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SUPERSEDING

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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
DESIGN STANDARD

NATIONAL AIRSPACE SYSTEM (NAS)
VISUAL SPECIFICATION FOR
AIRPORT SURFACE APPLICATIONS
(VSASA)

Terminal Surveillance, ATO-T

CONTENTS

1.0 SCOPE

1.1 General

The National Airspace System (NAS)Visual Specification for Airport Surface Applications (VSASA) is intended to define all of the visual and interactive aspects of surface surveillance systems that affect air traffic personnel. To that end, requirements in the VSASA have been guided by representatives of the air traffic community to ensure that the information that is displayed and the interactions that are required all contribute to helping air traffic personnel perform their jobs more effectively. As such, there are some terms that may be used to convey meanings not normally associated with those terms in other disciplines. Examples are words like coast and track. Please consult the glossary (see 6.2) for terms and their usage.

1.2 List of Figures

A list of Figures used in this document can be viewed by clicking here.

Figures can be viewed by clicking on the indicted hypertext (Figure XX). Press Escape “ESC” to leave the animation.

2.0 APPLICABLE DOCUMENTS

"Requirements Document for Airport Surface Movement Enhancement And Runway Incursion Prevention Airport Surface Detection Equipment System (Airport Surface Application)," Version 1.0

"National Airspace System (NAS) Subsystem Level Specification for Airport Surface Detection Equipment - Model X (Airport Surface Application)," FAA-E-2942

3.0 REQUIREMENTS

3.1 Local Tower Display Requirements

3.1.1 Maps

3.1.1.1 Map Attributes

3.1.1.1.1 Viewable Maps

The Airport Surface Application Viewable map shall [R1] represent five map areas in the coverage volume. No map area shall [R2] cover or interfere with the presentation of a target icon or data block. Each area shall [R3] have an independent color to represent it. Each area shall [R4] be filled with a color defined by standard RGB value sets. Each area shall [R5] have an outline with an independent color defined by standard RGB value sets. Each outline and fill color shall [R6] be independently adaptable (*e.g.*, RGB value set/off) by changing system configuration parameters. The option of no fill or no outline shall [R7] be available in the system configuration parameters. Areas that are configured to have no fill shall [R8] burn through to the root color. The map areas in the coverage volume are shown in FIGURE 1 and shall [R9] consist of the following:

1. Runways – this area shall [R10] consist of all runway areas and includes helicopter landing areas. Runways are shown in FIGURE 2 with fill only, FIGURE 3 with outline only, and FIGURE 4 with outline and fill.

2. Taxiways – this area shall [R11] consist of all taxiway areas and non-taxiway movement areas and includes helicopter taxiing areas. Taxiways are shown in FIGURE 5 with fill only, FIGURE 6 with outline only, and FIGURE 7 with outline and fill.

3. Ramps – Ramps shall [R12] include loading ramps, parking areas, and other areas near the terminal. Ramps are shown in FIGURE 8 with fill only, FIGURE 9 with outline only, and FIGURE 10 with outline and fill.

4. Background area "1" – background area "1" shall [R13] include islands between runways and taxiways and areas outside of runways and taxiways.

5. Background area "2" – background area "2" shall [R14] be used to define other significant geographical landmarks (*e.g.*, bodies of water, roadways, buildings, bridges) depending upon site specific requirements.

Any region not defined by one of the five map areas shall [R15] default to the root color.

3.1.1.1.2 Hold Bars

The Airport Surface Application shall [R379] [SL] be adaptable by selecting system configuration parameters (*i.e.*, on/off) to display hold bars on an active runway at each intersection in front of targets that are in the process of arriving, landing, departing, or aborting departure as shown in FIGURE 11. Hold bars shall [R380] [SL] appear in front of arriving tracks when the target is a system configuration parameter distance from the runway threshold. As a landing or departing track passes each intersection, the hold bar for that intersection shall [R381] [SL] be eliminated. The hold bars shall [R382] [SL] not be displayed at the intersection of two active runways. [R383 Deleted] Hold bars shall [R642] [SL] not appear in front of stopped targets or taxiing targets that are on the runway. [R384 Deleted]

3.1.1.1.3 Maintenance Maps

[R16 Deleted] Airport Surface Application Maintenance Maps shall [R385] [SL] include all areas defined in Sections 3.1.1.1.1 and 3.1.1.1.2. Additionally, Airport Surface Application Maintenance Maps shall [R17] include the following areas:

1. Any other areas needed for system operation shall [R18] be viewable in maintenance mode (*e.g.*, clutter maps, acquisition maps, sensor coverage maps, multipath regions, *etc.*)

2. Sensor locations – the Airport Surface Application shall [R19] be capable of identifying and graphically displaying all sensor locations

3. Arrival Corridors – arrival corridors shall [R20] outline the airspace used for approaching aircraft for each runway and helicopter landing area, including different approaches for a given runway or helicopter landing area.

3.1.1.2 Map Functions

3.1.1.2.1 Map Range

The Airport Surface Application shall [R21] display ranges from 300 ft. to 10 nautical miles. The displayed range scale shall [R22] be measured horizontally across the Airport Surface Application display. For example, if the main window and a secondary window are both set to the same range scale, then objects in both windows should appear to be the same size.

The Airport Surface Application shall [R23] have a zoom function to change the range scale in the active window. The zoom function shall [R24] change the range scale in increments calculated as a percentage of the current range scale. The percentages used in calculation shall [R25] be selected as part of the system configuration parameters. The minimum selectable value shall [R26] be 1%. The maximum selectable value shall [R27] be 99%. The user shall [R28] also be able to specify a particular range scale in hundreds of feet. All range scale adjustment increments shall [R29] be rounded to one hundred feet, or to the nearest one hundred foot increment, whichever is greater. The zoom function is illustrated in FIGURE 12.

3.1.1.2.2 Map Reposition

The Airport Surface Application system shall [R30] be capable of repositioning the current map in the active window without altering the range scale as shown in FIGURE 13. The user shall [R31] be able to reposition the map in any direction. The map reposition increment shall [R32] be calculated as a percentage of the current range scale. The percentage used in calculation shall [R33] be selected as part of the system configuration parameters. The minimum selectable value shall [R34] be 1%. The maximum selectable value shall [R35] be 99%.

3.1.1.2.3 Map Rotation

The Airport Surface Application system shall [R36] be capable of rotating the current map in the active window without altering the range scale as shown in FIGURE 14. The Airport Surface Application shall [R37] be capable of rotating to any map orientation. The axis of rotation shall [R38] be the center of the active window.

3.1.1.2.4 Default Function

[R39 Deleted] The Airport Surface Application shall [R386] [SL] have a default function which restores the display channel settings to the values contained in the system startup parameters excepting system mode and alert volume , which will not change.

3.1.2 Colors

All colors shall [R40] be constructed using standard RGB value sets. The defined RGB value set for each display component shall [R41] be at 100% brightness.

The system configuration parameters shall [R42] be able to contain at least two different colors for each display component. These colors shall [R43] be selectable by the user as two different color palettes. [R44 Deleted] [R387 Deleted] The display components contained in each palette shall [R605] [SL] include:

1. Root Color
2. Runways (filled)
3. Runways (outlined)
4. Taxiways (filled)
5. Taxiways (outlined)
6. Arrival Corridors
7. Ramps (filled)
8. Ramps (outlined)
9. Background area 1 (filled)
10. Background area 1 (outlined)
11. Background area 2 (filled)
12. Background area 2 (outlined)
13. Aircraft Icon
14. Heavy Aircraft Icon
15. Vehicle Icon
16. Unknown Icon
17. Suspend Icon
18. (deleted)
19. Maintenance Icons
20. Heavy Indicator
21. Cursor
22. DCB Text
23. DCB Toggle Selected Option Text Color
24. DCB Toggle not Selected Option Text Color
25. Data Block Text
26. Temporary Map Data (closed polygon)
27. Temporary Map Data (restricted polygon)
28. Temporary Map Data (alphanumeric)
29. Temporary Map Data (alphanumeric anchor point)
30. Temporary Map Data (highlight color)
31. Temporary Map Data (unselectable color)
32. Data Block Trait Areas
33. Data Block Off Areas
34. Unpressed DCB button Color 1
35. Unpressed DCB button Color 2
36. Depressed DCB button Color 1
37. Depressed DCB button Color 2
38. DCB Dwell Emphasis Color
39. DCB Border Color
40. List Text
41. Inactive Window Border Color
42. Active Window Border Color
43. New Window Outline Color
44. Velocity Vector Lines
45. Conflict Alert Message Text Color (Alert Scenario)
46. Alert Message Text Box Background Color

47. Alert Message Text Box Outline Color
48. Alert Scenario Data Block Background Color
49. Alert Scenario Data Block Outline Color
50. Alert Scenario Data Block Text Color
51. Cautionary Scenario Data Block Text Color
52. Cautionary Scenario Octagon
53. Alert Scenario Octagon
54. Hold Bars
55. Alert Scenario Icon Flash Color
56. Coast List Text Color
57. Target Icon Highlight Color 1
58. Target Dwell Emphasis Color
59. Suspended Icon Text Color
60. Predefined Surface Closure Color
61. Predefined Surface Restriction Color
62. Single-Track Selection Halo and Data Block Border

3.1.3 Brightness Controls

[R45 Deleted] [R388 Deleted] The Airport Surface Application system shall [R606] [SL] allow users to independently control the brightness of the following groups of display components:

1. Map Foreground – Runways, Taxiways, Ramps, and Background Area 2
2. Map Background – Background 1, Root Color
3. Target Icons – Aircraft, Heavy Aircraft, Heavy Indicator, Vehicle, Unknown, Suspend, Suspend Icon Text, Target History Trails, Velocity Vector Lines, Predefined Surface Closures and Restrictions
4. Data Blocks – Data Block Text, Leader Line
5. Lists – Coast/Suspend List Text, Preview Area Text
6. Graphical Temporary Map Data -- Closed Polygon, Restricted Polygon
7. Textual Temporary Map Data – Temporary Map Text, Temporary Map Text Anchor, Temporary Map Text Leader Line
8. Display Control Bar – DCB Text, DCB toggle Selected Option Text, DCB Toggle not Selected Option Text, Unpressed DCB button Color 1 & 2, Depressed DCB button Color 1 & 2, DCB Dwell Emphasis Color, DCB Border Color
9. Hold Bars – Hold Bars (blank and not functional if system is adapted with hold bars “off”)

Brightness controls shall [R46] be defined as a multiplying factor of an RGB value set. For example, if an RGB value set at 100% brightness of (1.00)*[200, 200, 200] is changed to 75% brightness, then (0.75)*[200, 200, 200] = [150, 150, 150]. [R47 Deleted] The Airport Surface Application system shall [R389] [SL] have a minimum brightness multiplier for each group defined above. [R48 Deleted] Each minimum brightness multiplier shall [R390] [SL] be adaptable as part of the system configuration parameters.

3.1.4 Data Blocks

The Airport Surface Application shall [R49] be capable of displaying a data block for each target in the coverage volume. [R50 Deleted] [R391 Deleted] A data block for an aircraft shall [R607] contain the fields as shown below in TABLE I and in FIGURE 15. A data block for a vehicle shall [R608] contain the fields as shown below in TABLE II and in FIGURE 15. A target represented by an unknown icon (see 3.1.6.1.1) shall [R609] not display an associated data block. [R51 Deleted] [R52 Deleted] All fields shall [R53] be left justified. [R54 Deleted] [R55 Deleted] Selected fields (see 3.1.4.4.1) shall [R392] be shifted left so there is one space between fields on the same line. A selected field occupies an interior position if there is another selected field to its right. Any selected field in an interior position, except Fields B, J, or K, shall [R393] be padded to the right with spaces up to the full width specified for the field in TABLE I. Any field which contains at least one visible character and which is the rightmost selected field shall [R394] occupy space within the data block up to and including the rightmost visible character. Any field, except Fields B, J or K, which contains no visible characters and which is the rightmost selected field shall [R395] occupy space within the data block up to the full width specified for the field in TABLE I. A line shall [R396] terminate at the end of the extent taken up by its rightmost selected field. If line 2 is involved in timesharing, then the line shall [R397] terminate at the longer of the two alternating set of fields.

TABLE I: Aircraft data block field descriptions

Field	Line # and Character Position	Field Content
A	Line 0; Characters 1-16	Track Status
B	Line 1; Characters 1-8	Callsign (timeshare with field C)
C	Line 1; Characters 1-8	Beacon Code (timeshare with field B)
D	Line 1; Characters 10-12	Altitude
E	Line 1; Characters 14-16	Sensor Coverage
F	Line 2; Characters 1-4	Aircraft/Vehicle Type (Timeshare with Fields J and K)
G	Line 2; Character 6	Aircraft Category (Timeshare with Fields J and K)
H	Line 2; Characters 8-10	Paired Fix or Departure Gate Information (Timeshare with Fields J and K)
I	Line 2; Characters 12-13	Velocity (Timeshare with Fields J and K)
J	Line 2; Characters 1-7	Scratchpad Area 1 (Timeshare with Fields F, G, H, and I)
K	Line 2; Characters 9-15	Scratchpad Area 2 (Timeshare with Fields F, G, H, and I)

TABLE II: Vehicle data block field descriptions

Field	Line # and Character Position	Field Content
A	Line 0; Characters 1-16	Track Status
B	Line 1; Characters 1-8	Callsign
E	Line 1; Characters 10-12	Sensor Coverage
F	Line 2; Characters 1-4	Aircraft/Vehicle Type (Timeshare with Fields J and K)
I	Line 2; Characters 6-7	Velocity (Timeshare with Fields J and K)
J	Line 2; Characters 1-7	Scratchpad Area 1 (Timeshare with Fields F and I)
K	Line 2; Characters 9-15	Scratchpad Area 2 (Timeshare with Fields F and I)

3.1.4.1 Data Block Fields

3.1.4.1.1 Field A – Track Status

Field A – Track Status: Field A shall [R56] be an alphanumeric field consisting of 16 characters. [R57 Deleted] Field A shall [R610] display the status of the track in special situations. (Examples of special situations may include potential multipath, conflicting data block information, conflict alert status, or coast situations, *etc.*) If Field A contains data, then the system shall [R57a] force the track's data block to be displayed.

3.1.4.1.2 Field B – Callsign

Field B – Callsign: Field B shall [R58] be an alphanumeric field containing the aircraft identification (ACID). Field B can also be used to indicate a vehicle identification. Field B shall [R59] consist of 8 characters. The ACID shall [R60] be displayed as the user default. If the ACID is not available, the beacon code shall [R61] be displayed. If both the ACID and the beacon code are available, the user shall [R62] be able to toggle between the ACID and the beacon code. [R398 Deleted]

3.1.4.1.3 Field C – Beacon Code

Field C – Beacon Code: Field C shall [R63] be an alphanumeric field containing the aircraft beacon code. Field C shall [R64] consist of 8 characters. The ACID shall [R65] be displayed as the user default. If the ACID is not available the beacon code shall [R66] be displayed. If both the ACID and the beacon code are available, the user shall [R67] be able to toggle between the ACID and the beacon code for four seconds. If there is no beacon code for a given track, and the user attempts to view the beacon code, the words "NO BCN" shall [R68] be displayed for four seconds in field C.

3.1.4.1.4 Field D – Altitude

Field D – Altitude; Field D shall [R69] be an alphanumeric field consisting of three characters that indicate the aircraft or vehicle altitude above Mean Sea Level (MSL) in hundreds of feet. The least significant digit shall [R70] represent 100 ft. If the altitude is available but is tagged as invalid, then each character of the field shall [R399] be filled with an uppercase X, (*i.e.*, “XXX”).

3.1.4.1.5 Field E – Sensor Coverage

Field E – Sensor Coverage: Field E shall [R71] be an alphanumeric field consisting of three characters that indicates the sensor coverage for a target as shown below in TABLE III.

TABLE III: Sensor coverage

Sensor	Coverage							
Mode-S, ATCRBS, or Primary from ASR-9	X	0	X	X	0	X	0	0
Mode-S or ATCRBS from Multilateration, or ADS-B	0	0	X	0	X	X	X	0
ASDE-X Radar Subsystem Primary	0	0	0	X	X	X	0	X
Sensor Coverage Label →	**ASR**	**CST**	**FUS**	**FUS**	**FUS**	**FUS**	**MUL**	**RDR**
Legend	X	Detected By Sensor						
	0	Not Detected By Sensor						

3.1.4.1.6 Field F – AC/Vehicle Type

Field F – AC/Vehicle Type: Field F shall [R72] be an alphanumeric field consisting of four characters that indicate the aircraft/vehicle type. The AC/Vehicle Type (together with fields G, H, and I) shall [R73] timeshare with Scratchpad areas 1 and 2 for a period of between 1 and 4 seconds, adaptable by selecting system configuration parameters if there is data in either Scratchpad Area 1 or 2. The Airport Surface Application shall [R400] have a generic aircraft type (*e.g.*, ACFT) adaptable by selecting system configuration parameters. The Airport Surface Application shall [R401] have a generic vehicle type (*e.g.*, VEH) adaptable by selecting system configuration parameters. Any entry in Field F not defined as a generic vehicle or generic aircraft type shall [R402] indicate an aircraft type.

3.1.4.1.7 Field G – Aircraft Category

Field G – Aircraft Category: Field G shall [R74] be an alphanumeric field consisting of 1 character. [R75 Deleted] [R76 Deleted] [R77 Deleted] The system shall [R403] recognize valid entries as defined in TABLE IV. If Field G contains a valid entry, and Field F contains no data, then the system shall [R404] automatically fill Field F with the generic aircraft type. The Aircraft Category (together with fields F, H, and I) shall [R78] timeshare with Scratchpad areas 1 and 2 for a period of between 1 and 4 seconds, adaptable by selecting system configuration parameters if there is data in either Scratchpad Area 1 or 2.

TABLE IV: Aircraft categories and their corresponding target icons

Aircraft Category	Description	Target Type
T	TCAS	Aircraft
H	Heavy	Heavy Aircraft
B	Heavy and TCAS	Heavy Aircraft
F	B757	Heavy Aircraft
L	B757 and TCAS	Heavy Aircraft
U	Heavy	Heavy Aircraft
V	VFR and Not Heavy	Aircraft
W	Heavy and VFR	Heavy Aircraft
X	High Performance Propeller Aircraft	Aircraft

3.1.4.1.8 Field H – Paired Fix or Departure Gate Information

Field H – Paired Fix or Departure Gate Information: Field H shall [R79] be an alphanumeric field consisting of three characters that indicate the paired fix or departure gate information. The Paired Fix or Departure Gate Information (together with fields F, G, and I) shall [R80] timeshare with Scratchpad areas 1 and 2 for a period of between 1 and 4 seconds, adaptable by selecting system configuration parameters if there is data in either Scratchpad Area 1 or 2.

3.1.4.1.9 Field I – Velocity

Field I – Velocity: Field I shall [R81] be an alphanumeric field consisting of two characters that indicate the speed of a target in tens of knots. The velocity shall [R82] be rounded to the nearest 10 knots. For example, an actual velocity of 112 knots would be displayed as “11”. The Velocity (together with fields F, G, and H) shall [R83] timeshare with Scratchpad areas 1 and 2 for a period of between 1 and 4 seconds, adaptable by selecting system configuration parameters if there is data in either Scratchpad Area 1 or 2.

3.1.4.1.10 Field J - Scratchpad Area 1

Field J - Scratchpad Area 1: Field J shall [R84] be an alphanumeric field consisting of seven characters. The user shall [R85] be able to enter free-format alphanumeric data in scratchpad area 1. Scratchpad Areas 1 and 2 shall [R86] timeshare with fields F, G, H, and I for a period of between 1 and 4 seconds, adaptable by selecting system configuration parameters if there is data in either Scratchpad Area 1 or 2.

3.1.4.1.11 Field K – Scratchpad Area 2

Field K – Scratchpad Area 2: Field K shall [R87] be an alphanumeric field consisting of seven characters. The user shall [R88] be able to enter free-format alphanumeric data in scratchpad area 2. The Scratchpad Areas 1 and 2 shall [R89] timeshare with fields F, G, H, and I for a period of between 1 and 4 seconds, adaptable by selecting system configuration parameters if there is data in either Scratchpad Area 1 or 2.

3.1.4.2 Data Block Positions

The information in the data block shall [R90] always be horizontal and readable from left to right when the display is upright. The Data Block shall [R91] be in one of eight positions relative to the centroid of the target icon as shown in FIGURE 16: up, down, left, right, diagonally up to the right, diagonally down to the right, diagonally up to the left, diagonally down to the left. The user shall [R92] be able to select the position of the data block relative to the target icon. [R93 Deleted] [R94 Deleted]

3.1.4.3 Leader Lines

[R95 Deleted] Each leader line shall [R405] originate at the centroid of its corresponding target icon and terminate at the data block at a point determined as specified below in TABLE V.

TABLE V: Leader line termination point

Leader Line Direction	Termination Point
Up	Center of Beginning of Line 1
Down	Center of Beginning of Line 1
Left	Center of End of Longest, Highest Line
Right	Center of Beginning of Line 1
Diagonally up to the Right	Center of Beginning of Line 1
Diagonally down to the Right	Center of Beginning of Line 1
Diagonally up to the Left	Center of End of Longest, Lowest Line
Diagonally down to the Left	Center of End of Longest, Highest Line

3.1.4.3.1 Leader Line Lengths

The default length of the leader line shall [R96] be adaptable by selecting system startup parameters. The selectable range shall [R97] be between 0" and 1.5" long. The user shall [R98] be able to adjust the leader line length within the selectable range to the nearest 0.1 inch. [R99 Deleted]

3.1.4.4 Data Block Customization

The Airport Surface Application shall [R100] have the capability to display full data blocks, partial data blocks, and no data blocks. If data blocks are turned off, there shall [R101] be no leader line.

3.1.4.4.1 Full Data Block

Fields A, B, and C shall [R102] always be part of the full data block. The user shall [R103] be able to customize the full data block by selecting (from the remaining fields) which fields will be displayed.

Selectable fields are D, E, F, G, H, I, J, and K. The two scratchpad areas (J and K) shall [R104] only be selectable to toggle together.

3.1.4.4.2 Partial Data Block

A partial data block shall [R105] consist of only Fields A, B, and C. The user shall [R106] not be able to customize the partial data block.

3.1.4.5 Data Block Toggle

The Airport Surface Application system shall [R107] provide a default toggle state for data blocks upon system startup. The default toggle state shall [R108] be adaptable by selecting system startup parameters.

