

FIELD DAY CONTACT SUGGESTIONS: RTTY

Alachua County ARES(R) / NFARC

Version 1.0 7/18/2022 GLG

File: REDCROSSHAMCLUB/2022/FieldDay/RTTYContactSuggestions.odt

Background on RTTY

From the ARRL: (Ref: <http://www.arrl.org/digital-data-modes>)

RTTY (radio teletype) is the original keyboard to keyboard mode, based on the 5-bit Baudot code, began with mechanical Teletypes as mentioned above. It is still a popular communications mode, but now uses PCs for coding and decoding, using 170 Hz frequency shift keying at a 45.45 baud rate -- 60 words per minute.

More information from Wikipedia: <https://en.wikipedia.org/wiki/Radioteletype>

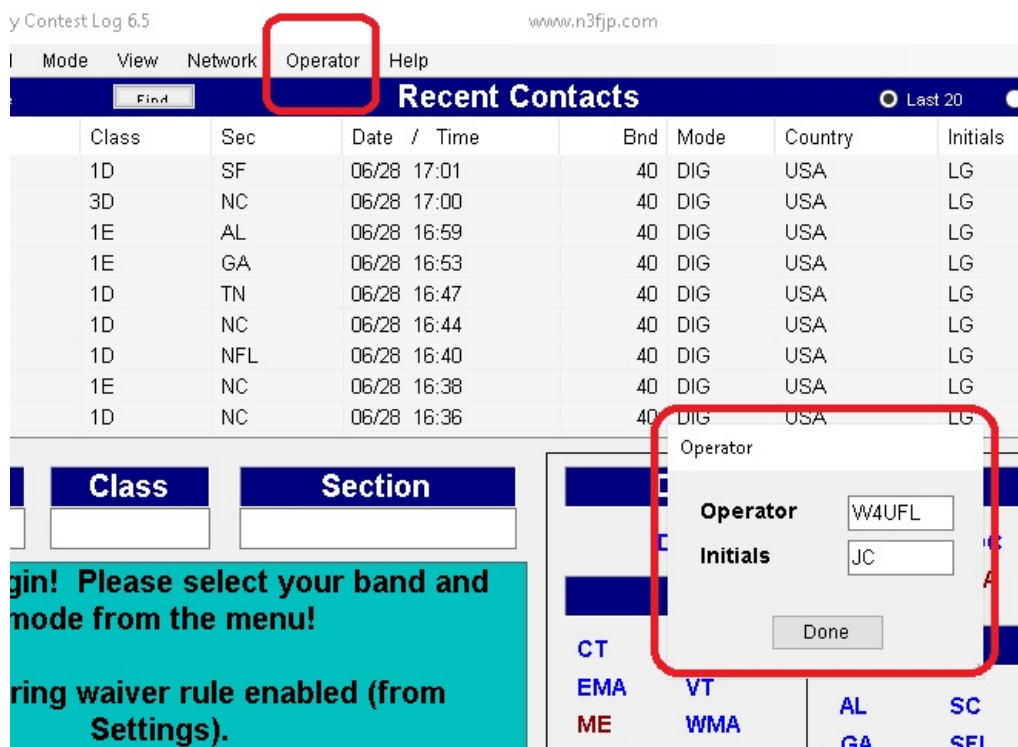
Amateur radio usage of radio teletype began in earnest after World War II, using equipment that was left over from the war. The Baudot code is a 5Bit code that allows for only 32 characters. As a result there are two "states" shifted, and non-shifted, and transmissions change state with a specific character to go from one state to the other.

Typical amateur radio transmissions are at 45.45 baud and use a frequency shift of 170Hz between the "mark" and "space" tones. (2295/2125 Hz on audio circuits). On HF circuits of course, the received audio frequency depends on how the receiver is tuned. Transmitters may be directly frequency-shifted (true FSK transmission) but increasingly they are SSB (sideband) transmitters being fed audio tones from a soundcard/software to create the same effect. As long as the shift is correct and the correct tone is mark or space, it works. Because of this, your software needs to know if you are transmitting in LSB or USB.

There are other shifts and other speeds in experimental use, but 170Hz 45.45 Baud transmissions are more common during contests.

