

VRM-100

Introduction

The VRM-100 module is designed to add speech functionality to the DTC-100 Antenna Rotator Controller. With this module voice commands can be used to control various functions of the DTC-100, including Automatic Calibration.

In addition to acting on recognized voice commands, the VRM-100 provides vocal feedback responses. One example would be for a position query. The user would activate the system by merely saying "HELLO-ROTATOR", then the question, "WHERE-ARE-YOU". The DTC-100 responds by passes rotator position to the VRM for enunciation of "1-TWENTY-THREE".

The VRM-100 communicates with the DTC-100 by means of the rear panel serial port using a 3.5mm TRS cables. A ¼" jack is available on the back panel for external speaker connection. Three voice commands, LOW/MED/HIGH, sets levels for output volume. A front panel control can be used fine adjust of volume as well. Input power requirement is 9-12Vdc and can be provided by the included power adapter, or an optional external 12 volt supply.

Initial Operation

Connect the VRM-100 to the DTC-100 using the included 3.5mm stereo cable. Connect the 12Vdc adapter or other suitable power source. Attach the provided speaker and toggle the VRM to the ON position.

The DTC-100 (version 5.3 or later) on power-up will enter a detection routine in search for the VRM-100, enabling voice interface operation once located. Therefore, it is imperative to ensure the VRM is connected and powered up prior to DTC power-up.

On successful connection the DTC will send a "WAKE-UP" command followed by the voice message "ARE-YOU-THERE". At this time the user should respond with "ROGER", which will cement the connection with the message "OK-LET'S-GO".

The above process will be required each time power has been removed from the DTC-100.

Operational Commands

Before attempting to operate the VRM-100 it is recommended the user become familiar with the operation of the DTC-100. Once the user understands how to navigate the system, operation with the VRM-100 will become almost second nature.

The first process after acquiring the DTC-100 and making the necessary connections, is to perform a standard calibration. This process requires the user to select type and antenna offset (where the antenna is pointing

when the rotator is at the full CCW position). Likewise, this same information will need to be given to the DTC, but this time using the VRM-100.

The voice recognition chip in the VRM-100 has excellent noise rejection capabilities; however, there are limitations. Pre-programmed commands have been tailored to provide added protection against false triggering. Eliminating single syllable words is helpful in reducing errors. As an example, all number entries must be prefixed with the word "DOT"

When entering numbers 0-9, the user can say "DOT-ONE", "DOT-TWO", and so on. Numbers between 10-90 would then be "DOT-TEN", "DOT-TWENTY", and between 100-300 "DOT-ONE-HUNDRED". It is also acceptable to say things like, "DOT-TWENTY" followed by "DOT-ONE" for 121. Another way to enter three digit numbers would be simply "DOT-TWO", "DOT-THREE", and "DOT-ZERO" for 230.

Words with multiple syllables or multi-work phrases are used whenever possible to reduce complexity while guarding against false triggering. Another feature of the command set is to say, "VERIFY-ENTRY" after entering a number to ensure the value interpreted was correct..

Active versus Stand-By

To further reduce possibilities of mis-interpretation the VRM uses an internal timer to turn off voice detection when not being addressed. This internal timer has been set for approximately 20 seconds. Once the user awakes the system it will remain active during this interval, then go into a "STANDING-BY" mode where it will be dormant until the next wake command.

The word "ROTATOR" has been chosen to wake the system. Say, "HELLO-ROTATOR" and the VRM will respond with "SYSTEM-READY". During this time and until "STANDING-BY" is considered the active time. Simply saying, "HELLO-ROTATOR" again will re-activate the voice chip.

Answering a Question

A few instances the DTC-100 needs confirmation to a question. This is done with the word "ROGER", like yes I agree. The converse of "CANCEL-ENTRY" will also satisfy the system.

"CANCEL-ENTRY" can also mean, clear the entry, or abort the process. Let's say the user said a number and didn't enter it correctly, or the system didn't acknowledge correctly, then say the phrase, "CANCEL-ENTRY".

Auto-Calibration

The most intense function between the VRM-100 and DTC-100 comes during the auto calibration routine. Depending largely on the rotator type being used, the calibration routine can last 3 or more minutes. Referring to the DTC-100 manual, the process includes selecting rotator type, turning the rotator first fully clockwise, then fully counter clockwise, and entering a numerical value at full CCW position.