The user shall [R109] be able to toggle (on/off) all data blocks in a window. The data block toggle state shall [R110] be independent for each window.

3.1.4.5.1 Individual Data Block Toggle

The user shall [R111] be able to toggle (on/off) the display of a target's data block as shown in FIGURE 17. For example, if data tags are not displayed (off), the user could toggle on the display of an individual target's data block (on/off).

The individual data block toggle shall [R112] override any individual track's data block state even if the track is in a data block toggle area.

3.1.4.5.2 Data Block Toggle Area

The user shall [R113] be able to define two types of areas in the coverage volume in which data blocks are automatically turned on or off. Each area shall [R114] be a user-defined polygon having up to 20 sides. The Airport Surface Application shall [R115] allow the user to define up to twenty-five (25) data block toggle areas (combined total for both types) throughout the coverage volume at any one time on a display channel. No toggle areas shall [R116] be capable of overlapping each other. Each area shall [R117] remain active until the user deactivates it. Defined areas shall [R118] be active over the same geographic area, regardless of map orientation, map reposition, or zoom.

The user shall [R119] be able to independently remove data block toggle areas after they have been defined. The Airport Surface Application system shall [R120] have a function to remove all data block toggle areas.

3.1.4.5.2.1 Data Block Off Area

The user shall [R121] be able to define an area in the coverage volume in which data blocks for all targets in the area are automatically inhibited as shown in FIGURE 18. For example, if the user defines a data block off area, then the display of a target's data block automatically turns off when the target enters the area. When the target exits the data block off area, the display of the target's data block automatically returns to the setting for that window.

3.1.4.5.2.2 Data Block Trait Area

The user shall [R122] be able to define an area in the coverage volume in which track data for all targets in that area assume a set of attributes as shown in FIGURE 19. The track data shall [R123] default to the settings in the active window. At the time the area is defined, the user shall [R124] be able to override default settings in the defined area by selecting the following attributes of a track:

1. Leader Line Length

2. Leader Line Direction
3. Data Block Character Size
4. Data Block Brightness
5. Data Block Displayed Fields (Customized Full or Partial)
6. Velocity Vector on/off

For example, if the user defines a data block trait area, then the display of a target's data block automatically turns on when the target enters the area. When the target exits the data block trait area, the display of the target's data block automatically returns to the setting for that window.

The system shall [R124a] allow the user to modify any traits in a data block trait area at any time after the area has been defined.

3.1.4.6 Automatic Data Block Association

[R125 Deleted] The Airport Surface Application shall [R406] automatically associate flight plan information with a target whenever the system detects a beacon code or a Mode-S transponder identification code for which it has flight plan information. The Airport Surface Application shall [R126] automatically associate flight plan information with a target whenever the user enters an ACID for which the system has flight plan information.

3.1.4.7 Manual Data Block Editing

The user shall [R127] be able to manually edit data block fields B (Callsign), C (Beacon Code), F (Aircraft/Vehicle Type), G (Aircraft Category), H (Paired Fix or Departure Gate Information), J (Scratchpad Area 1), and K (Scratchpad Area 2) (see 3.1.4) for any target within the coverage volume. The user shall [R128] not be able to edit data block information if the associated track is in a coasted or suspended state.

The Airport Surface Application shall [R129] allow a user to purge all editable data block information associated with a selected track. For example, if the user purges a track's data, the Aircraft Identification, Beacon Code, Heavy Indicator, Aircraft Type, Fix, and Scratchpad data are all purged, and the track's icon is changed to the "unknown" icon.

When data block editing is activated for a track, all of the data block fields which are capable of being edited, shall [R130] appear in the Preview Area as shown in FIGURE 20. The fields shall [R131] appear in the following order:

1. Aircraft ID
2. Beacon Code
3. Aircraft Category
4. Aircraft Type
5. Fix
6. Scratchpad 1
7. Scratchpad 2

The Airport Surface Application System shall [R611] reject manually edited data block entries that contain an Aircraft ID identical to one already associated with another target.

3.1.5 Fonts

All fonts shall [R132] be a non-proportionally spaced font in the sans serif class of fonts. All display components which utilize text shall [R133] have the same font type. Six font sizes shall [R134] be available for these display components. The nominal size of each character in the font shall [R135] be as specified below in TABLE VI.

TABLE VI: Airport surface application character sizes

Character Size	Nominal Character Width (mm)	Nominal Character Height (mm)
1	1.56	2.18
2	2.18	3.12
3	2.50	3.74
4	3.12	4.68
5	3.74	5.30
6	4.68	5.62

The Airport Surface Application system shall [R136] be able to independently change font sizes of the following items:

1. Data Blocks
2. Coast/Suspend List
3. Temporary Map Data
4. Preview Area
5. Display Control Bar

Control of the font size of alphanumeric data on target icons shall [R137] be linked to the data block font size. The DCB shall [R138] only be able to utilize character sizes 1, 2, and 3.

The selected font should allow users to easily distinguish among all characters at all six font sizes. Particular areas of confusion tend to be distinguishing among the letters D and O and the numbers 0 and 8 (D, O, 0, 8); the letter Z from the number 2 (Z, 2); the letter O from the letter Q (O, Q); and the letter I from the number 1 (I, 1). It is preferred that the zero in the selected font have a diagonal slash (top right to bottom left) internal to the zero.

3.1.6 Icons

3.1.6.1 Target Icons

3.1.6.1.1 Operational Target Icons

[R139 Deleted] The Airport Surface Application system shall [R612] display five different types of icons:

A. Aircraft
B. Vehicle
C. Unknown
D. Heavy Aircraft
E. Suspend

All target icons are depicted in FIGURE 21. The aircraft icon shall [R140] look like icon (A) in FIGURE 21. The Airport Surface Application shall [R141] indicate a heavy aircraft as shown in icon (D) of FIGURE 21. The color of the filled circle indicating a heavy aircraft type shall [R142] be independently adaptable by changing system configuration parameters.

The vehicle icon shall [R143] look like icon (B) of FIGURE 21. The unknown icon shall [R144] look like icon (C) of FIGURE 21. The suspend icon shall [R145] look like icon (E) of FIGURE 21. [R146 Deleted]

Each icon shall [R147] be filled with a color that can be defined by standard RGB values. Each icon shall [R148] have an outline with an independent color defined by standard RGB values. Each outline and fill color shall [R149] be adaptable (*e.g.*, off/RGB value set) by changing system configuration parameters. The option of no fill or no outline shall [R150] be available in the system configuration parameters.

[R151 Deleted] The Airport Surface Application shall [R613] select the target icon for a track (from one of the icons depicted in FIGURE 21) based upon Beacon Code (Field C of the Data Block), the contents of the AC/Vehicle Type (Field F of the Data Block) and the Aircraft Category (Field G of the Data Block). [R152 Deleted] While a track is in a suspended state, it shall [R614] be represented by icon E (see 3.1.8) regardless of the contents of the data block. TABLE VII depicts selection of icon type based on AC/Vehicle type and track state.

TABLE VII: Selection of target icon

Valid Beacon Code	Yes	Yes	Don't Care	Don't Care	Don't Care	Don't Care	No
Type	None	None	Aircraft	Aircraft	Vehicle	Don't Care	None
Heavy	Not	Heavy	Not	Heavy	Don't Care	Don't Care	Don't Care
Suspended	Not	Not	Not	Not	Not	Yes	Not
Icon	**A**	**D**	**A**	**D**	**B**	**E**	**C**

The length of each operational icon type shall [R153] nominally represent a system configuration parameter number of feet on the display at the current map range in each window, (range 30 ft. - 300 ft. in 10-ft. increments). For example, the length of icon (A) could represent 70 ft., the length of icon (B) could represent 30 ft., *etc*. [R154 Deleted] However, each Airport Surface Application target icon type shall [R407] have a minimum size adaptable by selecting system configuration parameters (nominal range 1.00 mm - 25.00 mm).

When the calculated velocity for a track is greater than or equal to a system configuration parameter number of knots, then the orientation of each icon shall [R155] represent the calculated heading for the track. When the calculated velocity for a track is less than the system configuration parameter number of knots, then the orientation of each icon shall [R156] represent the calculated heading for the track as long as the calculated heading does not change more than a system configuration parameter number of degrees (X = ±1° - ±45°) per display update. If the calculated heading for the track does change more than the selected parameter number of degrees per display update, then the icon shall [R157] only rotate the parameter number of degrees per display update until it has caught up with the calculated track heading. [R158 Deleted] [R159 Deleted]

3.1.6.1.2 Maintenance Target Icons

[R160 Deleted] Maintenance target icons shall [R408] only be viewable in the maintenance mode. [R161 Deleted] Target icons in the maintenance mode shall [R409] allow the user to identify all sensor components which are used to calculate the fused target. Authorized maintenance personnel shall [R162] be able to select and view any combination of sensor reports from the sensor subsystems and the fused position.

3.1.6.2 Functional Feedback Indicators

3.1.6.2.1 Cursors

3.1.6.2.1.1 Cursor Icons

[R163 Deleted] The Airport Surface Application system shall [R410] be capable of displaying seven distinct cursor icons. The cursor icons shall [R164] be adaptable by selecting system configuration parameters. The cursor shall [R165] not travel off of the display area. For example, the cursor should not wrap from top to bottom or side to side.

The nominal cursor size shall [R166] be 6.35 mm wide by 6.35 mm high. Cursor icons are shown in FIGURE 22 Cursor (A) shall [R167] be used as a default. The point of focus for cursor (A) shall [R168] be where the lines cross. Cursor (B) shall [R169] indicate a selectable item that has no other specified cursor (*e.g.*, temporary map areas, trait areas, off areas, *etc.*). The point of focus for cursor (B) shall [R170] be the dot in the middle. Cursor (C) shall [R171] indicate DCB focus when the cursor is not trapped. Cursor (D) shall [R172] indicate DCB focus when the cursor is trapped. The point of focus for cursors (C) and (D) shall [R173] be the tip of the arrow. Cursor (E) shall [R411] indicate that the user may adjust a horizontal secondary window border up or down. The point of focus for cursor (E) shall [R412] be the center of the vertical line between the arrowheads. Cursor (F) shall [R413] indicate that the user may adjust a vertical secondary window border left or right. The point of focus for cursor (F) shall [R414] be the center of the horizontal line between the arrowheads. Cursor (G) shall [R415] indicate that the user may adjust a corner of a secondary window in any direction. Cursor (G) shall [R416] also indicate that a secondary window, the coast/suspend list, or the preview area can be repositioned in any direction. The point of focus for cursor (G) shall [R417] be where the lines cross.

When the point of focus for the cursor is positioned over a selectable object (e.g., target icon, suspend list entry, DCB button, etc.), the object shall [R418] be highlighted by dwell emphasis.

3.1.6.2.1.2 Cursor Home

The Airport Surface Application shall [R174] have a Cursor Home function, which can be toggled (on/off) by the user. [R175 Deleted] [R176 Deleted] [R177 Deleted] When the cursor home function is toggled on, and focus is not in the DCB, the cursor shall [R419] warp to the home position defined by selecting system configuration parameters and is hidden from view when a command is completed. If the cursor home function is toggled on, and the DCB is not in a submenu, the cursor shall [R420] warp to the defined home position and hide from view after it has been idle for a system configuration parameter number of seconds. When the cursor home function is toggled off, and focus is not in the DCB, the cursor shall [R421] remain in position when a command is completed and is hidden from view at that location. If the cursor home function is toggled off, and the DCB is not in a submenu, the cursor shall [R422] remain in position and hide from view at that location after it has been idle for a system configuration parameter number of seconds.

3.1.6.2.2 Track Selection Indicators

3.1.6.2.2.1 Single-Track Selection Halo

The Airport Surface Application shall [R615] encircle a target icon with a single-track selection halo (with optional data block border and background) when the user can select the track for initiating or completing a function. The radius of the single-track selection halo shall [R616] be adaptable by selecting system configuration parameters (range 20 ft. – 300 ft. in 5-ft. increments) and whose center point is located at the centroid of the track. The color of the single-track selection halo shall [R617] be adaptable by selecting system configuration parameters. The radius of the single-track selection halo shall [R618] have a minimum size adaptable by selecting system configuration parameters (nominal range 1.00 mm - 27.00 mm). A rectangular border having the same color as the single-track selection halo shall [R619] be adaptable by selecting system configuration parameters (*i.e.*, toggle (on/off)) to be displayed around the track's data block when the single-track selection halo is visible.

3.1.6.2.2.2 Target Icon Layering

When the Airport Surface Application displays the track selection halo for a track, it shall [R620] display the track, the track's data block, and all associated selection indicators (*e.g.*, track selection halo, border around the data block, data block background) in a plane above other targets in the active window as shown in FIGURE 23.

3.1.7 Target Position Indicators

3.1.7.1 Target History Trails

The history trail is the set of all the displayed history data points. Target History Trails are illustrated in FIGURE 24. The Airport Surface Application shall [R178] be capable of displaying from 1 – 7 target history data points. Target history data points shall [R179] indicate the centroid of the most recently displayed target icon positions. For example, the system will not be capable of displaying the fourth most recent history data point without also showing the first, second, and third most recent history data points. The user shall [R180] be able to select the number of target history data points. The most recent history data shall [R181] never be brighter than the target icon. The apparent brightness of history data shall [R182] decrease once per scan according to the following formula:

$$\text{History data point RGB value set} = [\text{Track RGB value set}]*((6/7)^{(\text{history data point number})})$$

TABLE VIII: Example calculation of history data point RGB value sets

Object	Formula	RGB Value Set
Track Icon		[255, 255, 255]
History data point 1	[255, 255, 255]*((6/7)^(1))	[219, 219, 219]
History data point 2	[255, 255, 255]*((6/7)^(2))	[187, 187, 187]
History data point 3	[255, 255, 255]*((6/7)^(3))	[161, 161, 161]
History data point 4	[255, 255, 255]*((6/7)^(4))	[138, 138, 138]
History data point 5	[255, 255, 255]*((6/7)^(5))	[118, 118, 118]
History data point 6	[255, 255, 255]*((6/7)^(6))	[101, 101, 101]
History data point 7	[255, 255, 255]*((6/7)^(7))	[87, 87, 87]

The size of history trails shall [R423] be adaptable by selecting system configuration parameters (nominal range 0.50 mm - 5.00 mm).

3.1.7.2 Velocity Vector Lines

The system shall [R183] provide Velocity Vector Lines which are derived from past and/or current track speed and heading. The Vector Line shall [R184] indicate the target's predicted position. The system shall [R185] be capable of providing Vector Lines in 1 second increments from 1 to 20 seconds. Each Velocity Vector Line shall [R186] originate from the centroid of the current track position. The user shall [R187] be capable of toggling (on/off) the Velocity Vector Lines.

3.1.8 Lists

3.1.8.1 Track Coast/Track Suspend List

The system shall [R188] have a track coast list and a track suspend list. These lists shall [R189] be displayed in a combined area as shown in FIGURE 25. The combined list shall [R424] have no border. [R190 Deleted] [R191 Deleted] The combined list shall [R425] have a transparent background capable of simultaneously showing through to multiple windows. The track coast/suspend list shall [R192] be wide enough to display coast or suspend status, unique identifier (indicated in TABLE IX), target ACID, and a vertical scroll bar. In the combined coast/suspend list, tracks shall [R426] be grouped together in the list: coasted tracks at the top, suspended tracks in the middle, and dropped tracks at the bottom. A new track (coast, suspend, or drop) shall [R427] enter the coast/suspend list at the top of the appropriate grouping.

The track coast/suspend list shall [R193] automatically resize vertically to display up to five coasted, suspended or dropped tracks. When the number of tracks exceeds 5, an arrow shall [R194] appear on the right hand side of the bottom entry in the list, indicating that additional tracks are in the list. The user shall [R195] be able to select the arrow, allowing the user to view the next page (up to 5 tracks in the "unexpanded" list) in the list. For example, if there were 9 tracks in the list, page 1 would contain 5 tracks and page 2 would contain 4 tracks. The user shall [R196] be able to continue moving through the list using the down arrow or return to the previous page of information using a corresponding up arrow on the right hand side of the top entry in the list. The title bar of the coast/suspend list shall [R197] act as a button to expand the list to its full length, displaying all of its contents without moving the title bar of the coast/suspend list. The coast/suspend list shall [R198] not expand off the display area. If the contents of the coast/suspend list cannot be viewed even in the expanded mode, then navigational arrows similar to those used in the "unexpanded" list shall [R199] appear to allow the user to view the unseen portions of the list. The title bar of the coast/suspend list shall [R200] act as a button to contract the list to display five tracks or less. The contents of the track suspend list and of the track coast list shall [R201] be the same for each display channel.

TABLE IX: Track types and their identifier range

Track State/Type	Associated Identifier Range
Suspended Tracks	A-Z
Local Aircraft and Vehicles	101-276
Coasted Tracks	300-999

[R202 Deleted] The date and time shall [R203] appear in the title bar of the coast/suspend list. Greenwich Mean Date and Time shall [R204] be displayed. The date shall [R205] be in the format MM/DD/YY. The time shall [R206] be in the format HHMM/SS.

3.1.8.1.1 Track Coast List

The Airport Surface Application system shall [R207] place tracks into a coasted state under three conditions:

1. The Airport Surface Application system no longer detects, by at least one sensor subsystem, a target that has been under track. (see 3.1.8.1.1.1)

2. The Airport Surface Application system is unable to accurately associate the correct data block with a target. (The incorrect association of a data block and a target is operationally unacceptable. If the Airport Surface Application system is not confident that a data block and a target are correctly associated, then the track in question should be placed in a coasted state.) (see 3.1.8.1.1.2)

3. The target enters a ramp area. (see 3.1.8.1.1.3)

Information for tracks that are represented by an “unknown” icon (see 3.1.6.1.1) shall [R621] not appear in the track coast list. FIGURE 26 illustrates the states of a track and how a target can progress through the states into a coast situation.

3.1.8.1.1.1 Coast List Situation 1

When a track enters a coasted state as in situation 1 in Section 3.1.8.1.1, the following will happen:

1. Field E of the data block shall [R208] change to “CST.” Field E shall [R209] display “CST” as long as the multiprocessor indicates that there is no surveillance for a track. If the multiprocessor indicates that surveillance has been restored, then Field E shall [R210] display the appropriate sensor coverage for the track. [R428 Deleted] [R211 Deleted] [R212 Deleted] [R213 Deleted] [R214 Deleted]

2. [R215 Deleted] The coasted track information shall [R622] appear in the track coast list once the multiprocessor drops a track. [R216 Deleted] The coasted track information shall [R650] consist of a letter “C”, a unique 3-digit number (indicated in TABLE IX), and the Aircraft Callsign or Beacon Code (fields B and C of the data block) as shown in FIGURE 27. [R217 Deleted] If there is no information in fields B or C of the data block, then the list shall [R429] display “C”, XXX (3-digit number) and “NO DATA.” [R218 Deleted] After the multiprocessor drops a track, the dropped track information shall [R623] be displayed in the track coast list for a period of time (range 30 seconds to 10 minutes) adaptable by changing system configuration parameters, or until the user either assigns the track's information to a track with neither an ACID nor a Beacon Code or executes a terminate control sequence.

3.1.8.1.1.2 Coast List Situation 2

When a track enters a coasted state as in situation 2 in Section 3.1.8.1.1, the following will happen:

1. Once the multiprocessor indicates uncertainty in target identification, the target icon representing the target’s current position shall [R219] change to the "Unknown" icon. The target’s current position shall [R220] continue to be represented by the "Unknown" icon as long as the multiprocessor indicates an uncertainty in track identification. [R221 Deleted] [R222 Deleted] [R430 Deleted]

2. Once the multiprocessor indicates uncertainty in target identification, the coasted track information shall [R223] appear in the track coast list. [R224 Deleted] The coasted track information shall [R624] consist of a letter "C" (corresponding to the appearance of the "Unknown" icon), a unique 3-digit number (indicated in TABLE IX), and the Aircraft Callsign or Beacon Code (fields B and C of the data block) as shown in FIGURE 28. [R224b Deleted] If there is no information in fields B or C of the data block, then the list shall [R431] display "C", XXX (3-digit number) and “NO DATA.” The coasted track information shall [R625] be displayed in the track coast list for a period of time (range 30 seconds to 10 minutes) adaptable by changing system configuration parameters, or until the user either assigns the track's information to a track with neither an ACID nor a Beacon Code or executes a terminate control sequence. If the user executes a terminate control sequence, the coasted track information shall [R225] be removed from the coast list. [R226 Deleted] If the user assigns the coasted track information to a track with neither an ACID nor Beacon Code, the coasted track information shall [R227] be removed from the coast list, [R228 Deleted] and the coasted track information shall [R229] be assigned to the selected track. If the multiprocessor indicates that there is no longer track identification uncertainty then the coasted track information shall [R230] be removed from the coast list, [R231 Deleted] and the coasted track information shall [R232] be assigned to the correct track.

The Airport Surface Application shall [R233] incorporate algorithms to reassociate tracks with "coast" status automatically.

3.1.8.1.1.2.1 Duplicate Beacon Codes

[R234 Deleted] If the Airport Surface Application detects a new target with a beacon code identical to one already associated with another target, then Field A of the new target shall [R432] display "DUP BCN". While the situation persists, the ACID (field B of the Data Block) shall [R235] timeshare with the Beacon Code (field C of the Data Block) on a period of between 1 and 4 seconds, adaptable by selecting system configuration parameters.

If the system associates a data block with a track, and then its beacon code changes, the Airport Surface Application shall [R236] attempt to associate a new data block with the track while not excluding the original data block from association with another track in the future.

3.1.8.1.1.2.2 Duplicate Callsigns

If the Airport Surface Application detects a new target with a callsign identical to one already associated with another target, then Field A of the new target shall [R433] display "DUP ID".

3.1.8.1.1.3 Coast List Situation 3

When a track enters a coasted state as in situation 3 in Section 3.1.8.1.1, the following will happen:

1. Field E of the data block shall [R237] change to “CST.”

2. The dropped track information shall [R237b] appear in the track coast list. The dropped track information shall [R238] consist of a letter "D" (indicating that the multiprocessor has dropped the track), XXX (3-digit number), and the Aircraft Callsign or Beacon Code (fields B and C of the data block) as shown in FIGURE 29. [R238b Deleted] The dropped track information shall [R434] be displayed in the track coast list for a period of time (range 30 seconds to 10 minutes) adaptable by changing system configuration parameters, or until the user either assigns the track's information to a track with neither an ACID nor Beacon Code or executes a terminate control sequence.

