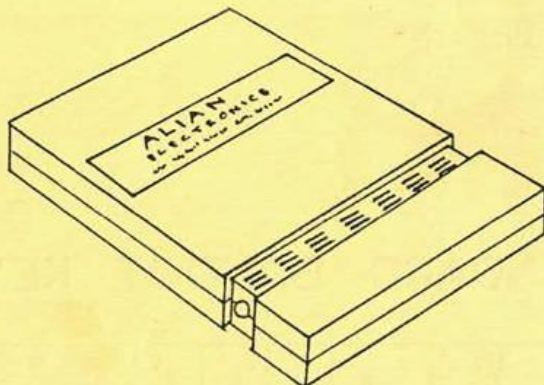


ALIAN ELECTRONICS

RTTY PACK RADIOTELETYPE INTERFACE FOR THE TANDY COLOUR COMPUTER



IMPORTANT NOTICE - PLEASE READ

RTTY PACK is a Radioteletype interface for use with a Tandy Color Computer, Color Computer2 or Color Computer3, and requires at least 32K of RAM for full operation. It is warranted to be free from defects for a period of 3 months from date of purchase under the following conditions.

- a) Installation must be according to instructions printed in this documentation.
- b) Use must be with an unmodified Tandy computer of the type described above.
- c) Use must be with the Software included in the unit without modification.
- d) The user alone is responsible for the connection of the unit and its application and so cannot hold the manufacturer responsible for any damages, consequential or otherwise, arising from the use of this unit.

Warranty does not cover any physical damage or any modified unit.

STANDARD BAUDOT KEYS.

EQUALS BELL

* EQUALS ANSWER BACK



CONNECTING THE RTTY PACK

The RTTY PACK must be connected to your modem before plugging into your computer. Connection diagrams are shown at the rear of this Manual. The input and output of the RTTY PACK are at TTL levels so your modem must interface at these levels for successful operation. After the RTTY PACK and modem have been interconnected, the following precaution must be taken.

TURN OFF ALL POWER TO THE COMPUTER AND ITS ACCESORIES.

This is most important as damage to the RTTY PACK can result if the unit is plugged into the computer while the power is on. You may now plug it into the expansion slot in the side of the computer. Users of the Tandy Multipak Interface can plug into any slot and move the select switch on the front of the Multipak to the appropriate position. "Y" Cables cannot be used with the RTTY PACK.

INTRODUCTION

Following the opening screen of the program, you will be invited to change the Identification which was loaded into memory by the program during initialisation. The callsign that exists there at startup is burned into the EPROM during manufacture, but if you are using a callsign other than the above, then you may change it at this point. You may also change it from the Main Menu of the program.

To change the callsign, you may either use the CLEAR key to clear the old one and start entering the new one or you may simply backspace using the LEFT ARROW key, and retype.

The length of the Identification may be a maximum of 32 characters of printable type ie, no Line Feeds or Carriage Returns allowed. Only legitimate BAUDOT characters will be allowed to be typed on the keyboard. (see the appendix showing the keyboard, legitimate keys and substitute keys) If an incorrect key is pressed anywhere during the program, the key will be ignored and a beep will sound in the TV set.

When all alterations are finished, press the BREAK key and the callsign will be entered. If no alterations are to be made, press the BREAK key and the existing callsign will be reloaded.

NOTE. This buffer has a dual function which will be explained in a later section but the main function is to provide a callsign at the end of the automatic CS caller. (see TRANSMIT MODE at the end of section B.)

THE MAIN MENU

After the callsign has been entered, the Main Menu will appear on the screen.

