



## CONNECTING an ICOM RADIO to a PC

- Example: the digital “word” in the above diagram is “8” bits long. It is 00101101.
- The voltage on the RS-232 cable toggles symmetrically anywhere between a minimum of 5 and 15V with respect to signal ground.

### 4. DB-9 Connector

- For connecting to COM ports, RS-232 cables use a connector having 9 pins. There are Male and Female versions. COM ports on PC's are DB-9 Male.



- Pins are functionally designated. Those listed here most often appear in software setups.
  - RXD, pin 2 typically receives data in to PC. Used by CI-V.
  - TXD, pin 3, typically transmits data out of the PC. Used by CI-V.
  - DTR, pin 4, typically transmits commands.
  - GND, pin 5 is signal ground.
  - RTS, pin 7 typically transmits commands.
- Commands are set in the software setup and control operations such as PTT, FSK, CW, or other.
- The above are NOT always assigned as listed. Software designers can reassign functionality. It is not necessarily consistent across platforms.

### 5. Converters

- RS-232 toggles between +V and –V.
- CI-V uses a signal between +V and ground.
- Command signals for CW, FSK, PTT, are usually ground-to-activate & open-circuit for “off”.
- Signal level-wise, they are incompatible with each other.
- Level converters are required to shift signal levels between the COM port and the CI-V and the Accessory Inputs.
- The CI-V Level Converter is used exclusively for the CI-V interface input/output.
- The RS-232 Interface Converter is used exclusively for the Accessory socket inputs.

### 6. COM Ports

- COM ports require setup.
- Unless there is a special requirement, these settings typically work.
  - Bits per Second      19200, or at least equal to or greater than required by S/W
  - Data Bits              8
  - Parity                  None
  - Stop Bits               1
  - Flow Control          None

- Pay attention to the software being used as to how it wants to be configured during set up.

### 7. PC / Software

- It is recommended that each software application have its own COM Port to avoid conflicts.
- Expect each application to have a setup specific to its needs.
- Sometimes a port can be shared, but only one application can be run at a time.

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## 8. Assess COM port Status on PC (Win 7)

- Start > Control Panel > System and Security > System > Device Manager.
- Expand Ports COM & LPT.
- A list of installed COM ports is shown.
- This does not tell you which COM ports are available. You have to know.
- Typically COM 1 is not available.
- The PC may not even have a hardware equipped COM port these days.
- If no additional COM Ports are listed, or equipped, you will need to install additional COM ports, either by,
  - Installing a COM Port Expansion card in the PC – usually 2 port, more if possible.
  - Obtaining an external USB to COM port converter device with 2 or more COM ports.
  - Buy a Rig to Computer Interface package. See Decision, Point, Section 11.

## 9. Schematics

- Schematics showing hardware interfaces follow, Figures 1 thru 5.

## 10. Requirements Summary

- One COM port to be dedicated to the CI-V data function.
- A second COM port to be dedicated to the Accessory Control function.
- Recommend 2 more COM ports be equipped, ready to be assigned to other software applications.
- All Rig-PC Com connections need level converters, unless an interface product is employed.
- Must have Audio Isolating Transformers when connecting Tx and Rx audio to the Accessory socket. This will break ground loops that may otherwise induce hum or RF feedback.

## 11. Decision Point

- You can buy complete interfaces that meet the above requirements as plug and play product.
- Some possibilities,

<http://www.westmountainradio.com/rigblaster.php>

<http://microham-usa.com/store/product-info.php?pid6.html>

<http://www.mfjenterprises.com/Product.php?productid=MFJ-1275>

- Do your own web search,

or:

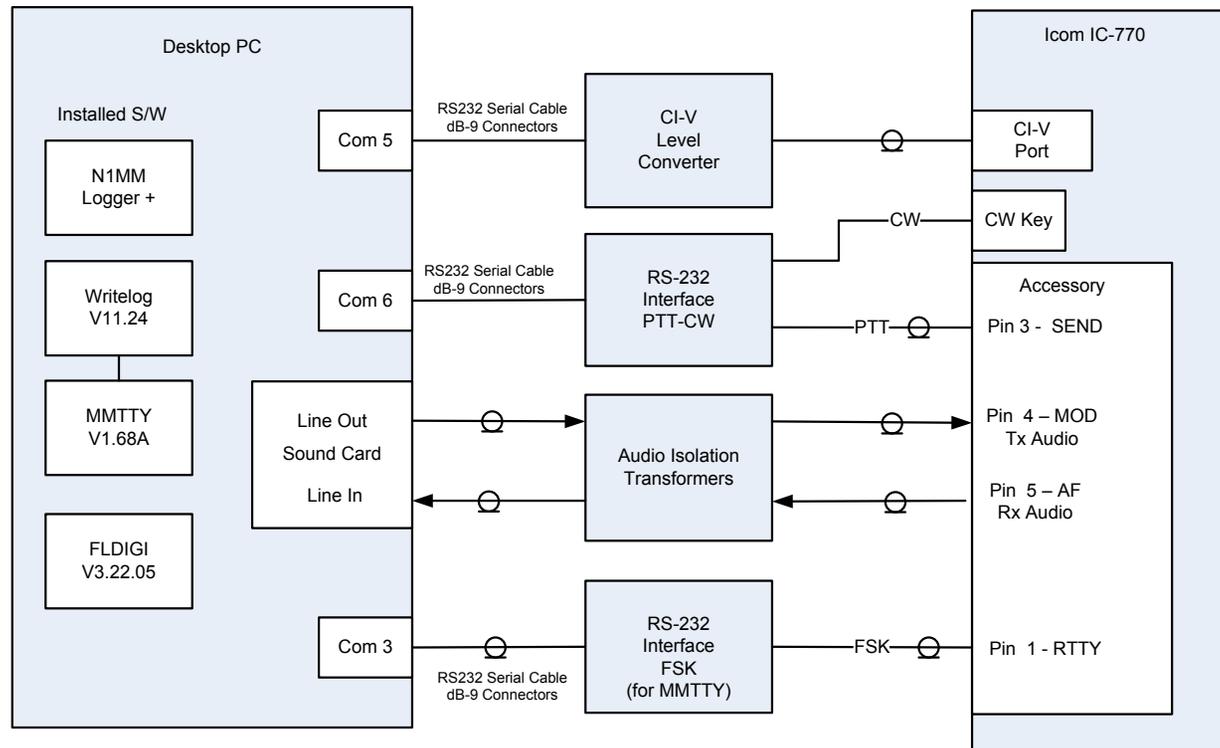
- You can make your own per the supplied schematics.
- Attempt only if you are experienced in home construction.
- Have appropriate tools.
- Have a parts supplier.

Hope this helps.

