SERVICE INFORMATION

Infor #. : 753
Mod # :
Model. : IC-M710.
Date. : 1996-04-30
Subject. : NMEA instruction manual.

It is for the IC-M710 control system insruction by the NMEA.

1 M710 NMEA Remote Control Interface Document

Summary

M710 interface has following features

- The protocol uses NMEA 0183 version 2.0
- This interface comes with following approved sentence for remote controls
    - FSI (Frequency Set Information) for setting / reading frequency, mode, transmit and receive.
    - SFI (Scanning Frequency Information) for setting / reading scanning mode.
- This interface also comes with following proprietary sentence to control following features.
    - Setting / reading the frequency and modes
    - Setting / reading the RF gain, TX power and AF gain
    - Setting / reading the AGC, noise blanker, speaker and dimmer
    - Setting / reading Tx / Rx and Tuner
    - Setting / reading meter function (S, Po, ANTC)
    - Reading above information at once
- This interface included talker ID and listener ID to control multiple radio
- The radio also provide CI-V interface from cloning port.

2. NMEA Interface

- Baud rate: 4800
- Start bit: 1
- Data bit: 8
- Parity : Non
- Stop bit: 1

3. Format

3-1. Usable character

This interface following characters

キャラクタ	コード (HEX)	キャラクタ	コード (HEX)	キャラクタ	コード (HEX)	キャラクタ	コード (HEX)	キャラクタ	コード (HEX)	キャラクタ	コード (HEX)
	20	0	30	@	40	P	50	`	60	p	70
		1	31	A	41	Q	51	a	61	q	71
"	22	2	32	B	42	R	52	b	62	r	72
#	23	3	33	C	43	S	53	c	63	s	73
		4	34	D	44	T	54	d	64	t	74
%	25	5	35	E	45	U	55	e	65	u	75
&	26	6	36	F	46	V	56	f	66	v	76
'	27	7	37	G	47	W	57	g	67	w	77
(	28	8	38	H	48	X	58	h	68	x	78
)	29	9	39	I	49	Y	59	i	69	y	79
		:	3A	J	4A	Z	5A	j	6A	z	7A
+	2B	;	3B	K	4B	[	5B	k	6B	{	7B
		<	3C	L	4C			l	6C	|	7C
-	2D	=	3D	M	4D	]	5D	m	6D	}	7D
.	2E	>	3E	N	4E			n	6E		
/	2F	?	3F	O	4F	_	5F	o	6F		

Reserved characters

キャラクタ	コード (HEX)	意味
<CR>	0D	<CR><LF>でセンテンス終了
<LF>	0A	
$	24	センテンス開始
*	2A	チェックサム・フィールド・デリミタ
,	2C	フィールド・デリミタ
!	21	(リザーブ)
¥	5C	
~	5E	
	7E	

3-2. Sentence

- Fields

$ a---, x---x, x--x, ..., x--x,*hh<CR><LF> (Maximum 82 characters)

- Address field

The field after "$" are address field, and supports following three different kind

- Approved sentence
- Query sentence
- Proprietary sentence

- Data field

The field after "," are data field, and supports following data

- "xxxx" (Numeric number): ie. 0234
- "hhhh" (Hex number: ie. 098A
- "x.x" (Floating number): ie: 12 = 012 = 12.0 = 012.0
  12.3 = 012.3 = 12.30
- "cccc" (Charactor): ie. ABCD

- Null field

The field that does not contain any data

ie. ",,"

",*"

",<CR><LF>"

- Check sum field

The field between "*" and "<CR><LF>"

3-3. Approved Sentence

- Field

$aaccc, x--x, x--x,....., x--x*hh<CR><LF> (Maximum 82 characters)

- Talker ID

Two characters after "$" are talker ID

ie. "CD": Digital Selective Call (DSC)
"CT" Radio-Telephone (MF/HF)
"CV" Radio-Telephone (VHF)
"CX" Scanning Receiver
"GP" GPS Receiver

