ICS
REPEATER
CONTROLLERS

LINKER II USER MANUAL

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General Description of the ICS Linker II Repeater Controller

Here at ICS we strive to make products that have new and innovative easy to use features at a reasonable cost with excellent quality. We believe the Linker is such a product. The Linker has such innovative features such as remote base control, a full featured control receiver input (has priority), programming with actual values (i.e. Volts, Hertz, Seconds, wpm) and a new very easy to use 3 level command access feature which has over 65 commands available. When designing the Linker we worked hard to provide a product that is easy to use, durable and of excellent quality. We also watched the cost. We believe we can provide an innovative high quality product at a reasonable cost.

The Linker has many unique features. One such feature is the control receiver input. This input is unique in that it provides a level of control normally only provided on more expensive controllers. The control a control receiver gives you is required for automatic control and is required by the FCC. The control receiver COS can be set to switch between 1 and 10 volts and the polarity can be set as well. When the control COS becomes active all the other COS signals are ignored and the Linker only listens to the control receiver for DTMF codes. This allows for total control with the control receiver input

Another such unique feature is the remote base control system, which will allow you to use most radios with memory and an input for UP memory. You simply program in the frequencies, offsets and CTCSS tones (encode and decode) into your radio's memory and tell the Linker how many memories you have on your radio. The Linker remembers where you are. All the user needs to do is select which memory you want. When the remote base radio is disabled or turned off the Linker will return the radio to the home memory. When desired you may select from one of 6 link / remote base commands to control your link radio. These commands are easy to use and to setup and allow you to have a multi frequency remote base at a reasonable cost.

The ever growing set of easy to use features can be accessed by a secure Setup mode (if DTMF access to Setup mode is allowed at all it can take 10 digits to access this level), a Control operator level and a User level. If desired the Setup mode can be accessed only by a hardware jumper. This provides the highest level of security. In the Setup mode all the commands are accessible by DTMF using their 2 digit command / function codes. This makes setup easy. The User and Control operator levels use from 1 to 5 digits to access these same commands / functions if setup to do so. From 0 to 25 DTMF command codes can be setup in the User and Control operator levels allowing easy setup, total flexibility and an extremely secure system for controlling the repeater and its functions.

It can be difficult at times to work on a repeater without knowing what the incoming and outgoing signals are doing. Connecting voltmeters, scopes and other monitoring equipment can sometimes be difficult. We have provided several LEDs to help ease the setup of the repeater. The Linker has 9 of them. Most of the input and output signals are indicated. The controller will also indicate when it recognizes a DTMF code. When not being used the LEDs can be disabled with a jumper. We have found these indicators to be a big help when working on repeaters.

The control inputs and outputs of the Linker II repeater controller are very simple to use. There are 4 COS inputs and 4 open collector type outputs. The inputs include a Control receiver COS input, a remote base / link receiver COS input and two COS inputs for the repeater's receiver. All of these COS inputs can be set to switch between 1 and 9 volts and the polarity is easily selectable. Both receiver ports have two COS inputs. Either one can be selected for COS control. This allows for the switching back and forth between carrier squelch and CTCSS (need an external CTCSS board) for the receivers COS signal. The software can also be setup to require both of the inputs for a receiver port for a valid COS signal (AND function).

The auxiliary outputs of the controller are multi featured and easy to use. One of the 4 outputs is dedicated to the repeater transmitter PTT connection. The 3 auxiliary outputs can be used for several different functions. All of the 3 auxiliary outputs can send a short pulse or either be locked on or off. The Auxiliary 1 output has a settable timer that can be enabled or disabled. It can also control a timed transmitter fan. The Auxiliary 2 output optionally provides the PTT for the linker / remote base transmitter. The Auxiliary 3 output can provide control of the remote base memory selection. All of the inputs are buffered and the outputs are protected to greatly reduce any chance of damage.

COMMAND STRUCTURE

The command structure of the Linker is easy to use and very versatile. It includes 3 levels. The levels are User mode, Control operator mode and Setup mode. The structure of these levels gives needed security and still provides a very easy system to setup. The Setup mode gives you direct access to all the commands / functions. The Control operator mode can only be reached when the Enable Control Operator mode command / function is activated. In the Control Operator mode the previously setup commands / functions can be accessed that were enabled at the Control Operator level and at the User mode level. The User mode will only allow access to commands/ functions that are enabled at the User mode level. Both in the Control operator mode and the User mode pre-entered DTMF codes need to be entered to allow use of a particular command / function.

The Setup mode is the most powerful. It allows access to all commands / functions. All the commands / functions are started just by entering the 2 digit code that represents that command / function. When the Linker controller leaves the factory the only way to access this level is with a hardware jumper. It initially can not be accessed any other way. There are two commands that can be used to enter and exit this level remotely. There is an Exit Setup mode and a Enter Setup mode command / function. The Enter Setup command / function can be enabled to a lower level from in the Setup mode only. This is done by setting up a DTMF code with the Enter Setup mode command / function on the User or Control operator levels.

When in the Setup mode the repeater uses a special courtesy tone. The courtesy tone is 3 dits or a Morse code "S" to indicate being in Setup mode. If the repeater is left in Setup mode and the repeater can not be physically accessed to remove the Setup jumper the Setup mode can be exited with a 2 digit Exit Setup command / function. This is true even if the Setup jumper is still installed.

The Control Operator mode gives a way to allow a higher level of control of the repeater without giving the total control of the Setup mode. From the User mode a settable DTMF code is entered and the repeater goes into Control Operator mode. In this mode more DTMF codes can be setup to allow access to commands / functions which need a higher level of security than the User mode. The Control Operator mode is exited with another settable DTMF code. Any, some or none of the Linker's command / functions can be enabled on this level.

The User mode may be used for general use. There may not be any available commands / functions at this level or something like the keypad test could be enabled here, or even remote base receive only. The Linker is flexible enough to allow any, some or none of its commands / functions to be enabled on this level.

To give access to a command / function at the Control Operator or User levels the DTMF code and command / function must be setup for that level. To start the entry use the "ENTER DTMF COMMAND LINE" function. First you enter the DTMF memory 0 – 24, then enter the 1 to 5 DTMF code digits, indicate if this command / function is to be on the Control operator level and of course the command / function itself (see the ENTER DTMF COMMAND LINE function in the command / function descriptions). All 16 digits can be used in this DTMF code including A, B, C, D, * and #. An example of the DTMF code layout is shown below;

Memory number	DTMF codes, 1 to 5 digits	Control Op?	command / function
0	2#0	N	33 (DISABLE TX 1)
1	2#1	Y	32 (ENABLE TX 1)
2	390B#	N	60 (SET CONTROL OPERATOR MODE)
3	C	Y	61 (CLEAR CONTROL OPERATOR MODE)
4	A#4B2	Y	58 (ENTER SETUP MODE)
5	B	N	48 (ACTIVATE KEYPAD TEST)

This is about the simplest way we could think to set this up. Any the commands / functions can be setup this way (or none of course). There is a chart at the end of this manual that is similar to the above and can be copied and used to keep track of your DTMF settings. Note: The controller comes with all DTMF memories empty.

REMOTE BASE CONTROLLER

The remote base controller on the Linker II uses new and unique method to control a remote base . Most radios that have an up input on the microphone can be used. The Linker II controller will allow you to select from any one of the preset memories in the remote base radio's memory. The Linker II supports from 1 to 250 memories. The Linker II remembers what memory the radio is on. The user only needs to select which memory he wants to use. This is very easy way of selecting remote base memories as the frequencies, offsets and CTCSS – DCS signals are all preset. You can choose to only have the receiver active, to have the receiver and transmitter active or even only the transmitter active. The commands are easy to setup and to use.

The connection from the remote base radio to the Linker II controller is fairly straightforward. First you will need to determine a way to get a COS signal from your remote base radio. The linker II's COS input can read voltages from 1 to 9 volts. While the COS input will read from 1 to 9 volts you can apply a voltage of 0 to 30 volts to it. The COS signal also needs to be able to operate with the Linker II's approximate input impedance of 10K. For further information on how to setup the remote base / linker COS input see the section QUICK CONNECT FOR THE REPEATER RECIEVER (Page 7). The remote base / link is setup very similar except you use the SET RX 2 COS VOLTAGE (Function #81 and #82) functions instead of the SET RX 1 VOLTAGE (Function #79 and #80) command / functions.

The next connection that needs to be made is the remote base / link receiver audio. This is fairly simple. First you should use a resister that has an equivalent resistance with a sufficient power rating to the radio's speaker, as this is the output impedance the radio was designed for. This resister should be tied from the audio output to ground. Keep the radio's volume as low as possible. The audio signal for the RX 2 input on the Linker II can be taken from the non ground side of this resister. There are other ways to get an audio signal but his is one easy way to get remote base / link audio. You may also use discriminator audio.

The mike input of the radio is the typical connection to the Linker II's TX 2 audio. You may want to add a resister to match the low output impedance of the Linkers RX 2 audio output to a high impedance microphone input of the remote base / link radio's microphone input.

