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# **MODEL QE-2i ANI ENCODER**

**Plug-In ANI - EMERGENCY IDENTIFICATION ENCODER  
for**



**Dual Mode**

**GE-STAR<sup>®</sup> and MDC-1200<sup>®</sup> COMPATIBLE**

**Instruction Manual  
P/N 05 50 0008**

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QE2i ANI Encoder Module for Icom Radios Instruction Manual  
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**WARNING:** Do not install the QE2i into a host radio without preparing it per the installation directions. Jumpers must be changed and the unit must be programmed. Failing to correctly align jumpers could result in damage to the radio or the QE2i or both.

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## Description

The Cimarron Technologies' Model QE-2i ANI/Emergency ID Encoder is a dual format encoder. The QE-2i can be programmed to operate in GE-STAR or MDC-1200 modes. The unit provides Automatic Numeric Identification (ANI) of a specific radio transmitter each time the microphone press-to-talk (PTT) switch is activated, and is capable of transmitting three other data messages.

The three additional messages are typically coded as "Stuck-Mic", "Emergency", and "Man-Down".

The Model QE-2i is programmable for General Electric GE-STAR® signaling method and format. The signaling format uses Phase Shift Keying (PSK). The format allows for complete flexibility for both one-way and two-way signaling and includes an error detection code and a signaling protocol to minimize decoding errors and falsing. The Model QE-2 is also programmable for the Motorola MDC-1200® signaling format. This signaling format is Frequency Shift Keying (FSK).

The QE-2i must be programmed before installation. All programming is done via the QPF-2 Field Programmer. Please refer to the QPF-2 Operation Manual for instructions.

**WARNING:** Do not install the QE2i into a host radio without preparing it per the installation directions. Jumpers must be changed and the unit must be programmed. Failing to correctly align jumpers could result in damage to the radio or the QE2i or both.

## Specifications

<b>Data Format Modulation Type Rate</b>	GE-STAR with all known variables PSK (Phase Shift Key) 400 bps on 1600hz $\pm$ 1% carrier [MDC-1200® FSK]
<b>ID Range</b>	0001 to 9999 in 16 different formats [0001 to 9999]
<b>ID Locations</b>	ANI at beginning of PTT, end of PTT, or both.
<b>Messages programmable</b>	PTT Emergency – many programmable modes ManDown – triggered by external mercury tilt switch – many modes Stuck Mic – triggered when PTT is active continuously for 1 minute [In MDC-1200®, ManDown and Stuck Mic sends Emergency]
<b>Sidetone</b>	1 KHz during transmission of data.
<b>Burst Length</b>	Programmable for 1½, 2½, 3½, or 4½ messages. [MDC is a fixed length message = 180 mS]
<b>Preamble Length</b>	16, 24, 32, or 48 bits programmable. [MDC is a fixed length]
<b>Attack Delay</b>	60, 70, 80, 90, 125, 325, 625, or 1300 mS programmable.
<b>Outputs</b>	KEY – HiZ to Low, open collector with 100 mA sink or HiZ to High. Audio Inhibit – HiZ to Low, open collector with 100 mA sink or HiZ to High Tone Control – Many voltage levels possible via Jumpers. Sidetone – 1 KHz Data Out – Capacitively coupled. Idle: $>10^9 \Omega$ impedance. Encode: adjustable 100 mV to 5 V P-P Aux I/O – Logic level.
<b>Inputs</b>	Emergency – Logic level with 39Kohm pullup to +5vdc ManDown – Logic level with 39Kohm pullup to +5vdc PTT – 0 to +12vdc with 50mS debounce Channel Busy – Logic level with 39Kohm pullup to +5vdc Aux I/O – Logic level.  <i>Caution: Do not exceed +5vdc on any logic level point!</i>
<b>Programming</b>	Use Cimarron's QPF-2 PC based programmer and software.
<b>Radio Interface</b>	Plug-in mates with accessory connector of radio
<b>Supply Voltage</b>	4.5 to 5.0 regulated supplied by host radio accessory port
<b>Supply Current</b>	3.5 mA standby, 35 mA encoding when connected to +12vdc.
<b>Temperature</b>	Operating: -30°C to +70°C (-22°F to +158°F).
<b>Humidity</b>	0% to 90% (non-condensing).
<b>Dimensions</b>	1.4" x .85" x .18" (35.6 x 21.7 x 4.5 mm)

## Message Capabilities

### **ANI-ID MESSAGE**

ANI (Automatic Numeric Identification) provides for digital identification of a transmission initiated by a transmitter's microphone switch ("Press-To-Talk" or "PTT" switch). This "digital burst" can occur when the switch is first pressed, or when the switch is released, or at both times. The burst time for most identifiers is approximately 1/3 second and, if transmitted upon pressing the PTT switch, may obliterate the first one or two syllables of spoken speech. To overcome this annoyance, the Model QE-2i is programmable to produce the burst either at the beginning, or at the end of the voice transmission, or at both times.

