model 38 also provides a flexible COR input permitting its use with nearly any receiver. When an external COR indication is unavailable, the Model 38's internal squelch circuit may be used. Only six connections are required in typical installations and interface assistance is available from Zetron.

PROGRAMMING AND CONTROL

The Model 38 Repeater Panel can be interrogated and programmed from a DTMF radio or from a computer that is either connected directly or operating through telephone or packet modems (see diagram). Programming by computer is easy because the Model 38 puts questions and lists of choices on-screen.

Programming via the built-in RS-232 port does not require taking the unit out of service. This means your repeater stays on the air, even as customers are added or removed from the system.

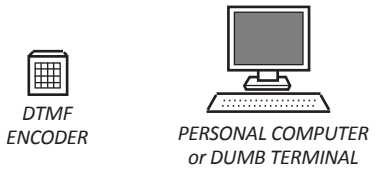
PROGRAMMABLE FUNCTIONS

Programming:	DTMF or RS-232
Validation:	Enable/disable per user
Privacy Mode:	Locks out other users during Tx hold time. Programmable on/off per tone/ code
Reserve Mode:	Reserves tone/code of disabled user Programmable on/off per user
Encode Select:	Encode tone/code programmable to any tone/code per user
Encode On/Off:	Encode tone/code can be enabled/ disabled during the Tx hold time Programmable on/off per user
DTMF Regeneration:	Long DTMF "*" mutes audio and enables DTMF regeneration. All received digits regenerated until DTMF time-out expires (adjustable). Ideal for DTMF paging or for use with a phone patch.
DTMF Time-out:	1 to 9 seconds
Temporary Cross :	Allows mobiles on different tones/codes to converse. Programmable on/off per user
Last User ID:	Sends last user's number in DTMF when user unkeys. Programmable on/off per user
Morse ID:	0 to 8 characters programmable per user
Morse ID Interval:	1 to 99 minutes
ID Frequency:	400 to 2000 Hz
Readback ID Mode:	Reads back user's Morse ID
Courtesy Beep:	Sent when user unkeys. Programmable on/off per user
Beep Frequency:	400 to 4000 Hz
Tx Hold Time:	0.0 to 25.0 sec in 0.1-sec steps, per user
Alarm Code:	0- to 8-digit DTMF with warble alert, with or without any tone/code
Call Time Limit:	1 to 99 minutes, per user
Idle Duration:	Requires user to remain idle to reset call timer. 1 to 99 seconds
Hog Penalty:	10 to 9990 seconds
Setup Procedure:	Test modes for system adjustments
User Time Counter:	Up to 250 hours per tone/code
Clear Time Counter:	Clear one or all time counters
Airtime Retrieval:	Slow Morse code or DTMF.

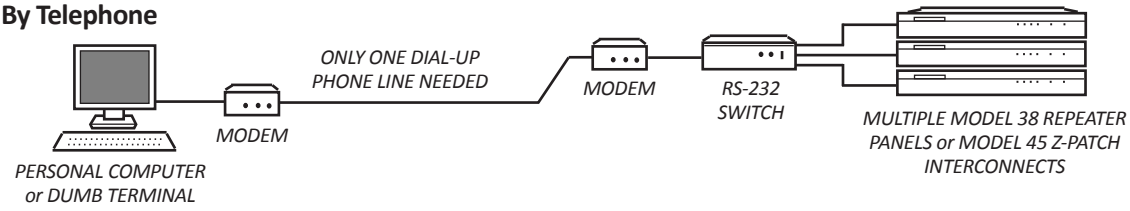
The Model 38 can be programmed by a variety of on-site or remote control devices. RS-232 programming does not interrupt normal repeater panel operation.

On-Site

If your Model 38 is located in your shop, control it with an RS-232 terminal. You won't interrupt normal repeater operation when you program it through its RS-232 port, since it can perform background and foreground tasks simultaneously. You can also use a DTMF encoder directly connected to the Model 38.



By Telephone



The best way to control a Model 38 over a phone line is with an RS-232 terminal and a pair of modems. If you have several Model 38s at a common site, use a multiport RS-232 switch so you don't have to obtain multiple phone lines.

SPECIFICATIONS

Decoder

Frequency Range:	67 to 250.3 Hz
38 CTCSS/22 DCS (Standard)	
No. of Tones:	38
No. of Digital Codes:	22
Bandwidth:	1.5%
50 CTCSS/18 DCS (No Cost Option)	
No. of Tones:	50
No. of Digital Codes:	18
Bandwidth:	1.0%
Input Impedance:	100K-ohm AC coupled. For connection to unsquelched discriminator audio

Encoder

Freq. Accuracy:	0.1 Hz
Freq. Stability:	Crystal controlled
Output Amplitude:	0.0 to 3.0 V p-p, selectable
Output Mode:	Flat or de-emphasized
Output Distortion:	Less than 1%
Impedance:	Less than 1K-ohm AC coupled

Tone Encoder

Morse ID Freq.:	1200 Hz; adjustable ±800 Hz
Beep Frequency:	1000 Hz; adjustable 400 to 3000 Hz
DTMF Encoder:	Standard DTMF tones

General

Connections:	Discriminator; Push-to-Talk; CTCSS Output; Repeat Audio; Alarm Input/ Remote PTT Input; Power; Ground
Connector Type:	Detachable screw terminal
Transmit:	SPDT relay
Adjustments:	Four adjustments from rear panel: Input Level; CTCSS Encode Level; Output Level; Squelch
Indicators:	Power; Carrier; Decode; Encode; Transmit; DTMF
Local Prog. Port:	Front-panel audio jack for local DTMF programmer
Serial Data Port:	RS-232 compatible levels:
Interface:	Tx data, Rx data, common/gnd
Handshake	Follows XON/XOFF protocol
Baud Rate	Selectable: 150; 300; 600; 1200; 2400; 4800
Rear Switches:	Audio Input Level (high/low); Audio Input (flat/de-emphasized); CTCSS Output Level (high/low); CTCSS Output (flat/de-emphasized); Audio Output Level (high/low); COR (internal/ external); COR Polarity (positive/negative)
Repeat Audio:	Flat or de-emphasized
Long Digit Reset:	A single DTMF digit received by the Model 38 for 15 seconds may be used to reset the Model 38 remotely.
ToneLock:	ToneLock decodes a CTCSS tone with a receiver quieting level of 3 dB SINAD after initial acquisition
COR Input Range:	Adjustable threshold of 0 to 7VDC. Level must change by at least 1 volt between carrier and no carrier conditions
Squelch Tail Elimination:	Model 38 decodes mobile's reverse phase burst, or digital turnoff code
Current Consumption:	350 mA at 13.8VDC
Oper. Voltage Range:	11VDC to 15.0VDC
Rack-Mount Size:	1.7" x 19" x 4.8"
Weight:	2.2 lb.
Operating Temp.:	0 to 65 degrees C.

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See Zetron price list for option pricing. Specifications subject to change without notice.

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