



# 5K Upgrade V2.0

*from all previous versions*

**Thank you** for purchasing the 5K Upgrade V2.0!

Enclosed you will find:

- A replacement RAM that also contains a battery and clock/calendar.
- A replacement EPROM containing V2.0 firmware.
- Update pages for the 5K manual.

You will need:

- A soldering pencil and solder.
  - Two short pieces of bare wire for jumpers.
  - A needle-nosed pliers.
  - A small screwdriver or similar tool to extract ICs from sockets.
1. Disconnect power and cabling from the 5K controller. Remove the board from its cabinet.
  2. Remove the push-on jumper (shunt) from the header marked "BATT". Discard it.
  3. Remove integrated circuits IC-6, IC-9, and IC-12 from their sockets. Discard them.
  4. Locate the 8-pin IC socket for IC-9, which is now empty. Install a wire jumper from pin 1 to pin 8. Install the other wire jumper from pin 5 to pin 6. Solder the two jumpers in place. (Note: Pins 1 and 5 are identified on the silkscreen. Count the pins counter-clockwise.)
  5. Carefully push the supplied DS1643 into the socket for IC-6. Carefully push the supplied V2.0 EPROM into the socket for IC-12. Be sure the ICs are correctly oriented in their sockets.
  6. Initialize the controller by performing a cold start. (To do a cold start, find the INITIALIZE pushbutton. Press it and keep it pressed while you turn the power on. Release it when you hear the CW message.)
  7. Additional information: The DS1643 module you installed contains an 8K byte RAM, a lithium battery, and a timekeeping circuit. When main power is lost, the battery inside the DS1643 maintains the data stored in RAM and also powers the timekeeping circuit. The original board-mounted lithium battery is no longer needed, and may be removed by unsoldering it from the board (if desired).
  8. Follow the instructions on the next page to update your 5K manual.

## Updating your 5K Manual

**Replace** your existing “Short Form Command List” with the new one.

If you are upgrading from **V1.6**, make the V2.0 changes.

If you are upgrading from **V1.5**, make the V2.0 and V1.6 changes.

If you are upgrading from **V1.4**, make the V2.0, V1.6, and V1.5 changes.

If you are upgrading from **V1.3**, make the V2.0, V1.6, V1.5, and V1.4 changes.

If you are upgrading from **V1.2**, make the V2.0, V1.6, V1.5, V1.4, and V1.3 changes.

If you are upgrading from **V1.1**, make the V2.0, V1.6, V1.5, V1.4, V1.3, and V1.2 changes.

### **V2.0 Changes:**

(V2.0 replaced the clock-setting command with one that includes the year and the day-of-week. V2.0 also added a Daylight Savings Time adjustment command and a 100-setpoint Scheduler.)

1. **Delete** the “Clock Correction” page.
2. **Replace** the “Set Time and Date” page with the “Set Clock and Calendar” page.
3. **Add** the “Daylight Savings Time” page.
4. **Add** the “Program a Setpoint” pages.
5. **Add** the “Delete a Setpoint” page.

### **V1.6 Change:**

(V1.6 added the Unkey Delay enable/disable command.)

1. **Add** the “Unkey Delay Enable/Disable” page.

### **V1.5 Change:**

(V1.5 added the Repeater Receiver COR, Control Receiver COR, and Repeater Receiver CTCSS inputs to the list of Logic Inputs.)

1. **Replace** the “Logic Inputs” page with the new one.

### **V1.4 Changes:**

(V1.4 added Tail Messages to the Normal ID (formerly, only the Initial ID had them), and increased the number of Tail Messages. In addition, a series of user mic button clicks could be used to execute a macro.)

1. **Replace** the original “ID Tail Message Select” page with the new one.
2. **Add** the “COR Pulse-Triggered Macro” pages.

### **V1.3 Changes:**

(V1.3 allowed a choice of Carrier, PL, AND-PL, OR-PL, Anti-PL, and NO access modes for the repeater receiver and for the DTMF decoder.)

1. **Delete** the “Repeater Receiver as Command Source” page.
2. **Add** the “Repeater Access Mode” page.
3. **Add** the “DTMF Decoder Access Mode” page.

**V1.2 Change:**

(Originally, the “\*” character indicated the end of a command on the Control Receiver channel. With this new feature, you may either enter the “\*”, or simply release the PTT. The feature already existed on the Repeater Receiver.)