To further guard against voice-syllable clipping, the user may program a "PTT Sidetone". When programmed, this feature will provide an audible tone during the transmission of the ANI-ID message burst to alert the operator that a digital burst is being transmitted.

### **STUCK-MIC-ID MESSAGE**

When a radio is inadvertently keyed due to a stuck microphone switch, it generally means that the radio frequency is unusable for communications. Unfortunately, a field operator sometimes deliberately causes this activity. By incorporating a Stuck-Mic-ID Message in the Model QE-2i's repertory, each time a microphone switch is held closed for more than a minute either the offending unit's identification is transmitted and a local tone is sounded every ten seconds, or the unit can be programmed to transmit the unit's ID once, sound a local tone, and then automatically open the key line until the microphone switch is released.

### **EMERGENCY-ID MESSAGE**

The Emergency-ID message is generally used by law enforcement, security agencies and fire departments to automatically signal a life-threatening situation where it is difficult, impossible or impractical to use voice. The emergency message is also frequently used by business and industrial users to signal a critical situation such as a mechanical failure, over or under temperature (pressure, etc.) or extraordinary event.

The Model QE-2i allows for programming the burst length and whether the message should be a single burst, repeated five times at ten second intervals or repeated continuously at ten second intervals. In addition, during the emergency cycle the microphone of the sending radio can be monitored and in the continuous mode can alternate between monitoring and allowing the channel to be used for voice communications.

### **MAN-DOWN-ID MESSAGE**

The Man-Down ID message is primarily for use by law enforcement, security agencies and fire departments. It also finds uses in business and industry where individuals can be overcome by toxic fumes, lack of oxygen, etc.

The Man-Down ID is generally initiated by closure of a mercury switch located within a hand-held radio when the radio is continuously tipped greater than 60 degrees from vertical. To guard against false "man-down" transmissions an initial pause of a few seconds during which the closure must be constant is provided. After

this duration a short tone is produced via the radio's speaker. A second pause follows the tone to allow the radio to be placed in an upright position (in the event that no actual "man-down" is occurring). Following the second pause the "Man-Down-ID" data burst is transmitted in the same manner as the "Emergency-ID", and depending upon programming, providing either a single, repeat, or continuous burst transmission. The Man-Down mode also can include the microphone monitoring alternative. Transmission of a unique coding (GE Star® only) for the Man-Down message (in lieu of a general Emergency coding), and multiple choices of initiation, tone, and final pause times are special features of the Model QE-2i.

### **STATUS-ID MESSAGES**

Status-ID messages typically relate to the status of the field unit, such as "In Service", "Out Of Service", "On Break", etc. The format (GE Star® Only) can include up to eight of these messages, and their coding configurations can be interpreted as having any meaning at the decoding site. The QE-2i is capable of transmitting two status messages (or a combination of two status and canned messages) in lieu of the Man-Down and Emergency.

### **CANNED-ID MESSAGES**

"Canned-ID" messages handle such communications as "Request-To-Talk", "Priority-Request-To-Talk", "Repeat Last Transmission", "Repeat Address", "10-4", "Roger", and other routine requests and responses. The format (GE Star® Only) can include several of these messages, and their coding configurations can be interpreted as having any meaning at the decoding site. The QE-2i is capable of transmitting two "Canned-ID" messages (or a combination of two status and canned messages) in lieu of the Man-Down and Emergency.

### **DUAL ID**

The QE2i is capable of being programmed with two separate ID's. If the radio is turned on while it is being held keyed, the second ID will be used until the radio is turned off and then back on. If the radio is turned on without holding down the PTT button, the first ID will be used.



## Programmable Parameters

### **ANI ID MESSAGE**

TRANSMIT TIME: Beginning, End, or Both.

BEGINNING BURST LENGTH: 1½, 2½, 3½, or 4½ messages. (GE Star® only)

END BURST LENGTH: 1½, 2½, 3½, or 4½ messages. (GE Star® only)

MESSAGE TYPE: Any other in lieu of ANI ID. (GE Star® only)

SIDETONE: Produces audible 1 Khz alert tone via receiver speaker during transmission of ANI-ID data burst.