- Sentence Formatter

Three characters after talker ID are listener ID

ie. "FSI" Frequency set information
"SFI" Scanning Frequency information

3-4. Query Sentence

- Field

SaabbQ, ccc*hh<CR><LF>

- Talker ID

Two characters after "$" are talker ID

- Listener ID

Two characters after talker ID are listener ID

"Q" after listener ID means Query Sentence

- Sentence Formatter

Three characters after listener ID and "Q" are requesting sentence formatter

Note: Equipment may not reply

3-5. Proprietary Sentence

- Format

$Paaax--x*hh<CR><LF> (Maximum 82 character)

- Manufacture code

Three characters after "$P" are manufacture code

ie. "ICO" ICOM OF AMERICA

"JRC" JAPN RADIO COMPANY

- Control Data

You may use available character include "," except reserved characters

Icom Proprietary Sentence

- Format

$PICOcx--x*hh<CR><LF> (Maximum 82 characters)

- Format identifying code

One character after "$PICO" is format identifying code

ie. "A" IC_M710, GM-110DSC

"B" to "Z" Reserve

- Control Data

The data are depend on format identifying code

- Check sum (Option)

Two digits (HEX) XOR of characters between "$" and "*". See NMEA interface document for details

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"$PICOA" sentence

- Format

$PICOA, xx, xx, c--c, <parameter 1>, <parameter 2>...., <parameter n>*hh<CR><LF>

- Talker ID

Two digits after "$PICOA" are talker ID

ie. "01" to "99" 01 to 69 Radio equipment (01 is IC-M710)
70 to 79 Meter equipment
80 to 89 Controller equipment (80 is GM-110DSC)
90 to 99 User define

Note: Talker ID can not be "00" or listener ID

- Listener ID

Two digits after Talker ID are listener ID

ie. "00" All radios
"01" to "99" Individual radio or equipment (See above for details)

Note: The reason to have talker ID and listener ID is to control multiple radios or equipment.

- Command

The characters after listener ID are command character

ie. "RXF" Receive frequencies
"TXF" Transmit frequencies
"MODE" Mode

- Parameter

The parameter's data are depend on the command data

ie. If radio command is "RXF"

Announce: , RXF, 14. 123456

Set: , RFX, 24. 234567

Acknowledgment from Set command (In case OK): , RXF, 24. 234567

(In case NG): , RXF, 14. 123456

Read: , RXF

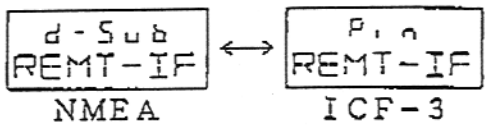
Acknowledgment from Read command: , RXF, 14. 123456

- Check Sum (Option)

See NMEA interface document for details

Interface

The radio provides following NMEA interface or ICF-3 (CI-V) interface for remote control, and you may select interface from "SET MODE A" on the radio



Note: When you selected ICF-3 interface mode, the radio will not respond approved sentence with"CT" (Talker ID)

Also when radio is switched to DSC mode during ICF-3 mode, the radio will switch the interface to NMEA interface mode temporally until turning radio off.

Remote mode

Remote mode is controlling mode for NMEA interface, and DSC mode is a part of remote mode.

When the radio is in the remote mode, frequency input, mode and clarify on the front will not work. (you may control frequency by 1Hz step instead of using clarify feature).

When the radio is out of remote mode, frequency, mode and clarify feature on the front panel works as normal.radio

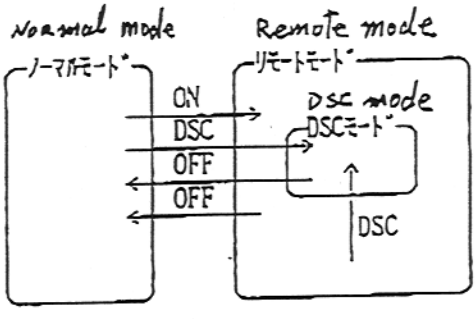
When the radio is in DSC mode, the radio will set RF gain to "9" and TX power to 3.

When radio is out of DSC mode, those setting are back to normal.

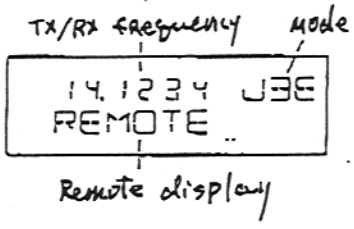
Also the radio is in DSC mode during ICF-3 mode is selected, the radio will continue uses NMEA interface mode until turning the radio off.

