

*** Locked Commands ***

	Prefix Number	Default Prefix	Action
*	00	00	Control operator access (prefix) <group-digit> <item-digit> [<optional-state-digit>] set group <g> item <i> to state <s> 0 <= g <= 7 group to program 0 <= i <= 7 item to program s = 0,1 state to set 1=on omit state to enquire value. controller will confirm with speech: control x point y is enabled disabled.
*	01	01	autopatch (prefix) <digits to dial> will make short beeps every second when 10 or less seconds remain of call. must be 7 digits, "1" + 7 digits, 10 digits, or "1" + 10 digits. 7 or 1+7 must have area code #3 set up for local area. 10 or 1+10 must have area code set up in area code 0-3. NNX must be enabled.
*	02	02	unrestricted autopatch (prefix) <digits to dial> will make short beeps every second when 10 or less seconds remain of call.
*	03	03	autodial (prefix) <n> 0 <= n <= 249 Autodial slot to dial.
*	04	04	emergency autodial (prefix) <n> 0 <= n <= 9 Emergency autodial slot to dial.
*	05	#	patch hang up code (prefix) will hang up the patch.
*	06	06	DTMF access (prefix) 1 enable repeater when in DTMF access mode. Repeater says "Repeater Access Enabled" Repeater stays up until timer 6 (x 10) seconds of idle time elapses, when it will say "Repeater Access Disabled." (prefix) 0 disable repeater when in DTMF access mode. Immediately "locks" repeater until (prefix) 1 is received again.
*	07	07	Re-send DTMF prefix (follow with up to 15 digits) (prefix) <up to 15 digits> will send digits over the air.
*	08	08	DTMF test (follow with up to 15 digits) (prefix) <up to 15 digits> will name digits sent.
*	09	09	reverse patch (prefix) pick up phone if it just rang.
*	10	10	audio check

enter prefix, then unkey.
get prompted for test message.
keyup and speak for up to 8 seconds.
unkey and hear recorded message.

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* 11	11	<p>mailbox (mimics command set of ACC DVR.)</p> <p>(prefix) plays headers for mailboxes.</p> <p>enter (prefix) then unkey. mailbox headers play.</p> <p>(prefix) <digit> play message <digit>. Valid: 1,2,3,4,5,6</p> <p>enter (prefix) then mailbox number. Unkey. Message plays.</p> <p>(prefix) * record mailbox message</p> <p>enter (prefix) *. unkey.</p> <p>controller will say "no mailbox" if all 6 are in use.</p> <p>otherwise...</p> <p>controller prompts for header</p> <p>key up, record header, unkey.</p> <p>controller prompts for message</p> <p>key up, record message, unkey.</p> <p>controller says OK.</p> <p>(prefix) ** delete last played mailbox message</p> <p>enter (prefix) **, then unkey.</p> <p>controller says OK if message deleted.</p> <p>controller says "bad mailbox command" if not deleted.</p> <p>(prefix) *** audio check</p> <p>enter (prefix) *** , then unkey.</p> <p>get prompted for test message.</p> <p>keyup and speak for up to 8 seconds.</p> <p>unkey and hear recorded message.</p>																																													
* 12	12	<p>remote base</p> <p>(prefix) 0 remote base off</p> <p>(prefix) 1 remote base alert mode</p> <p>(prefix) 2 remote base receive mode</p> <p>(prefix) 3 remote base transmit mode</p> <p>(prefix) 4 <mode-digit> CI-V mode select.</p> <table border="1"> <thead> <tr> <th>mode-digit</th> <th>mode</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>LSB</td> </tr> <tr> <td>1</td> <td>USB</td> </tr> <tr> <td>2</td> <td>AM</td> </tr> <tr> <td>3</td> <td>FM</td> </tr> </tbody> </table> <p>leave mode-digit blank to poll radio.</p> <p>(prefix) 5 <gmmm*kkkh> CI-V frequency select.</p> <p>gmmm*kkkh is the frequency. at least one m and one k must be specified:</p> <p>(prefix) 51*9 will get you 1.900 MHz.</p> <p>(prefix) 5147*105 will get you 147.105 MHz.</p> <p>omit gmmm*kkkh to poll radio.</p> <p>(prefix) 6 <vfo-digit> VFO select.</p> <table border="1"> <thead> <tr> <th>vfo-digit</th> <th>operation</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>select memory mode</td> </tr> <tr> <td>1</td> <td>select VFO mode.</td> </tr> <tr> <td>2</td> <td>select VFO A</td> </tr> <tr> <td>3</td> <td>select VFO B</td> </tr> <tr> <td>4</td> <td>make other VFO equal this VFO (A=B)</td> </tr> <tr> <td>5</td> <td>swap with other VFO (A/B)</td> </tr> </tbody> </table> <p>(prefix) 7 <mem-channel> memory channel select</p> <p>0 <= mem-channel <= 99 memory channel to select</p> <p>(prefix) 8 <split-digit> select split mode</p> <table border="1"> <thead> <tr> <th>split-digit</th> <th>split mode</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>split off</td> </tr> <tr> <td>1</td> <td>split on</td> </tr> </tbody> </table> <p>(prefix) 9 select fine-tune mode.</p> <p>fine-tune mode ends when '#' is received.</p> <table border="1"> <thead> <tr> <th></th> <th>100 KHz</th> <th>10 KHz</th> <th>1 KHz</th> <th>100 Hz</th> </tr> </thead> <tbody> <tr> <td>+</td> <td>1</td> <td>2</td> <td>3</td> <td>A</td> </tr> <tr> <td>-</td> <td>4</td> <td>5</td> <td>6</td> <td>B</td> </tr> </tbody> </table> <p>*gmmm*kkkhhh direct frequency access</p> <p>0 <mode-digit> shortcut to mode command</p> <p>C link receive mode (default)</p>	mode-digit	mode	0	LSB	1	USB	2	AM	3	FM	vfo-digit	operation	0	select memory mode	1	select VFO mode.	2	select VFO A	3	select VFO B	4	make other VFO equal this VFO (A=B)	5	swap with other VFO (A/B)	split-digit	split mode	0	split off	1	split on		100 KHz	10 KHz	1 KHz	100 Hz	+	1	2	3	A	-	4	5	6	B
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D link transmit mode
end fine-tune mode

