

Computer Aided Transceiver

Computerized control of Band, Frequency,
Mode, Filters, etc....

- CAT (term coined by Yaesu) controls HOW you operate/transmit: Frequency, Band, Mode (SSB vs CW ; LSB vs USB; RTTY etc), Filters, possibly Power,
- Versus Microphone / Signalink / Morse Code Key / Keyer / Rigblaster / Rascal etc that control WHAT you receive / transmit.....
- CAT is infrequently used on VHF/UHF because most operations on are “channels” versus frequencies, and usually FM.

When did CAT Start?

- Vacuum tube rigs – you controlled with **KNOBS & SWITCHES**
- Early solid state rigs (SBE-33) were just transistorized replacements of tubes
- Then microprocessors began to show up in transceivers & capitalism forced marketing to demand “something NEW” --- so enter **COMPUTER CONTROL.**

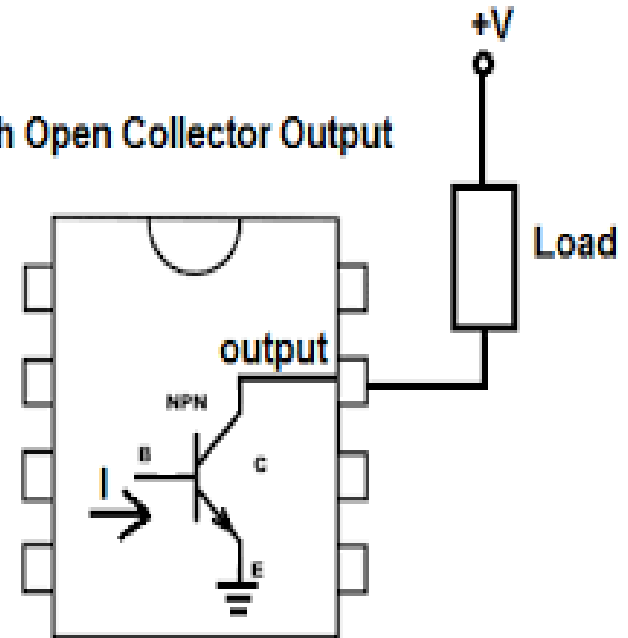
How do they talk?

- Early CAT was via RS-232 from early DOS and WINDOWS computers...
 - Baud rate 1200, 2400 4800, 9600 etc.
 - Parity Bit ("N" - none)
 - Stop bits (1 or 2)
 - Voltgages: Logic 0 = -3 to -25; Logic 1 = +3 to +25
- Later CAT tended to use USB serial ports (Logic 1= 2.8-3.6V; logic 0 = 0-0.3V)

ICOM is different

Open Collector = sending device can only pull DOWN; external resistor pulls it up; allows many devices to run on ONE WIRE; so more than one transceiver can be connected at once. Either the computer or a transceiver can SEND data; everyone can receive by simply sensing the voltage on the line.

Chip With Open Collector Output



Each transceiver must be identified by an “address” number.

Cables

- For serial port or USB you buy a cable that connects computer to transceiver.
- Same with ICOM open collector – but possibility exists to connect to 2 or more transceivers



Protocol

- THERE IS NO STANDARD.
- Every manufacturer implements their own protocol for what codes will cause the transceiver to do what, and how the transceiver will reply with information.
- ICOM tended to use the same protocol across many many transceivers
- YAESU tended to write a new protocol for every new design – and sometime change even during the life of one transceiver!

How to deal with this?

- A zillion different software packages have been written to communicate to ham radio transceivers
- Very confusing.