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Figure 1

## HARDWARE OVERVIEW of ICOM to PC CONNECTIVITY

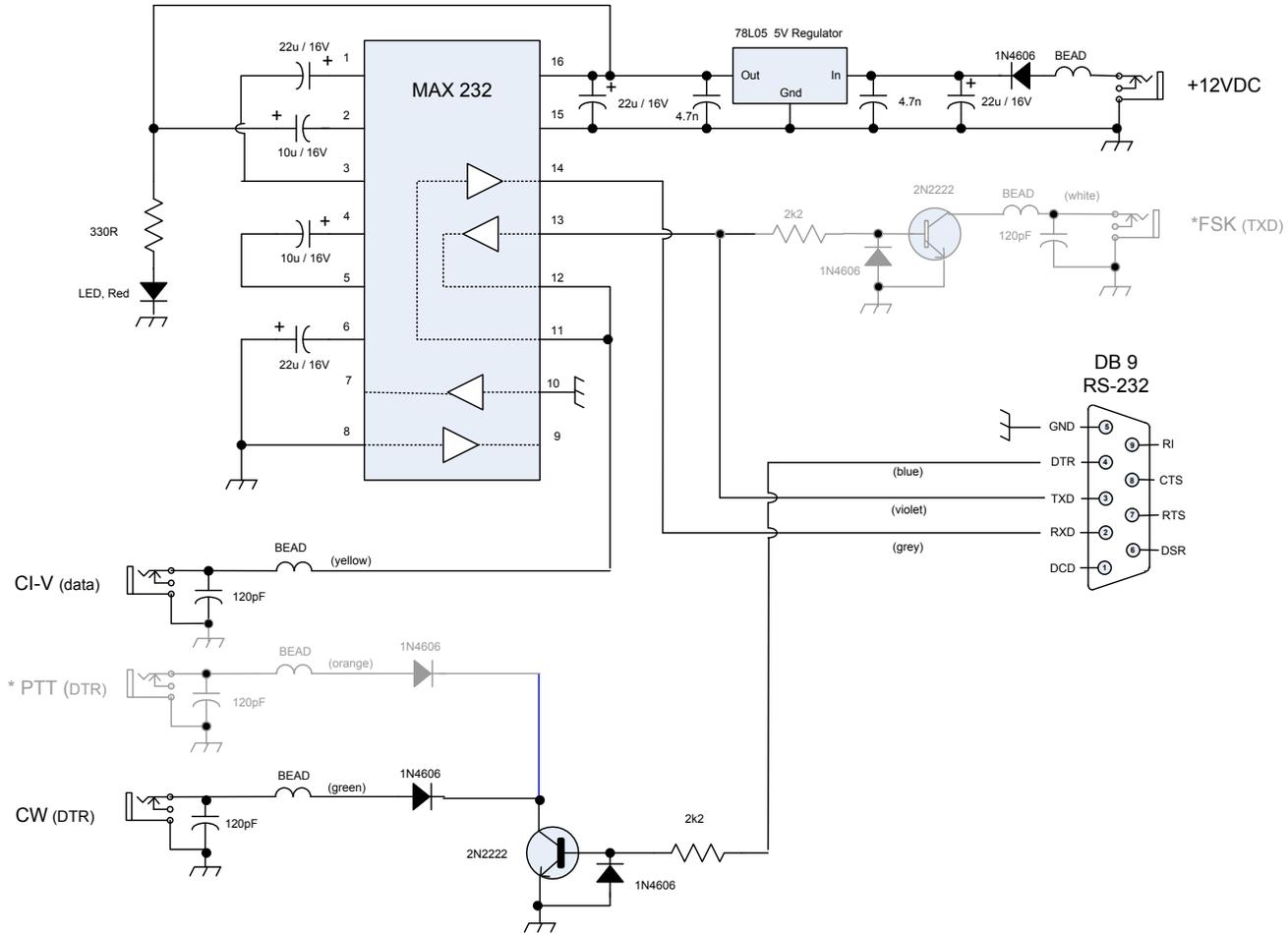


1. COM Port numbers are arbitrary
2. All leads are shielded
3. RS232 cables are 9 pin DB-9 style. All others are either RCA or 3.4 mm phono, monaural
4. Accessory socket is 8 pin DIN

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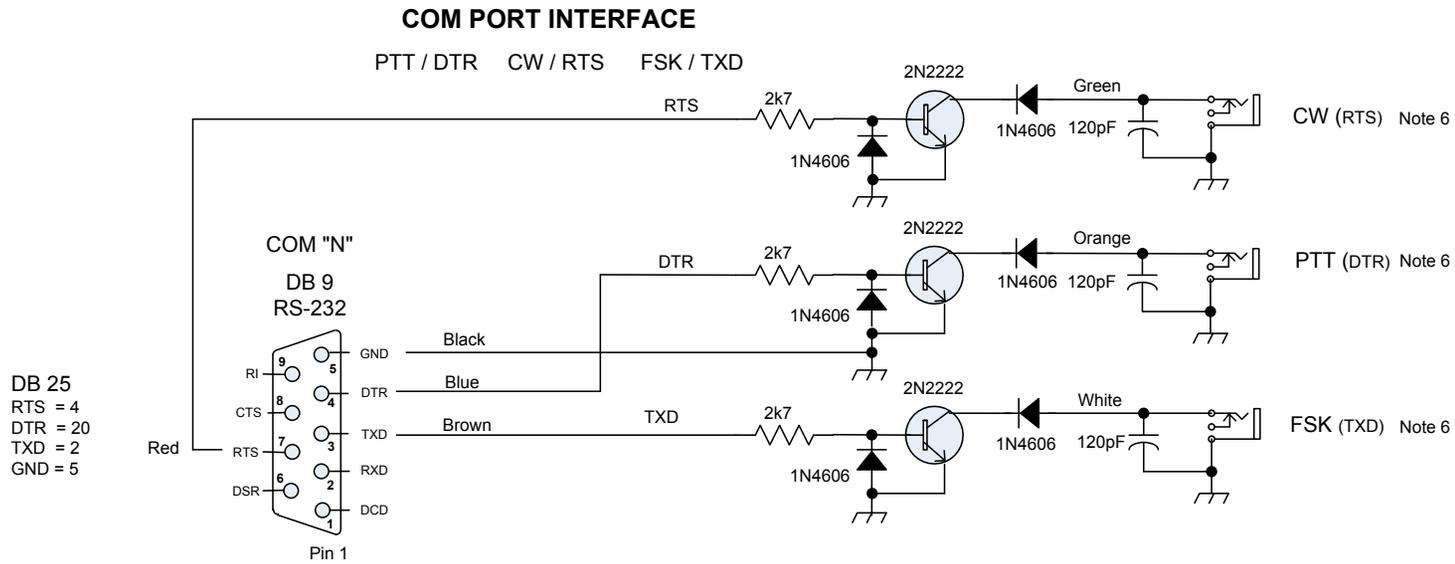
Figure 2