Turning "REMOTE" on or sending command to the radio.through the interface will cause the radio to be in "Remote Mode"

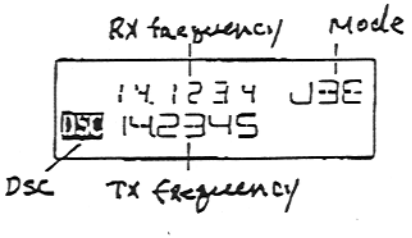
To turning "Remote mode" off, you may turn off remote command off or holding "FUNC" and "ALARM" buttons



Display



Remote mode



DSC mode

Approved sentence

- Talker ID
  - Radio's talker ID is "CT"
  - Controller's talker ID is depend on the controller

- Check sum
  - Controller to radio: Check sum is option
  - Radio to controller: Radio will send check sum

- Sentence

Basically radio will reply acknowledgment to controller when controller send set or read commands

Approved sentence is as follows

FSI: Frequency Set Information

SFI: Scanning Frequency Information

- FSI (Frequency Set Information)

$aaFSI, eeeeee, xxxxxx, c, x*hh<CR><LF>

- eeeeee: TX frequency
- xxxxxx: RX frequency
- c: Mode
- x: TX(include RF power)/RX

Parameter is as follows

- TX/RX frequency (Or ITU channel)

	Parameter	Example
Frequency	10M,1M,100K,1K,100 (Up to 29.9999Mhz)	123456 (12.3456MHz)
ITU (Voice)	3 0 Channel number	300401 (401 CH)
ITU (NBDP)	4 Band CH #	412156 (12156 CH)

- Mode

Parameter	Meaning	Mode
d	F3E/G3E simplex, telephone	

e	F3E/G3E duplex, telephone	
m	J3E, telephone	J3E
o	H3E, telephone	H3E
q	F1B/J2B FEC NBDP, TELEX/teleprinter	J2B
s	F1B/J2B ARQ NBDP, TELEX/teleprinter	J2B (RX only)
t	F1B/J2B receive only, teleprinter/DSC	J2B
w	F1B/J2B, teleprinter/DSC	J2B
x	A1A Morse, tape recorder	A1A
|	F1C/F2C/F3C, Fax-machine	A1A
{	A1A Morse, Morse key/head set	

- TX (Include RF power)/RX

parameter	Condition
0	Receive
1 to 3	Transmit (TX power level 1)
4 to 6	Transmit (TX power level 2)
7 to 9	Transmit (TX power level 3)

- TX/RX frequency setting

Parameter		Setting
Tx.	Rx	
Freq.	Freq.	Sets both TX/RX frequencies
Freq.	Null	Sets TX frequency using previous RX frequency
Null	Freq.	Sets Rx Frequency using previous TX frequency
CH	CH	Sets both TX/RX CH
CH	Null	Sets TX CH (Simplex)
Null	CH	Sets RX CH using previous RX CH
Freq.	CH	Sets TX frequency and RX CH
CH	Freq.	Sets TX CH and RX frequency

Note:

- If you wanted receive, you mast set the receive frequency. If you wanted transmit, you must enter the transmitting frequency. otherwise the radio uses previous frequency in the

memory.

- You can not enter blank frequency.
- The frequency range must be in radio acceptable frequency range.

- Mode setting
    - Null is invalid
    - When you set RX, the mode will be valid in receive mode
    - When you set TX, the mode will be valid in transmit mode
        - When radio is in 2182Khz TX mode, this mode setting will be invalid
        - When mode's parameter is "t", this mode setting will be invalid

- TX (include RF power level) / RX
    - When this parameter is null, the radio interpret as receiver mode

Note:

in case radio received mode:

- The radio receives at RX frequency with mode setting
- If radio is requested transmit mode (such as pressing PTT), the radio will not go in receive mode. However mode parameter was "t" (F1B/J2b receive only, teleprinter/DSC), The incoming transmit request will be ignored, and the radio will be in receive mode.

