

USER MANUAL

Specification

Frequency Range : 68 – 88 MHz general coverage.
Direct frequency entry and 7 banks of 100 user programmable channels.
Channel Spacing : 5KHz, 6.25KHz, 10KHz, 12.5KHz, 15KHz, 18.75KHz, 20KHz or 25KHz.
Mode : Frequency or Phase Modulation.
Antenna : BNC 50Ω
TX Power : 2W, 2.5W, 12.5W or 25W.
Deviation : 2.5kHz nominal, 4kHz peak.
DC Power : Nominal 13.2V (10.8 – 15.6V) (RX approx 0.5A, TX 6A @ 25W)

This document is based on information kindly supplied by Stephen Tompsett of the Rugby Amateur Transmitting Society (RATS) and from PA4DEN's website.

N.B. DTMF and CTCSS functions are not implemented in this firmware. The radio will, however, transmit user defined tone signals (ZVEI tones).

Basic Frequency Selection

The transceiver has three frequency modes - VFO, Memory & Favourite Channel.

VFO Mode

In this mode the display shows frequency on the top line and the selected memory bank at bottom right. The desired frequency is entered using the numeric keypad. The frequency entry will auto complete, dependant on the selected step size.

e.g. with 12.5kHz steps selected 70.45MHz is entered as **7 0 4 5** and with 5kHz steps selected 70.45MHz is entered as **7 0 4 5 0** (Note: No decimal point).

Memory Mode

In this mode the display shows the Memory Channel Number at top left followed by the channel frequency or alpha tag. The selected memory bank is shown at bottom right. There are 700 memory channels, arranged as 7 banks of 100. Each channel can have its own alpha tag of up to 23 characters. Note : Memory Mode will only appear if 1 or more of the memories in the selected bank has been programmed.

















Favourite Channel Mode

In this mode the display shows **A** at top left followed by the frequency or alpha tag. The selected memory bank is shown at bottom right.

KEYPAD OVERVIEW





MAIN FUNCTIONS

-  Rx Volume Up.
-  Rx Volume Down. (Speaker is fully off at minimum).
-  Power ON/OFF.
-  Squelch Override in Rx – 1750Hz tone when pressed in Tx.
-  DOWN 1MHz or 10 Memory Channels.
-  UP 1MHz or 10 Memory Channels.
-  Select Memory Bank.
-  DOWN 1 Frequency Step or 1 Memory Channel.
-  UP 1 Frequency Step or 1 memory Channel.
-  Exit Sub-Menu (when using Second Function 4).
-  SCAN (VFO or currently selected Memory Bank).
-  Reverse Shift.
-  Second Function of next key pressed (See P.3)
-  Toggle between VFO mode and Memory Channel mode.
-  Toggle in and out of Favourite Channel Mode.
-  Tone Squelch ON/OFF (toggles Rx Only, Tx only, Both and Off).
(N.B. Only Tx is supported)

SECOND FUNCTIONS

After first pressing the  (second function) button.....

1 Allows the Transmitter RF Power Output to be changed.

The Power is adjusted with the  and  buttons.

The display indicates the selected power level :

--- 25W (approx).

-- 12.5W (approx).

- 2.5W (approx).

No Bars 2W (approx).

2 Allows the Squelch/Rx Sensitivity to be changed.

Adjustment is with the  and  buttons.

The display indicates the selected Squelch and Rx Sensitivity level.

No Bars Maximum Sensitivity.

- Squelch Level increased (by about 5dB).

-- Rx Sensitivity reduced (by about 20dB).



--- Squelch Level increased and Rx Sensitivity reduced.

4 Activate MENU selections (See P.6 to 8).

5 Activate STATUS MENU (See P. 8).

6 Toggle display of Memory Channel or Favourite Channel Alpha Tag.

8 Allows selection of VFO frequency step size.

Select the required step size with the  and  buttons.

Available step sizes are : 5KHz, 6.25KHz, 10KHz, 12.5KHz, 15KHz, 18.75KHz, 20KHz & 25KHz.

***** Memory channel lockout from scan.

0 Set tones and call with tone signalling (ZVEI tones).

Select repeater shift. Toggles + , - or None.







⚠ Set Tone Squelch codes (N.B. only the Transmit code is supported)

🏠 Delete or Store Favourite channel (See P.4).




S Delete or Store Memory channel (See P.4).

