NAV Radio Requirements

## Powerup

**[NAVREQ-1]:** NAVRadio shall set the following parameters at powerup:

**DISPLAY\_STATE** to *DISP\_RADIO\_SUMMARY*

**ADF\_FREQ** to *ADF\_DEFAULT\_FREQ*

**DME\_FREQ** to *DME\_DEFAULT\_FREQ*

**VHF\_FREQ** to *VHF\_DEFAULT\_FREQ*

**VHF\_MODE** to *VOR*

**TACAN\_FREQ** to *TACAN\_DEFAULT\_FREQ*

## Radio Summary

**[NAVREQ-2]:** NAVRadio shall set the following parameters:

**LABEL\_1** to “ADF”

**LABEL\_2** to “DME”

**LABEL\_5** to “VHF”

**LABEL\_6** to “TACAN”

If the following logic evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_RADIO\_SUMMARY*)

)

**[NAVREQ-3]:** NAVRadio shall set **DISPLAY\_STATE** to *DISP\_ADF* if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_RADIO\_SUMMARY*) AND

(**BUTTON\_1\_PRESSED** is equal to True)

)

**[NAVREQ-4]:** NAVRadio shall set **DISPLAY\_STATE** to *DISP\_DME* if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_RADIO\_SUMMARY*) AND

(**BUTTON\_2\_PRESSED** is equal to True)

)

**[NAVREQ-5]:** NAVRadio shall set **DISPLAY\_STATE** to *DISP\_VHF* if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_RADIO\_SUMMARY*) AND

(**BUTTON\_5\_PRESSED** is equal to True)

)

**[NAVREQ-6]:** NAVRadio shall set **DISPLAY\_STATE** to *DISP\_TACAN* if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_RADIO\_SUMMARY*) AND

(**BUTTON\_6\_PRESSED** is equal to True)

)

## ADF Radio

**[NAVREQ-7]:** NAVRadio shall set the following parameters:

**LABEL\_4** to “Exit”

If the following logic evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_ADF*)

)

**[NAVREQ-8]:** NAVRadio shall set **LABEL\_1** to “Off” if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_ADF*) AND

(**ADF\_FREQ** is equal to *ADF\_DEFAULT\_FREQ*)

)

**[NAVREQ-9]:** NAVRadio shall set **LABEL\_1** to “Err” if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_ADF*) AND

(**ADF\_FREQ** is not equal to 0) AND

(

(**ADF\_FREQ** is less than *ADF\_MIN\_FREQ* ) OR

(**ADF\_FREQ** is greater than *ADF\_MAX\_FREQ* )

)

)

**[NAVREQ-10]:** NAVRadio shall set **LABEL\_1** to the following string:

“{i} kHz” where i is **ADF\_FREQ**

if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_ADF*) AND

(

(**ADF\_FREQ** is greater than or equal to *ADF\_MIN\_FREQ*) AND

(**ADF\_FREQ** is less than or equal to *ADF\_MAX\_FREQ*)

)

)

**[NAVREQ-11]:** NAVRadio shall set **ADF\_FREQ** to **USER\_ENTRY** if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_ADF*) AND

(**BUTTON\_1\_PRESSED** is equal to True) AND

(

(**USER\_ENTRY** is equal to *ADF\_DEFAULT\_FREQ* 0) OR

(

(**USER\_ENTRY** is greater than or equal to *ADF\_MIN\_FREQ*) AND

(**USER\_ENTRY** is less than or equal to *ADF\_MAX\_FREQ*)

)

)

)

**[NAVREQ-12]:** NAVRadio shall set **USER\_ENTRY** to “INVALID ENTRY” if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_ADF*) AND

(**BUTTON\_1\_PRESSED** is equal to True) AND

(**USER\_ENTRY** is not equal to *ADF\_DEFAULT\_FREQ*) AND

(

(**USER\_ENTRY** is less than *ADF\_MIN\_FREQ*) OR

(**USER\_ENTRY** is greater than *ADF\_MAX\_FREQ*)

)

)

**[NAVREQ-13]:** NAVRadio shall set **DISP\_STATE** to *DISP\_RADIO\_SUMMARY*if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_ADF*) AND

(**BUTTON\_4\_PRESSED** is equal to True)

)

## DME Radio

**[NAVREQ-14]:** NAVRadio shall set the following parameters:

**LABEL\_4** to “Exit”

If the following logic evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_DME*)

)

**[NAVREQ-15]:** NAVRadio shall set **LABEL\_1** to “Off” if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_DME*) AND

