AMATEUR RADIO DIGITAL MODES

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DIGITAL MODES – COMMON CHARACTERISTICS

- Encoded NOT Encrypted
- Generally not decoded by human ears
- Uses audible tones
- Generally uses a radio / computer link

DIGITAL MODES – COMMON CHARACTERISTICS

- Uses lower power (QRP) for transmissions.
- Largely text based. (some exceptions)
- Quiet in the shack. (no audible sound necessary to the operator)

SHORT LIST OF DIGITAL MODES

- AMTOR ,PACTOR ,G-TOR, PACTOR II, CLOVER , RTTY , PSK-31 , HF PACKET, HELLSCHREIBER, MT63 , THROB , MFSK16 , JT65 , Olivia , DominoEX , Contestia , FT-8 and Digital Television
- Most popular right now: RTTY, PSK-31, FT-8

DIGITAL MODES SETUP FOR HF RADIO

- Software specific to the digital mode. And it’s free!
- Windows, Linux, Mac based desktop, laptop or tablet.
- External sound card.
- Cabling from PC to external sound card.
- An HF Transceiver.
- Cabling from external sound card to transceiver.
- Setup can go directly from PC to Transceiver as well.

BASIC COMMUNICATION - RECEIVING

- Audio from radio to computer input
- Microphone or line in.
- Decoding to readable text (software)

BASIC COMMUNICATION - TRANSMITTING

- Text to Audio (software)
- Audio from computer
- Line out or speaker to transmitter.
- Trigger PTT or equivalent on transmitter