## CI-V / CT-17 Level Converter



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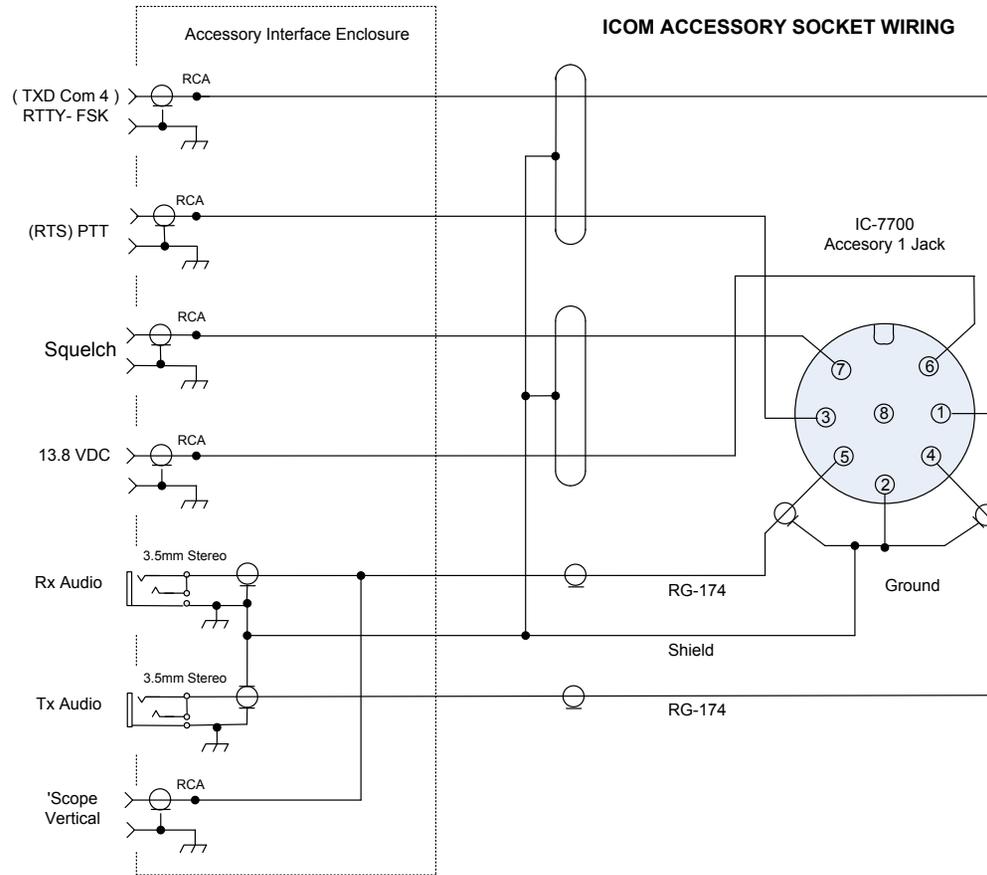
Figure 3



