G1FTU RTTY INSTRUCTIONS

Thank you for investing in the G1FTU RTTY program. These instructions are included to help you to get on the air, but you will find that the operation of the program is fairly straightforward.

To load the program just type LOAD "" and ENTER. DO NOT stop the tape until the command menu is on the screen.

A summary of the commands is given at the end of these notes for use as a quick reference but a more complete explanation of each command is given below.

SIGNAL RECEPTION

Best results will be obtained with the volume set at normal program loading levels,(that's pretty loud) though lower levels can be tolerated using demodulator 2. Therefore, if fading is a problem, use demodulator 2.

Only practice will enable you to determine the quality of signal which will decode to your satisfaction but obviously the cleaner the signal the better. Remember that it is the signal to noise ratio which is the important factor. It is quite possible to decode RTTY which is not moving the S-meter off the stop - but don't expect to understand much of a message which is S9 but buried in the noise.

CONNECTIONS

If you already transfer data or programs over the air via your Spectrum then the same connection techniques apply to this program and you will know just how to get on the air - so you can skip the following notes.

The output labelled 'MIC' on the back of the Spectrum should be connected to the audio input (or MIC) socket on the transceiver.

The input labelled 'EAR' on the Spectrum sholud be connected to the external speaker output of the transceiver. (Note that some equipment has an additional low level ,constant volume output - this should NOT be used, as the Spectrum requires more audio than is usually supplied.)

On some transceivers the above connections can be achieved using the Spectrum cassette leads but,in most cases, special leads will have to be made up. Use screened cable with the appropriate plugs.

If your transceiver is fitted with the VOX facility then it may be possible to use that for automatic transmit - receive switching during a QSO. Otherwise the swithching will have to done manually. This can be done by keying the mike (if you can type with one hand!) but it would be better to wire in a switch to the PTT input, or wire a mike plug to both feed in the transmit audio AND activate the PTT.(This plug is then inserted for transmissions)

OPERATION

The command menu lists the options available to the user. The required command is selected by pointing the arrow cursor to it and then pressing ENTER. Move the cursor using keys 6&7 with or without CAPS SHIFT

The commands themselves are explained below.

TRANSMIT

In this mode the computer outputs audio tones to the MIC socket. The flashing border and sound effects which accompany the transmission may be disabled (see below)

If no message is present in the transmit buffer then the output will just tick over by sending 'null' characters. These characters will not print anything at the distant station but will allow him or her to tune up onto your signal.

If any characters exist in the transmit buffer then these will now be sent. If a previous transmission was broken into, then transmission will now resume with the next character in the buffer.

If characters are entered from the keyboard then these will be transmitted until no more remain - at which point the 'tickover' character will be sent once more.

Note that the characters entered by you are displayed on the lower screen whereas the upper screen keeps you up to date with what has been sent so far. You can , of course, continue to enter text even if the Spectrum is way behind with what has been sent.

If the distant station is using a mechanical teletype machine then it is good practice to press ENTER after every other line, as they have no auto-carriage return. (ENTER sends both a carriage return AND a line feed character)

SPECIAL KEYS IN TRANSMIT MODE

These are all CAPS SHIFT plus another key.

CAPS SHIFT 1 to 9 refer to the 9 memories. Try entering CAPS SHIFT 1.

CAPS SHIFT J will send a 'BELL' character to the the distant station.(note that a bell is printed on the screen on the Spectrum)

CAPS SHIFT ENTER sends a line-feed character.(advances the paper up by one line on the old teletype machines)

CAPS SHIFT SPACE sends a space AND a letter shift character for use under difficult conditions if the distant station is having problems with noise flipping text from letters to figures.

CAPS SHIFT X(clear) clears the top screen.

CAPS SHIFT V(cls clears the bottom screen but DOES NOT clear the transmit buffer. when entering text the screen will not scroll but the printing position returns to the top of the screen area and overwrites the old text. As the old text is not erased , there comes a time when the display looks a little cluttered. It is good practice, therefore, to use cls and clear now and then. Note also that the bleep associated with the screen clearing will not print spurious characters at the distant station.

BREAK OUT OF TRANSMIT OR RECEIVE

To escape from transmit or receive modes press SYMBOL SHIFT+SPACE together. A flashing question mark will appear. At this point enter:-

i) R to enter RECEIVE mode
ii) T to enter TRANSMIT mode
iii) M to display the command menu

When using demodulator 1 the computer will always break out of receive when the above keys are pressed.

