F6CTE the 24th of July 2018

ARQ FAE IN 141A AND ALE400 EASY WITH MULTIPSK (4.36)

Introduction

In this document it will be found 5 forms (snapshots of Multipsk screen with indications to the « how to operate ») which show the basic functions of ARQ FAE in 141A and ALE400 modes. Auxiliary options are neglected (descriptions will be found in the manual) . It is based on ALE400 and applicable to 141A.

Notes about the help in Multipsk:

- for the contextual help, click on the right button of the mouse, with the focus over the mode button "ALE400", for example),
- use also the button hints (wait a fraction of second over a button).

List of the forms

- Simplest way to use ARQ FAE in « Non selective QSO »
- Non selective QSO in ARQ FAE(from the addressee side)
- Selective call in ARQ FAE
- APRS in FAE
- Mail with or without attached file in ARQ FAE

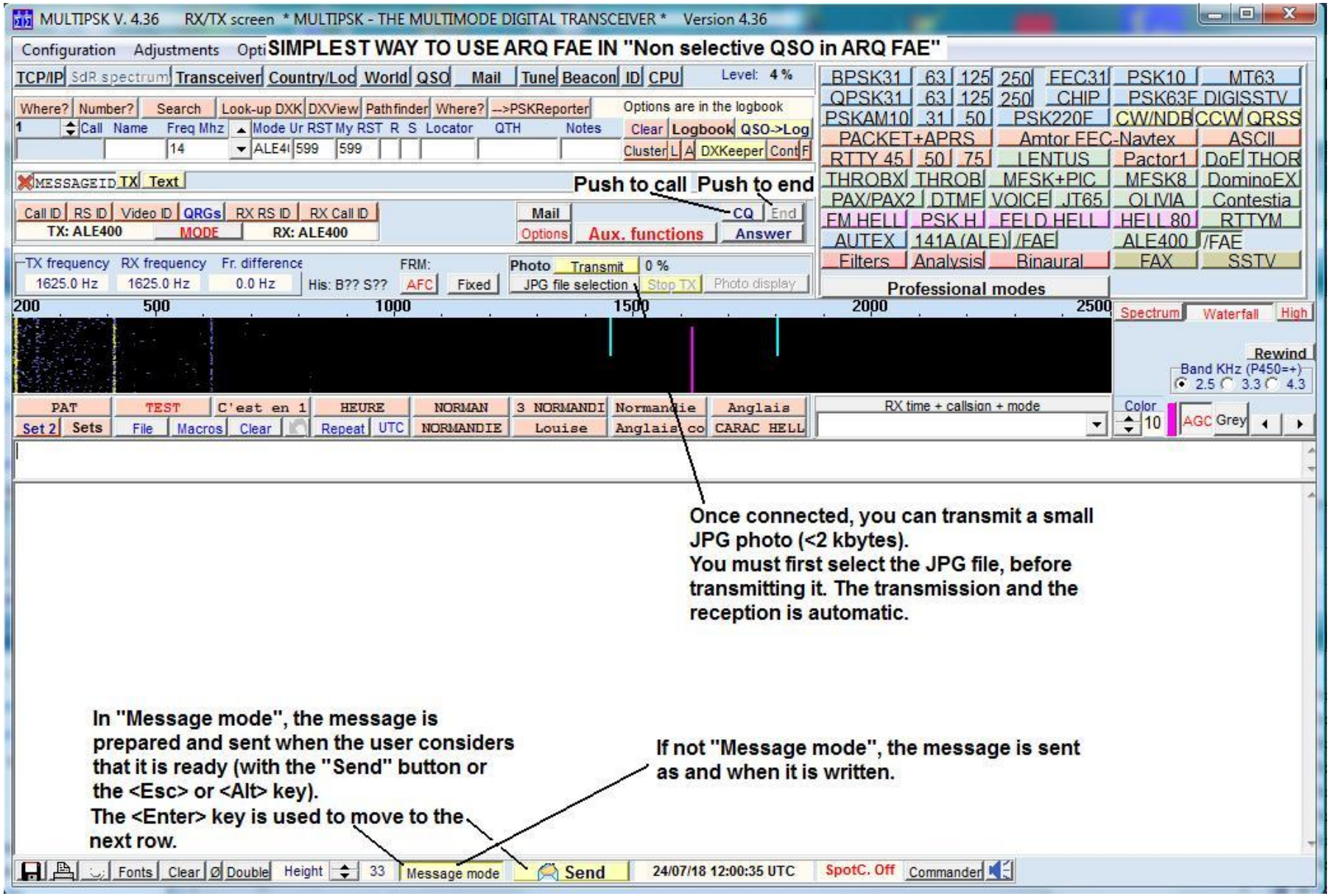
Differences between 141A and ALE400

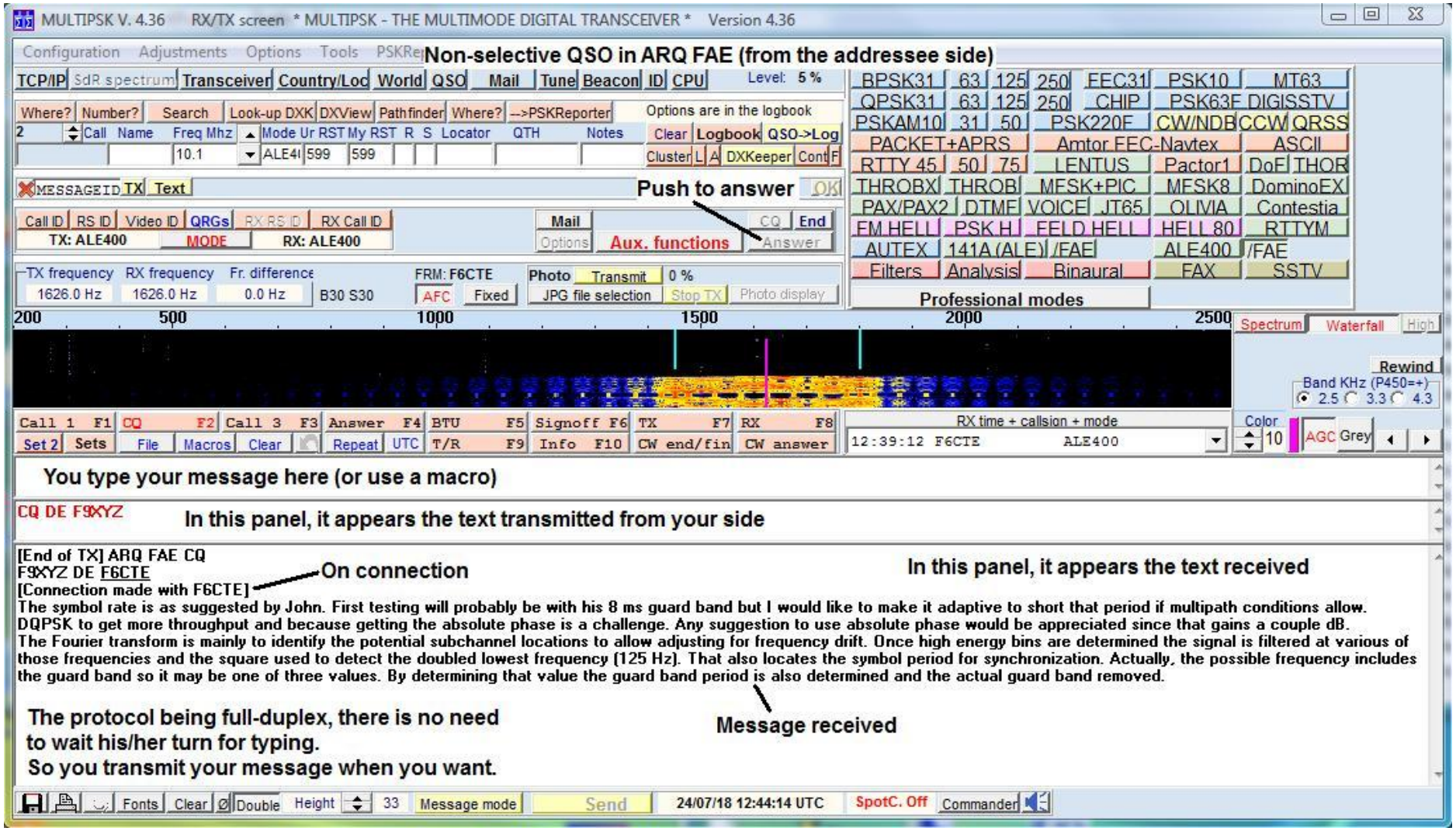
The ALE400 system has exactly the same functions as the ones of the 141A of Multipsk except that:

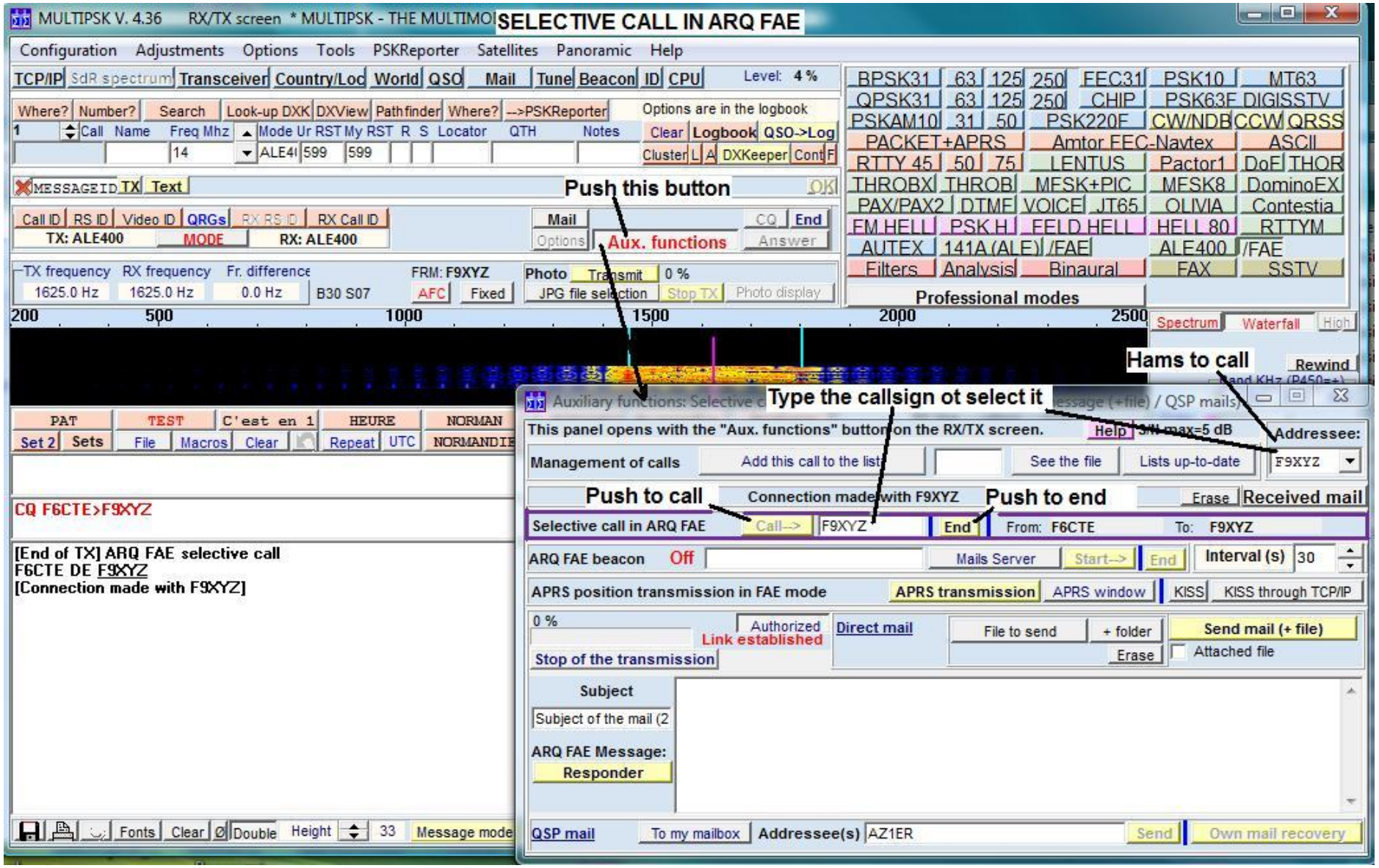
* the bandwidth is 400 Hz instead of 2000 Hz as in 141A,
* the modulation speed (50 bauds instead of 125 bauds) and consequently the text throughput are 2.5 slower,
* no fix frequency (as in MFSK16...), the automatic tuning being able to be done thanks to the RS/ID transmission,
* the S/N is 5 dB better: - 11.5 dB (- 13.5 dB with many repetitions) for ARQ FAE.

