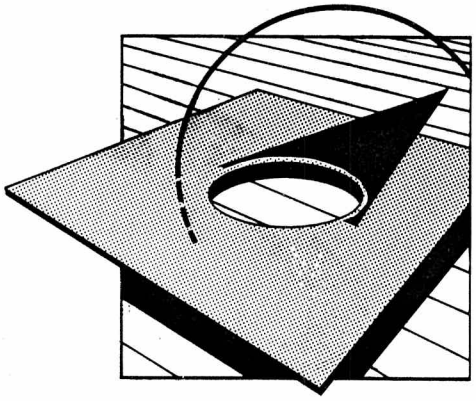
# USER GUIDE FOR

# CQP8000 PROGRAMMER



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# USER GUIDE FOR CQP8000 PROGRAMMER

# INTRODUCTION

The Manual is divided into the following two main parts:

- CQP8000 Features & Options section
- User Guide for CQP8000 Programmer.

The Features and Options section gives a description of the features included as standard in the radio as well as the options available. In addition to the descriptions are listed mutually exclusive options and incompatible options.

Before the second main part is included two different overviews of the features and options. One overview is listed by description and the other is listed by option number.

The second main part is a description of the CQP8000 Field Programming Software with information of the equipment required, equipment setup, system configuration and how to run the program.

In the back of the manual is included an appendix containing different tables and overviews.

# CQP8000 FEATURES AND OPTIONS

# CQP8000 FEATURES AND OPTIONS

## 1. SIGNALLING OVERVIEW

The CQP8000 is a versatile signalling radio with many features. This section gives a brief overview of the features allowing easier reading of the full descriptions given in the following sections.

The CQP8000 Signalling format which is supplied as Standard in all radios is the ZVEI "Select 5" format. Options exist to modify this format to most of those in common use in Europe, or to remove it completely. While these systems are described as "Select 5" as well as 5 tone the CQP8000 allows the signalling to be either single tone or 5, 4, 3 or 2 sequential tones provided that they are taken from one of the "Select 5" tables. Further options permit the use of single tone encode sequences which must be taken from the table of single tone frequencies (Appendix B), which includes over 300 frequencies between 600 and 2800 Hz.
When using "Select 5" formats or single tone signalling it is possible for the radio to store 4 unique codes:

**Decode code** This is the unique "Select 5" 1-5 tone sequence to which the radio will respond when called selectively.

**Sequence A** This encode sequence is generally used as the Unit ID of the radio by which it is identified.

**Sequence B** This encode sequence is generally used to call the base station or other designated control point when required. When the Multicall option is installed it is this sequence which will have variable tones.

**Sequence C** This encode sequence is referred to as the Repeater Access code, used to trigger a hilltop repeater.

There are options available to assign multiple code sequences to both PTT and Call buttons. A further option allows the omission of specific sequences and other facilities on a channel dependent basis. It is possible to arrange for a radio to transmit one "Select 5" sequence on one channel position, another sequence in the second position, both sequences in the third position and none at all on the fourth. Since the channel frequency may change or not this clearly gives considerable flexibility.

Private Line (or CTCSS) may be ordered with "Select 5" but **it is not possible to have both PL Decode and "Select 5" Decode enabled on the same channel**. PL encode and "Select 5" encode can be ordered on the same channel. **Note, however, that this is not simultaneous operation, the PL is turned off during transmission of the "Select 5" codes. You should check overall system operation.**

Other features available with this radio are Time out Timer, Auto Reset, Extended First Tone, Authorisation, Transmitter Inhibit on Busy Channel etc. Most of these options have minor variations and have incompatibilities and requirements both on a per radio and on a per channel basis. It is the purpose of the following section to explain these incompatibilities and requirements.

Chapter 3 lists the features and options in alphabetical order as well as by option number.

# 2. FEATURES

The features are the standard facilities of a radio. They require no further action than to define the five tone sequences for encode and decode and /or the PL tones.

## 2.1. VOLUME ON/OFF

**Description:**

The Volume On/Off switch turns the radio on or off and controls the loudness of the radio audio output.

## 2.2. CHANNEL CAPACITY 2/8

**Description:**

The standard CQP8000 radio is available in two versions with maximum channel capacities of 2 and 8 channels. Where radios are ordered with less than the maximum number of channels programmed the additional channels will be programmed with the same details as the highest channel number ordered. This will include **all** per channel features such as signalling, as well as frequencies.

## 2.3. DECODE SELECT SWITCH

**Description:**

A two position toggle switch used to switch from the receiver coded squelch mode, "Select 5" or PL, to carrier squelch. This may be done either prior to transmitting or to listen to the channel for general monitoring purposes. The switch is inoperative in carrier squelch radios or on carrier squelch channels.

## 2.4. CALL BUTTON

**Description:**

Normally used to send up to two predefined "Select 5" or single tone sequences. The sequence required must be defined using option MDH664AA-AM Call Button Sequences.

With Secret Operation (MDH364) up to 3 sequences are allowed using option MDH664AN Call Button Sequence CBA.

## 2.5. MONITOR BUTTON

**Description:**

Depressing the Monitor Button will cause the radio to unsquelch and noise will be heard from speaker. Release of the monitor button will cause the radio to revert to its initial squelch state. The monitor button is also used to manually reset the "Select 5" coded squelch in the following circumstances:

- After PTT or call button depression and prior to auto reset.
- After "Select 5" decode and before auto reset.

**Note:** The Monitor button is disabled when either
MDH365 - "Transmit inhibit on busy channel" or
MDH364 - "Secret operation with auto reset" are ordered.

## 2.6. 60 SECOND TIME-OUT TIMER (T.O.T.)

**Description:**

Time out timer is used to control air time usage. After 60 seconds of continuous transmission an alert tone will be generated and transmission terminated.The portable operator can recommence transmission by releasing and rekeying the PTT unless option MDH957 -T.O.T. Rekey time is ordered in which case the operator must wait the specified rekey time before depressing the PTT again.

**Note:** T.O.T. is a per radio facility and can be disabled by ordering option MDH781 Omit T.O.T.

## 2.7. ZVEI SIGNALLING FORMAT

**Description:**

The "Select 5" signalling format supplied standard in all radios is ZVEI. Details of all signalling formats are found in section 5.

**Mutually exclusive options:**

**- per radio**

MDH712 - CCIR

MDH745 - EEA

MDH768 - FRENCH MODIFIED ZVEI

MDH737 - 70 ms CCIR

MDH736 - MODIFIED ZVEI

**Incompatible options:**

**- per radio**

MDH809 - Omit 5 tone encode /decode

**Note:** one signalling can be disabled by ordering option MDH809 - Omit 5 tone encode/decode.

## 2.8. ENCODER PRETIME 200 ms

**Description:**

Pretime is the period of unmodulated carrier preceding the transmission of any tone sequence.

Pretimes are required for two purposes:

- To ensure full portable transmit power is reached before tone transmission commences.

- To set up the receiver circuitry of the repeater or receiving radio units to ensure proper decoding.

The standard pretime length is 200 ms however this can be varied from 100 - 1500 ms in 100 ms steps by specifying the required time on STIC 441. Each individual encode sequence will carry the same pretime, thus in multiple tone sequences the specified pretime length becomes the inter-sequence delay.

**Incompatible options:**

**- per radio:**

MDH642 - DECODE ONLY

MDH809 - OMIT 5 TONE ENCODE/DECODE

## 2.9. PTT TRANSMIT

**Description:**

The PTT switch will activate the radio's transmitter circuitry when it is depressed. Upon release of the PTT the radio will be in receive mode.

**Note:** The following options affect the operation of the PTT switch:
MDH365 - TRANSMIT INHIBIT ON BUSY CHANNEL
MDH443 - FORCED MONITOR
MDH364 - SECRET OPERATION WITH AUTORESET

## 2.10. AUTO RESET WITH CARRIER OVERRIDE

**Description:**

Auto reset with carrier override reverts the portable to the selective signalling mode 7 seconds (standard) OR 1-36 Seconds (non-standard) after the absence of a carrier. Detection of a carrier within this period, causes the timer to be reset. Radio transmission by the PTT, Call Button, or Auto Acknowledge will also reset the timer. A momentary depression of the Monitor Button prior to the Auto reset will manually reset the radio to coded squelch mode provided the decode select switch is in the tone squelch mode.

**Mutually exclusive options:**

MDH939 - MANUAL RESET

**Incompatible options:**

**- per radio**

MDH809 - OMIT 5 TONE ENCODE/DECODE

MDH924 - ENCODE ONLY

**Application:**

Auto reset prevents users inadvertently monitoring channel between traffic and missing the call intended for them! It also provides a measure of battery economy since the radio will be longer in the standby mode and less in the full receive mode.

## 2.11. ALERT TONES ENABLED

**Description:**

Alert tones are generated upon decoding an individual or group call code, and through the various PTT and optional keypad operations. The following list indicates the different alert tone frequencies and timings.

| | |
|---|---|
| Individual call decode: | 1640 Hz Interrupted |
| Group call decode: | 1640 Hz Continuous |
| Transmit time out-timer: | 820 Hz Continuous until release of PTT |

**PTT error tones :**

| | |
|---|---|
| TX inhibit: | 820 Hz Continuous until release of PTT |
| Forced monitor: | 820 Hz Continuous until release of PTT |
| TOT rekey time: | 820 Hz Continuous until release of PTT |
| Receive only channel : | 820 Hz Continuous until release of PTT |
| Authorisation not obtained: | 820 Hz Continuous until release of PTT |
| Synthesiser unlock - TX: | 1640 Hz Interrupted |
| Synthesiser unlock - RX: | 1640 Hz Continuous |

**NB:** PTT error tones are also given when the call button is used to transmit a sequence.

**Keypad alert tones :**

| | |
|---|---|
| Keypad key accept tones: | 1640 Hz Continuous until release of key |
| Keypad error tones: | 820 Hz Continuous until release of key |

**Note:** All above alert tones can be omitted by ordering option MDH153 - Omit alert tones.

**Incompatible options:**

**- per radio**

MDH924 - ENCODE ONLY

MDH809 - OMIT 5 TONE ENCODE/DECODE

**- per channel**

STD - PL DECODE

## 2.12. ENCODE SEQUENCES

**Description:**

The encode sequences are the codes which the portable may use to work in radio systems. Three encode sequences are available per radio. The 1-5 Tone or single tone encode sequences are programmed independent of the decode sequence. Up to two sequences may be selected to be transmitted with the call button or the PTT, using MDH664AA-AM Call Button Sequence(s) and/or MDH665AA-AM PTT Sequence(s).
Option MDH631 (omit functions per channel) provides the flexibility of disabling **individual** "Select 5" encode sequences on selected channels (Note: "Select 5" encode **is** available on channels requiring PL encode or decode). Upon encoding a sequence a sidetone will be generated. This sidetone can be disabled using option MDH619 - Omit Sidetones.

**Incompatible options:**

**- per radio**

MDH642 - DECODE ONLY

MDH809 - OMIT 5 TONE ENCODE/DECODE

## 2.13. PL ENCODE /PL DECODE

**Description:**

Enables PL on a per channel basis. A single PL code may be specified for transmit (PL encode) and another PL code for receive (PL decode). However only one PL encode and one PL decode can be assigned to a radio. PL encode **is** compatible with 5 tone encode/ decode (Standard) but PL Decode **cannot** be enabled on the same channel as 5 tone decode.

**Incompatible options**

**- per radio**

* MDH364 - SECRET OPERATION WITH AUTO RESET
* MDH626 - MULTICALL

**Mutually exclusive options:**

**- per channel**

* STD. - DECODE SEQUENCE
* MDH642 - DECODE ONLY
* MDH620 - AUTO ACKNOWLEDGE (A)

MDH741 - Standard GROUP CALL

MDH624 - EXPANDED GROUP CALL

* INCOMPATIBLE WITH PL DECODE

# 3. OPTIONS

The options are the alternative and extra facilities which may be installed as opposed to the standard features of a radio.

## 3.1. MDH712 CCIR SIGNALLING FORMAT

**Description:**

This is an alternative to the standard ZVEI tone signalling format. The tone duration is 100 ms and the frequency table is listed in section 5.1. Only one tone signalling format may be enabled per radio.

**Mutually exclusive options:**

STD ZVEI
MDH745 - EEA
MDH768 - FRENCH MODIFIED ZVEI
MDH737 - 70 ms CCIR
MDH736 - MODIFIED ZVEI

**Incompatible options:**

**- per radio**

MDH809 - OMIT 5 TONE ENCODE/DECODE

## 3.2. MDH745 EEA SIGNALLING FORMAT

**Description:**

This is an alternative to the standard ZVEI tone signalling format. The tone duration is 40 ms and the frequency table is listed in section 5.1. Only one tone signalling format can be enabled per radio.

**Mutually exclusive options:**

STD ZVEI

MDH712 - CCIR

MDH768 - FRENCH MODIFIED ZVEI

MDH737 - 70 ms CCIR

MDH736 - MODIFIED ZVEI

**Incompatible options:**

- per radio

MDH809 - OMIT 5 TONE ENCODE/DECODE

## 3.3. MDH768 FRENCH MODIFIED ZVEI

**Description:**

This is an alternative to the standard ZVEI tone signalling format. The tone duration is 70 ms and the frequency table is listed in section 5.1. Only one tone signalling format can be enabled per radio.

**Mutually exclusive options:**

STD ZVEI
MDH745 - EEA
MDH712 - CCIR
MDH737 - 70 ms CCIR
MDH736 - MODIFIED ZVEI

**Incompatible options:**

**- per radio**

MDH809 - OMIT 5 TONE ENCODE/DECODE

## 3.4. MDH737 70 ms CCIR SIGNALLING FORMAT

**Description:**

This is an alternative to the standard ZVEI tone signalling format. The tone duration is 70 ms and the frequency table is listed in section 5.1. Only one tone signalling format can be enabled per radio.

**Mutually exclusive options:**

STD ZVEI

MDH712 - CCIR

MDH768 - FRENCH MODIFIED ZVEI

MDH745 - EEA

MDH736 - MODIFIED ZVEI

**Incompatible options:**

**- per radio**

MDH809 - OMIT 5 TONE ENCODE/DECODE

## 3.5. MDH736 MODIFIED ZVEI SIGNALLING FORMAT

**Description:**

This is an alternative to the standard ZVEI tone signalling format. The tone duration is 70 ms and the frequency table is listed in section 5.1. Only one tone signalling format can be enabled per radio.

**Mutually exclusive options:**

STD ZVEI

MDH712 - CCIR

MDH768 - FRENCH MODIFIED ZVEI

MDH745 - EEA

MDH737 - 70 ms CCIR.

**Incompatible options:**

**- per radio**

MDH809 - OMIT 5 TONE ENCODE/DECODE

## 3.6. MDH746 EXTENDED FIRST TONE FOR ENCODE SEQUENCES A,B,C AND DECODE SEQUENCE

**Description:**

In "Select 5" signalling systems this option extends the duration of the first tone of the encode or decode sequence. The extended duration can be varied from 100 to 1500 ms in system tone length steps.

