

# SM-2000E Series User Manual

"Professional Mobile Radio"

**maxon**

TecNet International Inc.  
11535 W. 83rd Terrace  
Lenexa, KS 66214  
Tel.913-859-9515  
Fax.913-859-9550  
E-mail: [tecnet@tecnetusa.com](mailto:tecnet@tecnetusa.com)  
[www.tecnetusa.com](http://www.tecnetusa.com)



**maxon**

## SAFETY/ WARNINGS

### Safety Information

Please read the following before connecting the radio to a DC power supply.

1. **WARNING!** NEVER connect the transceiver to an AC outlet. This may pose a fire hazard or result in an electric shock.
2. **WARNING!** NEVER operate the radio transmitter without a suitable artificial load or antenna connected.
3. **WARNING!** NEVER connect the transceiver to a power source of more than 16V DC such as a 24V battery.
4. **WARNING!** NEVER place the transceiver where normal operation of the vehicle may be hindered or where it could cause bodily injury.
5. **WARNING!** NEVER expose the transceiver to rain, snow or any liquids.
6. **CAUTION** do not cut the DC power cable between the DC Plug and fuse holder. If an incorrect connection is made after cutting, the transceiver may be damaged.
7. **CAUTION** The transceiver will become hot when operating continuously for long periods.
8. **CAUTION** never modify a radio or accessory except as instructed in the service manual, engineering bulletins or formal communication as this may invalidate any warranty, guarantee or type approval.
9. **AVOID** using or placing the transceiver in areas with temperatures below - 30°C or above +60°C or in areas subject to direct sunlight, such as the dashboard.
10. **AVOID** operating the transceiver without running the vehicle engine. The vehicle battery will quickly run out if the transceiver transmits while the vehicle engine is OFF.
11. **AVOID** placing the transceiver in excessively dusty environments.
12. **AVOID** the use of chemical agents such as benzene or alcohol when cleaning, as they can damage the transceiver surfaces.
13. **ALWAYS USE** original Maxon microphones. 3rd party microphones have different pin assignments and may damage the transceiver.
14. **DO NOT** operate this equipment in environments containing explosive materials or vapors.



#### WARNING

Government law restricts the operation of unlicensed radio transmitters within government controlled territories.  
Illegal operation is punishable by fine or imprisonment or both.  
Refer service to qualified technicians only.



#### WARNING

**EXPLOSIVE ATMOSPHERES (GASES, DUST, FUMES, etc.)**  
Shut Off the transceiver while refueling or while parked in gasoline service stations.  
Do not carry spare containers in the trunk of your vehicle if your transceiver is mounted in the trunk area.



#### WARNING

**INJURY FROM RADIO FREQUENCY TRANSMISSIONS**  
Do not operate your transceiver when somebody is either touching the antenna or standing within two to three feet of it to avoid the possibility of radio frequency burns or related physical injury.

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## 2. Specification

### About Your SM-2000E Radio

Maxon's SM-2000E Series radio features 99 channels. Operation and functions of this radio are outlined in this manual.

We urge you to thoroughly read this manual before operating the radio.

The application of some of the functions described in this manual are determined by the system you use. Your Maxon Dealer will program your radio so that you have the greatest number of functions possible relative to your needs. The below specification outlines the approximation results from in-house testing and may vary slightly from radio to radio.

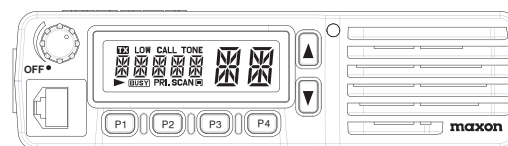
General	Performance certification	R&TTE Directive 1999/5/EC FCC/IC EMC Directive 89/336/EEC LV Directive 73/23/EEC EN 60950-1 72/245 EC as assembled by 2004/104/EC
	Frequency Band	136-174 MHz VHF 400-470 MHz UHF
	Modulation type	F3E/G3E
	Channels	99
	Channel Bandwidth	12.5 kHz
	PLL Step	2.5 kHz, 5kHz, 6.25kHz
	Input power supply	13.2Vdc nominal 15.6Vdc maximum (extreme) 10.8Vdc minimum (extreme)
	Antenna Impedance	50 ohm
	Operating Temps	-30°C to +60°C nominal
	Current consumption	OFF <10µA Standby (muted) <220mA Unmuted with 25% AF power <350mA Unmuted with 50% AF power <450mA Unmuted with 100% AF power <1000mA Transmit @ 5W RF output <2.5A Transmit @ 25W RF output <7.0A
	Intermediate frequencies	46.35MHz First I.F. 450kHz Second I.F.
	Frequency stability	+/- 2.5ppm
	Sensitivity	0.25 µV @ 12 dB SINAD
	Adjacent Channel	60 dB
Receive	Intermod Reject	65 dB
	Spurious Response	65 dB
	Audio Power Out	6 W int., (Internal 8Ω speaker)
	Audio Distortion	<=5%
	Output Power	5/25 W
Transmit	Frequency Stability	2.5 ppm
	Spurious & Harm.	-36 dBm (<1 GHz), -30 dBm (>1 GHz)
	Audio Distortion	<3% typical
	Adjacent Ch Power	>-60 dBc

## 3. Unpacking

Remove and carefully inspect the contents of your package(s) for the following items:

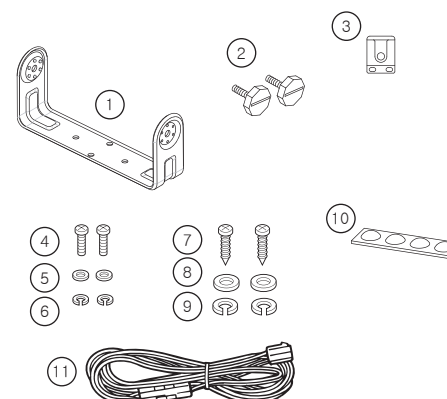
1. SM-2000E Transceiver
2. Microphone
3. Installation kit
4. User Manual

\* If any items are missing, please contact your Dealer



1. 1 x Main mounting bracket
2. 2 x Thumb wheel screws
3. 1 x Microphone bracket
4. 2 x M3 x 6mm Mic bracket Screw
5. 2 x M3 Mic bracket Washers
6. 2 x M3 Mic bracket Spring Washers
7. 2 x M5 x 11mm main bracket screws
8. 2 x M5 Washers
9. 2 x M5 Spring Washers
10. 4 x Rubber feet
11. 1 x power lead with 10 amp fuse.

### Installation Kit contents



## Installation

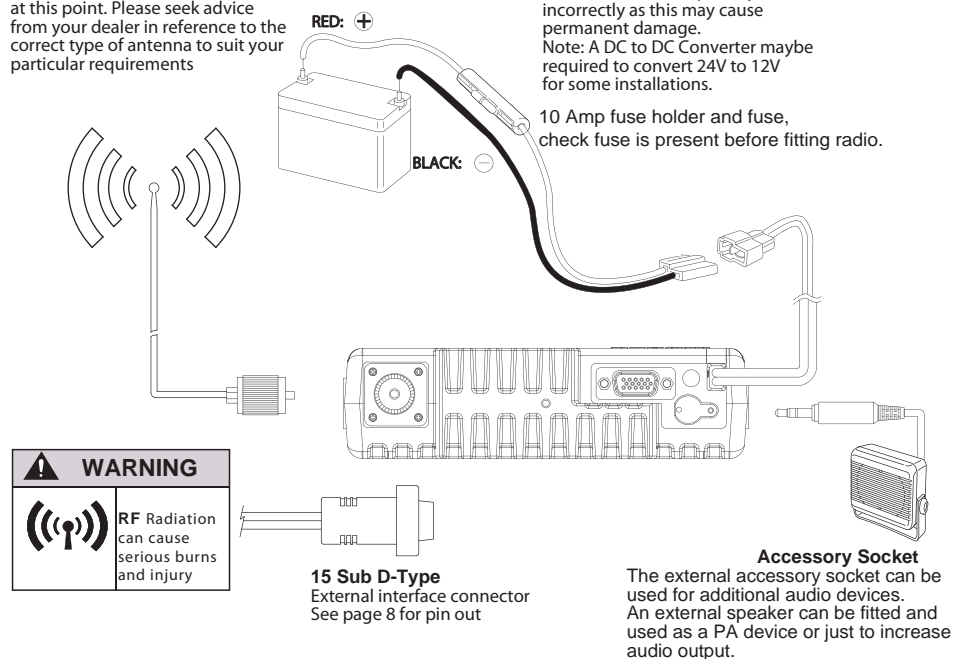
### Antenna socket

The antenna connector is a SO-239 "M" type with 50 ohm impedance at this point. Please seek advice from your dealer in reference to the correct type of antenna to suit your particular requirements

### DC Power Supply

The supply voltage for the SM-2000E is 12V – 13.8 Volts DC. Do not connect the polarity incorrectly as this may cause permanent damage. Note: A DC to DC Converter maybe required to convert 24V to 12V for some installations.

10 Amp fuse holder and fuse, check fuse is present before fitting radio.



**⚠** Installation of VHF and UHF radio equipment, antennas and power supplies should only be carried out by an engineer qualified in the relevant fields. Keep all antennas a good distance away from all areas of human activity and use a good ground plane. Use quality equipment for installations i.e. connectors, cable and power supplies. To minimise electric shock and RF leakage never modify a radio or accessory, except as instructed in the Service Manual.