3.1.8.1.2 Track Suspend List

The user shall [R239] be able to place an individual track into a suspended state. [R240 Deleted] The maximum number of suspended tracks shall [R435] be 26. When a track is placed into a suspended state, the following will happen:

1. The system shall [R241] assign a unique one-character suspend letter (indicated in TABLE IX) for the track.

2. The unique suspend letter shall [R242] appear on the suspended icon and replace the target icon as shown in FIGURE 30.

3. The letter “S”, the unique suspend letter and the Aircraft Callsign or Beacon Code shall [R243] appear in a track suspend list as shown in FIGURE 30.

The Airport Surface Application system shall [R244] associate the suspended track with its suspended data by dwell emphasis over the unique suspend number present on the suspended track. Dwell emphasis over the suspended track shall [R245] highlight both the suspended track and all suspended data present in the track suspend list with Target Icon Highlight Color 1.

The Airport Surface Application system shall [R246] associate the suspended data for a track with the suspended track by dwell emphasis over the suspended data present in the track suspend list. Dwell emphasis over suspended data in the track suspend list shall [R247] highlight both the suspended track and all of its suspended data present in the track suspend list with Target Icon Highlight Color 1.

The user shall [R248] be able to remove an individual track from a suspended state by clicking on either area of dwell emphasis described above**.**

Suspended tracks which are not dropped by the user or removed from the suspend list shall [R249] be purged from the track suspend list after a period of time (range from 1 - 24 hours) adaptable by selecting system configuration parameters.

If a track in a suspended state enters the coast state, then it shall [R250] behave as described in Section 3.1.8.1.1 and its subsections. The Airport Surface Application system shall [R251] only allow the user to suspend targets identified as vehicles, aircraft, or heavy aircraft.

3.1.8.2 Local Aircraft and Vehicle List

The Airport Surface Application shall [R252] have a list of local aircraft and vehicles accessible through the display control bar as shown in FIGURE 31. The local list information and its auxiliary data shall [R253] be adaptable by changing system configuration parameters. The list shall [R254] contain a unique three-digit number (indicated in TABLE IX) and the Callsign (Field B of the Data Block). The list shall [R255] be capable of containing at least 176 local aircraft and vehicles. The local aircraft and vehicle list shall [R256] accommodate blank entries.

Data from the local aircraft and vehicle list shall [R257] never be simultaneously associated with more than one track in the coverage volume.

The system shall [R258] have auxiliary data associated with each entry in the local list. This auxiliary data shall [R259] correspond to data block fields B (callsign) C (beacon code), F (aircraft type), G (aircraft category), H (paired fix or gate information), J (Scratchpad Area 1), and K (Scratchpad Area 2). The auxiliary data shall [R436] also include a field for the unique Mode-S transponder identification code.

The user shall [R260] be able to associate the data in the local aircraft and vehicle list with a track in the coverage volume. Once the user associates data in the local aircraft and vehicle list with a track, a data block shall [R261] appear in accordance with data tag display preferences and any data block toggle areas applicable to the track. When a user associates data from the local aircraft and vehicle list with a track the appropriate data block for the track shall [R262] change on all display channels.

The Airport Surface Application shall [R263] automatically associate data from the local aircraft and vehicle list with a target whenever possible. For example, if a user manually edits a data block and enters a callsign that matches one in the local list, the system should automatically label the target with all additional information contained in the local list. In an additional example, if the system detects a transponder code that matches information in the local list, the system should automatically label the target with all additional information contained in the local list.

3.1.8.3 Preview Area

[R264 Deleted] The system shall [R437] have a preview area which provides alphanumeric feedback (*i.e.*, keystrokes and interpretations of the functional accelerators entered by the user) to users. For example, the key sequence "F7" "B" "ENTER" would appear as "MULT B" in the Preview Area as shown in FIGURE 32. [R438 Deleted] The first line of the preview area shall [R639] [SL] indicate the title of the currently selected airport traffic configuration. The second line of the preview area shall [R640] be reserved to display system responses to user interactions (*e.g.*, INVALID ENTRY, *etc.*). When any portion of safety logic is disabled, the system shall [R439] [SL] indicate the condition in the safety logic status line of the preview area. The safety logic status line shall [R440] [SL] appear between the system response line and the functional feedback resulting from user interactions. Unless otherwise specified, all system responses to user interactions, including dwell emphasis and functional feedback, shall [R441] occur with no discernible time lag (not to exceed 100 msec). The preview area shall [R442] have no border. [R265

Deleted] The preview area shall [R443] have a transparent background capable of simultaneously showing through to multiple windows.

3.1.8.3.1 Preview Area Interaction

When the cursor is present in a suggested entry, that entry will be referred to as the active entry. Whenever the Airport Surface Application presents the active entry to the user, the cursor shall [R444] initially appear to the right of the last character of the active entry. The Airport Surface Application shall [R445] allow a user to accept a suggested entry and move to the next field when the user depresses either the <ENTER> key, the <TAB> key, or the <down arrow> key, unless specified otherwise elsewhere in this document.

The Airport Surface Application shall [R446] allow the user to edit a suggested entry when the user depresses the <BACKSPACE> key, the <DELETE> key, the <left arrow> key, or the <right arrow> key. Depressing the <BACKSPACE> key shall [R447] delete the character immediately to the left of the cursor from the active entry. Depressing the <DELETE> key shall [R448] delete the character immediately to the right of the cursor from the active entry. Depressing the <left arrow> key shall [R449] move the cursor one character to the left in the active entry. Depressing the <right arrow> key shall [R450] move the cursor one character to the right in the active entry. Once the system allows the user to modify a suggested entry, any printable characters shall [R451] be inserted in the active entry at the cursor location until the entry is accepted.

If the user has not chosen to edit the active entry, the Airport Surface Application shall [R452] allow the user to replace the active entry by typing any printable character (including the spacebar). The system shall [R453] accept the entry when the user depresses the <ENTER> key or the <TAB> key.

The Airport Surface Application System shall [R454] allow the user to return to the previous field when the user depresses the <up arrow> key, allowing the user to re-accept, replace, or edit the previous entry.

The Airport Surface Application shall [R455] respond to trackball movement during preview area interaction as synonymous with using the arrow keys as specified above. For example, rolling the trackball left is synonymous with depressing the <left arrow> key; rolling the trackball right is synonymous with depressing the <right arrow> key; rolling the trackball up is synonymous with depressing the <up arrow> key; and rolling the trackball down is synonymous with depressing the <down arrow> key.

The cursor shall [R456] not wrap from one end of a suggested entry to the other, from the top entry to the bottom, or from the bottom entry to the top.

3.1.9 User Preferences

The Airport Surface Application system shall [R266] be able to store up to 32 user preference sets for each of 150 users. After selection, the user preference set shall [R267] take effect in no more than 2 seconds. [R268 Deleted] At least the following parameters shall [R457] [SL] be saved for each user preference set:

1. Location and size of each secondary window
2. Coast/Suspend List On/Off
3. Coast/Suspend List Location
4. DCB Location
5. DCB On/Off
6. Data Blocks On/Off for each window
7. Data Block State (Full/Partial)
8. Selected Fields in Full Data Block
9. Default Data Block Position
10. All Brightness Controls
11. All character sizes
12. Range Scale in each window
13. Center Point for each window
14. Map Orientation for each window
15. Leader Line Length
16. History Trail Length
17. Cursor Speed
18. Cursor Home (on/off)
19. Alert Message Text Box Location
20. Preview Area Location
21. Data Block Trait Areas
22. Data Block Off Areas
23. Velocity Vector on/off for each window
24. Velocity Vector Length

The Airport Surface Application shall [R269] identify each user preference set with a unique two-letter identifier and a corresponding unique three-digit identifier. The unique two-letter identifier should correspond to the user's operating initials. The list of valid two-letter identifiers and corresponding three-digit identifiers shall [R270] be adaptable by selecting site configuration parameters. [R271 Deleted] The Airport Surface Application shall [R458] require a valid password (*i.e.*, a 4-digit PIN) to change a user preference set. A user shall [R272] be able to view and select any preference set using either the correct two-letter identifier or the corresponding unique three-digit identifier.

3.1.10 Temporary Map Data

[R273 Deleted] [R274 Deleted] [R275 Deleted] [R275a Deleted] [R276 Deleted] [R277 Deleted] [R278 Deleted] [R279 Deleted] [R279a Deleted] [R279b Deleted] [R279c Deleted] [R279d Deleted]

Temporary map data shall [R459] consist of polygons used to define closed and restricted areas and text objects used to provide free-format alphanumeric information. The Airport Surface Application shall [R460] allow users to create temporary map data for display anywhere within the coverage volume. [R461 Deleted] The user shall [R645] be able to create, remove, display, and hide the temporary map data. The temporary map data shall [R462] always cover the same geographic area over which it was defined, regardless of map range, position, and orientation.

3.1.10.1 Closed and Restricted Temporary Map Areas

The Airport Surface Application shall [R463] allow the user to define two types of temporary map areas (closed and restricted), each with its own color and fill pattern as shown in FIGURE 33. In the figure, the closed area is displayed in red with parallel lines (/) used as the fill pattern while the restricted area is displayed in yellow with parallel lines (/) used as the fill pattern. [R464 Deleted] Each closed and restricted temporary map area shall [R465] be defined by a polygon having up to 20 sides. The size of the fill patterns and the spacing between the fill patterns shall [R466] remain fixed regardless of map range, position, and orientation. The angle of the intersection between lines in the fill pattern and the longest three sides of the temporary map polygon shall [R646] be greater than a system configuration number of degrees (range: 1° – 29°). [R467 Deleted] As much of the fill pattern as possible should be displayed within each temporary map area, with minimal clipping of the fill pattern at the edges of each temporary map area.

3.1.10.2 Temporary Map Text

Temporary map text objects shall [R468] consist of an anchor point, a leader line, and a data block as shown in FIGURE 33. The temporary map text objects shall [R469] consist of one or two lines of free format alphanumeric text, with each line containing up to 16 characters. The first line (Line 1) of a temporary map text object shall [R470] contain at least one character. The second line shall [R471] only be displayed if it contains text. The leader line shall [R472] connect the anchor point to the temporary map text object as specified above in TABLE V. When temporary map areas and temporary map text overlap, the temporary map text shall [R473] always be displayed above the temporary map areas.

Text in the temporary map text objects shall [R474] be left justified. If either line in the data block has less than the maximum number of characters, then the unused characters shall [R475] occupy space within the temporary map text object up to and including the rightmost visible character. The information in the temporary map text object shall [R476] always be horizontal and readable from left to right when the display is upright. The Airport Surface Application shall [R477] allow the user to toggle the free format alphanumeric data on/off, change leader line direction, and length in the same manner as data block information. [R478 Deleted] [R479 Deleted] [R480 Deleted] [R481 Deleted]

3.1.10.3 Temporary Map Data Deactivation

The Airport Surface Application shall [R482] allow the user to selectively deactivate one or more temporary map data objects. [R483 Deleted] [R484 Deleted] When deactivating temporary map data, global temporary map data shall [R647] be removed from all display channels.

3.1.10.4 Temporary Map Data Visibility

The Airport Surface Application system shall [R485] allow a user to selectively hide from view one or more active global temporary map data objects on his or her display channel. The Airport Surface

Application shall [R486] not allow a user to hide temporary map data on another user's display channel. The user shall [R487] be able to display all hidden temporary map data on his or her display channel.

3.1.10.5 Temporary Map Data Storage

[R488 Deleted] The Airport Surface Application shall [R648] allow users to store up to 88 user-defined global temporary map data objects on the system. The system shall [R649] allow a temporary map data object to be stored only once (*e.g.*, in only one button). The user shall [R489] be able to delete temporary map data from storage. If the stored temporary map data is active when the user deletes it, then the temporary map data shall [R490] be removed from storage, but remains active. If the stored temporary map data is inactive when the user deletes it, then the temporary map data shall [R491] be removed from the system.

3.1.10.6 Predefined Surface Closures and Restrictions

The Airport Surface Application shall [R492] [SL] be capable of storing 26 predefined surface closures and restrictions. The Airport Surface Application shall [R493] [SL] allow each predefined surface closure or restriction to contain a polygon having up to 20 sides and up to two lines of free format alphanumeric data as shown in FIGURE 34. The Airport Surface Application shall [R494] [SL] allow an authorized user who has been granted access to more extensive maintenance data while in operational mode to save polygons and text as predefined surface closures and restrictions. Once saved by the authorized user, predefined surface closures and restrictions shall [R495] [SL] become available at all display channels for selection without rebooting any portion of the system.

The Airport Surface Application shall [R496] [SL] allow the user to activate any combination of the predefined surface closures and restrictions. Active predefined surface closures and restrictions shall [R497] [SL] appear on all display channels. Active predefined surface closures and restrictions shall [R498] [SL] be considered in processing safety alert logic.

3.1.10.7 Temporary Track Drop Areas

The Airport Surface Application shall [R626] allow users to establish up to 30 temporary areas where radar sensor data will not contribute to establishing or updating a track.

3.1.11 System Startup Parameters

The system shall [R280] be adaptable to startup in a predetermined display state after a system cold start as defined by a set of system startup parameters. One set of System Startup Parameters shall [R281] apply to all display channels. [R282 Deleted] The system startup parameters shall [R499] [SL] define the initial state of the following user functions:

1. System Mode
2. Number of secondary windows
3. Location and size of each secondary window
4. Coast/Suspend List On/Off
5. Coast/Suspend List Location
6. DCB Location
7. DCB On/Off
8. Data Blocks On/Off
9. Data Block State (Full/Partial)
10. Selected Fields in Full Data Block
11. Default Data Block Position
12. All Brightness Controls
13. All character sizes
14. Range Scale in each window
15. Center Point for each window
16. Map Orientation for each window
17. Leader Line Length
18. History Trail Length
19. Cursor Location
20. Cursor Speed
21. Alert Volume
22. Alert Window Location
23. Preview Area Location
24. Color Palette Choice
25. Velocity Vector Lines (on/off) for each window
26. Velocity Vector Lines Length

After an unplanned system shutdown, the system shall [R283] be able to restart with each display channel in the display configuration that was present not more than one minute before the unplanned shutdown.

3.1.12 System Modes

3.1.12.1 Operational Mode

[R284 Deleted] In the operational mode, the user shall [R500] be able to access all functions needed for operational use of the Airport Surface Application system. [R285 Deleted] The Airport Surface Application system shall [R501] be able to display basic system health data while in Operational Mode. [R286 Deleted] In the operational mode, users shall [R502] also be able to view more extensive maintenance data without affecting the operational integrity of another channel. The user shall [R287] be prompted for a password before being able to view additional maintenance data. [R288 Deleted] Each channel shall [R503] be able to independently access the additional maintenance data without affecting the system mode of another channel.

3.1.12.1.1 Operational Playback Mode

[R289 Deleted] In the operational playback mode, the user shall [R504] be able to access functions needed to review previously recorded data. [R290 Deleted] Operational Playback Mode shall [R505] not affect the operational integrity of other display channels. [R291 Deleted] A user accessing the operational playback mode shall [R506] be prompted for a password before being granted access to additional functionality and data. [R292 Deleted] Each channel shall [R507] be able to independently access the operational playback mode without affecting the system mode of another channel. [R293 Deleted] When a display channel has been put into operational playback mode, a clear indication of the display channel's mode shall [R508] be displayed at all times.

The system shall [R509] allow the user to access, at a minimum, the set of playback functions listed below in TABLE X.

TABLE X: List and description of playback controls

Row	Function	Function Description
1.	PLAY/ PAUSE	1. The “PLAY” button should allow the recorded data log to be displayed on the Display Channel in real time. The “PLAY” button is changed to the “PAUSE” button. The “PAUSE” button stops the recorded data log and freezes the current view on the Display Channel. Depressing the primary trackball button over the “PAUSE” button again returns the Display Channel to PLAY mode and the “PLAY” button is returned to the DCB.
2.	STOP	1. The “STOP” button causes the recorded data log to cease to play.
3.	END	1. The “END” button causes the recorded data log to advance to the user-selected end time.
4.	FAST FORWARD	1. The “FAST FORWARD ” button causes the recorded data log to play in forward motion on the Display Channel in a speed faster than real time.
5.	BEGIN	1. The “BEGIN” button causes the recorded data log to return to the user-selected start time.
6.	FAST REWIND	1. The “FAST REWIND” button causes the recorded data log to be played on the Display Channel in the reverse direction at a speed faster than real time.

TABLE X: List and description of playback controls – Continued.

Row	Function	Function Description
7.	START TIME	1. This area allows the user to enter the start date (MM/DD/YY) of the recorded data log they wish to view.
8.	DURATION	1. This area allows the user to enter the duration (HHMM/SS) of the recorded data log they wish to view.
9.	LOG TIME	1. Displays a rolling display of the start time plus the number of seconds that have elapsed in the recording accurate to the nearest second.
10.	LOG DATE	1. Displays the date for the associated log time.
11.	DONE	1. The "DONE" button closes the playback session.

3.1.12.2 Maintenance Mode

[R294 Deleted] In the maintenance mode, the user shall [R510] be able to access all Airport Surface Application functions including system adaptation, system configuration, and sensor control functions. A user requesting access to the maintenance mode shall [R295] be prompted for a password. [R296 Deleted] Once the correct password is entered correctly, all display channels shall [R511] enter the maintenance mode. [R297 Deleted] Leaving maintenance mode shall [R512] place all display channels in operational mode.

The Airport Surface Application shall [R298] allow the user to run and view the results of FIT from any display channel. The Airport Surface Application shall [R299] allow the user to view all system BIT from any display channel.

3.1.13 System Indicators

3.1.13.1 System Mode Indicator

The Airport Surface Application shall [R300] have an indicator of the current system mode (*e.g.*, operational, maintenance). Each display channel shall [R513] indicate if it has access to more functions than are needed for operational use (*e.g.*, playback controls, and limited maintenance controls). Examples of these indicators are shown in TABLE XI below.

TABLE XI: System mode indicators

System Mode	Accessible Functions	Illustration
Operational	Operational	FIGURE 35
Operational	Non-Interactive Playback	FIGURE 36
Operational	Interactive Playback	FIGURE 37
Operational	Maintenance	FIGURE 38
Maintenance	Non-Interactive Playback	FIGURE 39
Maintenance	Interactive Playback	FIGURE 40
Maintenance	Maintenance	FIGURE 41

3.1.13.2 System Health Indicator

[R301 Deleted] [R302 Deleted] [R303 Deleted] [R304 Deleted] The Airport Surface Application shall [R652] indicate two levels (green, red) of subsystem-level system health. The Green level (normal) shall [R653] indicate that the subsystem components are operating properly. The Red level (failed) shall [R654] indicate a failure that renders the subsystem operationally unusable.

3.1.14 User Control

3.1.14.1 Display Control Bar

The Airport Surface Application system shall [R305] have a Display Control Bar as a means for the user to select or alter data for display, adjust the display channel settings, and access system level data as shown in FIGURE 42. The Display Control Bar shall [R306] be made up of selectable buttons and other graphical controls (*e.g.,* sliders, radio buttons, check boxes, *etc.*). Labels for any graphical controls shall [R307] be in upper case letters. The user shall [R308] be able to select (from the font sizes defined in Section 3.1.5) the character size used in the Display Control Bar. The overall size of the Display Control Bar shall [R309] remain unchanged as a result of character size selection.

All buttons shall [R514] be center justified (left to right) when the DCB is in a horizontal position and center justified (up and down) when the DCB is in a vertical position. A submenu is considered to be bounded by the buttons in the submenu. That is, the blank space around the submenu buttons is not considered to be part of the submenu. The user shall [R310] be able to access submenus using the main Display Control Bar, if necessary. If the user does not need to use the cursor outside of the DCB to complete a submenu function, then the cursor shall [R311] be contained within the bounds of that submenu. The cursor shall [R312] be released when the user returns to the main DCB, or if a function requiring its release is invoked. The user shall [R313] be able to place the Airport Surface Application Display Control Bar in one of four positions as shown in FIGURE 42 and as shown in FIGURE 43: 1) horizontally at the top of the display, 2) horizontally at the bottom of the display 3) vertically on the left side of the display, or 4) vertically on the right side of the display. The user shall [R314] be able to hide the Display Control Bar from view. When the DCB is hidden from view, the DCB on/off button, system health indicator and system mode indicator shall [R315] appear in the upper right-hand corner of the display. [R316 Deleted] When the DCB is hidden from view, the system shall [R515] allow the user to restore the DCB to the last viewed location.

When the Display Control Bar is displayed horizontally, the nominal overall size shall [R317] be the width of the display by no more than 23.40 mm high. When the Display Control Bar is displayed vertically the nominal overall size shall [R318] be the height of the display by no more than 23.40 mm wide. The minimum Display Control Bar button size shall [R319] be 23.40 mm wide by 11.54 mm high.

Toggle buttons on the DCB depicting two options shall [R320] indicate to the user which option is currently selected as shown in FIGURE 44. DCB buttons that invoke a function shall [R321] be shaded differently than DCB buttons that do not invoke a function (e.g., opens a submenu, changes the options in a list, etc.)

When a submenu is visible, any higher-level menus and higher-level submenus shall [R516] be hidden from view until the user exits the submenu (higher).

DCB buttons that indicate the value of a parameter (*e.g.*, RANGE 130) shall [R322] indicate the correct value for the active window.