1. RECEIVE MODE - This is the normal listening mode of the program. It will print on the screen all of the printable incoming characters. While in this mode, characters can be typed on the keyboard and will appear on the screen on the bottom half of the screen while the incoming characters will appear on the top half of the screen. This is called SPLIT SCREEN OPERATION and allows you to start your reply before actually switching to

the TRANSMIT MODE. You may only type ahead for 8 screen lines. All BAUDOT characters may be typed to the screen and LEFT ARROW will backspace if pressed. A backspace is not possible immediately following a Carriage Return, Line Feed or after pressing the ENTER key which combines the Carriage Return and Line Feed in one key press and is displayed on the screen as "␣". Pressing the SHIFT and LEFT ARROWS at the same time will produce a Carriage Return which is displayed on the screen as "<". Pressing the SHIFT and DOWN ARROW at the same time will produce a Line Feed which is displayed on the screen as a "□". These keys function like this also when in the Transmit Mode. A bell will sound on the TV at the 64th character of the line. Pressing the EXCLAMATION MARK (SHIFT and !) will place the call sign entered into the Identification Buffer onto the screen. If you desire to clear the receive screen while in the Receive Mode, press SHIFT and CLEAR keys at the same time. This will not alter the printout if hardcopy is being taken. A screen cursor will point to the position of the next incoming character.

All characters received in the Receive Mode will be stored in memory in a continuous buffer. This memory buffer will hold approximately 24000 characters and when full will start at the beginning of memory again. Each time you switch to the Receive Mode, a marker is stored in memory at the start of the new text. The marker will appear as four "+" symbols. You may scan and obtain hardcopy as explained in section 9.

To return to the Main Menu from the Receive Mode press the SHIFT and UP-ARROW keys together. If this is done when a reply has been typed ahead on the screen, that text will be lost. Also the received text on the screen will be lost but the memory buffer remains intact.

2. CHANGE IDENT - As explained in the Introduction, the Identification or call sign can be changed from the Main Menu. Press "2" and proceed as described before for altering or storing the Identification.

3. LOAD BUFFERS - There are 3 memory buffers in which you may store up to 7 screen lines of text to be transmitted when desired. To fill a buffer, first press "3" at the Main Menu. The screen prompt will ask which buffer you wish to see on screen. If a new buffer is to be created, select any one of the three, then press the CLEAR key which will clear the screen, then you may type up to seven lines of text including Line Feeds and Carriage Returns. When finished, press the BREAK key and another screen prompt will ask for the number of the buffer to which the text is to be stored. If you do not wish to store the text, press the BREAK key and you will be returned to the Main Menu without storing any text or changing any existing buffers' contents. If you wish to clear the contents of the screen, press the CLEAR key. The cursor position will then be at the beginning of the screen. The UP and DOWN ARROW keys allow you to move up and down through the text and pressing either of these keys will move the cursor position to the beginning of the line as well as moving up or down. The RIGHT ARROW key can then be used to step over existing text to edit. When the text is ready to be saved, only the text before the cursor position will be saved, so be sure that the cursor position has been returned to the end of the text before saving. This will not be a problem if you haven't used the ARROW keys to edit the text.

4. SET PRINTER - Select option "4" from the Main Menu. This will allow you to set the status and Baud rate of your printer (if one is connected). Nominate the number corresponding to the desired printer option, or if the present status is correct, press the BREAK key. The screen will now display Baud rates. Nominate the Serial Baud rate of your printer. At startup, the program assumes "Printer - off / 600 Baud". Once again, if the Baud rate does not need changing, press the BREAK key and the screen will prompt you to nominate the maximum number of characters per line of print on the printer. Zero is not permitted and the maximum is 89. This facility will not affect printing if the received text contains Line Feeds and Carriage Returns at intervals less than the number of characters represented by your entry. Older mechanical teletype machines used a format of 72 characters per line and so a startup value of 73 has been entered into this location. Therefore if any transmission exceeds 72 characters per line, a Line Feed and Carriage Return will be sent to the printer. This does not matter on the screen as the text can wrap around to the next line. As you enter the second digit of the number, you will be returned to the Main Menu. If you do not wish to change the existing printer format, press the BREAK key and you will be returned to the Main Menu.

5. SET SPEED - Select option "5" from the Main Menu. The screen will ask you to select either 45.5 BAUD or 50 BAUD by pressing 1 or 2. Normally, Amateur protocol uses 45.5 BAUD and some Commercial services use 50 BAUD. After your selection, you will be returned to the Main Menu.