**Incompatible options:**

MDH809 - OMIT 5 TONE ENCODE/DECODE

**Extended first tone sequence A**

**Requires one of the following:**

MDH620 - AUTO ACKNOWLEDGE (A)
MDH664 AA - CALL BUTTON SEQUENCES AA
MDH664 AB - CALL BUTTON SEQUENCES BA
MDH664 AC - CALL BUTTON SEQUENCES CA
MDH664 AD - CALL BUTTON SEQUENCES AB
MDH664 AG - CALL BUTTON SEQUENCES AC
MDH664 AK - CALL BUTTON SEQUENCE A
MDH664 AN - CALL BUTTON SEQUENCES CBA

MDH665 AA - PTT SEQUENCES AA
MDH665 AB - PTT SEQUENCES BA
MDH665 AC - PTT SEQUENCES CA
MDH665 AD - PTT SEQUENCES AB
MDH665 AG - PTT SEQUENCES AC
MDH665 AK - PTT SEQUENCE A

**Extended first tone sequence B**

**Requires one of the following:**

MDH664 AB - CALL BUTTON SEQUENCES BA
MDH664 AD - CALL BUTTON SEQUENCES AB
MDH664 AE - CALL BUTTON SEQUENCES BB
MDH664 AF - CALL BUTTON SEQUENCES CB
MDH664 AH - CALL BUTTON SEQUENCES BC
MDH664 AL - CALL BUTTON SEQUENCE B
MDH664 AN - CALL BUTTON SEQUENCES CBA

MDH665 AB - PTT SEQUENCES BA
MDH665 AD - PTT SEQUENCES AB
MDH665 AE - PTT SEQUENCES BB
MDH665 AF - PTT SEQUENCES CB
MDH665 AH - PTT SEQUENCES BC
MDH665 AL - PTT SEQUENCE B

**Extended first tone sequence C**

**Requires one of the following:**

MDH664 AC - CALL BUTTON SEQUENCES CA
MDH664 AF - CALL BUTTON SEQUENCES CB
MDH664 AG - CALL BUTTON SEQUENCES AC
MDH664 AH - CALL BUTTON SEQUENCES BC
MDH664 AJ - CALL BUTTON SEQUENCES CC
MDH664 AM - CALL BUTTON SEQUENCE C
MDH664 AN - CALL BUTTON SEQUENCES CBA

MDH665 AC - PTT SEQUENCES CA
MDH665 AF - PTT SEQUENCES CB
MDH665 AG - PTT SEQUENCES AC
MDH665 AH - PTT SEQUENCES BC
MDH665 AJ - PTT SEQUENCES CC
MDH665 AM - PTT SEQUENCE C

## 3.7. MDH781 OMIT T.O.T.

**Description:**

This option disables the standard 60 second Time-out timer in the radio allowing continuous transmission for as long as the PTT is depressed.

**Incompatible options:**

MDH957 - T.O.T. REKEY TIME

## 3.8. MDH957 T.O.T. REKEY TIME

**Description:**

The Time-out timer Rekey Time option governs the amount of time the radio operator will be prohibited from keying up the radio following time out of the TOT. It is used to further control air-time usage and limit prolonged transmissions. The rekey time is programmable between 3 to 36 seconds in 3 second steps. Upon time out an alert tone is generated until the PTT is released at which time the portable is free to receive incoming transmissions but not to transmit. If the user depresses the PTT during the TOT ReKey time, an 820 Hz alert tone, will be generated and transmission will be inhibited.

**Incompatible options:**

MDH781 - OMIT T.O.T.

## 3.9. MDH939 MANUAL RESET

**Description:**

Manual reset, - reverts the portable to the selective signalling mode only after manual switching of the coded squelch switch or depression of the monitor button or 36 seconds has elapsed.

Contrary to "Auto Reset Carrier Override", (which is Standard - see 5.1.10), detection of carrier does not reset the auto reset timer.

**Mutually exclusive options:**

STD - AUTO RESET CARRIER OVERRIDE

AUTO RESET 7 SECONDS

**Incompatible options:**

**- per radio**

MDH809 - OMIT 5 TONE ENCODE/DECODE

MDH924 - ENCODE ONLY

## 3.10. MDH924 ENCODE ONLY

**Description:**

This option deletes all the Select 5 Decode functions in the radio.

**Mutually exclusive options:**

STD - 5 TONE ENCODE/DECODE

MDH642 - DECODE ONLY

MDH809 - OMIT 5 TONE ENCODE/DECODE

**Incompatible options:**

**- per radio**

STD - AUTO RESET 7 SECONDS

STD - AUTO RESET CARRIER OVERRIDE

STD - DECODE SEQUENCE

MDH741 - STANDARD GROUP CALL

MDH624 - EXPANDED GROUP CALL

* MDH443 - FORCED MONITOR

MDH620 - AUTO ACKNOWLEDGE (A)

* MDH365 - TRANSMIT INHIBIT ON BUSY CHANNEL

MDH364 - SECRET OPERATION WITH AUTO RESET

* Not incompatible if PL decode has been ordered.

## 3.11. MDH642 DECODE ONLY

**Description:**

Deletes all Select 5 Encode functions in the radio.

**Mutually exclusive options:**

STD - 5 TONE ENCODE/DECODE
MDH924 - ENCODE ONLY
MDH809 - OMIT 5 TONE ENCODE/DECODE

**Incompatible options:**

**- per radio**

MDH958 - SEQUENCE ON PTT
MDH960 - SEQUENCE ONCE ON PTT
MDH976 - SEQUENCE UPON DEKEY OF PTT
MDH364 - SECRET OPERATION WITH AUTO RESET
MDH619 - OMIT SIDE TONES
MDH622 - GROUP CALL ENCODE LOCKOUT
MDH623 - EMERGENCY ENCODE LOCKOUT
MDH746 - EXTENDED FIRST TONES SEQUENCES A-C
MDH626 - MULTICALL
MDH621 - OMIT KEYPAD MEMORY
STD - ENCODE PRETIME 200 ms
MDH664AA-AM - CALL BUTTON SEQUENCE(S)
MDH665AA-AM - PTT SEQUENCE(S)

**- per channel**

STD - PL DECODE

## 3.12. MDH809 OMIT 5 TONE ENCODE/DECODE

**Description:**

This option deletes all "Select 5" Encode and Decode functions on the radio. Selection of this option causes the radio to operate in carrier squelch unless PL encode and/or PL decode have been ordered.

**Mutually exclusive options:**

STD - 5 TONE ENCODE/DECODE
MDH924 - ENCODE ONLY
MDH642 - DECODE ONLY

**Incompatible options:**

**- per radio**

STD - ZVEI
STD - DECODE SEQUENCE
STD - AUTO RESET 7 SECONDS
STD - AUTO RESET CARRIER OVERRIDE
STD - ENCODE PRETIME 200 ms
MDH712 - CCIR
MDH745 - EEA
MDH768 - FRENCH MODIFIED ZVEI
MDH737 - 70 ms CCIR
MDH736 - MODIFIED ZVEI
MDH746 - EXTENDED FIRST TONE SEQUENCES A-C
and DECODE SEQUENCE
MDH741 - STANDARD GROUP CALL
MDH624 - EXPANDED GROUP CALL
MDH622 - GROUP CALL ENCODE LOCKOUT

MDH623 - EMERGENCY ENCODE LOCKOUT
MDH958 - SEQUENCE ON PTT
MDH960 - SEQUENCE ONCE FROM PTT
MDH976 - SEQUENCE UPON DEKEY OF PTT
MDH631 - OMIT FUNCTIONS PER CHANNEL
MDH626 - MULTICALL
MDH621 - OMIT KEYPAD MEMORY
MDH620 - AUTO ACKNOWLEDGE (A)
MDH664AA-AM - CALL BUTTON SEQUENCE(S)
MDH665AA-AM - PTT SEQUENCE(S)
MDH364 - SECRET OPERATION
* MDH443 - FORCED MONITOR
MDH619 - OMIT SIDE TONES
* MDH365 - TRANSMIT INHIBIT ON BUSY CHANNEL

* Not incompatible if PL decode has been ordered

## 3.13. MDH443 FORCED MONITOR

**Description:**

With the forced monitor option the portable user is able to transmit only if the radio has been put in carrier squelch by placing the toggle switch in the carrier squelch position. This forces the user to monitor the channel before transmission takes place. Transmission will then be possible **whether activity is present or not**. If the PTT is depressed while in the coded squelch mode, transmission will be inhibited and a 820 Hz alert tone will warn the user for as long as the PTT is depressed.

**Mutually exclusive options:**

STD - PTT TRANSMIT

MDH365 - TRANSMIT INHIBIT ON BUSY CHANNEL

**Incompatible options:**

**- per radio**

* MDH809 - OMIT 5 TONE ENCODE/DECODE
* MDH924 - ENCODE ONLY

MDH364 - SECRET OPERATION WITH AUTO RESET

* Not incompatible if PL decode is present

**Requires one of the following:**

STD - DECODE CODE

**OR** STD - PL DECODE

## 3.14. MDH365 TRANSMIT INHIBIT ON BUSY CHANNEL

**Description:**

This option is operational on "Select 5" or PL coded channels only. Depression of the PTT while carrier is present on "Select 5" channels will cause all transmitter functions to be disabled and a warning tone to be generated for as long as the PTT is depressed. Depression of the PTT when carrier is not present allows transmission. Release of the PTT reverts the radio to the coded squelch mode.

On PL channels transmission is inhibited if carrier is present and the proper PL code is not detected. An alert tone will be generated for as long as the PTT is depressed. If the proper PL is present then depression of the PTT will allow transmission.
The monitor button is disabled with this option.

**Mutually exclusive options:**

STD - PTT TRANSMIT
MDH443 - FORCED MONITOR

**Incompatible options:**

**- per radio**

STD - OPEN SQUELCH MONITOR
* MDH924 - ENCODE ONLY
* MDH809 - OMIT 5 TONE ENCODE/DECODE

* Not incompatible if PL decode is present

**Requires one of the following:**

STD - DECODE CODE
STD - PL DECODE

## 3.15. MDH958 SEQUENCE ON PTT

**Description:**

The SEQUENCE ON PTT option will result in the transmission of the UNIT ID or any other sequence tied to the PTT switch (defined with option MDH665AA-AM ) on every depression of the PTT switch.

**Mutually exclusive options:**

MDH960 - SEQUENCE ONCE FROM PTT

MDH976 - SEQUENCE UPON DEKEY OF PTT

**Incompatible options:**

**- per radio**

MDH642 - DECODE ONLY

MDH809 - OMIT 5 TONE ENCODE/DECODE

**Requires one of the following:**

MDH665AA-AM - PTT SEQUENCE(S)

## 3.16. MDH960 SEQUENCE ONCE FROM PTT

**Description:**

This option will result in the transmission of the UNIT ID **or** any other sequence tied to the PTT switch (defined with MDH665AA-AM ) only upon the 'first' depression of the PTT switch. Any subsequent PTT activation will cause the radio to transmit **without** the sequence(s) **until** the radio coded squelch has been reset by:

- Depression of the Monitor Button and/or decode select switch or,
- The auto reset time elapses (Section 2.10).

**Mutually exclusive options:**

MDH958 - SEQUENCE ON PTT

MDH976 - SEQUENCE UPON DEKEY OF PTT

**Incompatible options:**

**- per radio**

MDH642 - DECODE ONLY

MDH809 - OMIT 5 TONE ENCODE/DECODE

**Requires one of the following:**

MDH665 AA-AM - PTT SEQUENCE(S)

STD - DECODE SEQUENCE

## 3.17. MDH976 SEQUENCE UPON DEKEY OF PTT

**Description:**

SEQUENCE UPON DEKEY OF PTT will cause transmission of the UNIT ID or any other sequence tied to the PTT (defined with MDH665AA-AM ) to occur every time the PTT is released thus causing it to be sent at the end of the transmission.

**Mutually exclusive options:**

MDH958 - SEQUENCE ON PTT

MDH960 - SEQUENCE ONCE FROM PTT

**Incompatible options:**

**- per radio**

MDH642 - DECODE ONLY

MDH809 - OMIT 5 TONE ENCODE/DECODE

MDH364 - SECRET OPERATION WITH AUTO RESET

**Requires one of the following:**

MDH665AA-AM - PTT SEQUENCE(S)

## 3.18. MDH620 AUTO ACKNOWLEDGE (A)

**Description:**

Every time an individual call sequence is decoded the radio will respond with a preprogrammed 1 - 5 tone acknowledge code to the calling party to assure that the transmission was received. The code transmitted for AUTO ACKNOWLEDGE will be Sequence A. Alternatively, Sequence A can be a single tone.

AUTO ACKNOWLEDGE (A) is enabled per radio and can be omitted per channel by using option MDH631 - Omit functions per channel - Omit Auto acknowledge.

**Incompatible options:**

**- per radio**

MDH924 - ENCODE ONLY

MDH809 - OMIT 5 TONE ENCODE/DECODE

**- per channel**

STD - PL DECODE

## 3.19. MDH364 SECRET OPERATION WITH AUTO RESET

**Description:**

The purpose of SECRET OPERATION is to prevent the user from being able to transmit a voice message or monitor the channel unless permission has been granted from the base. Up to 3 encode sequences (any of the MDH664 options) can be sent from the call button of the portable for the purpose of transmitting the authorisation request code. Upon release of the call button, the radio will revert to carrier squelch for a fixed, non-resettable period of 2 seconds. This will enable the user to hear an acknowledgement tone from the base. Immediately following this period the radio will return to the coded squelch mode.

Transmission of tones or voice by depressing the PTT will be not be allowed, (indicated by generation of a 820 Hz alert tone for as long as the PTT is depressed), until authorisation has been received. Upon receipt of an individual call from the base for authorisation, the radio will generate an alert tone and will revert to carrier squelch until it is reset. Having received authorisation PTT sequences can be transmitted in the usual manner.

(If MDH664AN Call Button Sequence CBA has been ordered as the Authorisation request then use of the call button **after** authorisation has been received will cause transmission of sequence BA only.)

The Monitor button and coded squelch switch are disabled with this option.

**Incompatible options:**

**- per radio**

MDH642 - DECODE ONLY

MDH809 - OMIT 5 TONE ENCODE/DECODE

MDH924 - ENCODE ONLY

MDH443 - FORCED MONITOR

**- per channel:**

STD - PL DECODE

MDH976 - SEQUENCE UPON DEKEY OF PTT

MDH620 - AUTO ACKNOWLEDGE (A)

**Requires one of the following:**

MDH664AA - MDH664AN CALL BUTTON SEQUENCES **AND**
STD.-DECODE CODE

## 3.20. MDH741 STANDARD GROUP CALL

**Description:**

GROUP CALL decode allows a number of portables to be simultaneously called as a group, this is in addition to the individual call function. The GROUP CALL tone can be any digit from 0 to 9 or G. Note G is standard. The GROUP CALL digit selected must not be used in **any** position of the radio's individual decode code. For example if the GROUP CALL digit is '9' then decode code '12349' would be invalid. (This limits the number of individual decode codes to 9X9X9X9X9 = 59049.)

With **STANDARD GROUP CALL**, an alternating sequence of Group Call tone, Repeat tone and Group Call tone will occur automatically upon decoding the first Group Call tone.

Group call equipped units can belong to a maximum of five groups, the size of these groups being determined by the position of the group call digits. The example below explains this:

In this example Unit 1 belongs to three groups, the other units have not been enabled for group call decode. '0' has been selected as Group Call type digit. If the last five digits of the individual call are 12345 then the following demonstrates the valid group calls:

| | | | | | |
|---|---|---|---|---|---|
| Individual call: | 1 | 2 | 3 | 4 | 5 |
| Selected Group Level: | - | X | - | X | X |
| Valid Group Calls: | 1 | 0 | R | 0 | R |
| | 1 | 2 | 3 | 0 | R |
| | 1 | 2 | 3 | 4 | 0 |

Where 'R' = Repeat Tone

**Mutually exclusive options:**

MDH624 - EXPANDED GROUP CALL

**Incompatible options:**

**- per radio**

MDH924 - ENCODE ONLY

MDH809 - OMIT 5 TONE ENCODE/DECODE

**- per channel**

STD - PL DECODE

**Requires one of the following:**

STD - DECODE CODE

## 3.21. MDH624 EXPANDED GROUP CALL

**Description:**

This option also allows the decoder to accept the group call tone in any number of non-contiguous positions in the code. With **EXPANDED GROUP CALL**, upon detection of a Group call tone the following tone may be either **the valid** individual tone or (**only** if group call is enabled for the next tone) the Repeat tone. EXPANDED GROUP CALL provides more flexibility in selectively grouping and sub-grouping radios in a system. GROUP CALL and the group call levels are enabled per radio. Group call equipped units can belong to a maximum of five groups, the size of these groups being determined by the position of the group call digits. The example below explains this:

In this example Unit 1 has the capability of decoding a Group Call Tone or an individual call on the second, fourth and fifth digit. The other units have not been enabled for group call decode. '0' has been selected as Group Call type digit. If the last five digits of the individual call are 12345 then the following demonstrates the valid group calls:

| | | | | | |
|---|---|---|---|---|---|
| Individual call: | 1 | 2 | 3 | 4 | 5 |
| Selected Group Level: | - | X | - | X | X |
| Valid Group Calls: | 1 | 0 | 3 | 0 | R |
| | 1 | 0 | 3 | 0 | 5 |
| | 1 | 0 | 3 | 4 | 0 |
| | 1 | 0 | 3 | 4 | 5 |
| | 1 | 2 | 3 | 0 | 5 |
| | 1 | 2 | 3 | 4 | 0 |
| | 1 | 2 | 3 | 0 | R |

Where 'R' = Repeat Tone

**Mutually exclusive options:**

MDH741 - STANDARD GROUP CALL

**Incompatible options:**

**- per radio**

MDH924 - ENCODE ONLY

MDH809 - OMIT 5 TONE ENCODE/DECODE

**- per channel**

STD - PL DECODE

**Requires one of the following:**

STD - DECODE CODE

## 3.22. MDH622 GROUP CALL ENCODE LOCKOUT

**Description:**

Prevents one specific digit between 0 and 9 from being entered via the keypad during Multicall operation.