1. **Add** the “Command Termination for Control Receiver” page.

## S-COM 5K REPEATER CONTROLLER

### SHORT FORM COMMAND LIST V2.0

(PW) = password

#### **CLOCK & CALENDAR**

Daylight Savings Time (PW) 48 (0=fall back/1=spring ahead) \*  
Send Time or Date (PW) 14 (1=12 hr/2=24 hr/3=date) \*  
Set Clock & Calendar (PW) 25 (year,month,day-of-month,day-of-week,hour,minute) \*  
  
Scheduler:  
Delete a Setpoint (PW) 28 (setpoint number) \*  
Program a Setpoint (PW) 28 (setpoint number,macro,month,day,hour, minute) \*

#### **CW**

Disable/Enable (PW) 63 01 (0=disable/1=enable) \*  
Frequency of Beep 1 (PW) 07 (tone code) \*  
Frequency of Beep 2 (PW) 08 (tone code) \*  
Frequency of Beep 3 (PW) 09 (tone code) \*  
Frequency of CW (PW) 06 (tone code) \*  
Send CW Message (PW) 15 (message) \*  
Send Next Message Slowly (PW) 11 \*  
Speed Select, Normal Rate (PW) 12 (0-9=5-40 WPM) \*  
Speed Select, Slower Rate (PW) 13 (0-9=5-40 WPM) \*

#### **DTMF DECODER**

Access Mode (PW) 57 06 (mode 0-5) \*  
Interdigit Time (PW) 82 (0.1-9.9 sec) \*  
Mute Delay (PW) 96 (.0-.9 sec) \*  
Mute Disable/Enable (PW) 63 03(0=disable/1=enable) \*

#### **IDENTIFIER**

Callsign, Initial ID (PW) 53 (message) \*  
Callsign, Normal ID (PW) 52 (message) \*  
ID-Triggered Macros:  
Impolite ID (PW) 26 05 (macro name) \*  
Initial ID (PW) 26 03 (macro name) \*  
Polite ID (PW) 26 04 (macro name) \*  
Interval (PW) 51 (.5-30.0 min) \*  
Reset Initial to Normal (PW) 54 \*  
Send ID (PW) 55 \*  
Tail Message, Initial ID (PW) 50 (0,tailnumber 0-19) \*  
Tail Message, Normal ID (PW) 50 (1,tailnumber 0-19) \*

## LOGIC INPUTS

|                                   |                           |
|-----------------------------------|---------------------------|
| Logic Input 1 Hi-to-Lo transition | (PW) 26 06 (macro name) * |
| Logic Input 1 Lo-to-Hi transition | (PW) 26 07 (macro name) * |
| Logic Input 2 Hi-to-Lo transition | (PW) 26 08 (macro name) * |
| Logic Input 2 Lo-to-Hi transition | (PW) 26 09 (macro name) * |
| Logic Input 3 Hi-to-Lo transition | (PW) 26 10 (macro name) * |
| Logic Input 3 Lo-to-Hi transition | (PW) 26 11 (macro name) * |
| Rptr Rcvr COR Hi-to-Lo transition | (PW) 26 26 (macro name) * |
| Rptr Rcvr COR Lo-to-Hi transition | (PW) 26 27 (macro name) * |
| Ctrl Rcvr COR Hi-to-Lo transition | (PW) 26 28 (macro name) * |
| Ctrl Rcvr COR Lo-to-Hi transition | (PW) 26 29 (macro name) * |
| PL Input Hi-to-Lo transition      | (PW) 26 30 (macro name) * |
| PL Input Lo-to-Hi transition      | (PW) 26 31 (macro name) * |

## LOGIC OUTPUTS

|               |                                    |
|---------------|------------------------------------|
| Latched Off   | (PW) 71 (list the outputs 1-2-3) * |
| Latched On    | (PW) 70 (list the outputs 1-2-3) * |
| Momentary Off | (PW) 73 (list the outputs 1-2-3) * |
| Momentary On  | (PW) 72 (list the outputs 1-2-3) * |