## SM-2000E Features & Description

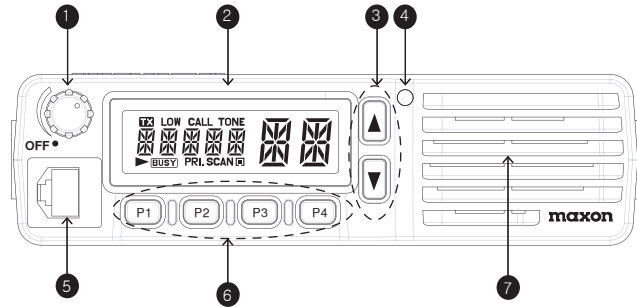
### Programmable feature list

Wideband 400-470 MHz 136-174 MHz	99 Programmable channels
High/Low power 25W or 5W Programmable	CTCSS/DCS/IDCS tone Signalling
Monitor button	10 User defined CTCSS tones
Channel groups	User adjustable squelch
Programmable 12.5/25 KHz channel spacing	5 tone selective calling
Busy channel lock-out	40 Encode and decode Selcall addresses
Mark Idle	ANI (Automatic Number Identification)
Time out timer	5 tone acknowledgement
Penalty timer	Start up definable logo
Key and status beeps	Key lock
Covert mode	DTMF
Master Mute button	PTT ID
Hook switch	Emergency Call
Hook scan	Stun and revive
Back light and color control settings	DTMF side tone
Electronic Serial number (read only)	Group/channel name or number
Programmer reads Firmware version	Memory channels
Password protected	4 x programmable keys short & long press
<b>Scanning</b>	<b>Alignment</b>
<ul style="list-style-type: none"> <li>* Channel scan</li> <li>* Priority channel scan</li> <li>* Scan list edit</li> <li>* Priority channel edit</li> <li>* Power on scan</li> <li>* Nuisance delete</li> </ul>	<p>All of the following adjustable RF parameters can be electronically adjusted. RF Power high and low, RX1 front end, RX2 front end, TCXO, Modulation deviation and CTCSS deviation.</p> <p>Please speak with your dealer if this is a requirement.</p>

### Product Description

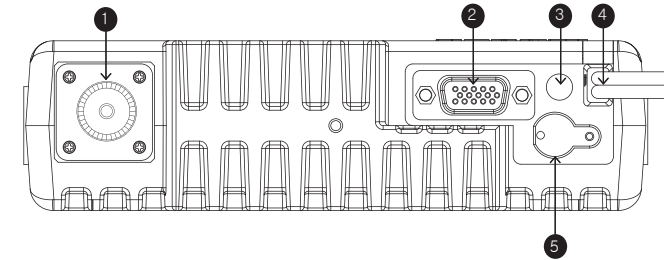
The SM-2000E is a fully featured mobile radio that has been developed as a worldwide product. The SM-2000E is a DTMF, Selcall and mobile radio with a 99 channel capability. The radio is programmable for output power, channel spacing, and a range of other features. The radio is packed full of sophisticated user and system features which allow the radio to be tailored to meet the requirements of most radio networks today. All the features described are made available thanks to the latest reliable, but functionally rich, software that controls each SM-2000E mobile. This means that all features described are available without the need to fit expensive and time consuming option boards. Most of the features or options described are activated in the radio as programmable parameters; please contact your dealer for full details on these options. The four buttons located on the bottom left-hand side of the radio under the LCD, are described as programmable. These four buttons (P1, P2, P3 and P4) have a short and long press and can be used for various pre-programmed features, following Monitor, Power H/L, Scan, DTMF, Key lock, Selcall, Scan, Open Close, and Light. The range conforms to R&TTE Directive. The unit meets the R&TTE Directive ETS 300.086 2001 and all FCC requirements.

## Front Panel



No.	Name	Description
1	Volume Control Knob	Power ON/OFF, Volume Control
2	Function LCD	LCD displays the following. <ul style="list-style-type: none"> <li>- Information about the current channel</li> <li>- TX/RX Status</li> <li>- Messages: see the LCD description page 10</li> <li>- Encode and decode Selcall codes</li> <li>- Power settings</li> <li>- Error messages</li> <li>- ANI</li> </ul>
3	UP/DOWN Keys	These keys are used for channel selection.
4	LED	Tri colored LED Indicator <ul style="list-style-type: none"> <li>- TX/RX and busy Status</li> <li>&gt; Transmit = Red</li> <li>&gt; Received signal = Green</li> <li>&gt; Channel is busy = Orange</li> <li>- Status indicator</li> </ul>
5	Microphone Connector	Connect the microphone to the RJ45 8 pin connector. This is also used for programming and cloning.
6	Programmable Keys	You can assign functions to these keys in the programmer.
7	Intenal Speaker	Audio is produced through the internal speaker.

## Rear Panel

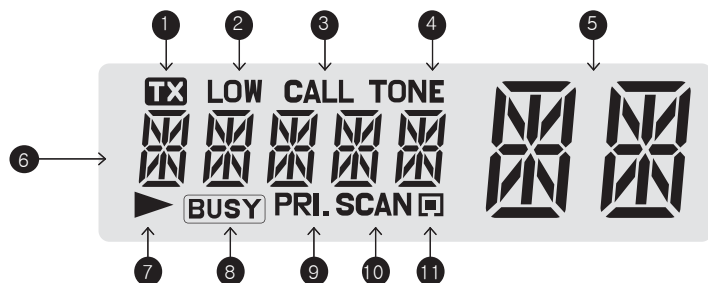


No.	Name	Description
1	SO-239 Antenna Connector	Antenna lead should be fitted here, the connector type is SO-239 M type. The impedance at this point is 50Ω.
2	15 Way Sub D-type	15 way Sub D-type External interface. Please see table below for pin-outs.
3	GPS Antenna Port (Optional)	There is an aerial port available if a GPS antenna is required. The port is currently sealed with a rubber grommet.
4	DC power lead	12 ~ 13.8 Volts are required to power the SM-2000E.
5	Accessory Socket	Any audio device can be fitted here e.g. external speaker.