**Incompatible options:**

MDH642 - DECODE ONLY
MDH809 - OMIT 5 TONE ENCODE/DECODE
MDH297 - DTMF INTERCONNECT

**Requires one of the following:**

MDH626 - MULTICALL

## 3.23. MDH623 EMERGENCY ENCODE LOCKOUT

**Description:**

Prevents the user from entering one **specific** digit in one **specific** variable tone position during Multicall operation to safeguard against accidentally transmitting a call which would be recognised by the system as an emergency. The use of a "9" in the first digit position is a common practice. The digit and position are defined per radio.

**Incompatible options:**

MDH642 - DECODE ONLY
MDH809 - OMIT 5 TONE ENCODE/DECODE
MDH297 - DTMF INTERCONNECT

**Requires one of the following:**

MDH626 - MULTICALL

## 3.24. MDH664AA-AM CALL BUTTON SEQUENCE(S)

**Description:**

These options define the order and type of signalling sequence(s) that will be transmitted by using the Call Button. Upon depression of the Call Button, the designated sequence is transmitted immediately following the encoder pretime. If more than one sequence is designated then each sequence is separated by an inter-sequence delay which is equal to the Pretime. It is possible to delete one or more tone sequences on a per channel basis using option MDH631 - Omit Functions per Channel.

**Options available per radio :**

**NB: Only one of the following per radio**

MDH664AA - CALL BUTTON SEQUENCES AA
MDH664AB - CALL BUTTON SEQUENCES BA
MDH664AC - CALL BUTTON SEQUENCES CA
MDH664AD - CALL BUTTON SEQUENCES AB
MDH664AE - CALL BUTTON SEQUENCES BB
MDH664AF - CALL BUTTON SEQUENCES CB
MDH664AG - CALL BUTTON SEQUENCES AC
MDH664AH - CALL BUTTON SEQUENCES BC
MDH664AJ - CALL BUTTON SEQUENCES CC
MDH664AK - CALL BUTTON SEQUENCE A
MDH664AL - CALL BUTTON SEQUENCE B
MDH664AM - CALL BUTTON SEQUENCE C

**Mutually exclusive options:**

**- per radio**

MDH664AN - CALL BUTTON SEQUENCES CBA

**Incompatible options:**

MDH642 - DECODE ONLY

MDH809 - OMIT 5 TONE ENCODE/DECODE

## 3.25. MDH664AN CALL BUTTON SEQUENCES CBA

**Description:**

Call Button sequences CBA can only be used with MDH364 - Secret Operation. It defines the order of the 1 - 5 tone sequences or single tones which will be transmitted upon depression of the call button for authorisation request. Upon depression of the call button and after an encode pretime, sequence C is transmitted followed by sequence B followed by sequence A.

Once authorisation has been received depression of the call button will result ONLY in the transmission of sequence B followed by sequence A.

All sequences are separated by an inter-sequence delay which is equal to the Pretime.

**Mutually exclusive options:**

- per radio

MDH664AA - CALL BUTTON SEQUENCES AA
MDH664AB - CALL BUTTON SEQUENCES BA
MDH664AC - CALL BUTTON SEQUENCES CA
MDH664AD - CALL BUTTON SEQUENCES AB
MDH664AE - CALL BUTTON SEQUENCES BB
MDH664AF - CALL BUTTON SEQUENCES CB
MDH664AG - CALL BUTTON SEQUENCES AC
MDH664AH - CALL BUTTON SEQUENCES BC
MDH664AJ - CALL BUTTON SEQUENCES CC
MDH664AK - CALL BUTTON SEQUENCE A
MDH664AL - CALL BUTTON SEQUENCE B
MDH664AM - CALL BUTTON SEQUENCE C

**Incompatible options:**

MDH642 - DECODE ONLY

MDH809 - OMIT 5 TONE ENCODE/DECODE

**Requires one of the following:**

MDH364 - SECRET OPERATION WITH AUTO RESET

## 3.26. MDH665AA-AM PTT SEQUENCE (S)

**Description:**

These options define the order and type of signalling sequence(s) that will be transmitted by using the PTT switch. Upon depression of the PTT, the designated sequence is transmitted immediately following the encoder pretime. If more than one sequence is designated then each sequence is separated by an inter-sequence delay which is equal to the Pretime. It is possible to delete one or more tone sequences on a per channel basis using option MDH631 - Omit Functions per Channel.

**Options available per radio :**

**NB: Only one of the following per radio**

MDH665AA - PTT SEQUENCES AA
MDH665AB - PTT SEQUENCES BA
MDH665AC - PTT SEQUENCES CA
MDH665AD - PTT SEQUENCES AB
MDH665AE - PTT SEQUENCES BB
MDH665AF - PTT SEQUENCES CB
MDH665AG - PTT SEQUENCES AC
MDH665AH - PTT SEQUENCES BC
MDH665AJ - PTT SEQUENCES CC
MDH665AK - PTT SEQUENCE A
MDH665AL - PTT SEQUENCE B
MDH665AM - PTT SEQUENCE C

**Incompatible options:**

MDH642 - DECODE ONLY
MDH809 - OMIT 5 TONE ENCODE/DECODE

## 3.27. MDH626 MULTICALL (100,000)

**Description:**

MULTICALL 100,000 provides the capability of selectively calling up to 100,000 other portables or mobiles in the system. Up to five digits in the call code, Sequence B, may be pre-programmed as variable. A 3 X 4 keypad, (0-9, # & *) is used to enter the variable digits. An initial depression of the '#' will clear the keypad memory and allow new digits to be entered. All predefined variable positions must be replaced by a numeric keypad entry otherwise transmission of the Multicall sequence will not be allowed and an error tone will be generated. Once the appropriate number of digits have been entered, depression of the Send key '*' will cause the Multicall encode sequence to be transmitted. The Multicall encode sequence can also be transmitted with a depression of the call button and/or the PTT if options MDH664 (Call Button Sequences) and/or MDH665 (PTT Sequences) containing sequence B are ordered. Any other sequences preprogrammed to these two controls will also be transmitted. Once the Multicall sequence has been entered, it will remain in memory until the radio is turned off or another sequence is entered unless option MDH621 - OMIT KEYPAD MEMORY is ordered. Option MDH621 erases the keypad memory when a channel change is made.

**Multicall code entry:**

To modify the preprogrammed call code (enter a multicall code):

- Press #, to initiate the entry and clear the memory of any previously entered code.

- Enter the Multicall code by depressing the proper keypad digits. Digits are entered from left to right in the encode sequence.

- Depress either the call button or the PTT switch to transmit the mulitcall code, along with any other sequences programmed to that key.

- Depress the * (send) key to transmit only the multicall code.

**Note:**

With an improper code sequence entry ( not enough digits or invalid digits), depressing any of the transmit buttons (Call button, PTT switch or * key) results in the generation of an error tone for as long as the button is depressed, and transmission of all codes is suppressed.

With an improper code sequence entry ( too many digits), an error tone is emitted each time a keypad entry is made over and above the predetermined number or variable code digits. Those digits are suppressed and not entered into the multicall sequence. Transmitting the multicall code is normal operation.

**Keypad disable:**

The keypad activation / deactivation button (pen switch) prevents inadvertant key activation. Each time the radio is turned on, the keypad is automatically enabled. The keypad can be disabled by momentarily depressing the recessed pen switch button, and an accept tone will be generated. Re-enable the keypad by depressing the pen switch button a second time, and the accept tone will be generated again.

**Hardware changes:**

A 3 x 4 keypad cover replaces the standard front cover.

**Incompatible options:**

**- per radio**

STD - PL DECODE

MDH642 - DECODE ONLY

MDH809 - OMIT 5 TONE ENCODE/DECODE

MDH297 - DTMF INTERCONNECT

**Requires one of the following:**

MDH664AB - CALL BUTTON SEQUENCES BA

MDH664AD - CALL BUTTON SEQUENCES AB

MDH664AE - CALL BUTTON SEQUENCES BB

MDH664AF - CALL BUTTON SEQUENCES CB

MDH664AH - CALL BUTTON SEQUENCES BC

MDH664AL - CALL BUTTON SEQUENCE B

MDH664AN - CALL BUTTON SEQUENCES CBA

MDH665AB - PTT SEQUENCES BA

MDH665AD - PTT SEQUENCES AB

MDH665AE - PTT SEQUENCES BB

MDH665AF - PTT SEQUENCES CB

MDH665AH - PTT SEQUENCES BC

MDH665AL - PTT SEQUENCE B

## 3.28. MDH621 OMIT KEYPAD MEMORY

**Description:**

Deletes the Multicall keypad inputs from memory when a channel change is made.

**Incompatible options:**

**- per radio**

MDH297 - DTMF INTERCONNECT

**Requires one of the following:**

MDH626 - MULTICALL

## 3.29. MDH359 CHANNEL BUSY LED

**Description:**

A flashing green LED is used to indicate that a carrier is present on the receive channel. Absence of the flashing LED signifies a clear channel.

## 3.30. MDH619 OMIT SIDE TONES

**Description:**

This option omits the audible tones which are normally heard through the speaker whenever an encode sequence is being transmitted.

**Mutually exclusive options:**

STD - SIDE TONES ENABLED

**Incompatible options:**

**- per radio**

MDH642 - DECODE ONLY *

MDH809 - OMIT 5 TONE ENCODE/DECODE

* Note: not incompatible with Auto Acknowledge (A)

## 3.31. MDH153 OMIT ALERT TONES

**Description:**

This option omits the general alert tones which are normally generated upon decoding an individual or group call code, and through the various PTT and optional keypad operations.

**Mutually exclusive options:**

STD.-ALERT TONES ENABLED

The following list indicates the different alert tones, and their frequencies and timings, which are disabled by this option.

| | |
|---|---|
| Individual call decode: | 1640 Hz Interrupted |
| Group call decode: | 1640 Hz Continuous |
| Transmit time out-timer: | 820 Hz Continuous until release of PTT |

**PTT error tones :**

| | |
|---|---|
| TX inhibit: | 820 Hz Continuous until release of PTT |
| Forced monitor: | 820 Hz Continuous until release of PTT |
| TOT rekey time: | 820 Hz Continuous until release of PTT |
| Receive only channel : | 820 Hz Continuous until release of PTT |
| Authorisation not obtained: | 820 Hz Continuous until release of PTT |
| Synthesiser unlock - TX: | 1640 Hz Interrupted |
| Synthesiser unlock - RX: | 1640 Hz Continuous |

**NB:** PTT error tones are also given when the call button is used to transmit a sequence.

**Keypad alert tones :**

| | |
|---|---|
| Keypad key accept tones: | 1640 Hz Continuous until release of key |
| Keypad error tones: | 820 Hz Continuous until release of key |

## 3.32. MDH297 DTMF INTERCONNECT

**Description:**

The DTMF feature enables the user to manually encode Dual Tone Multi-Frequency (DTMF) tones and access a local telephone network .

Additional features include a 9 memory location each able to store up to 16 characters, last number redial memory, and a scatchpad memory.

**Hardware changes:**

A 3 x 4 Keypad cover replaces the standard cover.

**Incompatible options:**

MDH622 - GROUP CALL ENCODE LOCKOUT
MDH623 - EMERGENCY ENCODE LOCKOUT
MDH626 - MULTICALL
MDH621 - OMIT KEYPAD MEMORY

## 3.33. MDH690 20 kHz CHANNEL SPACING

**Description:**

This option will factory tune **25 kHz** channel spacing radios to 20 kHz channel spacing by reducing the transmitter deviation.

## 3.34. MDH631 OMIT FUNCTIONS PER CHANNEL

This option allows the deletion of certain parameters on a per channel basis. Clearly functions cannot be omitted per channel unless they are first enabled per radio! The following sub-sections describe in detail the six parameters which may be disabled and their compatibility requirements.

### 3.34.1. MDH631 Omit Functions per Channel: Sequence (A)

**Description:**

This option omits Sequence A from the tone sequences transmitted through any control button on selected channels. When Sequence A is concatenated with Sequence B, and/or Sequence C, then **only** Sequence A is omitted.

**Requires one of the following:**

MDH664AA - CALL BUTTON SEQUENCES AA
MDH664AB - CALL BUTTON SEQUENCES BA
MDH664AC - CALL BUTTON SEQUENCES CA
MDH664AD - CALL BUTTON SEQUENCES AB
MDH664AG - CALL BUTTON SEQUENCES AC
MDH664AK - CALL BUTTON SEQUENCE A
MDH664AN - CALL BUTTON SEQUENCES CBA
MDH665AA - PTT SEQUENCES AA
MDH665AB - PTT SEQUENCES BA
MDH665AC - PTT SEQUENCES CA
MDH665AD - PTT SEQUENCES AB
MDH665AG - PTT SEQUENCES AC
MDH665AK - PTT SEQUENCE A

### 3.34.2. MDH631 Omit Functions per channel: Sequence (B)

**Description:**

This option omits Sequence B from the tone sequences transmitted through any control button on selected channels. When Sequence B is concatenated with Sequence A, and/or Sequence C, then **only** Sequence B is omitted.

**Requires one of the following:**

MDH664AB - CALL BUTTON SEQUENCES BA
MDH664AD - CALL BUTTON SEQUENCES AB
MDH664AE - CALL BUTTON SEQUENCES BB
MDH664AF - CALL BUTTON SEQUENCES CB
MDH664AH - CALL BUTTON SEQUENCES BC
MDH664AL - CALL BUTTON SEQUENCE B
MDH664AN - CALL BUTTON SEQUENCES CBA

MDH665AB - PTT SEQUENCES BA
MDH665AD - PTT SEQUENCES AB
MDH665AE - PTT SEQUENCES BB
MDH665AF - PTT SEQUENCES CB
MDH665AH - PTT SEQUENCES BC
MDH665AL - PTT SEQUENCE B

### 3.34.3. MDH631 Omit Functions per Channel: Sequence (C)

**Description:**

This option omits Sequence C from the tone sequences transmitted through any control button on selected channels. When Sequence C is concatenated with Sequence A, and/or Sequence B, then **only** Sequence C is omitted.

**Requires one of the following:**

MDH664AC - CALL BUTTON SEQUENCES CA
MDH664AF - CALL BUTTON SEQUENCES CB
MDH664AG - CALL BUTTON SEQUENCES AC
MDH664AH - CALL BUTTON SEQUENCES BC
MDH664AJ - CALL BUTTON SEQUENCES CC
MDH664AM - CALL BUTTON SEQUENCE C
MDH664AN - CALL BUTTON SEQUENCES CBA

MDH665AC - PTT SEQUENCES CA
MDH665AF - PTT SEQUENCES CB
MDH665AG - PTT SEQUENCES AC
MDH665AH - PTT SEQUENCES BC
MDH665AJ - PTT SEQUENCES CC
MDH665AM - PTT SEQUENCE C

### 3.34.4. MDH631 Omit Functions per Channel: Multicall

**Description:**

This option omits MULTICALL on a per channel basis.

**Requires one of the following:**

MDH626 - MULTICALL

### 3.34.5. MDH631 Omit Functions per Channel: Auto Acknowledge

**Description:**

This option omits AUTO ACKNOWLEDGE (SEQUENCE A) on a per channel basis. It does not effect Sequence A encode functions.

**Requires one of the following:**

MDH620 - AUTO ACKNOWLEDGE (A)

### 3.34.6. MDH631 Omit Functions per Channel: 5 Tone Decode Code

**Description:**

This option disables the "Select 5" selective call decode functions on a per channel basis. This includes Group call and Auto-acknowledge.