MEMORY OPERATION





To programme a memory channel :

- ◆ Select the required Memory Bank using .
- ◆ Get into VFO Mode -  - (if not there already).
- ◆ Select the required frequency (and Shift if required).
- ◆ Press  then .
- ◆ Select a channel number using the numeric keypad or up/down arrows.
(An arrow on the display to the left of the channel number indicates that the channel has already been programmed and will be overwritten.)
- ◆ Press .
- ◆ Enter an alpha tag for the channel, if required, using the numeric keypad (See P.5).
- ◆ Press  to complete the channel programming.



To clear a memory channel :

- ◆ Select the memory channel to be cleared.
- ◆ Press ,  and  again .

To scan the memories within a bank :





- ◆ Select the bank to scan using the  button.
- ◆ Press  to start scanning. Press it again to stop scanning. Use  and  to change the scan direction.

Memory Channel lockout from scan :





- ◆ Select the memory channel to be locked out.
- ◆ Press  then  to lockout (skip) the channel when scanning.
- ◆ Repeat the above to unlock.

FAVOURITE CHANNEL




To programme the favourite channel :

- ◆ Select VFO Mode.
- ◆ Select the required frequency (and Shift if required).
- ◆ Press ,  and  again.
- ◆ Enter an alpha tag, if required, using the numeric keypad (See P.5).
- ◆ Press  to complete favourite channel programming.

To clear the favourite channel :






- ◆ Select the favourite channel with .
- ◆ Press ,  and  again .








VFO SCAN

- ◆ Select VFO Mode.
- ◆ Start and Stop VFO Scan (at selected step size) using .
- ◆ Change direction of scan using  and .

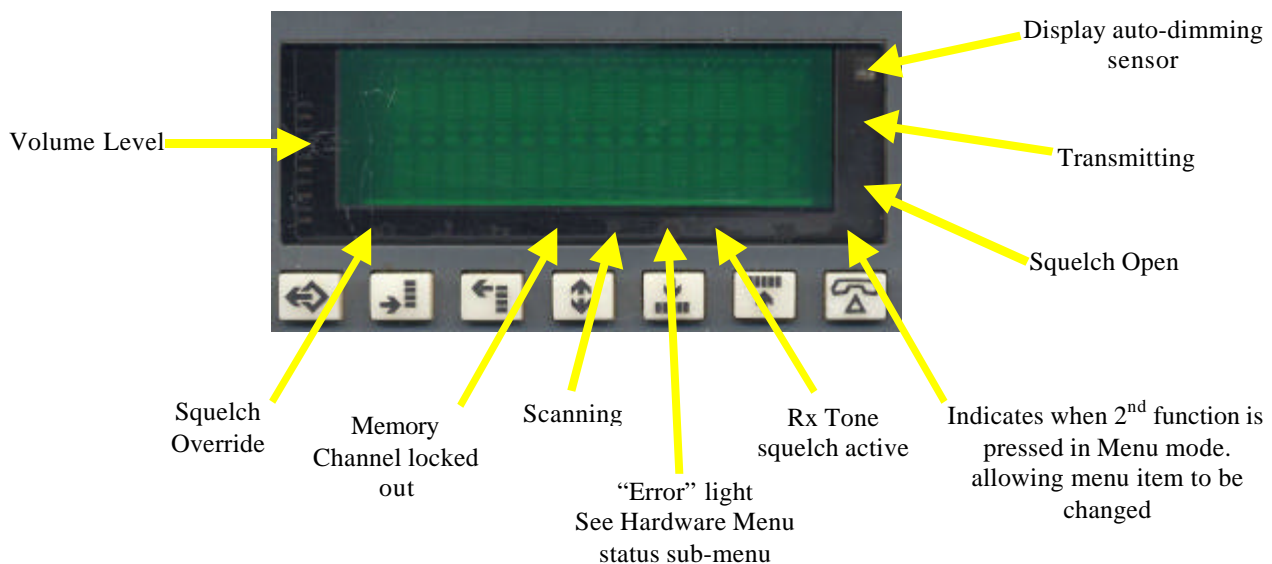
ENTERING TEXT FOR ALPHA TAGS.

Text is entered using the numeric keypad, in the same way as on a mobile phone.