## MACROS

|                  |                                |
|------------------|--------------------------------|
| Append to Macro  | (PW) 29 (macro name,command) * |
| Create New Macro | (PW) 20 (macro name,command) * |
| Erase Macro      | (PW) 21 (macro name) *         |
| Erase All Macros | (PW) 22 00 *                   |
| List Macro in CW | (PW) 33 (macro name) *         |
| Rename Macro     | (PW) 27 (old name,new name) *  |

## POWER ON

|                          |                           |
|--------------------------|---------------------------|
| Power-On Triggered Macro | (PW) 26 00 (macro name) * |
|--------------------------|---------------------------|

## REPEATER OPERATION

|                                  |   |
|----------------------------------|---|
| Access Mode                      | (PW) 57 00 (mode 0-5) *                 |
| COR Pulse Triggered Macro        | (PW) 26 17 (macro name) *               |
| COR Pulse Trig. Macro Parameters | (PW) 47 (0,count,width>window) *        |
| Courtesy Message                 | (PW) 31 (message) *                     |
| Courtesy Timer                   | (PW) 32 (0.0-5.0 sec) *                 |
| Dropout Message                  | (PW) 34 (message) *                     |
| Dropout Timer                    | (PW) 30 (0.0-5.0 sec) *                 |
| Pre-Timeout Message              | (PW) 41 (message) *                     |
| Post-Timeout Message             | (PW) 44 (message) *                     |
| Timeout Timer                    | (PW) 40 (.1-54.6 min/000=infinity) *    |
| Timeout Timer Reset              | (PW) 10 *                               |
| Activity-Triggered Macros:       |   |
| Start-of-Activity Macro          | (PW) 26 14 (macro name) *               |
| Post-Activity Macro              | (PW) 26 15 (macro name) *               |
| Activity Counter/Timer           | (PW) 45 (count 0-9,0.0-9.9 min delay) * |

## SECURITY

Control Operator Password (PW) 92 (new control op password) \*  
Master Password (PW) 93 (new master password) \*  
Privilege Level (PW) 94 (root no.,0=ctrl op/1=mstr only) \*

## TEST TONE

Single Test Tone (PW) 90 (tone code,0.1-9.9 sec) \*  
Two Sequential Test Tones (PW) 90 (two sequences as above) \*

## TRANSMITTER

Disable/Enable (PW) 63 00 (0=disable/1=enable) \*  
Key (PW) 00 (.1-54.6 min/000=inf/(none)=cancel) \*  
Unkey Delay (PW) 63 31 (0=disable/1=enable) \*

## UTILITIES

Command CW Responses (PW) 63 02 (0=disable/1=enable) \*  
Command Termination, Control Rcvr (PW) 56 (00=\* reqd/0.1-9.9 sec from COR) \*  
Command Termination, Repeater Rcvr (PW) 99 (00=\* reqd/0.1-9.9 sec from COR) \*  
Pause in Command Execution (PW) 98 (1-255 sec) \*

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## SET CLOCK AND CALENDAR

### COMMAND FORM:

**SET CLOCK AND CALENDAR:** (PASSWORD) 25 (year, month, day-of-month, day-of-week, hour, minute) \*

Programs the time and date into the clock and calendar. Each parameter is entered as two digits except the day-of-week, which is entered as one digit. You must enter all six parameters, including the year, each time you set the clock and calendar. (The year is needed so the calendar knows if it's a Leap Year). When you release the "\*" key at the end of the command, the clock and calendar are loaded with the time and date in the command. The seconds are set to zero.

The parameters must be within these ranges:

|              |           |                                       |
|--------------|-----------|---------------------------------------|
| Year         | = 00 – 99 | (Last two digits of the year)         |
| Month        | = 01 – 12 | (January is 01, February is 02, etc.) |
| Day-of-Month | = 01 – 31 |                                       |
| Day-of-Week  | = 0 – 6   | (Sunday is 0, Monday is 1, etc.)      |
| Hour         | = 00 – 23 | (24-hour format: 1 PM is 13, etc.)    |
| Minute       | = 00 – 59 |                                       |

**Acknowledgment:** Sends **OK**

**Errors:** ? **ERR 1** = wrong number of digits entered  
? **ERR 2** = illegal digit entered

**Default Condition:** At initialization, time and date are 00:00:00, Friday, January 1, 1993.

### EXAMPLE:

Let's set the clock/calendar to 6:02 PM on Saturday, June 26, 1993. (1) The year is 93. (2) The month is 06. (3) The day-of-month is 26. (4) The day-of-week is 6. (5) Since the clock is set in 24-hour time, 6:02 PM becomes 18 hours, 02 minutes. The command would be:

(PASSWORD) 25 93 06 26 6 18 02 \*

If the command is not entered correctly, an error message is sent, and the time and date are not changed.

