MODEL PM4500
PROGRAMMER

Instruction Manual

Programming Mini-Corn@ Plus SL and PT Series Transceivers

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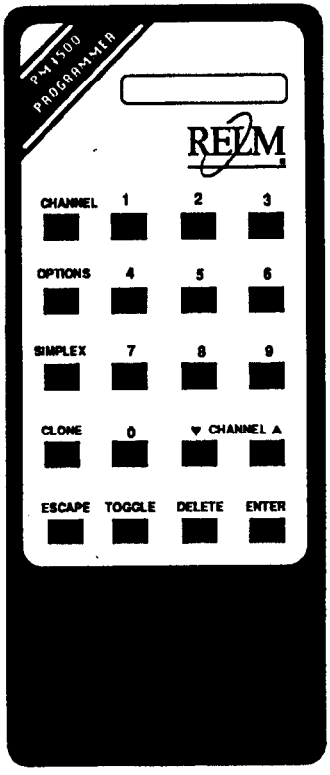

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PACKING LIST

1-Model PM4500 Programmer w/Modular Coupler
1-SL Series and PT Series Instruction Manual (P/N 7001-1841-901)
1-RM Series Instruction Manual (P/N 7001-1841-902)
1-RSP Series Instruction Manual (P/N 7001-1841-903)
1-LMV2548 Instruction Manual (P/N 7001-1841-904)
1-SM Series Instruction Manual (P/N 7001-1 841-905)

IMPORTANT
Please read this manual thoroughly before proceeding to program a SL and PT Series Radio.

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INTRODUCTION

This manual contains instructions for using the PM4500 Programmer (simply referred to as the Programmer) to program the Mini-Come Plus 6-Channel SL and PT Series Transceivers.

The Programmer has a non-volatile memory that requires no battery to maintain data.

The Programmer is used for:

1. Assigning to the Transceiver the following Options or configuration parameters:
   - Two-Tone Sequential Pair No. 1
   - Two-Tone Sequential Pair No. 2
   - Transmit Time Out Timer
   - TX Carrier Delay
   - Beep on Channel Change
   - Range

2. Assigning to each of the 6 channels the following parameters:
   - Receive Frequency
   - RX* Tone, DCS* Code or External Decoder
   - Transmit Frequency
   - TX* Tone, DCS* Code or External Encoder
   - Busy Channel Lockout

3. Cloning:
   - Transferring data from the Transceiver *to* the Programmer (Read Operation)
   - Transferring data *from* the Programmer to the Transceiver (Write Operation)

*DCS stands for Digital Coded Squelch
RX stands for Receive: TX stands for Transmit

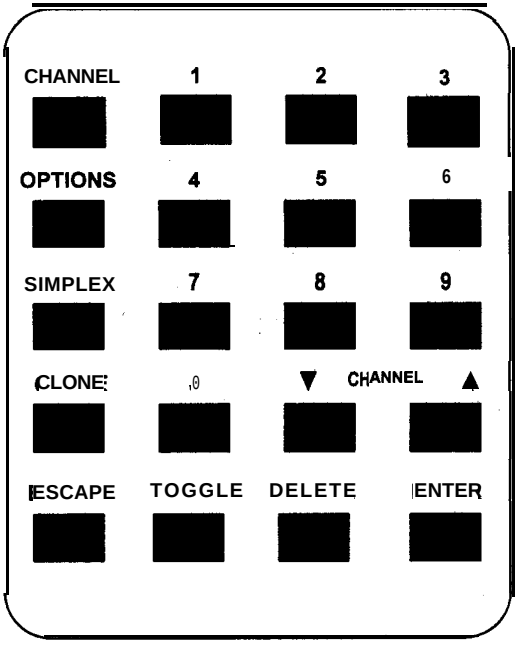
PROGRAMMER DETAILS

The Programmer contains a keyboard (see Figure below) with 20 keys arranged in a 4 x 5 matrix. A 6-character LCD* display lights up when power is applied.

All Programming and Cloning information is indicated on the Programmer's LCD display.

The Unit operates on 7 or 12VDC power from the Transceiver. Data between the Programmer and the Transceiver is transferred through a modular plug or a 6-pin circular cable connected to the Microphone jack on the Transceiver.

*LCD stands for Liquid Crystal Display



KEYBOARD

A description of the 20 keys follows:

CHANNEL
Press this key and a digit key to access a channel.

> **NOTE:** A channel number only requires a single-digit entry.

OPTIONS
Use this key for programming and reviewing the Options Parameters.

SIMPLEX
Press this key for readily programming the Transmitters Frequency and Tone Code the same as the Receiver's Frequency and Tone Code.

CLONE
This key is used for transferring or cloning data *from* the Transceiver *to* the Programmer, or *from* the Programmer *to* the Transceiver.

