

KENWOOD

**FYLDE
MICROSYSTEMS Ltd**

TK255/355 Trunk Variant

User Instruction Manual

Prepared by

Brian Seedle

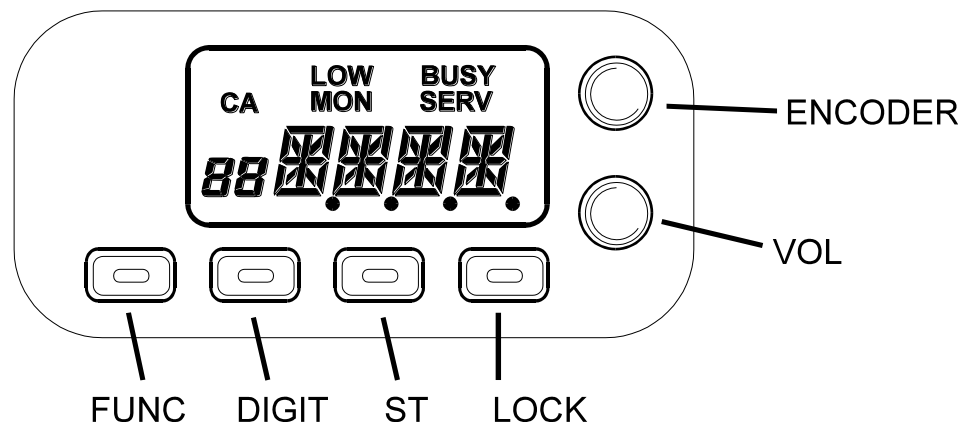
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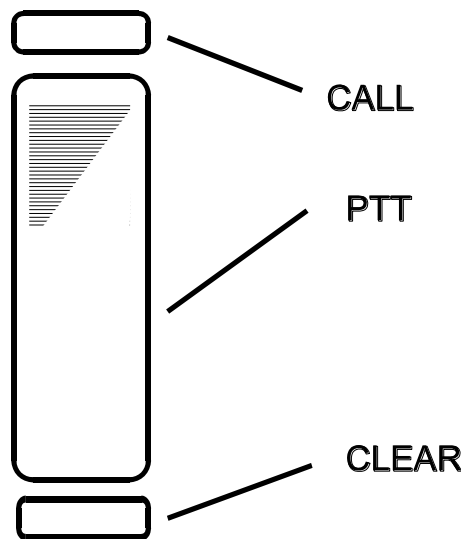
1. OVERVIEW

The radio is available in two variants. The simple variant does not have a keypad and has a user interface similar to the TK715 series of mobile designs. The installation of a keypad enables the MPT1343 dialling syntax to be used.

2. USER OPERATION



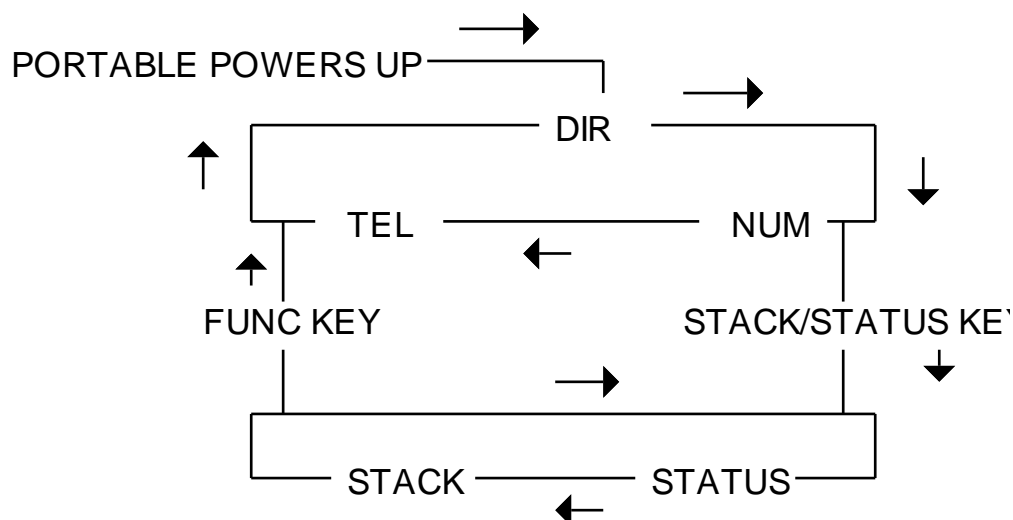
FUNC	-	Function key to select menu's Directory Numeric Tel
DIGIT	-	Select 100', 10's Units in Numeric Mode
ST	-	Status/Stack selection
LOCK	-	Keyboard/Encoder Lock and Display Invert
VOL	-	Volume Control
ENCODER	-	Increment/Decrement menu selection
LED	-	Transmit - Steady Red Low Batt - Flashing Red



There are several menu's selectable from the FUNC,DIGIT and ST keys. The DIR/NUM/TEL menu cycles around with each press of the FUNC key. (TEL and/or NUM may not be supported on some Networks so those menu's will not be accessible.) The STACK/STATUS menu is accessed and cycled around using the ST key.

The CALL symbol informs the user that a call has been made from another mobile which was not answered. There may also be an audible pip. The ident of the calling mobile will be stored in the memory of the mobile so that the call can be returned. The portable can store up to nine calls.

The In Service Indicator informs the user that the mobile is in range of a valid transmitting site, and can make calls.

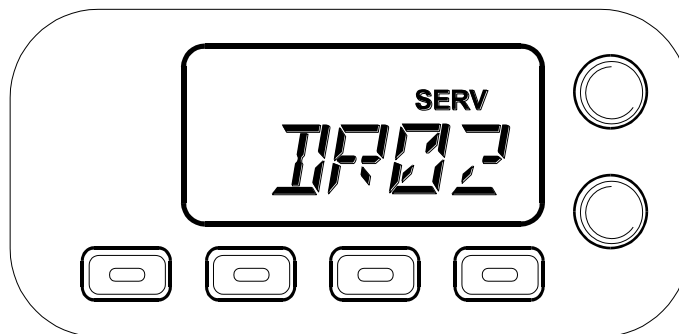


2.1 DIRECTORY MENU [dr]

On power up, the portable will display it's own ident, and then search for a control channel. When a control channel is found the In Service LED will flash.