**DAYLIGHT SAVINGS TIME****COMMAND FORM:**

**DAYLIGHT SAVINGS TIME:** (Password) 48 (0= fall back/1= spring ahead) \*

This command simplifies the twice-yearly job of resetting the clock for those affected by Daylight Savings Time. Instead of resetting the clock and calendar, use this command to decrement the hour ("fall back") or increment the hour ("spring ahead").

(Note: Do not "fall back" between midnight (00:00) and 59 minutes past midnight (00:59). During that time, subtracting an hour pushes the time back before midnight. At midnight, the calendar incorrectly gains an extra day.)

**Acknowledgment:** Sends **OK**

**Errors:**    ? **ERR 1**   wrong number of keystrokes  
              ? **ERR 2**   illegal digit entered

**Default Condition:** None

**EXAMPLES:**

To set the clock back one hour, enter:

(PASSWORD) 48 0 \*

To set the clock ahead one hour, enter:

(PASSWORD) 48 1 \*

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**PROGRAM A SETPOINT**
**COMMAND FORM:**

**PROGRAM A SETPOINT:** (Password) 28 (setpoint number, macro, month, day, hour, minute) \*

This command assigns a macro to one of the scheduler's 100 available setpoints, and selects the time and date the macro is to be executed. To reprogram a setpoint, simply program over the old one. To delete a setpoint, use this command but don't enter anything (except the "\*") after the setpoint number. Don't program more than 10 setpoints for exactly the same month, day, hour, and minute, since only the first ten will be executed. Although setpoint numbers may be programmed in any order, they will be executed sequentially, starting with 00. All setpoints are checked at the beginning of each minute. This process takes one second to complete. You must enter data for all parameters. If you want the scheduler to ignore the month, day, hour, or minute in a setpoint, you may enter the "wild card" code, 99, in place of that parameter.

|                  |               |   |
|------------------|---------------|---|
| Setpoint number= | 00-99         | (choose a unique 2-digit number for each setpoint)    |
| Macro            | = xxxx        | (the 4-digit name of the macro you wish to execute)   |
| Month            | = 01-12 or 99 | (2 digits, January is 01; 99 is a "wild card")        |
| Day              | = 01-68 or 99 | (2 digits, see list below; 99 is a "wild card")       |
| Hour             | = 00-23 or 99 | (2 digits, 24-hour [1 PM is 13]; 99 is a "wild card") |
| Minute           | = 00-59 or 99 | (2 digits; 99 is a "wild card")                       |

List of codes for the "Day" parameter:

|         |  |    |  |
|---------|--|----|--|
| 01 - 31 | Calendar Day-of-month                  | 50 | 2 <sup>nd</sup> Tuesday of the month   |
| 32      | Weekdays (Mon - Fri)                   | 51 | 2 <sup>nd</sup> Wednesday of the month |
| 33      | Weekends (Sat - Sun)                   | 52 | 2 <sup>nd</sup> Thursday of the month  |
| 34      | Sundays                                | 53 | 2 <sup>nd</sup> Friday of the month    |
| 35      | Mondays                                | 54 | 2 <sup>nd</sup> Saturday of the month  |
| 36      | Tuesdays                               | 55 | 3 <sup>rd</sup> Sunday of the month    |
| 37      | Wednesdays                             | 56 | 3 <sup>rd</sup> Monday of the month    |
| 38      | Thursdays                              | 57 | 3 <sup>rd</sup> Tuesday of the month   |
| 39      | Fridays                                | 58 | 3 <sup>rd</sup> Wednesday of the month |
| 40      | Saturdays                              | 59 | 3 <sup>rd</sup> Thursday of the month  |
| 41      | 1 <sup>st</sup> Sunday of the month    | 60 | 3 <sup>rd</sup> Friday of the month    |
| 42      | 1 <sup>st</sup> Monday of the month    | 61 | 3 <sup>rd</sup> Saturday of the month  |
| 43      | 1 <sup>st</sup> Tuesday of the month   | 62 | 4 <sup>th</sup> Sunday of the month    |
| 44      | 1 <sup>st</sup> Wednesday of the month | 63 | 4 <sup>th</sup> Monday of the month    |
| 45      | 1 <sup>st</sup> Thursday of the month  | 64 | 4 <sup>th</sup> Tuesday of the month   |
| 46      | 1 <sup>st</sup> Friday of the month    | 65 | 4 <sup>th</sup> Wednesday of the month |
| 47      | 1 <sup>st</sup> Saturday of the month  | 66 | 4 <sup>th</sup> Thursday of the month  |
| 48      | 2 <sup>nd</sup> Sunday of the month    | 67 | 4 <sup>th</sup> Friday of the month    |
| 49      | 2 <sup>nd</sup> Monday of the month    | 68 | 4 <sup>th</sup> Saturday of the month  |