### 15 pin-out D-type

Pin	Allocation name	Description	Specification
1	RSSI	DC power output	0.6 - 1.4V
2	IGN	Ignition signal input	Power ON: ↑8V Power Off: ↓6V LK20 is selection
	LSP	Low speed data	LK10 is selection
3	EXT/OUTPUT	Programmable	
4	AF_OUT	Audio output	500mV
5	EXT_MIC	Audio input	5KΩ
6	TXD FCN1	TX Serial data	3.3 TTL
7	RXD FCN2	RX Serial data	3.3 TTL
8	EXT_PTT	External PTT	3.3V (H) PTT Off 0V (L) PTT On
9	F_AUDIO	IF IC Output	100mW
10	COR/COS	Squelch output	SQ off:0V SQ on:3.3V
11	EXT/INPUT	Programmable	High impedance
12	DC+5V	DC Power Supply	DC+5V Max 100mA
13	EXT/OUTPUT	Programmable	
14	BEEP EXT	Beep signal input	
15	GND	Ground	Ground

## LCD Display



No.	Icon	FunctionName	Description
1	<b>TX</b>	TX	This icon appears when the transceiver transmits.
2	<b>LOW</b>	Low TX Power Channel	This icon appears when the TX power of the current channel is low.
3	<b>CALL</b>	Call alarm	This icon blinks when the transceiver receives a call.
4	<b>TONE</b>	Sub-audio Tone Channel	This icon appears when the current channel has sub-audio tone (CTCSS, DCS, and IDCS) option.
5		Channel Number	The current channel number is displayed.
6		Text Display	Display information such as channel name, group number, menu, ANI, etc.
7		Scroll	This icon blinks if the length of text is more than 6 characters.
8	<b>BUSY</b>	Busy	This icon appears when the transceiver receives signals.
9	<b>PRI.</b>	Priority Channel	This icon appears if the current channel is programmed with priority scan.
10	<b>SCAN</b>	Scan	This Icon blinks when the radio is scanning.
11		Scan List	This icon appears if the current channel is registered in scan list.

The LCD can display Alpha numeric characters and can be scrolled using the programmable (P1- P4) keys. Selcall numeric codes, stun and revive and error messages can also be displayed.

## Basic Radio Operation

Before beginning any operation of the product please ensure installation has been carried out by a qualified engineer. Make sure connections - power, antenna and microphone have been fitted correctly. Many of the functions set out below are controllable via the PC programmer, please contact to your dealer for more information.

### On/Off Volume Control

Turn the radio on by rotating the off/on/volume control clockwise. You will hear a click and the radio self-test alert tones (if enabled via dealer programming). If there is an error the LCD will display the error code. Increase the radio volume by continuing the clockwise rotation. To turn the radio off, rotate the control counter-clockwise until a click is heard.

### Power on Sequence

#### 1) Initialisation

Initialisation is performed when the transceiver is turned on. Error message will be displayed if any errors occur.



Error Code



Radio has no channels programmed

#### 2) Power ON Beep (if programmed)

Beep sounds after the initialisation process has finished (depends on beep option).

#### 3) Start Logo (if programmed)

Display the text for one second when the transceiver is turned on. All segments and icons will be displayed if there is no programmed start logo.



#### 4) Password Check (if programmed)

The password function requires the user to know the preprogrammed numeric code. The transceiver is inoperable until the password has been entered. The password consists of 1 to 5 numerical digits each digit can be 0-9 in range.

\* Key assignment for inputting password.

P1	P2	P3	P4
Delete Change	Digit	Next	Confirm

There is no limit to the amount of attempts a user can make for inputting the password.

The radio is ready to use after correct number is entered.

Note: if password is forgotten then the radio will need re-programming to reset the Password.

## Basic Radio Operation - Receiving

### Channels

The SM-2000E Series radio can store up to 99 channels within the same frequency band (UHF 400~470MHz VHF 136~174 MHz). These channels can be selected by using the ▼▲ (up/down) keys.

#### 1) Busy

When receiving a call, the **BUSY** icon appears. Adjust the volume level to a comfortable listening level. Mute and unmute condition is determined by the squelch level and current channel's tone option.



#### 2) Correct Call

This applies to channels that have sub-audio tone option (CTCSS, DCS, IDCS) programmed. Correct call means the received tone option is equal with the current channel option. The transceiver goes to unmute condition if the current channel is in correct call status, where the transceiver matches both carrier and correct CTCSS or DCS codes.

#### 3) Monitor Function

Release the squelch and tone option to check whether you can use current channel. Push 'MONITOR' KEY(ON/OFF) to use this function.

#### 4) Channel Selection

To change the channel, push ▼▲(up/down). The empty channels (not programmed) will be skipped automatically when channels are changed. Push and hold ▼▲ (up/down) to change channels rapidly.

#### 5) Group Selection

To change the current group, you can assign 'GROUP' functions to 'PROGRAMMABLE KEYS'. The empty groups (not programmed) will be skipped automatically when groups are changed. Push and hold the programmed key to change groups rapidly. LCD shows the name of the current group for 1 second if the group is changed.



#### 6) Options

##### Squelch Level

Squelch level is adjustable through the programmer. If signals are weak, you can decrease squelch level. You can increase the squelch level when unwanted signals exist.

## Basic Radio Operation - Transmitting

#### 1) PTT Key (Push To Talk)

Hold microphone approximately 3 inches distance from your mouth. Push and hold PTT key and then speak into the microphone. The PTT can also be used to transmit PTT ID codes, 5 tone Selcall, and DTMF codes. Select DTMF/Selcall code from Selcall List and push PTT key. Refer to individual tone section for more information.

#### 2) Call Key

If you have assigned a CALL function to the 'Programmable keys' to transmit codes, select 5-tone code from Selcall List and push the CALL key. Please refer to "Selective" section.

#### 3) Talk Around

This function allows users to communicate with others directly when repeater frequencies are programmed i.e. when RX and TX frequencies are different. When Talk Around is selected from the menu the receiving frequency is then used for both transmitting and receiving. To use this function, assign 'Talk Around' function to 'Programmable keys' in programmer. This function will be cancelled automatically when the channel is changed.