### **EMERGENCY ALARM MESSAGE**

MESSAGE TYPE: Can be programmed to any message type in lieu of the Emergency code in GE Star®.

BURST MODE:

Single Message:

The message is transmitted only once when the channel is clear. Generally used if the message is programmed as a Status or Canned Message.

Repeat Message:

W/PTT ANI-ID, W/Out Monitor Mic: The Emergency message is transmitted 5 times and only when the channel is clear.

W/PTT EM-ID, W/Out Monitor Mic: Transmits Emergency every 10 seconds, even if the Channel is busy. The transmitter is un-keyed during the 10 Second pauses. A count is made of clear Channel transmissions. After a count of 5 clear channel transmissions, the Emergency cycle is concluded. Voice can be used during the 10 Sec pauses.

This protocol increases the probability of an early decode and increases the reliability of decoding at the dispatch decoder.

Continuous Cycle:

Regardless of PTT alternative or whether the channel is busy or clear, the Emergency Message is transmitted every 10 seconds with un-keyed pauses between transmissions until power is removed from the radio.

PTT INITIATED MESSAGE:

Normal PTT ANI-ID Message:

During a Repeat or Continuous cycle, each activation of the PTT input results in a normal ANI-ID Message.

Emergency Cycle PTT EM-ID Message:

During an Emergency Repeat or Continuous cycle, each PTT switch actuation will result in the transmission of an additional Emergency Message in lieu of the ANI ID Message.

Continuous PTT EM-ID Message:

After an Emergency cycle is initiated, each PTT actuation will result in an additional Emergency Message until power is removed from the radio.

INPUT POLARITY: The Emergency switch input is programmable for either a normally open (N.O.) or normally closed (N.C.) switch.

**MONITOR OPEN MICROPHONE MODE:**

During the Emergency Repeat Cycle the radio is keyed continuously with an open microphone between the five, ten-second spaced Emergency Bursts. NOTE: As the radio is keyed between data bursts, the Channel/Busy circuit will not be operative, and the PTT input is not monitored. A total of five Emergency bursts will be transmitted.

If the Monitor Open Microphone Mode is selected in conjunction with the Continuous Emergency Cycle, the activated radio will first continuously transmit microphone audio between five Emergency bursts (Channel/Busy inoperative, PTT input not monitored). The unit then provides unkeyed pauses between Emergency bursts until a count of five clear channel bursts is made (Channel busy operative and PTT is monitored). The unit then reverts to continuously transmitting between five Emergency bursts, and alternates between these modes until power is removed.

This mode of operation will provide 40 seconds of open-mike monitoring, followed by at least 40 seconds in which emergency bursts with un-keyed pauses will be transmitted, thereby alternately allowing open-microphone monitoring, and possible voice transmissions between bursts on the radio channel.

LOCAL AUDIBLE ALERT TONE: Tone output is applied to the radio receiver's audio circuit. Programmable On/Off. If On, causes a 1 second tone each time the Emergency Burst is transmitted. If Off, no tone is sounded during the Emergency Mode.

**MAN-DOWN ALARM MESSAGE:**

MESSAGE TYPE: Can be programmed to any message type in lieu of the ManDown code in GE Star®. The unit can be programmed to transmit a unique "Man-Down" message. NOTE: The decoder-display must be capable of recognizing the unique message. In MDC-1200®, an emergency message is transmitted.

**BURST MODE:**

Single Message:

The message is transmitted only once when the channel is clear. Generally used if the message is programmed as a Status or Canned Message.

Repeat Message:

W/PTT ANI-ID, W/Out Monitor Mic: The ManDown message is transmitted 5 times and only when the channel is clear.

W/PTT EM-ID, W/Out Monitor Mic: Transmits ManDown every 10 seconds, even if the Channel is busy. The transmitter is un-keyed during the 10 Second pauses. A count is made of clear Channel transmissions. After a count of 5 clear channel transmissions, the ManDown cycle is concluded. Voice can be used during the 10 Sec pauses.

This protocol increases the probability of an early decode and increases the reliability of decoding at the dispatch decoder.

Continuous Cycle:

Regardless of PTT alternative or whether the channel is busy or clear, the ManDown Message is transmitted every 10 seconds with un-keyed pauses between transmissions until power is removed from the radio.

PTT INITIATED MESSAGE:

Normal PTT ANI-ID Message:

During a Repeat or Continuous cycle, each activation of the PTT input results in a normal ANI-ID Message.