3.1.14.1.1 Display Control Bar Buttons

[R323 Deleted] [R517 Deleted] The DCB buttons and controls shall [R627] [SL] be organized and have the functionality as defined in TABLE XII below:

TABLE XII: DCB buttons and controls

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
1.	RANGE				1. Depressing the primary trackball button over the "RANGE" DCB button, the user may decrease the range scale in the active window (zoom in) by rolling the trackball down, or the user may increase the range scale in the active window (zoom out) by rolling the trackball up. The range scale in the active window changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current range. The current range is displayed on the second line of the range button in hundreds of feet during range scale adjustment and after range scale selection. 2. Depressing the primary trackball button over the "RANGE" DCB button, the user may select the range scale in the active window by typing in the desired range in hundreds of feet. Depressing the "ENTER" key on the data entry device selects the range. The selected range is displayed on the second line of the range button in hundreds of feet.		a) Method 1: (blank system response line) RANGE b) Method 2: (blank system response line) RANGE <Entry> c) Invalid Entry: INVALID RANGE
2.	MAP RPOS				1. Depressing the primary trackball button over the "MAP RPOS" DCB button, the user may reposition the map in the active window in any direction by rolling the trackball in the desired direction. The map position in the active window changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current map position. 2. Depressing the <configured function accelerator sequence (*e.g.*, F8 key)> on the data entry device, the user may	F8	a) All Methods: (blank system response line) MAP RPOS

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					reposition the map in the active window in any direction by rolling the trackball in the desired direction. The map position in the active window changes as the user manipulates the trackball. Depressing the primary trackball button selects the current map position.		
3.	ROTATE				1. Depressing the primary trackball button over the "ROTATE" DCB button, the user may rotate the map in the active window clockwise to any map orientation by rolling the trackball to the right, or the user may rotate the map in the active window counter clockwise to any map orientation by rolling the trackball to the left. The map orientation in the active window changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current map orientation. 2. Depressing the primary trackball button over the "ROTATE" DCB button, the user may type in the desired heading. The map orientation in the active window changes to the user selected map heading. Depressing the "ENTER" key on the data entry device selects the current map orientation.		a) Method 1: (blank system response line) ROTATE b) Methods 2: (blank system response line) ROTATE <Entry> c) Invalid Entry: INVALID ENTRY
4.	UNDO				1. Depressing the primary trackball button over the "UNDO" DCB button, the user may restore the display channel settings to the values immediately preceding the most recent system function. 2. Depressing <configured function accelerator sequence (*e.g.*, F10 key)> on the data entry device, , the user may restore the display channel settings to the values immediately preceding the most recent system function.	F9	a) Valid Entry: (No Feedback) b) Invalid Entry: NOTHING TO UNDO
5.	DEFAULT				1. Depressing the primary trackball button over the "DEFAULT" DCB button, the user may restore the display channel settings to the values contained in the system startup parameters excepting system mode, DCB position, and alert volume,	HOME	(No Feedback)

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					which will not change. 2. Depressing <configured function accelerator sequence (*e.g.*, Default key)> on the data entry device, the user may restore the display channel settings to the values contained in the system startup parameters excepting system mode, DCB position, and alert volume, which will not change.		
6.	PREF <TITLE>				1. Depressing the primary trackball button over the "PREFS" DCB button, the DCB will change to display the user preference set submenu with the most recently viewed set name. 2 Depressing <configured function accelerator sequence (*e.g.*, F1 key)> then "ENTER" on the data entry device, the DCB will change to display the user preference set submenu with the most recently viewed set name. 3 Depressing <configured function accelerator sequence (*e.g.*, F1 key)> <two-letter operating initials> then "ENTER" on the data entry device, the DCB will change to display the user preference set submenu with the set name indicated by the two-letter operating initials. 4 Depressing <configured function accelerator sequence (*e.g.*, F1 key)> <three-number operating numbers> "ENTER" on the data entry device, the DCB will change to display the user preference set submenu with the set name indicated by the three-number operating numbers. 5 Depressing <configured function accelerator sequence (*e.g.*, F1 key)> <two-letter operating initials > <number> then "ENTER" on the data entry device, the display channel will assume the values contained in the user preference set indicated by the two-letter operating initials and number. The valid range for the number is 1-32. 6 Depressing <configured function accelerator sequence (*e.g.*, F1 key)><three-digit operating numbers> <number> "ENTER" on the data entry device, the display channel will	F1	a) Methods 1, 2: (blank system response line) PREFS b) Methods 3, 4, 5, 6: (blank system response line) PREFS <Entry> c) Invalid Entry: INVALID PREF

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					assume the values contained in the user preference set indicated by the three-number operating numbers. The valid range for the number is 1-32.		
7.	PREF <TITLE>	PRESET			1. Depressing the primary trackball button over one of thirty-two (32) preset DCB buttons (two sets of 16: 1-16 and 17-32) for the current operating initials, the display channel will assume the values contained in the selected user preference set. The title of the selected user preference set appears on the second line of the "PREFS" button on the main DCB. Each preset button displays the current operating initials and a two-digit number on the first row (*e.g.,* PW1), and the title (max of seven characters) on the second (*e.g.,* NORTH). 2. Depressing <configured function accelerator sequence (*e.g.*, F1 key)> <number> "ENTER" on the data entry device, the display channel will assume the values contained in the current user preference set. The valid range for the number is 1-32.	F1	a) Method 1: (blank system response line) PREFS b) Method 2: (blank system response line) PREFS <Entry> c) Invalid Entry: INVALID PREF d) Preference Not Defined NO STORED DATA
8.	PREF <TITLE>	17-32			1. Depressing the primary trackball button over the "17-32" DCB button for the current operating initials, the DCB will display preference sets 17-32 for the current operating initials. Each preset button displays the current operating initials and a two-digit number on the first row (*e.g.,* PW1), and the title (max of seven characters) on the second (*e.g.,* NORTH).		a) All Methods: (blank system response line) PREFS
9.	PREF <TITLE>		1-16		1. Depressing the primary trackball button over the "1-16" DCB button for the current operating initials, the DCB will display preference sets 1-16 for the current operating initials. Each preset button displays the current operating initials and a two-digit number on the first row (*e.g.,* PW1), and the title (max of seven characters) on the second (*e.g.,* NORTH).		a) All Methods: (blank system response line) PREFS
10.	PREF <TITLE>	DEFAULT			1. Depressing the primary trackball button over the "DEFAULT" DCB button, the user may restore the display channel settings to the values contained in the system startup parameters excepting system mode, DCB position, and alert volume, which will not change.		(No Feedback)

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
11.	PREF <TITLE>	DELETE			1. Depressing the primary trackball button over the “DELETE” DCB button and then depressing the primary trackball button over the desired preset DCB button or typing the desired preset identifier in the preview area (*e.g.,* JL01, 12501, *etc.*), the user will be prompted for the correct 4-digit PIN to delete the selected user preference set. The user must type the correct 4-digit PIN in the preview area to delete the selected user preference set. The system masks the user's PIN entry by displaying an asterisk (*) for each character typed. The user completes the action by depressing the <ENTER> key on the data entry device. If the user enters an invalid PIN, then the system indicates this, but allows the user to enter another PIN.		a) All Methods: (blank system response line) PREFS DELETE: <PREF> PIN: <Entry> b) Valid PIN: <PREF> DELETED PREFS c) Invalid PIN: INVALID PIN PREFS DELETE: <PREF> PIN: <Entry>
12.	PREF <TITLE>	SAVE AS			1. Depressing the primary trackball button over the “SAVE AS” DCB button, the user will be prompted in the preview area for the preference set identifier (*e.g.,* JL01, 12501, *etc.*), the preference set title (up to seven characters), and the correct 4-digit PIN to save the current display settings as the selected user preference set. By default, the system displays the next available preference set identifier for the current operating initials, which may be overwritten by the user. The system masks the user's PIN entry by displaying an asterisk (*) for each character typed. The user completes the action by depressing the <ENTER> key on the data entry device, and the system verifies that the user entered the correct PIN. If the correct PIN has been entered, then the current display channel settings will be saved as the selected user preference set, and its button will show the new title on the second line. If the user enters an invalid PIN or an invalid set name, then the system indicates this in the preview area, but allows the user to enter another PIN.		a) All Methods: (blank system response line) PREFS SAVE AS SET: <Entry> TITLE: <Entry> PIN: <Entry> b) Valid Entry <PREF> SAVED PREFS c) Invalid PIN INVALID PIN PREFS SAVE AS SET: <Entry> TITLE: <Entry> PIN: <Entry> d) Invalid Set INVALID SET PREFS

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
							SAVE AS SET: <Entry> TITLE: <Entry> PIN: <Entry>
13.	PREF <TITLE>	CHG PIN			1. Depressing the primary trackball button over the "CHG PIN" DCB button, the user will be prompted in the preview area to enter his operating initials (e.g., JL) or unique identifier (e.g., 125), old 4-digit PIN, new 4-digit PIN, and confirm the new PIN. By default, the system displays the current operating initials, which may be overwritten by the user. The system masks the user's PIN entries by displaying an asterisk (*) for each character typed. The user completes the action by depressing the <ENTER> key on the data entry device, and the system verifies that the user entered the correct PIN. The system will verify that the user entered the correct old PIN and identical new PINs. If everything is correct, then the PIN for the selected user preference set will be changed to the value entered by the user. If everything is not correct, then the system indicates an invalid entry and clears all the fields so the user may fill them again.		a) All Methods: (blank system response line) PREFS CHG PIN OP INITS: <Entry> OLD PIN: <Entry> NEW PIN: <Entry> CONFIRM NEW PIN: <Entry> b) Valid Entry: <OP INITS> PIN CHANGED PREFS c) Invalid Entry: INVALID ENTRY PREFS CHG PIN OP INITS: <Entry> OLD PIN: <Entry> NEW PIN: <Entry> CONFIRM NEW PIN: <Entry>
14.	PREF <TITLE>	OP INITS <##>			1. Depressing the primary trackball button over the “OP INITS” DCB button, the DCB will display the title of the current set (*e.g.*, PW, JL, DG). The user may type either two-letter identifiers or corresponding three-digit identifiers, but the two-letter identifiers should be displayed on the second line of the “OP INITS” button.		a) All Methods: (blank system response line) PREFS OP INITS <Entry> b) Invalid Entry INVALID ENTRY
15.	PREF <TITLE>	DONE			1. Depressing the primary trackball button over the “DONE” DCB button, the DCB will change to display the main DCB.	ESC	(No Feedback)
16.	BRITE				1. Depressing the primary trackball button over the “BRITE”		a) All Methods:

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					DCB button, the DCB will change to display the brightness submenu.		(blank system response line) BRITE
17.	BRITE	HOLD BARS <##>			1. Depressing the primary trackball button over the "HOLD BARS" DCB button, the user may increase the brightness of the hold bars in the active window by rolling the trackball up, or the user may decrease the brightness of the hold bars by rolling the trackball down. The brightness of hold bars in the active window changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current brightness (range 1-99). The current brightness is displayed on the second line of the HOLD BARS button during brightness adjustment and after brightness selection. 2. Depressing the primary trackball button over the "HOLD BARS" DCB button, the user may select the brightness of the hold bars in the active window by typing in the desired brightness. Depressing the "ENTER" key on the data entry device selects the brightness. The selected brightness is displayed on the second line of the HOLD BARS button after brightness selection.		a) Method 1: (blank system response line) BRITE HOLD BARS b) Method 2: (blank system response line) BRITE HOLD BARS <Entry> c) Invalid Entry: INVALID ENTRY BRITE
18.	BRITE	MVMENT AREA <##>			1. Depressing the primary trackball button over the "MVMENT AREA" DCB button, the user may increase the brightness of the movement areas in the active window by rolling the trackball up, or the user may decrease the brightness of the movement areas by rolling the trackball down. The brightness of movement areas in the active window changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current brightness (range 1-99). The current brightness is displayed on the second line of the MVMENT AREA button during brightness adjustment and after brightness selection. 2. Depressing the primary trackball button over the "MVMENT AREA" DCB button, the user may select the brightness of the movement areas in the active window by typing in the desired		a) Method 1: (blank system response line) BRITE MVMENT AREA b) Method 2: (blank system response line) BRITE MVMENT AREA <Entry> c) Invalid Entry: INVALID ENTRY BRITE

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					brightness. Depressing the "ENTER" key on the data entry device selects the brightness. The selected brightness is displayed on the second line of the MVMENT AREA button after brightness selection.		
19.	BRITE	BAKGND <##>			1. Depressing the primary trackball button over the "BAKGND" DCB button, the user may increase the brightness of the background map areas in the active window by rolling the trackball up, or the user may decrease the brightness of the background map areas by rolling the trackball down. The brightness of background map areas in the active window changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current brightness (range 1-99). The current brightness is displayed on the second line of the BAKGND button during brightness adjustment and after brightness selection. 2. Depressing the primary trackball button over the "BAKGND" DCB button, the user may select the brightness of the background map areas in the active window by typing in the desired brightness. Depressing the "ENTER" key on the data entry device selects the brightness. The selected brightness is displayed on the second line of the BAKGND button after brightness selection.		a) Method 1: (blank system response line) BRITE BAKGND b) Method 2: (blank system response line) BRITE BAKGND <Entry> c) Invalid Entry: INVALID ENTRY BRITE
20.	BRITE	TRACK <##>			1. Depressing the primary trackball button over the "TRACK" DCB button, the user may increase the brightness of the target icons in the active window by rolling the trackball up, or the user may decrease the brightness of the target icons by rolling the trackball down. The brightness of target icons in the active window changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current brightness (range 1-99). The current brightness is displayed on the second line of the target icon button during brightness adjustment and after brightness selection. 2. Depressing the primary trackball button over the "TRACK"		a) Method 1: (blank system response line) BRITE TRACK b) Method 2: (blank system response line) BRITE TRACK <Entry> c) Invalid Entry: INVALID ENTRY

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					DCB button, the user may select the brightness of the target icons in the active window by typing in the desired brightness. Depressing the "ENTER" key on the data entry device selects the brightness. The selected brightness is displayed on the second line of the target icon button after brightness selection.		BRITE
21.	BRITE	DATA BLOCKS <##>			1. Depressing the primary trackball button over the "DATA BLOCKS" DCB button, the user may increase the brightness of the target data blocks in the active window by rolling the trackball up, or the user may decrease the brightness of the target data blocks by rolling the trackball down. The brightness of target data blocks in the active window changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current brightness (range 1-99). The current brightness is displayed on the second line of the data block button during brightness adjustment and after brightness selection. 2. Depressing the primary trackball button over the "DATA BLOCKS" DCB button, the user may select the brightness of the target data blocks in the active window by typing in the desired brightness. Depressing the "ENTER" key on the data entry device selects the brightness. The selected brightness is displayed on the second line of the data block button after brightness selection.		a) Method 1: (blank system response line) BRITE DATA BLOCKS b) Method 2: (blank system response line) BRITE DATA BLOCKS <Entry> c) Invalid Entry: INVALID ENTRY BRITE
22.	BRITE	LISTS <##>			1. Depressing the primary trackball button over the "LISTS" DCB button, the user may simultaneously increase the brightness of the Coast/Suspend list, and the preview area by rolling the trackball up, or the user may simultaneously decrease the brightness of the Coast/Suspend list, and the preview area by rolling the trackball down. The brightness of the lists changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current brightness (range 1-99). The current brightness is displayed on the second line of the lists button during		a) Method 1: (blank system response line) BRITE LISTS b) Method 2: (blank system response line) BRITE LISTS <Entry> c) Invalid Entry:

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					brightness adjustment and after brightness selection. 2. Depressing the primary trackball button over the "LISTS" DCB button, the user may simultaneously select the brightness of the Coast/Suspend list, and the preview area by typing in the desired brightness. Depressing the "ENTER" key on the data entry device selects the brightness. The selected brightness is displayed on the second line of the lists button after brightness selection.		INVALID ENTRY BRITE
23.	BRITE	TEMP MAP AREAS <##>			1. Depressing the primary trackball button over the "TEMP MAP AREAS" DCB button, the user may increase the brightness of the temporary map areas by rolling the trackball up, or the user may decrease the brightness of the temporary map areas by rolling the trackball down. The brightness of the temporary map areas changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current brightness (range 1-99). The current brightness is displayed on the second line of the temporary map areas button during brightness adjustment and after brightness selection. 2. Depressing the primary trackball button over the "TEMP MAP AREAS" DCB button, the user may select the brightness of the temporary map areas by typing in the desired brightness. Depressing the "ENTER" key on the data entry device selects the brightness. The selected brightness is displayed on the second line of the temporary map areas button after brightness selection.		a) Method 1: (blank system response line) BRITE TEMP MAP AREAS b) Method 2: (blank system response line) BRITE TEMP MAP AREAS <Entry> c) Invalid Entry: INVALID ENTRY BRITE
24.	BRITE	TEMP MAP TEXT <##>			1. Depressing the primary trackball button over the "TEMP MAP TEXT" DCB button, the user may increase the brightness of the temporary map text by rolling the trackball up, or the user may decrease the brightness of the temporary map text by rolling the trackball down. The brightness of the temporary map text changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current brightness (range 1-99). The current brightness is		a) Method 1: (blank system response line) BRITE TEMP MAP TEXT b) Method 2: (blank system response line) BRITE TEMP MAP TEXT

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					displayed on the second line of the temporary map text button during brightness adjustment and after brightness selection. 2. Depressing the primary trackball button over the "TEMP MAP TEXT" DCB button, the user may select the brightness of the temporary map text by typing in the desired brightness. Depressing the "ENTER" key on the data entry device selects the brightness. The selected brightness is displayed on the second line of the temporary map text button after brightness selection.		<Entry> c) Invalid Entry: INVALID ENTRY BRITE
25.	BRITE	DCB <##>			1. Depressing the primary trackball button over the "DCB" DCB button, the user may increase the brightness of the display control bar by rolling the trackball up, or the user may decrease the brightness of the display control bar by rolling the trackball down. The brightness of the display control bar changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current brightness (range 1-99). The current brightness is displayed on the second line of the DCB button during brightness adjustment and after brightness selection. 2. Depressing the primary trackball button over the "DCB" DCB button, the user may select the brightness of the display control bar by typing in the desired brightness. Depressing the "ENTER" key on the data entry device selects the brightness. The selected brightness is displayed on the second line of the DCB button after brightness selection.		a) Method 1: (blank system response line) BRITE DCB b) Method 2: (blank system response line) BRITE DCB <Entry> c) Invalid Entry: INVALID ENTRY BRITE
26.	BRITE	DONE			1. Depressing the primary trackball button over the "DONE" DCB button, the DCB will change to display the main DCB.	ESC	(No Feedback)
27.	DAY/NITE				1. Depressing the primary trackball button over the "DAY/NITE" DCB button, the display channel will assume the values contained in the selected color palette. 2. Depressing the <configured function accelerator sequence (*e.g.*, F9 key)> on the data entry device, the display channel will assume the values contained in the selected color palette.	F10	(No Feedback)

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
28.	CHAR SIZE				1. Depressing the primary trackball button over the "CHAR SIZE" DCB button, the DCB will change to display the character size submenu.		a) All Methods: (blank system response line) CHAR SIZE
29.	CHAR SIZE	DATA BLOCK <#>			1. Depressing the primary trackball button over the "DATA BLOCK" DCB button, the user may increase the size of text in the target data blocks by rolling the trackball up, or the user may decrease the size of text in the target data blocks by rolling the trackball down. The size of text in the target data blocks changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current size of text in the target data blocks (range 1-6). The current size of text in the target data blocks is displayed on the second line of the target data block button during character size adjustment and after character size selection. 2. Depressing the primary trackball button over the "DATA BLOCK" DCB button, the user may select the size of text in the target data blocks by typing in the desired text size (range 1-6). Depressing the "ENTER" key on the data entry device selects the size of text in the target data blocks. The selected text size is displayed on the second line of the target data block button after character size selection.		a) Method 1: (blank system response line) CHAR SIZE DATA BLOCK b) Method 2: (blank system response line) CHAR SIZE DATA BLOCK <Entry> c) Invalid Entry: INVALID SIZE CHAR SIZE
30.	CHAR SIZE	DCB <#>			1. Depressing the primary trackball button over the "DCB" DCB button, the user may increase the size of text in the DCB by rolling the trackball up, or the user may decrease the size of text in the DCB by rolling the trackball down. The size of text in the DCB changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current size of text in the DCB (range 1-3). The current size of text in the DCB is displayed on the second line of the DCB button during character size adjustment and after character size selection. 2. Depressing the primary trackball button over the "DCB" DCB button, the user may select the size of text in the DCB by		a) Method 1: (blank system response line) CHAR SIZE DCB b) Method 2: (blank system response line) CHAR SIZE DCB <Entry> c) Invalid Entry: INVALID SIZE CHAR SIZE

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					typing in the desired text size (range 1-3). Depressing the "ENTER" key on the data entry device selects the size of text in the DCB. The selected text size is displayed on the second line of the DCB button after character size selection.		
31.	CHAR SIZE	COAST SUSPEND <#>			1. Depressing the primary trackball button over the "COAST SUSPEND" DCB button, the user may increase the size of text in the coast/suspend list by rolling the trackball up, or the user may decrease the size of text in the coast/suspend list by rolling the trackball down. The size of text in the coast/suspend list changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current size of text in the coast/suspend list (range 1-6). The current size of text in the coast/suspend list is displayed on the second line of the coast suspend button during character size adjustment and after character size selection. 2. Depressing the primary trackball button over the "COAST SUSPEND" DCB button, the user may select the size of text in the coast/suspend list by typing in the desired text size (range 1-6). Depressing the "ENTER" key on the data entry device selects the size of text in the coast/suspend list. The selected text size is displayed on the second line of the coast suspend button after character size selection.		a) Method 1: (blank system response line) CHAR SIZE CS LIST b) Method 2: (blank system response line) CHAR SIZE CS LIST <Entry> c) Invalid Entry: INVALID SIZE CHAR SIZE
32.	CHAR SIZE	TEMP DATA <#>			1. Depressing the primary trackball button over the "TEMP DATA" DCB button, the user may increase the size of text in the temporary map text objects by rolling the trackball up, or the user may decrease the size of text in the temporary map text objects by rolling the trackball down. The size of text in the temporary map text objects changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current size of text in the temporary map text objects (range 1-6). The current size of text in the temporary map text objects is displayed on the second line of the temp data button during character size adjustment and after character		a) Method 1: (blank system response line) CHAR SIZE TEMP DATA b) Method 2: (blank system response line) CHAR SIZE TEMP DATA <Entry> c) Invalid Entry: INVALID SIZE