#### 4) Transmit Inhibit

##### Time out Timer (TOT)

This function is to prevent continuous transmitting over that of the specified time. You can set this option through the programmer. Transmitting is inhibited if you keep transmitting more than the programmed time. LCD shows 'TOT' for a few seconds.



Function	Range	Default	Step
TOT ON/OFF	ON/OFF	OFF	-
TOT time	10~990	10	10



## Basic Radio Operation - Transmitting

### 5) Penalty Timer

You can not transmit during penalty time if transmitting is inhibited by 'TOT' function. LCD will show 'P-T' if you try to transmit within the specified time.



Function	Range	Default	Step
PT ON/OFF	ON/OFF	OFF	-
PT time	5~75	5	5

### 6) Busy Channel Lock Out (BCLO)

This function is to prevent transmitting when current channel is in busy status. LCD shows 'BCLO' if you try to transmit when the current is busy.

**Busy Channel Lockout - ON:** upon PTT being pressed, if carrier is present, the radio will not transmit and an audible alert tone will be heard.

**Busy Channel Lockout - OFF:** upon PTT being pressed, the radio transmits regardless of the presence of carrier.



### 7) Marked Idle

This option allows transmitting during correct call status even if BCLO option is activated.

#### Receive only Channel

Transmitting is inhibited if the current channel is a receiving only channel. You can create a receiving only channel through the programmer. LCD shows 'RX-CH' if you try to transmit in the receiving only channel.



### 8) TX Power

You can set transmitting power to low or high in each channel. The 'LOW' icon appears if the current channel is set to low power. The power can be switched by the user from High to Low by pressing a pre-programmed power key (P1-P4).



## Basic Radio Operation - Transmitting

### 9) TX Delay

TX delay eliminates squelch tails associated with CTCSS tone transmissions, by removing the CTCSS tone from the end of a transmission for approximately 200ms before the carrier is dropped.

### 10) Microphone Hook

This is a PC programmable function. Turned OFF, the user is not required to ground microphone button on to the Mic hanger. All decode and scan functions remain the same. Turned ON, the user is required to ground the microphone hook. When microphone is removed from ground all tone decode functions are disabled, scan functions are programmable as on or off with microphone removed from hook. Default is off with scan disabled.

### 11) PTT ID

You can transmit the PTT ID when you push PTT ID key. PTT ID is programmable up to 5 digits. The following table shows the options for PTT ID.

Position	Description
BOT	Begin of Transmission
EOT	End of Transmission



## Basic Programmable features

### 1) Beep On/Off Mode

All Beep tones can be globally enabled or disabled via the radio controls depending how the radio is programmed.

### 2) Squelch Options

The radio supports 3 kinds of Squelch options. A different Squelch option can be applied to each channel. Sub Audible Tone (SAT) codes are made up from frequencies which are below 300Hz. These frequencies are lower than the voice audio band. The two most common forms of SAT codes are CTCSS, Continuous Tone Coded Squelch System, and DCS, Digitally Coded Squelch.

CTCSS / DCS information may be added to speech during transmission. A receiving radio can then be programmed to react according to which tones or codes are being sent by a transmitting radio. The SM-2000E series radios are capable of generating all 38 standard CTCSS tones and can also generate the 104 standard DCS codes and 104 inverted DCS codes.

### CTCSS

38 kinds of TIA/EIA Standard CTCSS tones and 12 non-standard tones can be set up. 10 user defined tones can be added separately. All tones can be set up using the PC Programmer.

**TX Operation:** If PTT key is pressed, the radio transmits a programmed CTCSS tone.

**RX Operation:** If CTCSS tone is detected, the radio status is changed from Busy to Correct Call. If the CTCSS Tone is not detected, the radio would stay in busy mode or change from Correct Call to Busy mode.

No.	Freq.	No.	Freq.	No.	Freq.	No.	Freq.
1	67.0	14	107.2	27	167.9	40	159.8
2	71.9	15	110.9	28	173.8	41	165.5
3	74.7	16	114.8	29	179.9	42	171.3
4	77.0	17	118.8	30	186.2	43	177.5
5	79.7	18	123.0	31	192.8	44	183.5
6	82.5	19	127.3	32	203.5	45	189.9
7	85.4	20	131.8	33	210.7	46	196.6
8	88.5	21	136.5	34	218.1	47	199.5
9	91.5	22	141.3	35	225.7	48	206.5
10	94.8	23	146.2	36	233.6	49	229.1
11	97.3	24	151.4	37	241.8	50	254.1
12	100.0	25	156.7	38	250.3		
13	103.5	26	162.2	39	69.4		

## Basic Programmable features

### DCS

The radio supports 104 kinds of TIA/EIA Normal/Inverted DCS codes.

**TX Operation:** If PTT key is pressed, the radio transmits a pre-programmed DCS Bit pattern.

**RX Operation:** If the correct DCS Data Stream is detected, the radio status will change from busy mode to Correct Call. If the incorrect DCS Data Stream is detected, the radio will stay in busy mode or be changed from Correct Call back to busy mode.