Given the voice chip has been programmed for 20 second timeout, the system will enter "STANDING-BY" several times during a calibration event. Rather than requiring the operator to say "HELLO-ROTATOR" each time, the DTC-100 will "re-awake" the device.

While the above process works well, at any time the operator hears "Standing-BY" prior to being requested to enter information, please either wait until the DTC makes the wake request, or say "HELLO-ROTATOR" before entering numbers or action requested.

Auto-Calibration Commands

USER:	SYSTEM
"BEGIN-AUTOMATIC-CALIBRATION"	"SELECT-ROTOR-TYPE"
"ROTATOR-TYPE-IS-yaesu/HyGain"	"TURNING-FULL-CLOCKWISE"

The next portion of the process merely informs the user as to what is happening during the process (see DTC-100 for full explanation).

During the time the rotator is turning, measurements are being made for position input to the system. As these measurements are made, they are announced to the user. This information correlates to that seen on the status window of the DTC CAL page.

Calibration using the voice system is very similar to a normal DTC-100. The primary difference is when and how the antenna offset is entered. At the end of the calibration rotation process, system has placed the rotator at the FULL-CCW limit. The user or helper should use a compass to determine where the antenna is pointing at that time. The voice system will ask user to "ENTER-ANTENNA-POSITION". Please NOTE: be sure the VRM is NOT in the "STAND-BY" state. If in doubt, vocalize "ROTATOR" first, or wait for the system to indicate the system is again active ("SYSTEM-READY").

Upon entry of the azimuth position say, "VERIFY-ENTRY". If the response is the same as entered say "ROGER" when it asks "IS THAT CORRECT". After hearing your response, the next message will indicate "SAVING-RESULTS". If the values don't match, say "CANCEL-ENTRY" to start over.

In the event you are able to read the screen prompts follow the process outlined in the DTC-100 UserGuide

Auto-Rotate

Once the system has been calibrated, antenna movement to a certain location is done by entering desired azimuth followed by "LET'S-GO". When in doubt if the system understood, it is a good idea to say "VERIFY-ENTRY". By asking for verification the system will announce the position, then ask "IS-THAT-CORRECT". Answer "ROGER" if all is good, or "CANCEL-ENTRY" if there was an error.

Upon completion the system will respond with "ROTATION COMPLETED".

Jogging

This function changes the rotation by a few degrees (~= **(+/-) 5-7 degrees**) and stops. Say "TURN-CLOCKWISE", or "TURN-COUNTER_CLOCKWISE" to move a corresponding distance.

Upon completion the system will respond with "ROTATION COMPLETED".

Interrogation

Want to know where the antenna is pointing? "WHERE-ARE-YOU" for an accurate response to antenna position.

Set Memory

There are six memory locations, 1-6, that can be programmed for favorite azimuth positions. Follow the below sequence to set a value of 123 degrees into memory location ONE (1). "CANCEL-ENTRY" to exit

USER:	SYSTEM
"DOT-number 1-6"	
"SET-MEMORY-LOCATION"	
"VERIFY-ENTRY"	"ONE, IS-THAT-CORRECT"
"ROGER"	"ENTER-ANTENNA_POSITION"
"DOT-ONE"	"ONE"
"DOT-TWO"	"TWO"
"DOT-THREE"	"THREE"
"VERIFY-ENTRY"	"123, IS THAT-CORRECT"
"ROGER"	
"WHERE-ARE-YOU"	"LET-ME-LOOK, azimuth value"

Go To Memory

Follow the below to advance the rotator to a pre-programmed memory location. When destination reached the system will respond "ROTATION-COMPLETED". "CANCEL-ENTRY" to exit before rotation begins.