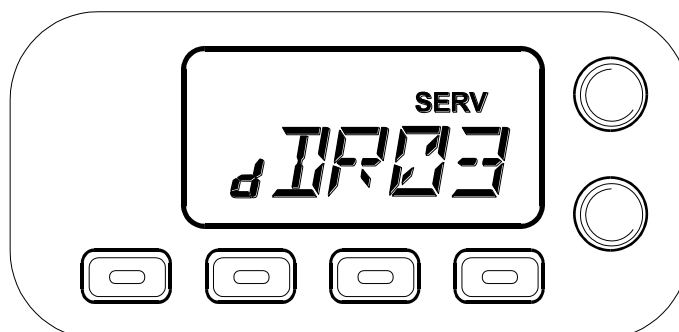
INITIATING CALLS

The portable will power up in DIRECTORY mode unless DiRectory mode has been disabled during Network Personalisation. The numbers of the mobiles within the fleet will have been stored in the directory. The indication of directory mode is the display -

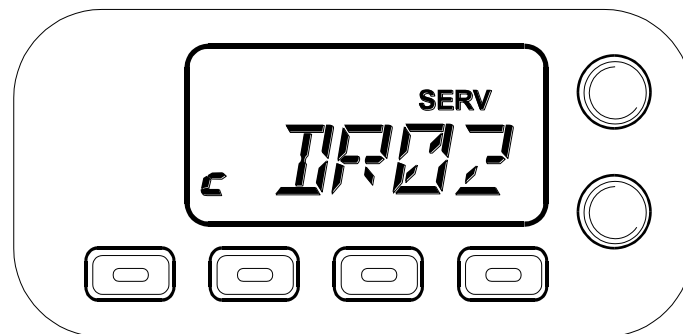


If the right hand knob is turned, the number in the display will change. Clockwise UP, Anticlockwise DOWN. Only numbers allocated in the directory will be displayed. The numbers rotate, i.e having reached the top, it will go to the bottom

If the IDENT stored in the directory is to a DISPATCHER, a small 'd' will also be displayed in the lower left hand corner of the display.



The directory may hold a number of GROUP numbers. This is a feature where several mobiles in the fleet may conference the same call together. If a group number has been selected, a small 'c' will be displayed.

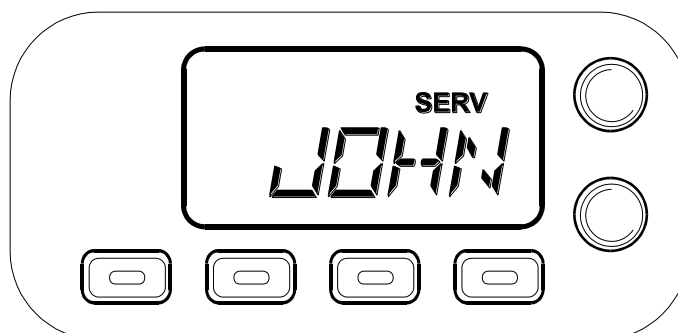


When a particular directory entry has been selected, the call may be made by pressing the CALL button. (The portable may have been personalised to initiate a call using the microphone pressel.)

There is only space in the directory for 20 entries. If the portable has been configured for NUM mode, pressing the FUNC key will change the display to the NUMERIC menu.

If DiRectory mode has been disabled during Network Personalisation, then the portable will power up in NUmeric mode.

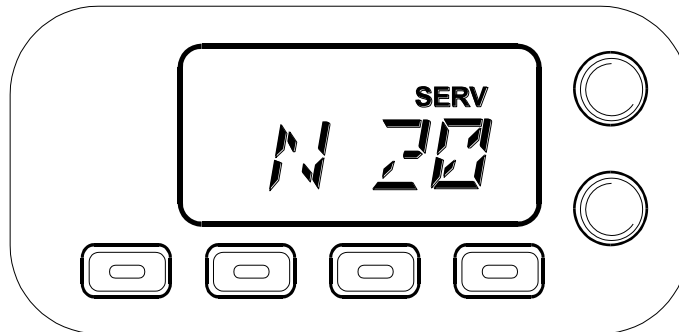
The directory menu display may be substituted with a display of the users choice during personalisation. Each DiRectory display entry may be changed to any four alphanumeric characters. Thus for example the names of the users could be displayed as DAVE, JOE, JOHN.



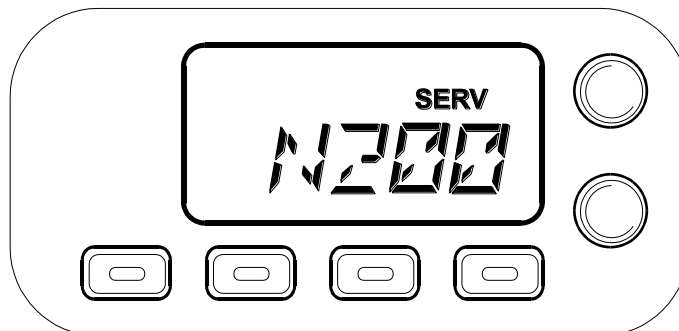
NUMERIC MENU [N]

When the portable is personalised, the fleet size may have been entered as either 'Large Fleet' or 'Small Fleet'.

A small fleet uses 2 digits within the range 20-99. Pressing the DIGIT button will make the tens digit flash. Rotating the knob changes the flashing digit, or the units digit if no digits are flashing.