ManDown Cycle PTT MD-ID Message:

During a Repeat or Continuous cycle, each PTT switch actuation will result in the transmission of an additional ManDown Message in lieu of the ANI ID Message.

Continuous PTT MD-ID Message:

After a ManDown cycle is initiated, each PTT actuation will result in an additional ManDown Message until power is removed from the radio.

INPUT POLARITY: The input is programmable for either a normally open (N.O.) or normally closed (N.C.) switch.

MONITOR OPEN MICROPHONE MODE:

During the ManDown Repeat Cycle the radio is keyed continuously with an open microphone between the five, ten-second spaced ManDown Bursts. NOTE: As the radio is keyed between data bursts, the Channel/Busy circuit will not be operative, and the PTT input is not monitored. A total of five bursts will be transmitted.

If the Monitor Open Microphone Mode is selected in conjunction with the Continuous Cycle, the activated radio will first continuously transmit microphone audio between five ManDown bursts (Channel/Busy inoperative, PTT input not monitored). The unit then provides unkeyed pauses between ManDown bursts until a count of five clear channel bursts is made (Channel busy operative and PTT is monitored). The unit then reverts to continuously transmitting between five ManDown bursts, and alternates between these modes until power is removed.

This mode of operation will provide 40 seconds of open-mike monitoring, followed by at least 40 seconds in which ManDown bursts with un-keyed pauses will be transmitted, thereby alternately allowing open-microphone monitoring, and possible voice transmissions between bursts on the radio channel.

MAN-DOWN INITIATION PERIODS: Eight (8) initiation time periods are programmable:

Initiation Time	Tone Time	Pause Time
.05 Sec.	N/a	N/a
5.0	1 Sec.	2 Sec.
5.0	1	5
10.0	1	10
10.0	1	20
10.0	1	30
10.0	1	45
10.0	1	60

The first selection would be used if the Man-Down input is used to initiate a status or canned message.

LOCAL AUDIBLE ALERT TONE: Output is applied to radio receiver audio circuit. Programmable On/Off.

*NOTE: If the Emergency and Man-Down inputs are to be used for other messages or as a combination of status (or canned message) and an Emergency, be advised that initiation of the Man-Down input will preempt any message transmissions from the Emergency input. Therefore, if a status (or canned message) and an Emergency are to be used, program the status (or canned) for the Emergency input and the Emergency message for the Man-Down input.*

**STUCK-MIC TRANSMISSION:**

To take advantage of the Stuck-Mic feature, the radio personality must be programmed with a Stuck-Mic actuation time of greater than 60 seconds.

MESSAGE TYPES:

ANI-ID Message: For decoder/display units which do not recognize the Unique Stuck-Mic code, the ANI ID code may be programmed for the Stuck-Mic cycle.

Unique Stuck-Mic Message: A unique "Stuck-Mic" message code may be transmitted in lieu of the ANI ID Message code. NOTE: The decoder-display in use must be compatible with the unique message code.

Other Message Codes: May be programmed to be any message type in lieu of ANI ID or unique Stuck-Mic codes.

In MDC-1200® mode, an emergency message is transmitted.

**STUCK-MIC PROTOCOL:** The Stuck-Mic protocol is disabled during the Emergency and Man-Down cycles.

**Ten-Second Repeat:**

The Stuck-Mic message is transmitted every 10 seconds until either the PTT switch is released or power is removed from the radio. If the tone output is interfaced to the radio receiver's audio circuit, a one second tone will be sounded each time the ANI burst is transmitted.

**Time-Out-Timer:**

The unit may be programmed such that after 60 seconds of continuous keying the unit will transmit one digital message, the PTT line will be opened, and if the tone output is applied to the receiver's audio circuit, an audible tone will be sounded for one second. The PTT line will remain open until the PTT switch is released, an Emergency or Man-Down mode is entered, or power is removed from the radio.

## **BURST LENGTH**

Burst length is adjustable only in the GE Star® mode. In general, the longer the burst length the higher the probability of decoding a digital message, thereby resulting in better reliability of data transfer. However, a long burst for beginning ANI ID may cut-off a voice syllable. A compromise can be made by using a short burst for a "beginning" ANI-ID and a long burst for an "end" ANI-ID.

The burst length is independently programmable for ANI ID at beginning, ANI ID at end, and one setting for Emergency, Man-Down, and Stuck Mic.

### ANI-ID BURST LENGTH:

The Burst Length may be independently programmed for beginning and end ANI-ID to 1½, 2½, 3½, or 4½ messages.

