

**DRAFT**  
**PC-ALE Radio Control**  
**Knowledge Base**

by N2CKH

8 MARCH 2009

OVERVIEW -

This document details PC-ALE v1.062H build 6 Radio Control support. A "RADIO TYPE MATRIX" is provided herein which details all choices of radio control supported by PC-ALE beginning with RADIO TYPE "NONE" where the radio is not under PC control, to "TXDPULSE" where a radio with memories and the ability to step through them where Up/Dn switches are provided, through each specific make/model CAT HF SSB transceiver and receiver that are supported.

Additional make/model radios equipments are always being added, should your radio not be listed under either the RADIO TYPE or COMMENTS columns in the RADIO TYPE MATRIX as it is new or obscure, please contact N2CKH@hfink.net with the details and all documentation you may have for computer control programming. In addition, if you radio is not listed, see the section "WHAT TO DO WHEN YOUR RADIO TYPE IS NOT LISTED" to determine if there is anyway to place your radio into use until specific support is added.

PC-ALE SUITABLE SSB RADIO -

Any frequency stable HF SSB transceiver or receiver can be used with PC-ALE for single channel ALE operation. For multi-channel ALE operation the radio of choice must possess computer control support (also know as Computer Aided Transceiver or CAT in Amateur Radio circles) in full or in part. At a minimum the ability to change the radios memories via either direct computer control command or using the TXDPULSE interfacing method (where only the desired number of memories required needs to be entered) for stepping memories that equate to the PC-ALE scan group in use. Any transceiver that is operated in any manor of computer control must not exceed the scan rate at which it will reliably detect and demodulate ALE signals.

The radio receiver section must provide for at least 2.0Khz IF SSB filtering where an IF Shift control provides for centering on the ALE 8FSK 1625hz signal center. With wider IF SSB filters the centering on 1625hz becomes less and less critical. In addition the receiver section AGC must be set to FAST and such things as Notch Filtering and other types of DSP filtering should be disabled. Newer transceivers with receiver section dual frequency monitor, such as Dual Watch in many ICOM transceivers must also be disabled. In addition receiver RF gain and squelch if adjustable must be wide open. The use of fixed level receiver line audio over receiver speaker audio is highly recommended for feeding the PC-ALE modem.

For transceivers, the RX/TX/RX turn-over timing of just about any make/model radio should be fast enough for ALE operation. However most HF transceivers make use of Power Amplifier (PA) spectral purity filters that are selected via relays based on frequency of operation, which during scanning are constantly switching and will if not placed into bypass prematurely shorten the relay life span.

For stations contemplating extended term ALE operations under CAT control, only radios that are listed in the radio type matrix as being rated QS/S (Quiet Scanning/Sounding) should be selected for use. Lastly the radio audio drive level should be adjusted so that the ALC reading just barely moves at any time during ALE 8FSK tones being sent.

## RADIO TYPE MATRIX -

The Radio Type Matrix listed below has three columns, RADIO TYPE, STATUS and COMMENTS.

### RADIO TYPE:

The RADIO TYPE column lists the radio model as listed in the RADIO TYPE selection box from the MIL-STD-188-141 Options Dialog in the program.

### STATUS:

The STATUS column lists a number of items where a color coded comment is always listed first which pertains to the current development status of the radio type as follows:

<b>TBD</b>	= May develop support but documentation is still required.
<b>PENDING</b>	= Under development (or awaiting radio loan).
<b>WIP</b>	= Work in progress, if listed in ALE.EXE for selection it may not yet be completely coded.
<b>ALPHA</b>	= Coding completed, however test results from user feedback still pending.
<b>RELEASED</b>	= Coding completed and fully tested by one or more parties.

### QS/S -

In addition to the development status, the color coded use of **QS/S** shall always be presented to denote the status of the radio to meet Quiet Scanning/Sounding when applicable. **QS/S** is where the radio is controlled in a manor so as to NOT energize the radios transmit Band Pass Filter (BPF) relays during receive scanning operation, but rather only during transmit.

**NOTE:** **QS/S** denotes a radio that should or is known to work with **QS/S**. **QS/S** denotes a radio that may not or is known not to meet **QS/S**. No **QS/S** indication listed means that the radio has no need for **QS/S** as far as we know.

### CAT PTT -

The color coded use of **CAT PTT** shall always be presented to denote whether the radio type supports PTT operation via CAT commands if "Use CAT for PTT" is selected (only one type of PTT needs selection) as the method of PTT via the MIL-STD-188-141 Options Dialog.

**NOTE:** ~~**CAT PTT**~~ shall denote **NO CAT PTT** support by the given radio model and **CAT PTT** will denote **CAT PTT** is fully supported.

The recommended type of PTT for use with PC-ALE is hardware PTT where either the RTS or DTR line along with the ground line of the serial port (CAT Comm Port) selected for the radio port or the dedicated PTT serial port (PTT Comm Port) is used to signal an external PTT interface that is wired to the radio.

**NOTE:** At no time should any type of VOX keying be used due to data bits being lost during the keying delay period. Should an external device which is VOX based already be in use, enabling **CAT PTT** if the radio provides it can over come the issue of data bit lost.

To make use of the radio port DTR line for PTT, DTR can not be used for any other purpose, thus DTR for powering an external level converter and DTR for MUTE must not be checked.

**NOTE:** If an external interface is wired to the DTR line and DTR for D.C. Power is checked, the DTR line will be held high, thus if that line is used for PTT the radio will always be keyed until either DTR for Power is unchecked or any jumpers or diodes in the interface are opened.

To make use of the radio port RTS line for PTT, if supported by the radio type being used, hardware handshaking can not be used as the RTS/CTS lines are already being used.

**NOTE:** If an interface is already in use where RTS is normally used for PTT and DTR is used for D.C. Power, but it is desired to make use of hardware handshaking, should the interface have a VOX switch (such as older RigBlaster models) and the radio support CAT PTT, then placing the interface switch into VOX and selecting CAT PTT is an option that works.

### **CHAN -**

If the Radio Type selected supports the option of using radio memory channels or only supports the use of memory channels then **CHAN** shall be listed.

**NOTE:** **CHAN** shall denote support for the given radio model for Radio Memory Channel based scanning which is ENABLED/DISABLED using the MMI commands ENABLE CHANNEL or DISABLE CHANNEL via the Data Bar when MMI is checked if the radio in question optionally supports this method. If CHAN is the only method the radio supports then **CHAN ONLY** will be listed, in which case the MMI commands have no effect.

The radio memory channels must be programmed to match the PC-ALE Scan Group channel numbers so that the listed channels that make up the scan group are properly selected in the radio.

### **CAT MUTE -**

If the Radio Type selected supports a CAT MUTE command or CAT Volume control then CAT MUTE shall be listed.

**NOTE:** **CAT MUTE** shall denote support for CAT MUTING where it must be enabled via the MIL-STD-188-141 Options Dialog along with the method being selected if the radio supports more than one method of muting. For CAT Volume Level Muting a MUTE and UN-MUTED level must be provided.

When a radio does not support CAT muting at all, the only MUTE operation will be RTS/DTR for MUTING if enabled by “Use DRT for Mute” or “Use RTS for Mute”.

CAT MUTING is optional for radio muting whereas a selection can be made between CAT vs. RTS/DTR for MUTING via a check box on the MIL-STD-188-141 options dialog. In addition, as a number of radios support both CAT Speaker Audio Level and a CAT MUTE command there is another check box available to select the Level method when a radio supports both methods.

CAT MUTING requires that line audio output from the radio be fed to the ALE modem and not speaker output. With RTS/DTR the speaker output can still be used as long as the pickup is on the swinger of the relay directly from the radios aux speaker port.

**NOTE:** For Kenwood radio type selection the RS-232 cabling and the signal lines must allow for the radio ID to be read from the radio to know that the Kenwood model being used supports CAT MUTING.

In support of CAT MUTING there are two speaker audio level entries on the MIL-STD-188-141 Options Dialog in support of the Speaker Level muting method. One is the UNMUTED level and the other being MUTED level. The MUTED audio is set to 0 as the default and UNMUTED to 25 by default. Either can be set to the range of 0..255 as some radios have the range of 0..100 and others 0..255 and others are in between. This allows for the MUTED level to be completely 0 or some lower level than the normal ( UNMUTED) listening audio level.

When the muting configuration selections have been made, clicking on the MUTE icon on the button bar will ENABLE or DISABLE muting and a message to that affect is now displayed in the Engineering Window. During scanning the audio will UNMUTE upon and ALE Link and again MUTE when the ALE Link is cleared automatically. When the program is terminated normally the radio will also UNMUTE. Otherwise the user needs to use the MUTE button to change the mute state. For those using receivers the MUTE button is the normal means to UMUTE unless your station is configured to intercept a muti-station call.

### CUSTOM RADIO PORT PARAMETERS (CPP) -

On the MIL-STD-188-141 options menu next to the COM port entry (COM ports 1..16 are supported) for CAT control, is a button labeled “Radio 1 Comm Port”, this selects the Custom Port Parameters setup dialog.



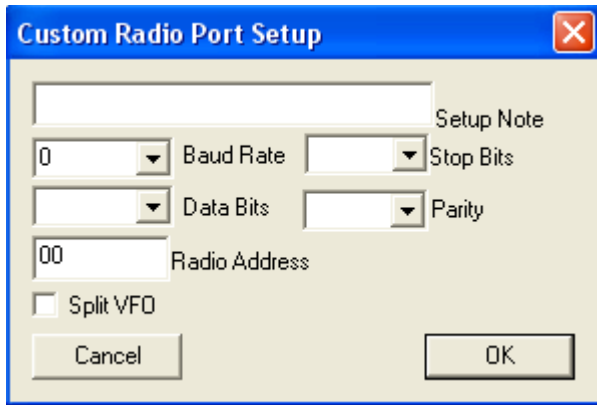
**NOTE:** Along with the STATUS, **CPP** shall denote **Custom Port Parameters** are supported for changing the baud rate and perhaps other parameters for the given radio model and not fixed, where the default values are listed immediately after.

