MA 4073C and MA 4073G

Programmer

User Handbook

RACAL

The Electronics Group

USER HANDBOOK

MA 4073C AND MA 4073G

PROGRAMMER

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Prepared by Group Technical Handbooks
Racal Group Services Limited

Ref. TH 8224
Issue: 3 May90 — 100

Printed in England

MA4073C/MA4073G Programmer

HANDBOOK AMENDMENTS

Amendments to this handbook (if any), which are on coloured paper for ease of identification, will be found at the front of the book. The action called for by the amendments should be carried out by hand as soon as possible.

CONTENTS

ILLUSTRATIONS

INTRODUCTION

1 The MA4073C and MA4073G Programmer is a channel and key variable data storage and loading device for use with Racal Programmable Transceivers in the COUGAR range. The MA4073C Programmer is used with Transceivers bearing Part Number with suffix S. The MA4073G Programmer is used with Transceivers bearing Part Numbers with suffix U, for example PRM4515H3TCU. All other COUGAR Transceivers will accept frequency fill but not key fill from MA4073C and MA4083C devices.

2 Data to be stored is entered via a keyboard, and can be verified on a display prior to storing in the internal memory. Stored data is 'filled' (loaded) into the transceiver (or other unit) via a cable connection.

3 If required, channel and key variable data can be loaded separately into the MA4083C or MA4083G Fill Gun which is then used to load the radio.

4 The Programmer is suitable for use with the Racal PRM4515 Personal and SRM4523 Static, Mobile and Transportable COUGARNET radios, the PRM4735 Covert radio and with the BCC 584D Control and Display Unit (CDU).

POWER SUPPLIES

5 During a radio FILL operation power to both units (the Programmer and the radio) can be supplied from either the Programmer battery or the radio battery. It is recommended that the Programmer battery is fitted and the radio battery is removed.

NOTE: A Programmer battery must be fitted when filling an MA4083C or MA4083G Fill Gun.

6 The Programmer uses an MA4516A 10 V battery mounted on the unit. The battery is charged using an MA4517A single battery charger or an MA4518A six-way battery charger. The battery is removed from the unit for charging, by pulling the release button and turning the battery anti-clockwise. No provision is made for battery charging in situ.

7 The battery is replaced by pulling the release button, pressing the battery downwards and turning clockwise.

BITE

12 At switch-on, the unit carries out Build In Test Equipment (BITE) functions to check that it is operating correctly. A fault condition is indicated on the display as:

(1) RAM DATA ERROR, or

(2) MAIN RAM FAULT, or

(3) NOVRAM (non-volatile RAM) FAULT (see para 14).

13 If a RAM DATA ERROR is indicated the unit should be zeroised and re-loaded. The other fault indications cannot be cleared without dismantling and repairing the unit.

MEMORY

14 The unit uses non-volatile memory devices therefore data stored in the unit is retained at switch-off, or when the battery is removed.

CONTROL FUNCTIONS

15 The front panel controls provide the following functions:

ON OFF	:	Turns the unit on and off by quick depression of switch.
Z ALL	:	Initialises memory erase.
Z FD	:	In channel entry mode enables a single frequency to be zeroised.
FILL	:	Initialises data fill.
^ v	:	Alters display brightness; 3 levels are provided. On power up the middle brightness is selected.
RND	:	In key entry mode, the MA4073C provides a means of entering a complete key via a random number routine. The key is not operative on the MA4073G.
A/D	:	In key mode provides a means of scrolling through keys A to D or for the examination of the key data.
KEY	:	Selects key entry mode.

CHANNEL FREQUENCY ENTRY

18 At switch-on the unit sets itself to the format in use at the previous switch-off. Format 1 allows 5 digit frequencies to be entered, format 2 allows 6 digit frequencies to be entered (para 21).

ENTER	DISPLAY
CHAN	CHAN ** < SELECT >
00 to 29 (channel number)	00 to 29
FTX or FRX	CH xx FTX (or FRX)y y y y y ↑ Channel No ↑ Frequency (if already programmed)
4 or 5 DIGITS dependent on format (para 21).	Channel Frequency.

NOTES: (1) The asterisk symbol acts as a prompt to key in data.

(2) The final frequency digit in the display is automatically entered. The last digit entered must not be 4 or 9.

(3) If a channel frequency is to be cleared (without entering a new frequency) enter ZFD.

19 To clear an error in a new entry enter CE. The EXEC, CHAN, KEY and FILL functions are disabled until the correct number of frequency digits have been entered.