DCS Code Table

No.	Code	No.	Code	No.	Code	No.	Code
1	023	27	152	53	311	79	466
2	025	28	155	54	315	80	503
3	026	29	156	55	325	81	506
4	031	30	162	56	331	82	516
5	032	31	165	57	332	83	523
6	036	32	172	58	343	84	526
7	043	33	174	59	346	85	532
8	047	34	205	60	351	86	546
9	051	35	212	61	356	87	565
10	053	36	223	62	364	88	606
11	054	37	225	63	365	89	612
12	065	38	226	64	371	90	624
13	071	39	243	65	411	91	627
14	072	40	244	66	412	92	631
15	073	41	245	67	413	93	632
16	074	42	246	68	423	94	654
17	114	43	251	69	431	95	662
18	115	44	252	70	432	96	664
19	116	45	255	71	445	97	703
20	122	46	261	72	446	98	712
21	125	47	263	73	452	99	723
22	131	48	265	74	454	100	731
23	132	49	266	75	455	101	732
24	134	50	271	76	462	102	734
25	143	51	274	77	464	103	743
26	145	52	306	78	465	104	754

### Squelch Defeat (Monitor) operation

Pressing the monitor key will open the squelch and switch on the loudspeaker. Everything on the channel, including FM noise, will be heard. It is possible to disable the monitor key via the programmer, to prevent a user openly monitoring a channel in a closed user group system. When using CTCSS or DCS controlled squelch, several user groups may use the same RF channel without overhearing the other groups. It is common practice to allow users to listen to a channel before placing a call. This allows the user to check they are not going to transmit over a conversation from another user group. This allows more efficient use of the RF channels available.

**Note:** some interference or call dropout may occur if channel is in a heavily used radio traffic area.

## CLONING

### Master Mode

- 1) While holding the channel "UP" Key switch on the radio.
- 2) The radio will display "Mster" in the LCD and the LED will go solid red. The radio is now in master standby mode.
- 3) At this stage see setup of Slave radio and put receiving radio into slave mode.
- 4) Connect the cloning lead to the microphone socket between master and slave radios.
- 5) To initiate cloning press the P4 key, the radio will start the cloning process.
- 6) While the radio is cloning the LCD will display "CLONE" and the LED will go orange.  
When cloning is complete the radio returns to standby mode and the radio is ready to begin the process again.

### Slave Mode

- 1) While holding the channel "Down" Key switch on the radio.
- 2) The radio will display "SLAVE" in the LCD and the LED will go green. The radio is now in slave standby mode.
- 3) Connect the cloning lead to the microphone socket. Cloning is initiated by the master radio.
- 4) When the cloning process is complete the radio will display "END" in the LCD.

## Scanning

### Scan operation

Scanning is a programmable feature that allows you to monitor a number of channels. Your Dealer will help you define a channel "scan list" to be programmed into a scan channel. Once that channel is selected, scan is initiated.

### Normal Channel Scan

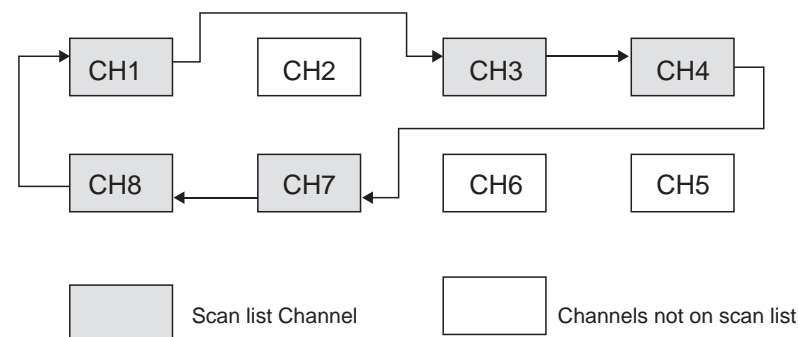
Once the scan list is programmed you can initiate scan. Simply press the pre-programmed P1-P4 scan key to initiate scanning. The green LED flashes while the transceiver is scanning. The LCD also shows channel number progress.



If RF activity, with any programmed options, is detected on any of the channels in the scan list, the radio will stop on that channel and monitor it. If programmed for normal scan TX, you will be able to transmit on that active channel during the programmed scan delay time. The scan delay time is the amount of time the radio will stay on that channel once the activity has ceased. The radio will resume scanning once the scan delay time has expired. Scanning will continue until the channel scanning is stopped by pressing scan button.



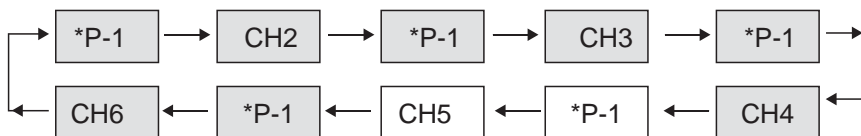
The following diagram shows the example of 'Normal Scan'.



## Scanning

### Priority Channel Scan

A single channel may be programmed as the "Priority" channel. The radio will constantly monitor this channel while scanning and when the radio has stopped on an active channel. If a call is detected on the "Priority" channel, the radio will automatically move to, and remain on, the "Priority" channel for as long as the priority conversation takes place. "Priority" channel activity takes precedence over all other conversations.