FIRST

Enter yourself as the operator into the **N3FJP Logging System** -- click "Operator" and enter call and initials:



SECOND

Set your **BAND** and **MODE** in the **N3FJP Logging System** --

- Click on **BAND** to pick the band (80, 40, 20, 15, 10, 6, 2 for example)
- Click on **MODE** to select **DIGITAL** (RTTY is one of several **DIGITAL** types)

THIRD: SET THE RADIO TO OPERATE

ICOM 7300 RADIO SETTINGS FOR RTTY		
ITEM	CHOICE	COMMENT
MODE	We'll probably always use USB-data -- set this in FLDGI if it isn't detected. Touch the current mode (USB LSB, whatever it is) on the screen and you'll get the options	NOTE: in the EOC station, do not have the PACTOR modem plugged in, EOC inside station. Unplug its DIN connector, back panel.
How to Tune the Antenna Tuner	Put any amplifier into BAREFOOT MODE (or leave OFF) Press the TUNER button left hand side of ICOM 7300 and watch the antenna tuner adjust.	

You can use a full 100 watts RTTY on our ICOM 7300's in 2022 Field Day. Just set the power level to 100W. ALC (Automatic Level Control) is automatic on Icom 7300's. Press the TUNER button and our antenna tuners are set to semi-automatically tune for you.

W1HKJ has provided a lot of training materials on how RTTY decoding works in FLDGI, and explains how important linearity and proper modulation is -- study these pages:

http://www.w1hkj.com/FldigiHelp/rtty_page.html

CORRECT MODULATION ILLUSTRATED

The ICOM 7300 is able to operate 80-100W output RTTY without any problems for long periods of time. Turn up the power output setting on the ICOM7300 to 100% and adjust the modulation power from FLDGI for **no ALC indication** and output power of roughly 80 Watts displayed on Po meter on 7300 or on the antenna tuner.



FLDGI: RTTY Operation

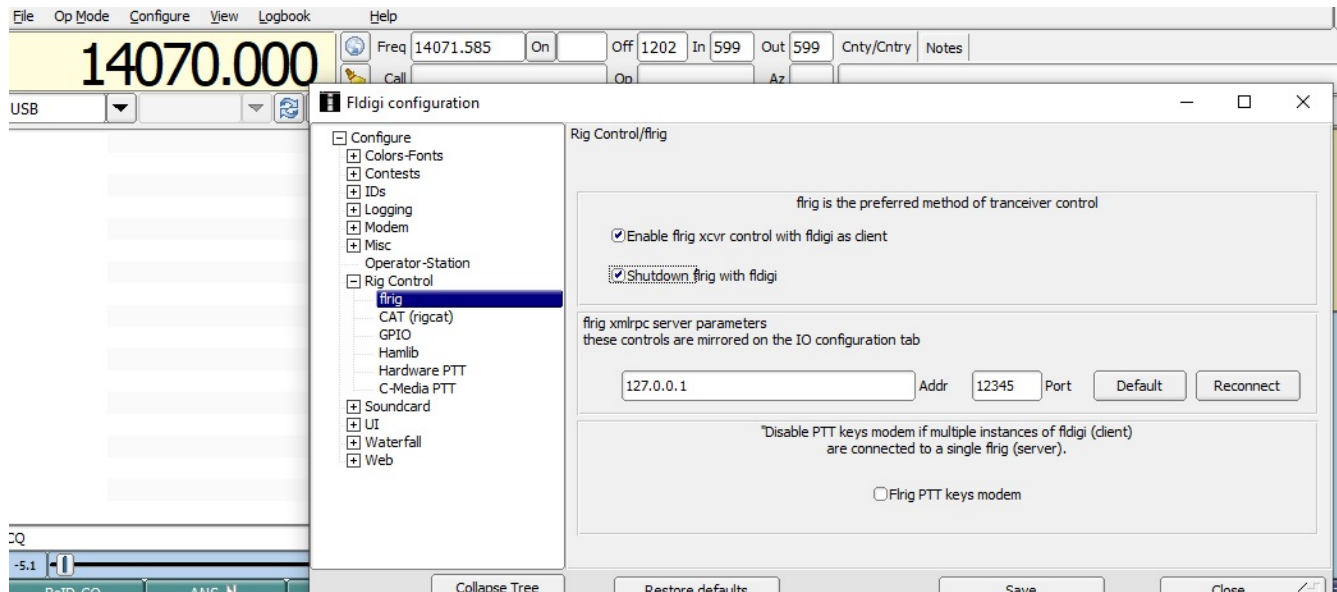
For RTTY you will likely be operating using FLDGI. Open FLDGI and click