* 13 911 play LITZ message.
 entering this prefix will cause the LiTZ message track
 (#115) to play. Also, sending the DTMF 0 tone for more
 than 3 seconds (the LiTZ signal) will cause the LiTZ
 message track to play.

Prefix Number	Default Prefix	Action
* 14	14	load saved setup (prefix) <digit> : load selected saved control operator groups. digit must be in the range of 0-4.
* 15	15	enable control access ("unlock" controller) (prefix) will unlock the controller. "#" to lock again.

*** UNLOCKED COMMANDS ***

lock controller.

*0
Control Operator Access
*0<g><i><s> set group <g> item <i> to state <s>
0 <= g <= 9 group to program
0 <= i <= 7 item to program
s = 0,1 state to set 1=on
leave s blank to inquire on/off state

*1
Save Setup
*1<s> save set of control operator groups #<s>
0 <= s <= 4 state number to save. set #0 is the power-up default.

*2
Program Command Prefix
*2<pp><prefix> program prefix <p> with prefix
00 <= pp <= 15 prefix index
<prefix> code to use as prefix. 1-7 digits.

Prefixes by index
00 control operator
01 autopatch
02 unrestricted autopatch
03 autodial
04 emergency autodial
05 patch hang up
06 dtmf access
07 pass dtmf
08 dtmf test
09 reverse patch
10 (reserved)
11 mailbox
12 remote base
13 play litz message (default 911)
14 load saved setup
15 unlock controller

*3
Set Timers
*3<nn> inquire timer nn value
*3<nn><time> set timer nn to time
00 <= nn <= 13 timer index
0 <= time <= 255 timer preset. 0=disable

Timer Indexes
00 hang timer long (tenths)
01 hang timer short (tenths)
02 id timer (tens)
03 patch timer (tens)
04 autodial timer (tens)
05 emergency autodial timer (tens)
06 DTMF access timer (tens)

07 timeout timer long (seconds)
08 timeout timer short (seconds)
09 DTMF muting timer (tenths)
10 fan timer (tens)
11 tail message tail counter (units)
12 phone rings to answer on. (units)
13 remote base auto-shutoff timer (tens)
14 kerchunker no-tail timer (tenths)

*4

Program Autopatch Restrictions

*40<nn><zzz> program area code #nn with zzz.

00 >= nn >= 15

zzz blank to query.

*41<nn><a> program area code #nn options #a to b [0=disable, 1=enable].

00 >= nn >= 15

b=blank to query.

options:

0 enable area code.

1 a leading one is allowed.

2 a leading one is required.

