



6. DIGITAL MODES – AI6JB

Chapter 6 Digital Modes

ARRL General Class

Sections 6.5 Digital Operating Procedures





Section 6.5

Digital Operating Procedures - Initiating & Terminating Digital Contacts

Sample CQ from a digital mode (RTTY, PSK31, etc.) ...
from KØILP

- CQ CQ CQ DE KØILP KØILP KØILP **K**

The **K** here is not a typo ... used at end of transmission
to indicate the other station is to transmit as shown.

Sample/typical response ... by KX4IU

- KØILP KØILP KØILP DE KX4IU KX4IU KX4IU **K**

Modes such as PACTOR and VARA ... the software or
modem will have a specific disconnect message ...
BYE or D



Connecting to Gateway and Mailbox Stations

The exact connection method depends upon equipment and mode, but begin by sending a CONNECT message

If signal is received without errors, a training sequence of packets may be exchanged to determine protocol to use

Because these stations respond without a human control operator present, FCC classifies them as automatically-controlled digital stations ... restricted to certain band segments (Table 6.4)

- Data also permitted on 6-meter and shorter wavelength bands

Stations under FCC rules must operate under local or remote control (with control operator in charge of all transmissions)



Automatic Control Band Segments for RTTY & Data

BAND (Meters)	FREQUENCY RANGE (MHz)
160	Not permitted
80	3.585 – 3.600
60	Not permitted
40	7.100 – 7.105
30	10.140 – 10.150
20	14.095 – 14.0995 & 14.1005 – 14.112
17	18.105 – 18.110
15	21.090 – 21.100
12	24.925 – 24.930
10	28.120 – 28.189
6	50.1 – 54.0
2	144.1 – 148