1. Applications such as MMTTY, N1MM, WriteLog, Ham Radio Deluxe, and others commonly use the RTS, DTR, TXD lines of the RS-232 port to control Rig functions.
2. This Com Port to Rig Interface converts the Computer RS-232 Com Port levels to "Open" and "Ground" levels which is commonly what the rig requires to operate the PTT line, CW Key jack, and FSK line.
3. Not all applications use the same RS-232 line for the same rig function. Check each application for setup.
4. Note that all output circuits are the same. The only difference is the RS-232 pin that each interface is connected to. Therefore if an application must have DTR do CW keying, then the DTR interface circuit would be re-labeled as CW, not PTT.
5. More interface circuits can be added if, for instance, CTS is specified by an application as required for rig control, then reconnect one of the interface circuits to the CTS pin.

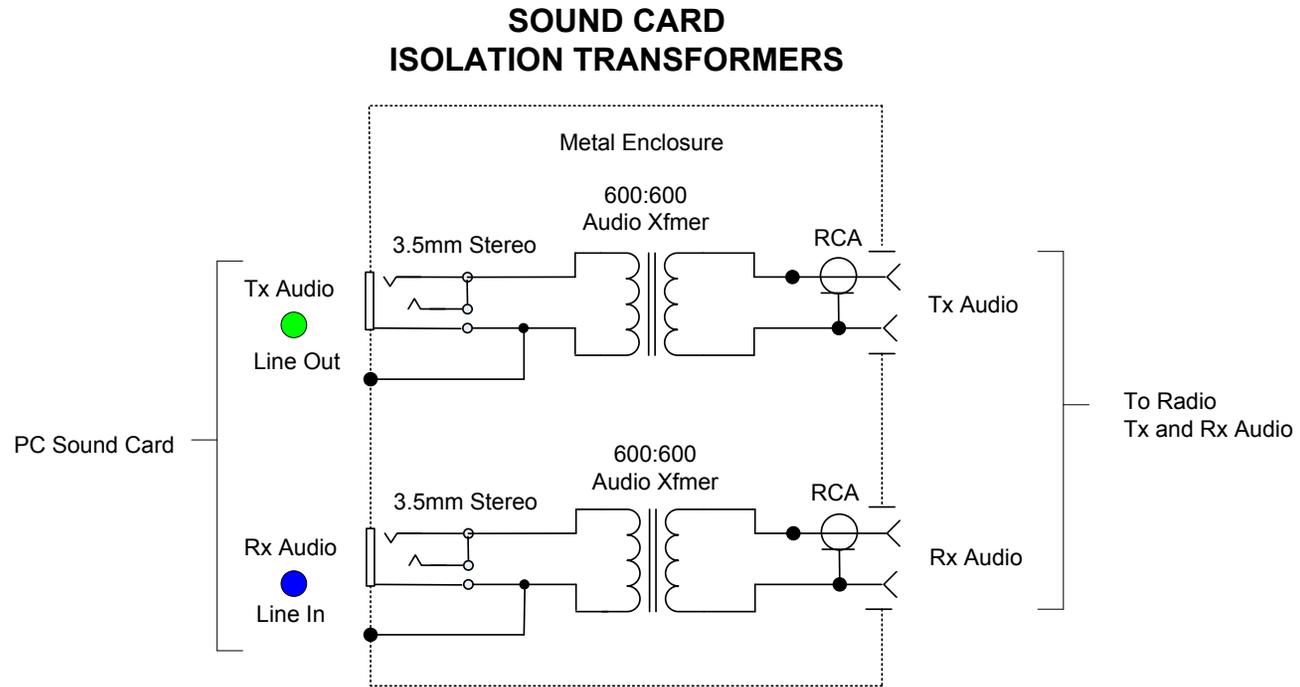
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Figure 4



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Figure 5



- Notes
1. The 3.5 mm Stereo jacks are grounded to metal enclosure.
  2. The RCA jacks are completely isolated from metal enclosure. There must be no metallic connection between input and output circuits