

AMBE 3000 for UDRX and RasPi



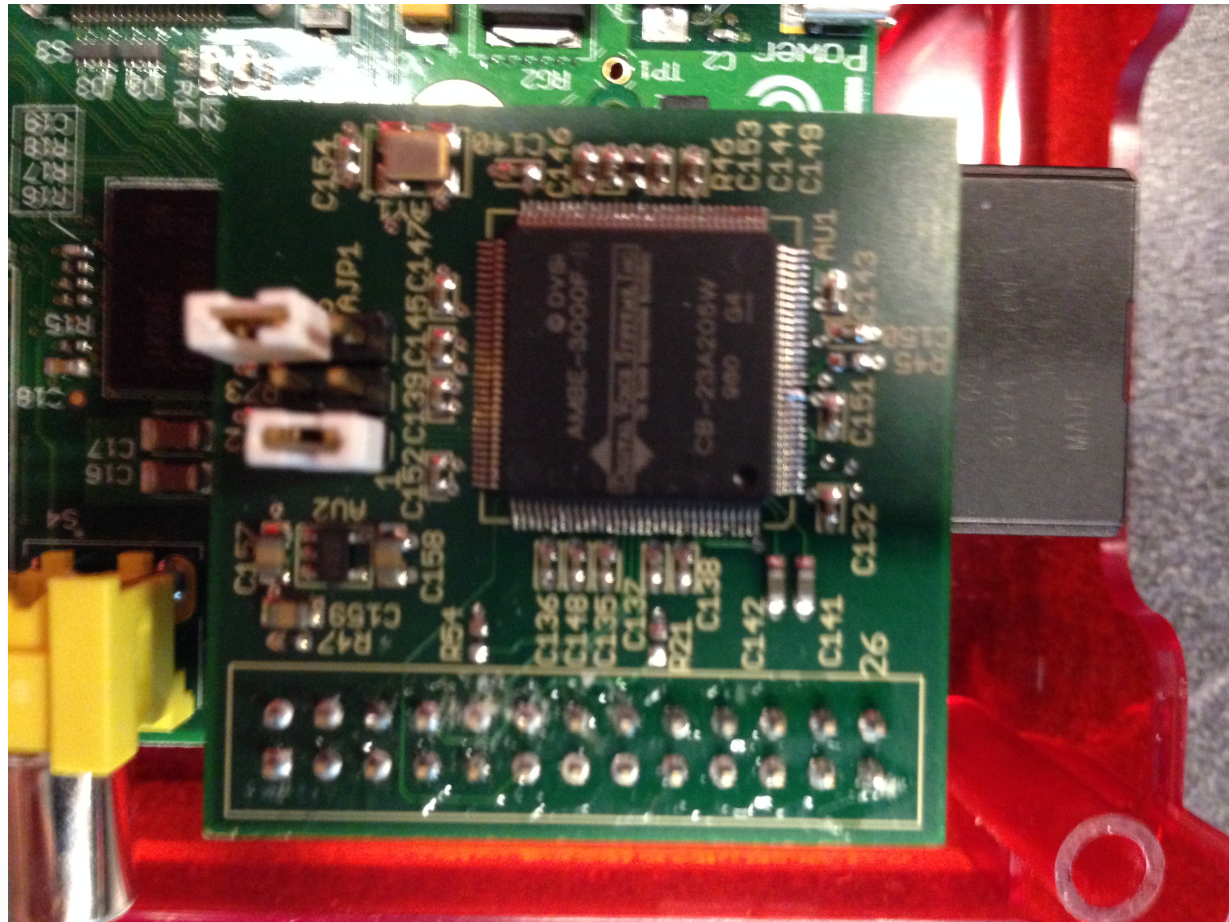
Digital Conference 2014
Redmond, WA
John D. Hays
K7VE