**Requires one of the following:**

STD - DECODE CODE

# 4. BATTERY/CARRYING CASE AND ANTENNA OPTIONS

## 4.1. STANDARD HARDWARE

The radio package supplied as Standard contains the following:

| | |
|---|---|
| Radio: | Complete with Operating Instructions and packaging. |
| Battery: | Regular rate according to radio power |
| Antenna: | VHF - Heliflex |
| | UHF - Flexible Whip |
| User guide: | English, German, French, Danish, Swedish |

Options are available which will delete or modify these Standard accessories and these are listed in the following pages.

## 4.2. BATTERIES

The following table details the standard battery supplied and the battery options available for each of the CQP8000 models by power and frequency band, together with the kit numbers. It also identifies the correct leather case size required and the kit numbers. Although automatically taken care of with packaged models, this information will be necessary when ordering additional batteries or cases at the time of purchase or later for spares. A brief description of each of the available battery options follows. Note that the radio is the same size for all channel capacities, bands and power ratings.

Only one battery can be supplied with a package model therefore **all** battery options are mutually exclusive. Where additional batteries or carrying aids are required they must be ordered separately.

| RADIO | | STANDARD RATE | | RAPID RATE | | ALKALINE |
|---|---|---|---|---|---|---|
| **BAND** | **POWER** | **500mAh NTN5046** | **900mAh NTN5048** | **500mAh NTN5047** | **900mAh NTN5049** | **1700mAh NTN4870** |
| VHF | 1 W | STD | MDH225 | MDH224 | MDH226 | MDH203 |
| | 2 W | STD | MDH225 | MDH224 | MDH226 | MDH203 |
| | 5 W | MDH221 | STD | MDH224 | MDH226 | N/A |
| UHF | 1 W | STD | MDH225 | MDH224 | MDH226 | MDH203 |
| | 2 W | STD | MDH225 | MDH224 | MDH226 | MDH203 |
| | 4 W | MDH221 | STD | MDH224 | MDH226 | N/A |
| Leather Case | STD | ● | | ● | | ● |
| | Large | | ● | | ● | |
| Swivel Leather Case | | | | | | |

### 4.2.1. MDH221 Medium Capacity Regular Rate Battery

**Description:**

This option deletes the standard battery and supplies the 500 mAh medium capacity (regular rate) battery.

**Mutually exclusive options:**

MDH224 - MED CAPACITY RAPID RATE BATTERY (500 mAh)
MDH225 - HIGH CAPACITY REGULAR RATE BATTERY (900 mAh)
MDH226 - HIGH CAPACITY RAPID RATE BATTERY (900 mAh)
MDH203 - ALKALINE BATTERY
MDH236 - HIGH CAPACITY FACTORY MUTUAL BATTERY
MDH753 - MED CAPACITY FACTORY MUTUAL BATTERY

**Case size:** Standard

### 4.2.2. MDH224 Medium Capacity Rapid Rate Battery

**Description:**

This option deletes the standard battery and supplies the 500 mAh capacity (rapid rate) battery.

**Mutually exclusive options:**

MDH221 - MED CAPACITY REGULAR RATE BATTERY (500mAh)
MDH225 - HIGH CAPACITY REGULAR RATE BATTERY (900 mAh)
MDH226 - HIGH CAPACITY RAPID RATE BATTERY (900 mAh)
MDH203 - ALKALINE BATTERY
MDH236 - HIGH CAPACITY FACTORY MUTUAL BATTERY
MDH753 - MED CAPACITY FACTORY MUTUAL BATTERY

**Applicable models:** CQP8000 ALL MODELS
**Case size:** Standard

### 4.2.3. MDH225 High Capacity Regular Rate Battery

**Description:**

This option deletes the standard battery and supplies the 900 mAh high capacity (regular rate) battery.

**Mutually exclusive options:**

MDH221 - MED CAPACITY REGULAR RATE BATTERY (500 mAh)
MDH224 - MED CAPACITY RAPID RATE BATTERY (500 mAh)
MDH226 - HIGH CAPACITY RAPID RATE BATTERY (900 mAh)
MDH203 - ALKALINE BATTERY
MDH236 - HIGH CAPACITY FACTORY MUTUAL BATTERY
MDH753 - MED CAPACITY FACTORY MUTUAL BATTERY

**Case size:** Large.

### 4.2.4. MDH226 High Capacity Rapid Rate Battery

**Description:**

This option deletes the standard battery and supplies the 900 mAh high capacity (rapid rate) battery.

**Mutually exclusive options:**

MDH221 - MED CAPACITY REGULAR RATE BATTERY (500 mAh)
MDH224 - MED CAPACITY RAPID RATE BATTERY (500 mAh)
MDH225 - HIGH CAPACITY REGULAR RATE BATTERY (900 mAh)
MDH203 - ALKALINE BATTERY
MDH236 - HIGH CAPACITY FACTORY MUTUAL BATTERY
MDH753 - MED CAPACITY FACTORY MUTUAL BATTERY

**Case size:** Large

## 4.2.5. MDH203 Alkaline Battery

**Description:**

This option deletes the 500 mAh (regular rate) standard battery and supplies the 1700 mAh alkaline battery which is suitable for the 1W & 2W models only.

N.B. This is a primary cell and no attempt must be made to recharge it.

**Mutually exclusive options:**

MDH221 - MED CAPACITY REGULAR RATE BATTERY (500 mAh)
MDH224 - MED CAPACITY RAPID RATE BATTERY (500 mAh)
MDH225 - HIGH CAPACITY REGULAR RATE BATTERY (900 mAh)
MDH226 - HIGH CAPACITY RAPID RATE BATTERY (900 mAh)
MDH236 - HIGH CAPACITY FACTORY MUTUAL BATTERY
MDH753 - MED CAPACITY FACTORY MUTUAL BATTERY

**Applicable models:** CQP8000 1 & 2 WATT MODELS
**Case size:** Standard

## 4.2.6. MDH753 Medium Capacity Battery FM Approved

**Description:**

Medium capacity nickel cadmium battery 500 mAh, FM approved, normally used on low power radios.

**Hardware changes:**

Replaces standard nickel cadmium battery with FM approved 500 mAH battery and Intrinsically Safe label.

**Mutually exclusive options:**

MDH221 - MED CAPACITY REGULAR RATE BATTERY (500 mAh)
MDH224 - MED CAPACITY RAPID RATE BATTERY (500 mAh)
MDH225 - HIGH CAPACITY REGULAR RATE BATTERY (900 mAh)
MDH226 - HIGH CAPACITY RAPID RATE BATTERY (900 mAh)
MDH203 - ALKALINE BATTERY
MDH236 - HIGH CAPACITY FACTORY MUTUAL BATTERY

**Applicable models:** CQP8000 1 & 2 WATT MODELS
**Case size:** Standard

### 4.2.7. MDH236 High Capacity Battery FM Approved

**Description:**

High capacity nickel cadmium battery, 900 mAh, FM approved.

**Hardware changes:**

Replaces standard nickel cadmium battery with FM approved 900 mAh battery and Intrinsically safe label.

**Mutually exclusive options:**

MDH221 - MED CAPACITY REGULAR RATE BATTERY (500 mAh)
MDH224 - MED CAPACITY RAPID RATE BATTERY (500 mAh)
MDH225 - HIGH CAPACITY REGULAR RATE BATTERY (900 mAh)
MDH226 - HIGH CAPACITY RAPID RATE BATTERY (900 mAh)
MDH203 - ALKALINE BATTERY
MDH753 - MED CAPACITY FACTORY MUTUAL BATTERY

**Applicable models:** CQP8000 4 & 5 WATT MODELS
**Case size:** Large

### 4.3. MDH112 OMIT ANTENNA

**Description:**

This option omits the standard antenna from both UHF and VHF models.

**Mutually exclusive options:**

MDH124 - HELIFLEX ANTENNA (UHF ONLY)

## 4.4. MDH124 HELIFLEX ANTENNA (UHF ONLY)

**Description:**

This option replaces the standard flexible whip antenna on UHF radios with a heliflex UHF antenna.

**Applicable models:** CQP8000 UHF

**Mutually exclusive options:**

MDH112 - OMIT ANTENNA

## 4.5. MDH312 LEATHER CARRY CASE & T-STRAP

**Motorola option, not Storno branded**

**Description:**

This option replaces the standard belt clip carry holder with a leather case of the correct size according to the battery option chosen, see table 5.1. A packing piece is included where necessary to ensure that the chosen radio / battery combination is properly housed.

**Mutually exclusive options:**

MDH315 - BELT CLIP OPTION

MDH317 - OMIT BELT CLIP CARRY HOLDER OPTION

MDH319 - LEATHER SWIVEL CARRY CASE & T-STRAP

MDH334 - LANYARD

## 4.6. MDH319 LEATHER SWIVEL CARRY CASE & T-STRAP

**Motorola option, not Storno branded**

**Description:**

This option replaces the standard belt clip carry holder with the swivel leather case of the correct size according to the battery option chosen, see table 5.1. A packing piece is included where necessary to ensure that the chosen radio / battery combination is properly housed.

**Mutually exclusive options:**

MDH312 - LEATHER CARRY CASE & T-STRAP
MDH315 - BELT CLIP OPTION
MDH317 - OMIT BELT CLIP CARRY HOLDER OPTION
MDH334 - LANYARD

## 4.7. MDH317 OMIT BELT CLIP CARRY HOLDER OPTION

**Motorola option**

**Description:**

This option omits the standard carry holder and does not replace it with an alternative.

**Mutually exclusive options:**

MDH312 - LEATHER CARRY CASE & T-STRAP
MDH315 - BELT CLIP OPTION
MDH319 - LEATHER SWIVEL CARRY CASE & T-STRAP
MDH334 - LANYARD

## 4.8. MDH315 BELT CLIP OPTION

**Description:**

This option adds a 2.5" belt clip which attaches to the back housing of the radio by means of two of the existing screws.

**Mutually exclusive options:**

MDH312 - LEATHER CARRY CASE & T-STRAP
MDH317 - OMIT BELT CLIP CARRY HOLDER OPTION
MDH319 - LEATHER SWIVEL CARRY CASE & T-STRAP
MDH334 - LANYARD

## 4.9. MDH334 LANYARD

**Description:**

This option adds a loop of nylon cord which attaches to the back housing of the radio by means of two of the existing screws.

**Mutually exclusive options:**

MDH312 - LEATHER CARRY CASE & T-STRAP
MDH315 - BELT CLIP OPTION
MDH317 - OMIT BELT CLIP CARRY HOLDER OPTION
MDH319 - LEATHER SWIVEL CARRY CASE & T-STRAP

# 5. FREQUENCY TABLES

## 5.1. SELECT 5 SIGNALLING FORMATS

| OPTION: | STD | MDH768 | MDH736 | MDH712 | MDH745 | MDH737 |
|---|---|---|---|---|---|---|

| TONE NUMBER | ZVEI | FRENCH Mod.ZVEI | MODIFIED ZVEI | CCIR | EEA | 70 ms CCIR |
|---|---|---|---|---|---|---|
| | Hz | Hz | Hz | Hz | Hz | Hz |
| 1 | 1060 | 1060 | 970 | 1124 | 1124 | 1124 |
| 2 | 1060 | 1160 | 1060 | 1197 | 1197 | 1197 |
| 3 | 1270 | 1270 | 1160 | 1275 | 1275 | 1275 |
| 4 | 1400 | 1400 | 1270 | 1358 | 1358 | 1358 |
| 5 | 1530 | 1530 | 1400 | 1446 | 1446 | 1446 |
| 6 | 1670 | 1670 | 1530 | 1540 | 1540 | 1540 |
| 7 | 1830 | 1830 | 1670 | 1640 | 1640 | 1640 |
| 8 | 2000 | 2000 | 1830 | 1747 | 1747 | 1747 |
| 9 | 2200 | 2200 | 2000 | 1860 | 1860 | 1860 |
| 0 | 2400* | 2400* | 2200* | 1981* | 1981 | 1981* |
| G | 2800 | 885 | 885 | 2400 | 1055 | 2400 |
| R | 2600 | 970 | 2400 | 2110 | 2110 | 2110 |

| DURATION | 70 ms | 70 ms | 70 ms | 100 ms | 40 ms | 70 ms |
|---|---|---|---|---|---|---|

*ALSO USED FOR GROUP CALL IN SOME SYSTEMS

## 5.2. PL TONE TABLES

Tone coded squelch operation on selected frequencies from any of the IEC Group A or B frequencies between 67.0 and 250.3 Hz is possible.

Note: All frequency assignments should be made from either group A or B to prevent interference.

IEC GROUP A

| Freq. Hz | Code |
|---|---|
| 67,0 | XZ |
| 77,0 | XB |
| 88,5 | YB |
| 100,0 | 1Z |
| 107,2 | 1B |
| 114,8 | 2A |
| 123,0 | 3Z |
| 131,8 | 3B |
| 141,3 | 4A |
| 151,4 | 5Z |
| 162,2 | 5B |
| 173,8 | 6A |
| 186,2 | 7Z |
| 203,5 | M1 |
| 218,1 | ME |
| 233,6 | M5 |
| 250,3 | M7 |

IEC GROUP B

| Freq. Hz | Code |
|---|---|
| 71,9 | XA |
| 83,5 | XY |
| 94,8 | ZA |
| 103,5 | 1A |
| 110,9 | 2Z |
| 118,8 | 2B |
| 127,3 | 3A |
| 136,5 | 4Z |
| 146,2 | 4B |
| 156,7 | 5A |
| 167,9 | 6Z |
| 179,9 | 6B |
| 192,8 | 7A |
| 210,7 | M2 |
| 225,7 | M4 |
| 241,8 | M6 |

# FEATURES AND OPTIONS OVERVIEW

## INDEX BY DESCRIPTION

| DESCRIPTION | OPTION | DATA ENTRY REQUIRED |
|---|---|---|
| 20 kHz CHANNEL SPACING | MDH690 | - |
| 60 SECOND TIME-OUT TIMER (T.O.T) | STD | - |
| 70 ms CCIR SIGNALLING FORMAT | MDH737 | - |
| ALERT TONES ENABLED | STD | - |
| ALKALINE BATTERY (1 W & 2 W MODELS ONLY) | MDH203 | - |
| AUTO ACKNOWLEDGE (A) | MDH620 | YES |
| AUTO RESET TIME 7 SECONDS | STD | YES IF # 7 SECS |
| AUTO RESET WITH CARRIER OVERRIDE | STD | - |
| BATTERIES | STD | - |
| BELT CLIP OPTION | MDH315 | - |
| CALL BUTTON | STD | - |
| CALL BUTTON SEQUENCE(S) | MDH664AA-AM | YES |
| CALL BUTTON SEQUENCES CBA | MDH664AN | YES |
| CCIR SIGNALLING FORMAT | MDH712 | - |
| CHANNEL BUSY LED | MDH359 | - |
| CHANNEL CAPACITY 2/8 | STD | - |
| DECODE ONLY | MDH642 | YES |
| DECODE SELECT SWITCH | STD | - |
| DECODE SEQUENCE | STD | YES |
| DTMF INTERCONNECT | MDH297 | - |
| EEA SIGNALLING FORMAT | MDH745 | - |
| EMERGENCY ENCODE LOCKOUT | MDH623 | YES |
| ENCODE ONLY | MDH924 | YES |
| ENCODE SEQUENCES | STD | YES |
| ENCODE PRETIME 200 ms | STD | YES IF # 200 ms |
| EXPANDED GROUP CALL | MDH624 | YES |
| EXTENDED FIRST TONE SEQUENCES A-C & DECODE | MDH746 | YES |
| FM NON-INCENDIVE LABEL | MDH757 | - |
| FORCED MONITOR | MDH443 | - |
| FRENCH MODIFIED ZWEI | MDH768 | - |
| GROUP CALL ENCODE LOCKOUT | MDH622 | YES |
| HELIFLEX ANTENNA (UHF ONLY) | MDH124 | - |
| HIGH CAPACITY BATTERY FM APPROVED | MDH236 | - |
| HIGH CAPACITY RAPID RATE BATTERY (900 mAh) | MDH226 | - |
| HIGH CAPACITY REGULAR RATE BATTERY (900 mAh) | MDH225 | - |
| LANYARD | MDH334 | - |
| LEATHER CARRY CASE & T-STRAP | MDH312 | - |
| LEATHER SWIVEL CARRY CASE & T-STRAP | MDH319 | - |
| MANUAL RESET | MDH939 | - |