If your radio has an "UP" input on its microphone input this can be used to give the Linker control over which memory to select. The Auxiliary 3 output of the Linker is used for this purpose. The "UP" input can be connected directly to the Auxiliary 3 input if the "UP" input is designed to go to ground for it's activation. The Linker uses an open collector configuration for this function. If the "UP" input does not normally get switched to ground a relay may be connected to the Auxiliary 3 output and appropriate connections to the radio made on the other side of the relay. This is all that is necessary to wire up the memory selection of your remote base.

The Linker will use a "Home memory" as a reference point. This is the memory in the remote base radio the Linker will consider memory number 0. The linker will always return the remote base radio to the Home memory when the remote base is disabled.

The Linker will always increment the memory up, even when returning to the Home memory or to go to one memory below the current memory. The Linker will "wrap around" memories. When the radio's highest memory is reached the Linker will expect the next UP signal to bring the radio to the first or lowest memory. While the memories are changing (or while any command / function is active) TX 1 will remain on. When TX 1 drops you will know the memory changing has been completed.

Once all the connections are made and the COS voltages (you probably don't need to change these) are set you will need to program the remote base radio itself. Once this is done the Linker will need to know how many memories it will have to increment through. This means the actual number of memories that show up on the display, even if they are not used. This is done using the "SET NUMBER OF REMOTE BASE MEMORIES " command/function (Function #71). The Linker's Remote base memory numbers start at 0 so the first memory is always memory number 0 (Home memory). Some radios start at 0 and some start at 1. If you are using the radio's memory number 1 as your home memory the Linker will call this memory number 0. You may use any memory as the home memory but the home memory will always be memory number 0 to the Linker.

TX 2 will not operate if TX 1 is disabled. If TX 1 times out or is disabled the TX 2 output will remain off. TX 2 will still remain enabled though even if TX 1 times out or is disabled. TX 2 will also go off if any DTMF tones are recognized. When doing control functions in most cases it is desirable to not be transmitting on the remote base's transmitter as the remote base may be on a repeater's input or frequency that is being used by others.

QUICK CONNECT FOR THE CONTROL RECEIVER

1. You should have a control receiver COS and audio signal already wired to the proper connections according to the plug layout in this manual before you start. These signals should be suitable to drive a 10K ohm load.

2. Make sure the repeater's transmitter is disconnected or disabled

3. Check to see what the COS on and off voltages are and write them down. The difference between them should be at least 1V and can be somewhat less if the COS voltages are very stable. If a battery is being used the COS voltages during battery discharge should also be taken into consideration when determining these settings. In the case of a discharging battery the voltage setting from R45 will change as well.

4. Turn the power off.

5. The input buffer jumper JP2 setting needs to be determined. For high gain (about 10 times) do not install the jumper. For a low gain (about 2 times) jumper pins 2 & 3. To de-emphasize the audio jump pins 1 & 2.

6. If the COS goes positive when activated make sure the jumpers in JP4 have their skinny parts both faced towards U5. This is the position for a positive going COS polarity.

7. (NOTE: The jumpers in JP4 are turned 90 degrees for the opposite COS polarity)

8. If the COS goes negative when activated make sure the jumpers in JP4 are set so that one jumper has its long side facing U5. This is the jumper position for a negative going COS polarity.

9. Turn the power on

10. If the Linkers control receiver COS input is setup for a positive COS monitor the voltage on pin 12 of U2, if the Linkers control receiver is setup for a negative COR monitor the voltage on pin 13 of U2

11. Adjust R45 (CONTROL RX COS LEVEL POT) until the voltage reading is in the middle of the measured COS voltage from step 3.

12. If you have a scope available, monitor the signal on U2 pin 7, if not skip to step 13.

13. Send a DTMF digit through the control receiver

14. Set R19 (CONTROL RX AUDIO) until you get about a 200mV reading. You should now see the VALID DTMF LED lit up.

15. If you do not have a scope available send start by sending a DTMF digit tone through the control receiver.

16. Adjust R19 (CONTROL RX AUDIO) until you see the VALID DTMF LED light up. Try to find a center point so you are not on the edge of operation.

17. The control receiver should now be ready to perform control functions. This is necessary before setting up the repeater receiver or the remote base / link receiver as the setup on the control receiver is done with a pot and jumpers. The setup for the repeater's receiver and the remote base / link ports are done using commands / functions. Before the repeater receiver voltages are entered it may be the case that the controller does not yet have valid voltage values for the repeater receiver COS signal. The control receiver COS will override the repeater's COS so when using the control receiver it makes no difference what the status of the repeater's COS currently is.

QUICK CONNECT FOR THE REPEATER RECEIVER

This is a procedure that will help connect up the repeater's receiver. It is not the only way to do it but one that we have used that works well.

1. You should have a repeater receiver COS and audio signal already wired to the proper connections according to the plug layout in this manual before you start. These signals should be suitable to drive a 10K ohm load. The control receiver should also be setup (but not necessarily). The control receiver is where the DTMF entries should be made if the repeater receiver COS voltages need to be changed. (See Quick connect for the control receiver Step 15). The default trigger voltages for RX 1 and RX 2 are 5V with a positive acting COR. These voltages can be reprogrammed if your COR signals are different.

2. Make sure the repeater's transmitter is disconnected or disabled

3. Check to see what the COS on and off voltages are and write them down. The difference between them should be 1V or so but can be somewhat less if the COS voltages are very stable. If a battery is being used the COS voltages during battery discharge should also be taken into consideration when setting up these settings.

4. Make sure the Linker is in setup mode (install the setup jumper) and the following DTMF codes should be sent from the control receiver.

5. The input buffer jumper JP5 setting needs to be determined. For high gain (about 10 times) do not install the jumper. For a low gain (about 2 times) jumper pins 2 & 3. To de-emphasize the audio jump pins 1 & 2.

6. For the repeater's COS level setting activate the command / function SET RX 1 COS VOLTAGE ON LEVEL. For most systems with a positive COS that goes over 6V you may skip the following steps.

7. Enter in a voltage value that is in-between the two measured voltages in step 3. Write down this voltage on a piece of paper. You may use three digits and the * as a decimal point. You would enter 2.34 Volts as 2*34 on your DTMF keypad.

8. After completing the SET RX 1 COS VOLTAGE ON LEVEL command / function you will need to enter a second voltage value. This will set the polarity of the receiver's COS input.

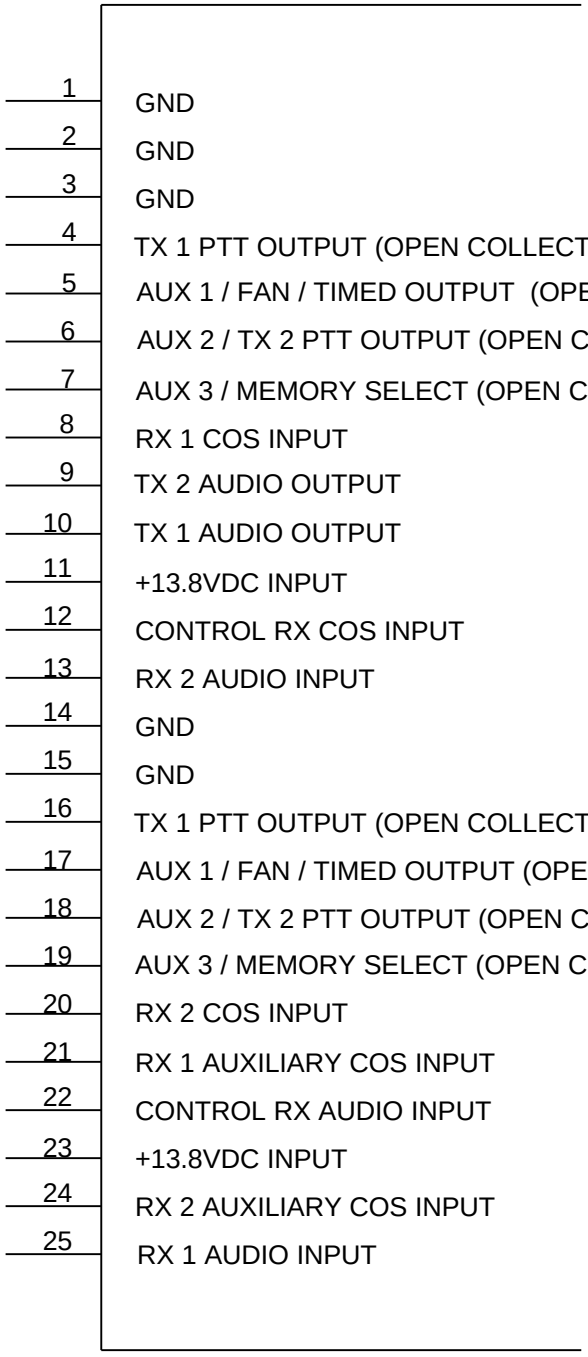
9. For the repeater's COS polarity setting use the command / function SET RX 1 COS VOLTAGE OFF LEVEL.