### BURST LENGTH FOR ALL OTHER MESSAGES:

Either 3½ or 4½ messages as a group.

## **ATTACK DELAY**

The attack delay provides time for a transmitter to reach full power and for all system audio circuits to open prior to transmission of data. Programmable to 60, 70, 80, 90, 125, 325, 625 or 1300 milliseconds.

## **PREAMBLE LENGTH**

The preamble length is only programmable in the GE Star® mode. The message preamble aids in bit synchronization. Shorter preambles are used in good signal conditions, while longer preambles allow synchronization in marginal signal conditions. Programmable for 16, 24, 32, or 40 preamble bits.

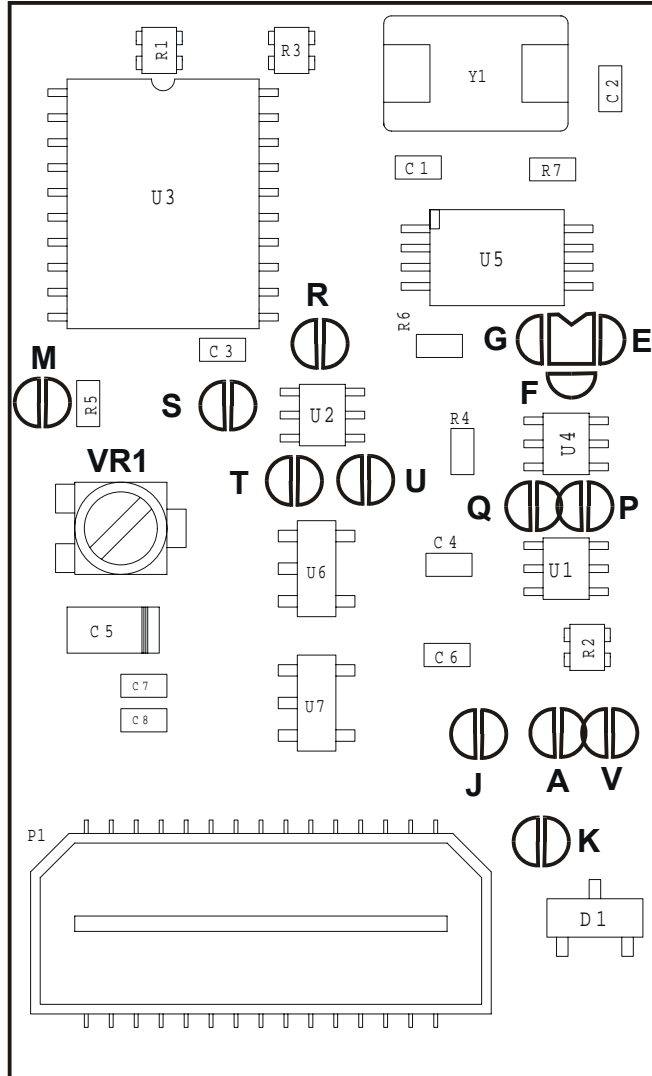
## **BUSY/CLEAR CHANNEL INPUT**

INPUT SENSE: Input sense for Channel Busy, programmable for logic Hi or Low.

# Jumpers

The QE-2i is supplied with jumpers K, P, S and U installed. To install any other jumpers, use a fine tip soldering iron and create a solder bridge. To remove a jumper, use the fine tip soldering iron and solder wick to wipe the jumper off. Add and remove jumpers as required to conform to the installation notes pertaining to the radio in which the QE2i is being installed.

## Jumper Locations



## Jumper Definitions

Jumper	Usage
A	Supplies A+ voltage to Tone Control circuit
E	Tone Control pull up resistor enable. Install to obtain a 1Kohm pull up resistor. Tone Control output will be pulled up to A+ or +5vdc depending on jumpers A and V.
F	Tone Control open collector enable. Install jumper F to obtain a PNP open collector output.
G	Tone Control direct output. Provides a simple 0 to +5v logic swing.
J	QE-2 supply voltage select. Install if QE-2 is to be supplied by regulated +5vdc. Remove if QE-2 is to be supplied by un-regulated +7.5vdc or greater.
K	PTT/KEY jumper. Connects PTT and Key lines together.
M	Data Output level boost. Install for Data Output 0 to 5vpp Remove for Data Output 0 to 150mVpp
P	PTT high voltage buffer. Install if radio PTT voltage ranges between 0 and greater than +5vdc.
Q	PTT direct input. Install if radio PTT voltage ranges between 0 and +5vdc.
R	Connects Key output directly from microprocessor
S	Disables Key transistor. Remove if Jumper R is inserted
T	Connects Audio inhibit directly from microprocessor
U	Disables Audio inhibit transistor. Remove if Jumper T is inserted
V	Supplies +5v to Tone Control Circuit