(codes 69 - 75 for 5<sup>th</sup> week are also supported)

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**PROGRAM A SETPOINT****(Continued)****Acknowledgment:** Sends **OK****Errors:** ? **ERR 1** wrong number of keystrokes  
? **ERR 2** illegal digit entered**Default Condition:** No setpoints exist at initialization**EXAMPLES:**

Setpoint 00 should execute macro 1234 at 6:00 AM Mondays through Fridays. (Macro 1234 might put the repeater into CTCSS mode for the start of the business day, for example.)

Setpoint 01 should execute macro 2345 at 6:30 PM Mondays through Fridays. (Macro 2345 might put the repeater into carrier mode for the evening.)

Setpoint 02 should execute macro 3456 at 5:00 AM on the first Wednesday of the month. (Macro 3456 might add a Saturday breakfast meeting notice to the identifier.)

Setpoint 03 should execute macro 4567 at 8:00 AM on the first Saturday of the month. (Macro 4567 might kill the meeting notice, since the meeting has now begun.)

Here are the commands:

Setpoint 00: (PW) 28 00 1234 99 32 06 00 \*

Setpoint 01: (PW) 28 01 2345 99 32 18 30 \*

Setpoint 02: (PW) 28 02 3456 99 44 05 00 \*

Setpoint 03: (PW) 28 03 4567 99 47 08 00 \*

**ADDITIONAL NOTES:**

1. Timekeeping continues when main power is lost, since the clock/calendar module has a lithium battery for backup power. However, the controller cannot execute macros during this time, since the other circuits are powered down. The controller will not catch up on lost setpoints that occurred while main power was lost.

2. Since the scheduler can execute any valid macro, it can be used for many purposes. In addition to the examples above, the scheduler can:

Operate logic outputs that control lights, amplifiers, squelch thresholds, antennas, etc.;

Indicate the start of a net with a tone or message;

Change the identifier to announce nets, meetings, Field Day, and other special events;

and other "alarm clock" uses.

3. The scheduler executes macros based only on the time and date. It is not polite; that is, it does not delay the execution of a macro if the repeater is in use. It is more polite to have the scheduler modify the identifier message, or perhaps the courtesy message or dropout message, than to have it send a message over a user if the repeater is in use at the time of the scheduled event.

## DELETE A SETPOINT

### COMMAND FORM:

**DELETE A SETPOINT:** (Password) 28 (setpoint number) \*

This command deletes a setpoint.

**Acknowledgment:** Sends **OK**

**Errors:**   ? **ERR 1**   wrong number of keystrokes  
              ? **ERR 2**   illegal digit entered

**Default Condition:** No setpoints exist at initialization.

### EXAMPLES:

To delete setpoints 00 and 01, enter:

(PASSWORD) 28 00 \*

(PASSWORD) 28 01 \*

**LOGIC INPUTS**

**COMMAND FORM:**

Each command below assigns a macro to be executed by the transition shown.