| DESCRIPTION | OPTION | DATA ENTRY REQUIRED |
|---|---|---|
| MEDIUM CAPACITY BATTERY FM APPROVED | MDH753 | - |
| MEDIUM CAPACITY RAPID RATE BATTERY (500 mAh) | MDH224 | - |
| MEDIUM CAPACITY REGULAR RATE BATTERY (500 mAh) | MDH221 | - |
| MODIFIED ZWEI SIGNALLING FORMAT | MDH736 | - |
| MONITOR BUTTON | STD | - |
| MULTICALL (100,000) | MDH626 | YES |
| OMIT 5 TONE DECODE | MDH631 | YES |
| OMIT 5 TONE ENCODE/DECODE | MDH809 | - |
| OMIT ALERT TONES | MDH153 | - |
| OMIT ANTENNA | MDH112 | - |
| OMIT AUTO ACKNOWLEDGE | MDH631 | YES |
| OMIT BELT CLIP CARRY HOLDER OPTION | MDH317 | - |
| OMIT FUNCTIONS PER CHANNEL | MDH631 | YES |
| OMIT KEYPAD MEMORY | MDH621 | - |
| OMIT MULTICALL | MDH631 | YES |
| OMIT SEQUENCE (A) | MDH631 | YES |
| OMIT SEQUENCE (B) | MDH631 | YES |
| OMIT SEQUENCE (C) | MDH631 | YES |
| OMIT SIDE TONES | MDH619 | - |
| OMIT T.O.T. | MDH781 | - |
| PL ENCODE/PL DECODE | STD | YES |
| PTT SEQUENCE (S) | MDH665AA-AM | YES |
| PTT TRANSMIT | STD | - |
| SECRET OPERATION WITH AUTO RESET | MDH364 | YES |
| SEQUENCE ON PTT | MDH958 | YES |
| SEQUENCE ONCE FROM PTT | MDH960 | YES |
| SEQUENCE UPON DEKEY OF PTT | MDH976 | YES |
| SIDE TONES ENABLED | STD | - |
| STANDARD FEATURES | STD | - |
| STANDARD GROUP CALL | MDH741 | YES |
| STANDARD HARDWARE | STD | - |
| T.O.T REKEY TIME | MDH957 | YES |
| TRANSMIT INHIBIT ON BUSY CHANNEL | MDH365 | - |
| TRANSMIT/LOW BATTERY/CALL LED INDICATOR | STD | - |
| VOLUME ON/OFF | STD | - |
| ZWEI SIGNALLING FORMAT | STD | - |

# INDEX BY OPTION NUMBER

| OPTION | DESCRIPTION | DATA ENTRY REQUIRED |
|---|---|---|
| STD | 60 SECOND TIME-OUT TIMER (T.O.T) | - |
| STD | ALERT TONES ENABLED | - |
| STD | AUTO RESET TIME 7 SECONDS | YES IF # 7 SECS |
| STD | AUTO RESET WITH CARRIER OVERRIDE | - |
| STD | BATTERIES | - |
| STD | CALL BUTTON | - |
| STD | CHANNEL CAPACITY 2/8 | - |
| STD | DECODE SELECT SWITCH | - |
| STD | DECODE SEQUENCE | YES |
| STD | ENCODE SEQUENCES | YES |
| STD | ENCODE PRETIME 200 ms | YES IF # 200 ms |
| STD | MONITOR BUTTON | - |
| STD | PL ENCODE/PL DECODE | YES |
| STD | PTT TRANSMIT | - |
| STD | SIDE TONES ENABLED | - |
| STD | STANDARD FEATURES | - |
| STD | STANDARD HARDWARE | - |
| STD | TRANSMIT/LOW BATTERY/CALL LED INDICATOR | - |
| STD | VOLUME ON/OFF | - |
| STD | ZWEI SIGNALLING FORMAT | - |
| MDH112 | OMIT ANTENNA | - |
| MDH124 | HELIFLEX ANTENNA (UHF ONLY) | - |
| MDH153 | OMIT ALERT TONES | - |
| MDH203 | ALKALINE BATTERY (1 W & 2 W MODELS ONLY) | - |
| MDH221 | MEDIUM CAPACITY REGULAR RATE BATTERY (500 mAh) | - |
| MDH224 | MEDIUM CAPACITY RAPID RATE BATTERY (500 mAh) | - |
| MDH225 | HIGH CAPACITY REGULAR RATE BATTERY (900 mAh) | - |
| MDH226 | HIGH CAPACITY RAPID RATE BATTERY (900 mAh) | - |
| MDH236 | HIGH CAPACITY BATTERY FM APPROVED | - |
| MDH297 | DTMF INTERCONNECT | - |
| MDH312 | LEATHER CARRY CASE & T-STRAP | - |
| MDH315 | BELT CLIP OPTION | - |
| MDH317 | OMIT BELT CLIP CARRY HOLDER OPTION | - |
| MDH319 | LEATHER SWIVEL CARRY CASE & T-STRAP | - |
| MDH334 | LANYARD | - |
| MDH359 | CHANNEL BUSY LED | - |
| MDH364 | SECRET OPERATION WITH AUTO RESET | YES |
| MDH365 | TRANSMIT INHIBIT ON BUSY CHANNEL | - |
| MDH443 | FORCED MONITOR | - |

| OPTION | DESCRIPTION | DATA ENTRY REQUIRED |
|---|---|---|
| MDH619 | OMIT SIDE TONES | - |
| MDH621 | OMIT KEYPAD MEMORY | - |
| MDH620 | AUTO ACKNOWLEDGE (A) | YES |
| MDH622 | GROUP CALL ENCODE LOCKOUT | YES |
| MDH623 | EMERGENCY ENCODE LOCKOUT | YES |
| MDH624 | EXPANDED GROUP CALL | YES |
| MDH626 | MULTICALL (100,000) | YES |
| MDH631 | OMIT AUTO ACKNOWLEDGE | YES |
| MDH631 | OMIT FUNCTIONS PER CHANNEL | YES |
| MDH631 | OMIT MULTICALL | YES |
| MDH631 | OMIT SEQUENCE (A) | YES |
| MDH631 | OMIT SEQUENCE (B) | YES |
| MDH631 | OMIT SEQUENCE (C) | YES |
| MDH631 | OMIT 5 TONE DECODE | YES |
| MDH642 | DECODE ONLY | YES |
| MDH664AA-AM | CALL BUTTON SEQUENCE(S) | YES |
| MDH664AN | CALL BUTTON SEQUENCES CBA | YES |
| MDH665AA-AM | PTT SEQUENCE (S) | YES |
| MDH690 | 20 kHz CHANNEL SPACING | - |
| MDH712 | CCIR SIGNALLING FORMAT | - |
| MDH736 | MODIFIED ZWEI SIGNALLING FORMAT | - |
| MDH737 | 70 ms CCIR SIGNALLING FORMAT | - |
| MDH741 | STANDARD GROUP CALL | YES |
| MDH745 | EEA SIGNALLING FORMAT | - |
| MDH746 | EXTENDED FIRST TONE SEQUENCES A-C & DECODE | YES |
| MDH753 | MEDIUM CAPACITY BATTERY FM APPROVED | - |
| MDH757 | FM NON-INCENDIVE LABEL | - |
| MDH768 | FRENCH MODIFIED ZWEI | - |
| MDH781 | OMIT T.O.T. | - |
| MDH809 | OMIT 5 TONE ENCODE/DECODE | - |
| MDH924 | ENCODE ONLY | YES |
| MDH939 | MANUAL RESET | - |
| MDH957 | T.O.T REKEY TIME | YES |
| MDH958 | SEQUENCE ON PTT | YES |
| MDH960 | SEQUENCE ONCE FROM PTT | YES |
| MDH976 | SEQUENCE UPON DEKEY OF PTT | YES |

# USER GUIDE FOR CQP8000 PROGRAMMER

# USER GUIDE FOR CQP8000 PROGRAMMER

## 1. PURPOSE

The purpose of this chapter is to familiarise you with the use and capabilities of the field programmer for the CQP8000 portable radio.

## 2. INTRODUCTION

The programmer provides you with five basic functions as follows:

- Radio alignment or tuning
- Read/Program a radio
- Read/Write radio data to disk
- Edit radio data
- Print radio data

## 3. REQUIRED EQUIPMENT

The following is a list of the equipment that you need in order to be able to use the programmer:

**An IBM Personal Computer**

The programmer is designed to operate on the IBM PC family of computers. IBM DOS 3.1 or higher, an asynchronous communications adaptor, and 512 K of RAM are required. The programmer is not compatible with networked computers.

**A Radio Interface Box (RIB): Part No. 0180353A74**

To enable communications between the radio and the IBM PC.

**A RIB Power Supply**

either: 220 V, Part No. EPN4041

or: 240 V, Part No. EPN4040

A power supply to provide the RIB with 9 V DC at 100 mA max.

**A Computer Interface Cable**

For an IBM XT (25 Way D-Type Connector): Part No. 3080369B71

For an IBM AT (9 Way D-Type Connector): Part No. 3080369B72

To connect the IBM PC to the RIB.

**A Program/Test Cable: Part No. RTK4205A**

To connect the RIB to the radio.

**A Programmer Disk and Manual Kit**

Kit comprising Manual and 5 1/4 Floppy Disk, Part No. EVN4210A

Kit comprising Manual and 3 1/2 Floppy Disk, Part No. EVN4211A

5 1/4 Floppy Disk alone, Part No. 01V02023F04

3 1/2 Floppy Disk alone, Part No. 01V02023F06

Manual alone, Part No. 68P02000F01.

**An IBM Compatible Printer**

For hard copies of radio codeplug data.

# 4. EQUIPMENT SETUP

To set up the equipment for programming you must follow the steps outlined below:

- Set up the IBM PC - refer to the appropriate IBM manual on detailed computer equipment setup.

- Plug the 15 pin connector on the computer interface cable to the RIB. Connect the other end of the cable to the asynchronous adapter on the computer. The program uses "COMI" as the default communications port. This is redefinable from COM1 within the programer, and via the configuration file.

- Supply power to the RIB using the RIB Power Supply unit.

- Plug the 25 pin connector on the Program/test cable to the RIB. Connect the 13 pin plastic connector on the Program/test cable to the radio.

**NOTE:**

If you are using an IBM PC Convertible and you plan to use the programmer while in the battery mode, you will need to set the serial/parallel adapter to run on the battery. This can be done by using the application selector diskette supplied with the system.

# 5. MAKING BACKUPS

> **NOTE**
>
> Under the terms of the Software Licence against which this Programmer is supplied, you are not allowed to make copies other than for backup purposes

Before you first use the programmer you must make a backup copy of the disk. The recommended method of backup depends on the type of PC that you have, as follows:

**Hard Drive Systems**

If your computer has a hard drive, it is recommended that you use it to store the program. To do this, change to the directory on the hard disk into which the programmer is to reside, and insert the programmer disk into drive "a", then type the following command:

**xcopy a: * . * /s**

**Floppy Drive Systems**

Insert the programmer diskette in drive "b" and a formatted diskette in drive "a", then enter the following command:

**xcopy b: * . * a: /s**

Having made a backup you should store the original diskette in a safe place and work with the copy you have made.

# 6. CONFIGURING THE SYSTEM

Each time the programmer is started up it will look for a configuragion file in the current directory, filename FPROG.CFG.

The configuration file provided with your system can be amended with a standard word processor, the basic rule to be followed is that the configuration file consists of a series of keywords plus parameters. Each keyword must be positioned at the start of a new line, and the parameter must be separated from the keyword by at least 1 space. If a keyword is not found in the configuration file, or no configuration file exists, then default settings will be assumed for all options.

The table below describes the operation of all the keywords, plus their default settings:

| Keyword | Parameters | Purpose | Default |
|---|---|---|---|
| serial_port | com1, com2 | To specify the serial port through which radio communications are to occur. | com1 |
| printer_port | lpt1, lpt2 | To specify the parallel printer port through which the printer will be accessed. | lpt1 |
| data_file_path | Full DOS file path | To spedify the full DOS path at which personality files will be found. | Current directory |
| help_file_path | Full DOS file path | To specify the full DOS path at which help files will be found. | Current directory |

# 7. PROGRAM START UP

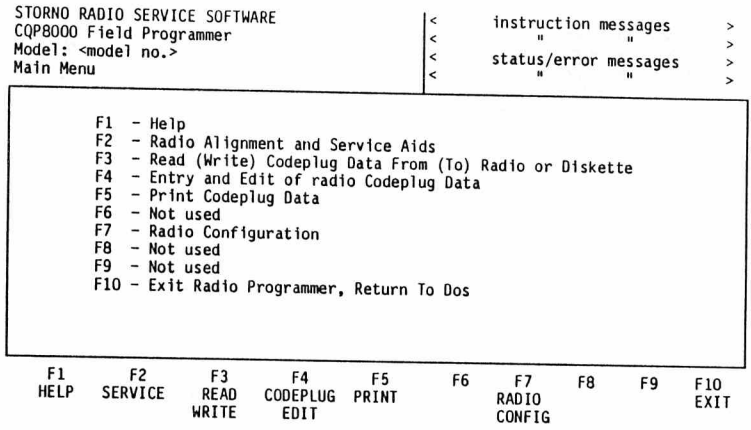
In order to start using the programmer the following steps must be followed:

- Turn on the CQP8000 radio and verify for proper operation e.g. check that the power up alert is given (provided that the power up alert option is enabled for your radio).

- Type **CQP8000** [ENTER] on your PC. The programmer will then be entered and a title screen will be displayed. If you do not wish to continue you may press [F10] and the program will abort. Press any other key to move on to the next screen.

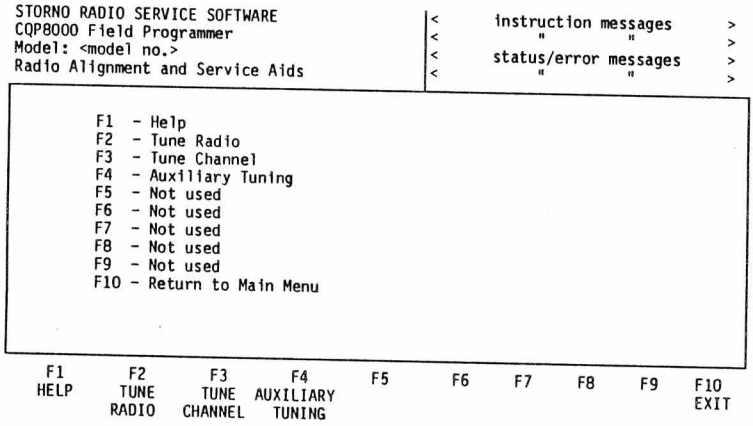
Note that section 9 gives more detailed information on how the programmer operates.

# 8. MAIN MENU




The main menu is entered after the title screen. It provides access to the five main functions of the programmer, plus the help facility.
The options available to you on the main menu are as shown on the above diagram. To select the menu option you require simply press the corresponding function key. When you first enter the programmer you must choose the F3 key to read personality data into the programmer's memory, the information can be read either from a radio or from a personality stored on disk.

## 8.1. RADIO ALIGNMENT AND SERVICE AIDS SCREEN




The Radio Alignment menu, shown above, gives you access to the 3 tuner screens.

The following section gives a broad outline of the tuning facilities available from the tuner screens, for specific detail about tuning the radio refer to the service manual.

For all the tuner screens, the data in the current field will be written to the radio when you press the [ENTER] key or when you use [↑] / [↓] to move off the field. The current setting can be incremented or decremented a single step at a time using [+] and [−], and on

reaching the maximum and minimum values [+] and [−] will reset the filed to its minimum or maximum value respectively (details of maximum & minimum values for each field are given below).
Each time a value is incremented or decremented it will be written to the radio, thus allowing the effect to be monitored.

Note that when on the tune channel data screen, or on the first option of the tune auxiliary screen, the data will apply to the currently selected channel on the radio, thus ensuring that the radio is set to the channel that you wish to align before changing any settings.
When on one of the channel related options every channel change will be reported by the programmer, the data in all the channel related fields will also be updated to show the current settings on the new channel.

The modifications to the Radio Alignment data will remain in effect until the radio is turned off, so to make the new settings permanent the radio must be programmed, i.e. on exit from the Radio Alignment screen you must select the "Read (Write) Codeplug Data" option from the Main Menu.