ESCAPE
Press this key to abort or leave a programming function and to check the Programmer's display.

TOGGLE
Press this key to change Y (Yes) to N (No) and vice-versa. Also, use this key to select Two-Tone Sequential's ALL CALL Tone **(A** or **B).**

DELETE
Use this key to delete numerical data *prior* to pressing **ENTER,** or to delete a channel.

ENTER
Use this key to complete an operation. Press this key to store the displayed information into the memory of the Transceiver and/or to advance to the next parameter for a selected channel. Also, use this key for reviewing the Transceiver's channel data or Options Parameters. In addition, press this key to answer Yes to any prompt that is displayed as a question.

▲
Use this key to look at the *same* parameter in the next *upward* channel, or go to the next *higher* channel. The new channel's number will be displayed briefly. Also use this key to step to the next Option Parameter.

▼
Use this key to look at the *same* parameter in the next *downward* channel, or go to the next lower channel. The new channel's number will be displayed briefly. Also use this key to step to the previous Option Parameter.

0-9
These are *digit* (numeral) keys. Use these for entering numerical data or selecting a channel.

PRELIMINARIES (Start-up)

Whether you are programming or cloning, start with the following 4 steps:

1. Turn the Transceiver OFF.
2. Connect the modular plug or 6-pin circular cable from the Programmer to the Microphone jack of the Transceiver. You will hear a *click* when the modular plug is fully seated.
3. Turn the Transceiver ON. The display on the Programmer should first show:

and then

4. The Unit is now ready to program the Transceiver.

PROGRAMMING PROCEDURE

NOTES:

1. Each time a Programmer key is pressed, a beep will be heard if an external speaker is plugged into the SL Series Transceiver. For the PT Series Transceiver, the *beep* will be heard from its internal speaker.

2. If an invalid number is tried, the Programmer will simply not accept it. A *Beep* will still be heard, indicating a key has been pressed.

3. Use the ▲ for stepping up (or ▼ for stepping down) to the *same* parameter in successive channels. Also use ▲ for stepping to the next Option Parameter and ▼ for stepping to the previous Option Parameter.

4. Press ESCAPE to abort any programming function or to stop. Display will momentarily show the Display Test pattern (see page 32) and then:

5. It is recommended that you program the Options Parameters *before* programming the individual Channel Parameters.

OPTIONS PARAMETERS

NOTES:

1. These parameters pertain to the Unit as a whole, not for a specific channel.

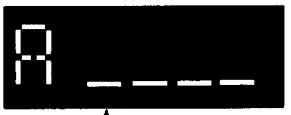
2. If an error is made in entering the data, press DELETE and start over.

3. To REVIEW the Options, repeatedly press OPTIONS. Press ENTER to review the **Two-**Tone Sequential parameters when reviewing Options.

OPTIONS (Continued)

1. **Press OPTIONS.** The display will show the ***first*** **TWO-TONE SEQUENTIAL** pair:

2. To review and/or change the first pair's parameters, press **ENTER** and the display will show:



Blinking

a. Key in the first tone (Tone **A)** by entering 4 digits if the frequency is **1000Hz** or higher. If the frequency is lower than **1000Hz,** enter 3 digits. NO decimal point is required (or allowed). See Table 4 starting on page 23 for the list of Two-Tone frequencies that can be used.

NOTE: If a frequency is entered that is NOT in the list, the Programmer will automatically select the *next* ***higher*** proper frequency.

Press ENTER to store **Tone A** in the Transceiver's memory and advance the display to Tone **A's Duration Time.**

If no frequency is entered for Tone A and ENTER is pressed, the display will show:

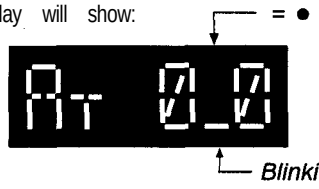
To answer Yes to the Delete **TTS1** question, press **ENTER.** The display will now show:

To continue, press OPTIONS and go to Step 3 on page 10. To program **TTS1** , press ENTER again and go back to Step 2.

OPTIONS (Continued)

b. **Tone A Duration Time**

The display will show:



Key in **Tone A's Duration Time** (in seconds) by entering the unit value, 0 through 7, and then the decimal value, 0 through 9. The *minimum* Duration is 0.1 seconds and the *maximum* is 7.0 seconds. Press **ENTER to** store **Tone A's Duration Time** in the Transceiver's memory and advance the display to the second tone **(Tone B)**.

NOTE: Gap Duration Time is NOT programmed.

