

# HAMTRONIX - SSM200 - Super Squelch Module

REVISION B

MARCH 2016

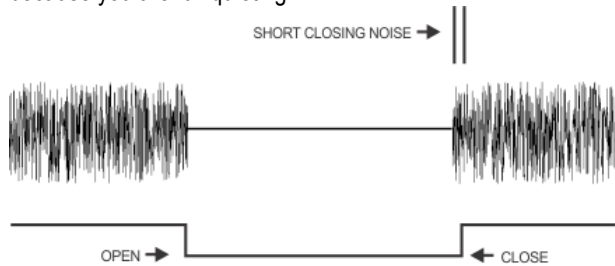
## DESCRIPTION

The **SSM200** is a smart squelch generator with exclusive three independent outputs of COR<sup>1</sup>. Unlike traditional circuits which closes the squelch immediately when the signal ceases, the **SSM200** analyzes the quality of the signal and if weak adds a squelch tail, significantly improving the reception for mobile and portable stations.

## HOW IT WORKS

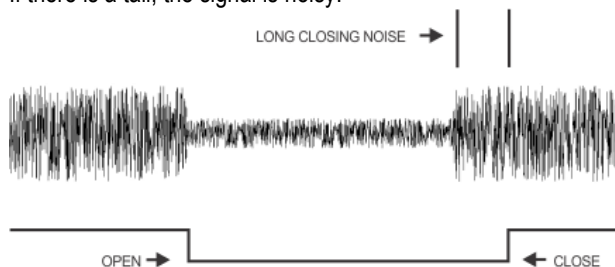
The **SSM200** needs only the receiver's discriminator to operate. This signal passes through some filters, goes to an analog to digital converter and then is handled by software algorithms which decide how much tail, if any, will be added to the squelch.

When a received signal is strong, it will be an immediate audio shut-off and no squelch tail. Not having a squelch tail on your repeater sounds great, plus you can tell your signal is strong because you are full quieting:



With strong signals, there is no squelch tail

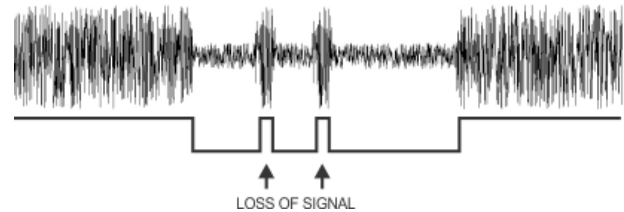
On the other hand, when a signal is weak or unstable, a tail is added, so there is no audio chopping under "flutter" conditions. If there is a tail, the signal is noisy:



With weak signals, there is a squelch tail

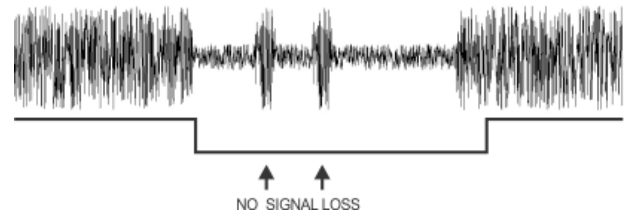
In "flutter" conditions, typical in mobile operations, a regular squelch circuit will cut the audio immediately, causing seconds

of interruptions plus a typical sequence of courtesy beeps over the mobile station:



"Flutter" condition with no squelch tail there is audio chopping

Now we have the same condition, but because there is a tail in the squelch we will be able to hear all the transmission, and more, you can tell the signal is weak:



No audio chopping under "flutter" conditions

## PLUS

With the **SSM200** you will not have to worry looking for C.O.R. logic signals inside a receiver anymore. As manufacturers are not supplying schematics anymore, what used to be a simple task in the past could be challenge nowadays.

The **SSM200** offers three different C.O.R. outputs with negative logic:

**C.O.R.** – Regular C.O.R. output with no tail. Just like you find in any receiver;

**SS C.O.R. SHORT** – Output with 300ms of tail only if the signal is not full quieting. Ideal for repeaters with no CTCSS<sup>2</sup> tones.

**SS C.O.R. LONG** – Output with 600ms of tail only if the signal is not full quieting. Ideal for repeaters with CTCSS tones.

## Notes

<sup>1</sup>C.O.R. (*Carrier Operated Relay*) or C.O.S. (*Carrier Operated Switch*) is a signal from the receiver, which tells the repeater controller that the squelch is open and there is a signal there.

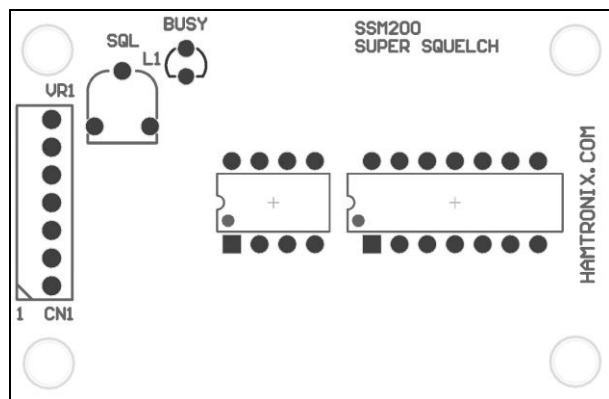
<sup>2</sup>CTCSS (*Continuous Tone Coded Squelch System*) is a series of sub-audible tones standard on today radios.

## CONNECTOR CN1

PIN	NAME	DESCRIPTION
1	Discriminator	Receiver discriminator audio (DET)
2	GND	Ground
3	Discriminador	Receiver discriminator audio output
4	C.O.R	Regular C.O.R. with no tail
5	C.O.R. Short	C.O.R. with 300ms of tail if signal is weak
6	C.O.R. Long	C.O.R. with 600ms of tail if signal is weak
7	VCC	11V ~ 15 VDC

## INSTALATION

- 1) Connect a discriminator audio output from the receiver with at least 200mV at pin 1;
- 2) Connect 13,8V DC at pin 7 e GND at pin 2;
- 3) Choose which C.O.R output you want to use (pins 4, 5 and 6) and connect to the C.O.R. input of the repeater controller;
- 4) Adjust the threshold of the squelch potentiometer VR1. Turning the VR1 left the squelch opens, turning right closes.



## TECHNICAL SPECIFICATIONS

Operation Voltage:	11V ~ 15V
Discriminator level:	Min. 200mV
Current drain:	10mA
C.O.R. tail:	25ms max.
SS C.O.R. Short tail:	300ms
SS C.O.R. Long tail:	600ms
Temperature range:	-20 ~ 60
Logic output level:	TTL (0V or 5V)
Outputs current:	10mA max.
Dimension:	55mm X 32mm X 20mm
Weight:	15g

## WARRANTY

This Warranty covers all defects in materials and workmanship in Hamtronix boards for the original purchaser. This Warranty will remain in effect for one (1) year from the date of purchase by the original purchaser.

This Warranty do not covers damage, deterioration or failure resulting from: 1) accident, misuse, abuse, neglect, unauthorized product modification or failure to follow instruction contained in the manual; 2) Water or other elements; 3) Repair or attempted repair by anyone not authorized by Hamtronix

This board must be connected through connectors. Any sign of direct soldering to the board will void the Warranty.

Hamtronix liability is limited to repair or replacement of any defective product, Hamtronix shall not be liable for any damages, whether incidental, consequential or otherwise, because of any defective Hamtronix product.

If it is necessary to ship the product to us for warranty service, you are responsible for the shipping charges.

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