In case radio is transmit mode:

-The radio activates tuner, and the radio will transmit at TX frequency with mode and RF power setting.

- Received RF power setting is temporal setting and will not change initial radio setting.on RF power level
- The radio will not reply acknowledgment until tuning is finished

- Reading (Controller -> Radio)

  $aaCTQ, FSI*hh<CR><LF>

● Acknowledgment

$CTFSI, eeeeee, xxxxxx, c, x*hh<CR><LF>

- eeeeee: TX frequency
- xxxxxx: RX frequency
- c: Mode
- x: TX(include RF power)/RX

- Transmit and receive frequencies
  - Condition of frequencies are same as above (Same as FSI or SFI)
  - If radio is CH display, and transmit and receive frequency are same, the radio reply receive CH only, and the radio reply null at transmit CH side.
  - If radio has blank CH, the radio reply null
  - If radio is operated "CLARIFY" in normal mode, actual received frequency will be deferent from replied frequency.(This condition is true for operating "TXF" key on the front panel)

- Mode

The radio reply mode the set by FSI or SFI. Otherwise radio reply following default parameter

Mode	Default parameter
J3E	m
R3E	Null
H3E	o
LSB	Null
J2B	q
FSK	Null
A1A	(

- Transmit power/Receive
  - In receive mode, the radio reply "0"

- In transmit mode (Including antenna tuning) the radio will reply set parameter SFI (In case the radio in antenna tuning mode, the radio reply "3"). Otherwise the radio reply following parameter

TX power	Default parameter
1	1
2	5
3	9

- SFI (Scanning Frequency Information)

Controller to Radio

$aaSFI, x.x, x.x, xxxxxx, c, ..., xxxxxx, c,*hh<CR><LF>

- xxxxxx, c: RX frequency and mode
- xxxxxx, c: RX frequency and mode
- x.x: Message number
- x.x: Message divider

Note:

- Frequency and mode pare will be able to send up to 6 pares
- See FSI for details on parameters
- If RX frequency and mode pare is not existing. the sentence will be ignored
- If parameter is not existing or null, the radio stop scan
- Frequency and mode pare can be divided up to 12.
- Message number shows, sentence order number.
- If you have only one sentence, message number will be 1

Example,

(Single sentence)

$aaSFI,1,1,1,02875,t,042075,t,063120,t,084145,t,125770,t,168045,t*hh<CR><LF>

(Divided to two sentence)

$aaSFI,2,1,021875,t,042075,t,063120,t,*hh<CR><LF>
$aaSFI,2,2,084145,t,125770,t,168045,t,*hh<CR><LF>

The radio reply acknowledgment after complete of sending sentence except invalid message.

Scanning action
- The radio will scan for 300ms per channel.
- The radio will not pause scan by SQL signals
- The radio will send acknowledgment every time when changed frequencies.

- Read (Controller -> Radio)
  $aaCTQ, SFI*hh<CR><LF>

  Acknowledgment (Radio -> Controller)
  $CTSFI, 1, 1, xxxxxx, c,.....xxxxxx, c,*hh<CR><LF>
  xxxxxx, c, : RX frequency and mode
  xxxxxx, c, : RX frequency and mode

  Note:
  - The radio should reply same sentence of controller
  - If radio is not scanning mode, the radio will reply following sentence
    $CTSFI,1,1*hh<CR><LF>

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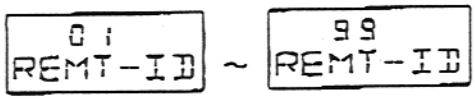
4. Private sentence

ID:

(Radio)

ID range 01 - 99 (01 - 69 is recommended, Default 01)

You may change ID by radio set mode A. 

(Controller)

ID range 01 -99 (90 -99 is recommended.)

Command and parameter

(Controller -> Radio)

You may have space between parameters

(Radio -> Controller)

Radio will not have space between parameters

Check Sum

(Controller -> Radio)

The radio does not care if you have check sum or not

(Radio -> Controller)

The radio sent out check sum

The radio will reply acknowledgment every time the radio received set or read information.

The list of private sentence

Format.