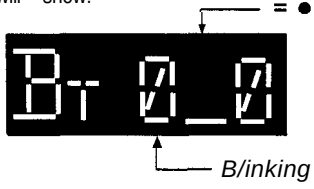
c. Tone B

The display will show:

Key in **Tone B** by entering 4 digits if the frequency is 1000Hz or higher. If the frequency is lower than 1000Hz, enter 3 digits. NO decimal point is required (or allowed). Press **ENTER** to store **Tone B** in the Transceiver's memory and to advance the display to **Tone B's Duration Time.**

d. **Tone B Duration Time**

Display will show:



OPTIONS (Continued)

Key in **Tone B's Duration Time** (in seconds) by entering the unit value, 0 through 7, and then the decimal value, 0 through 9. The *minimum* Duration is 0.1 seconds and the *maximum* is 7.0 seconds. Press **ENTER** to store **Tone B's Duration Time** in the Transceiver's memory and to advance the display to **TTS1's ALL CALL TONE.**

e. ALL CALL TONE

The display will show:.

If no **ALL CALL** Tone is required, press OPTIONS to store this selection in the Transceiver's memory and to advance the display to the *second* **Two-Tone Sequential** pair. Go to Step 3 on page 10.

If **Tone A** is required for **ALL CALL,** press **TOGGLE** *once* and the display will show:

If **Tone B** is required for **ALL CALL, press TOGGLE** again and the display will now show:

Key in **ALL CALL's Duration Time** (in seconds) by entering the value 1 through 9. (If no ALL CALL tone is desired, press **DELETE.)** Press **ENTER** to store the selection in the Transceiver's memory and then press OPTIONS to advance the display to the *second* **Two-Tone Sequential** pair.

OPTIONS (Continued)

3. TWO-TONE SEQUENTIAL pair No. 2:

a. To review and/or change the second pair's parameters, press **ENTER** and the display will show:

B/inking

b. Key in the first tone **(Tone A)** by entering 4 digits if the frequency is 1000Hz or higher. If the frequency is lower than 1000Hz, enter 3 digits. NO decimal point is required (or allowed). See Table 4 starting on page 23 for the list of Two-Tone frequencies that can be used.

NOTE: If a frequency is entered that is NOT in the list, the Programmer will automatically select the *next higher* proper frequency.

Press **ENTER** to store Tone A in the Transceiver's memory and advance the display to **Tone A's Duration Time.**

If no frequency is entered for **Tone A** and **ENTER** is pressed, the display will show:

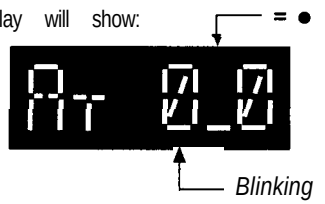
To answer Yes to the Delete **TTS2** question, press **ENTER.** The display will now show:

To continue, press **OPTIONS** and go to Step 4 on page 13. To program **TTS2**, press ENTER again and go back to Step 3.

OPTIONS (Continued)

c. Tone A Duration Time

The display will show:



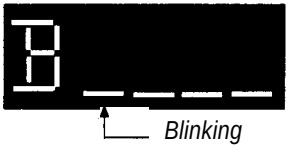
Blinking

Key in **Tone A's Duration Time** (in seconds) by entering the unit value, 0 through 7, and then the decimal value, 0 through 9. The *minimum* Duration is 0.1 seconds and the *maximum* is 7.0 seconds. Press **ENTER to** store **Tone A's Duration Time** in the Transceivers memory and advance the display to the second tone **(Tone B).**

NOTE: Gap Duration Time is NOT programmed.

d. **Tone B**

The display will show:

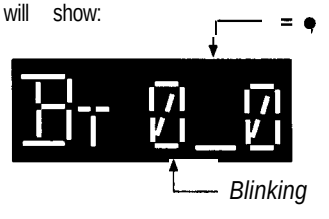


Blinking

Key in **Tone B** by entering 4 digits if the frequency is 1 000Hz or higher. If the frequency is lower than 1000Hz, enter 3 digits. NO decimal point is required (or allowed). Press **ENTER** to store **Tone B** in the Transceiver's memory and to advance the display to **Tone B's Duration Time.**

e. Tone B Duration Time

Display will show:



Blinking

OPTIONS (Continued)

Key in **Tone B's Duration Time** (in seconds) by entering the unit value, 0 through 7, and then the decimal value, 0 through 9. The *minimum* Duration is 0.1 seconds and the *maximum* is 7.0 seconds. Press **ENTER** to store Tone B's **Duration Time** in the Transceiver's memory and to advance the display to **TTS2's ALL CALL TONE.**

f. **ALL CALL TONE**

The display will show:

If no **ALL CALL** Tone is required, press **OPTIONS** to store this selection in the Transceiver's memory and to advance the display to **Transmit Time-Out Timer. Go** to Step 4.