When not using the Custom Radio Port Setup (CRPS) interface, all radios are supported at the default factory port parameters if the baud rate selected is 0 at which time the use of the highest supported baud rate will usually be used, an exception is Kenwood Amateur Grade transceivers where the Radio Type selections KENWOOD and KENWOOD\_HS are both set to 4800 baud by default due to years of radios only supporting such. At present no radios support “Radio Address” via this interface. Should the user choose to use the Custom Port Parameter interface, they must be sure to configure the radio properly and enter the proper parameters as well as take into consideration that baud rate has an affect of ALE Channel Scan Rate support. It is always best to have your radio powered and attached to the proper serial port at program start.

The CPP serial port settings are only enabled when the baud rate is other than 0, which tells the tool not to use the hard coded parameters, when 0 (regardless of other entries on this dialog) the default coded parameters are used.

CPP can be entered for only one instance of use, thus when CCP settings are changed for the currently selected radio type selected, if they do not apply to another radio type that may later be selected where said other radio type supports CPP settings, if the parameters selected do not apply, they would need to be updated.

At present there is NO support for any custom Radio Address selection, only the default factory radio address as listed below for any model which requires such is supported.



If a particular radio model supports CPP selection, then an appropriate Baud Rate along with Stop Bits, Data Bits and Parity can be entered, whenever the Baud Rate is 0, the coded default parameters are used. Changing the baud rate to other than 0 requires selection of all serial port parameters by the user.

The use of CPP is a must for any Kenwood radio that supports greater than 4800 baud if such higher baud rate operation is desired as the default baud rate for all Kenwood models, the starting default is 4800 baud regardless of what the factory setting may be due all the years of that baud rate being the only one supported and these selections supporting all Kenwood models.

It is recommended that the highest baud rate be used which any particular make/model radio supports for the best channel scan rate performance. Typically all baud rates support 1 ch/sec, 4800 baud or better is recommended for 2 ch/sec, 9600 baud or better is recommended for 5 ch/sec. Some radios due to their CPU ability to process serial port data may not meet a given Scan Rate regardless of the RS-232 baud rate being used.

Any data may be entered into the setup note section up to 38 characters to note which radio the CCP settings apply to and perhaps why they are being used in lieu of the default settings.

**NOTE:** A Null Modem cable is also known as a Serial Cross Over Cable or a Serial Laplink Cable. Wiring is as follows:

Radio end pin 2 connected to PC end pin 3

Radio end pin 3 connected to PC end pin 2

Radio end pin 5 connected to PC system ground (pin 5 for a 9 pin plug, or pin 7 for a 25 pin plug).

**NOTE:** Kenwood radios factory ID which is read at program start, thus you **MUST** have your Kenwood radio powered and attached to the proper serial port at program start to be recognized

**NOTE:** For radios that require polling (for radio ID and other data) and have time outs based on data being returned such as the Ten Tec Pegasus for one, **MUST** be attached at program start or else the radio will not be recognized and in some cases the tool will timeout constantly and prompt the user with a message to that affect. However for most make/models you can attach and power the radio after program starts

**NOTE:** FlexRadio, ICOM, Yaesu and Ten Tec models supporting Data Ports are supported using USB-D and LSB-D from CHANNEL ADD or CHANNEL MODIFY during configuration of scan groups where only those radio types that support such can be selected for USB-D or LSB-D.

## RADIO TYPE MATRIX

RADIO TYPE	STATUS	COMMENTS
NONE	RELEASED	Supports single channel use of any suitable non-CAT controlled radio.
TXDPULSE	RELEASED	Supports multi-channel scanning by providing a 10ms duration pulse on the RS-232 TXD line for the control of non-CAT radios for scanning where the radio memory channel UP ( DN is not used ) line can be wired to step the radio memory channels. The radio must allow for only programming the needed number of channels to match the Scan Group in use.
CODAN	RELEASED  QS/S  CAT PTT  CPP - 38400, 8N1	CODAN NGT ASR, AR, AR Voice, SR for basic control with PC sound device for all MIL-STD-188-141A ALE, 188-141B AQC-ALE and all ALE and MIL-STD-188-110x all data modes.  <b>NOTE:</b> RS-232 parameters are 38400 8N1 and null modem cable wiring is required. The 9-way (DB-9 connector) or 15-way (DB-15 connector) port can be used and must be configured for CICS operation. <b>NOTE:</b> RX and TX Audio can be wired from the 15-way connector. <b>NOTE:</b> Only 1 and 2 ch/sec scan rates are supported via CICS and the CODAN radio. <b>NOTE:</b> The on CODAN NGT AR and AR Voice the internal ALE modem is an option. <b>NOTE:</b> The CODAN radio must have programmed the same channels that are in the PC-ALE GROUP/Channels as the CODAN provides limited computer control as it will NOT accept on the fly Frequency and Mode change requests. However, using PC-ALE with the CODAN you will only scan the channels specified in the selected PC-ALE GROUP.
DX77T	RELEASED QS/S <del>CAT PTT</del>	Also use for DX-77, DX-77EQ, DX-701 and DX-707. Requires Alinco ERW-4 or compatible computer interface cable. Radio does not support CAT PTT.
FT450	RELEASED  QS/S CAT PTT CAT MUTE CPP - 38400	Direct RS-232 without need of external level converter. The CAT timeout should be set to 3000ms. This model supports optional use of RTS/CTS, use FT450_HS selection.  Support for USER_L and USER_U for the DATA port is made by selecting LSB-D and USB-D respectfully from Channel ADD/MODIFY. Do not use DIG_VOX operation for ALE. NOTE: FSK and FSK_R selections also support the DATA port whereas RTTY is the same as LSB.
FT450_HS	RELEASED  QS/S CAT PTT CAT MUTE CPP - 38400	Same as FT450 above except support CTS/RTS operation.
FT600	RELEASED	a.k.a. Vertex System 600

	<del>QS/S</del> <b>CAT PTT</b>	
FT650	RELEASED <del>QS/S</del> <b>CAT PTT</b>	Also FT-655. An external level converter using a 1/8 inch 3 conductor stereo plug where tip is Serial Data Out from the PC and shield is ground is required from the external level converter. The ring should only be connected if the RxD line will be monitor for Squelch status for scanning applications which PC-ALE does not support. This radio does NOT use any BPF relays.
FT757GX	RELEASED <del>CAT PTT</del> <del>QS/S</del>	Radio does not support CAT PTT
FT767	ALPHA <del>CAT PTT</del> <del>QS/S</del>	Radio does not support CAT PTT
FT817	RELEASED <del>QS/S</del> <b>CAT PTT</b> <b>CPP – 38400, 8N2</b>	Also used for FT-817ND, FT-857x, FT-897x.
FT817DIG	RELEASED <del>QS/S</del> <b>CPP – 38400, 8N2</b>	As FT187 but supports DIG mode to use data port at rear of radio.
FT847	RELEASED <del>QS/S</del> <b>CAT PTT</b> <b>CPP – 57600, 8N2</b>	<b>NOTE:</b> Requires the use of Null Modem cable. See the Yaesu section regarding interfacing to the radio otherwise.  NOTE: Radio must be turned on before software is started else the radio will not respond commands.
FT890	RELEASED <del>QS/S</del> <b>CAT PTT</b>	This choice supports the older FT-100, FT-747, FT-80C, FT-840, FT-890, FT-900, SB-1400.  NOTE: Do not use this selection for the FT-990 as it does not support QS/S operation for that model radio, see the stand alone FT-990 selection.  <b>NOTE:</b> An FT-890 QS/S hardware modification is available, refer to the MARS-ALE support files at <a href="http://www.n2ckh.com/MARS_ALE_FORUM">www.n2ckh.com/MARS_ALE_FORUM</a>
FT920	RELEASED <del>QS/S</del> <b>CAT PTT</b>	CAT PTT is not listed in the manual. Coded as others in its class for CAT PTT, feedback from AAR3SJ is that it works. The FT-920 uses a straight RS-232 cable, no external level converter is required.
FT920DATA	RELEASED <del>QS/S</del> <b>CAT PTT</b>	See FT920 above as well. The DATA-LSB and DATA-USB modes are needed for use with the DATA port. If you use an FT-920 and desire to use the DATA port for your interface point of control, the proper radio selection is "FT920DATA" otherwise select "FT920". The only modes available with the data port are LSB and USB, which for ALE operation is all we need. However, be sure to set the <b>AFSK-FSK</b> switch to <b>AFSK</b> . However, be sure to set the AFSK-FSK switch to AFSK and setup the radio for the <b>+2125hz offset</b> in the <b>U-45</b> setup menu as the software will subtract 2125hz from the assigned channel frequency so that the radio is on frequency, as the DATA port setup has NO provision for setting a 0hz offset. Also, the operator will need to manually switch from DATA to Voice in multimode operation, it recommended