SPICOA,xx,xx,<Command>,<Parameter>*hh<CR><LF> (St,Ak-S,Ak-R)
SPICOA,xx,xx,<Command>*hh<CR><LF> (Rd)

TX-ID , RX ID *hh チェックサム(オプショナル)

Items	Command	Parameters 形式	内容	センテンスの種類 St	Ak-S	Rd	Ak-R
RX Frequency	RXF	x.x	周波数 (単位:MHz, 最小有効桁:1Hz) 例)12.345678	○	○	○	○
TX Frequency	TXF	x.x	周波数 (単位:MHz, 最小有効桁:1Hz) 例)12.345678	○	○	○	○
Mode	MODE	c--c	J3E/R3E/H3E/LSB/J2B/FSK/A1A のモード表示 例)H3E AM	○	○	○	○
RF Gain	RFG	x.x	0~9 (システムのRFゲイン)	○	○	○	○
TX Power	TXP	x.x	1~3 (システムのTXパワー)	○	○	○	○
AGC	AGC	c--c	ON/OFF	○	○	○	○
NB	NB	c--c	ON/OFF	○	○	○	○
SQL Control	SQLC	c--c	ON/OFF	○	○	○	○
AF Gain	AFG	x.x	0~255 (0:最小, 255:最大)	○	○	○	○
Tuner	TUNER	c--c	ON/TUNE/OFF	○	○	○	○
TX/RX	TRX	c--c	TX/RX	×	×	○	○
SQL State	SQLS	c--c	OPEN/CLOSE	×	×	○	○
S Meter	SIGN	x.x	0~8 (メータレベル)	×	×	○	○
Po Meter	POW	x.x	0~8 (メータレベル)	×	×	○	○
ANTC Meter	ANTM	x.x	0~7 (メータレベル)	○	○	○	○
Speaker	SP	c--c	ON/OFF	○	○	○	○
Dimmer	DIM	c--c	ON/OFF (ON:暗, OFF:明)	○	○	○	○
Remote	REMOTE	c--c	ON/DSC/OFF	×	×	○	=1
All Information	ALL	/					

=1. 『RXF』 ～ 『REMOTE』 のアクノリッジを順に返す

xx	固定長の整数	St	セット
hh	固定長の１６進数	Ak-S	セットに対するアクノリッジ
x.x	可変長の整数または実数	Rq	リード
c--c	可変長のキャラクタ	Ak-R	リードに対するアクノリッジ

- RXF (RX Frequency): Parameter Frequency with Mhz (Minimum 1Hkz)

SET: (Controller -> Radio)

$PICOA, 90, 01, RXF, x. x* hh<CR><LF>

- You may delete un-necessary digits of frequencies
- The radio will ignore frequency digits less than 1Hz
- You can not send blank
- If "TXF" is engaged the radio, the will change RX frequency. But the radio will not change actual receiving frequency.

Read: (Controller -> Radio)

$PICOA, 90, 01, RXF*hh<CR><LF>

Acknowledgment: (Radio -> Controller)

$PICOA, 01, 90, RXF, x. x*hh<CR><LF>

- The radio replay frequency up to 1Hz digits except 10Mhz digits
- If radio has blank channel, the radio will reply null
- If radio has "Clarify" or "TXF" is engaged, the replied frequency are different from actual receiving frequencies.

- TXF (Tx Frequency): Parameter Frequency with Mhz (Minimum digits is 1Khz)

SET: (Controller -> Radio)

$PIOCA, 90, 01, TXF; x. x*hh<CR><LF>

- You may delete un-necessary digits of frequencies
- The radio will ignore frequency digits less than 1Hz
- You can not send blank

Read: (Controller -> Radio)

$PICOA, 90, 01, TXF*hh<CR><LF>

Acknowledgment: (Radio -> Controller)

$PICOA, 01,90, TXF, x. x*hh<CR><LF>

- The radio replay frequency up to 1Hz digits except 10Mhz digits
- If radio has blank channel, the radio will reply null

- MODE (Mode) Parameter (J3E/R3E/H3E/LSB/J2B/FSK/A1A)

SET: (Controller -> Radio)