**Logic Input 1, High-to-Low:** (PASSWORD) 26 06 (macro name) \*  
**Logic Input 1, Low-to-High:** (PASSWORD) 26 07 (macro name) \*  
**Logic Input 2, High-to-Low:** (PASSWORD) 26 08 (macro name) \*  
**Logic Input 2, Low-to-High:** (PASSWORD) 26 09 (macro name) \*  
**Logic Input 3, High-to-Low:** (PASSWORD) 26 10 (macro name) \*  
**Logic Input 3, Low-to-High:** (PASSWORD) 26 11 (macro name) \*  
**Repeater Rcvr. COR, High-to-Low:** (PASSWORD) 26 26 (macro name) \*  
**Repeater Rcvr. COR, Low-to-High:** (PASSWORD) 26 27 (macro name) \*  
**Control Receiver COR, High-to-Low:** (PASSWORD) 26 28 (macro name) \*  
**Control Receiver COR, Low-to-High:** (PASSWORD) 26 29 (macro name) \*  
**PL Input, High-to-Low:** (PASSWORD) 26 30 (macro name) \*  
**PL Input, Low-to-High:** (PASSWORD) 26 31 (macro name) \*

Enter the password, the 4-digit root number, the macro you wish to have executed on the transition, and the "\*". If the macro name has fewer than 4 digits, enter leading zeroes. If you wish to prevent a macro from executing that was previously assigned, enter the password, the 4-digit root number, and the "\*". Status of inputs is maintained on loss of power.

**Acknowledgement: OK**

**Errors:** ? **ERR 1** = wrong number of digits entered  
 ? **ERR 1** = illegal digit entered

**Default Condition:** No macros are assigned.

**EXAMPLE:**

Assume that macro "50" should be executed when logic input #1 goes low, and macro "51" should be executed when logic input #1 returns high. The logic input could indicate loss of main power, overtemperature, high water, high SWR, etc. Enter these commands:

(PASSWORD) 26 06 0050 \*  
 (PASSWORD) 26 07 0051 \*

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**ID TAIL MESSAGES****COMMAND FORM:**

**Initial ID Tail:** (PASSWORD) 50 (0,tail number) \*  
**Normal ID Tail:** (PASSWORD) 50 (1,tail number) \*

Tail Messages are short CW messages that can be appended to the **Initial ID Message** and the **Normal ID Message**.

Select the desired tail message from this list by entering the proper tail number, or (nothing) or "0" if no tail message is desired:

|           |                    |
|-----------|--------------------|
| 0= (none) | 10 = RACES         |
| 1= FEST   | 11 = TGIF          |
| 2= DUES   | 12 = /R            |
| 3= MEET   | 13 = LINK          |
| 4= NET    | 14 = RMT (remote)  |
| 5= HI     | 15 = BAT (battery) |
| 6= WX     | 16 = (not used)    |
| 7= ALERT  | 17 = SAC           |
| 8= WATCH  | 18 = SF            |
| 9= WARN   | 19 = OAK           |

Note: (nothing) = no message

The tail number can be (nothing), a single digit (0-9), or two digits (00 - 19).

**Acknowledgement:**

Initial ID Tail: Sends the ID plus the tail; cycles ID'er.

Normal ID Tail: Sends the ID plus the tail.

**Errors:** ? **ERR 1** = Wrong number of digits entered  
? **ERR 2** = Illegal digit; illegal tail number; illegal ID type no.

**Default Condition:** Both tail messages default to (none).

**EXAMPLES:**

To append the tail message "WX" to the Initial ID, enter "(PASSWORD) 50 0 6 \*".

To append "BAT" to the Normal ID, enter "(PASSWORD) 50 1 15 \*".

To delete the tail message from the Normal ID, enter "(PASSWORD) 50 1 \*" or "(PASSWORD) 50 1 0 \*".

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## COR PULSE TRIGGERED MACRO

The controller can execute a macro when a user keys his microphone PTT button several times in succession. Two commands are used to set up this feature: One command selects the macro to be executed, and the other command selects the parameters of the pulse string.

### COMMAND FORM:

**Select Macro:** (PASSWORD) 26 17 (macro name) \*  
**Select Parameters:** (PASSWORD) 47 (0, count, width, window) \*

"Macro Name" is the macro to be executed.

"Count" means Pulse Count. It is the number of pulses that occur within the Width and Window parameters to trigger execution of the macro. The range is 0 to 9 pulses.

"Width" means the **Minimum Duration** of a pulse to be considered valid, and it is measured in 10 mS increments. The range is 0001 to 9999, or 00.01 seconds (10 mS) to 99.99 seconds (99990 mS). By requiring a certain minimum pulse width, the controller can discriminate against narrow noise pulses. Use four digits.