If **Tone A** is required for **ALL CALL,** press **TOGGLE** *once* and the display will show:

Blinking

If **Tone B** is required for **ALL CALL,** press **TOGGLE** *again* and the display will now show:

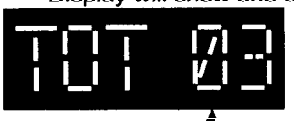
Blinking

Key in **ALL CALL's Duration Time** (in seconds) by entering the value 1 through 9. (If no ALL CALL tone is desired, press **DELETE.)** Press **ENTER** to store the selection in the Transceiver's memory and then press **OPTIONS** to advance the display to the **Transmit Time-Out Timer.**

OPTIONS (Continued)

4. Transmit Time Out Timer (TOT)

Display will show one of the following:



Blinking

if previously programmed

Blinking

if **DELETE is** pressed

a. Key in a value 00 – 15 (see Table 1 below). Press **ENTER** to store **TOT** in the Transceiver's memory and to advance the display to **TX Carrier Delay.**

Table 1. TOT (Seconds)

Value	TOT	Value	TOT
00	Disabled	08	135
01	30	09	150
02	45	10	165
03	60	11	180
04	75	12	195
05	90	13	210
06	105	14	225
07	120	15	240

5. TX Carrier Delay

Display will show.. for **example:**

Blinking

a. Key in a value 0 – 3 (see Table 2 below). Press **ENTER** to store **TX Carrier Delay** in the Transceiver's memory and to advance the display **to Beep On Channel Change.**

Table 2. TX Carrier Delay (mS)

Value	Delay	Value	Delay
0	100	2	400
1	300	3	500

OPTIONS (Continued)

6. Beep on Channel Change

Display will show, for example:

Blinking

or

Blinking

a. Press **TOGGLE** to change Y (Yes) to N (No) or vice-versa. Press **ENTER** to store the selection in the Transceiver's memory and to advance the display to **Range.**

7. Range

Display will show:

Blinking

WARNING: The Transceiver's proper Range is determined at the time of manufacture. It should NOT be programmed unless components that affect the Unit's memory have been replaced. It should never be changed to a *different* value.

a. If programming is necessary, key in the proper value 1, 2, 3 or 4 (see the CAUTION and Table 3 on page 15). Press **ENTER to store Range number** in the Transceiver's memory. The display will return to the start of Options and show **Two-Tone Sequential** pair No. 1.

OPTIONS (Continued)

CAUTION: If the Range number is *changed,* the display will show, for example:

Blinking

After ENTER is pressed, the display will show:

and then

ALL channels are *automatically deleted.* Thus, each **channel to be used will have to be programmed for all of its parameters.**

Table 3. Ranges

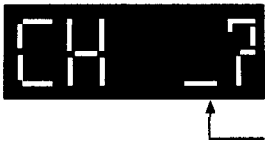
No.	Frequency Range (MHz)	Channel Steps (kHz)
1	150-174	5, 6.25
2	450-482	12.5
3	450-512	6.25, 12.5
4	30-50	5

CHANNEL PARAMETERS

NOTES:

1. Programming steps should be performed in the following order as shown.
2. It is recommended that Channel Parameters be programmed ***after*** you **have** programmed the Options Parameters.
3. See page 31 for examples of programmed channels.

1. **Channel Access**
Press **CHANNEL.**
The display will show:



Blinking

2. Press the desired Channel's Number. The display will show, for example:

Y shown only for reference

If:
Y = Blank, Channel has both a Receive *and* a Transmit frequency.

Y= R, Receive *only.* Hence, it can't transmit. See page 19 for procedure.

Y= D, Channel is deleted. Hence, it has no receive or transmit frequency.

a. To *delete* the channel at this time, press **DELETE.** The display will show:

Blinking

Press **ENTER** to answer Yes.

NOTE: To answer **No,** press **TOGGLE** or any diait kev.

Display will show, for example:

See page 31 for display sequence of a deleted channel.

NOTE: If you make an error in number entry, start over by pressing **CHANNEL** and the correct number.

b. To step to **Receive Frequency,** press **ENTER.**

3. Receive Frequency
Display will show, for PTL VHF models, one of the following:

Blinking
if previously programmed

Blinking
if none is programmed

For the PTV and SLV VHF models, the display will show one of the following:

Blinking
if previously programmed

Blinking
if none is programmed

For PTU and SLU UHF models, the display will show one of the following:

Blinking
if previously programmed

Blinking
if none is programmed

4. Key in the six (or remaining five) digits of the desired RX frequency. The valid frequency range is between 30 and 50 MHz for PTL VHF models, between 150 and 174 MHz for PTV and SLV VHF models, and between 450 and 512 MHz for PTU and SLU UHF models.