$PICOA, 90, 01, MODE, c--c* hh<CR><LF>

- If you are engaged "TXF", this mode parameter will work for transmit mode
- If you are transmitting radio, the radio will accept receiving mode only

Read: (Controller -> Radio)

$PICOA, 90, 01, MODE *hh<CR><LF>

Acknowledgment: (Radio -> Controller)

$PICOA, 01, 90, MODE, c--c*hh<CR><LF>

- If radio is blank, the radio will reply mode J3E

- RFG (RF Gain) Parameters (0 - 9)

SET: (Controller -> Radio)

$PICOA, 90, 01, RFG, x. x* hh<CR><LF>

Read: (Controller -> Radio)

$PICOA, 90, 01,RFG*hh<CR><LF>

Acknowledgment: (Radio -> Controller)

$PICOA, 01, 90, RFG, x. x*hh<CR><LF>

- TXP (TX Power) Parameters (1 - 3)

SET: (Controller -> Radio)

$PICOA, 90, 01, TXP, x. x* hh<CR><LF>

- When the radio is in tuning mode and the received sentence was "FSI", system power will be changed. However actual power will not change in tuning mode.

Read: (Controller -> Radio)

$PICOA, 90, 01, TXP*hh<CR><LF>

Acknowledgment: (Radio -> Controller)

$PICOA, 01, 90, TXP, x. x*hh<CR><LF>

- Following condition, the radio replay different power level than actual output power.
    - When transmitting alarm signals
    - When transmitting tuning mode for antenna coupler.
    - When transmitting power using "FSI" sentence

- AGC (AGC ON/OFF) Parameters (ON/OFF)

SET: (Controller -> Radio)
$PICOA, 90, 01, AGC, c--c* hh<CR><LF>

Read: (Controller -> Radio)
$PICOA, 90, 01, AGC*hh<CR><LF>

Acknowledgment: (Radio -> Controller)
$PICOA, 01, 90, AGC, c--c*hh<CR><LF>

- NB (Noise Blanker ON/OFF) Parameters (ON/OFF)

SET: (Controller -> Radio)
$PICOA, 90, 01, NB, c--c* hh<CR><LF>

Read: (Controller -> Radio)
$PICOA, 90, 01, NB*hh<CR><LF>

Acknowledgment: (Radio -> Controller)
$PICOA, 01, 90, NB, c--c*hh<CR><LF>

- SQLC (Squelch Control ON/OFF) Parameters (ON/OFF)

SET: (Controller -> Radio)
$PICOA, 90, 01, SQLC, c--c* hh<CR><LF>

Read: (Controller -> Radio)
$PICOA, 90, 01, SQLC*hh<CR><LF>

Acknowledgment: (Radio -> Controller)
$PICOA, 01, 90, SQLC, c--c*hh<CR><LF>

- AFG (AF Gain) Parameters (0 - 255)

SET: (Controller -> Radio)

$PICOA, 90, 01, AFG, x. x* hh<CR><LF>

- The radio will change audio level regardless to position of volume pots
- If operator changed volume setting on the front panel, the radio will cancel this mode.

Read: (Controller -> Radio)

$PICOA, 90, 01, AGF*hh<CR><LF>

Acknowledgment: (Radio -> Controller)

$PICOA, 01, 90, AGF, x. x*hh<CR><LF>

- TUNER (Tuner on/tune/off) Parameters (ON/TUNE /OFF)

SET: (Controller -> Radio)

$PICOA, 90, 01, TUNER, c--c* hh<CR><LF>

Parameter	AT-130	AT120	AH-3
ON	Start tuning	Start tuning	Start tuning
TUNE	Start tuning	Start tuning	Start tuning
OFF	N/A	N/A	Through

The radio reply acknowledgment after tuning is done

Read: (Controller -> Radio)

$PICOA, 90, 01, TUNER*hh<CR><LF>

Acknowledgment: (Radio -> Controller)

$PICOA, 01, 90, TUNER, c--c*hh<CR><LF>

Condition	AT-130	AT-120	AH3
During tuning	TUNE	TUNE	TUNE
Tuner on	ON	Null	ON
Tuner off	OFF	Null	OFF

- TRX (TX/RX) Parameters (TX/RX)

SET: (Controller -> Radio)

$PICOA, 90, 01, TRX, c--c* hh<CR><LF>

TX:

- It only valid with correct transmit frequency and mode
  - Except for 2182Khz mode
  - Except for F1B/J2B receive mode or teleprinter/DSC mode
- The radio uses modulation port on NMEA port

RX:

- If some one press PTT, the radio will not go to receive mode.