\* Channel 1 is 'Priority Channel'

Scan order: \*P1 -->CH2--> \*P1--> CH3--> \*P1--> CH4--> \*P1--> CH5 -->\*P1--> CH6

**LCD shows the current scanning channel and lower icon shows 'PRI.SCAN' to indicate priority scan.**



### Priority Lookback Time

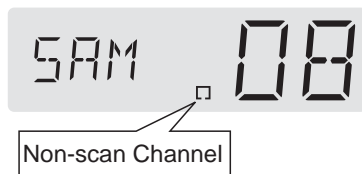
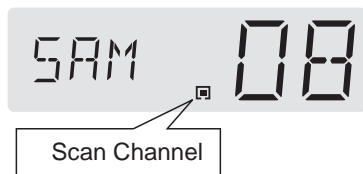
"Priority" channel scan "look back" requires that the radio leave an active channel for a fraction of a second (at regular intervals) to check the "priority" channel for activity depending how the radio is programmed, this may or may not be noticeable as "breaks" on the active channel for that same fraction of a second.

### Power-on scan

If the transceiver is turned OFF during scan, scan is activated again when the transceiver is turned ON. The transceiver goes straight back into scanning mode after switch on without the need to press scan button.

### Scan List

You can check if a channel is in the 'Scan List' by looking at the LCD, the current channel displays the 'Scan List' icon in the LCD. If the current channel is not assigned in the 'Scan List' the icon will not display.



## Scanning

### Nuisance delete

This function is to delete a channel temporarily from the scan list. If a specific channel is busy or noise is opening the squelch the transceiver pauses scan. You can push the down key to remove this channel and resume scan. The scan list is recovered when the transceiver resets. (switch ON/OFF)



**Down Key** to temporarily delete channel from scan list.

### TX Channel on scan

TX channel depends on the predefined option. See the table below.

Scan Type	TX Option	Scan Pause	During scan
Priority Scan	Priority Scan TX	Current Ch.	Priority Ch.
	Priority Only TX	Priority Ch.	Priority Ch.
Normal Scan	Normal Scan TX	Current Ch.	TX Inhibition
	RX Only TX	TX Inhibition	TX Inhibition

**Normal Scan TX:** Allows a transmission only after a call is received, depending on the programmed scan delay time. After the scan resumes, and a transmission is made, the radio will not allow a transmission during scanning

**Priority Scan:** Allows a transmission after a call is received depending on programmed scan delay time. The transmission will be made on the channel that the call was received. After the scan resumes, if a transmission is made, the radio will transmit on the programmed "priority" channel.

**Priority Only TX:** Allows a transmission on the "priority" channel when scanning and when stopped on an active channel. Always transmits on the priority channel.

**Receive Only Scan:** This only allows reception. If a transmission is attempted at any time, the radio will sound an alarm (two beeps) and will not allow the transmission.

### Options

Function	Range	Default	Step
Scan Speed Time(sec)	0.1 ~ 3	0.1	0.1
Scan Delay Time(sec)	0.5 ~ 10	4	0.5
Lookback time(sec)	0.5 ~ 5	3	0.5
Priority Channel Monitor	1 ~ 8	5	1
Scan Range	All channel /current channel	Current channel	-

## Scanning

### Group scan edit

The group scan edit feature can modify the scan list within each group. This feature can only be used if groups of channels have been pre-programmed into the radio by the programming software. If the scan lists are modified and saved using this method the new list is entered directly into the memory of the radio and will remain even after the radio is switch off and on again.

### Scan list edit mode (current group)

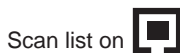
1. Press and hold the P1 key while switching on the radio.
2. The radio will display "S—EdT" this indicates the group scan editing mode.
3. Press the P2 key to display the current status of group and channel.
4. Use the UP/DOWN keys to select the channel to edit the in the group shown.
5. Press P2 to switch the scanning off or on for the current channel. The display shows the current channel scan status via the lower Icon on the LCD (as shown below).
6. To save settings and reboot the radio press P3.



Scan status indicator



Scan list off



Scan list on

### Group selection

1. To select a group Press P1 to enter group selection mode.
2. Use the UP/DOWN keys to select the group.
3. Press P1 to enter the new group of channels.
4. Use the UP/DOWN keys to select the channel to edit.
5. Press P2 to switch the scanning off or on for the current channel. The display shows the current channel scan status via the lower Icon on the LCD (as shown above)
6. To save settings and reboot the radio press P3.

## Scanning

### Priority Scan edit

The Priority scan edit feature can modify the scan priority channel. If the scan list is modified and saved using this method the new list is entered directly into the memory of the radio and will remain even after the radio is switch off and on again.

### Priority Scan list edit mode

1. Press and hold the P2 key while switching on the radio.
2. The radio will display "P—EdT" this indicates the Priority scan editing mode.
3. Press the P1 key to display the current status of priority channel.
4. Use the UP/DOWN keys to select the new channel to edit Priority scan.
5. Press P2 to switch the priority scanning on for the current channel. The display shows the current channel scan status via the lower Icon "PRI." on the LCD (as shown below).
6. To save settings and reboot the radio press P3.



"PRI" is displayed for the priority channel

### Priority within a Group

1. If Priority is in a group then switch on holding P2 for "P—EdT"
2. Use P1 to enter group selection mode and use UP/DOWN keys to select the group.
3. Press P1 again and select channel to be priority channel, make selection by pressing P2.
4. To save settings and reboot the radio press P3.

## Emergency Call

### Emergency mode on/off

Assign 'Emergency Call' function to any of Programmable keys P1-P4 in the programmer.  
If you push the emergency key, the transceiver transmits three alert tones and will stay in the TX mode until programmed TX time has ended.

### Backlight Blinking

LCD backlight blinks during emergency mode.