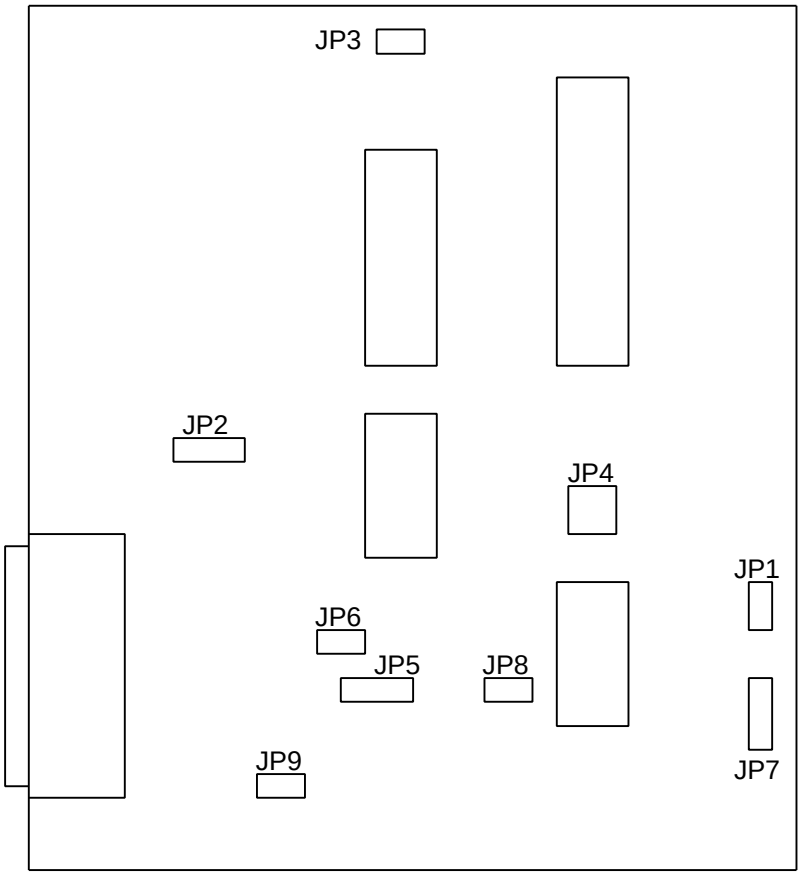
10. Enter in a voltage value that is at least 0.2V different than the previously voltage entered in step 6. If the repeater's COS is positive the voltage value should be 0.2 volts less than in step 6. If the repeater's COS is negative then this voltage should be 0.2 volts more than the voltage from step 6. Again you may use the * as a decimal point. You would enter 2.34 Volts as 2*34 on your DTMF keypad.

11. Care should be taken when adjusting the repeaters audio in level with R57 (RX 1 AUDIO) so the DTMF decoder gets a signal which will allow a reliable decoding of any DTMF digits from the repeater's receiver. (See Quick connect for the control receiver Step 11)

12. The Auxiliary COS and the remote base / link COS are set up in the same general way as the repeater COS input and this procedure can be used by replacing the COS setup command / functions for the repeater with those of the Auxiliary COS or remote base / link COS inputs.

MALE DB 25 CONNECTOR ON LINKER II BOARD





JP1 LED GROUND JUMPER, REMOVE TO DISABLE LED's

JP2 CONTROL RX AUDIO - 1 & 2 DE-EMPHISIZED, 2 & 3 LOW GAIN, NO JMP HIGH GAIN

JP3 SETUP JUMPER, INSTALL FOR SETUP MODE

JP4 CONTROL RX COS POLARITY - ROTATE 90 DEG FOR OPPOSITE COS POLARITY

JP5 RX 1 AUDIO - 1 & 2 DE-EMPHISIZED, 2 & 3 LOW GAIN, NO JMP HIGH GAIN

JP6 RX 1 AUDIO ENABLE, TO DISABLE RX 1 AUDIO REMOVE JUMPER

JP7 RX 2 AUDIO - 1 & 2 DE-EMPHISIZED, 2 & 3 LOW GAIN, NO JMP HIGH GAIN

JP8 RX 2 AUDIO ENABLE, TO DISABLE RX 2 AUDIO REMOVE JUMPER

JP9 NOT USED

SPECIFICATIONS

SUPPLY VOLTAGE	13.8V	
IDLE CURRENT	20mA @13.8V LEDs disabled	
MAXIMUM CURRENT TX 1 OUTPUT	1 A	
MAXIMUM CURRENT ON AUXILIARY 1 OUTPUT	1 A	
MAXIMUM CURRENT ON AUXILIARY 2 OUTPUT	1 A	
MAXIMUM CURRENT ON AUXILIARY 3 OUTPUT	1 A	
VOLTAGE IN ON RECEIVER 1 AUDIO INPUT	20mVpp to 10Vpp	
VOLTAGE IN ON RECEIVER 2 AUDIO INPUT	20mVpp to 10Vpp	
VOLTAGE IN ON THE CONTROL RECEIVER AUDIO INPUT	20mVpp to 10Vpp	
MAX VOLTAGE OUT ON RECEIVER 1 AUDIO OUTPUT	5Vpp	
MAX VOLTAGE OUT ON RECEIVER 2 AUDIO OUTPUT	5Vpp	
VOLTAGE IN ON THE RX 1 COS	0 to 30V	1 to 9V readable
VOLTAGE IN ON THE RX 2 COS	0 to 30V	1 to 9V readable
VOLTAGE IN ON THE CONTROL RX COS	0 to 30V	1 to 10V readable
VOLTAGE IN ON THE AUXILIARY COS	0 to 30V	1 to 9V readable
OUTPUT IMPEDANCE FOR TRANSMITTER 1 AUDIO OUTPUT	> 600 ohms	
OUTPUT IMPEDANCE FOR TRANSMITTER 2 AUDIO OUTPUT	> 600 ohms	
INPUT IMPEDANCE ON RECEIVER 1 INPUT	~10K ohms	
INPUT IMPEDANCE ON RECEIVER 2 INPUT	~10K ohms	

COMMAND / FUNCTION LIST FOR THE ICS LINKER II CONTROLLER

32	ENABLE TX 1
33	DISABLE TX 1
34	FORCE ID
35	USE RX 1 COS
36	SWITCH TO AUXILIARY COS
37	TURN AUXILIARY TIMER OFF
38	TURN AUXILIARY TIMER ON
39	TURN AUXILIARY 1 OUTPUT OFF
40	TURN AUXILIARY 1 OUTPUT ON
41	TURN AUXILIARY 2 OUTPUT OFF
42	TURN AUXILIARY 2 OUTPUT ON
43	TURN AUXILIARY 3 OUTPUT OFF
44	TURN AUXILIARY 3 OUTPUT ON
45	PULSE AUXILIARY 1 OUTPUT
46	PULSE AUXILIARY 2 OUTPUT
47	PULSE AUXILIARY 3 OUTPUT
48	ACTIVATE KEYPAD TEST
49	REMOTE BASE DISABLE (RX and TX disable)
50	REMOTE BASE RX ENABLE
51	REMOTE BASE TX DISABLE
52	REMOTE BASE TX ENABLE
53	REMOTE BASE RX ENABLE WITH MEMORY SELECT
54	REMOTE BASE RX AND TX ENABLE WITH MEMORY SELECT
55	WARM RESET
56	COURTESY TONE ENABLE
57	COURTESY TONE DISABLE
58	ENTER SETUP MODE
59	EXIT SETUP MODE
60	SET CONTROL OPERATOR MODE
61	CLEAR CONTROL OPERATOR MODE
62	ENABLE IDER
63	DISABLE IDER
64	TURN ON TEST TONE
65	TURN OFF TEST TONE
66	SET PARAMETERS TO FACTORY DEFAULTS
67	SET IDER RX ACTIVE HOLD OFF TIME
68	SET IDER INTERVAL
69	SET AUXILIARY 1 OUTPUT TIMEOUT TIME
70	SET WORD PER MINUTE RATE
71	SET NUMBER OF REMOTE BASE MEMORIES
72	SET HANG TIME
73	SET TX 1 TIMEOUT TIME
74	CLEAR ALL DTMF COMMAND LINES
75	CLEAR ONE DTMF COMMAND LINE
76	ENTER NEW ID
77	SET NEW CW FREQUENCY
78	ENTER NEW DTMF COMMAND LINE
79	SET RX 1 COS VOLTAGE OFF LEVEL
80	SET RX 1 COS VOLTAGE ON LEVEL
81	SET RX 2 COS VOLTAGE OFF LEVEL
82	SET RX 2 COS VOLTAGE ON LEVEL