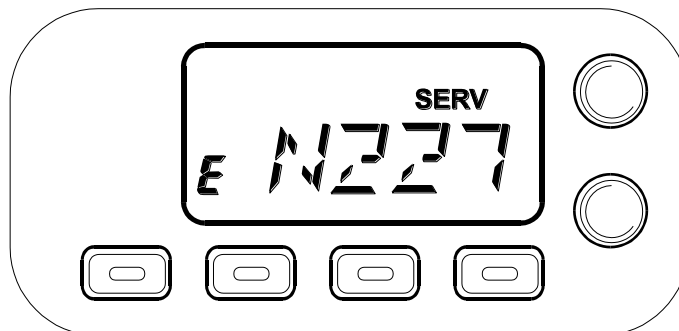
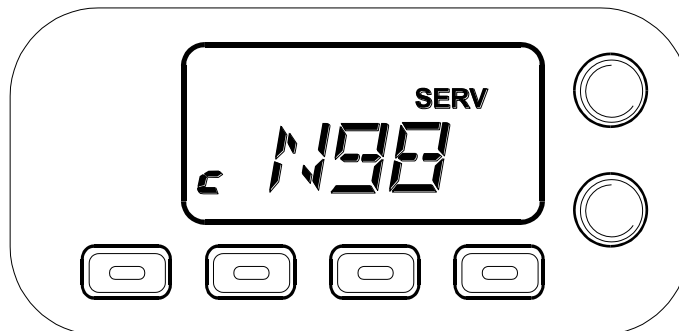
A large fleet uses 3 digits within the range 200-999. Pressing the DIGIT button will make the tens digit and then the hundreds digit flash. Rotating the knob changes the flashing digit, or the units digit if no digits are flashing.



To avoid calling mobiles outside the fleet, some of the numbers may be barred.
The small digit in the bottom left hand corner gives extra information

'E' The number selected is out of Rang[E]

'c' The number selected is a conference (group) ident

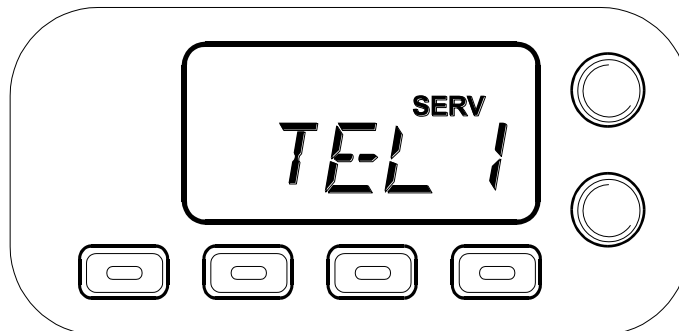


Pressing the call button with a barred number in the display will inhibit the attempt and give a 'range' error.

2.3 TEL DIRECTORY [tel]

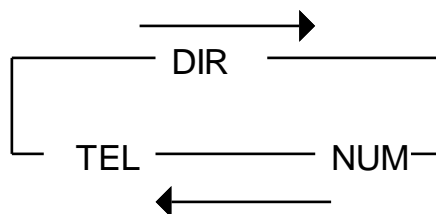
If the Network supports telephone interconnect and at least one PSTN/PABX number has been stored in the directory (there is space for 4) then pressing the FUNC will enter TEL mode

The display is -

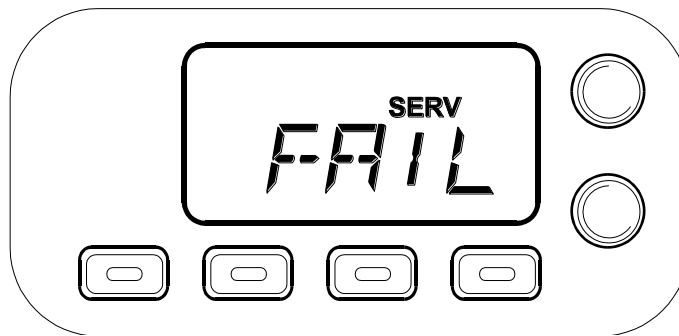


When a particular directory entry has been selected using the knob, the call may be made by pressing the CALL button. (or the microphone pressel if enabled during personalisation)

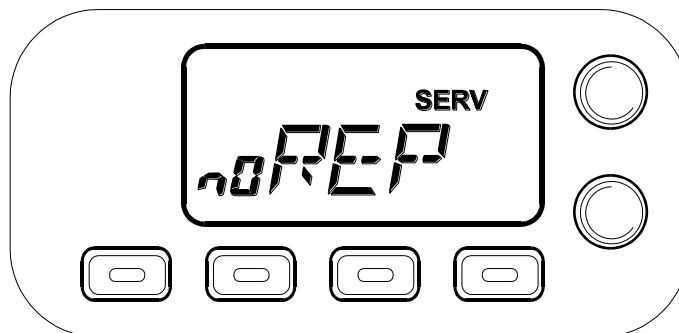
Pressing the FUNC key will return to DIR mode



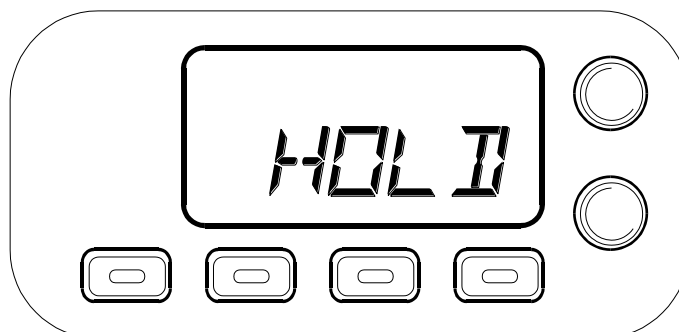
2.4 MESSAGES DISPLAYED DURING CALL SET-UP



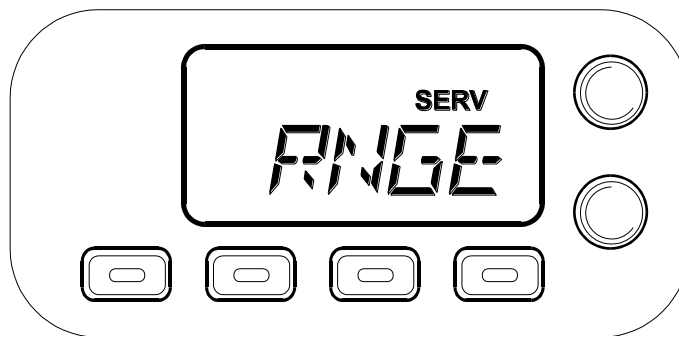
The call was rejected by the Network, because -
The Network cannot process your call at this time or, you or the other party are not valid on the Network or, the other party cannot be reached and the Network cannot queue your call request



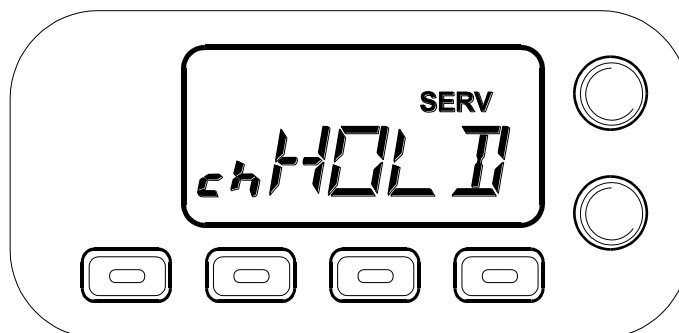
NoReply - The call was rejected by the Network, because the called mobile was either out of range or switched off.



