Why Use Digital Modes ?

Using Digital Communications Modes on HF

Including

Weak Signal QSOs During Poor Band Conditions

Why Use Digital Modes ?

Many of us have been using AM, SSB, and CW for years.

Now, we have a all of these 'Digital Communication Modes'.

Why do we want to bother with them?

One good reason might be because of the Sunspot Cycle.

It is going Down and the Dip is now predicted to be in 2020.

Why Use Digital Modes ?

As the Low End of the Sunspot Cycle , we see:

- Poor Communications on 10-12-15-17-20 Meters

- Crowding and Variability on 30-40-60-80 Meters

Many days you may sit down to make HF QSOs
and find that you make few or none.

Kind of takes the fun out of, especially if you like to work DX

Why Use Digital Modes ?

I have been through a few Sunspot Cycles.

If you use the 'Original Digital Mode' (CW) you may do better.

But, if you primarily use SSB, then you will not do so well.

Articles say that some Digital Modes will do pretty well during poor band conditions.

So we at Skyview decided to explore some of the Digital Modes

Why Use Digital Modes ?

We setup a Skyview “Digital Challenge”

We would use a different Digital Mode each month, for 5 months.

A lot of this presentation is based on our experiences

Why Use Digital Modes ?

There are now many Digital Modes that we can use.

Some, not so popular, and finding someone using them is hard.

Some, more popular, allowing you to get into a QSO easier.

We wanted to use the more popular Digital Modes
instead of some of the more obscure ones.

Why Use Digital Modes ?

We used the following Digital Modes during our Challenge:

JT65

BPSK31

OLIVIA

MFSK or RTTY

JT9

Why Use Digital Modes ?

We wanted to be a little competitive in our Digital Challenge.

So we decided to track our long QSOs and each month we would each submit our 10 QSOs with the highest mileage.

Was it a success?

I think so.

Why Use Digital Modes ?

There were 6 of us who participated during this 5 month period

The 'Top 10' Logs submitted by the 6 of us showed a total of

1,077,523 QSO Miles

That was from 300 QSOs (6 x 10 x 5 months)

That averages out to 3592 miles per QSO !!

(A lot of us made a lot more than just these 10 QSOs each month)

Why Use Digital Modes ?

This Challenge took place in February through June of this year

If you have been on the HF Bands, then you know that conditions have not really been that great this year.

By the way we limited ourselves to:

100 Watts Output for RTTY
and
20 Watts Output for All Other Digital Modes

Why Use Digital Modes ?

1,077,523 QSO Miles During the 5 Month Period

With relatively Poor Band Conditions

And for 4 of those 5 months, using no more than

20 Watts Output

Why Use Digital Modes ?

Are you getting close to seeing some value in using

Digital Communication Modes

during the low end of the Sunspot Cycle?

Why Use Digital Modes ?

How about the various Digital Modes that we used ?

What did we think of each of them ?

Some supported rag chewing, and were liked by the rag chewers

Some were more like quick impersonal contest QSOs
as they did not allow any rag chewing at all.

Why Use Digital Modes ?

JT65	Impersonal contest-like QSOs	Great during weak signal conditions	Can find in use on low bands 24 x 7	Took time, but became liked by all
BPSK31	Lots of Rag Chewers	Requires decent signals	Can usually find on low bands 24x7	Was pretty well liked by most all of us
OLIVIA	Lots of Rag Chewers	Good during weak signal conditions	Hard to find this mode being used	Was pretty well disliked by most all of us
MFSK	Some Rag Chewers	Requires decent signals	Hard to find this mode being used	We all opted to use mostly RTTY
RTTY	Few Rag Chewers	Requires decent signals	Seems like is mostly a contest mode	Was pretty well liked by most all of us
JT9	Impersonal contest-like QSOs	Great during weak signal conditions	Can find in use on low bands 24 x 7	Took time, but became liked by all

Why Use Digital Modes ?

OK. So what does it take to use Digital Modes on HF?

- HF Transceiver
- HF Antenna(s)
- Computer and Software
- Interface Between Computer and HF Transceiver

If you already have a computer in the shack, you really just need to add an Interface and some Software.