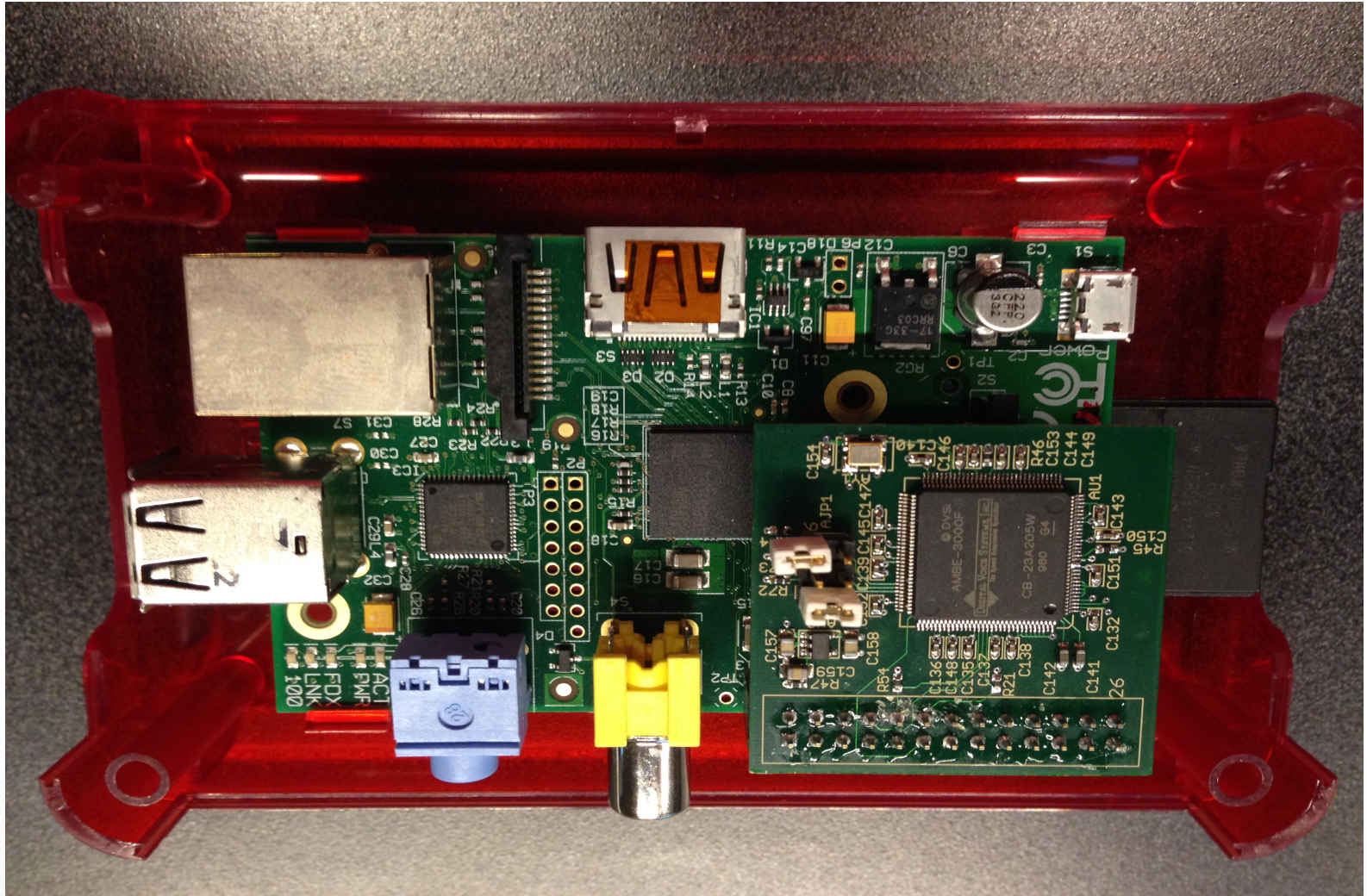
What is It?