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					size selection. 2. Depressing the primary trackball button over the "TEMP DATA" DCB button, the user may select the size of text in the temporary map text objects by typing in the desired text size (range 1-6). Depressing the "ENTER" key on the data entry device selects the size of text in the temporary map text objects. The selected text size is displayed on the second line of the temp data button after character size selection.		CHAR SIZE
33.	CHAR SIZE	PREVIEW AREA <#>			1. Depressing the primary trackball button over the "PREVIEW AREA" DCB button, the user may increase the size of text in the preview area by rolling the trackball up, or the user may decrease the size of text in the preview area by rolling the trackball down. The size of text in the preview area changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current size of text in the preview area (range 1-6). The current size of text in the preview area is displayed on the second line of the preview area button during character size adjustment and after character size selection. 2. Depressing the primary trackball button over the "PREVIEW AREA" DCB button, the user may select the size of text in the preview area by typing in the desired text size (range 1-6). Depressing the "ENTER" key on the data entry device selects the size of text in the preview area. The selected text size is displayed on the second line of the preview area button after character size selection.		a) Method 1: (blank system response line) CHAR SIZE PREVIEW b) Method 2: (blank system response line) CHAR SIZE PREVIEW <Entry> c) Invalid Entry: INVALID SIZE CHAR SIZE
34.	CHAR SIZE	DONE			1. Depressing the primary trackball button over the "DONE" DCB button, the DCB will change to display the main DCB.	ESC	(No Feedback)
35.	LDR LNG <#>				1. Depressing the primary trackball button over the "LDR LNG" DCB button, the user may increase the length of all leader lines by rolling the trackball up, or the user may decrease the length of all leader lines by rolling the trackball down. The length of the leader lines changes as the user manipulates the trackball	/ > <#> > ENTER	a) Method 1: (blank system response line) LDR LNG b) Method 2: (blank system response line)

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					(range 0-15). Depressing the primary trackball button again selects the current leader line length. The current leader line length is displayed on the second line of the leader line length button during leader line length adjustment and after leader line length selection. 2. Depressing <configured function accelerator key sequence (*e.g.*, "/")> <#> (range 0-15) "ENTER" on the data entry device, the user may select the length of all leader lines by typing in the desired length (range 0-15). Depressing the "ENTER" key on the data entry device selects the leader line length. The selected leader line length is displayed on the second line of the leader line length button		LDR LNG <Entry> c) Invalid Entry: INVALID LNG
36.	VECTOR ON/OFF				1. Depressing the primary trackball button over the "VECTOR ON/OFF" DCB button, the predicted track lines will be toggled on or off in the active window.		(No Feedback)
37.	TEMP DATA				1. Depressing the primary trackball button over the "TEMP DATA" DCB button, the DCB will change to display the temporary map data submenu.		a) All Methods: (blank system response line) TEMP DATA
38.	TEMP DATA	CLOSED RWY			1. Depressing the primary trackball button over the "CLOSED RWY" DCB button, the DCB will display the closed and restricted surfaces submenu.		a) All Methods: (blank system response line) TEMP DATA CLOSED RWY
39.	TEMP DATA	CLOSED RWY	<PRESET> OPN/CLSD		1. Depressing the primary trackball button over a <PRESET> OPN/CLSD button, the user can close or restrict each of up to 26 predefined areas. The selected closure or restriction affects the alerts that are generated by safety logic.		a) All Methods: (blank system response line) TEMP DATA CLOSED RWY
40.	TEMP DATA	CLOSED RWY	DONE		1. Depressing the primary trackball button over the "DONE" DCB button, the DCB will change to display the TEMP DATA DCB submenu.	ESC	a) All Methods: (blank system response line) TEMP DATA
41.	TEMP DATA	STORED GLOBAL TEMP			1. Depressing the primary trackball button over the "STORED GLOBAL TEMP DATA" DCB button, the DCB will change to display the stored temporary map data submenu.		a) All Methods: (blank system response line) TEMP DATA

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
		DATA					STORED GLOBAL DATA
42.	TEMP DATA	STORED GLOBAL TEMP DATA	PRESET		1. Depressing the primary trackball button over a preset DCB button, temporary map data stored for the selected preset is displayed in all windows on every display channel. If the temporary map data for the selected preset causes the system to exceed the maximum number of maps, then the system will not activate the selected preset data, and the user will receive an error. Each preset button displays a two-digit number on the first row, and the title (max of seven characters) on the second (*e.g.*, TXYB). If the user depresses the primary trackball button over the preset DCB button for a piece of stored temporary map data that is both active and visible on the current display channel, temporary map data associated with the selected preset is removed from display in all windows on every display channel. If the user depresses the primary trackball button over the preset DCB button for a piece of stored temporary map data that is active, but has been hidden on the current display channel, temporary map data associated with the selected preset is toggled to be viewable on the current display channel. The color of the text on buttons whose associated temporary map data is active is DCB Toggle Selected Option Text Color (see 3.1.2) while the data is active. The color of the text on buttons whose associated temporary map data is inactive is DCB Text (see 3.1.2) while the data is inactive.		a) All Methods: (blank system response line) TEMP DATA STORED GLOBAL DATA b) Temp Data Not Defined NO STORED DATA TEMP DATA STORED GLOBAL DATA
42a.	TEMP DATA	STORED GLOBAL TEMP DATA	23-44		1. Depressing the primary trackball button over the "23-44" DCB button, the DCB will display stored global temporary maps 23-44, and the “1-22” DCB button.		a) All Methods Before Data Selection: (blank system response line) TEMP DATA STORED GLOBAL DATA
42c.	TEMP DATA	STORED GLOBAL TEMP DATA		1-22	1. Depressing the primary trackball button over the "1-22" DCB button, the DCB will display stored global temporary maps 1-22, and the “23-44” DCB button.		a) All Methods Before Data Selection: (blank system response line) TEMP DATA STORED GLOBAL DATA

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
42d.	TEMP DATA	STORED GLOBAL TEMP DATA	45-88		1. Depressing the primary trackball button over the "45-88" DCB button, the DCB will display stored global temporary maps 45-66, the “1-44” DCB button and the “67-88” DCB button.		a) All Methods Before Data Selection: (blank system response line) TEMP DATA STORED GLOBAL DATA
42e.	TEMP DATA	STORED GLOBAL TEMP DATA		1-44	1. Depressing the primary trackball button over the "1-44" DCB button, the DCB will display stored global temporary maps 1-22, and the “23-44” DCB button.		a) All Methods Before Data Selection: (blank system response line) TEMP DATA STORED GLOBAL DATA
42f.	TEMP DATA	STORED GLOBAL TEMP DATA		67-88	1. Depressing the primary trackball button over the "67-88" DCB button, the DCB will display stored global temporary maps 67-88, and the “45-66” DCB button.		a) All Methods Before Data Selection: (blank system response line) TEMP DATA STORED GLOBAL DATA
42g.	TEMP DATA	STORED GLOBAL TEMP DATA		45-66	1. Depressing the primary trackball button over the "45-66" DCB button, the DCB will display stored global temporary maps 45-66, the “67-88” DCB button. Note that the “45-66” DCB button is only visible when preset buttons for stored global temporary maps 67-88 are visible.		a) All Methods Before Data Selection: (blank system response line) TEMP DATA STORED GLOBAL DATA
42b.	TEMP DATA	STORED GLOBAL TEMP DATA	SAVE		1. Depressing the primary trackball button over the “SAVE” DCB button, the user may select a global temporary map data object using the primary trackball button. The temporary map data object is highlighted when selected. The system prompts the user in the preview area for the preset identifier (*e.g.*, 1, 2, *etc.*) and the preset title (one to seven characters) required to save the temporary map data object. By default, the system displays the next available stored global temporary map data preset identifier, which may be overwritten by the user. The user may also select one of the preset buttons to overwrite the preset identifier entry with the button’s corresponding preset identifier. The user completes the action by depressing the <ENTER> key on the data entry device. The title entered by the user appears on the second line of the appropriate preset button on all display channels.		a) All Methods Before Data Selection: (blank system response line) TEMP DATA STORED GLOBAL DATA SAVE b) All Methods After Data Selection: (blank system response line) TEMP DATA STORED GLOBAL DATA SAVE SET: <Entry> TITLE: <Entry> c) Valid Entry: <SET> SAVED TEMP DATA STORED GLOBAL DATA

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
							d) No Global Temp Data On Display NO GLOBAL DATA TEMP DATA STORED GLOBAL DATA e) Global Temp Data Not Selected NO SLEW TEMP DATA STORED GLOBAL DATA f) Invalid Set or Title: INVALID SET TEMP DATA STORED GLOBAL DATA SAVE SET: <Entry> TITLE: <Entry> g) Data Already Stored in Preset: DATA IN SET <Set> TEMP DATA STORED GLOBAL DATA SAVE SET: <Entry> TITLE: <Entry>
43.	TEMP DATA	STORED GLOBAL TEMP DATA	DELETE PRESET		1. Depressing the primary trackball button over the "DELETE PRESET" DCB button, the user is prompted for the preset identifier (*e.g.*, 1, 2, *etc.*) of the stored global temporary map data to delete. The user may type the desired preset identifier in the preview area or select one of the preset DCB buttons to place its associated preset identifier into the preview area. If the user types the preset identifier, the user then completes the action by depressing the <ENTER> key on the data entry device. Once the action is complete, the system then prompts the user in the preview area to confirm the deletion of the stored global temporary map data. If the user confirms the		a) All Methods: (blank system response line) TEMP DATA STORED GLOBAL DATA DELETE PRESET SET: <Entry> b) Valid Entry <SET> DELETED TEMP DATA STORED GLOBAL DATA c) No Stored Global Temp Map Data

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					deletion of the stored global temporary map data, then the system removes the stored global temporary map data associated with the preset identifier and clears the title on the second line of the corresponding preset button on all display channels. If the user does not confirm the deletion of the stored global temporary map data, then the data is retained. If the global temporary map data associated with the preset identifier is active, this function does not remove the global data from the display.		NO STORED DATA TEMP DATA STORED GLOBAL DATA d) Invalid Set INVALID SET TEMP DATA STORED GLOBAL DATA DELETE PRESET SET:<Entry> e) After completion (blank system response line) TEMP DATA STORED GLOBAL DATA DELETE PRESET DELETE? 1 = NO 2 = YES (1 or 2):<Entry> f) Invalid Entry INVALID ENTRY TEMP DATA STORED GLOBAL DATA DELETE PRESET DELETE? 1 = NO 2 = YES (1 or 2):<Entry>
44.	TEMP DATA	STORED GLOBAL TEMP DATA	DONE		1. Depressing the primary trackball button over the “DONE” DCB button, the DCB will change to display the TEMP DATA DCB submenu.	ESC	a) All Methods: (blank system response line) TEMP DATA
45.	(Row intentionally blank)						
46.	(Row intentionally blank)						

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
47.	(Row intentionally blank)						
48.	(Row intentionally blank)						
49.	(Row intentionally blank)						
50.	TEMP DATA	DEFINE CLOSED AREA			1. Depressing the primary trackball button over the "DEFINE CLOSED AREA" DCB button, the user can define a closed global temporary map area having up to 20 sides. The user depresses the primary trackball button to place each vertex of the polygon. When the user presses the secondary trackball button, the system completes the polygon by drawing a line between the first and last vertices. Should the user define the maximum number of vertices, then the system automatically completes the polygon by drawing a line between the first and last vertices. When the polygon is complete, the data appears on all display channels.		a) All Methods: (blank system response line) TEMP DATA DEFINE CLOSED AREA b) Exceeds limit for temporary data ERROR: MAX LIMIT TEMP DATA
51.	TEMP DATA	DEFINE RESTR AREA			1. Depressing the primary trackball button over the "DEFINE RESTR AREA" DCB button, the user can define a restricted global temporary map area having up to 20 sides. The user depresses the primary trackball button to place each vertex of the polygon. When the user presses the secondary trackball button, the system completes the polygon by drawing a line between the first and last vertices. Should the user define the maximum number of vertices, then the system automatically completes the polygon by drawing a line between the first and last vertices. When the polygon is complete, the data appears on all display channels.		a) All Methods: (blank system response line) TEMP DATA DEFINE RESTRICTED AREA b) Exceeds limit for temporary data ERROR: MAX LIMIT TEMP DATA
52.	TEMP DATA	DEFINE TEXT			1. Depressing the primary trackball button over the “DEFINE TEXT” DCB button, the user is prompted to enter two lines of alphanumeric data, with each line holding up to 16 characters. The user must enter at least one character on the first line, but can leave the second line empty, if desired. Once the text has been entered, the user depresses the primary trackball button to place the anchor for the global temporary map text object somewhere in the coverage volume. When the text entry is		a) All Methods: (blank system response line) TEMP DATA DEFINE TEXT >:<Entry> >:<Entry> b) Too Many Characters Per Line ERROR: MAX LIMIT

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					complete, the data appears on all display channels.		TEMP DATA DEFINE TEXT >:<Entry> >:<Entry> c) Exceeds limit for temporary data ERROR: MAX LIMIT TEMP DATA
53.	TEMP DATA	SHOW HIDDEN DATA			1. Depressing the primary trackball button over the "SHOW HIDDEN DATA" DCB button, the user can toggle all active global temporary data objects to be viewable on the current display channel.		a) All Methods: (blank system response line) TEMP DATA b) No Hidden Temp Map Data NO HIDDEN DATA TEMP DATA
54.	TEMP DATA	HIDE DATA			1. Depressing the primary trackball button over the “HIDE DATA” DCB button, the user may select global temporary map data objects using the primary trackball button. The selected global temporary map data objects are automatically highlighted and can be deselected by clicking again. When the user presses the secondary trackball button, the system hides the selected temporary map data from view in all windows on the current display channel.		a) All Methods: (blank system response line) TEMP DATA HIDE DATA b) No Global Temp Map Data NO GLOBAL DATA TEMP DATA
55.	TEMP DATA	DELETE GLOBAL			1. Depressing the primary trackball button over the “DELETE GLOBAL” DCB button, the user may select one or more global temporary map data objects to be deleted from all display channels using the primary trackball button. Each temporary map data object is highlighted when selected. The user can toggle a temporary map data object between a selected (highlighted) and deselected (unhighlighted) state by selecting it with the primary trackball button. When the user presses the secondary trackball button, the selected global temporary map data is deleted from all display channels. For selected map(s) that are saved in a stored global temporary map data preset, this function toggles the preset button to “off” (removing the		a) All Methods (blank system response line) TEMP DATA DELETE GLOBAL b) No Global Data On Display NO GLOBAL DATA TEMP DATA

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					map from view on all display channels) without affecting the contents of the preset button. This function deletes selected map(s) that are not saved in a stored global temporary map data preset.		
56.	(Row intentionally blank)						
57.	(Row intentionally blank)						
58.	TEMP DATA	DONE			1. Depressing the primary trackball button over the “DONE” DCB button, the DCB will change to display the main DCB.	ESC	(No Feedback)
59.	SAFETY LOGIC <TITLE>				1. Depressing the primary trackball button over the “SAFETY LOGIC” DCB button, the DCB will change to display the safety logic submenu. The bottom line of the SAFETY LOGIC button displays the title of the current runway configuration.		a) All Methods: (blank system response line) SAFETY LOGIC
60.	SAFETY LOGIC <TITLE>	CLOSED RWY			1. Depressing the primary trackball button over the "CLOSED RWY" DCB button, the DCB will display the closed and restricted surfaces submenu.		a) All Methods: (blank system response line) SAFETY LOGIC CLOSED RWY
61.	SAFETY LOGIC <TITLE>	CLOSED RWY	<PRESET> OPN/CLSD		1. Depressing the primary trackball button over a <PRESET> ON/OFF button, the user can close or restrict each of up to 26 predefined areas. The selected closure or restriction affects the alerts that are generated by safety logic.		a) All Methods: (blank system response line) SAFETY LOGIC CLOSED RWY
62.	SAFETY LOGIC <TITLE>	CLOSED RWY	DONE		1. Depressing the primary trackball button over the “DONE” DCB button, the DCB will change to display the SAFETY LOGIC submenu.	ESC	a) All Methods: (blank system response line) SAFETY LOGIC
63.	SAFETY LOGIC <TITLE>	RWY CONFIG			1. Depressing the primary trackball button over the “RWY CONFIG” DCB button, the DCB will change to display the runway configuration submenu. 2. Depressing <configured function accelerator sequence (*e.g.*, F2 key)> <number> “ENTER” on the data entry device, the runway configuration on all display channels will change to the selected runway configuration. The title of the selected runway configuration appears on the last line of the “SAFETY LOGIC” button on the main DCB and in the first line of the	F2	a) Method 1: (blank system response line) SAFETY LOGIC RWY CONFIG b) Method 2: (blank system response line) SAFETY LOGIC RWY CONFIG <Entry>

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					preview area. The valid range for the number is 1-60.		c) Invalid Entry: INVALID CONFIG SAFETY LOGIC RWY CONFIG d) Runway Configuration Not Defined NO STORED DATA SAFETY LOGIC RWY CONFIG
64.	SAFETY LOGIC <TITLE>	RWY CONFIG	PRESET		1. Depressing the primary trackball button over one of sixty (60) runway configuration DCB buttons (three sets of 20: 1-20, 21-40, and 41-60), all display channels will process tracks in safety logic according to the rules contained in the selected runway configuration. The title of the selected runway configuration appears on the last line of the "SAFETY LOGIC" button on the main DCB and in the first line of the preview area. Each preset button displays a two-digit number on the first row, and the title (max of seven characters) on the second (*e.g.,* NORTH).		a) All Methods: <CONFIG> CONFIRMED SAFETY LOGIC RWY CONFIG b) Runway Configuration Not Defined NO STORED DATA SAFETY LOGIC RWY CONFIG
65.	SAFETY LOGIC <TITLE>	RWY CONFIG	21-40		1. Depressing the primary trackball button over the "21-40" DCB button, the DCB will display runway configuration sets 21-40, the "1-20" DCB button, and the "41-60" DCB button. Each preset button displays a two-digit number on the first row, and the title (max of seven characters) on the second (*e.g.*, NORTH).		a) All Methods: (blank system response line) SAFETY LOGIC RWY CONFIG
66.	SAFETY LOGIC <TITLE>	RWY CONFIG		1-20	1. Depressing the primary trackball button over the "1-20" DCB button, the DCB will display runway configuration sets 1-20, the "21-40" DCB button, and the "41-60" DCB button. Each preset button displays a two-digit number on the first row, and the title (max of seven characters) on the second (e.g., NORTH).		a) All Methods: (blank system response line) SAFETY LOGIC RWY CONFIG
67.	SAFETY LOGIC <TITLE>	RWY CONFIG		41-60	1. Depressing the primary trackball button over the "41-60" DCB button, the DCB will display runway configuration sets 41-60, the "1-20" DCB button, and the "21-40" DCB button. Each		a) All Methods: (blank system response line) SAFETY LOGIC

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					preset button displays a two-digit number on the first row, and the title (max of seven characters) on the second (e.g., NORTH).		RWY CONFIG
68.	SAFETY LOGIC <TITLE>	RWY CONFIG	41-60		2. Depressing the primary trackball button over the "41-60" DCB button, the DCB will display runway configuration sets 41-60, the “1-20” DCB button, and the “21-40” DCB button. Each preset button displays a two-digit number on the first row, and the title (max of seven characters) on the second (e.g., NORTH).		a) All Methods: (blank system response line) SAFETY LOGIC RWY CONFIG
69.	SAFETY LOGIC <TITLE>	RWY CONFIG		1-20	2. Depressing the primary trackball button over the "1-20" DCB button, the DCB will display runway configuration sets 1-20, the “21-40” DCB button, and the “41-60” DCB button. Each preset button displays a two-digit number on the first row, and the title (max of seven characters) on the second (e.g., NORTH).		a) All Methods: (blank system response line) SAFETY LOGIC RWY CONFIG
70.	SAFETY LOGIC <TITLE>	RWY CONFIG		21-40	3. Depressing the primary trackball button over the "21-40" DCB button, the DCB will display runway configuration sets 21-40, the “1-20” DCB button, and the “41-60” DCB button. Each preset button displays a two-digit number on the first row, and the title (max of seven characters) on the second (e.g., NORTH).		a) All Methods: (blank system response line) SAFETY LOGIC RWY CONFIG
71.	(Row intentionally blank)						
72.	SAFETY LOGIC <TITLE>	RWY CONFIG	DONE		1. Depressing the primary trackball button over the “DONE” DCB button, the DCB will change to display the SAFETY LOGIC submenu.	ESC	a) All Methods: (blank system response line) SAFETY LOGIC
73.	SAFETY LOGIC <TITLE>	TOWER CONFIG			1. Depressing the primary trackball button over the "TOWER CONFIG" DCB button, the DCB will display the positions defined by the current airport configuration in the tower configuration submenu.		a) All Methods: (blank system response line) SAFETY LOGIC TOWER CONFIG
74.	SAFETY LOGIC <TITLE>	TOWER CONFIG	<DEFAULT POSITION> ON		1. Each <DEFAULT POSITION> ON button indicates that in the currently selected airport configuration, the current display channel is configured as <DEFAULT POSITION> and will receive alerts for that position as defined in system		a) All Methods: (blank system response line) SAFETY LOGIC TOWER CONFIG

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					configuration parameters. The user may not deselect a <DEFAULT POSITION> button. Examples of position labels may include but not be limited to LOCAL, GROUND, MAINT, SUPER, *etc.*		
75.	SAFETY LOGIC <TITLE>	TOWER CONFIG	<OTHER POSITION> ON/OFF		1. Depressing the primary trackball button over a <OTHER POSITION> ON/OFF button toggles the display to receive alert data for the indicated position in addition to other selected positions. For example, for the display configured to receive LOCAL1 alerts, the user could choose to also receive GROUND1 alerts in addition to the LOCAL1 alerts at the current display channel.		a) All Methods: (blank system response line) SAFETY LOGIC TOWER CONFIG
76.	SAFETY LOGIC <TITLE>	TOWER CONFIG	DONE		1. Depressing the primary trackball button over the "DONE" DCB button, the DCB will change to display the SAFETY LOGIC submenu.	ESC	a) All Methods: (blank system response line) SAFETY LOGIC
77.	Deleted						
78.	Deleted						
79.	Deleted						
80.	SAFETY LOGIC <TITLE>	ARR ALERTS	<POSITION NAME> ON/OFF		1. Depressing the primary trackball button over a <position name> DCB toggle button, the user can suppress all arrival alerts for the selected position name. Arrival alerts are considered to be those alerts that have been adapted in system configuration parameters as arrival alerts. The alerts are suppressed for the current position name on all affected display channel(s) for a period of time between 10 seconds and 30 minutes, adaptable by selecting system configuration parameters. If arrival alerts for a position name are toggled off, then pressing a <position name> DCB toggle button cancels the remaining time and restores the presentation of all arrival alerts for the current position name for the current runway configuration. While arrival alerts are suppressed for a position name, the text "ARR ALERTS OFF: <Position Name 1 code>, <Position Name 2 code>, …, <Position Name m code>" will appear in the preview area in the safety logic status		a) Arrival Alerts Off: (blank system response line) ARR ALERTS OFF: <Display Channel Position Name(s) code(s)> SAFETY LOGIC ARR ALERTS b) Arrival Alerts On: (blank system response line) SAFETY LOGIC ARR ALERTS