(**DME\_FREQ** is equal to *DME\_DEFAULT\_FREQ*)

)

**[NAVREQ-16]:** NAVRadio shall set **LABEL\_1** to “Err” if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_DME*) AND

(**DME\_FREQ** is not equal to *DME\_DEFAULT\_FREQ*) AND

(

(**DME\_FREQ** is less than *DME\_MIN\_FREQ*) OR

(**DME\_FREQ** is greater than *DME\_MAX\_FREQ*)

)

)

**[NAVREQ-17]:** NAVRadio shall set **LABEL\_1** to the following string:

“{i} MHz” where i is **DME\_FREQ**

if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_DME*) AND

(

(**DME\_FREQ** is greater than or equal to *DME\_MIN\_FREQ*) AND

(**DME\_FREQ** is less than or equal to *DME\_MAX\_FREQ*)

)

)

**[NAVREQ-18]:** NAVRadio shall set **DME\_FREQ** to **USER\_ENTRY** if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_DME*) AND

(**BUTTON\_1\_PRESSED** is equal to True) AND

(

(**USER\_ENTRY** is equal to *DME\_DEFAULT\_FREQ* (0)) OR

(

(**USER\_ENTRY** is greater than or equal to *DME\_MIN\_FREQ*) AND

(**USER\_ENTRY** is less than or equal to *DME\_MAX\_FREQ*)

)

)

)

**[NAVREQ-19]:** NAVRadio shall set **USER\_ENTRY** to “INVALID ENTRY” if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_DME*) AND

(**BUTTON\_1\_PRESSED** is equal to True) AND

(**USER\_ENTRY** is not equal to *DME\_DEFAULT\_FREQ*) AND

(

(**USER\_ENTRY** is less than *DME\_MIN\_FREQ*) OR

(**USER\_ENTRY** is greater than *DME\_MAX\_FREQ*)

)

)

**[NAVREQ-20]:** NAVRadio shall set **DISP\_STATE** to *DISP\_RADIO\_SUMMARY*if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_DME*) AND

(**BUTTON\_4\_PRESSED** is equal to True)

)

## VHF Radio

**[NAVREQ-21]:** NAVRadio shall set the following parameters:

**LABEL\_4** to “Exit”

If the following logic evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_VHF*)

)

**[NAVREQ-22]:** NAVRadio shall set the following parameters:

**LABEL\_1** to “Off”

**LABEL\_2** to “Off”

If the following logic evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_VHF*) AND

(**VHF\_FREQ** is equal to *VHF\_DEFAULT\_FREQ*)

)

**[NAVREQ-23]:** NAVRadio shall set the following parameters:

**LABEL\_1** to “Err”

**LABEL\_2** to “Err”

If the following logic evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_VHF*) AND

(**VHF\_FREQ** is not equal to *VHF\_DEFAULT\_FREQ*) AND

(**VHF\_FREQ\_VALID** is equal to False)

)

**[NAVREQ-24]:** NAVRadio shall set **LABEL\_1** to the following string:

“{i} MHz” where i is **VHF\_FREQ**

if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_VHF*) AND

(**VHF\_FREQ\_VALID** is equal to True)

)

**[NAVREQ-25]:** NAVRadio shall set **VHF\_MODE** to *VOR* if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_VHF*) AND

(**VHF\_FREQ\_VALID** is equal to True) AND

(((FLOOR(**VHF\_FREQ**\*10)) MOD 2) is equal to 0)

)

**[NAVREQ-26]:** NAVRadio shall set **VHF\_MODE** to *ILS* if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_VHF*) AND

(**VHF\_FREQ\_VALID** is equal to True) AND

(((FLOOR(**VHF\_FREQ**\*10)) MOD 2) is equal to 1)

)

**[NAVREQ-27]:** NAVRadio shall set **LABEL\_2** to “VOR” if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_VHF*) AND

(**VHF\_FREQ\_VALID** is equal to True) AND

(**VHF\_MODE** is equal to *VOR*)

)

**[NAVREQ-28]:** NAVRadio shall set **LABEL\_2** to “ILS” if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_VHF*) AND

(**VHF\_FREQ\_VALID** is equal to True) AND

(**VHF\_MODE** is equal to *ILS*)

)

**[NAVREQ-29]:** NAVRadio shall set **VHF\_FREQ** to **USER\_ENTRY** if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_VHF*) AND