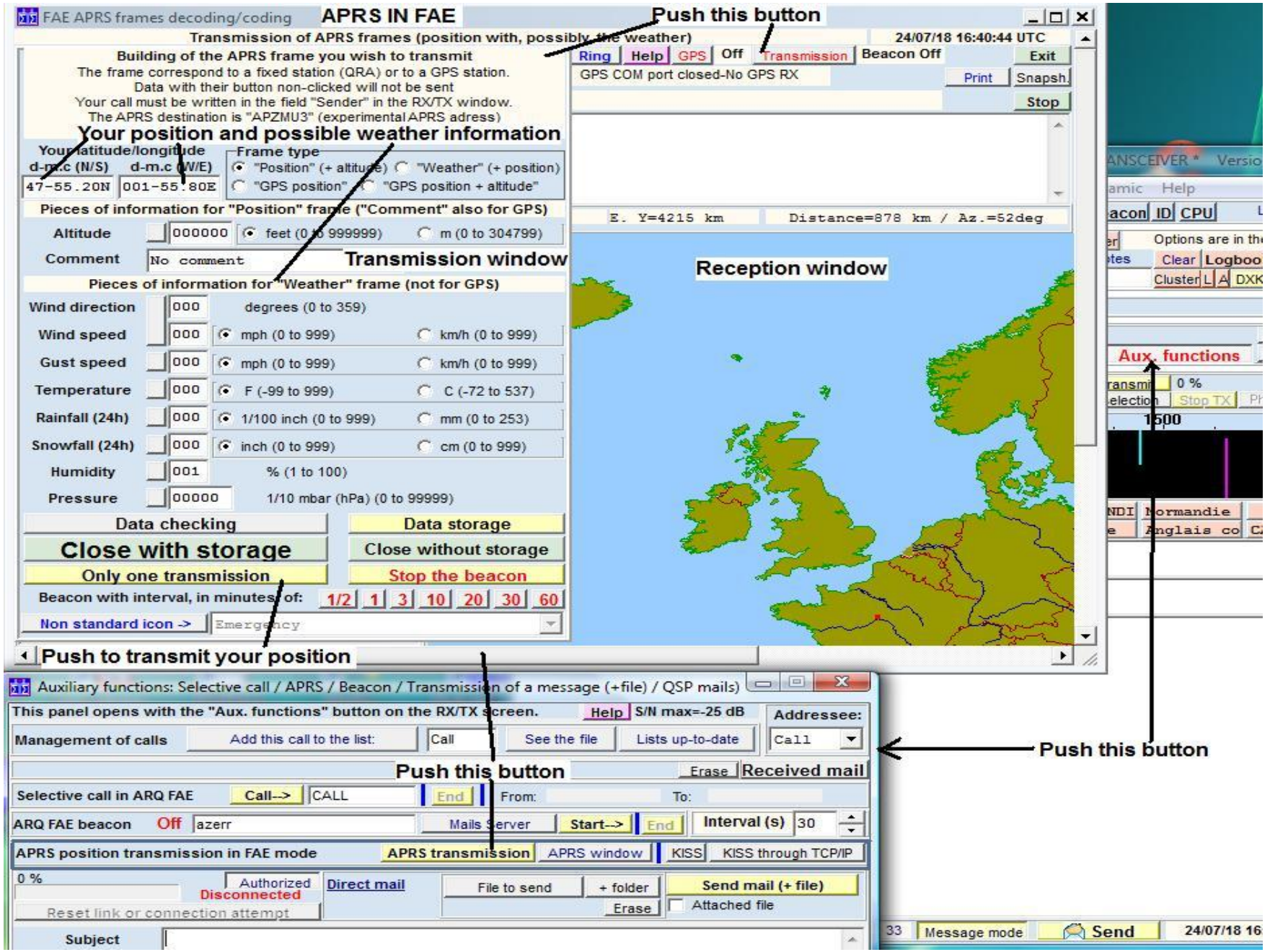
Other F6CTE "EASY" papers about ALE and ALE400 in FAE:

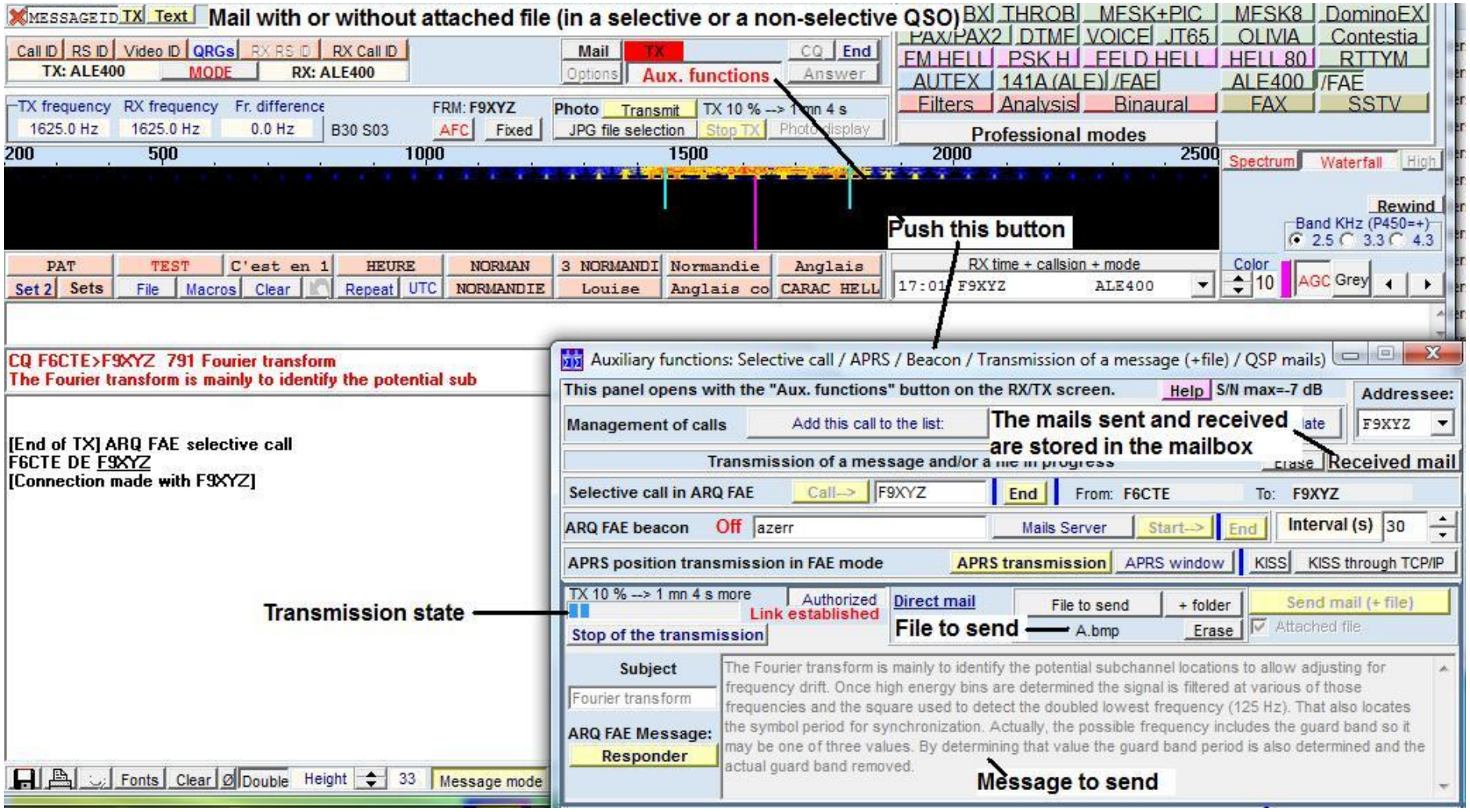
- "ALE_and_ALE400_APRS_with_UI-VIEW_through_Multipsk_easy"
- "The ARQ FAE beacon easy with Multipsk"
- "QSP_mails_forwarding_easy_with_Multipsk_in_ALE_and_ALE400.pdf"