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					line below the system response line on all display channels. Pressing the CLEAR key will not clear the safety logic status line.		
81.	SAFETY LOGIC <TITLE>	ARR ALERTS	DONE		1. Depressing the primary trackball button over the “DONE” DCB button, the DCB will change to display the SAFETY LOGIC submenu.	ESC	a) All Methods: (blank system response line) SAFETY LOGIC
82.	SAFETY LOGIC <TITLE>	TRACK ALERT INHIB			1. Depressing the primary trackball button over the “TRACK ALERT INHIB” DCB button, then using the trackball to select the desired track (slew “ENTER”), the selected track is inhibited so that it is not processed in safety logic. The system places a square having the same color as the target icon around the inhibited target icon to indicate to users that it is not being processed in safety logic. Executing the sequence on a track already filtered from safety logic will restore the track so that it is again processed in safety logic. 2. Depressing <configured function accelerator sequence (e.g., F12 key)> then using the trackball to select the desired track (slew "ENTER"), the selected track is inhibited so that it is not processed in safety logic. The system places a square having the same color as the target icon around the inhibited target icon to indicate to users that it is not being processed in safety logic. Executing the sequence on a track already filtered from safety logic will restore the track so that it is again processed in safety logic.	F12	a) All Methods: (blank system response line) SAFETY LOGIC TRACK ALERT INHIB
83.	SAFETY LOGIC <TITLE>	ALL TRACKS ENABLE			1. Depressing the primary trackball button over the "ALL TRACKS ENABLE" DCB button, the user can simultaneously restore all inhibited tracks so that they are again processed in safety logic.		a) All Methods: (blank system response line) SAFETY LOGIC
84.	SAFETY LOGIC <TITLE>	ALERT RPOS			1. Depressing the primary trackball button over the “ALERT RPOS” DCB button, the user may reposition the conflict alert window to the desired position on the display.		a) All Methods: (blank system response line) SAFETY LOGIC ALERT RPOS
85.	SAFETY	VOL			1. Depressing the primary trackball button over the “VOL” DCB	F7 > V >	a) Methods 1, 3:

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
	LOGIC <TITLE>	<##>			button, the user may increase the conflict alert volume by rolling the trackball up, or the user may decrease the conflict alert volume by rolling the trackball down. The conflict alert volume changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current conflict alert volume. The current conflict alert volume is displayed on the second line of the alert volume button during conflict alert volume adjustment and after conflict alert volume selection. 2. Depressing <configured function accelerator sequence (*e.g.*, F7 key → "V")> <#> (range 1-99) "ENTER" on the data entry device, the user may select the conflict alert volume by typing in the desired conflict alert volume (range 1-99). Depressing the "ENTER" key on the data entry device selects the conflict alert volume. The selected conflict alert volume is displayed on the second line of the conflict alert volume button. 3. Depressing the primary trackball button over the "VOL" DCB button, the user may select the conflict alert volume by typing in the desired conflict alert volume (range 1-99). Depressing the "ENTER" key on the data entry device selects the conflict alert volume. The selected conflict alert volume is displayed on the second line of the conflict alert volume button.	<#> > ENTER	(blank system response line) SAFETY LOGIC VOLUME b) Method 2: (blank system response line) MULT V <Entry> c) Invalid Entry: INVALID VOL SAFETY LOGIC
86.	SAFETY LOGIC <TITLE>	VOL TEST			1. Depressing the primary trackball button over the "VOL TEST" DCB button, the system plays a pre-defined test message through the speakers at the current display channel. 2. Depressing <configured function accelerator sequence (*e.g.*, F7 key → "V" → "T")> "ENTER" on the data entry device, the system plays a pre-defined test message through the speakers at the current display channel.	F7 > V > T > ENTER	a) Method 1: (blank system response line) SAFETY LOGIC VOLUME TEST b) Method 2: (blank system response line) MULT V T
86a.	SAFETY LOGIC <TITLE>	DONE			1. Depressing the primary trackball button over the "DONE" DCB button, the DCB will change to display the main DCB.	ESC	(No Feedback)
87.	TOOLS				1. Depressing the primary trackball button over the "TOOLS"		a) All Methods:

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					DCB button, the DCB will change to display the tools submenu.		(blank system response line) TOOLS
88.	TOOLS	RANGE			1. Depressing the primary trackball button over the "RANGE" DCB button, the user may decrease the range scale in the active window (zoom in) by rolling the trackball down, or the user may increase the range scale in the active window (zoom out) by rolling the trackball up. The range scale in the active window changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current range. The current range is displayed on the second line of the range button in hundreds of feet during range scale adjustment and after range scale selection. 2. Depressing the primary trackball button over the "RANGE" DCB button, the user may select the range scale in the active window by typing in the desired range in hundreds of feet. Depressing the "ENTER" key on the data entry device selects the range. The selected range is displayed on the second line of the range button in hundreds of feet.		a) Method 1: (blank system response line) TOOLS RANGE b) Method 2: (blank system response line) TOOLS RANGE <Entry> c) Invalid Entry: INVALID RANGE TOOLS
89.	TOOLS	MAP RPOS			1. Depressing the primary trackball button over the "MAP RPOS" DCB button, the user may reposition the map in the active window in any direction by rolling the trackball in the desired direction. The map position in the active window changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current map position. 2. Depressing the <configured function accelerator sequence (*e.g.*, F8 key)> on the data entry device, the user may reposition the map in the active window in any direction by rolling the trackball in the desired direction. The map position in the active window changes as the user manipulates the trackball. Depressing the primary trackball button selects the current map position.	F8	a) All Methods: (blank system response line) TOOLS MAP RPOS
90.	TOOLS	ROTATE			1. Depressing the primary trackball button over the "ROTATE"		a) Method 1:

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					DCB button, the user may rotate the map in the active window clockwise to any map orientation by rolling the trackball to the right, or the user may rotate the map in the active window counter clockwise to any map orientation by rolling the trackball to the left. The map orientation in the active window changes as the user manipulates the trackball. 2. Depressing the primary trackball button over the “ROTATE” DCB button, the user may type in the desired heading. The map orientation in the active window changes to the user selected map heading. Depressing the “ENTER” key on the data entry device selects the current map orientation.		(blank system response line) TOOLS ROTATE b) Methods 2: (blank system response line) TOOLS ROTATE <Entry> c) Invalid Entry: INVALID ENTRY TOOLS
91.	TOOLS	NEW WINDOW			1. Depressing the primary trackball button over the "NEW WINDOW" DCB button, the user places the first corner anchor of the window by pressing the primary trackball button (slew "ENTER"). A transparent frame then stretches with the cursor until the user places the opposing corner anchor (slew "ENTER"). The new secondary window assumes the current range scale of the main window and places the selected area in the new secondary window. 2. Depressing the <configured function accelerator sequence (*e.g.*, F11 key)> on the data entry device, the user places the first corner anchor of the window by pressing the primary trackball button (slew "ENTER"). A transparent frame then stretches with the cursor until the user places the opposing corner anchor (slew "ENTER"). The new secondary window assumes the current range scale of the main window and places the selected area in the new secondary window.	F11	a) Method 1: (blank system response line) TOOLS NEW WINDOW b) Method 2: (blank system response line) NEW WINDOW
92.	TOOLS	DELETE WINDOW			1. Depressing the primary trackball button over the “DELETE WINDOW” DCB button, the user can select a secondary window (slew "ENTER") to delete it.		a) All Methods: (blank system response line) TOOLS DELETE WINDOW b) Not over secondary window:

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
							NO SLEW TOOLS
93.	TOOLS	RESIZE WINDOW			1. Depressing the primary trackball button over the "RESIZE WINDOW" DCB button, the user may change the size of the active secondary window by selecting the desired side or corner of the window with the trackball (slew "Enter"). When the user moves the cursor over the active window's border, the cursor changes to one of the appropriate icons as described in Section 3.1.6.2.1.1. The user then depresses the primary trackball button to select the window border to be adjusted, moves the border to the desired position using the trackball, and presses the primary trackball button again to complete the function. 2. If the cursor is not trapped in a submenu and a function is not active, depressing <configured trackball button (*e.g.*, 4th button)> to activate the resize function, the user may change the size of the active secondary window by selecting the desired side or corner of the window with the trackball (slew "Enter"). When the user moves the cursor over the active window's border, the cursor changes to the icon described in Section 3.1.6.2.1.1. The user then depresses the primary trackball button to select the window border to be adjusted, moves the border to the desired position using the trackball, and presses the primary trackball button again to complete the function.		a) Method 1: (blank system response line) TOOLS RESIZE WINDOW b) Method 2: (blank system response line) RESIZE WINDOW c) Not over window border: NO SLEW
94.	TOOLS	WINDOW RPOS			1. Depressing the primary trackball button over the “WINDOW RPOS” DCB button, the user may reposition the active secondary window to the desired location on the display. 2. Depressing <configured trackball button (*e.g.*, 2nd button)> over the active secondary window, the user may reposition the secondary window to the desired position. The user anchors the secondary window in the desired position by depressing the secondary trackball button.		a) All Methods: (blank system response line) TOOLS WINDOW RPOS

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
95.	TOOLS	HISTORY ON/OFF			1. Depressing the primary trackball button over the "HISTORY ON/OFF" DCB button, the target history trails will be toggled on or off in the active window.		a) All Methods: (blank system response line) TOOLS
96.	TOOLS	HISTORY <#>			1. Depressing the primary trackball button over the "HISTORY" DCB button, the user may increase the number of history data points in the active window by rolling the trackball up, or the user may decrease the number of history data points by rolling the trackball down. Depressing the primary trackball button again selects the current number of history data points. The current number of history data points is displayed on the second line of the history button during history trail adjustment and after cursor speed selection. 2. Depressing the primary trackball button over the "HISTORY" DCB button, the user may select the history trail length in the active window by typing in the desired number of history data points (range 1-7). Depressing the "ENTER" key on the data entry device selects the history trail length.		a) Method 1: (blank system response line) TOOLS HISTORY b) Method 2: (blank system response line) TOOLS HISTORY <Entry> c) Invalid Entry: INVALID ENTRY TOOLS
97.	TOOLS	COAST ON/OFF			1. Depressing the primary trackball button over the "COAST ON/OFF" DCB button, the track coast/suspend list will be toggled on or off. 2. Depressing <configured function accelerator sequence (*e.g.*, F7 key → "C")> "ENTER" on the data entry device, the track coast/suspend list will be toggled on or off.	F7 > C > ENTER	a) Method 1: (blank system response line) TOOLS b) Method 2: (blank system response line) MULT C
98.	TOOLS	COAST RPOS			1. Depressing the primary trackball button over the "COAST RPOS" DCB button, the user may reposition the track coast/suspend list to the desired position on the display. 2. Depressing the secondary trackball button over the date and time (*i.e.*, the title bar) in the coast suspend list, the user may reposition the Track Coast/Suspend list to the desired position. The user anchors the Coast/Suspend list in the desired position by depressing the secondary trackball button. 3. Depressing <configured function accelerator sequence (*e.g.*, F7	F7 > C > slew "ENTER"	a) Method 1: (blank system response line) TOOLS COAST RPOS b) Method 2: (blank system response line) COAST RPOS c) Method 3: (blank system response line)

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					key → "C")> slew "ENTER" on the data entry device, the user may reposition the track coast/suspend list to the desired position on the display.		MULT C
99.	TOOLS	CSR SPD <#>			1. Depressing the primary trackball button over the "CSR SPD" DCB button, the user may increase the speed of the cursor by rolling the trackball up, or the user may decrease the speed of the cursor by rolling the trackball down. Depressing the primary trackball button again selects the current cursor speed. The current speed is displayed on the second line of the "CSR SPD" button during cursor speed adjustment and after cursor speed selection. 2. Depressing the primary trackball button over the "CSR SPD" DCB button, the user may select the speed of the cursor by typing in the desired cursor speed. Depressing the "ENTER" key on the data entry device selects the cursor speed. The selected cursor speed is displayed on the second line of the "CSR SPD"button.		a) Method 1: (blank system response line) TOOLS CSR SPD b) Method 2: (blank system response line) TOOLS CSR SPD <Entry> c) Invalid Entry: INVALID ENTRY TOOLS
100.	TOOLS	PREVIEW RPOS			1. Depressing the primary trackball button over the "PREVIEW RPOS" DCB button, the user may reposition the preview area to the desired position on the display. 2. Depressing <configured function accelerator sequence (*e.g.*, F7 key → "P")> slew "ENTER" on the data entry device, the preview area will be repositioned to the selected position on the display.	F7 > P > slew "ENTER"	a) Method 1: (blank system response line) TOOLS PREVIEW RPOS b) Method 2: (blank system response line) MULT P
101.	TOOLS	CSR HOME ON/OFF			1. Depressing the primary trackball button over the "CSR HOME ON/OFF" DCB button, the user may choose to have the cursor icon return to a predetermined display location (ON) or remain in the last displayed location (OFF) at the completion of functions.		a) All Methods: (blank system response line) TOOLS
102.	VECTOR <#>				1. Depressing the primary trackball button over the "VECTOR" DCB button, the user may increase the velocity vector length by rolling the trackball up, or the user may decrease the velocity vector length by rolling the trackball down.		a) Method 1: (blank system response line) VECTOR LENGTH b) Method 2:

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					Depressing the primary trackball button again selects the current velocity vector length. The current velocity vector length is displayed on the second line of the vector length button during velocity vector adjustment and after velocity vector selection. 2. Depressing the primary trackball button over the "VECTOR" DCB button, the user may select the velocity vector length by typing in the desired velocity vector length (range 1-20). Depressing the "ENTER" key on the data entry device selects the velocity vector length. The selected velocity vector length is displayed on the second line of the vector length button.		(blank system response line) VECTOR LENGTH <Entry> c) Invalid Entry: INVALID ENTRY
103.	TOOLS	DCB TOP			1. Depressing the primary trackball button over the "DCB TOP" DCB button, the DCB will move to the horizontal position at the top of the display. The DCB will change to display the main DCB.		(No Feedback)
104.	TOOLS	DCB LEFT			1. Depressing the primary trackball button over the "DCB LEFT" DCB button, the DCB will move to the vertical position at the left of the display. The DCB will change to display the main DCB.		(No Feedback)
105.	TOOLS	DCB RIGHT			1. Depressing the primary trackball button over the "DCB RIGHT" DCB button, the DCB will move to the vertical position at the right of the display. The DCB will change to display the main DCB.		(No Feedback)
106.	TOOLS	DCB BOTTOM			1. Depressing the primary trackball button over the "DCB BOTTOM" DCB button, the DCB will move to the horizontal position at the bottom of the display. The DCB will change to display the main DCB.		(No Feedback)
107.	TOOLS	CHG PWD			1. Depressing the primary trackball button over the "CHG PWD" DCB button, the DCB will change to display the change password submenu.		a) All Methods: (blank system response line) TOOLS CHG PWD
108.	TOOLS	CHG PWD	MAINT		1. Depressing the primary trackball button over the "MAINT" DCB button, the user will be prompted in the preview area to		a) All Methods: (blank system response line)

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					enter the old password, new password, and confirm the new password. The system masks the user's password entries by displaying an asterisk (*) for each character typed. The user completes the action by depressing the <ENTER> key on the data entry device, and the system verifies that the user entered the correct password. The system will verify that the user entered the correct old password and identical new passwords. If everything is correct, then the maintenance password will be changed to the value entered by the user. If everything is not correct, then the system indicates an invalid entry and clears all the fields so the user may fill them again.		TOOLS CHG MAINT PWD OLD PWD: <Entry> NEW PWD: <Entry> CONFIRM NEW PWD: <Entry> b) Valid Entry: MAINT PWD CHANGED TOOLS c) Invalid Entry: INVALID ENTRY TOOLS CHG MAINT PWD OLD PWD: <Entry> NEW PWD: <Entry> CONFIRM NEW PWD: <Entry>
109.	TOOLS	CHG PWD	PLAY BACK		1. Depressing the primary trackball button over the "PLAY BACK" DCB button, the user will be prompted in the preview area to enter the old password, new password, and confirm the new password. The system masks the user's password entries by displaying an asterisk (*) for each character typed. The user completes the action by depressing the <ENTER> key on the data entry device, and the system verifies that the user entered the correct password. The system will verify that the user entered the correct old password and identical new passwords. If everything is correct, then the play back password will be changed to the value entered by the user. If everything is not correct, then the system indicates an invalid entry and clears all the fields so the user may fill them again.		a) All Methods: (blank system response line) TOOLS CHG PLAY BACK PWD OLD PWD: <Entry> NEW PWD: <Entry> CONFIRM NEW PWD: <Entry> b) Valid Entry: PLAY BACK PWD CHANGED TOOLS c) Invalid Entry: INVALID ENTRY TOOLS CHG PLAY BACK PWD OLD PWD: <Entry> NEW PWD: <Entry> CONFIRM NEW PWD: <Entry>
110.	TOOLS	CHG	DONE		1. Depressing the primary trackball button over the “DONE”	ESC	

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
		PWD			DCB button, the DCB will change to display the TOOLS submenu.		
111.	TOOLS	PLAY BACK			1. Depressing the primary trackball button over the "PLAY BACK" DCB button, the user may enter alphanumeric data that makes up the playback password in the preview area. The system masks the user's password entries by displaying an asterisk (*) for each character typed. The user completes the action by depressing the <ENTER> key on the data entry device, and the system verifies that the user entered the correct password.		a) All Methods: (blank system response line) TOOLS PLAY BACK PWD: <Entry> b) Invalid Entry: INVALID PWD TOOLS
112.	TOOLS	DONE			1. Depressing the primary trackball button over the "DONE" DCB button, the DCB will change to display the main DCB.	ESC	
113.	LOCAL 101-188				1. Depressing the primary trackball button over the "LOCAL 101-188" DCB button, the DCB will change to display the local vehicles and aircraft submenu beginning with number 101. 2. Depressing <configured function accelerator sequence (*e.g.*, F3 key)> <#> <#> <#> (3-digit number range: 101-276) on the data entry device, then using the trackball to select the desired track (slew "ENTER"), the user assigns the selected information to the selected track. Each of the 176 preset buttons is labeled with a number on the first line and a title on the second.	F3 > <#> > <#> > <#> > slew "ENTER"	a) Method 1: (blank system response line) LOCAL b) Method 2: (blank system response line) INIT CNTL <Entry> c) Invalid Entry: INVALID ENTRY d) No Track Selected NO SLEW e) Local List Data Not Defined NO STORED DATA
114.	LOCAL 101-188	PRESET			1. Depressing the primary trackball button over a preset button, then using the trackball to select the desired track (slew "ENTER"), the user assigns the selected information to the selected track. Each of the 176 preset buttons is labeled with a number on the first line and a title on the second. 2. Depressing <configured function accelerator sequence (*e.g.*, F3 key)> <#> <#> <#> (3-digit number range: 101-276) on the data entry device, then using the trackball to select the desired	F3 > <#> > <#> > <#> > slew "ENTER"	a) Method 1: (blank system response line) LOCAL <TITLE> b) Method 2: (blank system response line) INIT CNTL <Entry>

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					track (slew "ENTER"), the user assigns the selected information to the selected track. Each of the 176 preset buttons is labeled with a number on the first line and a title on the second.		c) Invalid Entry: INVALID ENTRY LOCAL d) No Track Selected NO SLEW LOCAL <TITLE> e) Local List Data Not Defined NO STORED DATA LOCAL
115.	LOCAL 101-188	123-144			1. Depressing the primary trackball button over the "123-144" button displays local aircraft and vehicles numbered from 123 – 144.		a) All Methods: (blank system response line) LOCAL
116.	LOCAL 101-188		101-122		1. Depressing the primary trackball button over the "101-122" button displays local aircraft and vehicles numbered from 101 – 122.		a) All Methods: (blank system response line) LOCAL
117.	LOCAL 101-188	145-188			1. Depressing the primary trackball button over the "145-188" button displays local aircraft and vehicles numbered from 145 – 188.		a) All Methods: (blank system response line) LOCAL
118.	LOCAL 101-188		101-144		1. Depressing the primary trackball button over the "101-144" button displays local aircraft and vehicles numbered from 101 – 144.		a) All Methods: (blank system response line) LOCAL
119.	LOCAL 101-188		167-188		1. Depressing the primary trackball button over the "167-188" button displays local aircraft and vehicles numbered from 167 – 188.		a) All Methods: (blank system response line) LOCAL
120.	LOCAL 101-188			145-166	1. Depressing the primary trackball button over the "145-166" button displays local aircraft and vehicles numbered from 145 – 166.		a) All Methods: (blank system response line) LOCAL
121.	LOCAL 101-188	189-232			1. Depressing the primary trackball button over the "189-232" button displays local aircraft and vehicles numbered from 189 – 232.		a) All Methods: (blank system response line) LOCAL
122.	LOCAL		101-144		1. Depressing the primary trackball button over the "101-144"		a) All Methods:

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
	101-188				button displays local aircraft and vehicles numbered from 101 – 144.		(blank system response line) LOCAL
123.	LOCAL 101-188		211-232		1. Depressing the primary trackball button over the "211-232" button displays local aircraft and vehicles numbered from 211 – 232.		a) All Methods: (blank system response line) LOCAL
124.	LOCAL 101-188			189-210	1. Depressing the primary trackball button over the "189-210" button displays local aircraft and vehicles numbered from 189 – 210.		a) All Methods: (blank system response line) LOCAL
125.	LOCAL 101-188	233-276			1. Depressing the primary trackball button over the "233-276" button displays local aircraft and vehicles numbered from 233 – 276.		a) All Methods: (blank system response line) LOCAL
126.	LOCAL 101-188		101-144		1. Depressing the primary trackball button over the "101-144" button displays local aircraft and vehicles numbered from 101 – 144.		a) All Methods: (blank system response line) LOCAL
127.	LOCAL 101-188		255-276		1. Depressing the primary trackball button over the "255-276" button displays local aircraft and vehicles numbered from 255 – 276.		a) All Methods: (blank system response line) LOCAL
128.	LOCAL 101-188			233-254	1. Depressing the primary trackball button over the "233-254" button displays local aircraft and vehicles numbered from 233 – 254.		a) All Methods: (blank system response line) LOCAL
129.	LOCAL 101-188	DONE			1. Depressing the primary trackball button over the "DONE" DCB button, the DCB will change to display the main DCB.	ESC	
130.	LOCAL 189-276				1. Depressing the primary trackball button over the "LOCAL 189-276" DCB button, the DCB will change to display the local vehicles and aircraft submenu beginning with number 189. 2. Depressing <configured function accelerator sequence (*e.g.*, F3 key)> <#> <#> <#> (3-digit number range: 101-276) on the data entry device, then using the trackball to select the desired track (slew "ENTER"), the user assigns the selected information to the selected track. Each of the 176 preset buttons is labeled with a number on the first line and a title on the second.	F3 > <#> > <#> > <#> > slew "ENTER"	a) Method 1: (blank system response line) LOCAL b) Method 2: (blank system response line) INIT CNTL <Entry> c) Invalid Entry: INVALID ENTRY d) No Track Selected NO SLEW