6. ACCESS CODE - Select option "6" from the Main Menu. With the introduction of RTTY Repeaters, it has now become necessary to type an access character or code to allow the Repeater to become active (the most common code is one SPACE character). As well as providing an access code, this facility can also transmit callsigns if desired. Up to 32 characters can be entered into the Access Code buffer. Line Feeds and Carriage Returns are not allowed. When you select "6" from the Main Menu, the contents of the buffer will be displayed on the screen. The next character to be typed will be added to the end of the existing text. You may backspace using the LEFT ARROW key or you may clear the entire contents of the buffer by pressing the CLEAR key. If no text was stored in the buffer previously, then the first character to be typed will be first position on the screen. If you have displayed the stored text or have finished typing in the new text, pressing the BREAK key will store the screen contents to the buffer memory. You will then be returned to the Main Menu.

If any characters at all are stored in this buffer, every time you change from the Receive Mode to the Transmit Mode, these characters will be transmitted automatically. If you wish to remove this facility you must select ACCESS CODE from the Main Menu, then press the CLEAR key to clear the buffer, then BREAK key to return to the Main Menu.

7. READ MESSAGES - Select option "7" from the Main Menu. This will allow you to read and print all messages that may have been received while the equipment was unattended and left in the AUTO ANSWER MODE. As this facility is selected, the first message is displayed on the screen. Notice that the first message is number 0, not 1. There can be a maximum of 10 messages stored in memory and you can step through them by pressing the DOWN ARROW to step through all of them or press the UP ARROW to step backwards. Each message will be displayed together with its number, as the ARROW keys are pressed. If no text is displayed, then no messages were left or you have stepped past the number of messages that were left. These messages can be left in memory and will only be cleared if the AUTO ANSWER MODE is selected again or if the power is turned off.

If you desire a printout of any of the messages, press 'P' for Print when the message is being displayed and the screen of text will be printed as it was received. Each message can in turn be printed using this method. If you wish to stop the printout, press the BREAK key.

When you have finished reading/printing the messages, press the BREAK key and you will be returned to the Main Menu. As you exit from this selection, the Message Waiting light will switch off. Having this light remain on until now serves to remind you that there are messages still waiting to be read.

8. AUTO ANSWER - Select option "8" from the Main Menu. This mode will allow the operator to leave the equipment set up in an answer mode that requires an access code to be received before any text is received. The access code is really an identification so it is stored in the Identification buffer. This is done from the Main Menu by selecting option "2". This should of course be done before selecting the AUTO ANSWER Mode. The code that is stored must follow the same rules that applied for option "2" above and a code for Auto Answer should be one that would not normally be sent during a RTTY contact by any other operators on the same frequency, eg. a callsign is not a good access code. If no code exists in the Identification buffer, selecting the AUTO ANSWER Mode will display the error message on the screen "NO IDENT"; the TV will beep twice and you will be returned to the Main Menu.

When in the AUTO ANSWER Mode, a screen prompt will display the number of messages that have been received. If no message was left after the access code was accepted, the program will not increment the number of messages waiting. After a legitimate access code has been accepted, the program will switch to the Transmit Mode and send the message "SEND MESSAGE - MAX. 480 CHRS". The program will then return to the receive mode to accept a message. As can be identified from the outgoing message, the maximum size of each buffer is 480 characters. This includes Line Feeds and Carriage Returns. If an operator sends more than the maximum amount, the program will wait for 10 seconds after the last character of his transmission before sending a confirmation message.

The screen will also display the code entered at selection "2" of the Main Menu. As incoming characters are received, they are printed below the character that it will be compared with. If the two characters are identical, the program will wait for the next character. If the two characters are not identical, the screen will reset and wait for more characters. Also, if the time between one correct character of the code and the next received character is greater than 10 seconds, the screen will

reset and the sequence will start again. After the first message has been left, your TV set will produce a double beep sound at 10 second intervals. Also, the Message Waiting light in the interface package will be on. Normally, in the AUTO ANSWER Mode, the TV will not be left on so only the message waiting light in the Interface will show that a message has been left. After a message has been left in the buffer, the program will transmit the confirmation message "THANKYOU", back to the sender.

During reception of a message, if the time between any 2 characters is greater than 10 seconds, the program will store the text already received and will reset ready for the next message. Upon selection of this mode, the printer will be de-activated.

To return to the Main Menu from this mode, press the BREAK key.