Examples of keyed in frequencies:
37080 (37.080 MHz; PTL VHF models)
56045 (156.045 MHz; PTV and SLV VHF models)
67237 (167.2375 MHz; PTV and SLV VHF models)
470012 (470.0125 MHz; PTU and SLU UHF models)

NOTE: Ignore the decimal.

If an error is made in entering the digits, press **DELETE** and start over.

Press **ENTER** to store in the Transceiver's memory. The display will advance to **RX Tone Code.**

5. RX Tone Code

Display will show one of the following:.

Blinking

if previously programmed

if previously programmed

or

if none is programmed

Blinking

6. a. Enter a three-digit code corresponding to the desired CTCSS Tone Code from Table 5 on page 27 or DCS Code from Table 6 on pages 28 through 30. If you make an error in entering the digits, press **DELETE** and start over.

NOTE: External Decode is selected by entering 155 or higher (up to 189) for the RX Tone Code.

b. To select one of the **Two-Tone Sequential** pairs (programmed in Options), press **TOGGLE.** The display will show:

Press **TOGGLE** again and the display will show:

NOTE: If neither **TTS1** nor **TTS2** has been programmed, the display will NOT change.

7. a. If the Transmit Frequency and Tone Code (**TTS1** and **TTS2** are exceptions) are to be the same as Receive, press **SIMPLEX** and go to Step 11 on page 21.

b. If not, press **ENTER** to store the RX Tone Code in the Transceiver's memory and to advance the display to **Transmit Frequency.**

8. Transmit Frequency

Display will show for PTL VHF models, one of the following:

Blinking

if previously programmed

Blinking

if none is programmed

For PTV and SLV VHF models, the display will show one of the following:

Blinking

if previously programmed

Blinking

if none is programmed

For PTU and SLU UHF models, the display will show one of the following:

Blinking if previously programmed

Blinking if none is programmed

a. To program the channel for Receive *On/y:*
Press **DELETE.** The display will show one of the following:

B/inking

(B l i n k i n g

Then press **ENTER** and go to Step 11 on page 21 to continue. See page 31 for the display sequence of a Receive *Only* Channel.

b. To program the TX Frequency:
Enter the six (or remaining five) digits of the desired TX frequency. The valid **frequency range is between 30 and 50 MHz for PTL VHF models, between 150 and 174 MHz for PTV and SLV VHF models and between 450 and 512 MHz for PTU and SLU UHF models.**

Examples of keyed in frequencies:
37320 (37.320 MHz; PTL VHF models)
54010 (154.010 MHz; PTV **&** SLV VHF models)
71312 (171.3125 MHz; PTV **&** SLV VHF models)
460775 (460.775 MHz; UHF models)

NOTE: Ignore the decimal.

If an error is made in entering the digits, press **DELETE** and start over.

Press **ENTER** to store Transmit Frequency in the Transceiver's memory. The display will advance to **TX Tone Code.**

9. TX Tone Code
Display will show one of the following:

Blinking if previously programmed

Blinking if none is programmed

10. Enter a three-digit code corresponding to the desired CTCSS Tone Code from Table 5 on page 27 or DCS Code from Table 6 on pages 28 through 30.

NOTE: External Encode is selected by entering 155 or higher (up to 189) for the TX Tone Code.

If you make an error in entering digits, press **DELETE** and start over.

Press **ENTER** to store **TX Tone Code** in the Transceiver's memory and to advance the display to **Busy Channel Lockout.**

11. **Busy Channel Lockout**
The display will show one of the following:

B/inking or *Blinking*

NOTE: "No Tone" is displayed if the RX Tone Code is 000 (=no tone), TTS1 or TTS2. Thus, BCL Yes would be a meaningless choice and is not available. Continue with **step 13 on page 22.**

12. Press **TOGGLE** to change Y (Yes) to N **(No)** or vice versa.

13. Press ENTER to store the selection in the Transceiver's memory. The display will return to showing the channel number.

14. For other channels, repeat procedural steps 1 - 13, or repeatedly press CHANNEL ▲ (or ▼) to step to the next desired channel.

Reviewing Programmed Data

You may wish to review the data you have entered into a channel. There are two methods for doing this.

1. After step 13 above, press ENTER in succession to step through the channel's parameters.

2. Press CHANNEL and the desired channel's number. Then press ENTER in succession to step through the desired channel's parameters.

> NOTE: See page 31 for a summary of display sequences during channel parameters programming.

Table 4. Two-Tone Sequential Tones.