Whilst in any of the tuner screens the radio is being continuously monitored to check the communications link, thus if the communications fails at any stage a communications failure message will be displayed.

**WARNING**

**You must not switch radios whilst in any of the tuner screens.**

The options available on the three radio alignment screens are as follows:

### 8.1.1. TUNE RADIO

**Carrier Squelch**

This field holds the carrier squelch threshold that the radio uses when the mode select switch is in the carrier squelch position. The field can be varied between 0 and 15, open squelch is zero and tight squelch is 15.

**Tone squelch**

This field holds the tone squelch threshold for the radio, that is the squelch value the radio uses when the mode select switch is in the Tone Squelch position. In practice the tone squelch value will be slightly less than the carrier squelch value.
The field can be varied between 0 and 15, open squelch is zero and tight squelch is 15. In order to cause the radio to register changes in the tone squelch setting it is necessary to toggle the Squelch Select switch on the top of the radio.

**Volume**

This field holds the maximum audio level for the radio and may be varied between 0 and 255. Minimum volume is 0 whereas maximum volume is 255.

### 8.1.2. TUNE CHANNEL

**VCO Modulation Level**

This field holds the VCO TX modulation attenuator level and may be varied between 0 and 31. This field controls the deviation associated with the audio signals. This field is independently settable for every channel on the radio.

**Ref. Modulation Level**

This field holds the Ref TX modulation attenuator level and may be varied between 0 and 15. This field controls the deviation associated with sub-audio signals, i.e. PL signalling. This field is independently settable for every channel on the radio.

### 8.1.3. AUXILIARY TUNING

**Microphone Sensitivity**

This field along with the Microphone Preamp Gain field controls the preamplifier gain associated with the microphone. It is independently settable per-channel, and provides the fine tuning component on the overall preamplifier gain for the microphone. It has a range of 0 to 1.

**Mic Preamp Gain**

This field controls the coarse tuning on the microphone preamplifier gain, and is only settable per radio. It has a range of 0 to 1.

**RX Audio Gain**

This field is used to compensate for variations in the receive audio gain path. It is only available per radio and has a range of 0 to 1. The most likely cause for changing this field will be as a result of changing the channel spacing for the radio. The usual settings for this bit are:

"1" for a 12.5 kHz channel spacing

"0" for a 20/25 kHz channel spacing

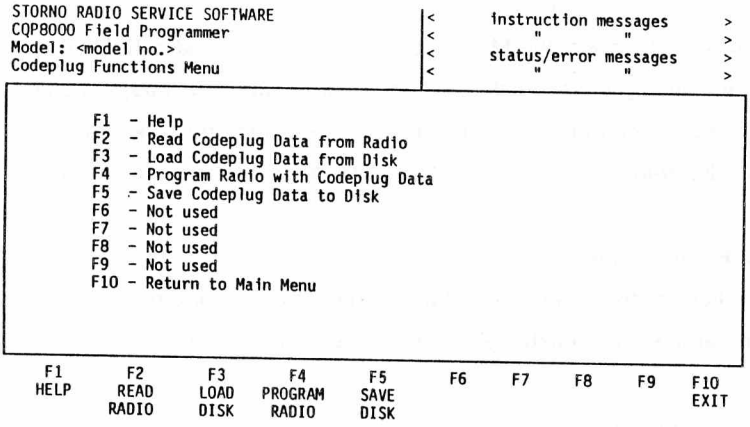
**PL Modulation Level**

This field controls the modulation level for the PL tone on the radio. It is only available per radio and has a range of 0 to 3.

## 8.2. READ/WRITE CODEPLUG DATA FROM/TO RADIO/DISKETTE SCREEN

To save or load codeplug information to or from the radio or disk press the [F3] key.

The codeplug functions menu will appear as shown:




The required option is selected by pressing the corresponding function key, i.e. [F2] to read the codeplug of the currently connected radio.

The operation of the options is as follows:

### 8.2.1. READ CODEPLUG DATA FROM RADIO

Before attempting to read any codeplug data from the radio make sure that the system has been set up as described in section 4 of this manual.

To read the radio codeplug data press F2 on the Codeplug Functions menu. Provided that the programmer can communicate with the radio the following message will appear:

**Radio Being Read**

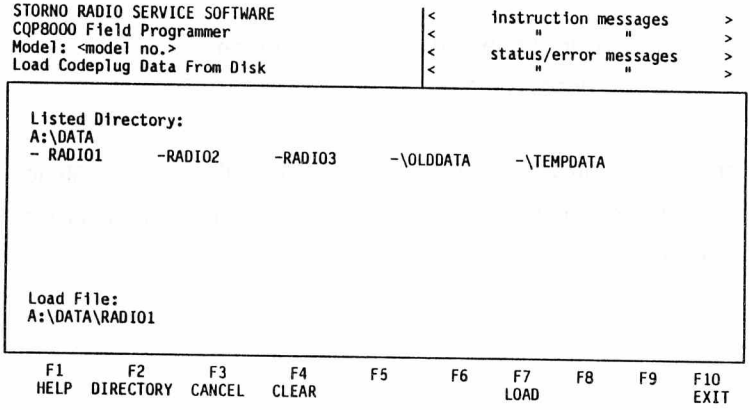
Providing the read was successful the following message will be displayed:

**Radio successfully Read**

In the event of a communications failure refer to section 8.5.

### 8.2.2. LOAD CODEPLUG DATA FROM DISK

To load an existing personality press F3 on the Codeplug Functions menu. The following is an example of the screen that will appear:



Any personality files in the current directory will be displayed, and the current full path specification will be shown at the load file prompt. Any sub-directories in the current directory will also be shown, prefixed by a "\".

A file can be loaded by either typing in the new filename at the prompt, or by selecting the required file from those currently displayed on the screen using the following keys:

| | |
|---|---|
| ↓ | Select file below the current file |
| ↑ | Select file above the durrent file |
| TAB | Select file to immediate right of current file |
| SHIFT TAB | Select file to immediate left of current file |

The currently selected file is shown in "reverse video", and will appear at the **load file**: prompt. Having selected the file press ENTER.

If you have previously loaded a personality from either disk or from a radio, then before loading the file the following message will be given:

**Current settings to be overwritten**
**Please confirm (Y/N)**

Responding to this message with **Y** will cause the specified file to be loaded, responding with **N** will return you to the current screen without loading any new data.

If no personality has been previously read in, then the file will be loaded immediately. Provided the file was successfully loaded, the following message will be given:

**File successfully loaded**

To load a personality from a different directory, you will need to first change the load directory and this is done as follows:

- Press the [F2] key, the prompt **load file** will be replaced with the prompt **directory**.

- Edit the current file path for the required directory, then on pressing [ENTER] any data files in the new directory will be displayed, along with any sub-directories.

The following examples illustrate typical file specifications, note that the initial drive letter, colon and slash must always be included:

- Directory: **a:\data** - directory on Drive "a"
- Directory: **c:\cqp8000\data** - directory on Drive "c"

Sub-directories can be picked up from the screen in the same way that filenames could be picked up, by using the 4 cursor navigation keys: [↑] , [↓] , [TAB] and [SHIFT] [TAB].
Once the new directory is specified, press the [F7] key to allow a file to be loaded.

### 8.2.3. PROGRAM RADIO WITH CODEPLUG DATA

The radio may be programmed with the current personality by pressing the F4 key on the Codeplug Functions menu. On programming a radio the following message will appear:

**Radio being Programmed**

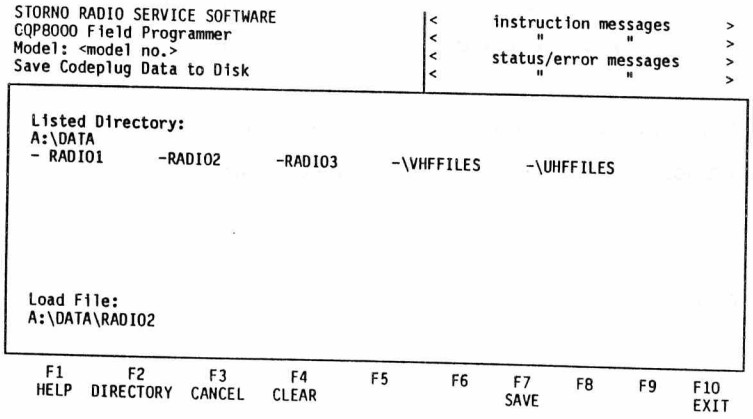
Provided that the radio was successfully programmed the following message will appear:

**Radio successfully programmed**

In the event of an error message being given, first check that te equipment is set up as described in section 4, otherwise refer to section 9.5.

### 8.2.4. SAVE CODEPLUG DATA TO DISK

To sage the codeplug press the F5 key on the Codeplug Functions menu. The following is an example of the screen that will appear as shown below:



To specify the directory path and file name for the save file, follow the procedure described in section 8.2.2 for loading data files. The exception to the procedure is that you must press the [F6] key (instead of [F7]). Once you have specified the filename, press [ENTER]. If the filename already exists in the current directory you will be given the warning:

**Overwrite Existing Files (Y/N)**

Assuming you wish to overwrite the current files, press **Y**, otherwise press **N** and specify a new filename. Providing the save was successful the following message will be given:

**File successfully Saved**

## 8.3. ENTRY AND EDIT OF RADIO CODEPLUG DATA

To enter or edit the codeplug data press [F4], the list of options data which you are able to edit is shown in Appendix D. Section 9.2 describes how to edit the options list.

Appendix A lists the PL codes that the programmer will support, and Appendix B lists the single tone frequencies that the programmer will support.

As the options are selected the programmer will perform compatibility checks, thus you will be notified immediately upon selecting inconsistent or incompatible options.

Appendix E lists the imcompatibilities and the requirements of each option.

### 8.3.1. COPY CHANNEL DATA

This feature is only available on channel related table screens, and enables you to copy data from any one channel to either another channel, or to a group of channels. To invoke the copy function, press [F9], the following prompt will then be issued:

**Specify Channel to Copy (1 - n)**

In the prompt, **n** will be set to the number of channels in the personality (see section 8.5, Radio Configuration Data).

At the prompt you must specify the source channel for the copy; specifying a channel outsde of the range **(1 - n)** will result in an error message. Press [ENTER] to set the source channel. The following prompt will then be displayed:

**Channel # data to be copied**
**Specify channel to copy to: s,e (start, end)**

The **#** in the prompt will be set to the source channel.
The **s,e** field will take the form of either a single digit (i.e. omit the ",e"), which will denote the target channel to which the source data will be copied, or two digits separated by a comma, to specify a start and an end channel.

In the latter case the source data will then be copied to all channels between the start and end inclusive.

### 8.3.2. RECEIVE ONLY CHANNELS

To make a channel "Receive Only" you must blank out the transmit frequency for the channel on the Channel Frequency table. Conversely, to enable transmit, you must enter a frequency under the Transmit column of the Channel Frequency table.

If a channel is "Receive Only" you will not be permitted to enable Multicall, Auto Acknowledge, or PL Encode.
Similarly you will not be able to make a channel "Receive Only" if any of the above options are enabled on the channel.

### 8.3.3. OMIT FUNCTIONS PER CHANNEL

The "Omit Functions per Channel" table permits you to disable certain options per channel. To omit a function enter "X" in the appropriate field of the table (enter a space to re-enable the function).

You will only be permitted to omit a function if the corresponding option has been enabled for the radio e.g. you will not be permitted to omit Auto Acknowledge for a given channel unless the Auto Acknowledge option has been enabled on the main option screen.

Note that the "Omit Functions per Channel" option may only be disabled if all fields of the table are blank i.e. all spaces.

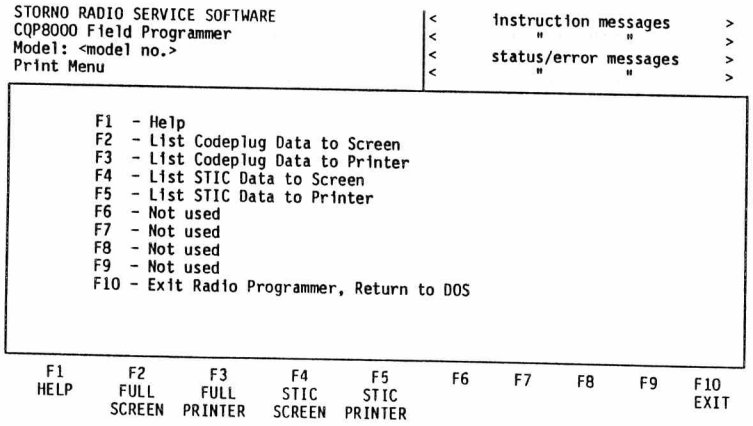
### 8.3.4. ENCODE SEQUENCE TABLES

There are two tables for setting up the sequences to be encoded by the radio. The "Call Button Sequence" table for defining the sequences to be encoded by the Call button and the "PTT Sequence" table for defining the sequences to be encoded by the PTT button. On each table there is a field for each channel, in which you may specify up to two encode sequences (combinations of A, B, C and D).
Encode from the PTT or Call button may be disabled by setting the appropriate field to spaces i.e. blank.

Note that the table may only be disabled if all its fields are blank.

## 8.4. PRINT CODEPLUG DATA

To produce a formatted listing of the codeplug settings of the current personality press [F5], the screen will appear as shown:



The operation of the options is as follows:

### 8.4.1. LIST CODEPLUG DATA TO SCREEN

To view the options selected in the current personality file press [F2]. You can move through the list using the [↑] and [↓] keys to move a line at a time, and [PG UP] and [PG DN] keys to move by a screen at a time.

### 8.4.2. LIST CODEPLUG DATA TO PRINTER

To produce a hard copy of the options selected, press the [F3] key.

### 8.4.3. LIST STIC DATA TO SCREEN

To view the options selected in the current personality file in the STIC format press [F4]. You can move through the list using the [↑] and [↓] keys to move a line at a time, and [PG UP] and [PG DN] keys to move by a screen at a time.

### 8.4.4. LIST STIC DATA TO PRINTER

To produce a hard copy of the options selected in the STIC format, press the [F5] key.

## 8.5. RADIO CONFIGURATION

To view or amend the radio configuration information, press the F7 key. Appendix C lists the options which will be presented on the two radio configuration screens. The setting of the radio configuration data will affect the way in which the codeplug information is presented to you, as follows:

**Hardware Configuration**

The power setting option forms part of the model number, and is not used by the programmer.

If a "2 Channel Radio" is selected, then the programmer will only give you access to channels 1 and 2 of the channel related information. If you change a 2 channel personality to an 8 channel personality, channels 3 to 8 will be overwritten with channel 2 information, the following warning will also be issued:

**Channel 2 data copied to channels 3 to 8**

The "Non Standard Channels" option will be set if the programmer reads a radio which has neither 2 nor 8 channels, you are able to select either the 2 channel or 8 channel options for such a radio, however you cannot make a 2 or 8 channel radio Non Standard.

The bandsplit information tells you which bandsplit the current personality is set up for. Changing the bandsplit will give the following warning:

**Please realign channel frequencies**
**to new bandsplit**

The "Channel Spacing" field tells you which channel spacings the current personality is operating with. If the channel spacing is set to either 12.5 kHz or 20 kHz/25 kHz, then changing the channel spacing will give the following warning:

**Please realign channel frequencies**
**to new bandsplit**

Note that having changed the channel spacing, it will probably be necessary to realign the radio in order to restore the RF performance. The fields likely to need retuning will be: the "RX Audio Gain" (see section 8.1.3), and the "VCO Modulation Level" (see section 8.1.2). The radio communications field allows you to specify which communications port will be used to interface with the RIB.