		that the B VFO be used in conjunction with radio memory channels. The software is ALWAYS using A VFO. The operator will need to switch back to VFO A unless the Up/Down Channel or Scan is used. The mic jack is not active in data mode. Also, the operator will need to manually switch from DATA to Voice in multimode operation and use Channel UP/Down or Scan to go back to ALE data. The RX audio out on this port is a constant-level 100 mV rms @ 600ohm audio output line (as is the AF Jack) which is not affected by the position of the front-panel AF GAIN control. This output should be taken to your sound card Line-In. However, if the gain and range of adjustment is not sufficient, Mic-in may be tried.
FT950	ALPHA  QS/S CAT PTT CAT MUTE CPP - 38400	Direct RS-232 without need of external level converter. The CAT timeout should be set to 3000ms. This model supports optional use of RTS/CTS, use FT950_HS selection.  Support for USER_L and USER_U for the DATA port is made by selecting LSB-D and USB-D respectfully from Channel ADD/MODIFY. Do not use DIG_VOX operation for ALE.
FT950_HS	ALPHA  QS/S CAT PTT CAT MUTE CPP – 38400	Same as FT950 above except support CTS/RTS operation.
FT980	RELEASED <del>CAT PTT</del> QS/S	Radio does not support CAT PTT
FT990	RELEASED QS/S CAT PTT	This selection is specific to the FT-990 and QS/S operation. <b>NOTE:</b> FT-990 requires ROM version 1.2 or later.
FT1000MP	RELEASED QS/S CAT PTT	Use for all FT-1000 series radios. <b>NOTE:</b> FT-1000D requires ROM version 6.0 or later.
FT2000	ALPHA QS/S? CAT PTT CAT MUTE CPP – 38400, 8N2	Also for FT-2000D.
FT2000HS	ALPHA QS/S? CAT PTT MUTE CPP – 38400, 8N2	This selection uses the CTS/RTS handshaking. Also for FT-2000D.
FTdx9000	ALPHA QS/S CAT PTT CAT MUTE CPP – 38400, 8N2	Use setup menu 70 to select the SSB-TX-BPF for either 300-2700hz or to 3000hz BW. Use setup menu 69 to select the SSB mic audio port, this is a poor design if it must be done all the time, most will likely want to use a RigBlaster type interface to the standard 8 pin mic port on the rear of the radio.  <b>NOTE:</b> FTDX-9000 CAT support currently suffers a known bug that requires a 200ms pause before data write/reads of a



		new value which impedes smooth operation.
GENERIC ICOM	RELEASED  CPP – User Entered	Does not support the use of IC-735 or IC-751 models.  Does not support the use of USB-D or USB-L.  Implements only basic radio features. CAT PTT is applied, but will only work if the physical radio supports CAT PTT.  User must select for SPLIT VFO operation to bypass PA filter relays for QS/S operation if the radio benefits from such operation.  User MUST enter the proper RS-232 port parameters and the ICOM radio Hex address.  It is always best to select an ICOM radio by its model number listed under Radio Type where each model has been coded with the factory default address and the highest baud rate the radio model supports as listed herein.
IC78	RELEASED  <del>CAT PTT</del> QS/S CAT MUTE CPP – 19200, 8N1	Radio does not support CAT PTT
IC703	RELEASED  <del>CAT PTT</del> QS/S CAT MUTE CPP – 19200, 8N1	Can be interfaced for DATA port using USB-D and LSB-D.
IC706	RELEASED  <del>CAT PTT</del> QS/S CPP – 19200, 8N1	Radio does not support CAT PTT
IC706MkII	RELEASED  <del>CAT PTT</del> QS/S CPP – 19200, 8N1	Radio does not support CAT PTT
IC706MkIIG	RELEASED  <del>CAT PTT</del> QS/S CPP – 19200, 8N1	Radio does not support CAT PTT
IC707	RELEASED  <del>CAT PTT</del> QS/S	Radio does not support CAT PTT
IC-718	RELEASED  <del>CAT PTT</del> QS/S CAT MUTE CPP – 19200, 8N1	Radio does not support CAT PTT
IC725	RELEASED  <del>CAT PTT</del> QS/S  CPP - 9600, 8N1	Radio does not support CAT PTT.  NOTE: Factory addressing is used, WRT address diodes D57-D63, only D60 and D62 should be in place for the factory address of 28h. Diode D64 for transceive operation should no be installed either.

		<p><b>NOTE:</b> 9600 baud is being used, not the factory default 1200 baud. As such, the CI-V Baud Rate diode, D2 must be in place and D3 must be empty. Also diode D4, the factory default, must be in place for standard 5 byte frequency data.</p>
IC726	<p>RELEASED <del>CAT PTT</del> QS/S</p> <p><b>CPP - 9600, 8N1</b></p>	<p>Radio does not support CAT PTT</p> <p><b>NOTE:</b> Factory addressing is used, WRT address diodes D57-D63, only D61 and D62 should be in place for the factory address of 30h. Diode D64 for transceive operation should no be installed either.</p> <p><b>NOTE:</b> 9600 baud is being used, not the factory default 1200 baud. As such, the CI-V Baud Rate diode, D2 must be in place and D3 must be empty. Also diode D4, the factory default, must be in place for standard 5 byte frequency data.</p>
IC728	<p>RELEASED QS/S <del>CAT PTT</del></p> <p><b>CPP - 9600, 8N1</b></p>	<p>Radio does not support CAT PTT. Also use for IC-77.</p> <p><b>NOTE:</b> Factory addressing is used, WRT address diodes D57-D63, only D60, D61 and D62 should be in place for the factory address of 38h. Diode D64 for transceive operation should no be installed either.</p> <p><b>NOTE:</b> 9600 baud is being used, not the factory default 1200 baud. As such, the CI-V Baud Rate diode, D2 must be in place and D3 must be empty. Also diode D4, the factory default, must be in place for standard 5 byte frequency data.</p>
IC729	<p>RELEASED <del>CAT PTT</del> QS/S</p> <p><b>CPP - 9600, 8N1</b></p>	<p>Radio does not support CAT PTT</p> <p><b>NOTE:</b> Factory addressing is used, WRT address diodes D57-D63, only D58, D60, D61 and D62 should be in place for the factory address of 3Ah. Diode D64 for transceive operation should no be installed either.</p> <p><b>NOTE:</b> 9600 baud is being used, not the factory default 1200 baud. As such, the CI-V Baud Rate diode, D2 must be in place and D3 must be empty. Also diode D4, the factory default, must be in place for standard 5 byte frequency data.</p>
IC735	<p>RELEASED <del>CAT PTT</del> QS/S</p> <p><b>CPP - 9600, 8N1</b></p>	<p>Radio does not support CAT PTT.</p> <p>The IC-735 is factory set to 1200 baud. It is however recommended that the J22 settings be changed for 9600 baud operation where the first two position set the baud rate where 1 is ON and 2 is OFF. To change the baud rate from 1200 to 9600 you need to remove the PA heat sink.</p>
IC736	<p>RELEASED <del>CAT PTT</del> QS/S</p>	<p>Radio does not support CAT PTT</p>
IC737	<p>RELEASED <del>CAT PTT</del> QS/S</p>	<p>Radio does not support CAT PTT. Also use for IC-737A</p>
IC738	<p>RELEASED <del>CAT PTT</del></p>	<p>Radio does not support CAT PTT</p>

	<del>QS/S</del>	
IC746	RELEASED QS/S CAT PTT CAT MUTE CPP – 19200, 8N1	
IC746PRO	RELEASED QS/S CAT PTT CAT MUTE CPP – 19200, 8N1	Also use for IC-7400.  Can be interfaced for DATA port using USB-D and LSB-D.
IC751	RELEASED <del>CAT PTT</del> <del>QS/S</del>	Also use for IC-750 and IC-751A. Radio does not support CAT PTT
IC756	RELEASED QS/S CAT PTT CPP - 19200, 8N1	
IC756PRO	RELEASED QS/S CAT PTT CAT MUTE CPP – 19200, 8N1	Also use for Signal One Milspec 1030E-DSP.  Can be interfaced for DATA port using USB-D and LSB-D.
IC756PROII	RELEASED QS/S CAT PTT CAT MUTE CPP – 19200, 8N1	Can be interfaced for DATA port using USB-D and LSB-D.
IC756PROIII	RELEASED QS/S CAT PTT CAT MUTE CPP – 19200, 8N1	Can be interfaced for DATA port using USB-D and LSB-D.
IC761	RELEASED <del>CAT PTT</del> QS/S ?	Radio does not support CAT PTT. Also use for IC-760.
IC765	RELEASED <del>CAT PTT</del> QS/S	Radio does not support CAT PTT
IC775	RELEASED <del>CAT PTT</del> QS/S	Radio does not support CAT PTT
IC781	RELEASED <del>CAT PTT</del> QS/S	Radio does not support CAT PTT. Also use for IC-780 and Signal One Milspec 1030C
IC7000	RELEASED <del>QS/S</del> CAT PTT CAT MUTE CPP – 19200, 8N1	
IC7200	ALPHA  <del>QS/S</del> CAT PTT	Can be interfaced for DATA port using USB-D and LSB-D.  When the USB port is used the radio CODEC can be selected as the ALE modem instead of the PC Sound Device,