3 local calling area (no area code required)

*42<nn><a> a=1 Enable all NNXs, a=0 Disable all NNXs, area code #nn

00 >= nn >= 15

a=blank--query not supported for all NNXs.

*43<nn><abc><d> Enable/disable particular NNX abc in area code #nn.

00 >= nn >= 15

d=0 disable, d=1 enable, d=blank=query.

*5

Program Autodial Slots

*50<n><number> program emergency autodial slot #n

0 <= n <= 9

number phone number, 1-15 digits.

leave number blank to enquire.

*51<n> clear emergency autodial slot #n

0 <= n <= 9

*52<nnn><number> program autodial slot #nnn

000 <= nnn <= 249 (3 digits required)

number phone number, 1-15 digits.

leave number blank to enquire.

*53<nn> clear autodial slot #nnn

00 <= nnn <= 249 (3 digits required)

*6

Not Implemented (User Commands program)

*6 play CW "OK"

*7

Record/Play CW and Courtesy Tones

*70 play CW ID

*70 <dd..dd..dd..> program cw message n with CW data in dd.dd.dd
see CW encoding table.

*71<n> play courtesy tone n, 0 <= n <= 7 (n is in range 0 to 7)

*71<n><ddtt,ddtt...> record courtesy tone n, 0 <= n <= 7

dd is duration in 10 ms increments. 01 <= dd <= 99

tt is tone. See tone table. 00 <= tt <= 63

*8

Record/Play Audio Track

*8<x><t> x=0 for play, x=1 for record. t=track number.

x = 0,1 0=play, 1=record.

0 <= t <= ? track number

*9

Not Implemented

*9 play CW "NG"

*A

Debug Phone On/Off

*Ax x=1 pick up phone x=0 hang up phone
x = 0,1 phone control on=1 off=0

*B

Not Implemented

*B play CW "NG"

*C
Not Implemented
*C play CW "NG"

*D
Not Implemented
*D play CW "NG"

** (*E)
Debug Reset via WDT Timeout
** infinite loop into WDT reset.

*# (*F)
Not Implemented
*# play CW "NG"

*** Control Operator Switches ***

Group	Item	Description	Default	Notes
0	0	Repeater Enable	1	
0	1	Repeater CTCSS required	0	
0	2	key up delay (kerchunk filter)	0	
0	3	Hang Timer Enabled	1	
0	4	Hang timer short/long select	0	1=long
0	5	DTMF access mode	0	
0	6	courtesy tone enabled	1	
0	7	Control op CTCSS required	0	
1	0	repeater time out timer enable	1	
1	1	time out long / short	1	1=long
1	2	Enable "dual squelch"	0	
1	3	Enable DTMF Muting	1	
1	4	Drop link to mute DTMF	0	
1	5	Patch requires CTCSS	0	
1	6	DTMF pad test enable	1	
1	7	Control Receiver is Link Port	0	
2	0	Enable Voice Initial ID	1	
2	1	Enable Normal ID #1	0	
2	2	Enable Normal ID #2	0	
2	3	Enable Normal ID #3	0	
2	4	Enable Tail message #1	0	
2	5	Enable Tail message #2	0	
2	6	Enable Tail message #3	0	
2	7	Enable Mailbox Tail Message	0	
3	0	CI-V tune auto-receive mode	0	
3	1	Allow ID Stomp by key up	1	
3	2	Enable voice time out message	1	
3	3	Link port repeater mode	0	
3	4	Digital output/Fan Control	0	1=fan control
3	5	Digital output control	0	
3	6	Delay present main port	0	
3	7	Delay present secondary port	0	
4	0	Autopatch enabled	1	
4	1	Unrestricted Autopatch enabled	1	
4	2	Autodial Enabled	1	
4	3	Emergency Autodial Enabled	1	
4	4	Emergency Autodial Timer Disable	1	
4	5	Reverse Patch Enabled.	1	
4	6	Reverse Patch Rings out over air.	1	
4	7	Phone Answer Enabled.	1	
5	0	Link Port Alert Mode	0	
5	1	Link Port Monitor Mode	0	
5	2	Link Port TX Mode	0	
5	3	Link Port enabled during patch	0	
5	4	Link Prefix Enable	1	
5	5	Link Port CTCSS required	0	
5	6	Link Port "Dual Squelch"	0	
5	7	Link Port time out timer enable	0	
6	0	Digital output 1 is pulsed	0	
6	1	Digital output 2 is pulsed	0	
6	2	Digital output 3 is pulsed	0	
6	3	Digital output 4 is pulsed	0	
6	4	Digital outputs 5,6,7,8 are pulsed	0	
6	5	Digital outputs "one-of" mode	0	
6	6	Drop main PTT to mute DTMF	0	
6	7	Suppress autopatch number readback	0	
7	0	Digital out 1 control	0	
7	1	Digital out 2 control	0	
7	2	Digital out 3 control	0	