"Window" means the overall time allowed for the pulses to be counted, and it is measured in 10 mS increments. The range is 0001 to 9999, or 00.01 seconds (10 mS) to 99.99 seconds (99,990 mS). Use four digits.

### Default Condition:

Macro Name = (none).  
Count = 3.  
Pulse Minimum Width = 0050 = 0.5 seconds  
Window = 0500 = 5.0 seconds

### Acknowledgement: OK

**Errors:** ? **ERR 1** = Wrong number of digits entered  
? **ERR 2** = Illegal digit; conflict in parameters

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## COR PULSE TRIGGERED MACRO

(Continued)

### HOW IT WORKS:

The window timing cycle starts at the leading edge of the first pulse. If the pulse is longer than the minimum width programmed, it is counted. If the correct number of pulses is counted before the window "closes", the programmed macro will be executed upon the falling edge of the last counted pulse.

The controller calculates a maximum pulse duration and a maximum deadzone (time between pulses) when you program the parameters. During a window timing cycle, the controller is timing pulses and deadzones. The window cycle will be aborted if the inter-pulse deadzone exceeds the maximum value; if any pulse exceeds the maximum value; and if any pulse is less than the minimum width. This means that a new window cycle can begin as soon as the old one is either properly executed or is discarded for any reason.

Pulses are created by COR and PL signals and depend upon the repeater access mode. If the repeater is in **Carrier Access Mode**, then the controller will count pulses at the COR input.

If the repeater is in **AND-PL Access Mode**, then the controller will count pulses that are made up of both COR and PL signals.

### EXAMPLE:

Execute macro "123", which forces a logic input ON, when four pulses are received. Each pulse must be 1/4 second long, and all four pulses must occur within 5 seconds. The commands are:

(PASSWORD) 26 17 0123 \*, which assigns macro "123".

(PASSWORD) 47 0 4 0025 0500 \*, which assigns parameters.

Note: "0025" =  $25 \times 10 \text{ mS} = 250 \text{ mS} = 1/4 \text{ second}$ , and "0500" =  $500 \times 10 \text{ mS} = 5000 \text{ mS} = 5 \text{ seconds}$ .

The controller calculates that 4 pulses times 1/4 second each equals one second pulse time. The maximum dead zone is then 4 seconds, and no pulse can exceed 4 1/4 seconds. The window will close if any of these timers are exceeded.

The controller will respond with an error if the pulse count, multiplied by the width, exceeds the window time.

### ACCESS MODE

#### COMMAND FORM:

**Repeater Access Mode:** (PASSWORD) 57 00 (mode 0-5) \*

This command selects one of six possible repeater access modes. The six modes are:

**Mode 0 = No Access.** Activity on the COR and PL inputs is ignored.

**Mode 1 = Carrier Access.** Activity on the COR input will key the transmitter. Activity on the PL input is ignored.

**Mode 2 = PL Access.** Activity on the PL input will key the transmitter. Activity on the COR input is ignored.

**Mode 3 = AND-PL Access.** Activity on both the COR and PL inputs simultaneously will key the transmitter.

**Mode 4 = OR-PL Access.** Activity on either the COR or PL inputs will key the transmitter.

**Mode 5 = ANTI-PL Access.** Activity on the COR input simultaneously with no activity on the PL input will key the transmitter.

Note that **Repeater Access** may be made different from **DTMF Decoder** access, if desired.

**Acknowledgement: OK**

**Errors:** ? **ERR 1** = wrong number of digits entered

? **ERR 2** = illegal digit entered

**Default Condition:** Mode 1 (Carrier Access)

#### EXAMPLES:

Assume that the repeater is in carrier access, and that PL access is desired. The proper command would be:

(PASSWORD) 57 00 2 \*

A better mode for many repeater installations is **Mode 3**, AND-PL Access. (This mode has better rejection of adjacent-channel interference than **Mode 2**, since noise falsing from unsquelched audio is eliminated). Also, COR drops out more quickly than PL, allowing a quick dropout result. Enter this command:

(PASSWORD) 57 00 3 \*

**Mode 4** allows both carrier access and PL operation. Since PL is more easily detected, PL users will find increased range. Carrier access users are unaffected. The squelch may be tightened to suppress band-opening problems.

**ANTI-PL** is used when the repeater is co-channel with another, PL-accessed repeater. Users of the second system are kept out of the ANTI-PL system.