	<b>CAT MUTE</b> <b>CPP – 19200, 8N1</b>	
IC7600	<b>PENDING</b>  <b>QS/S ?</b> <b>CAT PTT</b> <b>CAT MUTE</b> <b>CPP – 19200, 8N1</b>	Can be interfaced for DATA port using USB-D and LSB-D.  When the USB port is used the radio CODEC can be selected as the ALE modem instead of the PC Sound Device,
IC7700	<b>ALPHA</b>  <b>QS/S</b> <b>CAT PTT</b> <b>CAT MUTE</b> <b>CPP - 19200, 8N1</b>	Can be interfaced for DATA port using USB-D and LSB-D.
IC7800	<b>RELEASED</b> <b>QS/S</b> <b>CAT PTT</b> <b>CAT MUTE</b> <b>CPP – 19200, 8N1</b>	NOTE: QS/S capable WRT the BPF filters, but RF mixer filters are also relay switched, but do not present the problems associated with potential failure of TX BPF relays.  Can be interfaced for DATA port using USB-D and LSB-D.
ICF7000	<b>ALPHA</b> <b>QS/S</b> <b>CAT PTT</b> <b>CAT MUTE</b>	ICOM internal ALE modem transceiver where the radio is NOT placed into “SELCALL SQUELCHED SCAN” and thus its internal ALE modem is not enabled.  This selection is for stand alone operation using the PC sound device for all modem operation. See additional notes below for ICOM Marine Grade radios.  <b>NOTE:</b> Radio address must be set to 9.
ICM700PRO	<b>RELEASED</b> <b>QS/S</b> <b>CAT PTT</b> <b>CAT MUTE</b>	See IC-M710 above below.  <b>NOTE:</b> Radio address must be set to 2.
ICM710	<b>RELEASED</b> <b>QS/S</b> <b>CAT PTT</b> <b>CAT MUTE</b>	All ICM Marine grade radio coding/testing was performed with the IC-M710.  <b>NOTE:</b> Radio address must be set to 1.
ICM710RT	<b>RELEASED</b> <b>QS/S</b> <b>CAT PTT</b> <b>CAT MUTE</b>	See IC-M710 above notes.  <b>NOTE:</b> Radio address must be set to 3.
ICM801E	<b>RELEASED</b> <b>QS/S</b> <b>CAT PTT</b> <b>CAT MUTE</b>	See IC-M710 above notes.  <b>NOTE:</b> Radio address must be set to 7. <b>NOTE:</b> Remote connector must be set to NMEA.
ICM802	<b>RELEASED</b> <b>QS/S</b> <b>CAT PTT</b> <b>CAT MUTE</b>	See IC-M710 above notes.  <b>NOTE:</b> Radio address must be set to 8.
ICOM-ICOM	<b>PENDING</b>	An ICOM ham transceiver and ICOM receiver operating in TX/RX using same RS-232 port an CT-17 interface. 9600 baud is the default baud rate. However if both the ICOM transceiver and receiver support higher baud rates, the user can select a common higher baud rate via the Radio 1

		interface port settings. The transceiver address will be 28h, the receiver address will be the factory address for whichever ICOM receiver is selected from the Radio 2 choice, if no ICOM receiver is selected from the Radio 2 listing, the receiver address of 1Ah will be used. The end user will need to provide for the needed T/R operation with RX muting during TX between the two radios in hardware interfacing.
ICOM-WJCSMA	<b>PENDING</b>	An ICOM ham transceiver and Watkins-Johnson CSMA receiver in TX/RX using same RS-232 port an CT-17 interface. The ICOM transceiver needs to be set to radio address 28h and 9600 baud operation. The W-J receiver needs to be set to radio address 10 and 9600 baud operation. W-J receivers HF-1000, WJ-8710A, WJ8711A, WJ8712A, WJ8712P and WJ8690 and perhaps others are supported. The end user will need to provide for the needed T/R operation with RX muting during TX between the two radios in hardware interfacing.
JST245	<b>RELEASED</b> <b>QS/S</b> <b>CAT MUTE</b>	No user feedback provided as of yet. Also select for JST-145 operation.
K2/100	<b>RELEASED</b>  <b>QS/S ?</b>	Use "KENWOOD" selection, K2/100 emulates a Kenwood TS-570SD.  Under no circumstances should you use a standard RS232 cable to connect your K2 to a computer, you <b>MUST</b> use the cable specified by Elecraft in the KIO2 or KPA100 manual to avoid damage to your rig and/or computer. For more information see K/100 notes.
K3	<b>PENDING</b>  <b>CPP – 38400, 8N1</b>	CAT control follows that of the K2 at this time. The K3 uses a standard RS232 cable. The use of RTS and DTR via radio configuration can be made for PTT support.
K505DSP	<b>RELEASED</b>  <b>QS/S</b> <b>CAT MUTE</b>	Kachina 505DSP and also for KC105CTX. This radio is fully under computer control, as is the Ten-Tec Pegasus TT550, both designed by the same engineer. Polling is required to keep radio port open. Operates at 9600 baud. See detailed Kachina 505DSP notes in the body of the RHUG.
KENWOOD  _HS appended designates support of handshaking	<b>RELEASED</b>  <b>QS/S</b>  <b>CAT MUTE</b> <b>For models:</b> TS-480, TS-570, TS-870, TS-2000	Supports 4800 baud 8N2 operation by default. The radio model ID is read at program start and parameters are reset for best ALE operation. If CPP is not used to select a higher baud rate, the TS-480, TS-570, TS-870 and TS-2000 series must be reset to 4800 baud N82. e.g. the factory default setting is 9600 baud on the TS-2000 set menu 56 to 4800 baud. <b>NOTE:</b> Newer models use a straight RS-232 cable, not a null modem cable. <b>NOTE:</b> The TS-440 is excluded from QS/S routines. <b>NOTE:</b> Kenwood recommends that Hardware Handshaking be used to avoid loss of data to the radio, this is especially important at the higher baud rates for communications and the higher ALE Scan Rates. <b>NOTE:</b> For external interfacing an PTT only DTR can be used when handshaking is used as RTS is used for handshaking. For a unit such as the RigBlaster, an alternative approach is to use CAT PTT and place the unit into VOX from Auto.
MICOM	<b>ALPHA</b>	Supports Missile Command (MICOM) models by Motorola

	<p><b>9600, 801</b>  <b>QS/S</b>  <b>CAT PTT</b>  <b>CHAN ONLY</b></p>	<p>(MOBAT COMMUNICATIONS, DIVISION OF TADIRAN COMMUNICATIONS LTD. ISRAEL) such as Micom-H, 2E, 2B, 2BF, 2R, 2ET-RDP, 2ES, 2MF, 2RS, 2TS, 3F, 3R, 3T and perhaps others.</p> <p>This selection will use PC-ALE and the PC sound device for all operations. Models provide an internal ALE modem are operated in non-ALE mode.</p> <p>Set the radio for 9600 baud operation. Any port of the radio with provides GND, TDX and RDX will work, refer to your radios manual.. Interfacing is straight to the PC RS-232 port.</p> <p><b>NOTE:</b> At present ONLY radio MEMORY CHANNEL operation is supported. Later MMI commands are used to ENABLE and DISABLE the use of MEMORY CHANNEL support in PC-ALE, "ENABLE CHANNEL" or "DISABLE CHANNEL" .</p> <p><b>NOTE:</b> The MICOM-2BF, MICOM-2MF and Micom-H Amateur Radio band versions and perhaps others require the FLN2423 RS-232 option installed for computer control. The radio does Not have an ALE modem option listed.</p>
<p>PT8000A</p>	<p><b>TBD</b></p> <p><b>QS/S ?</b></p>	<p>Hilderbling PT8000A, PT8000B, PT8000C</p> <p>NOTE: Awaiting documentation. Known to follow ICOM CI-V CSMA protocol at this time only.</p>
<p>RF350ALK</p>	<p><b>RELEASED</b>  <b>QS/S</b>  <b>CAT PTT</b>  <b>CAT MUTE</b>  <b>CHAN</b>  <b>CPP - 9600, 701</b></p>	<p>Uses an ASCII protocol that supports the Harris RF-350, RF-350K, RT-1446 URC, AN/URC-119, AN/URC-121(V) basic control with PC sound device for MIL-STD-188-141A ALE, 188-141B AQC-ALE and all ALE and MIL-STD-188-110x all data modes. When radio is placed into remote, no local control is available.</p> <p>The J9 REMOTE connection is used for PC sound device modem and TNC connections. The radio's inputs are differential, but care must be taken to observe polarity of the audio lines for connection to the computer sound card. Phone operation is via the radio MIC in connection with the RED PTT button. See RF350ALK_TNC for auxiliary interfacing.</p> <p>Supports remote control board number 10088-6000. Part number is located in the upper left corner of the board which is installed behind the display board. This is the standard, non-addressable board and is used with the RF-352 remote control and the RF-7210A adaptive controller. Radios with this card are usually marked with a tag beside the unit identifier stating "THIS UNIT HAS BEEN MODIFIED USING KIT 10191-40029. SEE THE RF-7100-04 MANUAL FOR DETAILS."</p> <p><b>RS-232 Interface:</b> Radio Remote Control Interface (A1A19, Located behind display panel, p/n 10088-6000) Set S-1 to position 9 (ADAPT) Set S-2 to Position 1 (RS-232) [To use</p>