9. TEXT REVIEW - Select "9" from the Main Menu. This allows you to scan through the text that has been received while in the Receive Mode. The page of text which is displayed when this mode is selected from the Main Menu contains the last 400 characters received. You may step back to the previous line by pressing the UP ARROW key or step back to the previous page by pressing SHIFT and UP ARROW at the same time. If you have stepped backwards you may step forwards one line by pressing DOWN ARROW key or step forwards one page by pressing SHIFT and DOWN ARROW at the same time. If you wish to print the text, pressing the "P" key will start the printout at the top left of the screen page. When the displayed page has been printed, the screen will step forwards to the next page, and printing will continue. When the printer has finished your requirements, press the BREAK key and printing will cease. If no printer has been connected to your computer and the "P" key is pressed, the program will lockup because it is searching for the non-existent printer. To escape from this, press the RESET key on the rear of the computer and the program will start over. However all buffers in memory will be cleared.

When you have finished with the text in the receive buffer, and you wish to start from the beginning of buffer memory, press SHIFT and CLEAR keys at the same time. This will reset the memory pointer, will clear all text from memory and return you to the Main Menu.

When you have finished with the Text Review mode, press the BREAK key and you will be returned to the Main Menu.

TRANSMIT MODE

(selected from Receive Mode only)

When you are ready to transmit, press the BREAK key. The program will start by sending Carriage Return, Line Feed and Letters Shift. This will force the system at the other end to be at the same status as yours.

To return to the Receive Mode, press the BREAK key. If at any time during the transmission of characters, the BREAK key is pressed, the remainder of the unsent text will be lost and the program will return to the Receive Mode.

IT CAN BE SEEN THAT SWITCHING BETWEEN TRANSMIT AND RECEIVE MODES IS ACHIEVED BY PRESSING THE BREAK KEY.

After the above control characters are sent, the text that was entered into the 'type ahead' buffer during the Receive Mode will be sent. You will notice that as each character is sent, a ">" symbol appears on the screen in place of that character.

After it is sent, the original character is replaced on the screen. While this is happening, more text can be typed to the screen. Note that once the lower half of the screen is filled, the cursor indicating where the next character is to appear, jumps to the top of the lower half of the screen again. When any key is pressed, the program checks to see if the character being typed will move the cursor into the next screen line; if it does, another check is made to see if the whole of the next line has been transmitted. If not, the key press will be ignored and a beep will sound on the TV. This prevents typing over text which has not been transmitted yet.

As in the Receive Mode, when typing text to be transmitted, a bell will sound at 64 characters into the line. Also, pressing the SHIFT and 1 keys at the same time (EXCLAMATION MARK) will display the identification that was entered into the buffer at selection "2".

Certain functions can be performed during the Transmit Mode. They can be called up from the Transmit Menu. To access this Menu, all text that was on the screen must have been transmitted. Only then can you select the Menu by pressing the UP ARROW key while holding down the SHIFT key.

The selections are as follows:

"1" Send Buffer 1 - As the '1' key is pressed, the text that was loaded into the first buffer will be displayed on the screen. You will be prompted to press the BREAK key if you wish to cancel this function and return to the Transmit Mode. If you wish to continue, press any key other than the BREAK key and the text will be sent as if it were typed on the keyboard while in the Transmit Mode. The cursor for entering more text will appear at the next location after the last character in the buffer so more text can be added on the screen as the buffer contents are being sent.

"2" Send Buffer 2 - same as for "1" above.

"3" Send Buffer 3 - same as for "1" above.

"4" Send CQ - When the '4' key is pressed, a series of CQs will be displayed on the screen and transmitted at the same time. At the end of the CQs, the contents of the Identification Buffer are sent. This was the buffer set up at the beginning of the program or by selecting "2" from the Main Menu. When this text has been sent, the screen will clear and you will be returned to the Transmit Mode.

During transmission of this message, only one key will be accepted as valid. This is the BREAK key to allow transmission to cease if desired. Pressing this key will return you to the Transmit Mode with a clear screen.

"5" Send RY - When the '5' key is pressed, two lines of RY will be displayed on the screen and transmitted automatically. At the end of this, the screen will clear and you will be returned to the Transmit Mode.