83	SET AUXILIARY COS VOLTAGE OFF LEVEL
84	SET AUXILIARY ON VOLTAGE ON LEVEL
85	FORCE TX 1 FORCE ON
86	FORCE TX 1 FORCE CLEAR
87	SAVE STATUSES (ONLY SOME NEED TO BE SAVED)
88	ENABLE TIMED TX FAN ON AUXILIARY 1 OUTPUT
89	DISABLE TIMED TX FAN ON AUXILIARY 1 OUTPUT
90	SET CURRENT MEMORY AS REMOTE BASE HOME MEMORY
91	TURN DTMF MUTING ON
92	TURN DTMF MUTING OFF
93	SET RX1 COS TO AND
94	SET AUX RX2 OFF LEVEL
95	SET AUX RX2 ON LEVEL
96	USE RX2 MAIN INPUT FOR COR
97	USE RX2 AUX FOR COS
98	SET RX2 COS TO AND
99	SET RX2 DTMF CONTROL

Definition of Terms used

1. Key up – To activate the Control or Repeaters receiver COS (The repeaters receiver needs to be allowed to do DTMF control)
2. Unkey – To deactivate The Control or Repeaters receiver COS
3. COMMAND ACCEPTED indication – The controller sends a CW letter “K” for “OK”
4. ENTER NEXT DATA code – The controller sends a CW letter “M” for “ready for MORE information”
5. TX 1 = Transmitter 1 (typically the repeaters transmitter)
6. TX 2 = Transmitter 2 (typically the remote base / link transmitter)
7. RX 1 = Receiver 1 (typically the repeaters receiver)
8. RX 2 = Receiver 2 (typically the remote base / link receiver)
9. FUNCTION = “command / function” as described in the previous text
10. A decimal point can be entered on some functions by using the ‘*’ key on your touch pad

FUNCTION: ENABLE TX 1

FUNCTION CODE: 32

PURPOSE: Enables the TX 1 output

HOW TO USE:

1. Key up
2. Enter the ENABLE TX 1 function code.
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The TX 1 output is now enabled.

TX 2 will not transmit if TX 1 is disabled

The ENABLE TX 1 command will enable TX 1. If TX 1 was disabled on power up TX 1 will again be disabled on power up (or warm reset) unless you use SAVE STATUSES (Function number 87). If you ENABLE TX 1 and then use the SAVE STATUSES function TX 1 will always be enabled when a power or warm reset occurs.

FUNCTION: DISABLE TX 1

FUNCTION CODE: 33

PURPOSE: Disables the TX 1 output

HOW TO USE:

1. Key up
2. Enter the DISABLE TX 1 function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The TX 1 output is disabled.

TX 2 will not transmit if TX 1 is disabled

The DISABLE TX 1 command will disable TX 1. If TX 1 was enabled on power up TX 1 will again be enabled on power up (or warm reset) unless you use SAVE STATUSES (Function number 87). If you DISABLE TX 1 and then use the SAVE STATUSES function TX 1 will always be disabled when a power or warm reset occurs.

FUNCTION: FORCE ID

FUNCTION CODE: 34

PURPOSE: To force the controller to send the CW ID

HOW TO USE:

1. Key up
2. Enter FORCE ID function code
3. Unkey
4. When the command is accepted the controller will send the preset CW ID.

When the controller sends a forced ID the ID interval timer is not reset.

FUNCTION: USE RX1 COS

FUNCTION CODE: 35

PURPOSE: Changes the COS input which RX 1 uses

HOW TO USE:

1. Key up
2. Enter USE RX1 COS function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The RX 1 COS will now activate RX 1.

This function switches control for RX 1 from the Auxiliary COS to the RX 1 COS

FUNCTION: SWITCH TO AUXILIARY COS

FUNCTION CODE: 36

PURPOSE: Changes the COS input which RX 1 uses

HOW TO USE:

1. Key up
2. Enter SWITCH TO AUXILIARY COS function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The Auxiliary COS will now activate RX 1.

This function switches control for RX 1 from the RX 1 COS to the Auxiliary COS

FUNCTION: TURN AUXILIARY TIMER OFF

FUNCTION CODE: 37

PURPOSE: Disables the timer for the Auxiliary 1 output

HOW TO USE:

1. Key up
2. Enter the TURN AUXILIARY TIMER OFF function code
3. Unkey
4. The controller will send a COMMAND ACCEPTED indication
5. The Auxiliary 1 output timer will no longer affect the Auxiliary 1 output.

FUNCTION: TURN AUXILIARY TIMER ON

FUNCTION CODE: 38

PURPOSE: Enables the timer for Auxiliary 1 output

HOW TO USE:

1. Key up
2. Enter the TURN AUXILIARY TIMER ON function code
3. Unkey
4. The controller will send the COMMAND ACCEPTED indication
5. The Auxiliary output timer is now enabled

The Auxiliary 1 output timer will start when the Auxiliary output is on. When the timer times out the Auxiliary 1 output will be turned off.

FUNCTION: TURN AUXILIARY 1 OUTPUT OFF

FUNCTION CODE: 39

PURPOSE: Turns off the Auxiliary 1 output

HOW TO USE:

1. Key up
2. Enter the TURN AUXILIARY 1 OUTPUT OFF function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The Auxiliary 1 output will now be turned off.

FUNCTION: TURN AUXILIARY 1 OUTPUT ON

FUNCTION CODE: 40

PURPOSE: Turns on the Auxiliary 1 output ON

HOW TO USE:

1. Key up
2. Enter the TURN AUXILIARY OUTPUT ON function code
3. Unkey
4. The controller will send the COMMAND ACCEPTED indication
5. The Auxiliary 1 output will be turned on.

If the Auxiliary 1 output timer is enabled, the timer will turn the Auxiliary 1 output off when the timer times out.

FUNCTION: TURN AUXILIARY 2 OUTPUT OFF

FUNCTION CODE: 41

PURPOSE: Turns off the Auxiliary 2 output

HOW TO USE:

1. Key up
2. Enter the TURN AUXILIARY 2 OUTPUT OFF function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The Auxiliary 2 output is now turned off.

FUNCTION: TURN AUXILIARY 2 OUTPUT ON

FUNCTION CODE: 42

PURPOSE: Turns on the Auxiliary 2 output ON

HOW TO USE:

1. Key up
2. Enter the TURN AUXILIARY OUTPUT ON code
3. Unkey
4. The controller will now send the COMMAND ACCEPTED function indication
5. The Auxiliary 2 output is now turned on

Auxiliary 2 has no timeout timer.

FUNCTION: TURN AUXILIARY 3 OUTPUT OFF

FUNCTION CODE: 43

PURPOSE: Turns off the Auxiliary 3 output

HOW TO USE:

1. Key up
2. Enter the TURN AUXILIARY 3 OUTPUT OFF function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The Auxiliary 3 output is now turned off.

FUNCTION: TURN AUXILIARY 3 OUTPUT ON

FUNCTION CODE: 44

PURPOSE: Turns on the Auxiliary 3 output ON

HOW TO USE:

1. Key up
2. Enter the TURN AUXILIARY OUTPUT ON function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The Auxiliary 3 output is now turned on.

Auxiliary 3 does not have a timeout

FUNCTION: PULSE AUXILIARY 1 OUTPUT

FUNCTION CODE: 45

PURPOSE: Turns on the Auxiliary 1 output

HOW TO USE:

1. Key up
2. Enter the PULSE AUXILIARY OUTPUT 1 function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The Auxiliary 1 output will be pulsed

FUNCTION: PULSE AUXILIARY 2 OUTPUT

FUNCTION CODE: 46

PURPOSE: Pulses the Auxiliary 2 output

HOW TO USE:

1. Key up
2. Enter the PULSE AUXILIARY 2 OUTPUT function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The Auxiliary 2 output will be pulsed

FUNCTION: PULSE AUXILIARY 3 OUTPUT

FUNCTION CODE 47

PURPOSE: Pulses the Auxiliary 3 output

HOW TO USE:

1. Key up
2. Enter the PULSE AUXILIARY 3 OUTPUT function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The Auxiliary 3 output will be pulsed.

FUNCTION: ACTIVATE KEYPAD TEST

FUNCTION CODE: 48

PURPOSE: Allows testing of users radio touch pad

HOW TO USE:

1. Key up
2. Enter the ACTIVATE KEYPAD TEST function code
3. Unkey
4. The controller sends the ENTER NEXT DATA indication
5. Key up
6. Push the digit to be tested
7. Unkey
8. The controller will report which digit it heard in CW

The controller will wait for another DTMF digit to be sent. If it you wish to cancel the function key up without sending a DTMF digit and unkey. The controller will cancel the keypad test with no acknowledge tone.

FUNCTION: REMOTE BASE DISABLE (RX and TX disable)

FUNCTION CODE: 49

PURPOSE: Returns the remote base to the reset condition

HOW TO USE:

1. Key up
2. Enter the REMOTE BASE DISABLE function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The remote base has been disabled and the memory (if it had been changed from memory 0) is incrementing back to memory 0.

FUNCTION: REMOTE BASE RX ENABLE

FUNCTION CODE: 50

PURPOSE: Enables the remote base RX input

HOW TO USE:

1. Key up
2. Enter the REMOTE BASE RX ENABLE function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The remote base receiver will be enabled.

The remote base memory will not be changed with this function

FUNCTION: REMOTE BASE TX DISABLE

FUNCTION CODE: 51

PURPOSE: Disables the remote base TX output

HOW TO USE:

1. Key up
2. Enter the REMOTE BASE TX DISABLE function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The remote base transmitter will be disabled.