RECEIVE

In receive mode you are again presented with the split screen display. This time the top screen will display the incoming message and the bottom screen will contain your type-ahead message should you wish to type in your reply.

CHaracter entry onto the bottom screen in no way affects the reception of characters onto the top screen.

Note that in receive mode, G1FTU RTTY ignores line feed characters. but always performs the carriage return AND line feed operations when it receives a carriage return character. Also, if it receives the BELL character , it will print a bell on the screen .

SPECIAL KEYS IN RECEIVE MODE

Here again, special keys are all CAPS shifted.

CAPS SHIFT X clears the top screen.

CAPS SHIFT V clears the bottom screen.

CAPS SHIFT L forces received text to letters.

CAPS SHIFT F forces received text to figures.

CAPS SHIFT 5&8 adjust the input demodulator to suit the incoming tones.(VERY useful on F.M. reception) See 'USING THE TUNING INDICATOR' for details.

CAPS SHIFT T&U give access to memories 5&8 (keys 5&8 being occupied)

RECEIVE ONLY

This mode is the same as receive, but the whole screen is available for the received message.

When this mode is called, the transmit buffer is cleared - so that, if the the text buffer contains text which is no longer required, call receive only then break out again.

Note that the type-ahead is still in operation even in receive only. You can be watching incoming text using the whole screen and if you should decide to type in a reply then you may do so - the transmit text going to the lower half of the screen as usual. The advantage being that the receive screen is not cleared as it would be if you swapped to the split screen display.

ENTER TEXT

This mode is used to enter text into the transmit buffer prior to a QSO. Owners of issue 2 Spectrums may find this more useful due to the way that the EAR input is arranged on these machines. The way that the program works on receive is by checking the audio at the EAR input and then scanning the keyboard. If there is no signal at the EAR socket then the computer waits for something to arrive - and the keyboard never gets scanned. On issue three machines this is not a problem, as there is sufficient internally generated noise at the EAR socket to satisfy the program. Issue 2 machines, however, are quite 'quiet' and thus APPEAR to 'lock-up' as the keyboard doesn't respond if no audio is present. The only situations in which this can arise are prior to a QSO - in which case use ENTER TEXT - and in the second or so change over period between transmit and receive IF there is no background noise around.

EDIT MEMORIES

Enter the required memory number (2 to 9) when asked to do so. Text may be added to or deleted from the memory.

Note that the delete function (CAPS SHIFT 0) should only be used within paragraphs.(This applies to transmit also)

The memory may be completely cleared by pressing CAPS SHIFT V.

Memories may contain references to any other memories - so that, for example, you can put a message in memory 2 and, at the end, enter CAPS SHIFT 4 (or any other memory for that matter). Then, in the transmit mode, the program will transmit memory 2 followed by memory 4. Of course, the reference to other memories doesn't have to come at the end - the entry of CAPS SHIFT and memory number at any point will call that memory up when the transmission gets to that point in the text.

References to empty memories will simply come straight back, but cyclic loops(as described below) should NOT be created with empty memories for the reason given below.

Note that if,say, you call memory 3 at some point in memory 2 AND call memory 2 at some point in memory 3, then the transmission will cycle round between the two until SYMBOL SHIFT and SPACE are pressed. (This is not recommended, however, as the computer will eventually run out of memory for all of the 'where do I go back to?' addresses, and the results are unpredictable.)

To exit from EDIT MEMORIES press SYMBOL SHIFT and SPACE.

SAVE MEMORIES

The best place to put the memories is on the tape just after G1FTU RTTY. You will see the KEY prompt. This replaces the 'start tape and press any key' prompt normally used. The memories are saved as a headerless block for speed, and the program immedeiately goes into VERIFY mode. At this point either rewind to the start of the memories on tape and press 'PLAY' to verify, or press SYMBOL SHIFT and SPACE to cancel the verify. If the verification fails, you will see the 'ERR' message.

LOAD MEMORIES

To load the memories back into the program off cassette, just play the tape when the indicator lights up in yellow. Any errors in loading will give the 'ERR' messaage.

SET TONES

This mode gives you the ability to make slight adjustments to the 'mark' and 'space' tones used by the program in TRANSMIT mode .(This is very rarely needed, but the odd station has been known to think that they are right and the rest of the world is wrong.)

The high tone is given first. Adjust the tone by separate presses of the 6 or 7 keys. When the tone is correct, press the 0 key. You are then given the low tone and the same procedure applies. The prompt 'OK?' is then displayed. At this point, enter :-

i) Y or ENTER to make the modification final.
ii) N to cancel the mods and try again.
iii) R to reset the the tones to normal.