During transmission of this message, only the BREAK key will be accepted as valid. This will stop transmission if pressed and will return you to the Transmit Mode with a clear screen.

SETTING UP THE PRINTER

The program lends itself well to interfacing with most printers of differing Baud rates. The most common rates of 600, 1200, 2400 and 4800 have been catered for in the Baud rate selection rate facility. Of course the standard for the Color Computer remains as serial RS232 via the serial I/O port at the rear of the computer. A printer/plotter can also be used with the RTTY PACK. In the small print mode, the text and pictures look excellent. Your printer may be configured in one of two ways.

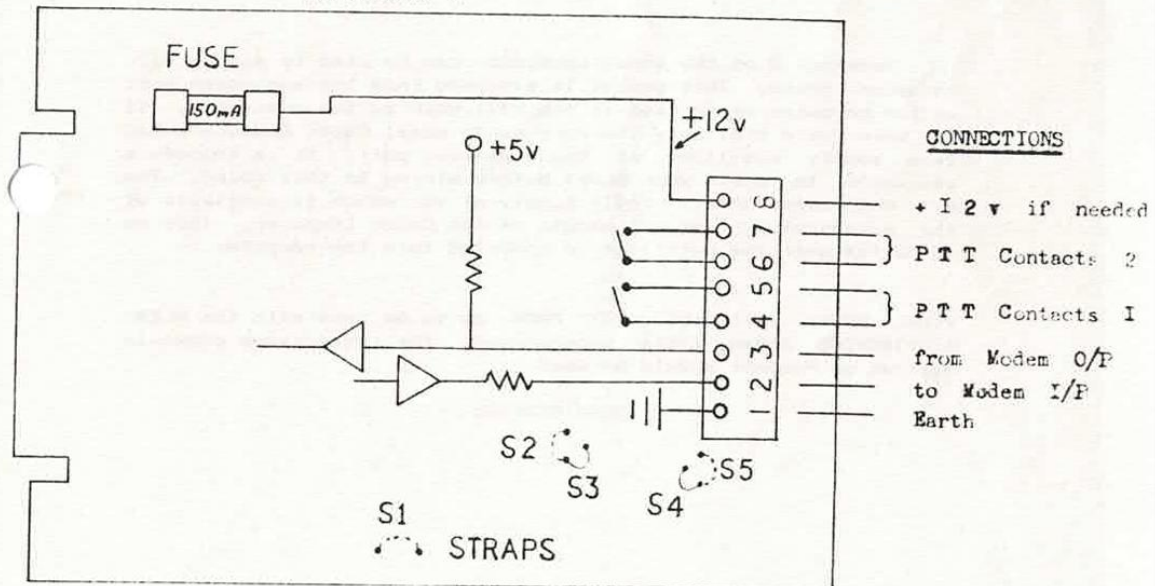
a) if only text is to be printed and no over printing is to be received, then the setting of the DIP switches within the printer can be such that it will do a line feed with a carriage return.

b) if overprinting is to be received, the setting of the DIP switches should be such that NO line feed will occur when a carriage return is received.

Over printing is sometimes used when sending pictures and occurs when a carriage return is sent but no line feed follows; then characters are typed over the existing on the same line. For the correct DIP switch settings, consult your printer handbook.

The program contains a routine for storing characters destined for the printer in a buffer before outputting them. Therefore the speed at which a line of text is actually printed does not matter, because if the printer is busy, the characters waiting in the buffer will not be sent until the printer is free. This will happen when the printer is actually printing (on some printers only) and cannot accept any more characters until it has finished the line.

DIAGRAM 1



HARDWARE AND CONNECTIONS

IMPORTANT NOTE: RTTY PACK contains a failsafe circuit which limits transmissions to 14 minutes. This circuit has been included as a precaution against computer malfunctions which might cause the Transmit Mode to be selected when the equipment is unattended thereby causing a nuisance to other operators on the same frequency. The failsafe circuit will force the transceiver into the receive mode until you return the program to the Receive Mode. This circuit can be disabled by inserting strap S1 on diagram 1 at the rear of this manual. With this strap in place, the timer is disabled and a malfunction in the computer may cause unsupervised transmissions for an indefinite period.