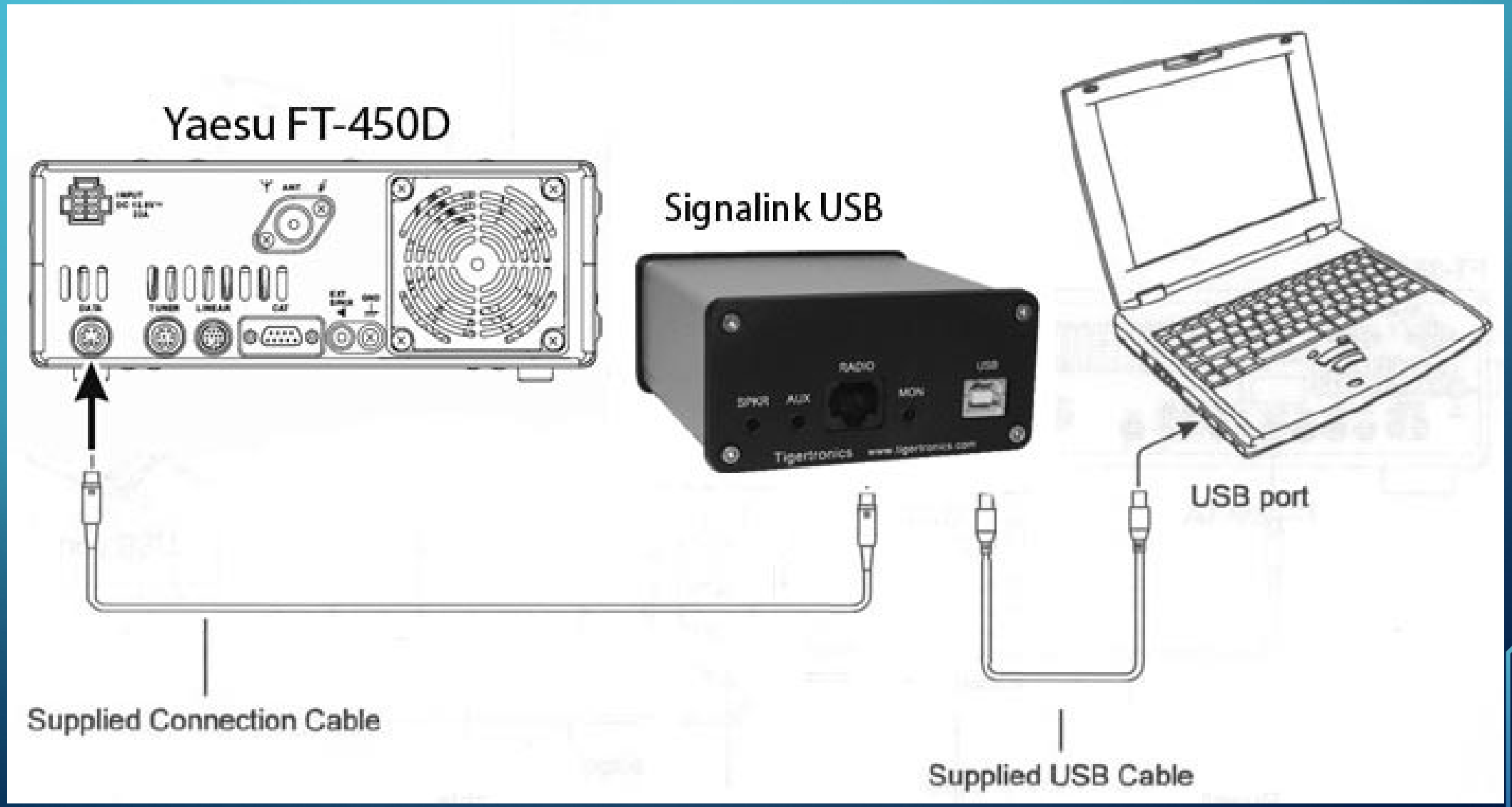
EXAMPLE EXTERNAL SOUND CARD

- Built-in Low-noise Sound Card
- Complete Radio Isolation
- USB Port Powered
- Works with most radios
- Uses Mic, Data, or Accessory Port

WHY USE AN EXTERNAL SOUND CARD?

- Sound processing is away from the PC’s CPU.
- Better performance in decoding.
- Excludes computer sounds
- Audio level adjustments are easier.

A TYPICAL HARDWARE SETUP



MOST POPULAR DIGITAL MODES AND FEATURES

- FT-8
- PSK-31
- RTTY
- CW

FT-8 MOST POPULAR DIGITAL MODE

- Weak-signal radio communication. (below noise level)
- Developed and released in 2016 by Joe Taylor, K1JT.
- American astrophysicist and Nobel Prize in Physics laureate.
- FT-8 allows amateurs to exchange limited contact info.

FT-8 HF

- Message is compressed.
- Encoded with Forward Error Correction. (FEC)
- Software adds redundancy to the data.
- Transmission is 15 seconds long. 47 Hz wide.

FT-8 HF

- Software used is open source and free.
- A monster! More than half of QSO’s are FT-8.

FT-8 HF

- Each transmission begins at t = 1s after the start of a UTC minute and finishes at t = 13.5 s.
- Computer time is critical. Set PC using WWV, CHU Canada or internet time
- 100% duty cycle on transmit.
- 5 milliwatts to max allowable watts on HF.

FT-8 HF

No rag chewing here, strictly making and acknowledging contact.

Message types: CQ, Acknowledge, Report and 73.

All messages are generally software generated.

Once CQ contact is made all others messages are automatic.

FT-8 HF

- Fun?
- Not for everyone, but it does work even in poor band conditions.
- Not a contesting mode. Wait! Now it is. As of 3 months ago.
- New software works for Dxpeditions.

2ND MODE: PSK-31

- Uses Phase Shift Keying, 31 Baud (roughly 30 characters per second).
- Other variants/speeds but this one is the most popular.
- The information is transmitted by patterns of polarity-reversals (sometimes called 180-degree phase shifts).
- 5 -35 watts (50 max) on HF. Usually USB.

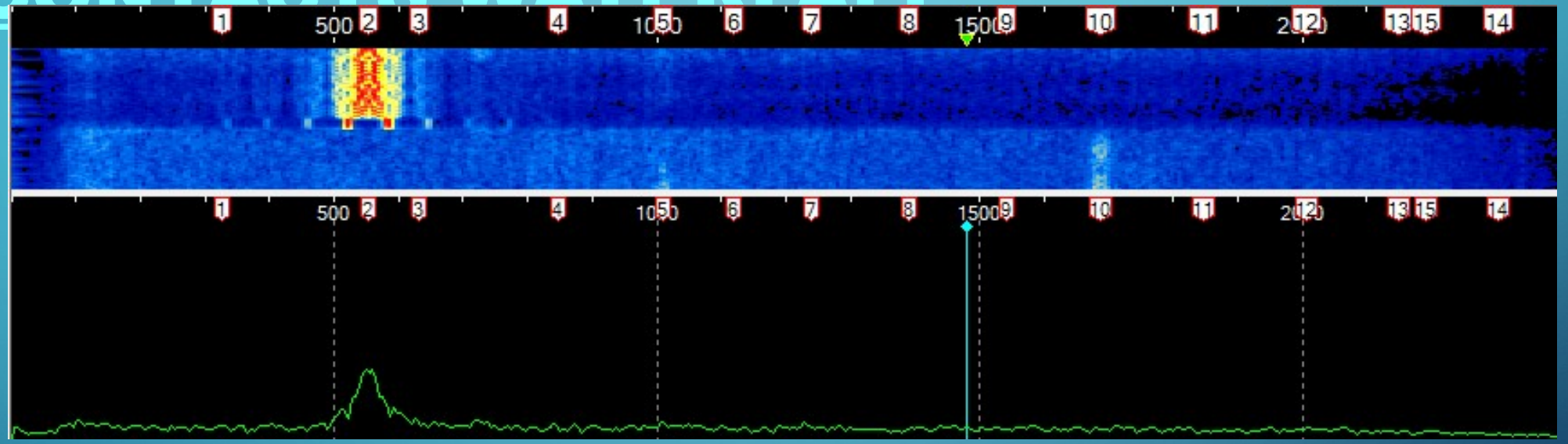
2ND MODE: PSK-31

- 100% duty cycle on transmit. Watch it on long raw-chewing QSOs.
- Is it a contesting mode? Yes. Definitely.