Tone (Hz)	Tone (Hz)	Tone (Hz)
2735	292.7	314.8
274.1	293.4	315.6
274.7	294.1	316.4
275.3	294.8	317.2
275.9	295.5	318.0
276.5	296.2	318.8
277.1	296.9	319.6
277.7	297.6	320.5
278.3	298.3	321.3
279.0	299.0	322.1
279.6	299.7	322.9
280.2	300.4	323.8
280.8	301.2	324.6
281.5	301.9	325.5
282.1	302.6	326.3
282.8	303.3	327.2
283.4	304.1	328.0
284.0	304.8	328.9
284.7	305.6	329.8
285.3	306.3	330.6
286.0	307.1	331.5
286.6	307.8	332.4
287.3	308.6	333.3
288.0	309.4	334.2
288.6	310.1	335.1
289.3	310.9	336.0
290.0	311.7	336.9
290.6	312.5	337.8
291.3	313.2	338.7
292.0	314.0	339.6

NOTE: The decimal point and its following digit can NOT be entered. It is only necessary to key in the digits to the LEFT side of the decimal point.

Table 4 is continued on the next page.

Table 4. Two-Tone Sequential Tones (Continued)

Tone (Hz)	Tone (Hz)	Tone (Hz)
340.5	376.5	420.8
341.5	377.6	422.2
342.4	378.7	423.7
343.4	379.9	425.1
344.3	381.0	426.6
345.3	382.2	428.0
346.2	383.4	429.5
347.2	384.6	431.0
348.1	385.8	432.5
349.1	386.9	434.0
350.1	388.1	435.5
351.1	389.4	437.0
352.1	390.6	438.5
353.1	391.8	440.1
354.1	393.0	441.6
355.1	394.3	443.2
356.1	395.5	444.8
357.1	396.8	446.4
358.1	398.0	448.0
359.1	399.3	449.6
360.2	400.6	451.2
361.2	401.9	452.8
362.3	403.2	454.5
363.3	404.5	456.2
364.4	405.8	457.8
365.4	407.1	459.5
366.5	408.4	461.2
367.6	409.8	462.9
368.7	411.1	464.6
369.8	412.5	466.4
370.9	413.9	468.1
372.0	415.2	469.9
373.1	416.6	471.6
374.2	418.0	473.4
375.3	419.4	475.2

Table 4 is continued on the next page.

Table 4. Two-Tone Sequential Tones (Continued)

Tone (Hz)	Tone (Hz)	Tone (Hz)
477.0	550.6	651.0
478.9	553.0	654.4
480.7	555.5	657.8
482.6	558.0	661.3
484.4	560.5	664.8
486.3	563.0	668.4
488.2	565.6	672.0
490.1	568.1	675.6
492.1	570.7	679.3
494.0	573.3	683.0
496.0	576.0	686.8
498.0	578.7	690.6
500.0	581.3	694.4
502.0	584.1	698.3
504.0	586.8	702.2
506.0	589.6	706.2
508.1	592.4	710.2
510.2	595.2	714.2
512.2	598.0	718.3
514.4	600.9	722.5
516.5	603.8	726.7
518.6	606.7	730.9
520.8	609.7	735.2
523.0	612.7	739.6
525.2	615.7	744.0
527.4	618.8	748.5
529.6	621.8	753.0
531.9	625.0	757.5
534.1	628.1	762.1
536.4	631.3	766.8
538.7	634.5	771.6
541.1	637.7	776.3
543.4	641.0	781.2
545.8	644.3	786.1
548.2	647.6	791 .1

Table 4 is continued on the next page.

Table 4. Two-Tone Sequential Tones (Continued)

Tone (Hz)	Tone (Hz)	Tone (Hz)
796.1	1024.5	1436.7
801.2	1033.0	1453.4
806.4	1041.6	1470.5
811.6	1050.4	1488.0
816.9	1059.3	1506.0
822.3	1068.3	1524.3
827.8	1077.5	1543.2
833.3	1086.9	1562.5
838.9	1096.4	1582.2
844.5	1106.1	1602.5
850.3	1116.0	1623.3
856.1	1126.1	1644.7
862.0	1136.3	1666.6
868.0	1146.7	1689.1
874.1	1157.4	1712.3
880.2	1168.2	1736.1
886.5	1179.2	1760.5
892.8	1190.4	1785.7
899.2	1201.9	1811.5
905.7	1213.5	1838.2
912.4	1225.4	1865.6
919.1	1237.6	1893.9
925.9	1250.0	1923.0
932.8	1262.6	
939.8	1275.5	
946.9	1288.6	
954.1	1302.0	
961.5	1315.7	
968.9	1329.7	
976.5	1344.0	
984.2	1358.6	
992.0	1373.6	
1000.0	1388.8	
1008.0	1404.4	
1016.2	1420.4	

Table 5. PM4500 Codes vs. CTCSS Tones.