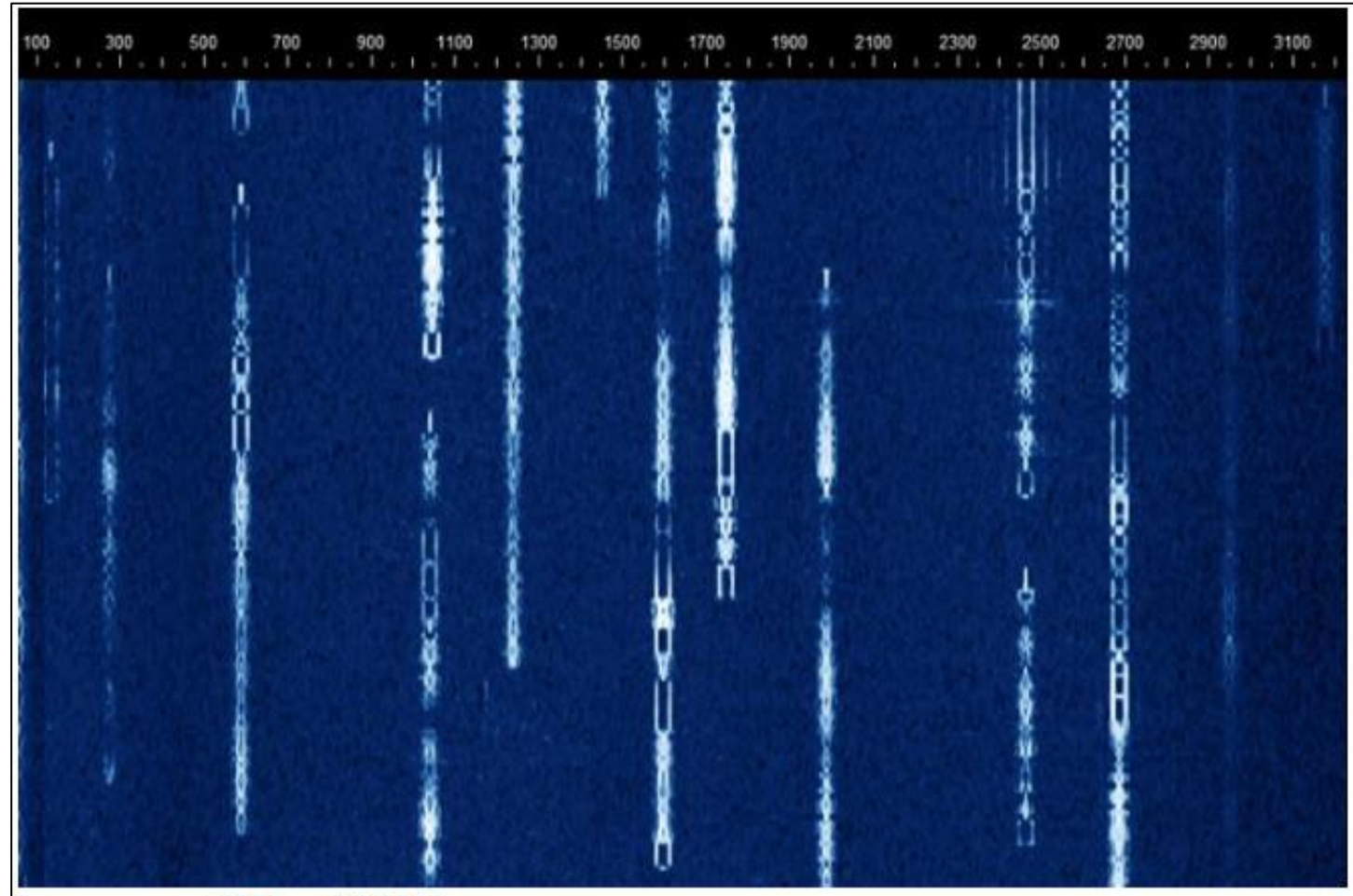


During the Contact (Operating Displays) – See Fig 6.5 in text

A waterfall display displays the presence of signals as a series of lines representing a scan across the frequency range

Signal strength is represented as brightness, intensity, or color

As new lines are captured, older lines are moved down or to one side, giving the impression of a waterfall

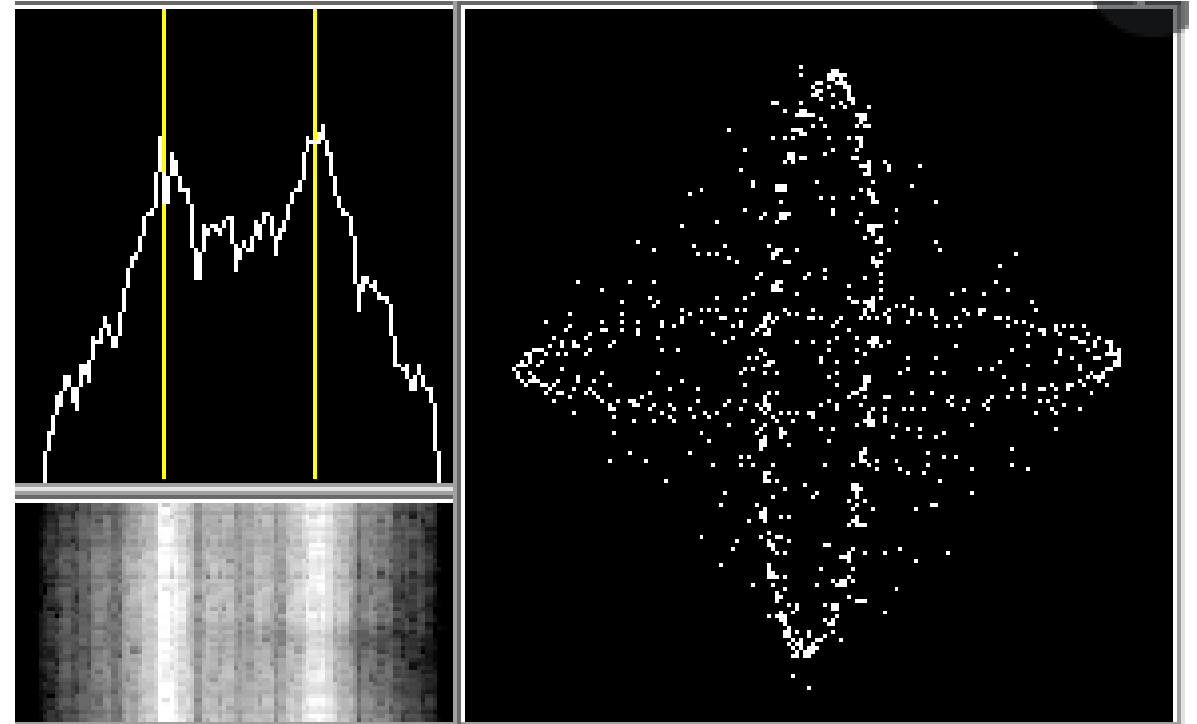




Tuning Aids for RTTY Signal Display

The left side is a spectrum of the filtered received audio. The vertical lines are at the mark and space frequencies, and help tune in the signal so the peaks are on the lines (indicating the right tone frequencies)

The crossed-ellipses on the right are used for fine tuning ... ellipses at right angles and the same size indicate correct tuning





Third-Party Traffic in Digital Modes

All FCC rules about 3rd party messages apply to digital transmissions

- Includes info in email, digital images, or web pages transmitted via amateur radio

Commercial messages may not be transmitted via amateur radio



Interfering Signals in Digital Modes

“Hidden transmitter” problems occur in all modes

- If you’re in a skip zone for a receiving station involved in a contact, you may not hear another station, “hidden transmitter”, but the receiving station might hear both of you
- The resulting interference is unintentional but prevents both you and the hidden transmitter from completing a contact

Packet modes (PACTOR, WINMOR) don’t recover from reception difficulties resulting in ... failure to connect, frequent retries, transmission delays, timeouts, and dropped connections

Keyboard-to-keyboard modes (RTTY, PSK31) do a better job



QUESTIONS?

ONLINE EXAM REVIEW AND PRACTICE QUESTIONS:

<http://www.arrl.org/examreview>