- Model number DV3000
- A small daughter card for the UDRX
 - Pin Out matches UDRX and Raspberry Pi
 - Provides a UART based interface
 - Packet Mode (Audio ↔ AMBE)
 - Selectable Baud Rate
 - Default to 230400 bps

“Lab” DV3000



DV3000 on Raspberry Pi





What Does The DV3000 Do?

- Provides basic AMBE Vocoder (FEC + Voice)
 - D-STAR
 - DMR
 - P25 Phase 2 Half Rate
 - dPMR
 - NXDN / NexEDGE / IDAS
 - Yaesu Fusion (?)
 - More



Applications

Northwest Digital Radio
has not committed to create these
applications, but encourages their
development and deployment
for UDRX and Pi
by interested parties.

No warranty is conveyed or implied that the device
will be appropriate for any particular application.



Non-RF Links to D-STAR Network

- DPLUS, Dextra, DCS, CCS
 - Use in place of
 - Desktop/Laptop
 - USB Attached AMBE board
 - Simple interface or GUI

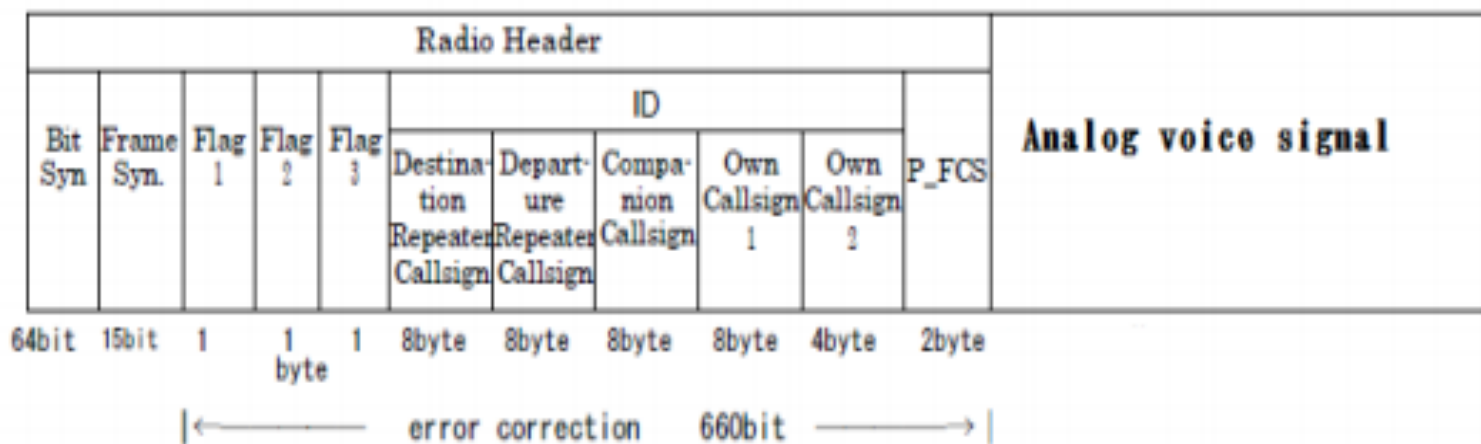


Digital Telephone Interconnect

- Raspberry Pi
- Asterisk or other VOIP system
 - app_rpt
- DV3000
- Protocol Stack to D-STAR, DMR, dPMR,
...
- Map radio ID / Callsign to DID
 - e.g. K7VE – 1-206-555-K7VE (5783)
- Ethernet or WiFi to Internet

Analog (FM) to D-STAR Bridge

D-STAR specification provides for MSK header for analog interconnect



Modulation: 1200bps MSK. 1: 1800Hz 0: 1200Hz



Bridge to Other DV Protocols

- DMR
- P25 Phase 2 Half Rate
- dPMR
- NXDN / NexEDGE / IDAS
- Yaesu Fusion (?)
- More



I Have An Application

If you have a proposal for an application and
want early access to a card,
email: sales@nwdigitalradio.com
with a proposal