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**ACCESS MODE****COMMAND FORM:**

**Access Mode:** (PASSWORD) 57 06 (mode 0-5) \*

This command selects one of six possible DTMF decoder access modes. The six modes are:

**Mode 0** = No Access. Activity on the COR and PL inputs is ignored; only the control receiver may be used to send commands to the unit.

**Mode 1** = Carrier Access. Activity on the COR input will allow access to the DTMF decoder. Activity on the PL input is ignored.

**Mode 2** = PL Access. Activity on the PL input will allow access to the DTMF decoder. Activity on the COR input is ignored.

**Mode 3** = AND-PL Access. Activity on both the COR and PL inputs simultaneously will allow access to the DTMF decoder.

**Mode 4** = OR-PL Access. Activity on either the COR or PL inputs will allow access to the DTMF decoder.

**Mode 5** = ANTI-PL Access. Activity on the COR input simultaneously with no activity on the PL input will allow access to the DTMF decoder.

Note that DTMF Decoder Access may be made different from Repeater Access, if desired.

**Acknowledgement: OK**

**Errors:** ? **ERR 1** = wrong number of digits entered  
? **ERR 2** = illegal digit entered

**Default condition:** Mode 1 (Carrier Access)

**EXAMPLES:**

Assume that the DTMF decoder is in carrier access, and that PL access is desired. The proper command would be:

(PASSWORD) 57 06 2 \*

A better mode for many repeater installations is **Mode 3**, AND-PL Access. (This mode has better rejection of adjacent-channel interference than **Mode 2**, since noise falsing from unscelched audio is eliminated. Enter this command:

(PASSWORD) 57 06 3 \*

**Mode 4** allows both carrier access and PL operation. Since PL is more easily detected, PL users will find increased range. Carrier access users are unaffected. The squelch may be tightened to suppress band-opening problems. ANTI-PL is used when the repeater is co-channel with another, PL-accessed repeater. Users of the second system are kept out of the ANTI-PL system.

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**COMMAND TERMINATION for CONTROL RECEIVER****COMMAND FORM:**

**Command Termination:** (PASSWORD) 56 (00= \* req'd/0.1-9.9 sec after COR) \*

This command allows commands to be terminated by requiring the "\*" character, or by releasing the push-to-talk button (COR drop). The "\*" character will terminate a command in either case. If the COR drop method is desired, enter two digits representing the amount of time after COR drop is sensed that the command will be executed. If the "\*" character only method is desired, enter 00.

**Acknowledgement: OK**

**Errors:** ? **ERR 1** = wrong number of digits entered  
? **ERR 2** = illegal digit entered

**Default Condition:** "\*" character required to terminate all commands

**EXAMPLES:**

If desired, control operators can simply enter a command on the control receiver channel and release the push-to-talk button instead of entering the "\*" character. If a time delay of 1.0 seconds after COR drop is desired, enter:

(PASSWORD) 56 10 \*

The purpose of the 1.0-second delay is to prevent short, accidental COR drops from triggering command execution. The COR drop must be sustained for 1 second in this example, after which the command will be executed. Remember, the "\*" character can still be used to terminate the command. This can be important if weak, on-frequency signals are holding the COR up.

To return the controller to the "\*" -only mode, enter:

(PASSWORD) 56 00 \*

Do not use long delays with this command, since the **Interdigit Timer** may expire before the COR drop timer. An excessive delay between DTMF digits causes the command just entered to be cleared.

**UNKEY DELAY ENABLE/DISABLE****COMMAND FORM:**

**Unkey Delay Disable/Enable:** (PASSWORD) 63 31 (0= disable/1= enable) \*

The 5K uses a 100-mS Unkey Delay Timer to “filter out” momentary drops of the push-to-talk line, which may occur between queued messages or certain other activities. This timer adds 100 mS to the repeater’s “hang” or “tail” time.

In certain applications, the transmitter needs to drop quickly after the incoming signal disappears. When this command is used to defeat the Unkey Delay, and the Courtesy Timer and Dropout Timer are set to zero, the transmitter will drop as quickly as possible.

**Acknowledgement: OK**

**Errors:** ? **ERR 1** = wrong number of digits entered  
? **ERR 2** = illegal digit entered

**Default Condition:** enabled