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
							e) Local List Data Not Defined NO STORED DATA
131.	LOCAL 189-276	PRESET			1. Depressing the primary trackball button over a preset button, then using the trackball to select the desired track (slew "ENTER"), the user assigns the selected information to the selected track. Each of the 176 preset buttons is labeled with a number on the first line and a title on the second. 2. Depressing <configured function accelerator sequence (*e.g.*, F3 key)> <#> <#> <#> (3-digit number range: 101-276) on the data entry device, then using the trackball to select the desired track (slew "ENTER"), the user assigns the selected information to the selected track. Each of the 176 preset buttons is labeled with a number on the first line and a title on the second.	F3 > <#> > <#> > <#> > slew "ENTER"	a) Method 1: (blank system response line) LOCAL <TITLE> b) Method 2: (blank system response line) INIT CNTL <Entry> c) Invalid Entry: INVALID ENTRY LOCAL d) No Track Selected NO SLEW LOCAL <TITLE> e) Local List Data Not Defined NO STORED DATA LOCAL
132.	LOCAL 189-276	101-144			1. Depressing the primary trackball button over the "101-144" button displays local aircraft and vehicles numbered from 101 – 144.		a) All Methods: (blank system response line) LOCAL
133.	LOCAL 189-276		123-144		1. Depressing the primary trackball button over the "123-144" button displays local aircraft and vehicles numbered from 123 – 144.		a) All Methods: (blank system response line) LOCAL
134.	LOCAL 189-276			101-122	1. Depressing the primary trackball button over the "101-122" button displays local aircraft and vehicles numbered from 101 – 122.		a) All Methods: (blank system response line) LOCAL
135.	LOCAL 189-276		189-232		1. Depressing the primary trackball button over the "189-232" button displays local aircraft and vehicles numbered from 189 – 232.		a) All Methods: (blank system response line) LOCAL
136.	LOCAL	145-188			1. Depressing the primary trackball button over the "145-188"		a) All Methods:

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
	189-276				button displays local aircraft and vehicles numbered from 145 – 188.		(blank system response line) LOCAL
137.	LOCAL 189-276		167-188		1. Depressing the primary trackball button over the “167-188” button displays local aircraft and vehicles numbered from 167 – 188.		a) All Methods: (blank system response line) LOCAL
138.	LOCAL 189-276			145-166	1. Depressing the primary trackball button over the “145-166” button displays local aircraft and vehicles numbered from 145 – 166.		a) All Methods: (blank system response line) LOCAL
139.	LOCAL 189-276		189-232		1. Depressing the primary trackball button over the “189-232” button displays local aircraft and vehicles numbered from 189 – 232.		a) All Methods: (blank system response line) LOCAL
140.	LOCAL 189-276	211-232			1. Depressing the primary trackball button over the “211-232” button displays local aircraft and vehicles numbered from 211 – 232.		a) All Methods: (blank system response line) LOCAL
141.	LOCAL 189-276		189-210		1. Depressing the primary trackball button over the “189-210” button displays local aircraft and vehicles numbered from 189 – 210.		a) All Methods: (blank system response line) LOCAL
142.	LOCAL 189-276	233-276			1. Depressing the primary trackball button over the “233-276” button displays local aircraft and vehicles numbered from 233 – 276.		a) All Methods: (blank system response line) LOCAL
143.	LOCAL 189-276		189-232		1. Depressing the primary trackball button over the “189-232” button displays local aircraft and vehicles numbered from 189 – 232.		a) All Methods: (blank system response line) LOCAL
144.	LOCAL 189-276		255-276		1. Depressing the primary trackball button over the “255-276” button displays local aircraft and vehicles numbered from 255 – 276.		a) All Methods: (blank system response line) LOCAL
145.	LOCAL 189-276			233-254	1. Depressing the primary trackball button over the “233-254” button displays local aircraft and vehicles numbered from 233 – 254.		a) All Methods: (blank system response line) LOCAL
146.	LOCAL 189-276	DONE			1. Depressing the primary trackball button over the “DONE” DCB button, the DCB will change to display the main DCB.	ESC	(No Feedback)
147.	INIT				1. Depressing the primary trackball button over the “INIT CNTL”	F3 > <#> >	a) Method 1:

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
	CNTL				DCB button, then using the trackball to select the desired suspended track (slew "ENTER"), the user can remove the selected track from a suspended state as described in this document. 2. Depressing the primary trackball button over the "INIT CNTL" DCB button, then typing a letter on the data entry device, the user can remove the selected track from a suspended state as described in this document. 3. Depressing <configured function accelerator sequence (*e.g.*, F3 key)> <X> (letter) on the data entry device, the user can remove the selected track from a suspended state as described in this document. 4. The user may remove an individual track from a suspended state by clicking on either area of dwell emphasis described in Section 3.1.8.1.2**.** 5. Depressing the primary trackball button over the "INIT CNTL" DCB button, then typing a 3-digit number (range: 300 – 999) on the data entry device, then using the trackball to select the desired track (slew "ENTER"), the user can remove the selected track from the track coast/suspend list as described in Section 3.1.8.1.1.2 of this document. 6. Depressing the primary trackball button over the "INIT CNTL" DCB button, then typing a 3-digit number (range: 101 – 276) on the data entry device, then using the trackball to select the desired track (slew "ENTER"), the user can associate local aircraft and vehicle data from the local aircraft and vehicle list with the selected track as described in Section 3.1.8.2 of this document. 7. Depressing <configured function accelerator sequence (*e.g.*, F3 key)> <#> <#> <#> (3-digit number range: 300 – 999) on the data entry device, then using the trackball to select the desired track (slew "ENTER"), the user can remove the selected track from the track coast/suspend list as described in Section	<#> > slew "ENTER"	(blank system response line) INIT CNTL b) Methods 2, 3, 5, 6, 7: (blank system response line) INIT CNTL <Entry> c) Method 4: (No Feedback) d) Invalid Entry: INVALID ENTRY e) No Track Selected NO SLEW f) Track Not Defined NO STORED DATA

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					3.1.8.1.1.2 of this document.		
148.	DB AREA				1. Depressing the primary trackball button over the "DB AREA" DCB button, the DCB will change to display the Data block area submenu, and the system will toggle all currently defined data block areas to be viewable.		a) All Methods: (blank system response line) DB AREA
149.	DB AREA	DEFINE TRAIT AREA			1. Depressing the primary trackball button over the "DEFINE TRAIT AREA" DCB button, the user can define a data block trait area having up to 20 sides. The user depresses the primary trackball button to place each vertex of the polygon. When the user presses the secondary trackball button, the system completes the polygon by drawing a line between the first and last vertices. Should the user define the maximum number of vertices, then the system automatically completes the polygon by drawing a line between the first and last vertices.		a) All Methods: (blank system response line) DB AREA DEFINE TRAIT AREA
150.	DB AREA	DEFINE TRAIT AREA	FULL/ PART		1. Depressing the primary trackball button over the "FULL/PART" DCB button, all aircraft data blocks in the defined area will toggle to display the partial data block format or the user-selected full data block format. If the full data block format is selected, then the buttons allowing the user to configure the full data block are selectable.		a) All Methods: (blank system response line) DB AREA DEFINE TRAIT AREA
151.	DB AREA	DEFINE TRAIT AREA	ALTITUDE ON/OFF		1. Depressing the primary trackball button over the "ALTITUDE" DCB button, toggles on or off the display of altitude information		a) All Methods: (blank system response line) DB AREA DEFINE TRAIT AREA
152.	DB AREA	DEFINE TRAIT AREA	TYPE ON/OFF		1. Depressing the primary trackball button over the "TYPE" DCB button, toggles on or off the display of aircraft type		a) All Methods: (blank system response line) DB AREA DEFINE TRAIT AREA
153.	DB AREA	DEFINE TRAIT AREA	SENSORS ON/OFF		1 Depressing the primary trackball button over the "SENSORS" DCB button, toggles on or off the display of sensor coverage information		a) All Methods: (blank system response line) DB AREA DEFINE TRAIT AREA

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
154.	DB AREA	DEFINE TRAIT AREA	CAT ON/OFF		1 Depressing the primary trackball button over the "CAT" DCB button, toggles on or off the display of the aircraft category indicator in the data block		a) All Methods: (blank system response line) DB AREA DEFINE TRAIT AREA
155.	DB AREA	DEFINE TRAIT AREA	FIX ON/OFF		1 Depressing the primary trackball button over the "FIX" DCB button, toggles on or off the display of fix information		a) All Methods: (blank system response line) DB AREA DEFINE TRAIT AREA
156.	DB AREA	DEFINE TRAIT AREA	VELOCITY ON/OFF		1. Depressing the primary trackball button over the "VELOCITY ON/OFF" DCB button, toggles on or off the display of velocity information		a) All Methods: (blank system response line) DB AREA DEFINE TRAIT AREA
157.	DB AREA	DEFINE TRAIT AREA	SCRATCH PAD ON/OFF		1. Depressing the primary trackball button over the "SCRATCH PAD ON/OFF" DCB button, toggles on or off the display of scratch pad information in area 1 and area 2		a) All Methods: (blank system response line) DB AREA DEFINE TRAIT AREA
158.	DB AREA	DEFINE TRAIT AREA	DB SIZE <#>		1. Depressing the primary trackball button over the "DB SIZE" DCB button, the user may increase the size of text in the target data blocks by rolling the trackball up, or the user may decrease the size of text in the target data blocks by rolling the trackball down. The size of text in the target data blocks changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current size of text in the target data blocks (range 1-6). 2. Depressing the primary trackball button over the "DB SIZE" DCB button, the user may select the size of text in the target data blocks by typing in the desired text size (range 1-6). Depressing the "ENTER" key on the data entry device selects the size of text in the target data blocks		a) Method 1: (blank system response line) DB AREA DEFINE TRAIT AREA CHAR SIZE DATA BLOCK b) Method 2: (blank system response line) DB AREA DEFINE TRAIT AREA CHAR SIZE DATA BLOCK <Entry> c) Invalid Entry INVALID SIZE DB AREA DEFINE TRAIT AREA

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
159.	DB AREA	DEFINE TRAIT AREA	DB BRITE <##>		1. Depressing the primary trackball button over the “DB BRITE” DCB button, the user may increase the brightness of the target data blocks in the defined area by rolling the trackball up, or the user may decrease the brightness of the target data blocks by rolling the trackball down. The brightness of target data blocks in the defined area changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current brightness (range 1-99) 2. Depressing the primary trackball button over the “DB BRITE” DCB button, the user may select the brightness of the target data blocks in the defined area by typing in the desired brightness. Depressing the “ENTER” key on the data entry device selects the brightness.		a) Method 1: (blank system response line) DB AREA DEFINE TRAIT AREA BRITE DATA BLOCK b) Method 2: (blank system response line) DB AREA DEFINE TRAIT AREA BRITE DATA BLOCK <Entry> c) Invalid Entry INVALID ENTRY DB AREA DEFINE TRAIT AREA
160.	DB AREA	DEFINE TRAIT AREA	VECTOR ON/OFF		1. Depressing the primary trackball button over the “VECTOR ON/OFF” DCB button, the predicted track lines will be toggled on or off in the defined area.		a) All Methods: (blank system response line) DB AREA DEFINE TRAIT AREA
161.	DB AREA	DEFINE TRAIT AREA	LDR LNG <#>		1. Depressing the primary trackball button over the “LDR LNG” DCB button, the user may increase the length of all leader lines in the defined area by rolling the trackball up, or the user may decrease the length of all leader lines by rolling the trackball down. The length of the leader lines changes as the user manipulates the trackball (range 0-15). Depressing the primary trackball button again selects the current leader line length.		a) Method 1: (blank system response line) DB AREA DEFINE TRAIT AREA LDR LNG
162.	DB AREA	DEFINE TRAIT AREA	LDR DIR <#>		1. Depressing the primary trackball button over the "LDR DIR" DCB button, the user may change the leader line direction in the defined area by rolling the trackball up or down through		a) Method 1: (blank system response line) DB AREA

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					the numbers representing leader line direction (see 3.1.14.1.3). Depressing the primary trackball button selects the leader line direction. The selected number representing the desired leader line direction is displayed on the second line of the LDR DIR button. 2. Depressing the primary trackball button over the "LDR DIR" DCB button, the user may change the leader line direction in the defined area by typing in the number representing the desired leader line direction (see 3.1.14.1.3). Depressing the "ENTER" key on the data entry device selects the leader line direction. The selected number representing the desired leader line direction is displayed on the second line of the LDR DIR button.		DEFINE TRAIT AREA LDR DIR b) Method 2: (blank system response line) DB AREA DEFINE TRAIT AREA LDR DIR <Entry> c) Invalid Entry: INVALID ENTRY DB AREA DEFINE TRAIT AREA
163.	DB AREA	DEFINE TRAIT AREA	DONE		1. Depressing the primary trackball button over the "DONE" DCB button, the DCB will change to display the DB AREA submenu.	ESC	a) All Methods: (blank system response line) DB AREA
164.	DB AREA	DEFINE OFF AREA			1. Depressing the primary trackball button over the "DEFINE OFF AREA" DCB button, the user can define a data block off area having up to 20 sides. The user depresses the primary trackball button to place each vertex of the polygon. When the user presses the secondary trackball button, the system completes the polygon by drawing a line between the first and last vertices. Should the user define the maximum number of vertices, then the system automatically completes the polygon by drawing a line between the first and last vertices.		a) All Methods: (blank system response line) DB AREA DEFINE OFF AREA
165.	DB AREA	MODIFY TRAIT AREA			1. Depressing the primary trackball button over the "MODIFY TRAIT AREA" DCB button, the user can slew and select a trait area. After selecting the trait area the user may modify the traits (not the shape of the polygon) of that area though the DCB.		a) All Methods: (blank system response line) DB AREA MODIFY TRAIT AREA
166.	DB AREA	MODIFY TRAIT AREA	FULL/ PART		1. Depressing the primary trackball button over the "FULL/PART" DCB button, all aircraft data blocks in the defined area will toggle to display the partial data block format		a) All Methods: (blank system response line) DB AREA

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					or the user-selected full data block format. If the full data block format is selected, then the buttons allowing the user to configure the full data block are selectable.		MODIFY TRAIT AREA
167.	DB AREA	MODIFY TRAIT AREA	ALTITUDE ON/OFF		1. Depressing the primary trackball button over the "ALTITUDE" DCB button, toggles on or off the display of altitude information.		a) All Methods: (blank system response line) DB AREA MODIFY TRAIT AREA
168.	DB AREA	MODIFY TRAIT AREA	TYPE ON/OFF		1. Depressing the primary trackball button over the "TYPE" DCB button, toggles on or off the display of aircraft type		a) All Methods: (blank system response line) DB AREA MODIFY TRAIT AREA
169.	DB AREA	MODIFY TRAIT AREA	SENSORS ON/OFF		1 Depressing the primary trackball button over the "SENSORS" DCB button, toggles on or off the display of sensor coverage information		a) All Methods: (blank system response line) DB AREA MODIFY TRAIT AREA
170.	DB AREA	MODIFY TRAIT AREA	CAT ON/OFF		1 Depressing the primary trackball button over the "CAT" DCB button, toggles on or off the display of the aircraft category indicator in the data block		a) All Methods: (blank system response line) DB AREA MODIFY TRAIT AREA
171.	DB AREA	MODIFY TRAIT AREA	FIX ON/OFF		1 Depressing the primary trackball button over the "FIX" DCB button, toggles on or off the display of fix information		a) All Methods: (blank system response line) DB AREA MODIFY TRAIT AREA
172.	DB AREA	MODIFY TRAIT AREA	VELOCITY ON/OFF		1. Depressing the primary trackball button over the "VELOCITY ON/OFF" DCB button, toggles on or off the display of velocity information		a) All Methods: (blank system response line) DB AREA MODIFY TRAIT AREA
173.	DB AREA	MODIFY TRAIT AREA	SCRATCH PAD ON/OFF		1. Depressing the primary trackball button over the "SCRATCH PAD ON/OFF" DCB button, toggles on or off the display of scratch pad information in area 1 and area 2		a) All Methods: (blank system response line) DB AREA MODIFY TRAIT AREA
174.	DB AREA	MODIFY TRAIT	DB SIZE <#>		1. Depressing the primary trackball button over the "DB SIZE" DCB button, the user may increase the size of text in the target		a) Method 1: (blank system response line)

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
		AREA			data blocks by rolling the trackball up, or the user may decrease the size of text in the target data blocks by rolling the trackball down. The size of text in the target data blocks changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current size of text in the target data blocks (range 1-6). 2. Depressing the primary trackball button over the "DB SIZE" DCB button, the user may select the size of text in the target data blocks by typing in the desired text size (range 1-6). Depressing the "ENTER" key on the data entry device selects the size of text in the target data blocks		DB AREA MODIFY TRAIT AREA CHAR SIZE DATA BLOCK b) Method 2: (blank system response line) DB AREA MODIFY TRAIT AREA CHAR SIZE DATA BLOCK <Entry> c) Invalid Entry INVALID SIZE DB AREA MODIFY TRAIT AREA
175.	DB AREA	MODIFY TRAIT AREA	DB BRITE <##>		1. Depressing the primary trackball button over the "DB BRITE" DCB button, the user may increase the brightness of the target data blocks in the defined area by rolling the trackball up, or the user may decrease the brightness of the target data blocks by rolling the trackball down. The brightness of target data blocks in the defined area changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current brightness (range 1-99) 2. Depressing the primary trackball button over the "DB BRITE" DCB button, the user may select the brightness of the target data blocks in the defined area by typing in the desired brightness. Depressing the "ENTER" key on the data entry device selects the brightness.		a) Method 1: (blank system response line) DB AREA MODIFY TRAIT AREA BRITE DATA BLOCK b) Method 2: (blank system response line) DB AREA MODIFY TRAIT AREA BRITE DATA BLOCK <Entry> c) Invalid Entry INVALID ENTRY DB AREA MODIFY TRAIT AREA
176.	DB AREA	MODIFY	VECTOR		1. Depressing the primary trackball button over the "VECTOR		a) All Methods:

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
		TRAIT AREA	ON/OFF		ON/OFF" DCB button, the predicted track lines will be toggled on or off in the defined area.		(blank system response line) DB AREA MODIFY TRAIT AREA
177.	DB AREA	MODIFY TRAIT AREA	LDR LNG <#>		1. Depressing the primary trackball button over the "LDR LNG" DCB button, the user may increase the length of all leader lines in the defined area by rolling the trackball up, or the user may decrease the length of all leader lines by rolling the trackball down. The length of the leader lines changes as the user manipulates the trackball (range 0-15). Depressing the primary trackball button again selects the current leader line length.		a) Method 1: (blank system response line) DB AREA MODIFY TRAIT AREA LDR LNG
178.	DB AREA	MODIFY TRAIT AREA	LDR DIR <#>		1. Depressing the primary trackball button over the "LDR DIR" DCB button, the user may change the leader line direction in the defined area by rolling the trackball up or down through the numbers representing leader line direction (see 3.1.14.1.3). Depressing the primary trackball button selects the leader line direction. The selected number representing the desired leader line direction is displayed on the second line of the LDR DIR button. 2 Depressing the primary trackball button over the "LDR DIR" DCB button, the user may change the leader line direction in the defined area by typing in the number representing the desired leader line direction (see 3.1.14.1.3). Depressing the "ENTER" key on the data entry device selects the leader line direction. The selected number representing the desired leader line direction is displayed on the second line of the LDR DIR button.		a) Method 1: (blank system response line) DB AREA MODIFY TRAIT AREA LDR DIR b) Method 2: (blank system response line) DB AREA MODIFY TRAIT AREA LDR DIR <Entry> c) Invalid Entry: INVALID ENTRY DB AREA MODIFY TRAIT AREA
179.	DB AREA	MODIFY TRAIT AREA	DONE		1 Depressing the primary trackball button over the "DONE" DCB button, the DCB will change to display the DB AREA submenu.	ESC	a) All Methods: (blank system response line) DB AREA MODIFY TRAIT AREA
180.	DB AREA	DELETE			1. Depressing the primary trackball button over the "DELETE		a) All Methods:

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
		ALL AREAS			ALL AREAS" DCB button, the system will prompt the user to confirm that the action will delete all Data Block areas. The user completes the action by depressing the <ENTER> key on the data entry device.		(blank system response line) DB AREA DELETE ALL AREAS? 1 = NO 2 = YES (1 OR 2): <Entry> b) Invalid Entry: INVALID ENTRY DB AREA
181.	DB AREA	DELETE ONE AREA			1. Depressing the primary trackball button over the "DELETE ONE AREA" DCB button, all DB ON/OFF areas are shown, the user can slew and enter to delete desired areas.		a) All Methods: (blank system response line) DB AREA DELETE ONE AREA
182.	DB AREA	DONE			1. Depressing the primary trackball button over the "DONE" DCB button, the DCB will change to display the main DCB,, and the system will toggle all currently defined data block areas not to be viewable.	ESC	(No Feedback)
183.	TRK SUSP				1. Depressing the primary trackball button over the "TRK SUSP" DCB button, then using the trackball to select the desired track (slew "ENTER"), the user can place the selected track into a suspended state as described in this document. 2. Depressing <configured function accelerator sequence (*e.g.*, F4 key)> on the data entry device, then using the trackball to select the desired track (slew "ENTER"), the user can place the selected track into a suspended state as described in this document.	F4	a) Methods 1, 2: (blank system response line) TRK SUSP b) Over Suspend Limit: ERROR: MAX LIMIT c) No Track Selected: NO SLEW
184.	DB EDIT				1. Depressing the primary trackball button over the "DB EDIT" DCB button, the DCB will change to display the data block editing submenu.		a) All Methods: (blank system response line) DB EDIT
185.	DB EDIT	FULL/ PART			1. Depressing the primary trackball button over the "FULL/PART" DCB button, all aircraft data blocks in the active window will toggle to display the partial data block format or the user-selected full data block format. If the full		a) All Methods: (blank system response line) DB EDIT