OP MODE | RTTY | RTTY-45

In the drop-down menu just below the large FREQUENCY display, select USB to match the choice on the ICOM 7300.

FLRIG: In order to have CAT control of the 7300, we usually have to use FLRIG. Within FLRIG you may need to adjust the options for the 7300 transceiver if they haven't been set up properly. Generally we will be using a Baud rate of 115200, but you may need to use DEVICE MANAGER from the Windows computer to determine the proper COM PORT where the CP102 interface is located.

Within FLDGI, Configure | Configure Dialog | Rig Control | flrig, check both of the checkboxes to use flrig and to shut it down when you're done with FLDGI. See the image below:



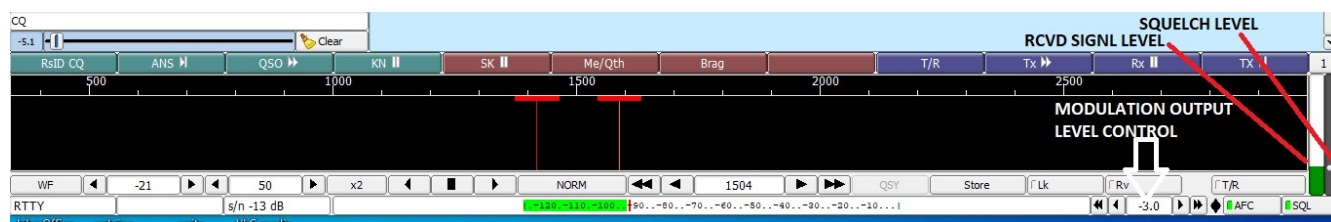
At this point, the radio should be connected to the FLDGI and frequencies should show up etc.

If FLDGI isn't already set to use the audio CODECs from the IC-7300 and to do CAT control for PTT, you may need to set those options also. At that point, you should see received signals in the Waterfall, and if you press the TUNE button on FLDGI, the transceiver should go into transmit with power output.

Adjust the modulation level so that you are not overmodulating. There should be NO ALC.

Refer to this image to see how to set the Transmit Modulation level from FLDGI, how to observe what FLDGI is seeing as its incoming received audio level, and where you have the "squelch" for decoding set: (All of these are on the bottom / bottom right of FLDGI screen) [SQUELCH is operative if you have the Squelch button pressed just below this. See:

http://www.w1hkj.com/FldigiHelp/operating_controls_page.html toward the bottom of that section.)



FREQUENCIES: RTTY may be found anywhere in the CW/RTTY portions of bands, but look especially between 7080-7100 and analogous frequencies on other bands.

Fourth:

CONTEST SAVVY: MAKING CONTACTS

Two methods: Hold a frequency and call CQ Field Day to get people to come to you, or "hunt and pounce" by listening for others calling CQ and quickly answering them. To hold a frequency you have to keep a strong signal and keep talking -- if you are absent for a bit someone else will take the clear spot! To hunt and pounce you have to move around quickly. If you move in tiny frequency increments, retuning of antenna and transmitter aren't crucial. When you move more than 50kHz time to retune a bit.

IMPORTANT RTTY CONVENTIONS

RTTY has some conventions on how to handle transmissions during a contest to allow the receiving station at the other end to quickly separate your signals from NOISE. Let's examine the conventions:

Here is an example of a typical Field Day RTTY exchange:¹

•**NF4AC** "<CR> CQ CQ FD FD DE NF4AC NF4AC CQ K "

RTTY OPERATORS PREFER THAT YOU BEGIN YOUR TRANSMISSION WITH A CARRIAGE RETURN SO AS TO PUT YOUR TRANSMISSION ON A NEW LINE. END YOUR TRANSMISSION WITH A SPACE OR TWO TO SEPARATE YOUR "K" FROM NOISE. THEY ALSO RECOMMEND THAT YOU HAVE A CQ AT THE END AS WELL.