The remote base memory will not be changed with this function

FUNCTION: REMOTE BASE TX ENABLE

FUNCTION CODE: 52

PURPOSE: Enables the remote base TX output

HOW TO USE:

1. Key up
2. Enter the REMOTE BASE TX ENABLE function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The remote base transmitter will be enabled.

The remote base memory will not be changed with this function. The remote base TX will follow the RX 1 COS unless TX 1 is disabled or timed out

FUNCTION: REMOTE BASE RX ENABLE WITH MEMORY SELECT

FUNCTION CODE: 53

PURPOSE: Enables the remote base RX input and will change the remote base memory

HOW TO USE:

1. Key up
2. Enter the REMOTE BASE RX ENABLE function code
3. Unkey
4. The controller sends the ENTER NEXT DATA code
5. Key up
6. Enter the memory number you wish to have the remote base set to
7. Unkey
8. The controller sends the COMMAND ACCEPTED indication
9. The repeater transmitter (TX 1) will be forced on while the remote base memory is changing
10. The remote base memory will be selected
11. Then the remote base receiver will be enabled
12. Once the remote base receiver is enabled the repeaters transmitter (TX 1) will no longer be forced on.

When entering the desired memory if no value is entered (key up and unkey) memory 0 (Home memory) will be selected.

FUNCTION: REMOTE BASE RX AND TX ENABLE WITH MEMORY SELECT

FUNCTION CODE: 54

PURPOSE: Enables the remote base RX input and TX output and will change the remote base memory

HOW TO USE:

1. Key up
2. Enter the REMOTE BASE RX AND TX ENABLE WITH MEMORY SELECT function code
3. Unkey
4. The controller sends the ENTER NEXT DATA indication
5. Key up
6. Enter the memory number you wish to have the remote base set to
7. Unkey
8. The controller sends the COMMAND ACCEPTED indication
9. The repeater transmitter (TX 1) will be forced on while the remote base memory is changing
10. The remote base memory will be selected
11. Then the remote base receiver will be enabled
12. Once the remote base receiver is enabled the repeater’s transmitter (TX 1) will no longer be forced on.

When entering the desired memory, if no value is entered (key up and unkey) memory 0 will be selected.

FUNCTION: WARM RESET

FUNCTION CODE: 55

PURPOSE: Resets all statuses to power up condition.

HOW TO USE:

1. Key up
2. Enter the WARM RESET function code
3. Unkey
4. There will be no direct acknowledging from the controller.

When you unkey after entering the WARM RESET code the transmitter will drop immediately as the controller does a reset and does not remember that the receiver was active.

FUNCTION: COURTESY TONE ENABLED

FUNCTION CODE: 56

PURPOSE: Enables the all of the Courtesy tones.

HOW TO USE:

1. Key up
2. Enter the COURTESY TONE ENABLED function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. All the Courtesy tones will enabled

FUNCTION: COURTESY TONE DISABLE

FUNCTION CODE: 57

PURPOSE: Disables the all of the Courtesy tones.

HOW TO USE:

1. Key up
2. Enter the COURTESY TONE DISABLE function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. All the Courtesy tones will be disabled.

This function does not affect the acknowledge codes. The Remote base, Setup mode and normal Courtesy tones will be disabled. The COMMAND ACCEPTED and ENTER NEXT DATA indications will still operate.

FUNCTION: ENTER SETUP MODE

FUNCTION CODE: 58

PURPOSE: Puts the controller in the Setup mode

HOW TO USE:

1. Key up
2. Enter the ENTER SETUP MODE function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The controller will be in the Setup mode

Entering the Setup mode with this command will occur regardless of the position of the setup jumper.

FUNCTION: EXIT SETUP MODE

FUNCTION CODE: 59

PURPOSE: Takes the controller out of the Setup mode

HOW TO USE:

1. Key up
2. Enter the EXIT SETUP MODE function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The controller will not be in the setup mode.

Exiting the Setup mode with this command will occur regardless of the position of the setup jumper.

FUNCTION: SET CONTROL OPERATOR MODE

FUNCTION CODE: 60

PURPOSE: Puts the controller in the Control operator mode

HOW TO USE:

1. Key up
2. Enter the SET CONTROL OPERATOR MODE function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The controller will be in the Control operator mode..

If the Control operator mode is enabled during the Setup mode it will have no effect until exiting the setup mode. Upon exiting the setup mode the controller will be in Control operator mode. The controller can be both in Setup mode and Control operator mode at the same time but the Setup mode has priority.

FUNCTION: CLEAR CONTROL OPERATOR MODE

DTMF CODE: 61

PURPOSE: Takes the controller out of the Control operator mode

HOW TO USE:

1. Key up
2. Enter the CLEAR CONTROL OPERATOR MODE function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The controller will not be in the Control operator mode.

If the Control operator mode is enabled during the Setup mode it will have no effect until exiting the setup mode. Upon exiting the setup mode the controller will be in Control operator mode. The controller can be both in Setup mode and Control operator mode at the same time but the Setup mode has priority.

FUNCTION: ENABLE_IDER

FUNCTION CODE: 62

PURPOSE: To allow the user to have the IDer operate

HOW TO USE:

1. Key up
2. Enter the ENABLE_IDER function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The controller's IDer will now be enabled...

If the IDer was not enabled on power up the Save statuses function will need to be run. This will store the new IDer status along with others. This needs to be done or the IDer status will return to the way it was the last time the controller was powered up.

FUNCTION: DISABLE_IDER

FUNCTION CODE: 63

PURPOSE: To allow the user to keep the IDer from operating

HOW TO USE:

1. Key up
2. Enter the DISABLE_IDER function code
3. Unkey
4. The controller will send the COMMAND ACCEPTED indication
5. The controller's IDer will now be disabled...

If the IDer was enabled on power up the Save statuses function will need to be run. This will store the new IDer status (along with others). This needs to be done or the IDer status will return to the way it was the last time the controller was powered up.

FUNCTION: TURN ON TEST TONE

FUNCTION CODE: 64

PURPOSE: To provide an audio test signal from the controller

HOW TO USE:

1. Key up
2. Enter the TURN ON TEST TONE function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The controller will send a continuous tone at the frequency that is currently set.

This function will not cause the transmitter to stay on. It only provides the tone from the tone output. The transmitter can be locked on by using the TX 1 force on function.

FUNCTION: TURN OFF TEST TONE

FUNCTION CODE: 65

PURPOSE: To turn off the test tone signal from the controller

HOW TO USE:

1. Key up
2. Enter the TURN OFF TEST TONE function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The controller will stop sending the test tone

FUNCTION: SET PARAMETERS TO THE FACTORY DEFAULT

FUNCTION CODE: 66

PURPOSE: To give the user a way to reset to the factory defaults

HOW TO USE:

1. Key up
2. Enter the SET PARAMETERS TO THE FACTORY DEFAULT function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The Parameters are now set to the Factory Default

The factory defaults are as follows:

1.	Words per minute	10 WPM
2.	CW frequency	1000Hz
3.	TX 1 timeout time	300 seconds
4.	Hang time	2 seconds
5.	RX 1 COR levels	5V positive action
6.	RX 2 COR levels	5V positive action
7.	Number of remote base memories	1
8.	Auxiliary 1 output timer time	600 seconds
9.	IDer COS active wait time	150 seconds
10.	IDer interval time	600 seconds
11.	Statuses are set to default (See SAVE STATUSES Function)	

FUNCTION: SET IDER RX ACTIVE HOLD OFF TIME

FUNCTION CODE: 67

PURPOSE: To allow changes to the time the IDer will wait for RX 1 COS to become inactive

HOW TO USE:

1. Key up
2. Enter the SET IDER RX ACTIVE HOLD OFF TIME function code
3. Unkey
4. The controller sends the ENTER NEXT DATA indication
5. Key up
6. Enter the time in seconds for the hold off time
7. Unkey
8. The controller sends the COMMAND ACCEPTED indication
9. The new time value is stored

The time range is from 30 seconds to 2500 seconds. If a value is entered outside these limits the controller will not save the entered value, it will give the ERROR indication (B in CW) and the function will be ended.

FUNCTION: SET IDER INTERVAL

FUNCTION CODE: 68

PURPOSE: To allow changes to the time the IDer will wait before it tries to ID

HOW TO USE:

1. Key up
2. Enter the SET IDER INTERVAL function code
3. Unkey
4. The controller sends the ENTER NEXT DATA indication
5. Key up
6. Enter the time in seconds for the interval time
7. Unkey
8. The controller sends the COMMAND ACCEPTED
9. The value is changed.

The time range is from 30 seconds to 2500 seconds. If a value is entered outside these limits the controller will not save the entered value, it will give the ERROR indication (B in CW) and the function will be ended.