### Software Configuration

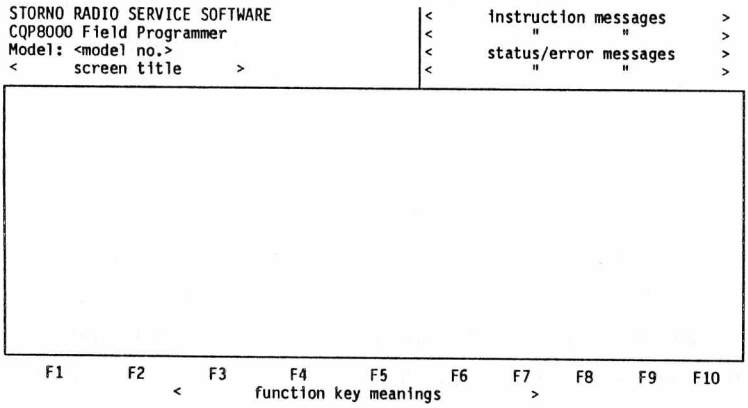
The 5 Tone encode/decode options will control which of the 5 Tone options will be offered on the Edit Codeplug screen. It is important to note that changing an option on the configuration screen will not automatically enable the corresponding options on the Edit Codeplug screen, i.e. selecting "Decode Only" will not enable 5 Tone Decode. It will however disable all 5 Tone encode options and remove those fields related to 5 Tone Encode from the options list.

The block of 4 5-tone encode/decode options that appear on the Software Configuration screen are also shown on the Edit Codeplug screen for informaton i.e. you will not be able to change their setting on the Edit Codeplug screen.
The omit Multicall option, if selected, will disable and remove all Multicall related options from the Edit Codeplug options screen.

# 9. PROGRAMMER OPERATION

## 9.1. SCREEN LAYOUT

All the screens that the programmer shows you, with the exception of the entry screen, have the same basic layout (shown below). The screen is split into a number of areas each of which is used for displaying a particular type of information.




The screen is divided into 4 areas as follows:

**The Header Area**

The header area is situated at the top left corner of the screen. It will be used for showing product information and for the screen title.

### The Message Area

The message area is situated at the top right corner of the screen. Status, instruction and error information will be displayed in this area.

### The Central Screen Area

This is the main display area of the screen. It will be used for displaying menu options, help information, data fields etc.

### The Function Key Area

The function key area is situated at the bottom of the screen. It will be used for indicating the meanings of the function keys [F1] - [F10].

## 9.2. EDITING DATA

Your current position on an options screen will be shown by the option pointer -> , and the current field within that option will be shown in reverse video. Your postion in the current field is shown by a flashing underline cursor.
Within a field the cursor can be moved using either [←] or [→], however you will not be able to move the cursor outside of the current field, [|↤] and [DEL] can also be used within a field. If an option has more than one field then the additional fields can be accessed using [TAB], to move to the adjacent righthand field, and [SHIFT] [TAB], to move to the adjacent lefthand field.

To move through an options screen the following keys are used: [↑] and [↓] move the option pointer up or down by an option at a time, [PG UP] and [PG DN] are used to move through options data by a screen at a time.
[HOME] moves you to the first option on the screen, and [END] moves you to the last option on the screen.
[CTRL] [HOME] moves you to the first option on the list, and [CTRL] [END] moves you to the last option on the list.

The programmer will check the new data when [ENTER] is pressed. If the programmer finds that the new data is not valid then an error message will be displayed. The programmer will not allow you to move off the current data field unless it is valid.

The [F3] key will restore the current field to its last valid entry, and the [F4] key will clear the field.

The [F5] and [F6] keys offer a store and recall facility between option fields, pressing [F5] will put the data in the current option field into the store field, and [F6] will recall the stored data into the current field.
In the event of the recall field being shorter than the source field, you will loose the surplus characters from the right hand side of the field.

To search for a string within the options list, press the [F7] key, the following prompt will be issued:

**Enter text to be found:**

You may specify up to 36 characters in the search string, and the search will be case insensitive. When first invoked the search will take place from the start of the options list, then subsequent searches with the same string will start at the current option pointer position. Upon finding a match the option pointer will be positioned at the option containing the match, if no match is found then the following error message will be given:

**Text not found**

When editing "Table" options, the main options screen will be replaced by a table screen. The table screens are edited in the same fashion as the options screen, [F10] returns you to the options screen once you have finished editing the table.

## 9.3. HELP INFORMATION

The programmer will display help information relating to the current screen when you press the [F1] key. This will be available on all screens. When veiwing the help information you can use the [PG UP] and [PG DN] keys to see the next page or previous page of information. For a menu screen, you will be given a help menu from which you will be able to select help information for any of the options on the original menu. To exit from help you may use either [F10] or [ESC] [F10] will take you back one level i.e. if you are looking at help information from a help menu you will have to press [F10] twice, whereas [ESC] can take you straight back to the main menu. When you press [ESC], the message "Return to main menu" will be given, responding with **Y** will return you to the main menu, whereas **N** will take you back to your previous level.

## 9.4. INCOMPATIBILITY HANDLING

The programmer performs compatibility checks at two phases during the editing and programming cycle for a radio.

The first level of checking is performed as the radio options are being selected. These ensure that the minimum requirements and incompatibility constraints are met for each option, Appendix E lists the requirements and incompatibilities for each option.
If requirements are not met, or incompatibility rules are violated then one of the Error messages or Warnings detailed in section 9.5 will be generated.

The second level of incompatibility checking is performed immediately prior to programming a radio with the current personality. To do this the programmer will read the personality of the radio and make the following compatibility checks against the current personality:

**No. of Channels:** The number of channels in the radio must be greater than or equal to the number of channels in the personality. If the radio has more channels than the personality then the extra channels in the radio will be set to the same as the last channel in the personality.
In the event of there being less channels in the radio than the personality the following message will be issued:

**Channel number inconsistency**
**Radio is # channel**

# denotes the number of channels in the radio.

**Frequency Band:** The radio must operates in the same frequency band as the personality, i.e. VHF or UHF. If the operating band is found to be wrong the following message will be given:

**Band Inconsistency**
**Radio is <A> HF**

Where <A> will be either **V** or **U** for VHF or UHF.

## 9.5. ERROR MESSAGES AND WARNINGS

Whilst operating this programmer, if any error conditions occur they will be reported by an error message in the error field on the screen. The common causes and cures for most of the error messages are listed below:

**Band Inconsistency**
**Radio is <A> HF**

You have attempted to write a VHF personality to a UHF radio, or vice versa, which is not allowed. Either read the radio's personality, or use a personality from the correct type of radio.

**Cannot access specified Drive**

The computer cannot access the specified drive, i.e. you have specified a drive that does not exist, or the door is open on the drive.

**Cannot disable:-**

**<text>**

You cannot disable the option specified in the <text> field. See Appendix D.

**Channel number Inconsistency**

**Radio is <n> Channel**

You cannot program a radio which has less channels than the personality with which you are trying to program it.

**Current option is required by:-**

**<text>**

You have tried to disable an option which is required by the option specified in the <text> field. See Appendix D.

**Decode error for channel <n>**

**5-Tone and PL both set**

You have enabled both 5-tone and PL decode on the specified channel, the radio cannot support this so you must amend the personality.

**Disk is Read Only**

The write protect tab has not been removed from the disk you are trying to access.

**Error - All frequencies must be <A> HF**

The codeplug data has a mix of VHF and UHF frequencies. You must specify frequencies that are all in the correct band.

**Error - frequency must be <A> HF**

You have selected a frequency in the wrong frequency band, i.e. UHF instead of VHF. You must specify a frequency in the correct band.

**File does not exist**

You have requested a file that does not exist in the current directory. Use [F5] to change to the correct directory, or retype the filename.

**Insufficient Disk Space**

There is insufficient room left on the disk in the specified drive to save your data.

**Invalid Frequency**

The frequency you have specified cannot be supported by the radio, i.e. it is not on a valid channel spacing.

**Invalid Specification**

You have given an unrecognized file specification, see section 8.2.2 for further information.

**Option Requirements not met**

You have tried to enable an option whose requirements have not been met, see Appendix D.

**Printer Error**

An error has occured whilst the programmer was trying to access the printer.

**Radio cannot decode PL and 5-tone on the same channel**

You cannot enable this option because it will cause both 5-tone and PL to be decoded on the radio, which cannot be supported by the radio.

**Radio Communications Failed - Error nn**

This error will occur if the programmer cannot communicate with the radio for any reason, on read or write. Check the equipment and the equipment set up (section 4). Common error numbers are detailed in section 8.6.

**Radio Incompatible - Error nn**

If the radio version is incompatible with the programmer this message will be given. The radio cannot be programmed with this programmer - please contact your Storno service representative for assistance.

**Selection incompatible with:-**

**<text>**

You have selected an option which is incompatible with the option specified in the <text> field. See Appendix D.

**Sequence <s> not enabled**

This option cannot be enabled because the sequence specified in the <s> field has not been enabled.

**Warning - Bandsplit violation**

**Please Check entry**

A frequency violation the current bandsplit has been entered, see the radio configuration screen (section 7.5).

## 9.6. RADIO COMMUNICATION

If the programmer is unable to communicate with the radio then you will see the following message:

**Radio Communications Failed - Error nn**

Where **nn** indicates the type of failure. A list of common failure numbers and their likely causes is given below:

1. Radio not connected to RIB

3. Radio powered off

11. RIB not connected to computer or
RIB power failure or
RIB connected to wrong "com" port (see Hardware configuration)

Should a communications failure occur please check that your equipment is set up correctly according to the "Equipment Setup" section and that power is supplied to both RIB and radio.

## 9.7. SAMPLE PROGRAMMING SESSION

In order to clarify the operation of the field programmer, this section will take you through a sample programming session. Before you try this session, please ensure that you have gone through the backup procedure, described in section 5.

If you are using a machine with a hard disk, change to the directory containing the field programmer files, otherwise insert your copy of the field programmer disk into drive "a", and change to drive "a".

To start the field programmer enter the command CQP8000 then press [ENTER]. The title page will now be displayed. You may press [F10] to stop this programming session or any other key to continue.

You will now be on the main menu screen, press the [F3] key to enter the "Read/Write codeplug to/from Radio or diskette screen", from here the codeplug can be initialised. For the example session the codeplug will be read from disk so press the [F3] key to enter the "Load Codeplug Data from Disk" screen.

The screen will be displaying the filename "VHFRADIO". Press the [↓] key to pickup this filename, and then press [ENTER]. When the file has been loaded, the following message will appear:

**File successfully loaded**

To edit the codeplug data press the [F4] key, this will take you to the "Entry and Edit of Radio Codeplug Data" screen. The following example will show you how to:

- Change the Decode sequence
- Change a frequency

**Change of Decode Sequence**

Use the [↓] key to move the option pointer to the "Std. 5 Tone Encode/Decode Code" option. The cursor will now be placed into the pretime field, so to move it to the decode sequence field press the [TAB] key. The decode sequence field can now be edited as required with the new tone sequence.

To proceed with the example, use the [↑] key to move to the frequency specification table. You will note that the decode sequence field has remained highlighted to signify that it is enabled.

**Change of Frequency**

Assuming that you have moved the cursor up to the frequency specification field, you can edit the frequency table by pressing [ENTER]. The current screen will be replaced by the frequency specification screen, and the transmit frequency for channel 1 will be the currently selected option.

The frequency can be edited as required, to move to the next frequency use one of the cursor navigation keys as described in section 9.2. Once the frequencies have been amended as required press [F10]. To return to the Main Menu press [F10] again.

This edited personality can now be saved to either disk or to the radio, for either case this will involve pressing [F10] to return to the main menu screen, then selecting the "Codeplug read/write to/from Radio or Diskette" menu by pressing [F3]. To save the radio to diskette select option [F5], this will cause you to enter the "Save Codeplug Data to Disk" screen. To save the file enter the file name and then press [ENTER], once you receive the **File successfully saved** prompt you can return to the read/write menu by pressing [F10].
Further information on saving files to disk is given in section 8.2.4.

To program the radio with the personality, connect up the radio to the computer as described in section 4, then press [F4]. When the radio has been programmed the message **Radio successfully Programmed** will be issued.
Further information on programming radios is given in section 7.2.3.

**NOTE**

You may only program the radio with your own allocated frequencies.

# APPENDICES

## APPENDIX A

The following is a list of the PL codes that can be supported by the programmer, and their corresponding nominal frequencies. It must be noted that the actual frequency generated or decoded may differ from this nominal but will be within acceptable tolerance limits:

| PL code | PL frequency | PL code | PL frequency |
|---|---|---|---|
| XZ | 67.0 | 4Z | 136.5 |
| WZ | 69.3 | 4A | 141.3 |
| XA | 71.9 | 4B | 146.2 |
| WA | 74.4 | 5Z | 151.4 |
| XB | 77.0 | 5A | 156.7 |
| WB | 79.7 | 5B | 162.2 |
| YZ | 82.5 | 6Z | 167.9 |
| YA | 85.4 | 6A | 173.8 |
| YB | 88.5 | 6B | 179.9 |
| ZZ | 91.5 | 7Z | 186.2 |
| ZA | 94.8 | 7A | 192.8 |
| ZB | 97.4 | M1 | 203.5 |
| 1Z | 100.0 | 8Z | 206.5 |
| 1A | 103.5 | M2 | 210.7 |
| 1B | 107.2 | M3 | 218.1 |
| 2Z | 110.9 | M4 | 225.7 |
| 2A | 114.8 | M5 | 233.6 |
| 2B | 118.8 | M6 | 241.8 |
| 3Z | 123.0 | M7 | 250.3 |
| 3A | 127.3 | | |
| 3B | 131.8 | | |

# APPENDIX B

The following is a list of the single tone frequencies (Hz) that can be encoded by the radio:

| | | | | | | |
|---|---|---|---|---|---|---|
| 603 | 680 | 778 | 911 | 1097 | 1380 | 1858 |
| 605 | 682 | 781 | 914 | 1102 | 1388 | 1873 |
| 606 | 684 | 784 | 918 | 1108 | 1396 | 1889 |
| 608 | 686 | 786 | 922 | 1113 | 1405 | 1904 |
| 610 | 688 | 789 | 925 | 1118 | 1414 | 1920 |
| 611 | 690 | 792 | 929 | 1124 | 1422 | 1936 |
| 613 | 692 | 794 | 933 | 1129 | 1431 | 1953 |
| 614 | 694 | 797 | 937 | 1135 | 1440 | 1969 |
| 616 | 696 | 800 | 940 | 1141 | 1449 | 1986 |
| 618 | 698 | 803 | 944 | 1146 | 1458 | 1003 |
| 619 | 700 | 806 | 948 | 1152 | 1468 | 2021 |
| 621 | 702 | 808 | 952 | 1158 | 1477 | 2039 |
| 623 | 705 | 811 | 956 | 1164 | 1486 | 2057 |
| 624 | 707 | 814 | 960 | 1170 | 1496 | 2076 |
| 626 | 709 | 817 | 964 | 1176 | 1506 | 2095 |
| 628 | 711 | 820 | 968 | 1182 | 1516 | 2114 |
| 630 | 713 | 823 | 972 | 1188 | 1526 | 2133 |
| 631 | 716 | 826 | 976 | 1194 | 1536 | 2153 |
| 633 | 718 | 829 | 980 | 1200 | 1546 | 2174 |
| 635 | 720 | 832 | 985 | 1206 | 1557 | 2194 |
| 636 | 722 | 835 | 989 | 1213 | 1567 | 2215 |
| 638 | 725 | 838 | 993 | 1219 | 1578 | 2248 |
| 640 | 727 | 841 | 997 | 1226 | 1589 | 2259 |
| 642 | 729 | 844 | 1002 | 1232 | 1600 | 2281 |
| 644 | 731 | 847 | 1006 | 1239 | 1611 | 2304 |
| 645 | 734 | 850 | 1011 | 1245 | 1623 | 2327 |
| 647 | 736 | 853 | 1015 | 1252 | 1634 | 2351 |
| 649 | 738 | 857 | 1019 | 1259 | 1646 | 2375 |
| 651 | 741 | 860 | 1024 | 1266 | 1658 | 2400 |
| 653 | 743 | 863 | 1029 | 1273 | 1670 | 2425 |
| 655 | 746 | 866 | 1033 | 1280 | 1682 | 2451 |
| 656 | 748 | 869 | 1038 | 1287 | 1694 | 2477 |
| 658 | 750 | 873 | 1043 | 1294 | 1707 | 2504 |
| 660 | 753 | 876 | 1047 | 1302 | 1719 | 2532 |
| 662 | 755 | 879 | 1052 | 1309 | 1732 | 2560 |
| 664 | 758 | 883 | 1057 | 1317 | 1745 | 2589 |
| 666 | 760 | 886 | 1062 | 1324 | 1759 | 2618 |
| 668 | 763 | 890 | 1067 | 1332 | 1772 | 2648 |
| 670 | 765 | 893 | 1072 | 1340 | 1786 | 2679 |
| 672 | 768 | 897 | 1077 | 1347 | 1800 | 2711 |
| 674 | 771 | 900 | 1082 | 1355 | 1814 | 2743 |
| 676 | 773 | 904 | 1087 | 1363 | 1829 | 2776 |
| 678 | 776 | 907 | 1092 | 1371 | 1843 | 2810 |

# APPENDIX C

The radio configuration information is shown via two screens, Radio Hardware Configuration, and Radio Software Configuration. The contents of these screens are as follows:

## RADIO HARDWARE CONFIGURATION

Power level 1 (0.1 watt)
Power level 2 (1 watt)
Power level 3 (2 watt)
Power level 4 (4/5 watts)

2 Channel Radio
8 Channel Radio
Non Standard Channels

| | | | | |
|---|---|---|---|---|
| VHF | 136 | - | 151 | Bandsplit |
| VHF | 146 | - | 162 | Bandsplit |
| VHF | 157 | - | 174 | Bandsplit |
| UHF | 403 | - | 433 | Bandsplit |
| UHF | 438 | - | 470 | Bandsplit |
| UHF | 470 | - | 500 | Bandsplit |
| UHF | 488 | - | 520 | Bandsplit |

UHF XBand: Rx (440 - 449) Tx (425 - 432)

12.5 kHz Channel Spacing
20 / 25 kHz Channel Spacing

Radio communication via 'COM1'
Radio communication via 'COM2'

## RADIO SOFTWARE CONFIGURATION

5 Tone Encode/Decode

Encode only

Decode only

Omit 5 Tone Encode/Decode

Omit Multicall Options

# APPENDIX D

This appendix describes the list of options which are available on the code plug options screen.