		<p>with Harris RF-7210 Adaptive controller, S-2 should be set to position 2 (RS-422.)] Set S-5 to 4 wire audio input/output.</p> <p>The software is operating at 9600 Baud, 7-bit data, odd parity, 1 stop bit, no handshake.</p> <p>NOTE: Radio firmware should be at least Rev Level 604. Rev 601 may work, but Radio must be in USB mode before starting. A firmware upgrade may be required to support ADAPT, please contact AFA1PU for further details at: <a href="mailto:afa1pu@speakeasy.net">afa1pu@speakeasy.net</a></p> <p><b>Cable Wiring:</b></p> <table border="0"> <thead> <tr> <th style="text-align: left;"><b>Computer 9-pin D</b></th> <th style="text-align: left;"><b>Radio 25-pin D</b></th> </tr> </thead> <tbody> <tr> <td>2 (input)</td> <td>3 (output)</td> </tr> <tr> <td>3 (output)</td> <td>2 (input)</td> </tr> <tr> <td>5 (Ground)</td> <td>7 (Ground)</td> </tr> <tr> <td>4-Jump to 6</td> <td>12 Audio Line Out (-)</td> </tr> <tr> <td></td> <td>13 Audio Line Out (+)</td> </tr> <tr> <td>7-Jump to 8</td> <td>24 Audio Line In (+)</td> </tr> <tr> <td></td> <td>25 Audio Line In (-)</td> </tr> </tbody> </table> <p>On the Computer DB9, jumper pins 4 to 6 and pins 7 to 8.</p> <p><b>PAY SPECIAL NOTE TO THE POLARITY OF THE AUDIO LINES.</b></p> <p>NOTE: Support is also provide for other than the standard RS-232 port parameters in support of the KO6NO serial port adapter which can go to 19200 baud as detailed at:</p> <p><a href="http://www.ko6no.com/web_page_000001.htm">http://www.ko6no.com/web_page_000001.htm</a></p>	<b>Computer 9-pin D</b>	<b>Radio 25-pin D</b>	2 (input)	3 (output)	3 (output)	2 (input)	5 (Ground)	7 (Ground)	4-Jump to 6	12 Audio Line Out (-)		13 Audio Line Out (+)	7-Jump to 8	24 Audio Line In (+)		25 Audio Line In (-)		
<b>Computer 9-pin D</b>	<b>Radio 25-pin D</b>																			
2 (input)	3 (output)																			
3 (output)	2 (input)																			
5 (Ground)	7 (Ground)																			
4-Jump to 6	12 Audio Line Out (-)																			
	13 Audio Line Out (+)																			
7-Jump to 8	24 Audio Line In (+)																			
	25 Audio Line In (-)																			
RF350ALK_TNC	<p style="text-align: center;">RELEASED  <b>QS/S</b>  <b>CAT PTT</b>  <b>CAT MUTE</b>  <b>CHAN</b>  <b>CPP - 9600, 701</b></p>	<p>As RF350ALK above, in addition it supports the use of an external TNC/Modem transmit as follows: In REMOTE mode, the only active Audio I/O is from the J9 REMOTE connector so both the TNC and Sound Card connections must be made through the J9 REMOTE connector. PTT is normally disabled in REMOTE mode but PC-ALE enables the MIC and TB1 PTT. Clicking the RED PTT button allows the MIC to be used for voice contacts. You must remember to click the RED PTT button again at the end of the voice contact to restore audio to the J9 REMOTE connector for ALE/TNC operation.</p> <p><b>RS-232 SERIAL CONNECTIONS</b></p> <table border="0"> <thead> <tr> <th style="text-align: left;"><b>J9-REMOTE</b></th> <th style="text-align: left;"><b>Computer Serial Port</b></th> </tr> <tr> <th style="text-align: left;"><b>DB25 Female</b></th> <th style="text-align: left;"><b>DB9 Female</b></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1-NC</td> </tr> <tr> <td>2-----</td> <td>3-Tx</td> </tr> <tr> <td>3-----</td> <td>2-Rx</td> </tr> <tr> <td>4</td> <td>4-jump to-6</td> </tr> <tr> <td>5</td> <td>7-jump to-8</td> </tr> <tr> <td>6</td> <td>9-NC</td> </tr> <tr> <td>7-----</td> <td>5-GND</td> </tr> </tbody> </table>	<b>J9-REMOTE</b>	<b>Computer Serial Port</b>	<b>DB25 Female</b>	<b>DB9 Female</b>	1	1-NC	2-----	3-Tx	3-----	2-Rx	4	4-jump to-6	5	7-jump to-8	6	9-NC	7-----	5-GND
<b>J9-REMOTE</b>	<b>Computer Serial Port</b>																			
<b>DB25 Female</b>	<b>DB9 Female</b>																			
1	1-NC																			
2-----	3-Tx																			
3-----	2-Rx																			
4	4-jump to-6																			
5	7-jump to-8																			
6	9-NC																			
7-----	5-GND																			

		<p><b>AUDIO CONNECTIONS (TNC=PK232)</b></p> <p><b>RADIO                      TNC                      Sound Card</b>  12-GND-----Brn/Shld----Mic/Line GND  13-Out-----Green-----Mic/Line Input  24-In-----White-----Spkr/Line Output  25-GND-----Brn/Shld----Spkr/Lind GND</p> <p><b>Hardware PTT (TNC=PK232 TNC)</b>  TB1-11-PTT-Red  TB1-12-GND-Brn/Shld</p> <p>NOTE: Connect GNDs together (J9-12, J9-25, TNC Brown/Shield, TB1-12) PTT is active when pulled down to 0 volts.</p> <p><b>NOTE: Support is also provide for other than the standard RS-232 port parameters in support of the KO6NO serial port adapter which can go to 19200 baud as detailed at:</b></p> <p><a href="http://www.ko6no.com/web_page_000001.htm">http://www.ko6no.com/web_page_000001.htm</a></p>
RF350KWT	<p>ALPHA</p> <p><del>QS/S</del></p>	<p>No user feedback received as of yet. Supports the Harris RF-350 Key West Transmitter with ASCII capable RS-232 board part number 10085-9100</p>
RF5022	<p>RELEASED</p> <p><del>QS/S</del></p> <p>CAT PTT</p> <p>CPP – 9600, 8N1</p>	<p>Supports RF-5022, RF-5020, RF-5122, AN/TRC-510(V), RT-5104(P)/U, RF-5200, RF-5800, AN/PRC-138, RT-1694 for <b>basic control with PC sound device for MIL-STD-188-141A ALE, 188-141B AQC-ALE and all ALE and MIL-STD-188-110x all data modes.</b></p> <p><b>NOTE:</b> Radio mode of operation selection must be <b>REMOTE (RMT)</b>.</p> <p><b>NOTE:</b> The RF-5020 exciter itself being 100mw and PIN diode switched is QS/S.</p>
RF3200	<p>CPP – 9600, 8N1</p> <p>CHAN ONLY</p>	<p>Harris RF-3200 series to include RF-3200E, RF-3200T, RF-3200EB, RF-3200EM, RF-3200EV, RF-3200M, RF-3201 and perhaps others.</p> <p>Only radio MEMORY CHANNEL operation is supported by this radio series. Memory channels 1 thru 120 can be used and must match the PC-ALE scan group.</p> <p>Supports RMT operation without using the RF-3272E ALE modem option board if installed.</p> <p>The rear ACC connector must be used for audio and PTT as during RMT operation the MIC port is disabled.</p> <p>Commercial off the shelf interface cables are available from Buxcom and peraps others, where the wiring for the DB-15 accessory connector is:</p>



		<table border="1"> <thead> <tr> <th>Pin</th> <th>Name</th> <th>I/O</th> <th>Note</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>SPKR+</td> <td rowspan="2">Out</td> <td rowspan="2">4 Ohm min 11 Vpp max</td> </tr> <tr> <td>2</td> <td>SPKR-</td> </tr> <tr> <td>3</td> <td>ACRXOUT</td> <td>Out</td> <td rowspan="2">600 Ohm</td> </tr> <tr> <td>4</td> <td>ACCTXIN</td> <td>In</td> </tr> <tr> <td>5</td> <td>/ACCRQ</td> <td>In</td> <td>Key</td> </tr> <tr> <td>6</td> <td>GNDAUD</td> <td>Audio gnd</td> <td></td> </tr> <tr> <td>7</td> <td>ACCTGC</td> <td>In</td> <td>external AGC</td> </tr> <tr> <td>8</td> <td>ACCTR+</td> <td>I/O</td> <td rowspan="2">Tx On Realy closed</td> </tr> <tr> <td>9</td> <td>ACCTR-</td> <td>I/O</td> </tr> <tr> <td>10</td> <td>/RMTSW</td> <td>In</td> <td>gnd:Pwr On</td> </tr> <tr> <td>11</td> <td>SWA+</td> <td>Out</td> <td>13.6 VDC switched 800 ma max</td> </tr> <tr> <td>12</td> <td>RTS</td> <td>Out</td> <td>not used do not connect</td> </tr> <tr> <td>13</td> <td>GNDLOG</td> <td>Logic gnd</td> <td></td> </tr> <tr> <td>14</td> <td>RXD</td> <td>Out</td> <td>data</td> </tr> <tr> <td>15</td> <td>TXD</td> <td>In</td> <td>data</td> </tr> </tbody> </table>	Pin	Name	I/O	Note	1	SPKR+	Out	4 Ohm min 11 Vpp max	2	SPKR-	3	ACRXOUT	Out	600 Ohm	4	ACCTXIN	In	5	/ACCRQ	In	Key	6	GNDAUD	Audio gnd		7	ACCTGC	In	external AGC	8	ACCTR+	I/O	Tx On Realy closed	9	ACCTR-	I/O	10	/RMTSW	In	gnd:Pwr On	11	SWA+	Out	13.6 VDC switched 800 ma max	12	RTS	Out	not used do not connect	13	GNDLOG	Logic gnd		14	RXD	Out	data	15	TXD	In	data
Pin	Name	I/O	Note																																																											
1	SPKR+	Out	4 Ohm min 11 Vpp max																																																											
2	SPKR-																																																													
3	ACRXOUT	Out	600 Ohm																																																											
4	ACCTXIN	In																																																												
5	/ACCRQ	In	Key																																																											
6	GNDAUD	Audio gnd																																																												
7	ACCTGC	In	external AGC																																																											
8	ACCTR+	I/O	Tx On Realy closed																																																											
9	ACCTR-	I/O																																																												
10	/RMTSW	In	gnd:Pwr On																																																											
11	SWA+	Out	13.6 VDC switched 800 ma max																																																											
12	RTS	Out	not used do not connect																																																											
13	GNDLOG	Logic gnd																																																												
14	RXD	Out	data																																																											
15	TXD	In	data																																																											
SDR1000 support where user selects radio type KENWOOD	<p style="text-align: center;"><b>QS/S CAT PTT</b></p> <p>Follows Kenwood where the user needs to setup com port using CPP interfaced</p>	<p>When Flex Radio ID is set to 019, which is default the radio will be treated as a TS-2000, which is not the proper thing to do as QS/S will be applied and its not needed for the FlexRadio series.</p> <p>When Flex Radio ID is 900 the SDR1000 will be treated as an SRD1000 and supports FlexRadio SDR-1000 via the CAT interface with the PowerSDR console v1.3.x and later code from Flex Radio. The N8VB vCOM Virtual Serial Ports Driver is required. When using this selection turn off pre-configuration in CPP.</p> <p>NOTE: It is recommended that the SDR1000 radio type selection be used for all FlexRadio models.</p>																																																												
SDR1000	<p style="text-align: center;"><b>RELEASED</b></p> <p style="text-align: center;"><b>QS/S CAT PTT CAT MUTE CPP – 9600, 8N1</b></p>	<p>Supports FlexRadio SDR-1000, Flex-5000A, Flex-5000C (and possibly the Sunair RT-8100) and Flex-3000 via the CAT interface with the PowerSDR console v1.3.x and later code from Flex Radio. The N8VB vCOM Virtual Serial Ports Driver is required.</p> <p>Can be interfaced for DATA port using USB-D and LSB-D.</p> <p>All commands to include the extended ZZxx commands from the SDR1000 CAT Command Dictionary dated February 2007 have been coded.</p>																																																												