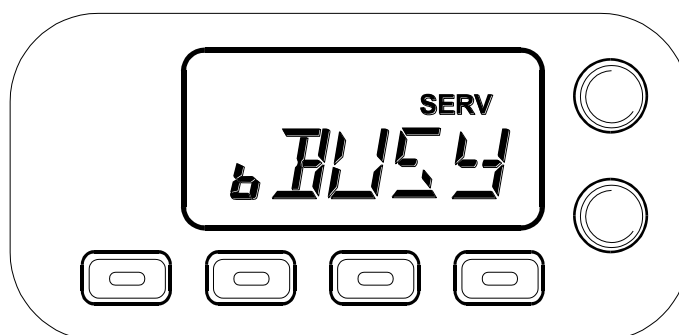
The call has been acknowledged by the Network. More information to follow.



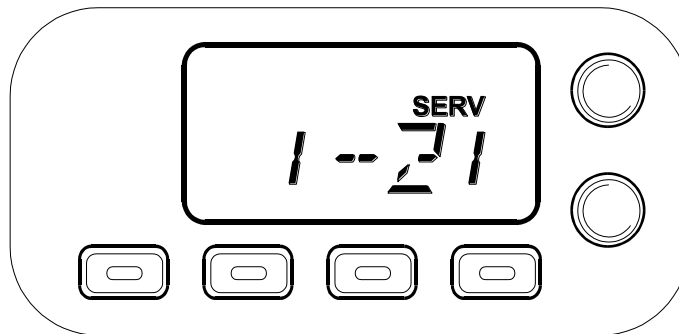
The call button was pressed with a barred number in the display.
The call attempt is inhibited



The call has been acknowledged by the Network, but there are no channels available to connect the call at the moment. The Network will attempt to connect the call when a channel becomes free.

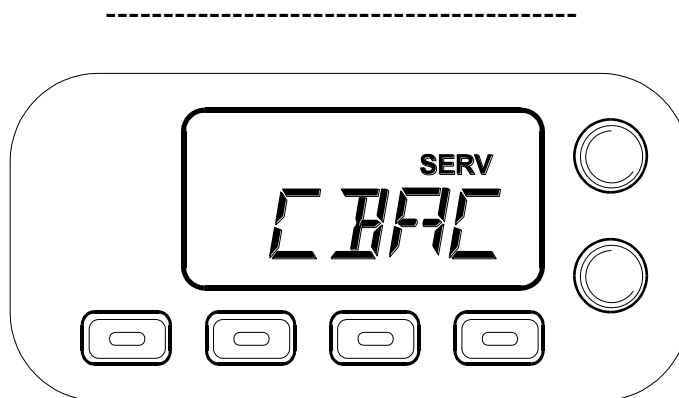


The call has been acknowledged by the Network, but the called ('B' party) party is engaged on another call. The Network will attempt to connect the call when the other party becomes free.

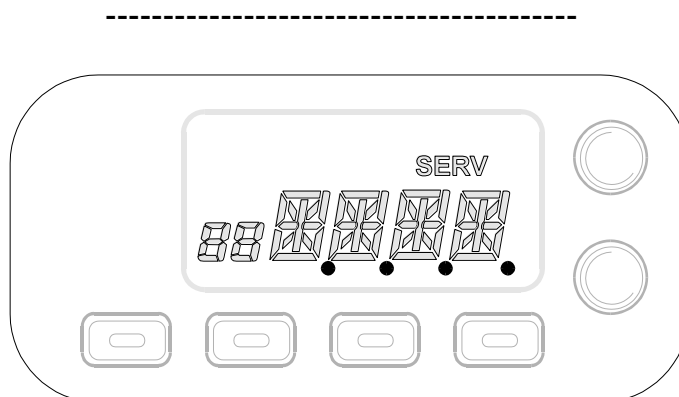


The call has been connected and the display is showing a call timer. If the Network supports dynamic call time, the display will count down and indicate the time left for the call. If the display counts up, it indicates the duration of the call so far. If the squelch is open, the 'BUSY' will be illuminated.

When the call is complete, the user can press the CLEAR button or if installed, replace the microphone on the hook.



The call has been stacked by the other party, and you will be called back



The four dots indicate the received signal strength on the control channel. A strong signal will be shown as four dots.

2.5 STATUS MENU

If the Network supports STATUS then the Kenwood supports comprehensive facilities for -

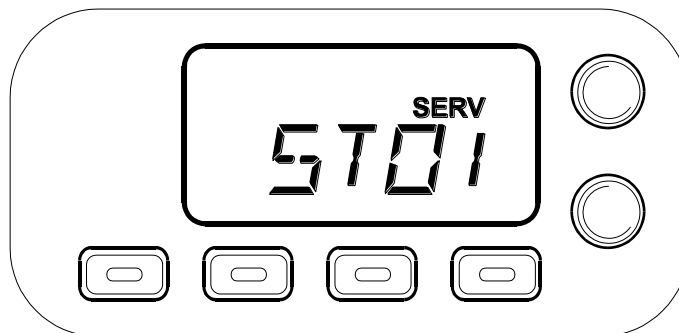
- Transmitting a STATUS
- Receiving a STATUS
- Interrogating another mobile for its STATUS.

Sending a Status

A status is a single numeric value in the range 1-30 which may be transmitted to another mobile in the Network. The status value 0 is reserved for dispatcher operation. The value 31 may be used to erase a status previously transmitted.