(**BUTTON\_1\_PRESSED** is equal to True) AND

(

(**USER\_ENTRY** is equal to *VHF\_DEFAULT\_FREQ*) OR

(

(**USER\_ENTRY** is greater than or equal to *VHF\_MIN\_FREQ*) AND

(**USER\_ENTRY** is less than or equal to *VHF\_MAX\_FREQ*) AND

(((**USER\_ENTRY**\*100) MOD 5) is equal to 0)

)

)

)

**[NAVREQ-30]:** NAVRadio shall set **USER\_ENTRY** to “INVALID ENTRY” if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_VHF*) AND

(**BUTTON\_1\_PRESSED** is equal to True) AND

(**USER\_ENTRY** is not equal to *VHF\_DEFAULT\_FREQ*) AND

(**USER\_ENTRY\_VHF\_VALID** is equal to False)

)

**[NAVREQ-31]:** NAVRadio shall set **DISP\_STATE** to *DISP\_RADIO\_SUMMARY*if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_VHF*) AND

(**BUTTON\_4\_PRESSED** is equal to True)

)

**[NAVREQ-32]:** NAVRadio shall set **VHF\_FREQ\_VALID** to True if the following evaluate to True

(

(**VHF\_FREQ** is greater than or equal to *VHF\_MIN\_FREQ*) AND

(**VHF\_FREQ** is less than or equal to *VHF\_MAX\_FREQ*) AND

(((**VHF\_FREQ**\*100) MOD 5) is equal to 0)

)

Otherwise, set **VHF\_FREQ\_VALID** to False.

**[NAVREQ-40]:** NAVRadio shall set **USER\_ENTRY\_VHF\_VALID** to True if the following evaluate to True

(

(**USER\_ENTRY** is greater than or equal to *VHF\_MIN\_FREQ*) AND

(**USER\_ENTRY** is less than or equal to *VHF\_MAX\_FREQ*) AND

(((**USER\_ENTRY**\*100) MOD 5) is equal to 0)

)

Otherwise, set **USER\_ENTRY\_VHF\_VALID** to False.

## TACAN Radio

**[NAVREQ-33]:** NAVRadio shall set the following parameters:

**LABEL\_4** to “Exit”

If the following logic evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_TACAN*)

)

**[NAVREQ-34]:** NAVRadio shall set **LABEL\_1** to “Off” if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_TACAN*) AND

(**TACAN\_FREQ** is equal to *TACAN\_DEFAULT\_FREQ*)

)

**[NAVREQ-35]:** NAVRadio shall set **LABEL\_1** to “Err” if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_TACAN*) AND

(**DME\_FREQ** is not equal to *TACAN\_DEFAULT\_FREQ*) AND

(

(**TACAN\_FREQ** is less than *TACAN\_MIN\_FREQ*) OR

(**TACAN\_FREQ** is greater than *TACAN\_MAX\_FREQ*)

)

)

**[NAVREQ-36]:** NAVRadio shall set **LABEL\_1** to the following string:

“{i} MHz” where i is **TACAN\_FREQ**

if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_TACAN*) AND

(

(**TACAN\_FREQ** is greater than or equal to *TACAN\_MIN\_FREQ*) AND

(**TACAN\_FREQ** is less than or equal to *TACAN\_MAX\_FREQ*)

)

)

**[NAVREQ-37]:** NAVRadio shall set **TACAN\_FREQ** to **USER\_ENTRY** if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_TACAN*) AND

(**BUTTON\_1\_PRESSED** is equal to True) AND

(

(**USER\_ENTRY** is equal to *TACAN\_DEFAULT\_FREQ* (0)) OR

(

(**USER\_ENTRY** is greater than or equal to *TACAN\_MIN\_FREQ*) AND

(**USER\_ENTRY** is less than or equal to *TACAN\_MAX\_FREQ*)

)

)

)

**[NAVREQ-38]:** NAVRadio shall set **USER\_ENTRY** to “INVALID ENTRY” if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_TACAN*) AND

(**BUTTON\_1\_PRESSED** is equal to True) AND

(**USER\_ENTRY** is not equal to *TACAN\_DEFAULT\_FREQ*) AND

(

(**USER\_ENTRY** is less than *TACAN\_MIN\_FREQ*) OR

(**USER\_ENTRY** is greater than *TACAN\_MAX\_FREQ*)

)

)

**[NAVREQ-39]:** NAVRadio shall set **DISP\_STATE** to *DISP\_RADIO\_SUMMARY*if the following evaluates to True:

(

(**DISPLAY\_STATE** is equal to *DISP\_TACAN*) AND

(**BUTTON\_4\_PRESSED** is equal to True)

)