SEA-235	<p>PENDING</p> <p>QS/S ?</p> <p>CPP – 9600, 8N1</p>	Supports SEA-235, SEA-235R and SEA-245 using SEABUS-232 protocol.
SEA-330	<p>PENDING</p> <p>QS/S ?</p>	Supports SEA-330.  <b>NOTE:</b> Requires SEA2320 interface to allow PC connection to the radio. The SEA2320 converts RS232 to RS485 type protocol that the radio uses.
SGC2000	<p>RELEASED</p> <p><del>QS/S</del></p> <p>CHAN</p>	<p>Also use for PRC-2250MIL.</p> <p>Can make use of straight RS-232 or Null Modem cable when internal jumper is properly set. From the factory, the radio is configured for a straight cable. Only Pins 1, 2 and 3 should be wired in the RS-232 cable.</p> <p>Direct control and radio memory channel control of the SGC is provided. If memory channels are used, the radios first 100 user channels need to be configured to match the scan group channels 1..100</p> <p><b>NOTE:</b> MMI commands are used to ENABLE and DISABLE the use of MEMORY CHANNEL support in PC-ALE, “ENABLE CHANNEL” or “DISABLE CHANNEL” .</p> <p><b>NOTE:</b> Due to the nature of the Windows OS, the RS232 ATTENTION timing is subject to interruption and thus the radio will at times not change to the correct channel commanded by the software. The only way to completely over come this is either to use an external hardware ALE modem/controller with these radios, such as the Frederick/NSG M1045 or M2045 or for a hardware microcontroller based interfacing controller to be designed for interface use, such as something based on a PIC processor.</p>
SKANTI-8250	<p>RELEASED</p> <p>QS/S ?</p> <p>CAT MUTE</p>	Serial communications is 2400 7O1 via the Telex port.
TK80	<p>ALPHA</p> <p>QS/S</p>	<p>Kenwood TK-80 and TRC-80 using IF-232C or compatible external level converter.</p> <p>The TK-80 will support PC control through the scan rate of 2 ch/sec.</p>
TK90	<p>ALPHA</p> <p>QS/S</p> <p>CAT MUTE</p>	<p>Kenwood TK-90 HF radio with the KCT-31 interface cable option for PC control installed per the documentation found in the TK90 Modification Information (MOD) publication version 2.0 date March 2007 or later.</p> <p>In the setup software under COM port settings for the KCT-31 select “PC Command” for the operating mode rather than GPS.</p>

		<p>The TK-90 will support PC control through the scan rate of 5 ch/sec.</p> <p>NOTE: An optional internal ALE modem (P/N KP2-E) is available which provides stand alone ALE operation which is not supported by this selection.</p>
TK90_HS	<p>ALPHA</p> <p>QS/S</p> <p>CAT MUTE</p>	<p>Support for hardware flow control enabled by assigning RTS/CTS to the AUX port using a custom made cable.</p>
TT516	<p>RELEASED</p> <p>QS/S</p> <p>CAT PTT</p> <p>CHAN ONLY</p>	<p>Supports Argonaut V .</p> <p>The radios memory channels are used in sync with the .QRG file and can be programmed by PC-ALE directly.</p> <p>NOTE: This model Ten Tec uses diode switching thus no special programming is needed, no BPF relays to contend with.</p>
TT538	<p>RELEASED</p> <p>QS/S</p> <p>CAT PTT</p> <p>CAT MUTE</p>	<p>Supports Ten Tec Jupiter.</p> <p>Do NOT use for OMNI VII TT588 in RADIO MODE as the TT588 has many differences.</p> <p>The TT538 Jupiter native command set requires at a minimum firmware version “1.18 05/12/02” or later in a Jupiter radio as it was at that point that the non-Pegasus PC control interface was added. However, as many bugs have been addressed in the radio with updates thereafter, some of which address the new command set, it is recommended that firmware version “1.28 03/01/06” or later be used. For anyone using firmware version “1.17” or older, you will need to select either TT550 or TT550MA as appropriate.</p> <p>TT538 uses MIC port for both voice and for ALE (on the Jupiter setup menu on the radio, for “Audio Source”, you select “MIC”). With a suitable interface such as a RigBlaster needs to used. PTT can only be DTR as RTS can NOT be used as the radio uses handshaking with the RTS/CTS lines and the Jupiter command set Radio does not support CAT PTT.</p> <p>NOTE: The tool writes the ALE RX channel to VFO A and the ALE TX channel to VFO B all the time as the Jupiter command set dictates that you must write to both VFO A and B. However, the Jupiter command set provides no command to place the radio into SPLIT operation, this must be done manually if the operator desires separate RX/TX frequency operation, otherwise the RX/TX channel will be the RX channel.</p> <p>NOTE: The TT538 can emulate the Pegasus transceiver, however its use precludes front panel operation while using the CAT interface. When uses with the TT550 or TT550MA selections, the Jupiter screen with change to the Pegasus flying horse logo when the radio is addressed with frequency</p>

		<p>and mode data for the first time. All radios parameters from the front panel will be locked out. There is a volume slider control on the Radio Control panel for adjusting receiver audio in Pegasus mode.</p> <p><b>NOTE:</b> The Jupiter command set does not allow for selection between the mic port and rear auxiliary port for which the TT550 selection must be used.</p> <p><b>NOTE:</b> The RS-232 serial interface on the Jupiter is controlled by a 16C550 UART located on the DSP board with the parameters fixed at 57,600 baud, No Parity, 8 Data bits, 1 Stop bit. The UART uses hardware handshaking to control the data flow between the PC and the radio, thus RTS/CTS signaling is used which means that only DTR for PTT is available as there is no CAT PTT in the Jupiter command set.</p>
TT550	<p>RELEASED</p> <p><del>QS/S</del> CAT PTT CAT MUTE</p>	<p>TT550 requires polling and uses MIC port for both voice and for ALE with a suitable interface such as a RigBlaster needs to be used. PTT can only be DTR as RTS can NOT be used as the radio uses handshaking with the RTS/CTS lines.</p> <p><b>NOTE:</b> The RS-232 serial interface on the Pegasus is controlled by a 16C550 UART located on the DSP board with the parameters fixed at 57,600 baud, No Parity, 8 Data bits, 1 Stop bit. The UART uses hardware handshaking to control the data flow between the PC and the radio, thus RTS/CTS signaling is used which means that only CAT PTT or DTR for PTT is available for use PTT.</p>
TT550MA	<p>RELEASED</p> <p><del>QS/S</del> CAT PTT CAT MUTE</p>	<p>TT550MA selection uses the MIC port for Voice and rear AUX port ALE. PTT must be CAT PTT or DTR with your external interface to the rear port. Whenever the tool puts the radio into TX it will select the rear AUX port, in RX, you have the front MIC for your Voice communications using the RED PTT button.</p> <p><b>NOTE:</b> The RS-232 serial interface on the Pegasus is controlled by a 16C550 UART located on the DSP board with the parameters fixed at 57,600 baud, No Parity, 8 Data bits, 1 Stop bit. The UART uses hardware handshaking to control the data flow between the PC and the radio, thus RTS/CTS signaling is used which means that only CAT PTT or DTR for PTT is available for use PTT.</p>
TT563	<p>PENDING</p> <p><del>QS/S</del></p>	TBD. Omni VI
TT565	<p>ALPHA</p> <p><del>QS/S</del> CAT MUTE</p>	For ORION I and also TT566/TT566AT ORION II.
TT585	<p>RELEASED</p> <p><del>QS/S</del></p>	Paragon I. Tested by AAR3UO. Radio/PC requires use of Null Modem cable.
TT586	<p>RELEASED</p> <p><del>QS/S</del> CAT PTT</p>	Paragon II. PTT is supported via Ten Tec extended command.