20 When a new frequency entry is complete

ENTER	DISPLAY
EXEC	CH xx FTX y y y y y y (receive frequency example)

If a transmit frequency has been selected the status of the pilot tone setting is given

	<TONE> ON <EX>
or	<TONE> OFF <EX>

If the status is correct then

EXEC	CH xx FRX y y y y y y

To change the status

T ON OFF	
EXEC	CH xx FRX y y y y y y

23 To view an existing key:

ENTER	DISPLAY
KEY	<A/D> A <EX/FI>
EXEC (for Key A)	<A/D> TO SCROLL
OR	
A/D (successively for Keys B to D)	<A/D> B/C/D <EX/FI>
EXEC	<A/D> TO SCROLL

A/D (successively) for A1 = first 12 digits of 36 digit key

A2 = second 12 digits of 36 digit key

A3 = third 12 digits of 36 digit key (and finally exit viewing)

24 A new key can be entered when the first 12 digits of the present key are displayed. The asterisk indicates the position of the next digit to be keyed.

EXEC, CHAN, KEY and FILL functions are disabled until 36 digits have been entered. The display auto scrolls on the 13th and 25th entries. The asterisk disappears after the 12th, 24th and 36th entry, but remains active. The CE key deletes the number to the left of the asterisk on the current line only.

25 To complete a key entry from the keypad press EXEC after the last (36th) digit. The unit responds with:

ENTER	DISPLAY
	VIEW/SAVE ? 1/2

1 To view key

OR

2 To enter keys in memory

The new key overwrites the previous key when 2 is pressed.

Filling Procedure - Key Variables

30

ENTER	DISPLAY
KEY	<A/D> A EX/FI
FILL	ALL KEYS FILL
EXEC	>----< (during loading)
(or CE to return to menu)	<CHAN/KEYS> (loading successful) (or fault indication, para 31)

NOTE: All four keys are transferred.

Fill Failure

31 A fill failure is indicated as follows:

DISPLAY		
RADIO FAIL (during channel or key filling)	indicates	(a) the radio is not connected (b) the radio is switched off (c) the radio is otherwise faulty (d) BCC 584D CDU not set to radio (keyfill only).
NO RADIO ALARM (during key filling)	indicates	(a) the radio is set to CLEAR (b) the radio or programmer may be faulty (c) an alarm signal path is not provided by the radio system (d) a crypto module is not fitted to the radio.
KEY FILL FAIL (during key filling)	indicates a corruption of data.	
ERROR Txx Ryy (during channel fill)	P	indicates a transmit channel xx failed, receive channel yy failed or a pilot tone select command failed. NOTE: only the lowest failed channel number is shown.
NO CHANNEL DATA (during channel fill)		indicates no data in store

NOTE: (1) Press CE to return to main menu or press CHAN, KEY or select required function.

(2) Press EXEC to send data again.

APPENDIX A

FILL GUN OPERATING INSTRUCTIONS

CONTENTS

APPENDIX A

FILL GUN OPERATING INSTRUCTIONS

INTRODUCTION

1 The MA4083C and MA4083G Fill Gun provides a means of transporting channel-frequency or encryption key-variables between a MA4073C or MA4073G Programmer and COUGAR range programmable transceivers.

2 The MA4083C and MA4083G variants are used to key fill radios with suffix letters S and U respectively at the end of the part number. The Fill Gun is also used to fill channel frequencies into all variants of COUGAR Transceiver.

3 While being filled by a Programmer or while filling a radio, the Fill Gun takes its power from the attached equipment. Therefore, the Fill Gun LEDs (NR and ON) will not function unless an equipment is attached. An internal battery maintains memory data when the Fill Gun is disconnected.

4 A Fill Gun can contain:

(1) 30 transmit and 30 receive channel frequencies, or

(2) Four key-variables (encryption codes).

FILLING THE FILL GUN

5 (1) Connect the Fill Gun to the Programmer, using cable ST792252.

NOTE: A filling procedure erases all information previously stored in the Fill Gun.

(2) Follow the appropriate filling procedure (channel frequencies or key-variables) described in para 26 of this handbook.

During the filling operation the NR (red) LED is on.

At completion the NR LED goes off and the ON (yellow) LED comes on. Any other sequence indicates an error (see ERROR INDICATIONS, para 8).

(3) Disconnect the Fill Gun from the Programmer.

(2) The alarm tone is not received by the Fill Gun during filling of key variables.

NOTE: Some types of radio cannot generate an alarm tone. In such cases the LED flashes but the filling procedure continues. The radio should be air tested with another radio to confirm acceptance of fill.

NR LED (Red)

10 Flashes if:

(1) Data from the Programmer cannot be loaded into the Fill Gun.

(2) Channel data cannot be loaded into the radio.

(3) Key-variables cannot be loaded into the radio.

(4) The supply voltage from the attached equipment is low (between 5.5 V and 4 V).

(5) Memory data has been corrupted. Note that this will be so if the Fill Gun has been zeroised.

REMEDIAL ACTION

11 If an error is indicated while filling a radio from the Fill Gun, try again. If that fails, re-fill the Fill Gun and try again.

12 If the error indication persists, try the Fill Gun with a known, good radio. And try the radio with a known, good Fill Gun.

13 If an error is indicated while filling the Fill Gun, try again. If the error persists, try the Programmer with a known, good Fill Gun.