Code #	TONE (Hz)	Code #	TONE (Hz)	Code #	TONE (Hz)
000	No Tone	017	118.8	034	218.1
001	67.0	018	123.0	035	225.7
002	71.9	019	127.3	036	233.6
003	74.4	020	131.8	037	241.8
004	77.0	021	136.5	038	250.3
005	79.7	022	141.3	039	69.4
006	82.5	023	146.2	040	159.8
007	85.4	024	151.4	041	165.5
008	88.5	025	156.7	042	171.3
009	91.5	026	162.2	043	177.3
010	94.8	027	167.9	044	183.5
011	97.4	028	173.8	045	189.9
012	100.0	029	179.9	046	196.6
013	103.5	030	186.2	047	199.5
014	107.2	031	192.8	048	206.5
015	110.9	032	203.5	049	229.1
016	114.8	033	210.7	050	254.1

NOTE (Concerning Table 6 that follows on pages 28, 29 and 30): For communication systems utilizing only SL and/or PT Series transceivers, it is recommended that Standard PM4500 DCS (Standard DCS) codes be used. For existing communication systems employing DCS, it may be necessary to use the Inverted (or complemented) DCS and corresponding PM4500 Code for proper Transceiver operation.

Table 6. PM4500 Codes vs. DCS* Codes.

STD PM4500 Code	DCS Code STD	DCS Code INV	INV PM4500 Code
051	023	047	058
052	025	244	090
053	026	464	127
054	031	627	141
055	032	051	059
056	036	172	082
057	043	445	121
058	047	023	051
059	051	032	055
060	053	452	123
061	054	413	117
062	065	271	100
063	071	306	102
064	072	245	091
065	073	506	131
066	074	174	083
067	114	712	148
068	115	152	077
069	116	754	154
070	122	225	087
071	125	365	113
072	131	364	112
073	132	546	136
074	134	223	086
075	143	412	116
076	145	274	101
077	152	115	068
078	155	731	050
079	156	265	098
080	162	503	130
081	165	251	093
082	172	036	056
083	174	074	066
084	205	263	097
085	212	356	Ill

* DCS stands for Digital Coded Squelch.

Table 6 continued on next page.

Table 6. PM4500 Codes vs. DCS* Codes (Cont'd).

STD PM4500 Code	DCS Code STD	DCS Code INV	INV PM4500 Code
086	223	134	074
087	225	122	070
088	226	411	115
089	243	351	110
090	244	025	052
091	245	072	064
092	246	523	133
093	251	165	081
094	252	462	126
095	255	446	122
096	261	732	151
097	263	205	084
098	265	156	079
099	266	454	124
100	271	065	062
101	274	145	076
102	306	071	063
103	311	664	146
104	315	423	118
105	325	526	134
106	331	465	128
107	332	455	125
108	343	532	135
109	346	612	139
110	351	243	089
111	356	212	085
112	364	131	072
113	365	125	071
114	371	734	152
115	411	226	088
116	412	143	075
117	413	654	061
118	423	315	104
119	431	723	149
120	432	516	132

* DCS stands for Digital Coded Squelch.

Table 6 continued on next page.

Table 6. PM4500 Codes vs. **DCS*** Codes **(Cont'd).**

STD PM4500 Code	DCS Code STD	DCS Code INV	INV PM4500 Code
121	445	043	057
122	446	255	095
123	452	053	060
124	454	266	099
125	455	332	107
126	462	252	094
127	464	026	053
128	465	331	106
129	466	662	145
130	503	162	080
131	506	073	065
132	516	432	120
133	523	246	092
134	526	325	105
135	532	343	108
136	546	132	073
137	565	703	147
138	606	631	142
139	612	346	109
140	624	632	143
141	627	031	054
142	631	606	138
143	632	624	140
144	654	743	153
145	662	466	129
146	664	311	103
147	703	565	137
148	712	114	067
149	723	431	119
150	731	155	078
151	732	261	096
152	734	371	114
153	743	654	144
154	754	116	069

* DCS stands for Digital Coded Squelch.

NOTE: If Code # is 155 or higher (up to 189) for the Tone Code, an External Decoder or Encoder can be enabled.

DISPLAY SEQUENCE DURING CHANNEL PARAMETER PROGRAMMING

OPERATION	EXAMPLES OF DISPLAY INDICATION					
Press **CHANNEL** and Ch. No. for Channel Indicator*	CH 4	CH 5	CH 38	CH 60	CH 60	NO RCV
Press **ENTER** for Receive Frequency	155.325	158.745	162.550	----	CH 60	NO RCV
Press **ENTER** for Receive Tone Code	RX 015	TX 151	RX 000	NO XMT	CH 60	NO RCV
Press **ENTER** for Transmit Frequency	154.710	154.850	----	NO XMT	----	NO RCV
Press **ENTER** for Transmit Tone Code	TX 033	TX 000	NO XMT	NO XMT	----	NO RCV
Press **ENTER** for Busy Channel Lockout	BSY Y	BSY N	BSY N	BSY N	BSY N	NO RCV

***Channel Indicators:** R=Receive Only Channel; D=Deleted Channel

DISPLAY TEST

Press and *hold* **ESCAPE.** The Programmer's display will show a characteristic Test Pattern with all segments on, thus:

(Blow-up of a single digit of the display)

and then revert to:

in the display when **ESCAPE** is released.