Why Use Digital Modes ?

There are many, many different kinds of HF Transceivers and many, many different kinds of Computers in use.

So, this will not touch on how you can Interface your HF Transceiver to your Computer

There are inexpensive do-it-yourself Interface options.

There are commercial Interface options.

Why Use Digital Modes ?

Google is your friend.

Google on *“Digital Interface for [your-transceiver]”*

Read though the on-line information provided by the various commercial Digital Interface suppliers.
(ie: Rig Blaster, Signal Link, and ZLP)

If you like to homebrew, you will find lots of 'from scratch' articles and there are lots of kits available on eBay.

Why Use Digital Modes ?

You will need to obtain 'Digital Interface Software'.

But, while you have to build or buy a Digital Interface, Digital Software programs can be downloaded for free.

The 6 Digital Modes that we used in our Digital Challenge could be done with just two Digital Software programs.

Why Use Digital Modes ?

fldigi will do BPSK31, OLIVIA, MFSK, and RTTY

(and many more)

WSJT-X will do JT65 and JT9

There are other choices – Google can help you find them . . .
. . . just Google on the particular Digital Mode

Why Use Digital Modes ?

You will have to do some 'setup configuration' to make it all play nice together. But the documentation is pretty good.

And yes, there is a learning curve (like everything else). But, there is lots of on-line help for each Digital Mode.

The signal level between the computer and the transceiver must be set to the correct level and that level maintained.

(These Digital Modes manipulate audio tones in USB Mode)

Why Use Digital Modes ?

One thing that we learned about being novices with these Digital Modes is that others will screw up while using them also.

There are lots of new people getting into Digital Modes. And most of the 'old-hands' at it will offer helpful advice.

Why Use Digital Modes ?

Before we wrap up, I want to give you just a little info on the two modes that work best with really weak signals.

With us being down in the sunspot cycle, we are now having a lot of days where weak signals are the new normal.

JT65 and JT9 were designed for “weak signal communications”.

While they use a rather rigid contest-like messaging format, these are the Digital Modes that are available on some band 7 x 24.

Why Use Digital Modes ?

JT65 and JT9 are really great if you like to make DX contacts.

There have been days where the only QSOs that span any significant distance on 10 through 20m are JT65 or JT9 QSOs.

Using JT65 or JT9, running only 20 watts to a simple antenna, one can routinely work DX during the day and during the evenings on 40 meters and during the evenings on 80 meters.

That may contribute to the current popularity of JT65 and JT9.

Why Use Digital Modes ?

JT65 and JT9 do not support any Rag Chewing.

JT65 and JT9 QSOs are like Contest QSO's, short and sweet.

The exchanges are brief, and contain no personal info.

But, unlike typical Contest QSOs, they are not Fast.

A “short and sweet” JT65 or JT9 QSO takes 6 minutes.

You can't make it go any faster, and it could take longer.

Why Use Digital Modes ?

JT65 and JT9 QSO exchanges use a well defined format:

Minute 1: **K3JZD** calls CQ

Minute 2: *P5AA* answers **K3JZD**'s CQ

Minute 3: **K3JZD** gives *P5AA* a Signal Report

Minute 4: *P5AA* gives **K3JZD** a Signal Report

Minute 5: **K3JZD** says 73

Minute 6: *P5AA* says 73

During each of those minutes, a very small packet of digital data is being transmitted repeatedly, for 46 seconds out of that minute. That is generally how your low powered transmissions make it there under weak conditions.

Why Use Digital Modes ?

Using JT65 or JT9 has been compared to watching grass grow.

Using JT65 or JT9 has been compared to watching paint dry.

But, some have said that JT65 and JT9 are like cocaine for amateurs . . . . . because they can become addictive.

It is easy to say, just this one more QSO and then I'll quit . . .

. . but you see another one that you want, and keep going.

After a while, you begin to think that it might be nice to get some JT65 or JT9 Mode WAS and DXCC wallpaper.

Why Use Digital Modes ?