Read: (Controller -> Radio)

$PICOA, 90, 01, TRX*hh<CR><LF>

Acknowledgment: (Radio -> Controller)

$PICOA, 01, 90, TRX, c--c*hh<CR><LF>

Parameter	Condition
TX	Transmit mode including tuning antenna tuner
RX	Receiving mode

- SQLS (Squelch State open or close) Parameters (OPEN/CLOSE)

Read: (Controller -> Radio)

$PICOA, 90, 01, SQLS*hh<CR><LF>

Acknowledgment: (Radio -> Controller)

$PICOA, 01, 90, SQLS, c--c*hh<CR><LF>

- The radio is in transmit mode or tuning antenna tuner, the radio reply CLOSE

- SIGM (S Meter) Parameter (0 - 8)

Read: (Controller -> Radio)
$PICOA, 90, 01, SIGM*hh<CR><LF>

Acknowledgment: (Radio -> Controller)
$PICOA, 01, 90, SIGM, x. x*hh<CR><LF>
- The radio is in transmit mode, the radio reply "0"

- POM (Power Meter) Parameters (0 - 8)

Read: (Controller -> Radio)
$PICOA, 90, 01, POM*hh<CR><LF>

Acknowledgment: (Radio -> Controller)
$PICOA, 01, 90, POM, x. x*hh<CR><LF>
- If the radio is in receive mode, the radio replays "0"

- ANTM (ANTC Meter) Parameters (0 - 7)

Read: (Controller -> Radio)
$PICOA, 90, 01, ANTM*hh<CR><LF>

Acknowledgment: (Radio -> Controller)
$PICOA, 01, 90, ANTM, x. x*hh<CR><LF>
- The radio in receive mode, the radio replay "0"

- SP (Speaker) Parameters (ON/OFF)

SET: (Controller -> Radio)
$PICOA, 90, 01, SP, c--c* hh<CR><LF>

Read: (Controller -> Radio)
$PICOA, 90, 01, SP*hh<CR><LF>

Acknowledgment: (Radio -> Controller)
$PICOA, 01, 90, SP, c--c*hh<CR><LF>

DIM (Dimmer) Parameter (ON/OFF)
SET: (Controller -> Radio)
$PICOA, 90, 01, DIM, c--c* hh<CR><LF>

Read: (Controller -> Radio)
$PICOA, 90, 01, DIM*hh<CR><LF>

Acknowledgment: (Radio -> Controller)
$PICOA, 01, 90, DIM, c--c*hh<CR><LF>

ALL (All information)
Read: (Controller -> Radio)
$PICOA, 90, 01, ALL*hh<CR><LF>

Acknowledgment: (Radio -> Controller)
$PICOA, 01, 90, RXF, x. x*hh<CR><LF>

$PICOA, 01, 90, REMOTE, c--c*hh<CR><LF>
The radio reply all status in order.

- REMOTE (Remote) Parameters (ON/DSC/OFF)

Parameters	Modes
ON	Remote mode without DSC
DSC	DSC mode
OFF	Normal

SET: (Controller -> Radio)

$PICOA, 90, 01, REMOTE, c--c* hh<CR><LF>

ON:

- This parameter does not work if radio is in DSC mode

DSC:

- The radio defaults to RF gain = 9 and TX power = 3

OFF:

- The radio will back to previous frequencies in normal mode.
- If the radio was in DSC mode, RF gain and TX power will be previous parameter before in to DSC mode.
- The radio can be turn off the remote mode except DSC mode.

Read: (Controller -> Radio)

$PICOA, 90, 01, REMOTE*hh<CR><LF>

Acknowledgment: (Radio -> Controller)

$PICOA, 01, 90, REMOTE, c--c*hh<CR><LF>