The characters shown in the data fields indicate the characters which may be entered into that field as described below:

- n - Numeric digits (0 - 9, .)
- T - Tone characters (0 - 9, G)
- S - Sequence character (A, B, C, D)
- x - Selection character (X, SPACE ) eg Omit functions Table
  Positional specifications (X, -) eg Group call field

The option data on the Codeplug Option screen will be as follows:

| **Std. Frequency Specifications** | **Table** |
|---|---|
| PL encode | Freq : nnnnn Hz. Code : AA |
| PL Decode | Freq : nnnnn Hz. Code : AA |
| Std. ZVEI<br>MDH736 Modified ZVEI<br>MDH768 French Modified ZVEI<br>MDH712 CCIR<br>MDH737 70 ms. CCIR<br>MDH745 EEA | |
| Std. 5 Tone Encode/Decode | Pretime nnnn ms.<br>Dec. Tones TTTTT |
| MDH924 Encode Only | Pretime nnnn ms. |
| MDH642 Decode Only | Dec. Tones : TTTTT |
| MDH809 Omit 5 Tone Encode/Decode | |
| Std. 60 Sec. Time Out Timer<br>MDH781 Omit T.O.T | |
| MDH957 T.O.T Rekey Time | nn secs. |

| Std. Frequency Specifications | Table |
|---|---|
| Std. Auto Reset Carrier Override | Auto Reset Time nn secs. |
| MDH733 Auto Reset Carrier Independent | Auto Reset Time nn secs. |
| MDH939 Manual Reset | |
| MDH746BB Extended 1st Tone On Dec. | First Tone Duration : nnnnn ms. |
| MDH746AY Extended 1st Tone On Enc(A) | First Tone Duration : nnnnn ms. |
| MDH746AZ Extended 1st Tone On Enc(B) | First Tone Duration : nnnnn ms. |
| MDH746BA Extended 1st Tone On Enc(C) | First Tone Duration : nnnnn ms. |
| Extended 1st Tone On Enc (D) | First Tone Duration : nnnnn ms. |
| MDH631 Omit Functions Per Channel | Table |
| MDH364 Secret Op. with Auto Reset | Auto Seq : SSS<br>Reset Time : nn secs. |
| MDH359 Channel Busy LED | |
| MDH365 Tx Inhibit on Busy Channel | |
| MDH443 Forced Monitor | |
| MDH619 Omit Side Tones | |
| Side Tone Volume | nnn |
| MDH153 Omit Alert Tones | |
| MDH741 Standard Group Call | Group Call : XXXXX<br>Group Type : T |
| MDH642 Expanded Group Call | Group Call : XXXXX<br>Group Type : T |
| Sequence A : 5 Tone | Tones : TTTTT |
| Sequence A : Single Tone | Freq : nnnn Hz.<br>Duration : nnnnn ms. |
| MDH620 Auto Acknowledge | Sequence : S.<br>A/A Delay : nnn ms. |

| Std. Frequency Specifications | Table |
|---|---|
| Sequence B : 5 Tone<br>Sequence B : Single Tone | Tones : TTTTT<br>Freq : nnnn Hz.<br>Duration : nnnnn ms. |
| MDH626 Multicall | Variable Tone Positions : XXXXX |
| MDH621 Omit Keypad Memory | |
| MDH622 Group Call Encode Lockout | Lockout Digit : T |
| MDH623 Emergency Encode Lockout | Lockout Position : TTTTT |
| Sequence C : 5 Tone<br>Sequence C : Single Tone | Tones TTTTT<br>Freq : nnnn Hz.<br>Duration : nnnnn ms. |
| MDH664 Call Button Sequence | Table |
| MDH665 PTT Sequence | Table |
| MDH958 Sequence(s) on PTT<br>MDH960 Sequence(s) One on PTT<br>MDH976 Sequence(s) Upon dekey of PTT | Auto Reset Time : nn secs. |

(The options below are described in Appendix F)

| | |
|---|---|
| Sequence D : 5 Tone<br>Sequence D : Single Tone | Tones : TTTTT<br>Freq. : nnnn Hz.<br>Duration : nnnnn ms. |
| Omit Power Up Tone | |
| Omit 5 Tone Decoder Indicator | |
| Omit Low Battery LED | |
| Omit Battery Saver | |
| Pen Switch Enabled | |
| Omit Keypad Feedback Tone | |

| Std. Frequency Specifications | Table |
|---|---|
| Keypad Sidetone Volume | nnn |
| Keypad Radio Volume | nnn |
| Sleep Mode for Keypad | |
| Personal Call Code Enabled | |
| Keypad Password | nnnn |
| Autocall Enabled | |
| Ten Call Limit on Autocall | |
| AutoCall Interdelay Period | nn secs. |
| Inhibit Keypad on Radio Alert | |
| Call Sequence on Autocall<br>Sendkey Sequence on Autocall | |
| G-tone Entry Option | |
| Omit Multicall through PTT | |
| Omit Multicall through Call | |

# APPENDIX E

The following defines the codeplug option incompatibilities and option requirements that will be checked by the field programmer. In order to enable an option all its incompatible options must be disabled and at least one of its required options must be enabled. If the requirements are shown as more that one list (bracketed) then at least one option from each list must be enabled. Note that the incompatibilities shown do not cover mutually exclusive options as they are shown as "blocks" on the Codeplug option list Appendix C.

| Option Text | Incompatibilities | Requirements |
|---|---|---|
| 1 Std. Frequency Specifications | | |
| 2 PL Encode | | |
| 3 PL Decode | | |
| 4 Std. ZVEI | | |
| 5 MDH736 Modified ZVEI | | |
| 6 MDH768 French Modified ZVEI | | |
| 7 MDH712 CCIR | | |
| 8 MDH737 70 ms. CCIR | | |
| 9 MDH745 EEA | | |
| 10 Std. 5 Tone Encode/Decode | | |
| 11 MDH924 Encode Only | 17,18,19,26, 33,34,37. | |
| 12 MDH642 Decode Only | 26,30,37,40, 42,43,46,47, 48,49,50. | |

| Option Text | Incompati-bilities | Require-ments |
|---|---|---|
| 13 MDH809 Omit 5 Tone Encode Decode | 17,18,19,26, 28,29,30,33, 34,37,40,42, 43,46,47,48, 49,50. | |
| 14 Std. 60 Sec. Time Out Timer | | |
| 15 MDH781 Omit T.O.T. | 16. | |
| 16 MDH957 T.O.T. Rekey Time | 15. | |
| 17 Std. Auto Reset Carrier Override | 11,13. | |
| 18 MDH733 Auto Reset Carrier Independent | 11,13. | |
| 19 MDH939 Manual Reset | 11,13. | |
| 20 MDH746BB Extended 1st Tone On Decode | | 10,12. |
| 21 MDH746AY Extended 1st Tone On Enc(A) | | 35. |
| 22 MDH746AZ Extended 1st Tone On Enc(B) | | 38. |
| 23 MDH746BA Extended 1st Tone On Enc(C) | | 44. |
| 24 Extended 1st Tone On Enc(D) | | 51. |
| 25 MDH631 Omit Functions Per Channel | | |
| Omit 5 tone decode code | | 10,12. |
| Omit multicall code | | 40. |
| Omit Auto Acknowledge | | 37. |
| Omit PL encode | | 2. |
| Omit PL decode | | 3. |
| 26 MDH364 Secret Op. with Auto Reset | 11,12,13, 29,50. | |

| Option Text | Incompatibilities | Requirements |
|---|---|---|
| 27 MDH359 Channel Busy LED | | |
| 28 MDH365 TX Inhibit on Busy Channel | | 3,10,12. |
| 29 MDH443 Forced Monitor | 26 | 3,10,12. |
| 30 MDH619 Omit Side Tones | 12,13. | |
| 31 Side Tone Volume | 12,13. | 40. |
| 32 MDH153 Omit Alert Tones | | |
| 33 MDH741 Standard Group Call | 11,13. | |
| 34 MDH642 Expanded Group Call | 11,13. | |
| 35 Sequence A : 5 Tone | | |
| 36 Sequence A : Single Tone | | |
| 37 MDH620 Auto Acknowledge | 11,12,13. | |
| 38 Sequence B : 5 Tone | | |
| 39 Sequence B : Single Tone | | |
| 40 MDH626 Multicall | 12,13,51,52 | 38,39. |
| 41 MDH621 Omit Keypad Memory | | 40. |
| 42 MDH622 Group Call Encode Lockout | 12,13 | 40. |
| 43 MDH Emergency Encode Lockout | 12,13 | 40. |
| 44 Sequence C : 5 Tone | | |
| 45 Sequence C : Single Tone | | |
| 46 MDH664 Call Button Sequence | 12,13. | |
| 47 MDH665 PTT Sequence | 12,13. | |
| 48 MDH958 Sequences on PTT | 12,13 | 47. |
| 49 MDH960 Sequences Once on PTT | 12,13 | 47. |
| 50 MDH976 Sequences upon of PTT | 12,13,26 | 47. |
| 51 Sequence D : 5 Tone | 40. | |
| 52 Sequence D : Single Tone | 40. | |

| Option Text | Incompatibilities | Requirements |
|---|---|---|
| 53 Omit Power Up Tone | | |
| 54 Omit 5 Tone Decoder Indicator | | |
| 55 Omit Low Battery LED | | |
| 56 Omit Battery Saver | | 40. |
| 57 Pen Switch Enabled | | 40. |
| 58 Omit Keypad Feedback Tone | | 40. |
| 59 Keypad Sidetone Volume | | 40. |
| 60 Keypad Radio Volume | | 40. |
| 61 Sleep Mode for Keypad | | 40. |
| 62 Personal Call Enabled | | 40. |
| 63 Keypad Password | | 40. |
| 64 AutoCall Enabled | | 40. |
| 65 Ten Call Limit on Autocall | | 64. |
| 66 Autocall Interdelay Period | | 64. |
| 67 Inhibit Keypad on Radio Alert | | 40. |
| 68 Call Sequence on Autocall | | 64. |
| 69 Sendkey Sequence on Autocal | | 64. |
| 70 G-tone Entry Option | | 40. |
| 71 Omit Multicall through PTT | | (40) (47) |
| 72 Omit Multicall through Call | | (40) (46) |

# APPENDIX F

Options which are field programmable but not listed in the reference book.

**Sequence D : 5 Tone**

**Sequence D : Single Tone**

The same sequence A, B or C; not compatible with Multicall.

**Omit Power up Tone**

Stops the tone sounding when the radio is turned on (self check is still done)

**Omit 5 Tone Decoder Indicator**

Stops LED flashing when a 5 tone sequence is decoded.

**Omit Low Battery LED**

Stops the LED flashing when the battery is low.

**Omit Battery Saver**

This option disables the battery saver, which turns off parts of the radio when there is no activity. Radios are normally shipped with the battery saver disabled.

**Pen Switch Enabled**

Activates the penswitch so that the Multicall keypad can be turned on and off during radio operation.

**Omit Keypad Feedback Tone**

The tones that are generated by pressing the Multicall keypad are inhibited with this option.

**Keypad Sidetone Volume**

This option sets the keypad feedback tones at the same volume as the sidetones in the radio.

**Keypad Radio Volume**

This option sets the keypad feedback tones at the same volume as the voice levels in the radio, i.e. in line with the volume control knob.

**Sleep Mode for Keypad**

This current saving feature allows the front-cover to periodically enter sleep mode when there is no keypad entry. If the keypad has not been pressed for the last 10 seconds and there is no keypad bus activity detected then the front cover processor will be placed into wait mode and will be woken up by the watch dog timer hardware about every 80 ms. until a key is pressed.

**Personal Call Enabled**

To allow the user to define user specific (personal) 5 tone call sequences, a max. of three personal code sequences are available.

The sequences are stored in three areas (in addition to store 0, the Multicall code) accessible by pressing # and either 0, 1, 2 or 3.

The sequence is changed by keying the new 5 tone sequence with the (#) key depressed. Requires Multicall option.

**Keypad password**

To allow only a permitted portable radio operator to use the Multicall front cover. A 4 digit password is used which is entered form the keypad. 30 sec. is allowed for the password to be entered when the radio is switched on, if the passord is not entered in time, the radio will have to be turned off then on again. However, an alternative is to turn the keypad pen_switch off then on. Correct keypad sequence produces an accept tone with each correct digit. A wrong password is not indicated to the user but the keypad will be inoperative.

If the # key is pressed within the first 30 sec then the password is erased and then another four digits can be entered within this original 30 sec. Requires Multicall option.

**Autocall enabled**

To transmit the selected code sequence repeatedly after every preprogrammed duration for a maximum of 10 calls if limited Autocall option is enabled. Otherwise the call is transmitted until disabled. The interval between calls is programmable in steps of 142 ms in the code plug. The maximum duration is 36 seconds.

The code sequence transmitted will be the call button sequence unless the "SEND KEY SEQUENCE ON AUTOCALL" option is enabled, in which case the multicall code or, if enabled selected and defined, the personal code, will be transmitted.

To transmit the selected code sequence repeatedly, press the "#" button and then the send button with the "#" button remaining keyed. It will continue until:

- the same keys are pressed again
- the * key is pressed
- the # key is pressed
- 10 calls have been transmitted if limited autocall option is enabled
- a valid 5 tone call is detected by the radio
- the channel is changed
- PTT or call button is pressed by the user

Requires Multicall option.

**Ten Call Limit on Autocall**

Limits the number of Autocalls to a maximum of 10 calls.

**Autocall Interdelay Period**

This is the time interval between Autocall encoded transmissions, it is variable in 142 ms steps from zero to a maximum of 36 seconds.

**Inhibit Keypad on Radio Alert**

To inhibit the keypad on radio turn on. It turns on again after the power up alert is completed. Sometimes necessary to not desturb the radio alert tones.

**Call Sequence on Autocall**

**Send key Sequence on Autocall**

Allows the user to select the sequence(s) to be used with autocall; either the call button sequence(s) or the multicall send key sequence(s) can be selected. These are mutually exclusive.

**G-Tone Entry Option**

Allows the entry of the "G" tone via the keypad using two keys. The sequence is push the # key, then press the number 6 whilst holding down the # key. If this option is not enabled then #6 will not be accepted and the error tone will be heard.

**Omit Multicall through PTT**

If a sequence or number of sequences are tied to the PTT, this option inhibits the sending of the modified multicall code and only allows transmission of the fixed call code associated with Sequence B.

**Omit Multicall through Call**

If a sequence or number of sequences are tied to the Call button, this option inhibits the sending of the modified multicall code and only allows transmission of the fixed call code associated with Sequence B.