The ident of the mobile must first be entered in DIR or NUM mode. (A status cannot be sent to the PABX/PSTN)

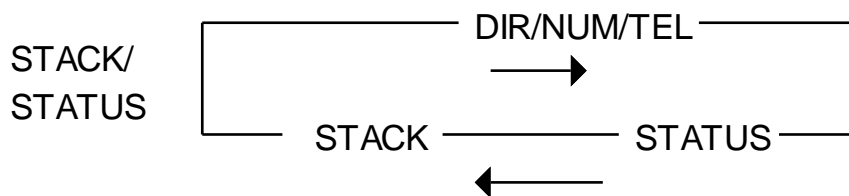
Pressing the STATUS/STACK key will change to the status menu



The status value transmitted will be stored in the STACK of the recipients mobile.

Rotating the knob will select a value in the range 1-31. Pressing the call button will transmit the status to the ident previously selected in DR or NUM mode.

There is another powerful feature associated with Status. A mobile may be interrogated for its status value. A mobile will only reply with its status if its STxx menu is in its display. If a mobile is interrogated, and the STnn is not displayed, it will reply with status 28 (which means status not set). If interrogated with STnn displayed however (nn in range 1-29), the mobile will send the status value displayed back to the interrogating mobile. To interrogate another mobile, the status value 30 must be sent. The result is placed in the mobile call stack which is described on the next page.



2.6 STACK MENU

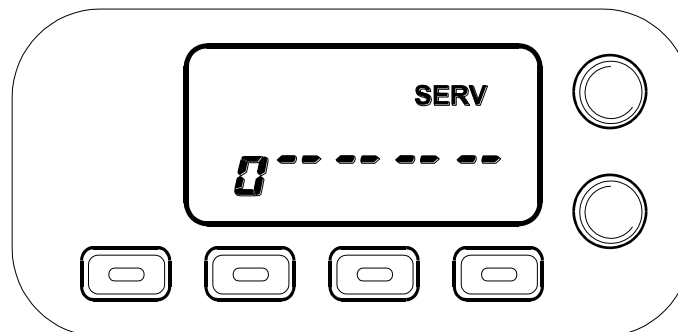
Pressing the STATUS/STACK key once more will enter STACK mode. This menu displays a call stack. There is space for 9 entries.

The call stack can store -

- Status values and the ident of the calling party for status's received.

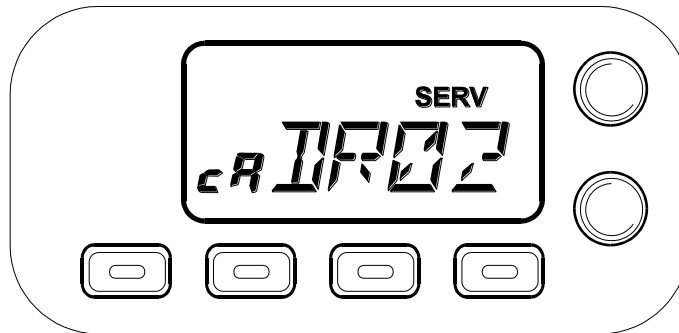
- Idents of mobiles which called and were unanswered.

If there are no entries in the stack the display will be

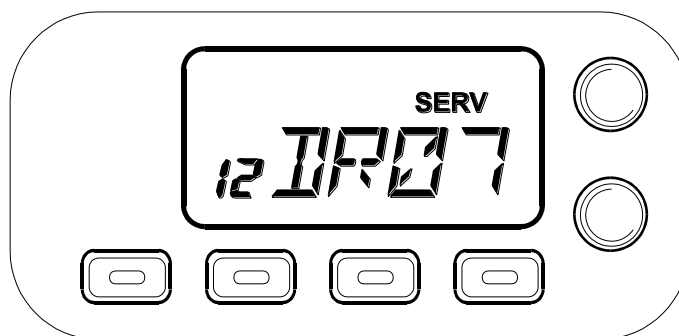


The small right hand digit in the display will be non zero if there any entries in the stack. If there is more than one entry, rotating the knob will move up and down the stack

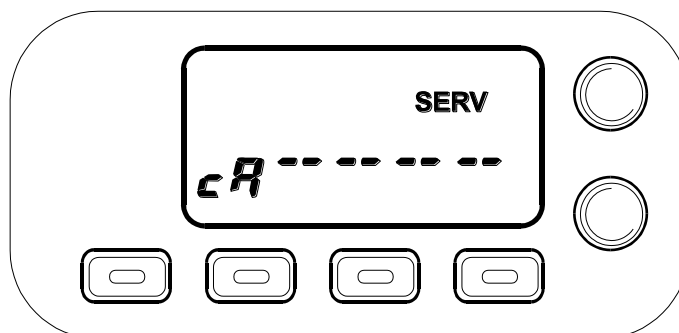
If a call has been stacked by the TK255, the green LED will flash to indicate to the user that a call is waiting to be returned. If calls are returned or the CLEAR is pressed to delete calls in the stack, the green flashing LED will stop when the stack is empty.



This display shows that a called in absence was received from a mobile whose ident is in the directory position 02. The call button may be pressed to return the call, or the RESET button pressed to delete this stack entry.



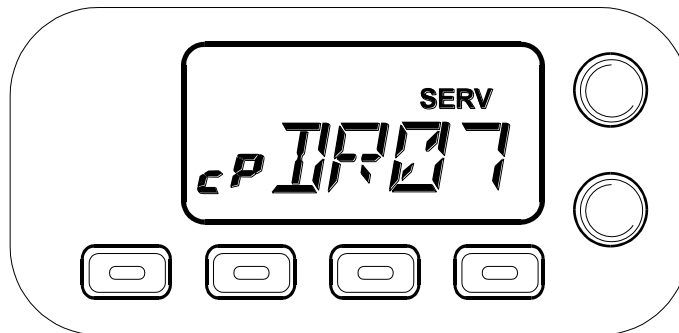
This display shows that a status 12 was received from a mobile whose ident was calculated at dr07. The position in the stack cannot be displayed. In the case of a status received, the call cannot be returned by pressing the call button. If a call is attempted, a ST ERR message will result.



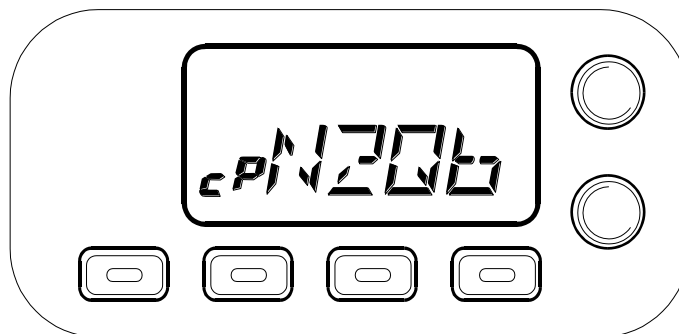
This display shows a call in absence that has been stacked, but the portable is unable to determine the calling party ident. The call can however be returned using the call button or deleted using the CLR button.