## Tone Control Jumper Selections

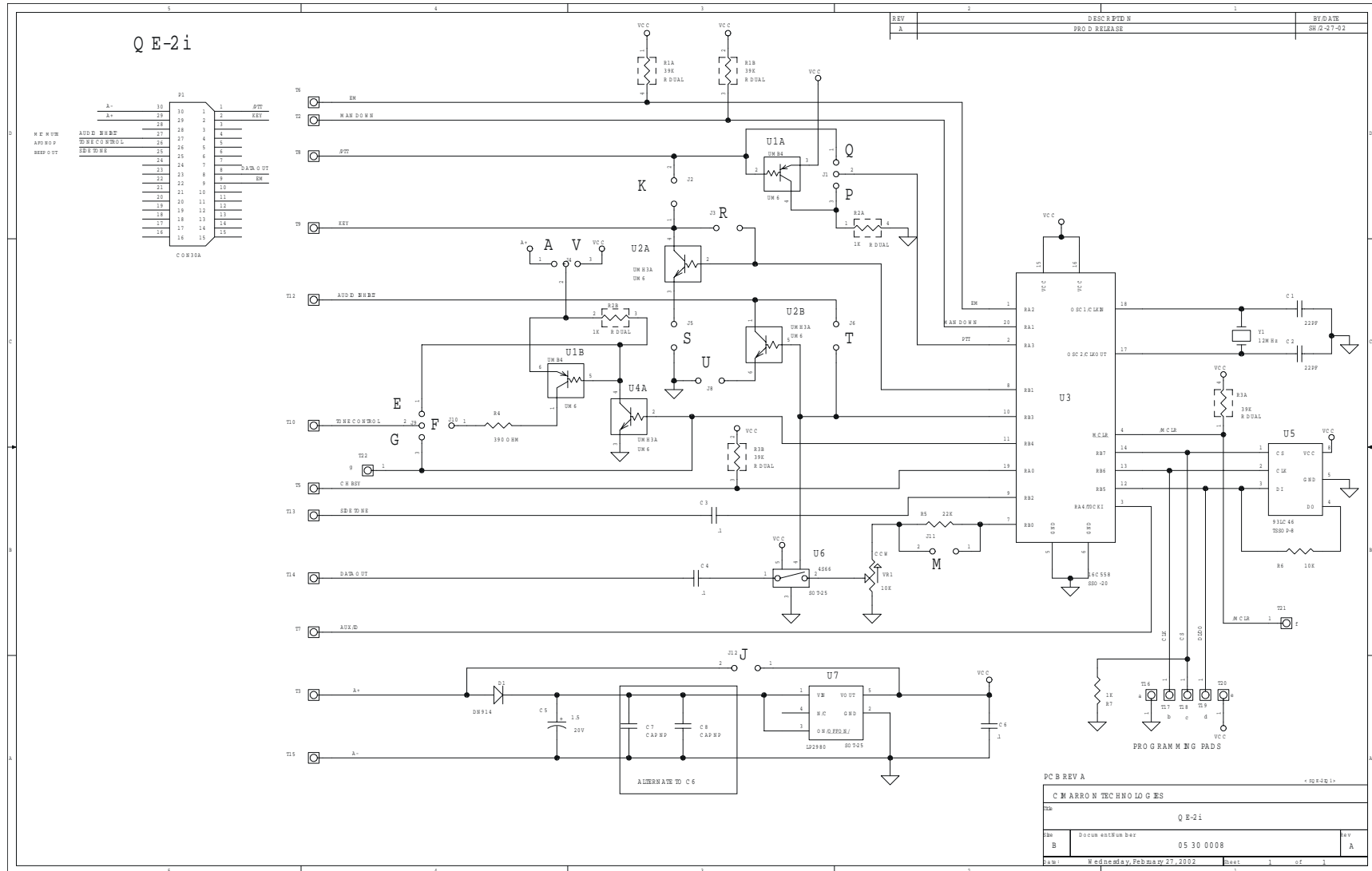
The tone control output is used to control audio amplifier circuits of the radio. The following table defines the output states available.