THE "DE" IS SAID TO BE IMPORTANT ALSO AS SOME SOFTWARE AUTOMATICALLY DETECTS YOUR CALL SIGN BASED ON THIS.

•**W1AW**: "<CR> W1AW W1AW "

THE RESPONDING STATION IS ADVISED TO ONLY SEND THEIR CALL SIGN, N O T THEIR EXCHANGE AND AGAIN, IT BEGINS WITH A CARRIAGE RETURN AND ENDS WITH SOME SPACES

•**NF4AC** : "<CR> W1AW 2F 2F NFL NFL DE NF4AC K "

•**W1AW**: "<CR> QSL 5A 5A CT CT DE W1AW "

•

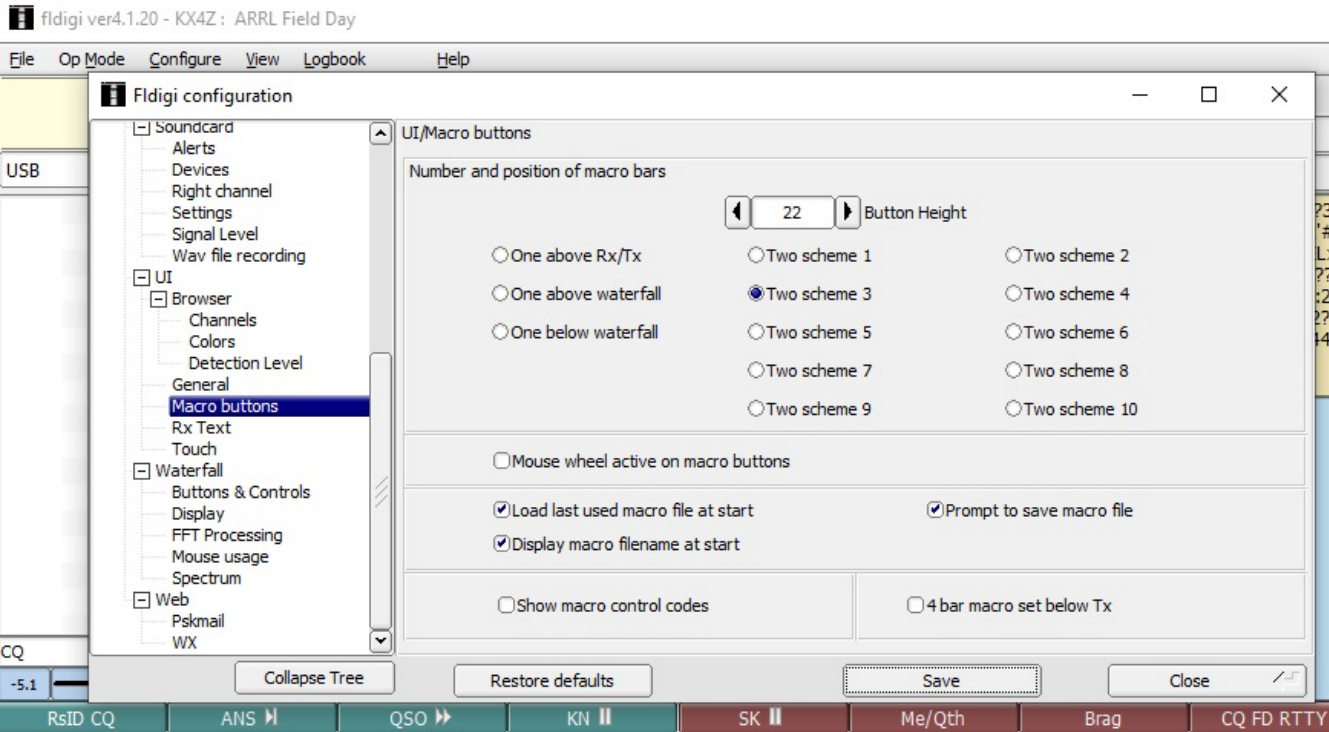
•**NF4AC**: " <CR> TU CQ CQ FD FD DE NF4AC NF4AC CQ K "

From this example you can also figure out how to do "hunt and pounce." In Field day, the station calling CQ generally tries to KEEP that frequency. In SOME sprint contests, the rules require that they move to a different frequency after completing a contact -- beware of and follow the individual rules for each contest.