2.7 RECEIVING CALLS

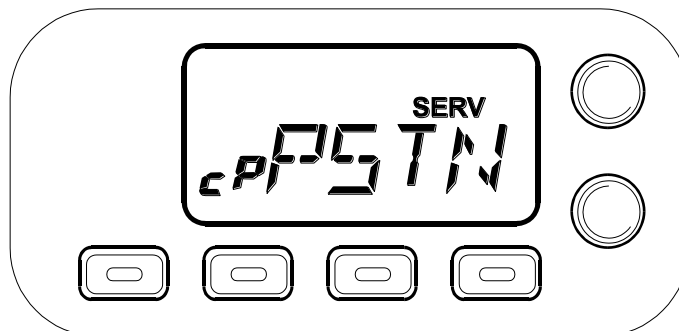
Calls received inbound alert the user (called party), and the calling party is displayed in either dr or nu form. Some examples are given



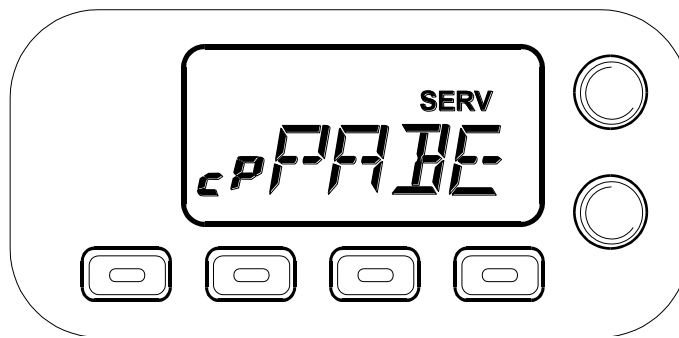
Call from dr 07



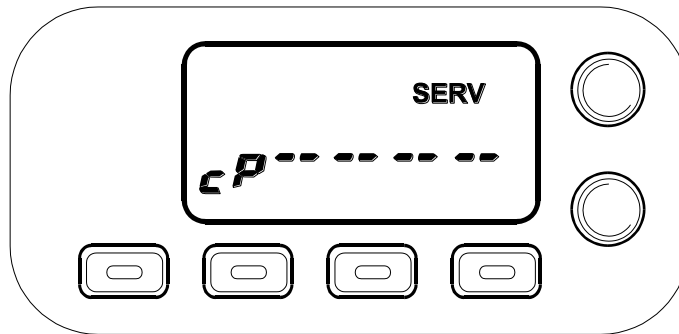
Call from NU206



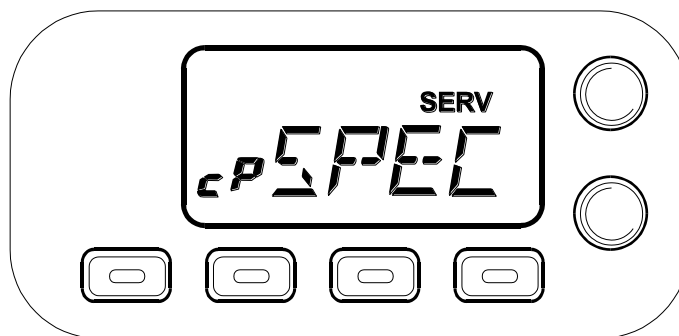
Call from the PSTN



Call from the PABX



This last display shows that the mobile is unable to determine the calling party ident. The call may be returned however by pressing the CALL button.

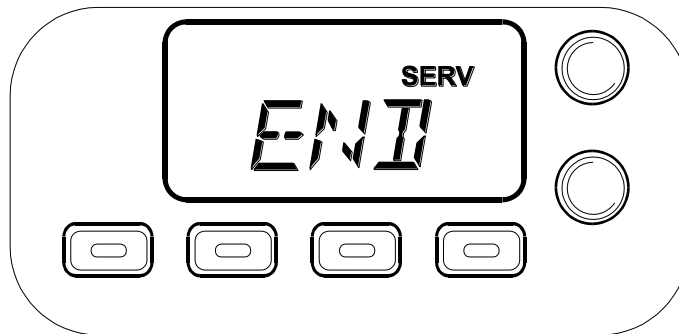


A special ident (not a mobile) which the Network uses.

If the call is not answered, (except in the case of PABX/PSTN and SPECIAL idents, the ident of the caller will be put in the mobile stack.

The CALL symbol is used to indicate that there is one or more entries in the stack. A pip tone is also generated.

2.8 OTHER DISPLAYS



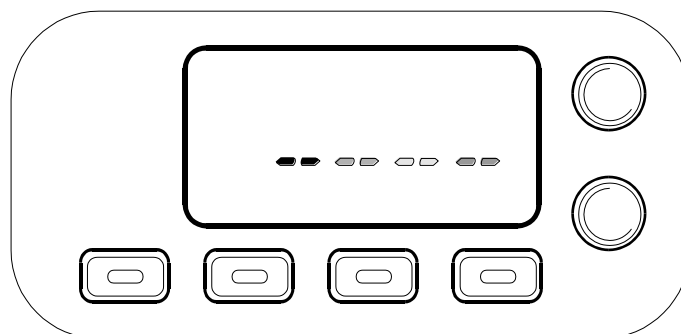
The call has either -

- Been terminated because the mobile traffic channel timer has expired.

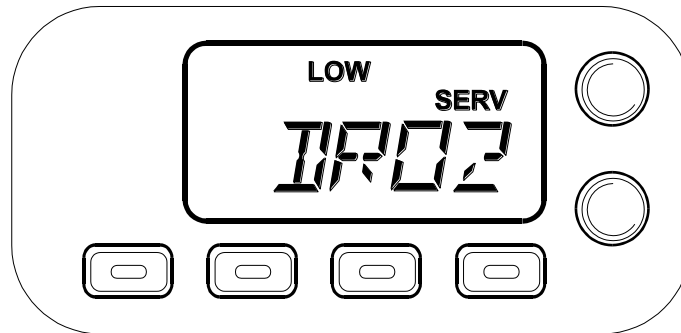
- Been terminated because the Network traffic channel timer has expired.