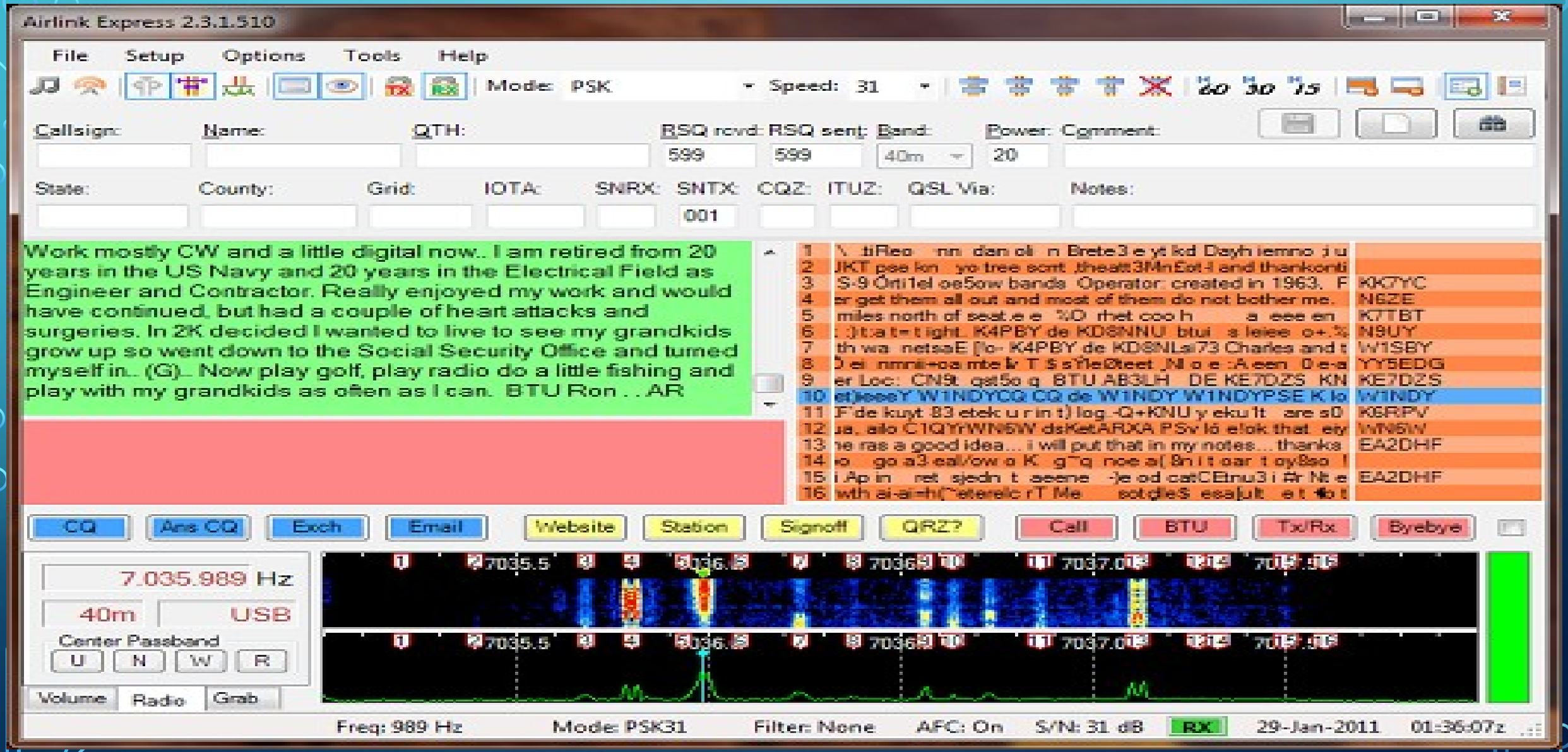
PSK-31

- Fun? Yes.
- Great for folks who are mic shy or who love to type their QSOs.
- And again, the shack is quiet!
- Many transmissions can fit into the same bandwidth that would be occupied by an SSB signal. (2.4kHz approx.)
- It is common to see 15 or more signals on a

PSK-31 – ONE STRONG AND 14 WEAK CONTACTS WATERFALL



PSK-31 FULL SCREEN – 8 X 10 GLOSSY EDITION



PSK-31 DECODING – IT AIN'T PERFECT AT TIMES

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A SAMPLE OF HF DIGITAL MODES

QUESTIONS ?