Jumper Selection					Tone Control Output	
E	F	G	A	V	Inactive	Active
Out*	Out*	In*	In*	Out*	Low	+5vdc
In	Out	Out	Out	Out	HiZ	Low
In	Out	Out	In	Out	A+	Low
In	Out	Out	Out	In	+5vdc	Low
Out	In	Out	In	Out	HiZ	A+
Out	In	Out	Out	In	HiZ	+5vdc

*Caution: **Never** connect jumpers A and V simultaneously! Damage will occur.  
**Never** connect jumpers E, F and G simultaneously.*



# Schematic



## Signal Descriptions

Not all of the described signals are used in the operation of the QE2i. The descriptions are present for reference only.

A+	Positive supply voltage to the QE-2. Regulated or Unregulated +6 to +16.5 VDC. If only +5 VDC is available, install jumper J. <i>Note: If J is installed, there is no reverse voltage protection!!</i>
A-	Supply ground.
Aud Inhib	Audio Inhibit Output – This line is used to disable the microphone during data transmission time.
KEY	Key Output. This line keys the radio when required by the QE-2i. This is an open collector output and is high impedance when idle and sinks to within 1 volt of system ground when active.
PTT	PTT input. Detects when the radio is keyed. The signal is buffered before being sent to the microprocessor.
Sidetone	Capacitively coupled 1 Khz 5 Vpp signal output, interfaced to the radio audio amplifier input. The QE-2i microprocessor activates this tone line under the following circumstances.  If programmed for tone on PTT, this line will be active for the duration of the transmitted ANI data. This gives the operator audible notice when the ANI burst is finished and un-clipped speech is possible.  If programmed for tone on Emergency or Man Down, this line will be active as described in the applicable sections.
Emergency	Emergency message input from external switch. This line is normally pulled high and grounding it activates the emergency condition. Programming can reverse the sense. This line can alternately be used as a status or canned message.
Man-Down	Man Down message input from external sensor or switch. This line is normally pulled high and grounding it activates the Man Down condition. Programming can reverse the sense. Like the Emergency line, this line can also be used as a status message or canned message.
Aux I/O	Auxiliary input/output. Can be programmed to perform one of the following four functions.  1. Transmit Control. Idle state is +5 VDC. Active state occurs during all data burst transmissions. When active, it sinks a maximum 10 mA to within 1 volt of system ground. Typically used to control a transmitter CTCSS, turning it off during ANI transmissions.  2. Home Control. Similar to Transmit control but can be programmed active only during Emergency or Man Down data

transmissions. Typically used to change the radio channel to a "Home" channel before sending the Emergency or Man Down message.

3. Tone Control. Idle state is +5 VDC. Active during sidetone outputs. When active, it sinks a maximum 10 mA to within 1 volt of system ground. Used to enable receiver audio circuits to allow amplification of the Sidetone signal.

4. Data Inhibit Control. An input to the QE-2 microprocessor. Will put the QE-2 to "sleep" when active. Active state is programmable for logic 1 or 0.

Chan Busy	Channel Busy input. Provides the QE-2 the status of the interfaced radio.
ToneCtl	Tone control output. Used to activate the radio audio amplifier when Sidetone is being generated by the QE-2i.
Data Out	Capacitor coupled ANI data output. The output is adjustable from 0.0 to 4.5 Vpp.

## Physical Installation

### ICOM F3S-2 Radio

#### **Preparations of the radio prior to install:**

Note: Close all applications in Windows that are running when programming the radio.

1. Remove resistor "D" (W1) which is next to the accessory connector of the radio.
2. Program the radio for the Emergency key assignment by selecting the "common" tool icon. Then open the FO conventional key assignment and select OPT1 Momentary/L.

#### **Preparations of the QE-2i prior to install:**

Note: The QE-2i must go toward the right side edge of the QPF-2 red plastic carrier (programming guide) when programming. This provides the correct alignment of the programming pads of the QE-2i with the QPF-2 programming pins.

1. Program the QE-2i with defaults. Select the PTT options tab and enable active high under the PTT input parameter and enable Key Follows PTT under the PTT 60-second timer Parameter. As needed enable PTT Side Tone or other parameters.
2. Install jumpers R, V, F, M, T and J. Verify default jumper P is installed.
3. Remove jumper K, U and S.
4. Adjust the ANI deviation level at VR1 to just below the voice deviation level.

#### **To install the QE-2i:**

Plug onto connector Adjust VR1 (50 K Ohm potentiometer) to provide a data deviation to match the voice deviation.

### ICOM F30GT Radio

#### **Preparations of the radio prior to install:**

Note: Close all applications in Windows that are running when programming the radio.