The designer of the JT65 and JT9 weak signal mode also wrote and maintains the free WSJT-X software.

It consist of two windows:

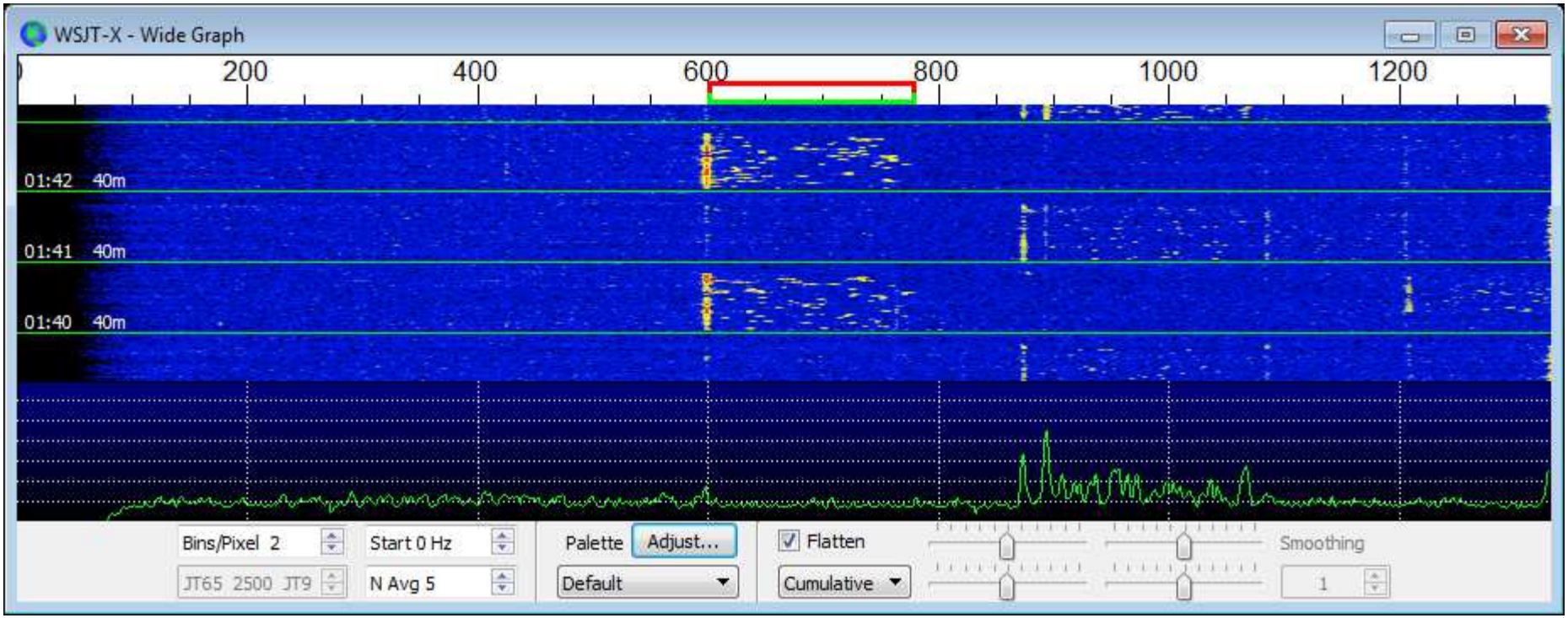
One is a graphical 'waterfall view' of the received signals

The other is a colorful textual based window.

I'll show them to you, but I will not be going into any great detail on how they work during this brief overview.