- Been terminated because the Network inactivity timer has expired. (i.e no one is talking)

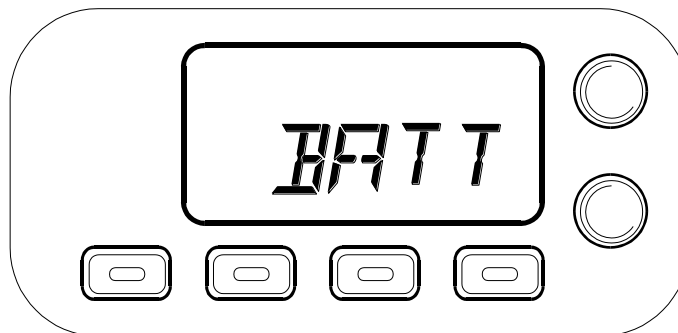
- Been terminated by this mobile, or the other party pressing the CLEAR button.



A dash travelling across the screen indicates that the mobile is searching for a control channel.

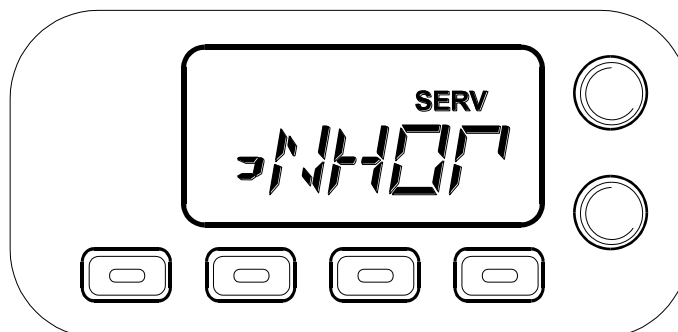


The LOW symbol indicates that the battery is low but the portable is still usable to make and receive calls. To alert the user that the battery is low, a short pip is generated every 5 seconds. In addition the Red LED flashes.



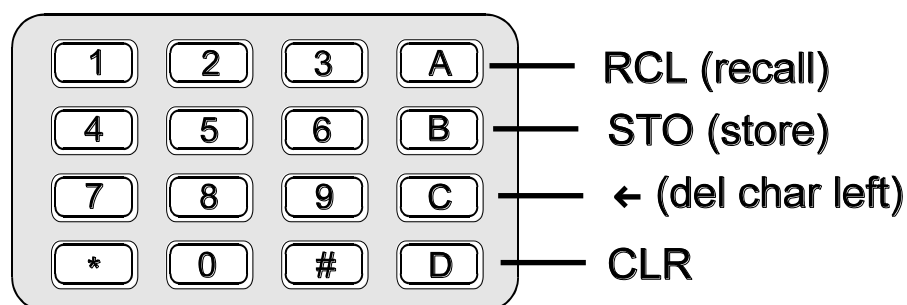
The battery voltage is low and calls cannot be made or received. The controller has stunned the portable. the battery must be changed.

If the LOCK key is held for more than 2 seconds, the display will invert. This is to make the display easy to read when the TK255 is worn on a belt.



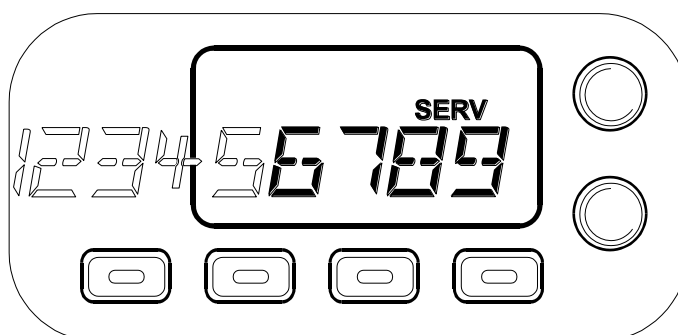
The example shows a group ident selected to JOHN

3. USER OPERATION KEYPAD



The portable can also initiate calls using the keypad. If any key is pressed, the keypad mode is selected. If any of the buttons FUNC, DIGIT or ST are pressed, or the encoder is rotated, the portable will return to directory mode as previously described. In applications where the keypad may be inadvertently pressed, a keyboard LOCK key will freeze the keyboard. A pip tone indicates that the keyboard is locked. If the LOCK key is pressed again, the keyboard will unlock. Two pips acknowledge the unlock.

The keypad conforms to the MPT1343 dialling scheme.



Since there are only 4 visible digits, the four least significant digits will be displayed. In the example, the user has entered the number 123456789. Only the 6789 is visible, the other digits scrolled to the left as they were entered.

CLR

This key changes to keypad mode and clears the display. The combination * # can also be used to clear the display.

Numeric Digits 0-9

The value will be echoed in the display

Hash key

Terminates the keyboard entry and initiates the call

Star Key *

Used to clear the display with the Hash key. Also used as a "call modifier". A call modifier changes the action of the entry (For example changes a speech call into a status call)

Del Char Left

Deletes one last entered single digit entry.

Recall RCL

Recalls a previously stored number

Store STO

Saves the number entered on the keypad.

When the desired number has been entered, the CALL button can be used to initiate the call in place of the # key. If the keyboard has been locked, the CALL button must be used to set up a call.