MULTIPSK V. 4.36 RX/TX screen * MULTIPSK - THE MULTIMODE DIGITAL TRANSCEIVER * Version 4.36
SIMPLEST WAY TO USE ARQ FAE IN "Non selective QSO in ARQ FAE"
Push to call
Push to end
Once connected, you can transmit a small JPG photo (<2 kbytes).
You must first select the JPG file, before transmitting it. The transmission and the reception is automatic.
In "Message mode", the message is prepared and sent when the user considers that it is ready (with the "Send" button or the <Esc> or <Alt> key).
The <Enter> key is used to move to the next row.
If not "Message mode", the message is sent as and when it is written.


MULTIPSK V. 4.36 RX/TX screen * MULTIPSK - THE MULTIMODE DIGITAL TRANSCEIVER * Version 4.36
Non-selective QSO in ARQ FAE (from the addressee side)
Push to answer
Aux. functions
Professional modes
You type your message here (or use a macro)
CQ DE F9XYZ
In this panel, it appears the text transmitted from your side
[End of TX] ARQ FAE CQ
F9XYZ DE F6CTE
[Connection made with F6CTE]
On connection
In this panel, it appears the text received
The symbol rate is as suggested by John. First testing will probably be with his 8 ms guard band but I would like to make it adaptive to short that period if multipath conditions allow.
DQPSK to get more throughput and because getting the absolute phase is a challenge. Any suggestion to use absolute phase would be appreciated since that gains a couple dB.
The Fourier transform is mainly to identify the potential subchannel locations to allow adjusting for frequency drift. Once high energy bins are determined the signal is filtered at various of those frequencies and the square used to detect the doubled lowest frequency (125 Hz). That also locates the symbol period for synchronization. Actually, the possible frequency includes the guard band so it may be one of three values. By determining that value the guard band period is also determined and the actual guard band removed.
Message received
The protocol being full-duplex, there is no need to wait his/her turn for typing.
So you transmit your message when you want.


SELECTIVE CALL IN ARQ FAE
Push this button
Aux. functions
Type the callsign ot select it
Hams to call
Push to call
Push to end
Auxiliary functions: Selective c
This panel opens with the "Aux. functions" button on the RX/TX screen.
Management of calls
Add this call to the list
See the file
Lists up-to-date
Addressee:
F9XYZ
Connection made with F9XYZ
Selective call in ARQ FAE
Call-->
End
From: F6CTE
To: F9XYZ
ARQ FAE beacon
Off
Mails Server
Start-->
Interval (s)
APRS position transmission in FAE mode
APRS transmission
APRS window
KISS
KISS through TCP/IP
Authorized
Link established
Direct mail
File to send
+ folder
Send mail (+ file)
Attached file
Stop of the transmission
Subject
ARQ FAE Message:
Responder
QSP mail
To my mailbox
Addressee(s)
AZ1ER
Send
Own mail recovery
CQ F6CTE>F9XYZ
[End of TX] ARQ FAE selective call
F6CTE DE F9XYZ
[Connection made with F9XYZ]