¹ Paraphrased from N6NA River City Amateur Radio Communications Society tips, <http://www.n6na.org/fieldday/field-day-prep>

We will probably need TWO ROWS of Macro Buttons. "2 Scheme 3" Setting in the User Interface may be the best.

Configure | Configure Dialog | User Interface | Browser | Macro Buttons



CANNED TEXTS to fit both CQ and Hunt&Pounce Techniques:

Memory Button Legend	Send	Comment
CQ FD RTTY	<TX> CQ CQ FD FD DE NF4AC NF4AC CQ K <RX>	CQ call. NOTE the carriage returns and spacing are intentional Putting some SPACE

		<p>around the callsign makes it easier for receiving stations to "swipe" the call with their mouse and answer.</p> <p><i>Type ANSWERING STATIONS's callsign in to CALL box</i></p>
ANSW FD	<p><TX></p> <p><CALL> <MYCLASS> <MYCLASS> <MYSECTION> <MYSECTION> DE <MYCALL> K <RX></p>	<p>acknowledge their call, give their exchange. Then they answer, type it into the exchange</p> <p>Again some space around the key items.</p>
AGN?	<p><TX></p> <p>AGN? AGN? DE NF4AC K <RX></p>	request repeat
QSL-CQ	<p><TX></p> <p>TU QSL CQ CQ FD FD DE NF4AC NF4AC CQ K <RX></p>	answering an exchange
POUNCE	<p><TX></p> <p>NF4AC NF4AC K <RX></p>	Type CQ station callsign into CALL Box ASAP
EXCH	<p><TX></p> <p>TU 2F 2F NFL NFL DE NF4AC NF4AC K <RX></p>	<p>USE "AGN" above if you miss their exchange.</p> <p>After you send this, the cq station should QSL or else ask for AGN.</p> <p>If they QSL, you're done, go find another CQ station</p>

FIFTH: LOGGING

Study this page on Contesting with FLDGI:

http://www.w1hkj.com/FldigiHelp/contest_how_to_page.html

Make certain that you have entered the correct call sign, class and section appropriately. The "canned" text above depend on that.

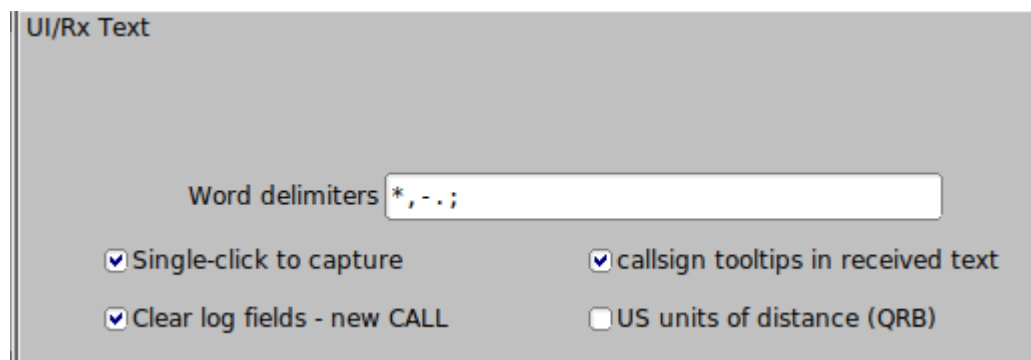
There are semi-automated ways to capture text from FLDGI and have it populate properly into log fields and then log into N3FJP. They involve highlighting received text, and FLDGI will auto enter. Study this page:

http://www.w1hkj.com/FldigiHelp/n3fjp_logs_page.html

Especially this content:

Capturing Rx text in fldigi

The fldigi user can capture text, both word delimited and mouse high-lighted from the received text panel. The text will capture either with a double-left or single-left mouse click. This is selectable on this fldigi configuration tab:



Single-click is faster, but makes marking text a bit more difficult, especially if the text is being moved vertically as it is being decoded. I hardly ever mark-bound a text to capture, so I prefer the single-click paradigm.