FUNCTION: SET AUXILIARY 1 OUTPUT TIMEOUT TIME

FUNCTION CODE: 69

PURPOSE: Changes the time for the Auxiliary 1 timer

HOW TO USE:

1. Key up
2. Enter the SET AUXILIARY 1 OUTPUT TIMEOUT TIME function code
3. Unkey
4. The controller sends the ENTER NEXT DATA indication
5. Key up
6. Enter the time in seconds for the Auxiliary 1 timeout timer
7. Unkey
8. The controller sends the COMMAND ACCEPTED indication
9. The timer value is changed.

The time range is from 10 seconds to 2520 seconds. If a value is entered outside these limits the controller will not save the entered value, it will give the ERROR indication (B in CW) and the function will be ended.

FUNCTION: SET WORD PER MINUTE RATE

FUNCTION CODE: 70

PURPOSE: Changes the word per minute rate for the CW output

HOW TO USE:

1. Key up
2. Enter the SET WORD PER MINUTE RATE function code
3. Unkey
4. The controller sends the ENTER NEXT DATA indication
5. Key up
6. Enter the time in seconds for the new wpm rate
7. Unkey
8. The controller sends the COMMAND ACCEPTED indication
9. The Word per minute value is changed

The time range is from 5 wpm to 20 wpm. If a value is entered outside these limits the controller will not save the entered value, it will give the ERROR or BAD VALUE indication (B in CW) and the function will be ended.

FUNCTION: SET NUMBER OF REMOTE BASE MEMORIES

FUNCTION CODE: 71

PURPOSE: To tell the controller the number of memories the remote base is using

HOW TO USE:

1. Key up
2. Enter the SET NUMBER OF REMOTE BASE MEMORIES function code
3. Unkey
4. The controller sends the ENTER NEXT DATA indication
5. Key up
6. Enter the number of memories the remote base has that the controller will increment through
7. Unkey
8. The controller sends the COMMAND ACCEPTED indication
9. The number of remote base memories is set

The time range is from 1 memory to 254 memories. If a value is entered outside these limits the controller will not save the entered value, it will give the ERROR or BAD VALUE indication (B in CW) and the function will be ended.

When deciding the value for this function the actual number of memories that appears on the radio's display is what needs to be programmed in. To make sure the right number is selected set the radio to the first memory. Then count as the mike up button is pushed. Count the memories until the first is reached again. Use this number for the number of remote base memories.

FUNCTION: SET HANG TIME

FUNCTION CODE: 72

PURPOSE Sets the time TX 1 is on after the COS goes off

HOW TO USE:

1. Key up
2. Enter the SET HANG TIME code
3. Unkey
4. The controller sends the ENTER NEXT DATA code
5. Key up
6. Enter the hang time in seconds
7. Unkey
8. The controller sends the COMMAND ACCEPTED indication
9. The new hang time value is stored

The range of the timer is from 0.1 seconds to 25 seconds. If a value is entered outside these limits the controller will not save the entered value, it will give the ERROR or BAD VALUE indication (B in CW) and the function will be ended. The timer is accurate to about 0.2 seconds and has a minimum of about a quarter of a second

FUNCTION: SET TX 1 TIMEOUT TIME

FUNCTION CODE: 73

PURPOSE Sets the time TX 1 is allowed to be on after the COS comes on

HOW TO USE:

1. Key up
2. Enter the SET HANG TIME function code
3. Unkey
4. The controller sends the ENTER NEXT DATA code
5. Key up
6. Enter the hang time in seconds
7. Unkey
8. The controller sends the COMMAND ACCEPTED indication
9. The new hang time value is stored

Sets the time maximum time TX 1 remains on after the COS becomes valid
The time range is from 10 seconds to 1200 seconds in 10-second increments. The accuracy is about 10 seconds. If a value is entered outside these limits the controller will not save the entered value, it will give the ERROR or BAD VALUE indication (B in CW) and the function will be ended.

FUNCTION: CLEAR ALL DTMF COMMAND LINES

FUNCTION CODE: 74

PURPOSE: To allow the user to keep the IDer from operating

HOW TO USE:

1. Key up
2. Enter the CLEAR ALL DTMF COMMAND LINES function code
3. Unkey
4. The controller will send the COMMAND ACCEPTED indication
5. All of the DTMF codes are now cleared from the controller's EEPROM

If it is only necessary to clear one or a few DTMF lines the CLEAR ONE DTMF COMMAND LINE function can be used.

FUNCTION: CLEAR ONE DTMF COMMAND LINE

FUNCTION CODE: 75

PURPOSE: To clear only one DTMF command line

HOW TO USE:

1. Key up
2. Enter the CLEAR ONE DTMF COMMAND LINE function code
3. Unkey
4. The controller sends the ENTER NEXT DATA indication
5. Key up
6. Enter the memory number of the DTMF line to clear
7. Unkey
8. The controller will send the COMMAND ACCEPTED indication
9. The DTMF codes in the selected line / memory are now cleared from the EEPROM

If it is desired to clear all of the DTMF command lines from the EEPROM the CLEAR ALL DTMF COMMAND LINES function may be used.

FUNCTION: ENTER NEW ID

FUNCTION CODE: 76

PURPOSE: To set the information the IDer sends

HOW TO USE:

1. Key up
2. Enter the ENTER NEW ID function code
3. Unkey
4. The controller sends the ENTER NEXT DATA indication
5. Key up
6. Hold the key while entering in a series of 0's, 1's and 2's.
7. The 0's will enter a space, the 1's will enter a DIT and the 2's will enter a DAH.
8. When all the information is entered unkey.
9. The controller sends the COMMAND ACCEPTED indication
10. The new ID is stored

There is enough room to store as much as two call signs. If the controller did not like the information it received the controller will not save the entered data and it will give the ERROR or BAD VALUE indication (B in CW) and the function will be ended.

FUNCTION: SET NEW CW FREQUENCY

FUNCTION CODE: 77

PURPOSE: To set the frequency at which the controller sends any tone

HOW TO USE:

1. Key up
2. Enter the SET NEW CW FREQUENCY function code
3. Unkey
4. The controller sends the ENTER NEXT DATA indication
5. Key up
6. Enter the new frequency for the controller to send (from 700Hz to 1500Hz)
7. Unkey
8. The controller will send the COMMAND ACCEPTED indication
9. The DTMF codes in the selected line / memory are now cleared from the EEPROM

The frequency range is from 700Hz to 1500Hz. If a value is entered outside these limits the controller will not save the entered value, it will give the ERROR indication (B in CW) and the function will be ended.

FUNCTION: ENTER DTMF COMMAND LINE

FUNCTION CODE: 78

PURPOSE: To enter a DTMF code that when entered will do a function

HOW TO USE:

1. Key up
2. Enter the ENTER DTMF COMMAND LINE function code
3. Unkey
4. The controller sends the ENTER NEXT DATA indication
5. Key up
6. Enter the DTMF line memory number 0 to 24. (A total of 25 DTMF memories)
7. Unkey
8. The controller sends the next ENTER NEXT DATA indication
9. Key up
10. Enter the DTMF digits for the DTMF code, do <u>not</u> unkey while entering the 1 to 5 DTMF digits
11. Unkey.
12. The controller sends the next ENTER NEXT DATA indication
13. Key up, <u>do NOT unkey</u> for the following steps
14. If this DTMF command line is to be used only at the Control operator's level (and only if) enter in “16”
15. Do NOT unkey yet
16. Enter in the numerical value of the Function for this DTMF command line to do
17. Ok, NOW unkey
18. The controller sends the COMMAND ACCEPTED indication
19. The new DTMF command line is now stored in EEPROM

If the controller did not like the information it received the controller will not save the entered data and it will give the ERROR or BAD VALUE indication (B in CW) and the function will be ended. This can occur from step 4 to step 18.

FUNCTION: SET RX 1 COS VOLTAGE OFF LEVEL

FUNCTION CODE: 79

PURPOSE: Sets the RX 1 voltage which when reached the control will consider the COS to be OFF

HOW TO USE:

1. Key up
2. Enter the SET RX 1 COS VOLTAGE OFF LEVEL function code
3. Unkey
4. The controller sends the ENTER NEXT DATA indication
5. Key up
6. Enter the COS voltage (1v to 9v) that when reached the controller should consider the RX 1 COS to be OFF
7. Unkey
8. The controller sends the COMMAND ACCEPTED indication
9. The new RX 1 COS voltage off level is stored in EEPROM.
10. A cold or warm reset will be necessary to have the newly stored value used for RX 1 COS

The COS voltage entered can be from 1V to 9V and can be entered down to 0.01V. The accuracy of this function is about 0.2V. If the COS voltage the controller receives is not in the 1V to 9V range the controller will not save the entered data and it will give the ERROR or BAD VALUE indication (B in CW) and the function will be ended.

This sets the COS off voltage. When setting the voltage care should be taken not to set it to the exact COS voltage measured because the actual COS voltage may not always be exactly the same each time the COS signal changes. It is a good idea to set the COS voltage at a level that is not quite at the final voltage when the COS switches. This can help avoid misread COS signals when the system is in operation.