SET BAUD RATE

Use the 6 or 7 keys to change the diplayed value of baud rate , then ENTER to confirm the choice. Separate key presses are required for each step of 5 in baud rate value.

UNSHIFT ON SPACE

Each press of ENTER switches this on and off alternately.

Unshift on space is a facility whereby the received text automatically flips to letters each time a space character is received. Its use is most beneficial under 'noisy' conditions where a spurious 'figure shift' character can turn letters into figures - resulting in unreadable text. If you are liable to be receiving lists of figures, then U.O.S. should be switched off.

DEMODULATOR

Use keys 6 & 7 to select the number required (1,2 or 3) and press ENTER to confirm the choice.

Three different tone demodulators are provided :-

1) Normally in use
2) Gives a wider separation of the input tones for better discrimination. Issue 2 owners may find that break-in requires audio at the EAR socket.(Though noise will suffice)
3) Use this for a wider separation on issue 3 Spectrums if the internally generated noise is generating spurious characters when the input audio is weak. This demodulator is guaranteed to require plenty of audio at the EAR socket for you to break into receive.

INVERT INPUT

Occasionally a station will transmit with the 'mark' and 'space' tones reversed. If this seems to be the case (the printed message will be garbage, even though the tones have been discriminated correctly) then select INVERT INPUT.

EXIT PROGRAM

Only use this facility if you have finished using the program. You will be prompted with 'Y?' to guard against accidental calling of the EXIT mode. If you enter Y then then computer will be cleared to save you unplugging the power supply. Any other key will return you to the command menu.

USING THE TUNING INDICATOR

In RECEIVE modes the tuning indicator appears in the black window at the bottom of the screen. In normal use you should have two groups of flashing 'LEDS' with a distinct gap inbetween them. The idea is to position this gap centrally about the marker in the border.

When using SSB then all that is necessary to tune accurately is to use the clarifier or tuner of the receiver itself. The group of 'LEDS' will be seen to swing from left to right and vice-versa as the clarifier is adjusted. On FM, however, no such adjustment is provided on the receiver, so the program has a built-in 'clarifier' facility. To move the display to the left or right use separate presses of the CAPS SHIFT 5 or 8 keys depending on the direction of the tuning required (Use the cursor keys on the Spectrum +). Note that the tuning is quite fine, so that repeated presses of the cursor keys are usually required to achieve a substantial effect.

The tuning can, of course, be carried out at any time whilst receiving RTTY. As with everything, practice makes perfect!

If the display exhibits no apparent separation then the chances are that the baud rate is wrong.

If the gap still seems a little marginal then try changing the demodulator. (of course, if the other other station is using the G1FTU program, then he can easily widen his tone separation on transmission - but this has never been necessary to date.)

H.F. RTTY

In order to get the best performance from the program on the overcrowded h.f. bands then you must use the filters of the transceiver to their best effect. The idea is to reduce the passband to as narrow as possible whilst still allowing the RTTY through (usually 170 Hz shift). In this way the immunity to noise and QRM will be optimised. The CW filter of the transceiver may be used to good effect in rejecting those unwanted stations. Of course, if you are a keen experimenter, then there is no reason why you shouldn't try introducing a narrow audio bandpass filter into the 'EAR' line to boost the selectivity.

COMMAND SUMMARY

COMMAND	DESCRIPTION
TRANSMIT	Output RTTY tones to 'MIC' socket
RECEIVE	Receive RTTY from 'EAR' socket (split screen)
RECEIVE ONLY	Receive RTTY from 'EAR' socket (full screen)
ENTER TEXT	Enter text into transmit buffer prior to QSO
EDIT MEMORIES	Change contents of memories 2 to 9
SAVE MEMORIES	Save memories 2 to 9 to cassette
LOAD MEMORIES	Load memories 2 to 9 off cassette
SET TONES	Adjust the transmit 'mark' and 'space' tones
SET BAUD RATE	Change the transmit and receive baud rate
UNSHIFT ON SPACE	Switch the receive U.O.S. function on or off
TUNING INDICATOR	Switch the tuning indicator on or off
BORDER EFFECTS	Switch the transmit border effects on or off
SOUND EFFECTS	Switch the transmit sound effects on or off
DEMODULATOR	Select one of the three tone demodulators
INVERT INPUT	Receive reversed 'mark' and 'space' tones
EXIT PROGRAM	Clear the computer completely

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