The behavior of the left-click transfer is dependent on whether fldigi is configured for casual contacts or contesting (include field day). The word capture for both casual and contesting will always transfer a recognized CALL to the fldigi logging entry for CALL. Call recognition uses a Regular Expression Parser.

A word that passes the rules for RST will be transferred to the RSTin entry.

A word that passes the rules for Maidenhead locator (grid square) will be transferred to the Loc entry.

For casual contacts, the fields are then populated in order: NAME, QTH.

Contest fields are populated in a similar way for CALL. If the contest fields for Xchg are visible then the left click paradigm is to append each clicked word LEFT to RIGHT with a space separator to the XchngrIn entry control.

If the Field Day contest fields CLASS and SECTION are visible then the left-clicked Rx text words will be entered in that order.

Capturing the Field Day values for CALL, CLASS and SECTION can take as few as 3 mouse clicks.

Trigger Actions

Immediately after the call field is updated, the CALLTAB command is sent to ACL. This doesn't actually change focus in ACL, but performs all the functions associated with tabbing from the Call field in ACL, including duplicate check, listing previous contacts and retrieving previous contact info. In ACL, it also initiates call book lookup (if enabled), checks Watch List, etc.

This action takes place when:

- fldigi's log call field is populated from the Rx text transfer
- fldigi's log call field is exited via ENTER or TAB key

The TXTENTRY in ACL will change whenever a 3 or more keystrokes occurs in the fldigi log call field, or when the log call field is populated from the Rx text grab.

Clearing the fldigi log fields will clear the N3FJP call fields

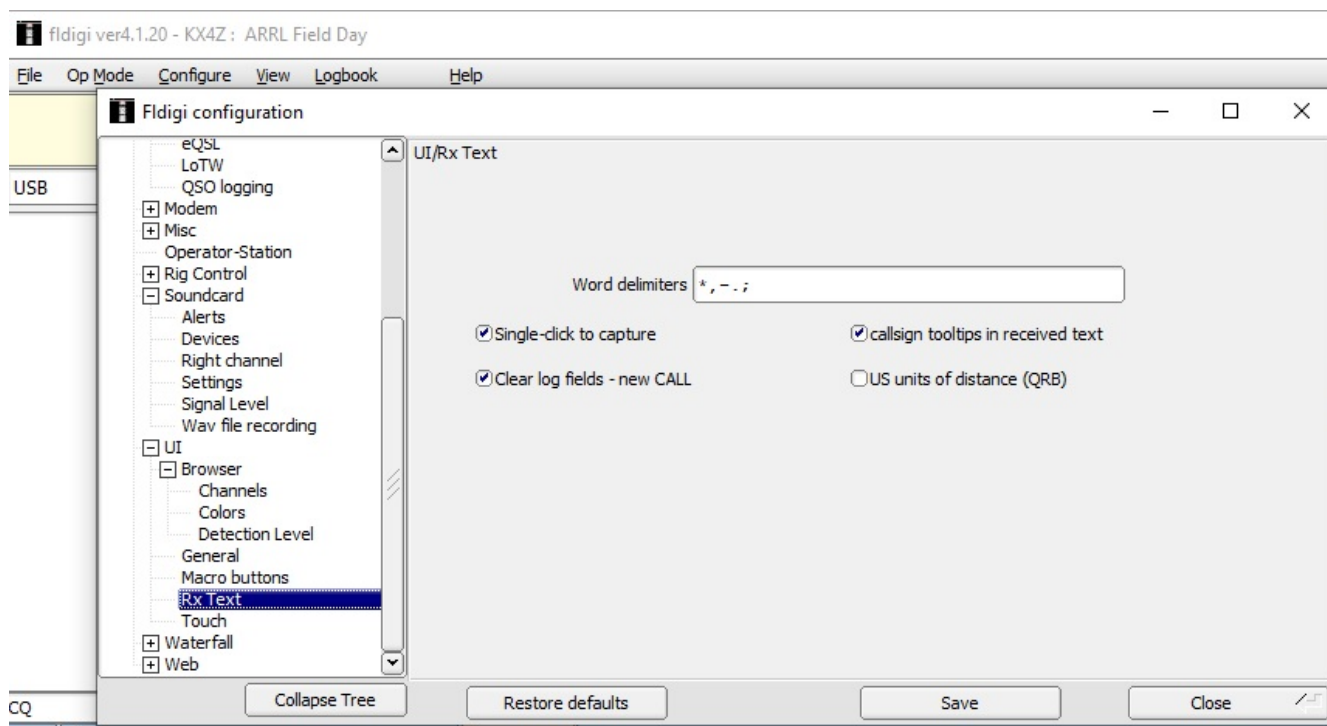
Clearing the fldigi log call field using the right-click-clear paradigm will clear the N3FJP call fields