FUNCTION: SET RX 1 COS VOLTAGE ON LEVEL

FUNCTION CODE: 80

PURPOSE: Sets the RX 1 voltage which when reached the control will consider the COS to be ON

HOW TO USE:

1. Key up
2. Enter the SET RX 1 COS VOLTAGE ON LEVEL function code
3. Unkey
4. The controller sends the ENTER NEXT DATA indication
5. Key up
6. Enter the COS voltage (1v to 9v) that when reached the controller should consider the RX 1 COS to be ON
7. Unkey
8. When the controller sends the COMMAND ACCEPTED indication
9. The new RX 1 COS voltage on level is stored in EEPROM.
10. A cold or warm reset will be necessary to have the newly stored value used for RX 1 COS

The COS voltage entered can be from 1V to 9V and can be entered down to 0.01V. The accuracy of this function is about 0.2V. If the COS voltage the controller receives is not in the 1V to 9V range the controller will not save the entered data and it will give the ERROR or BAD VALUE indication (B in CW) and the function will be ended.
This sets the COS on voltage. When setting the voltage care should be taken not to set it to the exact COS voltage measured because the actual COS voltage may not always be exactly the same. It is a good idea to set the COS voltage at a level that is not quite at the final voltage when the COS switches. This can help avoid misread COS signals when the system is in operation.

FUNCTION: SET RX 2 COS VOLTAGE OFF LEVEL

FUNCTION CODE: 81

PURPOSE: Sets the RX 2 voltage which when reached the control will consider the COS to be OFF

HOW TO USE:

1. Key up
2. Enter the SET RX 2 COS VOLTAGE OFF LEVEL function code
3. Unkey
4. The controller sends the ENTER NEXT DATA indication
5. Key up
6. Enter the COS voltage (1v to 9v) that when reached the controller should consider the RX 2 COS to be OFF
7. Unkey
8. When the controller sends the COMMAND ACCEPTED indication these values have been entered
9. The new RX 2 COS voltage off level is stored in EEPROM
10. A cold or warm reset will be necessary to have the newly stored value used for RX 2 COS

The COS voltage entered can be from 1V to 9V and can be entered down to 0.01V. The accuracy of this function is about 0.2V. If the COS voltage the controller receives is not in the 1V to 9V range the controller will not save the entered data and it will give the ERROR or BAD VALUE indication (B in CW) and the function will be ended.

This sets the COS off voltage. When setting the voltage care should be taken not to set it to the exact COS voltage measured because the actual COS voltage may not always be exactly the same. It is a good idea to set the COS voltage at a level that is not quite at the final voltage when the COS switches. This can help avoid misread COS signals when the system is in operation.

FUNCTION: SET RX 2 COS VOLTAGE ON LEVEL

FUNCTION CODE: 82

PURPOSE: Sets the RX 2 voltage which when reached the control will consider the COS to be ON

HOW TO USE:

1. Key up
2. Enter the SET RX 2 COS VOLTAGE ON LEVEL function code
3. Unkey
4. The controller sends the ENTER NEXT DATA indication
5. Key up
6. Enter the COS voltage (1v to 9v) that when reached the controller should consider the RX 2 COS to be ON
7. Unkey
8. When the controller sends the COMMAND ACCEPTED indication these values have been entered
9. The new RX 2 COS voltage on level is stored in EEPROM
10. A cold or warm reset will be necessary to have the newly stored value used for RX 2 COS

The COS voltage entered can be from 1V to 9V and can be entered down to 0.01V. The accuracy of this function is about 0.2V. If the COS voltage the controller receives is not in the 1V to 9V range the controller will not save the entered data and it will give the ERROR or BAD VALUE indication (B in CW) and the function will be ended.

This sets the COS on voltage. When setting the voltage care should be taken not to set it to the exact COS voltage measured because the actual COS voltage may not always be exactly the same. It is a good idea to set the COS voltage at a level that is not quite at the final voltage when the COS switches. This can help avoid misread COS signals when the system is in operation.

FUNCTION: SET AUXILIARY COS VOLTAGE OFF LEVEL

FUNCTION CODE: 83

PURPOSE: Sets the voltage which when reached the control will consider the COS to be OFF

HOW TO USE:

1. Key up
2. Enter the SET AUXILIARY COS VOLTAGE OFF LEVEL function code
3. Unkey
4. The controller sends the ENTER NEXT DATA indication
5. Key up
6. Enter the COS voltage (1v to 9v) that when reached the controller should consider the COS to be OFF
7. Unkey
8. When the controller sends the COMMAND ACCEPTED indication these values have been entered
9. The new AUXILIARY COS voltage off level is stored in EEPROM
10. A cold or warm reset will be necessary to have the newly stored value used for AUXILIARY COS

The COS voltage entered can be from 1V to 9V and can be entered down to 0.01V. The accuracy of this function is about 0.2V. If the COS voltage the controller receives is not in the 1V to 9V range the controller will not save the entered data and it will give the ERROR or BAD VALUE indication (B in CW) and the function will be ended.

This sets the COS off voltage. When setting the voltage care should be taken not to set it to the exact COS voltage measured because the actual COS voltage may not always be exactly the same. It is a good idea to set the COS voltage at a level that is not quite at the final voltage when the COS switches. This can help avoid misread COS signals when the system is in operation.

FUNCTION: SET AUXILIARY COS VOLTAGE ON LEVEL

FUNCTION CODE: 84

PURPOSE: Sets the voltage which when reached the control will consider the COS to be ON

HOW TO USE:

1. Key up
2. Enter the SET AUXILIARY COS VOLTAGE ON LEVEL function code
3. Unkey
4. The controller sends the ENTER NEXT DATA indication
5. Key up
6. Enter the COS voltage (1v to 9v) that when reached the controller should consider the RX 2 COS to be ON
7. Unkey
8. When the controller sends the COMMAND ACCEPTED indication these values have been entered
9. The new RX 2 COS voltage on level is stored in EEPROM
10. A cold or warm reset will be necessary to have the newly stored value used for RX 2 COS

The COS voltage entered can be from 1V to 9V and can be entered down to 0.01V. The accuracy of this function is about 0.2V. If the COS voltage the controller receives is not in the 1V to 9V range the controller will not save the entered data and it will give the ERROR or BAD VALUE indication (B in CW) and the function will be ended.

This sets the COS on voltage. When setting the voltage care should be taken not to set it to the exact COS voltage measured because the actual COS voltage may not always be exactly the same. It is a good idea to set the COS voltage at a level that is not quite at the final voltage when the COS switches. This can help avoid misread COS signals when the system is in operation.

FUNCTION: TX 1 FORCE ON

FUNCTION CODE: 85

PURPOSE: Forces TX 1 on

HOW TO USE:

1. Key up
2. Enter the TX 1 FORCE ON function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. TX 1 will be locked on.

The TX 1 FORCE ON will be cancelled when either the TX 1 FORCE CLEAR is used or when the TX 1 timeout timer times out.

FUNCTION: TX 1 FORCE CLEAR

DTMF CODE: 86

PURPOSE: Cancels the command TX 1 FORCE ON

HOW TO USE:

1. Key up
2. Enter the TX 1 FORCE CLEAR function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. If the TX 1 FORCE ON command is active, the TX 1 FORCE command will now be canceled.

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FUNCTION: SAVE STATUSES

FUNCTION CODE: 87

PURPOSE: To allow the user to make supported statuses permanent

HOW TO USE:

1. Key up
2. Enter the SAVE STATUSES function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The controller's selected statuses will now be stored in EEPROM

The statuses need to be changed before using Save statuses. Save statuses just stores them the way it finds them in the controllers temporary RAM memory.
This command will put the value of the statuses listed below in EEPROM memory so they are as currently in RAM when the controller is powered up again. If the Save statuses function is not used and any of these values are changed the values will go back to what they were before power up. The factory defaults are also shown below;

1. TX ENABLED Default = TRUE
2. ID ENABLED Default = TRUE
3. BEEP ENABLED Default = TRUE
4. AUXILIARY 1 TIMER ENABLED Default = TRUE
5. DTMF MUTING ENABLED Default = TRUE
6. ENABLE TX FAN Default = FALSE
7. RX 1 COR IN AND MODE Default = FALSE
8. RX 2 COR IN AND MODE Default = FALSE
9. DTMF CONTROL ON RX 2 INPUT Default = FALSE

FUNCTION: ENABLE TIMED TX FAN ON AUXILIARY 1 OUTPUT

FUNCTION CODE: 88

PURPOSE: To enable control for a transmitter fan for TX 1 on Auxiliary 1 output

HOW TO USE:

1. Key up
2. Enter the ENABLE TIMED TX FAN ON AUXILIARY 1 OUTPUT function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The fan output is now enabled on the Auxiliary 1 output

This function will turn on its output when TX 1 comes on and remain on for a preset time after TX 1 goes off. The output used for this function is the Auxiliary 1 output. The Auxiliary 1 output timer is used for the fan timer. It starts when TX 1 goes off. To set the time for this function use the SET AUXILIARY 1 OUTPUT TIMEOUT TIME function (function code 69).