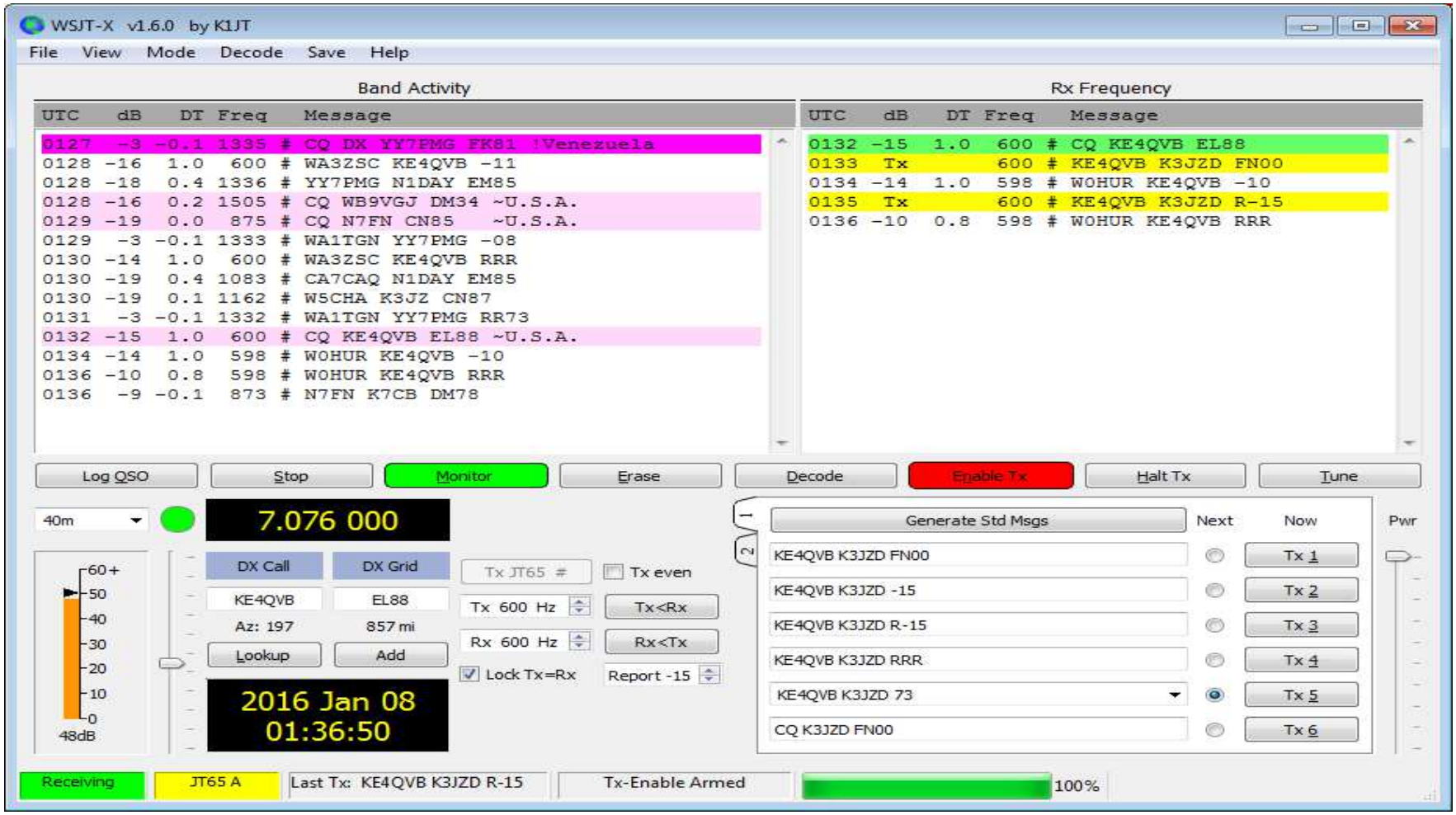
Why Use Digital Modes ?

Here is the **WSJT-X** 'Waterfall' Window



Why Use Digital Modes ?

Here is the **WSJT-X** Operating Window



Why Use Digital Modes ?

As I mentioned earlier, there is a learning curve.

There are lots of different pieces of information being displayed

Each color has a meaning.

And there is a fixed rhythm to the communications to adapt to.

But, each of us who have used it have quickly picked up on it, and have successfully used it to make a lot of DX QSOs.

Consider trying these two Digital Modes if you do decide to try some Digital Communications.

Why Use Digital Modes ?

Questions ??

Download slide show from: http://www.nelis.net/K3JZD