I Want to Order A DV3000 for A Pi Application

- NW Digital Radio will open for orders when
 - We have a couple of open source applications, for reference
 - Work is underway to provide these for D-STAR
- Will take orders 30 days before delivery
 - US Manufacture, quicker delivery schedule
- Price \$99.00 (plus tax/shipping)



I Want A DV3000 with a UDRX

- Pre-Orders for UDRX w/DV3000 will be delivered together
- There will be a discount when the UDRX and DV3000 are ordered as a bundle
- Dependent on delivery of UDRX



Other Features

- We have the opportunity to add a few features in the production revision of the board.
 - Possible interface for non-UDRX radio connection
 - Ground, PTT, SQL/COR
 - Audio In/Out to AMBE-3000 Codec Interface
- Thoughts from the group?



Questions and Comments?



UDRX Software API Architecture

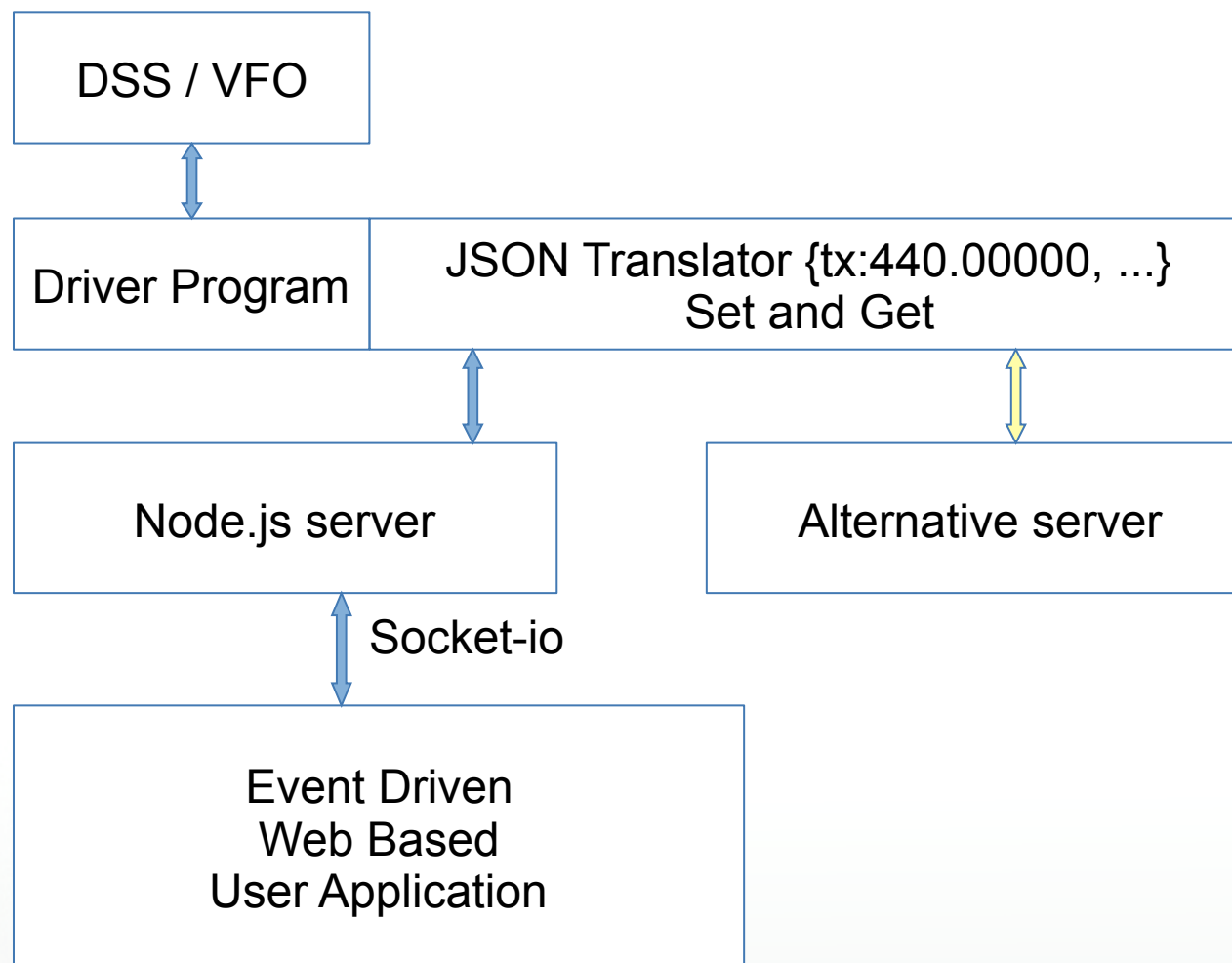
JSON Asynchronous API
Socket Based Access to Radio Stages