UNIT TURN OFF

After Programming or Cloning is completed:

1. Turn Transceiver power *off.*
2. Remove inter-connecting cable from transceiver.

CLONING PROCEDURE

This feature permits duplicating (cloning) the same programmed data into any number of transceivers. Be sure to use the proper Start-up (see PRELIMINARIES, page 5) and Unit Turn Off procedures (above) when cloning.

NOTE: The **CLONE** key toggles from the **Read function to the Write function, or** vice versa, each time it is pressed.

If a Transceiver already contains the data to be cloned, connect it to the PM4500 and proceed with Step 3 on page 33, using proper Start-up procedure.

If the data to be duplicated (cloned) is NOT already in a Transceiver, proceed as follows:

1. Connect the PM4500 to the Transceiver to be *programmed* using proper Start-up procedure.
2. Enter the data into the transceiver by using the PM4500 normal programming functions.
3. Press **CLONE.**
   If "READ?" is in the display, press **ENTER.** If not, press **CLONE** again and then **ENTER.** This will copy the Transceiver's entire data into the Programmer's memory.
4. Turn OFF the Transceiver and then disconnect the PM4500.
5. Connect the PM4500 to a Transceiver to be *cloned,* using proper Start-up procedure.
6. Press **CLONE** ("WRITE?" must be in the display) and then **ENTER.**
7. Repeat steps 4, 5 and 6 for all other Transceivers to be *cloned.*

A detailed description of the **CLONE (READ** and **WRITE)** operations follows:

TRANSFERRING DATA *INTO* THE PROGRAMMER *(READ* OPERATION)

1. Press **CLONE.** Display will show:

Blinking

NOTE: If not, press CLONE again.

2. Press **ENTER** (to answer Yes).
   Processing will begin. During data transfer, the display will show:

3. When transfer is complete, the display will show:

TRANSFERRING DATA *INTO* THE TRANSCEIVER (*WRITE* OPERATION)

1. Press CLONE. Display will show:

Blinking

NOTE: If not, press CLONE again.

2. Press ENTER (to answer Yes).
Processing will begin. During data transfer, the display will show:

NOTE: If you attempt to transfer SL (for example) Series data in the Programmer to a different series Radio (such as PT, RSP, etc.), the display will show:

The Transceiver will emit a series of beeps and no transfer will take place.

3. When transfer is complete, the display will show:

PROGRAMMING WITH A PC

An IBM@ PC-compatible computer with a serial port can be used for all programming and cloning functions the same as the **PM4500**. Consult the factory for details of the menu-driven software and the necessary Interface Adapter required between the PC and an SL or PT Series Transceiver. A modular coupler can be used for connecting the Interface Adapters cable to the **PM4500**. This coupler is stored in the Programmer's rear panel compartment.

Programming the Transceiver is accomplished through its microphone jack. The **software** provides for a pre-formatted print out of all information programmed into the Transceiver.

NOTES: _____

Serial Number: _____ is programmed with the following parameters.

Ch. 1 RX Frequency _____
RX Tone/Code _____
TX Frequency _____
TX Tone/Code _____
BCL (Yes/No) _____

Ch. 2 RX Frequency _____
RX Tone/Code _____
TX Frequency _____
TX Tone/Code _____
BCL (Yes/No) _____

Ch. 3 RX Frequency _____
RX Tone/Code _____
TX Frequency _____
TX Tone/Code _____
BCL (Yes/No) _____

Ch. 4 RX Frequency _____
RX Tone/Code _____
TX Frequency _____
TX Tone/Code _____
BCL (Yes/No) _____

Ch. 5 RX Frequency _____
RX Tone/Code _____
TX Frequency _____
TX Tone/Code _____
BCL (Yes/No) _____

Ch. 6 RX Frequency _____
RX Tone/Code _____
TX Frequency _____
TX Tone/Code _____
BCL (Yes/No) _____

TTS1 Tones: A _____ Hz @ _____ secs.
B _____ Hz @ _____ secs.
All Call Tone _____ (A/B) @ _____ secs.
TTS2 Tones: A _____ Hz @ _____ secs.
B _____ Hz @secs. _____
All Call Tone _____ (A/B) @ _____ secs.
Transmit Time Out Timer = _____ secs.
TX Carrier Delay (Tone Only) = _____ mS.
Beep on Channel Change: _____ (Yes/No)

NOTES: _____