TT588RAD	<p>ALPHA</p> <p><del>QS/S</del></p> <p>CAT MUTE</p>	<p>Also use for TT588AT, however ATU is not under CAT command.</p> <p>Supports the OMNI VII RADIO MODE as documented in Model 588 Programmers Reference Guide Rev 1.0, which is not 100% the same as the Jupiter native protocol. To enter RADIO MODE hold down digit 1 on the band stack keyboard until the firmware version string and RADIO appears on the display.</p>
TT588REM	<p>ALPHA</p> <p><del>QS/S</del></p> <p>CAT PTT</p> <p>CAT MUTE</p>	<p>For use for OMNI VII TT588 and TT588AT in REMOTE MODE, a new protocol that places the TT588 series radio into a hands off operation by the user.</p> <p>Can be interfaced for LINE port audio source using USB-D and LSB-D mode selections. When this is the case, the front MIC port for Voice communications is selected when using the RED PTT button.</p> <p>OMNI VII REMOTE MODE as documented in Model 588 Programmers Reference Guide Rev 1.0. To enter REMOTE MODE hold down digit 2 on the band stack keyboard until the firmware version string and REMOTE appears on the display.</p>
VX1700	<p>RELEASED</p> <p><del>QS/S</del></p> <p>CAT PTT</p>	<p>Supports VX-1700 and VH-1700HF.</p> <p>An optional ALE (P/N ALE-1) option board can be installed, however for PC-ALE use, the ALE-1 if installed must NOT be enabled.</p> <p>The VX-1700 will support PC control through the scan rate of 10 ch/sec.</p> <p>RS-232 control can be had by:</p> <ol style="list-style-type: none"> <li>1. Using a CT-62 or compatible interface attached to the ATU TUNER port.</li> <li>2. Using the 9-pin D GPS connector with a null modem cable. To use this approach a one time procedure must be followed where switches S4002 and S4003 are placed into position A on the ALE-1 board assembly.</li> </ol> <p>Scan rates of 1, 2, 5 are supported with PC-ALE. All frequency control is on the fly with PC-ALE from .QRG file groups.</p> <p><b>NOTE:</b> When using PC-ALE the radio is not QS/S as it is when using the ALE-1 option for control as not means of relay bypass is provided.</p>
VX1700J2B	<p>RELEASED</p> <p><del>QS/S</del></p>	<p>Same as VX1700 above but supports use of the data port where in the CE-77 software USB or LSB is selected as the J2B mode.</p>

	<b>CAT PTT</b>	
XK2100	<b>ALPHA</b>  <b>CPP – 2400, 7E1</b>	<p>Rohde &amp; Schwarz XK2000 family of transceivers, XK2100, XK2500 and XK2900.</p> <p>Requires null modem cabling where pins 1 and 9 are not used.</p> <p>NOTE: R&amp;S software by default uses 2400 baud, however it is recommended that a higher baud rate be used with PC-ALE if scanning greater than 1 ch/sec. is used.</p>

**The current status for radio Receiver support is presented here:**

**NOTE:** All receivers that support CAT MUTING require manual un-mute.

<b>RADIO MODEL</b>	<b>STATUS</b>	<b>COMMENTS</b>
95S-1	<b>PENDING</b>	Use for Collins 95S-1, 95S-1(A)
ARONE	<b>PENDING</b> <b>CPP – 9600, 8N2</b>	For AR-ONE, AR-ONE/BB. Default RS-232 port settings are 19200,N,8,2 with Xon/Xoff
AR5000	<b>RELEASED</b> <b>CPP – 19200, 8N2</b>	Use for AOR AR5000. Default RS-232 port settings are 19200,N,8,2 with Xon/Xoff
AR7000	<b>RELEASED</b> <b>CPP – 19200, 8N2</b>	Use for AOR AR7000. Default RS-232 port settings are 19200,N,8,2 with Xon/Xoff
AR7030	<b>RELEASED</b>	Use for AOR AR7030
AR8600	<b>ALPHA</b> <b>CPP – 19200, 8N2</b>	Use for AOR AR8600 and AR8600MkII. Default RS-232 port settings are 19200,N,8,2 with Xon/Xoff
DR333	<b>TBD</b>	Mckay-Dymek DR333, DR3360 and DR300PCB.
EK890	<b>RELEASED</b>	Use for Rhode & Schwarz EK095, EK890, EK891, EK893 RS-232 port set to 9600,E,7,1 by default.
EK896	<b>RELEASED</b> <b>CPP – 19200, 8N1</b>	Use for Rhode & Schwarz EK895 and EK896 RS-232 port set to 19200,N,8,1 by default.
EK2000	<b>ALPHA</b> <b>CAT MUTE</b> <b>CPP – 9600, 7E1</b>	Use for Rhode & Schwarz EK2000 where address is set to 00 for single receiver operation.
FRG100	<b>RELEASED</b>	Use for Yaesu FRG-100
FRG8800	<b>RELEASED</b>	Use for Yaesu FRG-8800
HF1000	<b>RELEASED</b>	Use for Watkins-Johnson HF-1000, HF-1000A
HF2050	<b>RELEASED</b> <b>CPP – 19200, 8N1</b>	Use for Collins HF-2050. HF-2050 Remote control interface (RS-422). All other units only have the RS-422 DB25 female on rear of receiver for remote control using EIA Standard RS-422 wiring. An RS-422 to RS-232 converter is needed.  The unit with the pre-selector, has a RS-232 interface option for which a standard RS-232 cable is used.
HF150	<b>PENDING</b>	Lowe HF-150. The IF-150 RS-232 interface cable is required. 1200 baud 8N1. FREQ/MODE and MEMORY supported via RS-232.
HF235	<b>PENDING</b>	Lowe HF-235 and HF-235/F. The HF-235/RC RS-232 option is required 1200 8N1. Radio must be set to address 1. RTS/CTS required.
HF250	<b>PENDING</b>	Lowe HF-250
KENWOOD or KENWOOD_HS	<b>RELEASED</b>	Use for Kenwood R-5000
LCR2000	<b>ALPHA</b> <b>CPP – 19200, 8N1</b>	Use for Cubic LCR-1200, LCR-2000, LCR-2400, SMR-2000, SMR-2400, CDR-3250, CDR-3280. Radio Address is fixed at 001 and default port parameters are 19200 8N1.
MICOM1	<b>TBD</b>	Documentation still required. Requires FLN-5062A RS232 interface card.
NRD345	<b>RELEASED</b>	Use for JRC NRD-345. Requires null modem cabling.
NRD525	<b>RELEASED</b>	Use for JRC NRD-525. Requires null modem cabling.
NRD535	<b>RELEASED</b>	Use for JRC NRD-535. Requires null modem cabling.
NRD535D	<b>RELEASED</b>	Use for JRC NRD-535D. Requires null modem cabling.
NRD545	<b>RELEASED</b> <b>CAT MUTE</b>	Use for JRC NRD-545. . Requires null modem cabling.

		NOTE: The NRD-545 allows you to disable the band pass filters when scanning to disable the relays, unfortunately it can't be done over the remote interface.
NRD630	<b>TBD</b>	Documentation still required.
PCR1000	<b>RELEASED CAT MUTE</b>	Use for ICOM PCR1000. Radio is used at default 9600 baud. The ICOM OPC-743 or any standard straight RS-232 cable will work.
PRC1500	<b>RELEASED CAT MUTE</b>	Supports USB/VCP RS-232 based PCR1500, IC-R1500 and IC-R2500. NOTE: At this time, after the tool is started, if the MIL-STD-188-141 dialog is used to change and settings, clicking OK, will reset the radio and shut it down. A restart of the program will be required to reboot the radio omm.. Port. Connection.
RA6790GM	<b>RELEASED CPP – 19200, 8N1</b>	<p>Use for RACAL RA6790GM, R-2174(A)/URR. May work for other RACAL receivers such as the RA6793A, R-2320/URR series, if so a report would be welcome, if not, inform us what RACAL supported is needed and provide the needed commands if possible.</p> <p>Computer control of the RA6790GM requires installation of the optional A6A1 Microprocessor Board. Should this be missing from your unit, Toronto Surplus (and likely others) have been known to have complete A6A1 and blank A6A1 boards, for more information see: <a href="http://www.torontosurplus.com">http://www.torontosurplus.com</a></p> <p>For RS-232 operation soldered jumpers need to be in place on the A6A1 Microprocessor Board as follows: Link1 Install, Link2 Open, Link3 Install, Link4 Install, Link5 Install, Link6 Open. The receiver to PC RS-232 cable, it must be wired for Receiver Address 10, 19200 baud, No Parity, 1 Stop Bit.</p> <p>The cable connector on the A6A1 board on this receiver is a military type plug which can be acquired surplus from William Perry Co., Inc., 702 (Rear) Beechwood Road, Louisville KY 40207, 1-502-893-8724.</p> <p>A pre-wired cable can be purchased from Bill Holland, KC2CNB, <a href="http://hollandelectronics.net/">http://hollandelectronics.net/</a>, 1-609-693-7281 at a reasonable cost. Just tell him it's for PC-ALE, if you want a DB9 or DB25 on the PC side and the length you require, 6 foot is standard.</p>
RA6830JD	<b>ALPHA CPP – 19200, 8N1</b>	<p>Also for TCI-4070. RS-232 parameters of: 19200 baud, 8 data bits, No Parity, 1 Stop bit, Receiver Address 85. The receiver must have a (standard 25 pin DIN connector on rear for J-13, otherwise you have a GPIB-488 interface or none installed.</p> <p><b>NOTE:</b> If you have a GPIB-488 interface, an RS-232 to GPIB-448 converter such as the National Instruments GPIB-232-CV-A will be required, see <a href="http://www.ni.com/pdf/products/us/4gpiib688-690.pdf">http://www.ni.com/pdf/products/us/4gpiib688-690.pdf</a></p> <p><b>NOTE:</b> Receiver RS-232 serial port parameters are 19200 8N1 which are S1 switch selected as 1,2 and 3 OPEN for 19200, 4 OPEN for 1 stop bit, 5 DONT CARE, 6 CLOSED</p>