USER:	SYSTEM
"DOT-number 1-6"	
"GO-TO MEMORY"	"Destination xxx"

Additional Command List

COMMAND	ACTION/RESPONSE
"TURN-CLOCKWISE"	Turns Clockwise approximately 5-7 degrees
"TURN-COUNTER-CLOCKWISE"	Turns CCW approx. 5-7 degrees
"LOW-VOLUME"	"MINIMUM-VOLUME"
"MEDUM-VOLUME"	"MEDIUM-VOLUME"
"HIGH-VOLUME"	"MAXIMUM-VOLUME"
"ROTATOR-STOP"	Stops and aborts action
"LET'S-GO"	Begins rotation to entered azimuth location
"LOW-INTENSITY"	Sets backlight to Dim
"MEDIUM-INTENSITY"	Sets backlight to medium brightness
"MAX-INTENSITY"	Sets backlight to maximum brightness
"ROGER"	"DO-YOU-WANT-TO-GO-THERE"
"ROGER"	"SAVING-RESULTS"
Requested to turn beyond limits system responds:	"ROTATION-LIMIT, ALL-STOP"

Calibration Responses from System

"CALIBRATION-REQUIRED"
"FULL-CLOCKWISE"
"CLOCKWISE-COMPLETED"
"FULL-COUNTER-CLOCKWISE"
"COUNTER-CLOCKWISE-COMPLETED"
"CLOCKWISE-STOP"
"COUNTER-CLOCKWISE-STOP"
"SAVING-RESULTS"
"ENTER-ANTENNA-POSITION"
"CALIBRATING"



NOTE: During autocalibration the system will say numbers that correspond to the feedback device value, as an example, resistive values during the calibration process. These numbers are used only as an indication the system is still operational.

Full Command List

Command Word(s)	1-Jul-26
WELCOME	
GOODBYE	
HELLO-ROTATOR	
VOLUME-UP	
VOLUME-DOWN	
MAX-VOLUME	
MEDIUM-VOLUME	
LOW-VOLUME	
ROTATOR-STOP	
ROBOT-SLEEP	
GO-THERE	
DOT-ZERO	
DOT-ONE	
DOT-TWO	
DOT-THREE	
DOT-FOUR	
DOT-FIVE	
DOT-SIX	
DOT-SEVEN	
DOT-EIGHT	
DOT-NINE	
DOT-TEN	
DOT-ELEVEN	
DOT-TWELVE	
DOT-THIRTEEN	
DOT-FOURTEEN	
DOT-FIFTEEN	
DOT-SIXTEEN	
DOT-SEVENTEEN	
DOT-EIGHTEEN	
DOT-NINETEEN	
DOT-TWENTY	
DOT-THIRTY	
DOT-FORTY	
DOT-FIFTY	
DOT-SIXTY	
DOT-SEVENTY	
DOT-EIGHTY	

DOT-NINETY
DOT-ONE-HUNDRED
DOT-TWO-HUNDRED
DOT-THREE-HUNDRED
DOT-FOUR-HUNDRED
TURN-CLOCKWISE
TURN-COUNTER-CLOCKWISE
WHERE-ARE-YOU

PUSH-DOWN Test Msg

RODGER
GO-AHEAD
GO-TO-MEMORY
SET-MEMORY-LOCATION
I-AM-READY
ROTATION-COMPLETED
CANCEL-ENTRY

WHAT-TIME-IS-IT Test Msg

ALL STOP
THAT-IS-CORRECT
VERIFY-ENTRY
BEGIN-AUTOMATIC-CALIBRATION
ROTATOR-TYPE-IS-YAESU
ROTATOR-TYPE-IS-HIGH-GAIN
ANTENNA-AZIMUTH-IS

SET-STEP-SIZE Not Implemented

TURN-FULL-CLOCKWISE
ABORT
TURN-FULL-COUNTER-CLOCKWISE
ABORT-PROCESS
MAX-INTENSITY
MEDIUM-INTENSITY
LOW-INTENSITY
ROTATOR-IS-D-C-U-3
ROTATOR-IS-SPID
ROTATOR-IS-R-T-FORTY-FIVE
ROTATOR-IS-ORION

SPECIFICATIONS

Enclosure:	Extruded Aluminum, Black Anodized, W76mm x H35mm x L100mm
Weight:	Base Unit: 200grams
Power:	12Vdc, 100mA (avg)
Audio Output:	3 Watts (Max)
Interface:	TTL-232, 115K baud, 8n1
Package Contents:	VRM-100 Base Unit 110/220 Vac Adapter, 12Vdc, 2.1mm Ctr (+) 3.5mm Stereo Cable, 1 meter Speaker, 3 Watt, 4 ohm, 80mm dia (or Equiv) Adapter, ¼" phone to 3.5mm mono