A series of characters is assigned to each key. Repeated pressing of the key cycles through the available characters. This can also be done with the  and  buttons. The cursor is moved using the  and  buttons. The  button will give a space if at the end of the line of text, and if over a character will erase it and cause the following characters to shift back (Like a DEL key). The keys are assigned as follows :



	1	:	;	<	=	>	?	@	↑	↓
	2	A	B	C	a	b	c	Ä	ä	
	3	D	E	F	d	e	f	ë		
	4	G	H	I	g	h	i	ï		
	5	J	K	L	j	k	l			
	6	M	N	O	m	n	o	Ö	ö	
	7	P	Q	R	S	p	q	r		
	8	T	U	V	t	u	v	Ü	ü	
	9	W	X	Y	Z	w	x	y	z	
	0	{SPACE}	!	"	#	\$	%	&	()	* + , - . /


DISPLAY LAMPS




THE MENU SELECTIONS

These are displayed by pressing  followed by .

Scroll through the different menus, submenus and multiple menu options using  and .

To change a menu or submenu option or to select the submenu press .

To come out of the menu or submenu press .

N.B. Several of the menu/submenu functions are not (apparently?) supported in this version of firmware but have been included for completeness.

Shift : MENU

Set the repeater shift. (Default - 01.600.000kHz)

Tx limit : MENU

Set the Tx timeout timer value. (Default - None)

Scan Mode : MENU

Sets how the radio reacts when receiving a signal while scanning.

Wait silence - Waits for squelch to close before continuing scan.

Scan and stop - Does not re-start scanning automatically when squelch closes.

Wait - Pause for 5 seconds then continue scanning.

Audio : MENU

Submenu -->

Rx mode : AUDI

Select FM or PM mode of Rx operation (Default - FM).

Tx mode : AUDI

Select FM or PM mode of Tx operation (Default - FM).

Datakiller : AUDI

Suppress ZVEI tones (Default - On). (N.B. Not supported ?)

Key beep : AUDI

Turn On/Off keypad beeps (Default - On).

Key beep : AUDI

Volume : ---

Adjust volume of key beeps (Default ---).

Rogerbeep : AUDI

Turn On/Off transmitted beep at end of each transmission (Default - On).

DTMF tones : AUDI

Set the length of the DTMF tones (Default - 100mS). (N.B. Not supported)

ZVEI tones : AUDI

Set the length of the ZVEI tones (Default - 70mS).

Calltutor MENU

Submenu -->

This allows the setting up of some sort of beacon – Not supported.

Calltutor : CALL

Sets function **Off/On/On (Hold TX) ?**

Callsign : CALL

Allows text entry ?

Calltutor : CALL

After TX : 10S

Time is adjustable ?

Calltutor : CALL

Every : 270S

Time is adjustable ?

User MENU

Submenu -->

My number : USER

Allows entry of personal 5-tone code of the user. Radio gives alarm when receiving this code.
Not supported ?

Step : USER

Acc : 5

This sets the acceleration of the Up and Down buttons. The longer the key is pressed, the faster the frequency will change.

Keys : USER

Repeat

Sets whether buttons auto-repeat or not when pressed. Options are Repeat/Only Once.

Settings : USER

Clear memory

Pushing  changes display to < **CLEAR ?** > . A Further push clears all memories.

Hardware MENU

Submenu -->

IF : HARD



Select 1st IF – 21.855MHz or 20.945MHz ?

LP filters : HARD

Select >20kHz raster or <20kHz raster ?

Status : MENU

Give diagnose



When the red "error" light is on [above the  button] this menu gives error messages, viewable by repeated pushing of the  button.

The red error light appears to be always on when the Rx is tuned below 72MHz and this menu option gives an **Rx VCO Limit** error message even though the radio appears to work OK ?



Common MENU

Submenu -->

TX Power : COMM

Allows adjustment of RF power level – same as   (See P.3).

Squelch : COMM

Allows adjustment of squelch and Rx sensitivity – same as   (See P.3).

Tone sql : COMM

Toggles tone squelch ON/OFF for RX & TX (N.B. RX not supported).

Rx Code : COMM

Set code for RX tone squelch (N.B. not supported).

Tx Code : COMM

Set code transmitted when Tone sql set to ON for TX above.

View name : COMM

Toggle display to indicate either frequency or alpha tag – same as   (see P.3).

Lock out : COMM

Lockout selected memory channel from scan – same as   (see P.3).

Bank : COMM

Indicates which memory banks are empty.

STATUS MENU

ZVEI buf : STAT

Shows last tone code received (N.B. not supported).

Tone code : STAT

???

RX VCO : STAT

DAC = 0 ??

TX VCO : STAT

DAC = 0 ??