7	3	Digital out 4 control	0
7	4	Digital out 5 control	0
7	5	Digital out 6 control	0
7	6	Digital out 7 control	0
7	7	Digital out 8 control	0

Group	Item	Description	Default	Notes
8*	0	write protect control group setups	0	
8*	1	write protect prefixes	0	
8*	2	write protect timers	0	
8*	3	write protect patch setup	0	
8*	4	write protect autodials	0	
8*	5	(reserved)	0	
8*	6	write protect CW & courtesy tones	0	
8*	7	write protects pre-recorded tracks	1	
9*	0	enable access to group 0	1	
9*	1	enable access to group 1	1	
9*	2	enable access to group 2	1	
9*	3	enable access to group 3	1	
9*	4	enable access to group 4	1	
9*	5	enable access to group 5	1	
9*	6	enable access to group 6	1	
9*	7	enable access to group 7	1	

* controller must be unlocked to access groups 8 and 9

*** Tone Table ***

Tone Code	Tone Description	Tone Code	Tone Description
00	DTMF 0 tone	32	Note G6
01	DTMF 1 tone	33	Note G#6
02	DTMF 2 tone	34	Note A6
03	DTMF 3 tone	35	Note A#6
04	DTMF 4 tone	36	Note B6
05	DTMF 5 tone	37	Note C7
06	DTMF 6 tone	38	Note C#7
07	DTMF 7 tone	39	Note D7
08	DTMF 8 tone	40	Note D#7
09	DTMF 9 tone	41	Modem 1300
10	DTMF A tone	42	Modem 2100
11	DTMF B tone	43	Modem 1200
12	DTMF C tone	44	Modem 2200
13	DTMF D tone	45	Modem 980
14	DTMF * tone	46	Modem 1180
15	DTMF # tone	47	Modem 1070
16	Note D#5	48	Modem 1270
17	Note E5	49	Modem 1650
18	Note F5	50	Modem 1850
19	Note F#5	51	Modem 2025
20	Note G5	52	Modem 2225
21	Note G#5	53	DTMF row 1
22	Note A5	54	DTMF row 2
23	Note A#5	55	DTMF row 3
24	Note B5	56	DTMF row 4
25	Note C6	57	DTMF column 1
26	Note C#6	58	DTMF column 2
27	Note D6	59	DTMF column 3
28	Note D#6	60	DTMF column 4
29	Note E6	61	No tone
30	Note F6	62	No tone
31	Note F#6	63	No tone

*** CW Table ***

Letter	Code	Letter	Code	Letter	Code	Letter	Code
0	00	A	21	K	52	U	82

1	01
2	02
3	03
4	04
5	05
6	06
7	07
8	08
9	09

B	22
C	23
D	31
E	32
F	33
G	41
H	42
I	43
J	51

L	53
M	61
N	62
O	64
P	71
Q	70
R	72
S	73
T	81

V	83
W	91
X	92
Y	93
Z	90
SPACE	11
/	12
AR	13
BT	14

CW Pitch and Speed are programmed using “magic” letter codes, which are inserted into the ID message.

Speed	Code
5	58
6	59
7	64
8	65
9	66
10	67
11	68
12	69
13	74
14	75
15	76
16	77
17	78
18	79
19	84
20	85
21	86
22	87
34	88
24	89
25	94
26	95
27	96
28	97
29	98
30	99

Tone	Code	Frequency, Hertz
D#5	16	622.25
E5	17	659.26
F5	18	698.46
F#5	19	739.99
G5	24	783.99
G#5	25	830.61
A5	26	880.00
A#5	27	932.33
B5	28	987.77
C6	29	1046.50
C#6	34	1108.73
D6	35	1174.66
D#6	36	1244.51
E6	37	1318.51
F6	38	1396.91
F#6	39	1479.98
G6	44	1567.98
G#6	45	1661.22
A6	46	1760.00

A#6	47	1864.66
B6	48	1975.53
C7	49	2093.00
C#7	54	2217.46
D7	55	2349.32
D#7	56	2489.02