1. Cut egg shaped jumper "G" which is next to the accessory connector of the radio.
2. Program the radio Emergency key assignment by selecting the "common" tool icon. Then open the F0 conventional key assignment and select OPT11 for Momentary/L (if connecting to OPT1 (J1) connector) or select OPT21 for Momentary/L (if connecting to OPT 2 (J2) connector).

#### **Preparations of the QE-2i prior to install:**

Note: The QE-2i must go toward the right side edge of the QPF-2 red plastic carrier (programming guide) when programming. This provides the correct alignment of the programming pads of the QE-2i with the QPF-2 programming pins.

1. Program the QE-2i with defaults. Select the PTT options tab and enable active low under the PTT input parameter and enable Key Follows PTT under the PTT 60-

second timer Parameter. As needed enable PTT Side Tone or other parameters.

2. Install jumpers V, F and J. Verify default jumpers P, U and S are installed.
- 3 Remove jumper K.
4. Adjust the ANI deviation level with VR1 to just below the voice deviation level.

**To install the QE-2i:**

Plug onto connector.

## **ICOM F3GS-2 Radio**

**Preparations of the radio prior to install:**

Note: Close all applications in Windows that are running when programming the radio.

1. Cut egg shaped jumper "D" which is next to the accessory connector of the radio.
2. Program the radio for the Emergency key assignment by selecting the "common" tool icon. Then open the FO conventional key assignment and select OPT1 Momentary/L.

**Preparations of the QE-2i prior to install:**

Note: The QE-2i must go toward the right side edge of the QPF-2 red plastic carrier (programming guide) when programming. This provides the correct alignment of the programming pads of the QE-2i with the QPF-2 programming pins.

1. Program the QE-2i with defaults. Select the PTT options tab and enable active high under the PTT input parameter and enable Key Follows PTT under the PTT 60-second timer Parameter. As needed enable PTT Side Tone or other parameters.
2. Install jumpers R, V, F, M and J. Verify default jumpers P and U are installed.
3. Remove jumper K and S.
4. Adjust the ANI deviation level at VR1 to just below the voice deviation level.

**To install the QE-2i:**

Plug onto connector.

## **ICOM F320S Radio**

**Preparations of the radio prior to install:**

Note: Close all applications in Windows that are running when programming the radio.

- 1 Cut egg shaped jumper "C" which is next to the accessory connector of the radio.
- 2 Program the radio for the Emergency key assignment by selecting the "common" tool icon. Then open the FO conventional key assignment and select OPT1 Momentary/L.

**Preparations of the QE-2i prior to install:**

Note: The QE-2i must go toward the right side edge of the QPF-2 red plastic carrier (programming guide) when programming. This provides the correct alignment of

the programming pads of the QE-2i with the QPF-2 programming pins.

- 1 Program the QE-2i with defaults. Select the PTT options tab and enable active low under the PTT input parameter and enable Key Follows PTT under the PTT 60-second timer Parameter. As needed enable PTT Side Tone or other parameters. If PTT Side Tone (Go ahead beep) is desired, the audio level will be very high. One possible solution to this problem is to remove QE2i capacitor C3 and replace with a 1 meg ohm surface mount resistor.
2. Install jumpers V, F and J. Verify default jumpers P, U and S are installed.
- 3 Remove jumper K.
4. Adjust the ANI deviation level with VR1 to just below the voice deviation level.

**To install the QE-2i:**

Plug onto connector.

## **ICOM F620/621 Radio**

**Preparations of the radio prior to install:**

Note: Close all applications in Windows that are running when programming the radio.

- 1 Cut egg shaped jumper "C" which is next to the accessory connector of the radio.
- 2 Program the radio Emergency key assignment by selecting the "common" tool icon. Then open the desired conventional key assignment and select OPT1 for Momentary/L.

**Preparations of the QE-2i prior to install:**

Note: The QE-2i must go toward the right side edge of the QPF-2 red plastic carrier (programming guide) when programming. This provides the correct alignment of the programming pads of the QE-2i with the QPF-2 programming pins.

- 1 Program the QE-2i with defaults. Select the PTT options tab and enable active low under the PTT input parameter and enable Key Follows PTT under the PTT 60-second timer Parameter. As needed enable PTT Side Tone or other parameters.
2. Install jumpers V, F and J. Verify default jumpers P, U and S are installed.
- 3 Remove jumper K.
4. Adjust the ANI deviation level with VR1 to just below the voice deviation level.

**To install the QE-2i:**

Plug onto connector.