FAE APRS frames decoding/coding
APRS IN FAE
Push this button
Transmission of APRS frames (position with, possibly, the weather)
24/07/18 16:40:44 UTC
Building of the APRS frame you wish to transmit
The frame correspond to a fixed station (QRA) or to a GPS station.
Data with their button non-clicked will not be sent
Your call must be written in the field "Sender" in the RX/TX window.
The APRS destination is "APZMU3" (experimental APRS adress)
Ring
Help
GPS
Off
Transmission
Beacon Off
Exit
GPS COM port closed-No GPS RX
Print
Snapsh.
Stop
Your position and possible weather information
Your latitude/longitude
d-m.c (N/S)
d-m.c (W/E)
47-55.20N
001-55.80E
Frame type
"Position" (+ altitude)
"Weather" (+ position)
"GPS position"
"GPS position + altitude"
E. Y=4215 km
Distance=878 km / Az.=52deg
Pieces of information for "Position" frame ("Comment" also for GPS)
Altitude
000000
feet (0 to 999999)
m (0 to 304799)
Comment
No comment
Transmission window
Reception window
Pieces of information for "Weather" frame (not for GPS)
Wind direction
000
degrees (0 to 359)
Wind speed
000
mph (0 to 999)
km/h (0 to 999)
Gust speed
000
mph (0 to 999)
km/h (0 to 999)
Temperature
000
F (-99 to 999)
C (-72 to 537)
Rainfall (24h)
000
1/100 inch (0 to 999)
mm (0 to 253)
Snowfall (24h)
000
inch (0 to 999)
cm (0 to 999)
Humidity
001
% (1 to 100)
Pressure
00000
1/10 mbar (hPa) (0 to 99999)
Data checking
Data storage
Close with storage
Close without storage
Only one transmission
Stop the beacon
Beacon with interval, in minutes, of:
1/2
1
3
10
20
30
60
Non standard icon ->
Emergency
Push to transmit your position
Auxiliary functions: Selective call / APRS / Beacon / Transmission of a message (+file) / QSP mails)
This panel opens with the "Aux. functions" button on the RX/TX screen.
Help
S/N max=-25 dB
Addressee:
Management of calls
Add this call to the list:
Call
See the file
Lists up-to-date
Call
Push this button
Erase
Received mail
Selective call in ARQ FAE
Call-->
CALL
End
From:
To:
ARQ FAE beacon
Off
azerr
Mails Server
Start-->
End
Interval (s)
30
APRS position transmission in FAE mode
APRS transmission
APRS window
KISS
KISS through TCP/IP
0 %
Authorized
Disconnected
Direct mail
File to send
+ folder
Send mail (+ file)
Erase
Attached file
Reset link or connection attempt
Subject
Push this button
Aux. functions
Message mode
Send
24/07/18 16


MESSAGEID TX Text
Mail with or without attached file (in a selective or a non-selective QSO)
Aux. functions
Push this button
Professional modes
Spectrum
Waterfall
Rewind
CQ F6CTE>F9XYZ 791 Fourier transform
The Fourier transform is mainly to identify the potential sub
[End of TX] ARQ FAE selective call
F6CTE DE F9XYZ
[Connection made with F9XYZ]
Auxiliary functions: Selective call / APRS / Beacon / Transmission of a message (+file) / QSP mails)
The mails sent and received are stored in the mailbox
Received mail
Transmission state
File to send
Message to send
Subject
Fourier transform
ARQ FAE Message:
Responder
The Fourier transform is mainly to identify the potential subchannel locations to allow adjusting for frequency drift. Once high energy bins are determined the signal is filtered at various of those frequencies and the square used to detect the doubled lowest frequency (125 Hz). That also locates the symbol period for synchronization. Actually, the possible frequency includes the guard band so it may be one of three values. By determining that value the guard band period is also determined and the actual guard band removed.