3.1 Summary of Numbering Convention

Two digit dialled strings (YZ)

YZ	20 - 89	Individual number
YZ	90 - 99	Group number

Three digit dialled strings (XYZ)

XYZ	200 - 899	Individual calls in fleet
	999	Emergency Operator
XYZ	900 - 998	Group number

Four digit dialled strings (WXYZ)

WXYZ	1000 - 8999	PABX extension number
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Five digit dialled strings (VWXYZ)

V	3 - 6	PABX access number for single addressword calls (value sets FLAGS 1 and 2), EXT = '1'
WXYZ	1000 - 8999	PABX extension number
V	0, 7 or 8	PABX network access number (extended addressing protocol) (PABXI)
WXYZ	NNNN	Exchange routing digits and extension number

Six digit dialled strings (UVWXYZ)

UVWX	2001 - 6050	Fleet number	
YZ	20 - 99	Individual or group number	
U	0, 7 or 8	PABX network access number	(PABXI)
VWXYZ	NNNNN	PABX routing digits and extension number	

Seven digit dialled strings (TUVWXYZ)

TUVW	2001 - 6050	Fleet number	
XYZ	200 - 998	Individual or group number	
T	0, 7 or 8	PABX network access number	(PABXI)
UVWXYZ	NNNNNN	PABX routing digits and extension number	

Eight digit dialled strings (STUVWXYZ)

S	0	PSTN access number	(PSTNGI)
TUVWXYZ	NNNNNNNN	PSTN routing digits and subscriber number	
S	7 or 8	PABX network access number	(PABXI)
TUVWXYZ	NNNNNNNN	PABX routing digits and extension number	
S	1	MPT1327 syntax	
TUVWXYZ	ppp i i i i	ppp 000-127 prefix	
		i i i i Ident in range 0001-8100	

Nine digit dialled strings (RSTUVWXYZ)

RST	200 - 327	Number prefix	
UVWXYZ	-	For details see six digit numbers, inter-fleet numbers	
R	0	PSTN access number	(PSTNGI)
STUVWXYZ	NNNNNNNNN	PSTN routing digits and subscriber number	
R	7 or 8	PABX network access number	(PABXI)
STUVWXYZ	NNNNNNNNN	PABX routing digits and extension number	

Ten digit dialled strings (PRSTUVWXYZ)

PRS	200 - 327	Number prefix	
TUVWXYZ	-	For details see seven digit numbers, fleet numbers	
P	0	PSTN access number (PSTNGI)	
RSTUVWXYZ	NNNNNNNNN	PSTN routing digits and subscriber number	

Eleven or more digit dialled strings (NPRSTUVWXYZ)

N	0	PSTN access number	
PRSTUVWXYZ	NNNNNNNNNN	Routing digits and subscriber number	

3.2 SUMMARY OF CONTROL CODES

*#	Call set-up abandoned, call complete
0nn	Status 'nn' to despatcher
1	Conference call

11	Broadcast call
8	Priority call
9	Emergency call, RQE
#	End dialled string, accept call if radio unit is alerting

3.3 CHANGING MODES

When the TK255 is powered up it will start in MENU mode. The menu's may be selected using the 'F', 'DGT','ST' and Encoder Knob.

If the keypad is fitted and if a key is pressed, the mode will change to KEYBOARD mode. Successive keys will then enter dialling digits.

MENU mode is resumed by any of the 'F', 'DGT','ST' Encoder buttons or one single turn of the Encoder.

The LOCK button has a separate function. Momentary pressed will lock and unlock the keyboard. If held down for 4 seconds in MENU mode however, the display will invert. If pressed again for 4 seconds the display will be restored. If KEYBOARD mode is active then it is not possible to invert the display using the LOCK button. If the display is inverted (MENU mode) and KEYBOARD mode is activated the display will be restored ONLY WHILE IN KEYBOARD MODE.

3.4 STORING DIALLED DIGITS

There are 99 stores for dialled digits. A dialled string is entered from the keyboard which can be a call to another radio, a PABX call, status, PSTN. The STORE key is pressed followed by a two digit number in the range 01-99, AND THEN THE STORE KEY ONCE more.

Stored digits may be restored by RCL followed by the two digit number.

To delete an entry, press the CLR the STORE followed by the two digit store to delete and STORE again.

3.5 KEYPAD OPERATION ON THE TRAFFIC CHANNEL

If the keypad has not been disabled (LOCK key), when a call is active on the traffic channel, the keypad can be used to over dial DTMF. The PTT must be pressed to transmit the DTMF tones. This is useful if extra routing digits are required after being connected from a PSTN call.

Another application may have a simple interconnect unit attached to a particular traffic channel.

All 'Bell' Standard DTMF tones are supported including *,#,A,B,C,D.

The tones are also echoed in the TK255 loudspeaker.

3.6 EXAMPLES OF KEYBOARD STRINGS

Assume - IBI=1020 GBI=6000
 Indiv Prefix=001 Indiv Ident=1028

KEYPAD	CALL
Small Fleet	
21	Single Prefix RQS to 001/1021
89	Single Prefix RQS to 001/1089
90	Single Prefix Group RQS to 001/6000
221	Error (3 digits is large fleet)
*8*21	Single Prefix Hi-Priority RQS to 001/1021
*1*21	Error (Non Broadcast to group only)
*1*90	Single Prefix Group RQS to 001/6000
*012*21	Single Prefix RQQ Status 12 to 001/1021
*012*21	Single Prefix RQQ Status 12 to 001/1021
*012*90	Error (Cannot send status to group)
*045*21	Error (Status must be in range 0-31)
2001 21	Single Prefix (interfleet) RQS to 001/0003
2510 20	Interfleet Single Prefix RQS to 001/1020
5002 90	Single Prefix (interfleet) RQS to group 001/6004
202 2510 21	Interprefix RQS call to 002/1021
202 5000 90	Interprefix RQS to group 002/6000
Large Fleet	
21	Error (2 digits is small fleet)
201	Single Prefix RQS to 001/1021
900	Single Prefix Group RQS to 001/6000
995	Single Prefix Group RQS to 001/6995
*8*201	Single Prefix Hi-Priority RQS to 001/1021
*1*211	Error (Non Broadcast to group only)
*1*900	Single Prefix Group RQS to 001/6000
*020*456	Single Prefix RQQ Status 12 to 001/1476
*012*900	Error (Cannot send status to group)
*045*456	Error (Status must be in range 0-31)
Technician only	
1 001 4567	Single prefix RQS to 001/4567
1 020 4567	Interprefix RQS to 020/4567
PABX	
3 2340	PABX call to Echg=0 Number=1340
4 6666	PABX call to Echg=1 Number=5666
5 6478	PABX call to Echg=2 Number=5478
6 4444	PABX call to Echg=3 Number=3444
02345	PABX call to Exchg & Number=02345
72345	PABX call to Exchg & Number=72345
82345	PABX call to Exchg & Number=82345
PSTN	
0nnnnnnnnnn . . .	PSTN call to nnnnnnnnn... (leading 0 suppressed)