N3FJP FD Contest

You will need to perform some additional configuration in fldigi to fully appreciate the data capture and FD event logging. Open the Contest configuration tab and make the following entries: FD operator CALL, your CLASS, your SECTION.

This can be configured within FLDGI via:

Configure | Configure Dialog | UI | Browser | RX Text



We may have a "canned text button" that causes the log to be written.

Memory Button Legend	Send	Comment
LOG	<LOG>	<i>Doesn't transmit at all - causes the entered FLDGI data (which is already showing up as a current contact in N3FJP if properly connect) to be transferred into the log of N3FJP as a completed contact.</i>

NOTE: Highlighting the next (new, different) callsign in the RX window automatically erases the previously captured QSO data, enters the new callsign in FLDGI & N3FJP and prepares you to begin logging a new contact. It works exactly the way you would want it to work.

If you aren't able to highlight the text and populate the log fields, you'll have to enter the information manually in N3FJP:

After each QSO enter the QSO into the N3FJP Field Day Contest Log -- when you hit "enter" after the Section it will be entered. You can go back and edit or delete any entry by clicking on it. The Abbreviations are in the table right there on the screen for all the Sections. Use DX for any foreign stations.

Recent Contacts

Rec	Call	Class	Sec	Date / Time	Bnd	Mode	Country	Initials	Operator
254	K3SK	1D	SF	06/28 17:01	40	DIG	USA	LG	AA3YB
253	K4RGN	3D	NC	06/28 17:00	40	DIG	USA	LG	AA3YB
252	N8QQA	1E	AL	06/28 16:59	40	DIG	USA	LG	AA3YB
251	K4VMI	1E	GA	06/28 16:53	40	DIG	USA	LG	AA3YB
250	K4AVG	1D	TN	06/28 16:47	40	DIG	USA	LG	AA3YB
249	WB4DOC	1D	NC	06/28 16:44	40	DIG	USA	LG	AA3YB
248	K4HRL	1D	NFL	06/28 16:40	40	DIG	USA	LG	AA3YB
247	WB4OSU	1E	NC	06/28 16:38	40	DIG	USA	LG	AA3YB
246	WB4AK	1D	NC	06/28 16:36	40	DIG	USA	LG	AA3YB

Score Statistics

Total CW Contacts	0
Total Phone Contacts	12
Total DIG Contacts	237
Total QSO Points	486
QSOs / Hr (Last 20 min)	0
QSOs / Hr (Last 60 min)	0

Call **Class** **Section**

W1AW 5A CT

Possible Duplicates ☒ Any Portion

DX

DE MDC	AR NTX	AK NV	CO MO
EPA WPA	LA OK	AZ OR	IA ND
MS STX	MS STX	EWA UT	KS NE
NM WTX	NM WTX	ID WWA	MN SD
MT WY	MT WY	Canada	
AB NT	BC ONE	GTA ONN	MAR ONS
MB PE	NL QC	SK	

3

4

5

6

7

8

9

0

Bearing: 68
Miles: 1,051
Band: 20
Mode: PH
NF4AC
2F
NFL
7:47:30 AM
11:47:30 UTC
6/1/2021