Links

- Bonito Radiocom
 - Supported radios are listed [here](#)
 - Comments on EHam for this software can be found [here](#)
- CBT, Inc- Commercial programming software for Aicom radios.
- Commander Commander is a free application that controls up to 4 Icom, TenTec, Kenwood, Yaesu, Elecraft, FlexRadio, Aicom, or Kachina transceivers, switching between them manually or automatically based on frequency, and displaying frequency-dependent settings for devices like tuners and amplifiers; includes a bandspeed and transverter support. Commander is a member of the freeware DXLab Suite, which supports soundcard PSK31, soundcard PSK83, soundcard and/or TNC RTTY, CW generation, logging, award tracking, QSL generation, LotW and eQSL.cc synchronization, QSL route discovery, antenna rotation, world map display, DX and WWW/spot collection, and propagation forecasting.
 - Comments on EHam about Commander can be found [here](#)
 - Yahoo Group for the DXLab Suite
- CTR-Control the Radio (Pocket PC and PC Control apps)
 - The list of supported radios is found [here](#)
 - CTR Remote Yahoo group
- DX Buddy Multi Platform support - Windows, Linux and OSX
- G4HFQ's closed-source, commercial software for the MS-Windows platform that controls a variety of Yaesu radios. Demo available.
 - FTBCat - Rig Control for the Yaesu FT-100/D, FT-817/ND, FT-847, FT-857/D, FT-897/D, FT-920, FT-1000MP Mark V transceivers and VR-5000 and FRG-100 receivers. Comments on EHam about FTBasic.
 - FTBasicMMO - A memory management only program for Yaesu FT-817, FT-817ND, FT-847, FT-857, FT-857D, FT-897 and FT-897D transceivers.
 - Comments on EHam about FTBasicMMO can be found [here](#)
 - FTBasic Yahoo Group
- Ham Radio Deluxe - Ham Radio Deluxe (HRD) is a suite of free Windows programs providing CAT control for commonly used transceivers and receivers. HRD also includes mapping and PSK31 software. Supports most Icom, Kenwood, Ten-Tec, Yaesu, and Elecraft Receivers and Transceivers. Great for both Ham operators and SWL listeners.
 - The list of supported radios can be found [here](#)
 - Comments on EHam about Ham Radio Deluxe can be found [here](#)
 - Ham Radio Deluxe support forum
 - Ham Radio Deluxe Yahoo group for version 5.x versions only
- Hamsoft Rig Control Software for Linux users
- KC8UNJ- Free programming software for many Yaesu handhelds, including the VX-2, VX-5, VX-6, VX-7, VR-120, FT-60 as well as the Icom R-2.
- MacLogger DX For Mac users
 - Support for MacLoggerDX can be found [here](#) and [here](#)
- N4PY software Extensive support for TenTec, Icom and Elecraft
 - Reviews of these packages are indexed on the [EHam Software reviews page](#)
- RadioCtl
- RT Systems- Commercial programming software for Yaesu and Icom radios.
 - Comments on EHam about RT Systems products can be found [here](#)

What is important to know?

- 1. WINLINK includes its own rig control, developed by volunteers for each different transceiver they were able to figure out.
- 2. For WINLINK, unless you are running a GATEWAY, this is OPTIONAL --- you can just dial in the frequency you wish. But it is NICE because you can double click a station and your rig instantly goes to the right frequency, etc.

Exit Settings Switch to Peer-to-Peer Channel Selection Forecast Best chan. Next chan. Hide TNC Start Stop Abort

KB5OZE Center Freq. (kHz): 7087.500 Dial Freq. (kHz): 7086.000 Bearing: 273 Quality: 43

Favorites: KB8UVN-10 @ 10134.500 Select Add to favorites Remove from favorites

Channel Free In: 0/0 Out: 0/0 BPM: 0/0 Disconnected

**** Using Yaesu FT-600, COM18, 4800 baud
**** Ready

- Inbox (42 unread)
- Read Items (0)
- Outbox (0)
- Sent Items (331)
- Saved Items (1)
- Deleted Items (3)
- Drafts (1)
- Gordon (0)
- HurricaneTest (0)

- ANDERSON ERIC
- ART_(GMAIL.COM)
- ART_(WINLINK)
- BANNON_GENE
- BASSETT_JOE
- BLEDSOE_JIM
- BOAL_SHANNON
- BOLLENS_SKIP
- BROOK_JAMES
- CAPEHART_JEFF
- CHERYL_CARR_(FIRELINE)
- CHESNEY_VANN
- CHRIS_CARR_(FIRELINE)
- CINDY_(WINLINK)
- CINDY_GRANT_(GMAIL)
- CINDY_GRANT_(GMAIL.COM)
- COOK_RAY
- CROKE_WARREN
- CULBRETH_GENE