INTERFACING: RTTY PACK input and output circuits operate at TTL levels; ie, logic 1 = +5v and logic 0 = 0v with respect to Earth. The input interface to RTTY PACK should be similar to diagram 2 and the output interface should be similar to diagram 3. Note that these are suggested circuits only and that actual configurations will vary according to the modem used with the RTTY PACK. For convenience, normal and inverting circuits for both input and output have been provided. The method of selection of these is by straps S2 to S5. The table below shows the selections and diagram 1 shows the position of the straps on the printed circuit board. To change these straps or connect to the screw connector, the cartridge must be opened. To do this, insert a small screwdriver between the two halves of the plastic case and twist the screwdriver. This is easier to do at the end of the case facing outwards when the cartridge is inserted into the computer.

INPUT AND OUTPUT SELECTION STRAPS

S2	INVERTED INPUT
S3	NORMAL INPUT
S4	NORMAL OUTPUT
S5	INVERTED OUTPUT

Terminal 8 of the screw connector can be used to supply +12v to your modem. This supply is extended from the expansion port of the computer via a fuse in the RTTY PACK to the connector. It has been found that only the very early model Color Computers had this supply available at the expansion port. It is therefore advisable to check your model before wiring to this point. The RTTY PACK needs only a single supply of +5v which is available at the expansion port of all models of the Color Computer. This is connected when the cartridge is inserted into the computer.

FINAL NOTE: If the RTTY PACK is to be used with the ALIAN ELECTRONICS Modem (sold separately), the connections shown in diagram on request should be used.

GOOD RTTYing

DIAGRAM 2
SAMPLE INPUT CIRCUIT

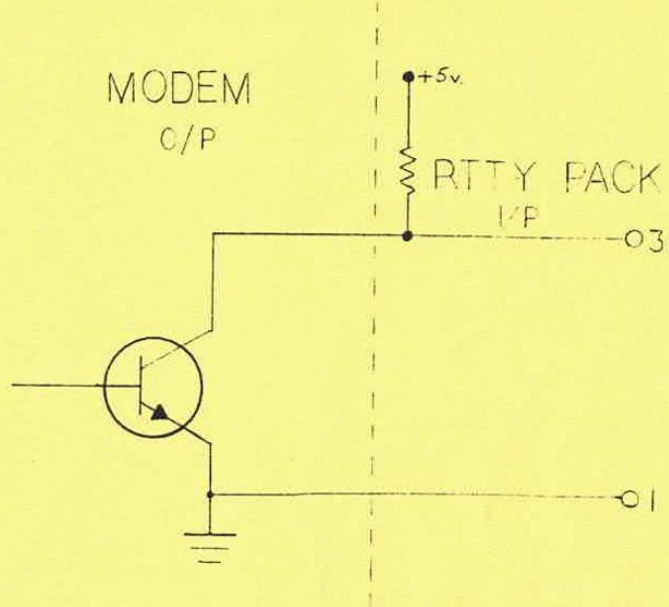
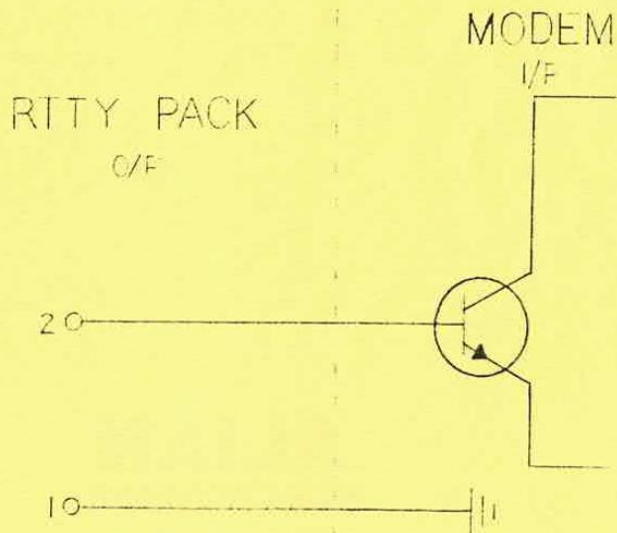


DIAGRAM 3
SAMPLE OUTPUT CIRCUIT



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