#### (1) LCD Display

LCD displays '-EMG-' during emergency mode.

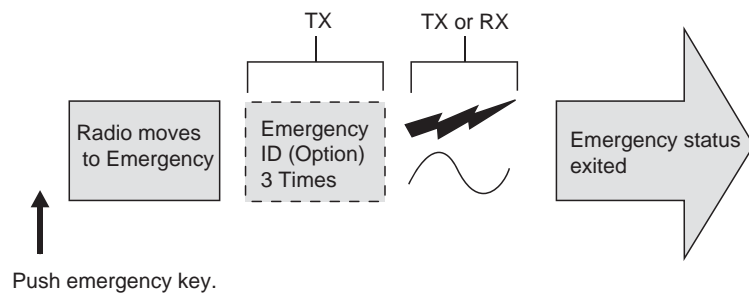


### Emergency ID

The transceiver transmits DTMF or 5 TONE SELCALL code when it goes to emergency mode.  
This is usually used for ANI when in a emergency situation.

#### EMERGENCY CALL DIAGRAM

The following diagram shows the process of emergency call.



## Selcall code selection

Press **P1** Selcall selection button

The LCD will display:



Then press the **▲** or **▼** display scrolls through programmed TX encode list.



Or



To send the correct call press P2 the **P2** Call Button

The LCD will display:



The radio displays the above when sending call the 01 represents the channel number.

Please Note: If groups are programmed you will have to select the correct group first, see details on page 11.

## Status and Error Messages

Your SM-2000E radio has a sophisticated microprocessor control, which provides a range of audible alert tones. Upon each power-up, a quick melody indicates that the self-test of the microprocessor functions has been completed. A sequence of audible tones may be sounded with any of the following conditions:

- > Attempt to transmit on a channel set for receive only
- > Attempt to transmit on a channel that is already in use when busy channel lockout has been programmed into the radio
- > Transmitting time has exceeded time-out timer programmed length.
- > Selecting a channel with no programmed frequency.
- > TX inhibit is in operation.

Description	Status tones and Messages	
	SM-2000E LCD	Audible Tone/LED
Power On	Model & Firmware version	Six Beeps
Button		Single Beep
Busy		Yellow
Correct Call		Green
Transmit		Red
In Scan Mode		Green Blinking
Scan Delete	"del"	Single beep
All Scan deleted	"A-del"	Single beep
Transmit Inhibit in Scanning	"No-TX"	Two beeps
Receive Only-No TX	"No-TX"	Two beeps
Time-Out-Timer	"TOT"	Two beeps
Penalty	"P--T"	Two beeps
Penalty End		Single beep
Busy Channel Lock Out	"BCLO"	Two beeps
Out of Lock Error	"unloc"	Two beeps
PC Program Read	"READ"	Red Blinking
PC Program Write	"WRITE"	Green Blinking
Clone Master	"Mster"	Red Blinking
Clone Slave	"Slave"	Green Blinking
Clone End	"END"	

## Service Information

### Service

Do not tamper with internal adjustments as this may cause damage to the equipment and will invalidate the warranty.

There are no user serviceable items inside the radio. It is recommended that you return your radio to a qualified dealer for any service or repairs.

### Maintenance

Your SM-2000E Radio is designed to be maintenance free. To keep your radio in good working condition:

Clean external surfaces with a clean cloth dampened in a solution of dishwasher detergent diluted in water.

Apply the solution sparingly to avoid any moisture leaking into cracks and crevices.

Do not submerge the radio.

Use a non-metallic brush to dislodge stubborn particles, if necessary.

Dry the surface thoroughly with a soft, lint free cloth.

DO NOT use solvents or spirits for cleaning they may permanently damage the housing.

### Limited Warranty

**TecNet International, Inc. offers to the original end user a:**

**Three (3) Year Limited Warranty on New Maxon Radio Products.**

**One (1) Year Limited Warranty on LMR Radio Accessories.**

TecNet warrants each new radio product manufactured or supplied by it to be free from defects in material and workmanship under normal use and service for the time period stated, provided that the user has complied with the requirements stated herein. The warranty period begins on the date of purchase from an Authorized TecNet Dealer. This warranty is not assignable or transferable. This warranty is void if the product serial number is altered, defaced or removed. TecNet is not responsible for any equipment that is attached to or used in conjunction with the products.

During the warranty period, if the product fails to function under normal use, because of manufacturing defects or workmanship, it should be returned to the Authorized TecNet Dealer from which it was purchased.

The Authorized TecNet Dealer will repair the product or return the product for repair to TecNet or its Authorized Repair Depot. The user is responsible for the removal of the product from a vehicle or any equipment attached to it or other site of its use transportation of the product to the Authorized TecNet Dealer, for the return of the repaired or replacement product to the site of its use and for the reinstallation of the product.

## Service Information

TecNet shall have no obligation to make repairs or replacement of product which results from normal wear and tear, or is necessitated by catastrophe, fault, or negligence of the user, improper or unauthorized alterations or repairs to the product, incorrect wiring, use for which it was not designed or by causes external to the product. TecNet's sole obligation shall be to replace or repair the product covered by warranty.

Replacement is done at TecNet's discretion and may consist of a similar or higher featured product. Repair may include the replacement of parts with functionally equivalent new or reconditioned parts. All replaced parts and accessories are warranted for the balance of the original time period. All parts and accessories that are replaced become the property of TecNet International Inc.

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