Subject
//wL2K Florida Winlink Net Report June 11,2018
.0 Port:8500

Receive Rcv Level: [Progress Bar]
Remote Station Offset: 0 Hz
Busy Detector
Squelch: 5



Winmor Winlink Settings

Radio Selection

Select Radio Model: **Yaesu FT-600** (dropdown menu open)

- Icom Amateur Radios (Early)
- Icom HF Marine Radios
- Icom 7100
- Icom 7200
- Icom 7300
- Icom 7410
- Icom 7600
- Icom 9100
- Icom IC-F8101
- Kenwood Amateur
- Kenwood TS-590S
- Kenwood TS-590SG
- Kenwood Commercial
- Micom 3F
- Ten-Tec Omni 7 & Jupiter
- Ten-Tec Orion & Eagle
- Yaesu FT-100
- Yaesu FT-450
- Yaesu FT-600
- Yaesu FT-817**
- Yaesu FT-840
- Yaesu FT-847
- Yaesu FT-857
- Yaesu FT-897
- Yaesu FT-920
- Yaesu FT-950
- Yaesu FT-891

Antenna Selection: Default

Digital FM Use Internal Tuner

Enable RTS Enable DTR TTL

9600 Enable RTS Enable DTR

Close

am not sure how your doing that, if your a
?

- WINLINK gateways MUST computer control because they scan multiple frequencies and find recipients when in HF forwarding mode.
- WINLINK includes control for 30+ transceivers or groups of transceivers. (ICOM: most use the same control, you just enter the special number address for the type transceiver you have.) YAESU: must choose correct model.

FLDIGI

- FLDIGI is also volunteer written and includes CAT control by more than one possible way:
- OPTIONAL – most of the time you don't even need it....for PSK, go 70kHz up from the bottom of the band and then just click on the waterfall to pick which audio frequency you send into the mic. Every different mode has a little “niche” area of the band, and you get used to them.

FLDIGI rig control continued

- FLRIG – use their special software (I haven't tried it)
- RIGCAT – use an .xml file to specify how to talk to rig
- HamLib – includes a BOATLOAD of different rigs (I've used this the most)
- XML-RPC – dump the control on an external program via xml commands
- Hardware PTT – just control the PTT switch with serial port line (e.g. DTR or CTS)
- GPIO – for Raspberry PI, you pick which lines do PTT

14070.000

Frq 14071.354 On Off 1625 In Out
 Call Op Az
 Qth St Pr L C

Read Logbook: C:\Users\Gordon\fldigi.files\logs\glgtest
0.0 seconds

Fldigi configuration

Operator UI Waterfall Modems Rig Audio ID Misc Web Autostart IO PSM
 flrig RigCAT Hamlib XML-RPC Hardware PTT GPIO

Use Hamlib

Rig: Yaesu FT-857 (Beta) Device: COM7

Yaesu FT-847 (Beta)
 Yaesu FT-857 (Beta)
 Yaesu FT-890 (Stable)
 Yaesu FT-897 (Beta)
 Yaesu FT-900 (Untested)
 Yaesu FT-920 (Stable)
 Yaesu FT-950 (Stable)
 Yaesu FT-980 (Alpha)
 Yaesu FT-990 (Alpha)

PTT via Hamlib command
 Audio on Auxiliary Port
 DTR +12
 RTTS/CTS flow control
 RTTS +12
 XON/XOFF flow control
 CW is LSB mode
 RTTY is USB mode

Baud rate: 9600
 Stopbits: 1
 Polling Interval (msec): 250
 Mode delay (msec): 200
 Sideband: Rig mode

Advanced configuration:

Initialize

Restore defaults Save Close

CQ 3.0

500

3500 4000

ICOM Addresses

- For some rigs I've actually used:
- ICOM-706 48 (hex)
- ICOM-706MkII 4E (hex)
- ICOM-718 5E (hex)
- ICOM 725 28 Hex
- ICOM 728 38 (hex)
- If you need them, just google, they are all over.

uBitx CAT Control

- uBitx comes with a subset of Yaesu FT-857 or FT-817 computer control --- so you can control it!
- Means that this little radio can be a WINLINK gateway transceiver!
- Add a solid state amplifier with computerized bandswitching and its a wonderful little digital rig – that also does SSB & CW!!