		for NO PARITY, 7 and 8 CLOSED for 8 data bits. The mother board soldered Links in radio for RS-232 operation are: LINK2, LINK4, LINK7.
R8	RELEASED	Use for Drake R8
R8A	RELEASED	Use for Drake R8A
R8B	RELEASED	Use for Drake R8B
R10	ALPHA CPP – 19200, 8N	ICOM R10
R20	ALPHA CPP – 19200, 8N	ICOM R20
R71	RELEASED	Use for Icom R71
R72	RELEASED	Use for Icom R72
R75	RELEASED CAT MUTE CPP – 19200, 8N1	Use for Icom R75
R3030STXx	RELEASED CPP – 19200, 8N1	Use for Cubic models R-3030, R-3050, R-3080, R-3090, R-2307/U,R3030A <b>NOTE:</b> Three choices are available as R3030STX1, R3030STX2 and R3030STX3 for the required number of start characters to be sent. The Radio Address is fixed 01 and default port parameters are 19200 8N1.
R2411/U	ALPHA CPP – 19200, 8N1	Use for Cubic R-2411/U dual receiver. The receiver selected must be set to address 01 and be in REMOTE.
R5000 where KENWOOD is selected	RELEASED	Use for Kenwood R5000.
R7000	RELEASED CPP – 19200, 8N1	Use for Icom R7000
R7100	RELEASED CPP – 19200, 8N1	Use for Icom R7100
R8500	RELEASED CAT MUTE CPP – 19200, 8N1	Use for Icom R8500
R9000	RELEASED CPP – 19200, 8N1	Use for Icom R9000
R9500	RELEASED CAT MUTE CPP – 19200, 8N1	Use for Icom R9500
RF590	RELEASED CPP - 19200, 8O2	Use for RF-590, R-2368(A)/URR, RF-590A,R-2368B(V)1/URR, 2368B(V)3/URR RF590H, R-2557A/URC configured to use the Harris HRRCP command protocol.  RS-232 parameters are 19200 baud, Odd parity, 8 data bites , 2 stop bits and radio address 1.  For the RF-590A, to select Harris HRRCP protocol the A14 board jumper at J20 must be set to jumper pins 2 and 3. On older units, revision E and below, there is no jumper, instead, a jumper wire may be soldered connecting U26-10 to U26-8 that must be removed.
RF-590A	RELEASED	Use for RF-590A, RF590H, R-2368B(V)1/URR,

	<b>CPP - 19200, 701</b>	<p>2368B(V)3/URR, R-2557A/URC with firmware 208C or above configured to use the ASCII command protocol. User must manually enable the front panel remote switch. Software is written for 19200 baud, Odd parity, 7 data bits and 1 stop bit using radio address 1 operation.</p> <p>For the RF-590A and later units of revision F and above, to select Harris ASCII protocol the A14 board jumper at J20 must be set to jumper pins 1 and 2. On older units, revision E and below, there is no jumper, instead, a jumper wire must be soldered connecting U26-10 to U26-8 for the ASCII protocol.</p> <p>WRT relay chatter, as here is no ASCII command take the top cover off, remove the A19 cover and pull the A19A2 daughter board. Use a thin wire and jumper the two coaxial connectors. Does not effect the BITE and the relays are pulled from the circuit. Submitted by AFA1PU.</p>
RX320	RELEASED CAT MUTE	Use for Ten Tec RX320 series and the RX-321 models built for Globe Wireless.
RX330	RELEASED CPP - 9600, 8N1	Use for Ten Tec RX-330 Set parameters to radio address 1 and default 9600 baud with 8N1.
RX331	RELEASED CPP - 9600, 8N1	Use for Ten Tec RX-331 Set parameters to radio address 1 and default 9600 baud with 8N1.
RX340	RELEASED CPP - 9600, 8N1	Use for Ten Tec RX-340. Set parameters to radio address 1 and default 9600 baud with 8N1.
RX350	RELEASED CAT MUTE	Use for Ten Tec RX-350. Will also control TT538 Jupiter.
TCI8174	RELEASED CAT MUTE CPP - 19200, 8N1	Use for TCI 8074, 8172, 8173, 8174 and perhaps other models. Radio Address 1 (ASCII letter A) where dip switch settings for S1 are 11100000 (1 is up 0 is down) . NOTE: For TCI-4070 see RA6830JD.
VR5000	RELEASED CPP - 57600, 8N1	Yaesu VR-5000. Requires a null modem cable.
WJ8711	RELEASED	Use for Watkins-Johnson WJ-8711 and other WJ receivers.
WJ8711A	PENDING	Use for Watkins-Johnson WJ-8711A and other WJ receivers.
WJCSMA	ALPHA	Use for older Watkins-Johnson receivers via the CSMA port (such as HF-1000, WJ-8710A, WJ8711A, WJ8712A and possibly others) with an ICOM CT-17 or compatible interface with the receiver set to address 10.

## **WHAT TO DO WHEN YOUR RADIO TYPE IS NOT LISTED?**

If your CAT radio is not listed by its model number under the **RADIO TYPE** column in the above chart, check to see if its listed in the **COMMENTS** column as being in the same family as the one listed. For example, under FT890 there are a number of Yaseu models as well as OEM models under other brand names that are all supported by the FT890 selection.

If your radio is not listed under **COMMENTS** then follow the following advice per manufacturer radio type.

### **ICOM:**

Most recent ICOM models and some older high end models are QS/S compliant as detailed in the chart above under **STATUS**. If your model is not listed due to it being a brand new model not yet added, determine if its QS/S by changing bands from 160-10m with the radio in **SPLIT VFO** and if you hear no relays cycling you can assume the radio is QS/S. Then select the most recent ICOM model that is QS/S and change your radio address to the factory address for that model (see the list below), select the highest baud rate supported for that model and see if the radio functions properly. If the radio is not QS/S follow the steps as just detailed however select the most recent ICOM radio type that is no QS/S.

All ICOM radio models listed under **RADIO TYPE** are supported using the default factory address and the highest baud rate supported. Select your specific model listed in the "Radio Type" pull down menu.  
Transceivers:

IC7800: <b>6A</b>	IC781: <b>26</b>	IC775: <b>46</b>	IC765: <b>2C</b>
IC761: <b>1E</b>	IC756PROIII: <b>6E</b>	IC756PROII: <b>64</b>	IC756PRO: <b>5C</b>
IC756: <b>50</b>	IC751: <b>1C</b>	IC746PRO: <b>66</b>	IC746: <b>56</b>
IC738: <b>44</b>	IC737: <b>3C</b>	IC736: <b>40</b>	IC735: <b>04</b>
IC729: <b>3A</b>	IC728: <b>38</b>	IC726: <b>30</b>	IC725: <b>28</b>
IC718: <b>5E</b>	IC707: <b>3E</b>	IC706MkIIG: <b>58</b>	IC706MkII: <b>4E</b>
IC706: <b>48</b>	IC703: <b>68</b>	IC78: <b>62</b>	IC7000: <b>70</b>
IC7200: <b>76</b>	IC7600: <b>7A</b>	IC7700: <b>74</b>	<b>X3: ?</b>

Receivers:

ICR9000: <b>2A</b>	ICR7100: <b>34</b>	ICR7000: <b>08</b>	ICR8500: <b>4A</b>
ICR9500: <b>72</b>	ICR75: <b>5A</b>	ICR71: <b>1A</b>	ICR72: <b>32</b>
PCR-1000: <b>N/A</b>	PCR-1500: <b>N/A</b>	PCR-2500: <b>N/A</b>	ICR10: <b>52</b>

ICR20: **6C**

### **KENWOOD**

All models are support by reading the Radio ID back at program start, which means the radio must be properly cabled to the PC for RS-232 control and turned on before starting the software. If the Radio ID is properly returned, but is not recognized in the database, its assumed to be a NEW model Kenwood radio and treated as if it is compatible with the full TS-480 series command set. If the radio ID type is NOT returned, the radio will be treated as a basic Kenwood model for frequency, mode and CAT PTT only.

Both the **KENWOOD** and **KENWOOD\_HS** selections support all models at 4800 baud 8N2 by default. For other RS-232 port parameters the custom port setup must be utilized to select the parameters that the radio is configured.

All Kenwood models to date, except the TS-440 (which is excluded from QS/S SPLIT VFO operation) are QS/S compliant. Kenwood radios can be selected for use with and without hardware handshaking, for hardware handshaking, use **KENWOOD\_HS** ( only CAT PTT or DTR PTT can be \_HS as the RTS line is used in hand shaking).

## **YAESU**

YAESU model sub family groupings at exist for a number of models, for example:

FT817/FT817DIG - Select this choice for FT-817, FT-817ND, FT-857 and FT-897 models.

FT890 - Select this choice for FT-100, FT-100D, FT-747GX, FT-840, FT-890, FT-900, FT-990 and also for the Heathkit SB-1400 (a.k.a. FT-747GX).

FT1000MP - Select this choice for FT-1000, FT-1000D, FT-1000MP series.

**Ten Tec:** Select from the specific models listed or the ICOM interface for older models as specified in your user manual. Although the Paragon II emulates the IC-765, it has been specifically coded so as to take advantage of extended features such at CAT PTT operation.