The ENABLE TIMED TX FAN ON AUXILIARY 1 OUTPUT command will enable the TX fan. If the TX fan was disabled on power up the TX FAN will again be disabled on power up (or warm reset) unless you use the SAVE STATUSES (Function number 87). If you ENABLE TIMED TX FAN ON AUXILIARY 1 OUTPUT and then use the SAVE STATUSES function the TX fan will always be enabled when a power or warm reset occurs.

FUNCTION: DISABLE TIMED TX FAN ON AUXILIARY 1 OUTPUT

FUNCTION CODE: 89

PURPOSE: To disable control for a transmitter fan for TX 1 on Auxiliary 1 output

HOW TO USE:

1. Key up
2. Enter the DISABLE TIMED TX FAN ON AUXILIARY 1 OUTPUT function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The fan output is now disabled

The DISABLE TIMED TX FAN ON AUXILIARY 1 OUTPUT command will disable the TX fan. If the TX fan was enabled on power up the TX FAN will again be enabled on power up (or warm reset) unless you use the SAVE STATUSES (Function number 87). If you DISABLE TIMED TX FAN ON AUXILIARY 1 OUTPUT and then use the SAVE STATUSES function the TX fan will always be disabled when a power or warm reset occurs.

FUNCTION: USE CURRENT MEMORY AS REMOTE BASE HOME MEMORY

FUNCTION CODE: 90

PURPOSE: To tell the controller the remote base is now on memory zero (home memory)

HOW TO USE:

1. Key up
2. Enter the USE CURRENT MEMORY AS REMOTE BASE HOME MEMORY function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The current memory in the remote base is now Memory 0 or Home memory to the controller

As the Linker II controller uses EEPROM to remember what memory the remote base is on. This provides a method to tell the Linker what memory in the remote base radio to use as memory 0 or the Home memory.

FUNCTION: TURN DTMF MUTING ON

FUNCTION CODE: 91

PURPOSE: Tell the controller to mute RX1 or RX2 audio when DTMF tones are heard

HOW TO USE:

1. Key up
2. Enter the TURN DTMF MUTING ON function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The DTMF tones will now be muted

The TURN DTMF MUTING ON command will enable DTMF muting. If DTMF muting was disabled on power up the DTMF muting will again be disabled on power up (or warm reset) unless you use the SAVE STATUSES (Function number 87). If you TURN DTMF MUTING ON and then use the SAVE STATUSES function the DTMF muting will always be enabled after a power up or warm reset occurs.

FUNCTION: TURN DTMF MUTING OFF

FUNCTION CODE: 92

PURPOSE: Tell the controller not to mute RX1 or RX2 audio when DTMF tones are heard

HOW TO USE:

1. Key up
2. Enter the TURN DTMF MUTING OFF function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The DTMF tones will now not be muted

The TURN DTMF MUTING OFF command will disable DTMF muting. If DTMF muting was enabled on power up the DTMF muting will again be enabled on power up (or warm reset) unless you use the SAVE STATUSES (Function number 87). If you TURN DTMF MUTING OFF and then use the SAVE STATUSES function the DTMF muting will always be disabled after a power up
or warm reset occurs.

FUNCTION: SET RX1 COS TO AND

FUNCTION CODE: 93

PURPOSE: Requires an AND condition for a valid RX1 COS signal

HOW TO USE:

1. Key up
2. Enter the SET RX1 COS TO AND function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The controller is now in COS AND mode on receiver 1 (RX1, port 1)

This function when enabled will set the receiver #1 input (RX1) to require both the RX1 main input and the RX1 AUX input to be active (AND condition) before an active COR signal is recognized by the controller.

To make this function permanent (Function stays active after power up or reset) the SAVE STATUSES function (function # 87) must be used.

FUNCTION: SET AUX RX2 OFF LEVEL

FUNCTION CODE: 94

PURPOSE: Sets the voltage which when reached the control will consider this input to be off

HOW TO USE:

1. Key up
2. Enter the SET AUX RX 2 VOLTAGE OFF LEVEL function code
3. Unkey
4. The controller sends the ENTER NEXT DATA indication
5. Key up
6. Enter the COS voltage (1v to 9v) that when reached the controller should consider the RX 2 input to be OFF
7. Unkey
8. When the controller sends the COMMAND ACCEPTED indication these values have been entered
9. The new RX 2 input voltage off level is stored in EEPROM
10. A reset or power down / power up action will be necessary to have the new value for the RX 2 Aux input

The voltage entered can be from 1V to 9V and can be entered down to 0.01V. The accuracy of this function is about 0.2V. If the entered voltage is not in the 1V to 9V range or if it is the same as the 'ON' voltage the controller will not save the entered voltage and it will give the ERROR or BAD VALUE indication (B in CW) .

This sets the RX2 AUX off voltage. When setting the voltage care should be taken not to set it to the exact voltage measured because the actual voltage may not always be exactly the same. It is a good idea to set the voltage at a level that is not quite at the final voltage the COS reaches. This can help avoid problems if the voltage changes slightly.

FUNCTION: SET AUX RX2 ON LEVEL

FUNCTION CODE: 95

PURPOSE: Tell the controller to mute RX1 audio when DTMF tones are heard

HOW TO USE:

1. Key up
2. Enter the SET AUX RX 2 VOLTAGE ON LEVEL function code
3. Unkey
4. The controller sends the ENTER NEXT DATA indication
5. Key up
6. Enter the COS voltage (1v to 9v) that when reached the controller should consider the RX 2 input to be ON
7. Unkey
8. When the controller sends the COMMAND ACCEPTED indication these values have been entered
9. The new RX 2 input voltage on level is stored in EEPROM
10. A cold or warm reset will be necessary to have the newly stored value used for RX 2 input

The voltage entered can be from 1V to 9V and can be entered down to 0.01V. The accuracy of this function is about 0.2V. If the entered voltage is not in the 1V to 9V range or if it is the same as the 'OFF' voltage the controller will not save the entered voltage and it will give the ERROR or BAD VALUE indication (B in CW) .
This sets the RX2 AUX on voltage. When setting the voltage care should be taken not to set it to the exact voltage measured because the actual voltage may not always be exactly the same. It is a good idea to set the voltage at a level that is not quite at the final voltage the COS reaches. This can help avoid problems if the voltage changes slightly.

FUNCTION: USE RX2 MAIN INPUT FOR COR

FUNCTION CODE: 96

PURPOSE: Sets the COS input which RX 2 uses to the main RX 2 input

HOW TO USE:

1. Key up
2. Enter USE RX2 MAIN INPUT FOR COS function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The RX 2 COS will now activate RX 2.

This function switches control for RX 2 from the Auxiliary RX 2 input and to the Main RX 2 input. If RX 2 is setup for AND operation this function will cancel the AND function.

To make this function permanent (Function stays active after power up or reset) the SAVE STATUSES function (function # 87) must be used.

FUNCTION: USE RX2 AUX FOR COS

FUNCTION CODE: 97

PURPOSE: Allows an AND condition to be required for a valid RX1 COS signal

HOW TO USE:

1. Key up
2. Enter the USE RX2 AUX FOR COS function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The controller will now look for a valid signal from the RX 2 Aux input for a valid COS signal

This function switches control for RX 2 COS to the Aux RX 2 input. If RX 2 is setup for AND operation this function will cancel the AND function.

This function status will ***not*** be saved with the SAVE STATUSES command.

FUNCTION: SET RX2 COS TO AND

FUNCTION CODE: 98

PURPOSE: Allows an AND condition to be required for a valid RX1 COS signal

HOW TO USE:

1. Key up
2. Enter the SET RX2 COS TO AND function code
3. Unkey
4. The controller sends the COMMAND ACCEPTED indication
5. The controller is now in COS AND mode on receiver 2 (RX2, port 2)

This function when enabled will set the receiver #2 input (RX 2) to require both the RX 2 input and the RX 2 AUX input to be active (AND condition) before an active COR signal is recognized by the software.

To make this function permanent (Function stays active after power up or reset) the SAVE STATUSES function (Function #87) must be used.

FUNCTION: SET RX2 DTMF CONTROL

FUNCTION CODE: 99

PURPOSE: Tell the controller to allow or not allow DTMF control from the RX 2 input

HOW TO USE:

1. Key up
2. Enter the SET RX2 DTMF CONTROL function code
3. Unkey
9. The controller sends ENTER NEXT DATA indication
4. Enter a '1' to allow RX 2 DTMF control or a '0' to Not allow RX 2 DTMF control
5. Unkey
6. The controller sends the COMMAND ACCEPTED indication
7. If a '1' was entered DTMF control can now be done from the RX 2 receiver input

This function will allow you to enable or disable DTMF control from RX 2. Entering a '1' enables the DTMF control and entering a '0' disallows DTMF control from the RX 2 input or port.

The default status (factory default) is DTMF control is not allowed from RX 2.

To keep the current setting of this function you must use the SAVE STATUSES command (command #87). This will insure the current status of this setting will be maintained upon power up and reset.

THIS FRAME IS INTENTIONALLY BLANK

REPEATER CONTROL CODES

Memory #	DTMF Codes	Control Op ?	Function code	Function Description
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
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23				
24				