JSON Asynchronous API

- Low level interfaces to the hardware are wrapped into JSON strings by daemons
 - Frequency Control
 - Power Control
 - Temperature Measurements
 - Other monitors and controls

Example



Node.js Server Simplified Worker

```
io.sockets.on('connection',
function(socket) {
    ...
    socket.on('txfreq', function(data) {
        if (data.txfreq < 450.0 &&
data.txfreq > 430.0) {
            tx.freq =
eval(data.txfreq);
            // Call daemon and set freq

socket.emit('tx',tx);
        }
    });
    ...
});
```

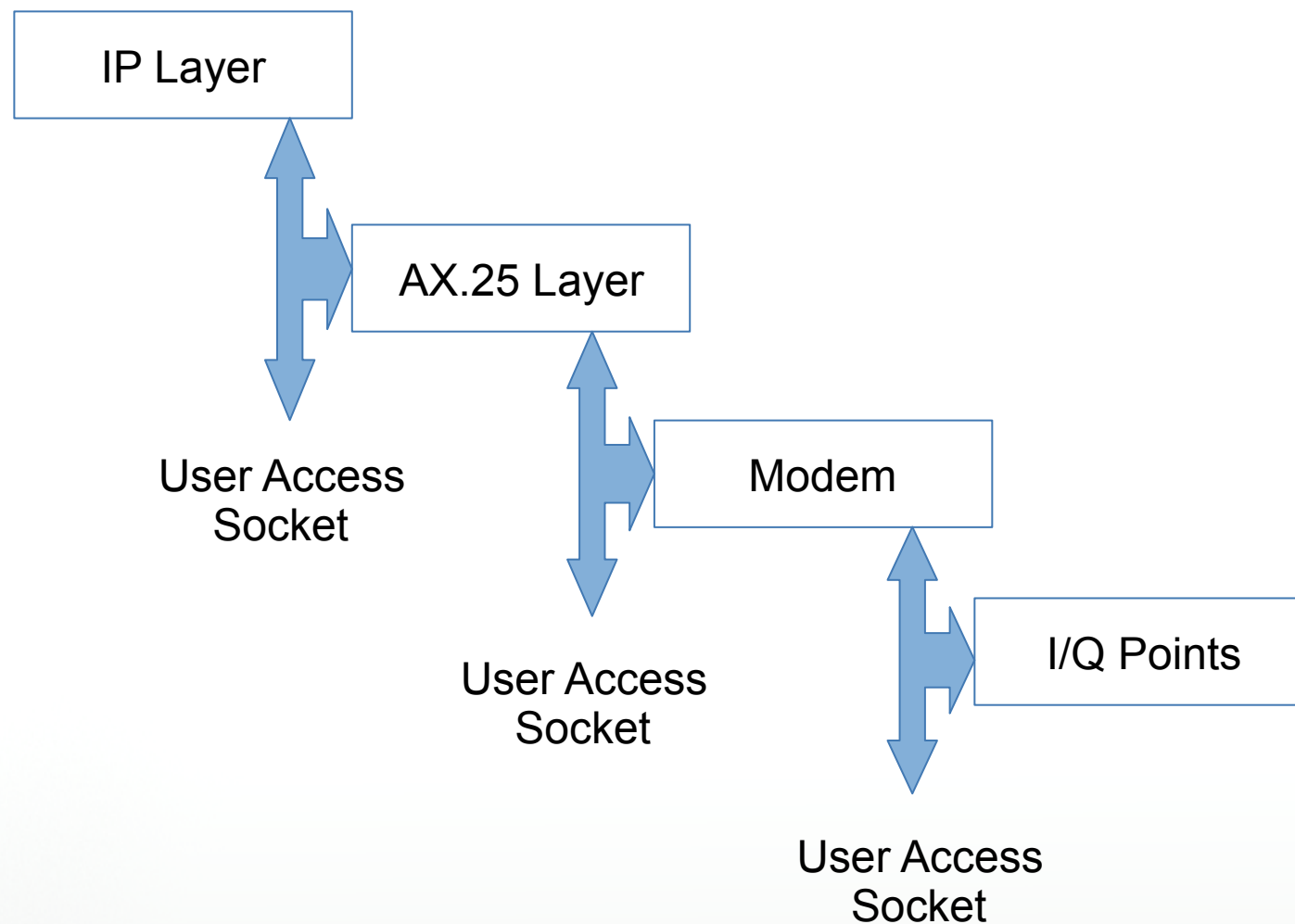


Web Client (Simulated)

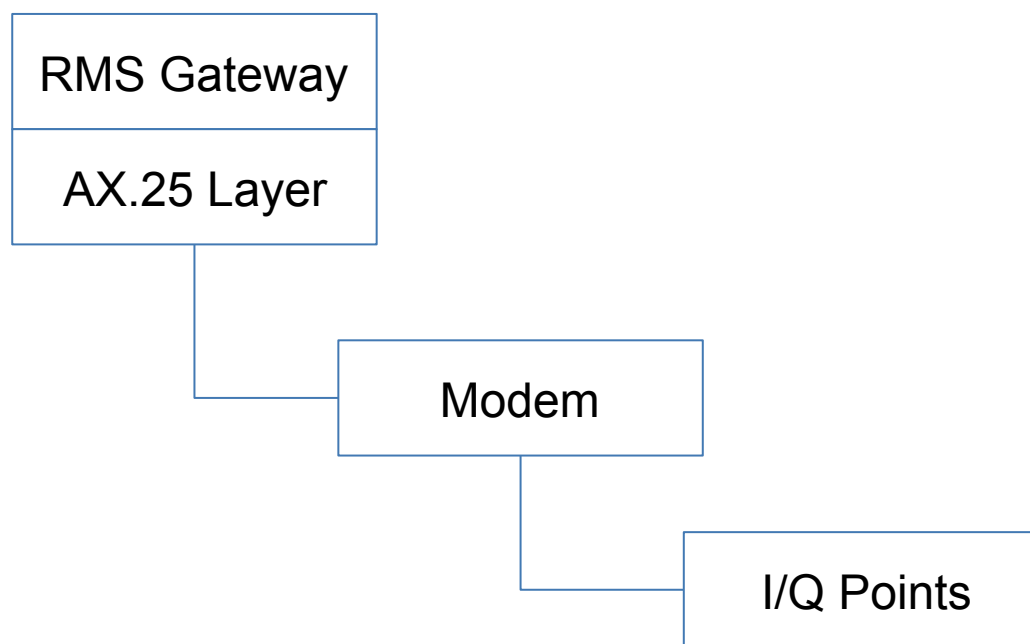
Network Message: {tx,{"freq":440.2625,"po":1}}

```
var txf; // holds current tx frequency
client.on('tx',function(data){
  $('#txfreqset').val(data.freq);
  if(txf != data.freq) {
    ctx.font="15px Stencil";
    ctx.clearRect(10,40,200,10);
    ctx.fillText(data.freq.toFixed(6) +
' TX',10,50);
    txf = data.freq;
  }
})
```


Socket Based Access to Radio Stages



Example Application





Questions