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					data block format is selected, then the buttons allowing the user to configure the full data block are selectable.		
186.	DB EDIT	ALTITUDE ON/OFF			1. Depressing the primary trackball button over the "ALTITUDE" DCB button, toggles on or off the display of altitude information		a) All Methods: (blank system response line) DB EDIT
187.	DB EDIT	TYPE ON/OFF			1. Depressing the primary trackball button over the "TYPE" DCB button, toggles on or off the display of aircraft type		a) All Methods: (blank system response line) DB EDIT
188.	DB EDIT	SENSORS ON/OFF			1. Depressing the primary trackball button over the "SENSORS" DCB button, toggles on or off the display of sensor coverage information		a) All Methods: (blank system response line) DB EDIT
189.	DB EDIT	CAT ON/OFF			1. Depressing the primary trackball button over the "CAT" DCB button, toggles on or off the display of the aircraft category indicator in the data block		a) All Methods: (blank system response line) DB EDIT
190.	DB EDIT	FIX ON/OFF			1. Depressing the primary trackball button over the "FIX" DCB button, toggles on or off the display of fix information		a) All Methods: (blank system response line) DB EDIT
191.	DB EDIT	VELOCITY ON/OFF			1. Depressing the primary trackball button over the "VELOCITY" DCB button, toggles on or off the display of velocity information		a) All Methods: (blank system response line) DB EDIT
192.	DB EDIT	SCRATCH PAD ON/OFF			1. Depressing the primary trackball button over the "SCRATCH PAD" DCB button, toggles on or off the display of scratch pad information in area 1 and area 2		a) All Methods: (blank system response line) DB EDIT
193.	DB EDIT	DONE			1. Depressing the primary trackball button over the "DONE" DCB button, the DCB will change to display the main DCB.	ESC	(No Feedback)
194.	TERM CNTL				1. Depressing the primary trackball button over the "TERM CNTL" DCB button, then typing a 3-digit number (range: 300 - 999) on the data entry device, the system removes the coasted track information from the coast list. 2. Depressing <configured function accelerator sequence (e.g., F5 key)> <#> <#><#> (3-digit number range: 300 - 999) on the data entry device, the system removes the coasted track information from the coast list.	F5 > slew "ENTER"	a) Methods 3, 4: (blank system response line) TERM CNTL b) Method 1, 2, 5, 6: (blank system response line) TERM CNTL <Entry> c) Invalid Entry:

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					3. Depressing the primary trackball button over the "TERM CNTL" DCB button, then using the trackball to select the desired track (slew "ENTER"), the system clears the data block information for the selected track and changes the track icon to the Unknown icon. 4. Depressing <configured function accelerator sequence (e.g., F5 key)> on the data entry device, then using the trackball to select the desired track (slew "ENTER"), the system clears the data block information for the selected track and changes the track icon to the Unknown icon. 5. Depressing the primary trackball button over the "TERM CNTL" DCB button, then typing a letter on the data entry device, the system removes the suspended track information from the suspend list. 6. Depressing <configured function accelerator sequence (e.g., F5 key)> <X> (letter) on the data entry device, the system removes the suspended track information from the suspend list.		INVALID ENTRY d) No Track Selected NO SLEW e) Track Not Defined NO STORED DATA
195.	DB ON/OFF				1. Depressing the primary trackball button over the “DB ON/OFF” DCB button, the user can toggle all data blocks in the active window on or off. 2. Depressing the <configured function accelerator sequence (e.g., F6 key)> on the data entry device, the user can toggle all data blocks in the active window on or off.	F6	(No Feedback)
196.	DCB ON/OFF				1. Depressing the primary trackball button over the “DCB ON/OFF” DCB button, the user can toggle the DCB on or off.		(No Feedback)
197.	System Mode and Health				1. Depressing the primary trackball button over the system mode and health DCB button, the DCB will change to display the system health submenu.		(No Feedback)
198.	System Mode and Health	COMP. GO/NO GO			1. Each Component go/no go button displays green if all monitored values are within the specified range.		(No Feedback)
199.	System Mode and	MAINT. LOGON/			1. Depressing the primary trackball button over the "MAINT" DCB button, the user may enter alpha numeric data that makes		a) All Methods: (blank system response line)

TABLE XII: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
	Health	LOGOFF			up the maintenance password in the preview area. The system masks the user's password entries by displaying an asterisk (*) for each character typed. The user completes the action by depressing the <ENTER> key on the data entry device, and the system verifies that the user entered the correct password.		SYSTEM HEALTH MAINT PWD: <Entry> b) Invalid Entry: INVALID PWD SYSTEM HEALTH
200.	SYSTEM MODE & HEALTH	DONE			1. Depressing the primary trackball button over the “DONE” DCB button, the DCB will change to display the main DCB.	ESC	

3.1.14.1.2 Data Entry Device Keys

3.1.14.1.2.1 CLEAR Key

3.1.14.1.2.1.1 Function Cancellation

The airport surface application system data entry device shall [R324] have a CLEAR function key (*e.g.*, ESC). When a function has been selected it is considered active until it is completed or cleared. It shall [R325] be possible to clear any active function and return the variable to its previous condition by depressing the clear key. Incomplete adjustments, if any, shall [R326] be discarded. Functional feedback in the preview area that is unique to the cancelled function (*i.e.*, not feedback indicating the submenu level) shall [R518] be discarded.

3.1.14.1.2.1.2 Submenu Closure

When the user has accessed a DCB submenu and no function has been selected or is active, pressing the "CLEAR" key shall [R519] return the DCB to the next highest menu level until the main DCB is displayed.

3.1.14.1.2.1.3 Cursor Homing

The airport surface application system shall [R327] have a "cursor home" function. [R328 Deleted] The "cursor home" shall [R520] be activated by depressing the "CLEAR" key when no other system function has been selected or is active and the cursor is not in a DCB submenu. [R329 Deleted] The cursor home function shall [R521] be capable of repositioning the cursor to a predetermined display location adaptable by system parameters.

3.1.14.1.2.1.4 Functional Feedback Clearance

Pressing the CLEAR key shall [R522] discard text contained in the "system response line" of the preview area.

3.1.14.1.2.2 Multifunction Key

The Airport Surface Application system data entry device shall [R329a] have a "multifunction" key (*e.g.*, F7). The system shall [R329b] interpret predefined keystroke(s) following the "multifunction" key as function accelerators for system functions. All functions invoked using the "multifunction" key shall [R329c] be completed either by depressing the "ENTER" key on the data entry device or by depressing the primary trackball button (slew "ENTER").

3.1.14.1.3 Implied Functions

[R330 Deleted] Implied functions are functions or aspects of functions that cannot be executed in another way. [R331 Deleted] [R523 Deleted] The system shall [R634] [SL] implement implied functions as described in TABLE XIII below:

TABLE XIII: Implied functions

Row Num	Function	Function Manipulation	Function Accelerator	Feedback (Preview Area)
1.	Leader Line Direction: Upper Left	1. Depressing the key sequence "1" "ENTER" on the data entry device, the user changes all leader lines to the upper left-hand direction. 2. Executing the sequence "1" slew "ENTER", the user changes the leader line for the selected track or temporary map text object to the upper left-hand direction	1	a) All Methods: (blank system response line) LDR DIR 1 b) No Track Selected NO SLEW
2.	Leader Line Direction: Lower Left	1. Depressing the key sequence "7" "ENTER" on the data entry device, the user changes all leader lines to the lower left-hand direction. 2. Executing the sequence "7" slew "ENTER", the user changes the leader line for the selected track or temporary map text object to the lower left-hand direction.	7	a) All Methods: (blank system response line) LDR DIR 7 b) No Track Selected NO SLEW
3.	Leader Line Direction: Upper	1. Depressing the key sequence "2" "ENTER" on the data entry device, the user changes all leader lines to the upper direction. 2. Executing the sequence "2" slew "ENTER", the user changes the leader line for the selected track or temporary map text object to the upper direction.	2	a) All Methods: (blank system response line) LDR DIR 2 b) No Track Selected NO SLEW

TABLE XIII: Implied functions – Continued.

Row Num	Function	Function Manipulation	Function Accelerator	Feedback (Preview Area)
4.	Leader Line Direction: Lower	1. Depressing the key sequence "8" "ENTER" on the data entry device, the user changes all leader lines to the lower direction. 2. Executing the sequence "8" slew "ENTER", the user changes the leader line for the selected track or temporary map text object to the lower direction.	8	a) All Methods: (blank system response line) LDR DIR 8 b) No Track Selected NO SLEW
5.	Leader Line Direction: Upper Right	1. Depressing the key sequence "3" "ENTER" on the data entry device, the user changes all leader lines to the upper right-hand direction. 2. Executing the sequence "3" slew "ENTER", the user changes the leader line for the selected track or temporary map text object to the upper right-hand direction. .	3	a) All Methods: (blank system response line) LDR DIR 3 b) No Track Selected NO SLEW
6.	Leader Line Direction: Lower Right	1. Depressing the key sequence "9" "ENTER" on the data entry device, the user changes all leader lines to the lower right-hand direction. 2. Executing the sequence "9" slew "ENTER", the user changes the leader line for the selected track or temporary map text object to the lower right-hand direction.	9	a) All Methods: (blank system response line) LDR DIR 9 b) No Track Selected NO SLEW
7.	Leader Line Direction: Right	1. Depressing the key sequence "6" "ENTER" on the data entry device, the user changes all leader lines to the right-hand direction. 2. Executing the sequence "6" slew "ENTER", the user changes the leader line for the selected track or temporary map text object to the right-hand direction	6	a) All Methods: (blank system response line) LDR DIR 6 b) No Track Selected NO SLEW

TABLE XIII: Implied functions – Continued.

Row Num	Function	Function Manipulation	Function Accelerator	Feedback (Preview Area)
8.	Leader Line Direction: Left	1. Depressing the key sequence “4” “ENTER” on the data entry device, the user changes all leader lines to the left-hand direction. 2. Executing the sequence “4” slew “ENTER”, the user changes the leader line for the selected track or temporary map text object to the left-hand direction. .	4	a) All Methods: (blank system response line) LDR DIR 4 b) No Track Selected NO SLEW
9.	DB Editing	1. Executing the sequence "slew, depress tertiary trackball button" will invoke DB editing. A table containing the selected track's data will appear in the preview area. By default, each field contains the current data block information for the selected track. The user may overwrite information in each field by typing new data. The user may move through the fields using the <ENTER> key. When the user presses the <ENTER> key from the Scratchpad 2 field the system will update the selected track's data block information with the new data. If the user types an entry which is invalid, then the system discards the erroneous data and retains the original data, notifies the user of the error, and allows the user to re-enter data in that field.	Slew, Right Button enter	a) All Methods: (blank system response line) A/C: <Entry> BCN: <Entry> CAT: <Entry> TYP: <Entry> FIX: <Entry> SP1: <Entry> SP2: <Entry> b) Invalid Entry: INVALID ENTRY A/C: <Entry> BCN: <Entry> CAT: <Entry> TYP: <Entry> FIX: <Entry> SP1: <Entry> SP2: <Entry> c) Duplicate ACID: DUP ID A/C: <Entry> BCN: <Entry> CAT: <Entry> TYP: <Entry> FIX: <Entry>

TABLE XIII: Implied functions – Continued.

Row Num	Function	Function Manipulation	Function Accelerator	Feedback (Preview Area)
				SP1: <Entry> SP2: <Entry>
10.	Scratch Pad 1	1. Executing <configured function accelerator sequence (*e.g.*, F7 key → "Y")> on the data entry device, then using the trackball to select the desired track (slew "ENTER"), the user may edit the scratch pad information in area 1 for the selected track without being in the DB Edit mode.	F7>Y	a) All Methods: (blank system response line) MULT Y <Entry>
11.	Scratch Pad 2	1. Executing <configured function accelerator sequence (*e.g.*, F7 key → "H")> on the data entry device, then using the trackball to select the desired track (slew "ENTER"), the user may edit the scratch pad information in area 2 for the selected track without being in the DB Edit mode.	F7>H	a) All Methods: (blank system response line) MULT H <Entry>
12.	Cursor Home	1. Depressing the "CLEAR" key on the data entry device when no other function has been selected or is active and the cursor is not in a DCB submenu, the cursor icon will return to a predetermined display location	Clear	(No Feedback)
13.	Cursor Location Readout	1. Simultaneously depressing the key sequence <CTRL> + <SHIFT> + <C>, the system will dynamically display the cursor location (x, y) in the preview area. The (x, y) coordinate will represent the number of feet between the Air Traffic Control tower and the cursor location. The CLEAR key cancels the function.	CTRL + SHIFT + C	a) All Methods: (blank system response line) X: <Value> Y: <Value>
14.	Beacon Code Toggle	1. Executing <configured function accelerator sequence (e.g., F7 key → "B")> on the data entry device, then selecting the desired track (slew "ENTER") the system toggles on the	F7 > B > slew	a) All Methods: (blank system response line) MULT B

TABLE XIII: Implied functions – Continued.

Row Num	Function	Function Manipulation	Function Accelerator	Feedback (Preview Area)
		beacon code for the selected track for 4 seconds.	"ENTER"	
15.	Callsign and Type	1. Typing up to 8 characters, then using the primary trackball button to select the desired track (slew "ENTER"), the user can associate the entry as the Callsign for the selected track. If Field F is empty, then the system automatically fills the field with a generic aircraft type to indicate that the track is an aircraft. 2. Typing up to 8 characters, a <SPACE>, "A", then using the primary trackball button to select the desired track (slew "ENTER"), the user can associate the entry as the Callsign for the selected track. The system automatically fills Field F with a generic aircraft type to indicate that the track is an aircraft. 3. Typing up to 8 characters, a <SPACE>, "V", then using the primary trackball button to select the desired track (slew "ENTER"), the user can associate the entry as the Callsign for the selected track. The system automatically fills Field F with a generic vehicle type to indicate that the track is a vehicle.	<Entry> slew ENTER	a) All Methods: (blank system response line) ACID <Entry> b) No Track Selected NO SLEW c) Invalid Entry INVALID ENTRY d) Duplicate ACID DUP ID
16.	Deleted			
17.	Individual Data Block Toggle	1. Using the primary trackball button to select the desired track or temporary map text object (slew "ENTER"), the user can toggle the data block for a track or temporary map text object on or off.	Slew, Primary Trackball Button	(No Feedback)
18.	Tower Configura-tion	1. Executing <configured function accelerator sequence (*e.g.*, F7 key → "T" → "C")> on the data entry device, then pressing "ENTER" the system displays in the preview area the alerts that are configured and selected to be indicated on the current display channel. Pressing the "ESC" key clears the preview area of the requested information.	F7 > T > C > ENTER	a) All Methods: (blank system response line) <Airport Configuration Title> <Display Channel Position Name 1 code>: <RWY 1>,<RWY 2>, …<RWY *n*> <Display Channel Position

TABLE XIII: Implied functions – Continued.

Row Num	Function	Function Manipulation	Function Accelerator	Feedback (Preview Area)
				Name 2 code>: <RWY 1>,<RWY 2>, …<RWY *n*> … <Display Channel Position Name *m* code>: <RWY 1>,<RWY 2>, …<RWY *n*>
19.	Alert Silence	1. Depressing <configured function accelerator sequence (*e.g.*, F12 key)>, audible alert indicators for a cautionary scenario or an alert scenario in progress are silenced.	F12	(No Feedback)
20.	Active Window Cycle	1. When in a submenu, the user may execute <configured function accelerator sequence (*e.g.*, fourth trackball button)> on the data entry device to change the active window. The user may continue to press the configured function accelerator sequence to sequentially cycle the active window through all available windows including the main window. For example, to change the brightness in two different windows, the user might select the active window, go to the brightness submenu and make changes, change the active window using this implied function, and finally make more changes before leaving the brightness submenu.	Fourth Trackball Button	(No Feedback)
21.	(Intentionally Blank)			
22.	Create Temporary Track Drop Area	1. Depressing <configured function accelerator sequence (*e.g.*, F5 key → <space> → "O" → "K")>, then using the primary trackball button to select the desired radar-only track (slew "ENTER"), the user can place a temporary track drop area around the selected radar-only track. The temporary track drop area establishes a circle with a radius adaptable by selecting system configuration parameters (20 – 100 ft.) in which radar plots will not contribute to updating a track's position or to establishing a track. The selected radar-only track is removed from all display channels 1 sec. after the area is enabled. The temporary track drop area will remain until either a period of	F5 > <space> > "O" > "K" > slew "ENTER"	a) All Methods: (blank system response line) TERM CNTL OK b) Exceeds limit ERROR: MAX LIMIT TERM CNTL OK c) Invalid Track INVALID TRACK

TABLE XIII: Implied functions – Continued.

Row Num	Function	Function Manipulation	Function Accelerator	Feedback (Preview Area)
		time has elapsed since it was established (range 15 min. – 24 hrs.) or no radar plots have been received in the area for a period of time (2 s – 24 hrs.) both adaptable by selecting system configuration parameters.		

3.1.14.2 Function Accelerators (Hotkeys)

Function accelerators shall [R332] be adaptable by selecting system configuration parameters and accessible using the data entry device and/or the trackball or combinations of both. Executing a function using a function accelerator shall [R332a] not affect the DCB unless specified elsewhere in this document.

3.1.14.3 Trackball Button Assignment

The functionality of each track ball button shall [R333] be adaptable to invoke any function in Sections 3.1.14.1.1 and 3.1.14.1.3 by selecting system configuration parameters. The execution of a function shall [R334] not require a user to depress and hold a trackball button. Trackball buttons shall [R524] only perform functions that have been explicitly defined in this document. For example, clicking the middle button on the RANGE DCB button would not invoke the range function.

3.1.14.4 Function Cancellation

The user shall [R335] be able to cancel any function using either the pointing device or the data entry device.

3.1.14.5 Trackball Control Rates

[R335a Deleted] The Airport Surface Application shall [R525] provide a means to independently modify the trackball response (adaptable by selecting system configuration parameters) for at least the following types of functions:

- Rotate
- Parameter Adjustment (value range 0-10)
- Parameter Adjustment (value range 0-100)
- Parameter Adjustment (value range 0 - >100)
- Cursor Movement
- Object Reposition (*i.e.*, secondary windows, coast/suspend list, preview area, map reposition, *etc.*)
- Preview Area Interaction

The system shall [R335b] allow the user to adjust the overall cursor speed, which simultaneously affects all trackball responses defined by system configuration parameters.

3.1.14.6 Track Selection

The Airport Surface Application shall [R628] have a track pick area that is centered about the point of focus for the cursor icon and that has a radius adaptable by selecting system configuration parameters (nominal range 1 mm – 51 mm). The Airport Surface Application shall [R629] encircle the target icon that is closest to the point of focus for the cursor icon with the single-track selection halo if the closest track is within the track pick area. If no target icon is within the track pick area, then the Airport Surface Application shall [R635] not encircle a target icon with the single-track selection halo.

3.1.15 Window Management

The Airport Surface Application shall [R336] have a Main Window. The Main window shall [R337] always be the size of the display area. The main window shall [R338] appear behind the display control bar, all secondary windows and lists when such objects are selected for viewing by the user as shown in FIGURE 45.

The Airport Surface Application system shall [R339] be able to display and manage up to 4 independent secondary windows for viewing traffic. The border for a secondary window shall [R526] nominally measure 1.5 mm in width. The secondary windows shall [R340] be capable of being placed in any location on the main window. The Airport Surface Application system shall [R527] allow the user to resize or delete a secondary window. The user shall [R341] not be able to position any portion of a secondary window off of the display area. No portion of a secondary window shall [R342] overlap a portion of any other secondary window. Graphical objects in the window should appear to remain stationary when a user resizes a secondary window.

[R343 Deleted] The Preview Area, Coast/Suspend List, and Alert Message Text Box shall [R528] [SL] be able to overlay secondary windows. [R344 Deleted] The Preview Area, Coast/Suspend List, and Alert Message Text Box shall [R529] [SL] initially open in pre-defined locations adaptable by selecting system startup parameters. The Airport Surface Application shall [R345] allow the track coast/suspend list to be placed in any location on a display channel. [R346 Deleted] [R347 Deleted] The user shall [R530] [SL] not be able to position any portion of the Coast/Suspend list, Preview Area, or the Alert Message Text Box off of the display area. If the user closes the Coast/Suspend List and reopens it at a later time it shall [R348] open in the most recently viewed location.

3.1.16 Data Management

[R349 Deleted] Airport Surface Application data shall [R531] [SL] be managed as indicated in TABLE XIV below:

TABLE XIV: Data management

	Function	Independent for each window	Independent for each display channel	Common to all display channels
1.	Brightness	X		
2.	Coast List Contents			X
3.	Coast/Suspend List (On/Off)		X	
4.	Color Palette		X	
5.	Conflict Alert Volume		X	
6.	Conflict Alert Volume Test		X	
7.	Current Display Configuration		X	
8.	Cursor Icons			X
9.	Data Block Contents			X
10.	Data Block Off Area	X		
11.	Data Block Trait Area	X		
12.	Data Block Size (Full/Partial)	X		
13.	Data Block View (On/Off)	X		
14.	Character Sizes	X		
15.	Font Type			X
16.	Maintenance Mode			X
17.	Function Accelerators			X
18.	Hardware Configuration		X	
19.	History Trail (On/Off/Length)	X		
20.	Default Function			X
21.	Individual Data Block Toggle	X		
22.	Operational Playback Mode		X	
23.	Leader Line Direction	X		
24.	Leader Line Length	X		
25.	Local Aircraft and Vehicle List			X
26.	Map Color Scheme			X
27.	Map Range Scale	X		
28.	Map Rotation	X		
29.	Map Temporary Data (Global)			X
30.	Map Reposition	X		
31.	Operational Mode		X	

TABLE XIV: Data management – Continued.

	Function	Independent for each window	Independent for each display channel	Common to all display channels
32.	Preset Display Configurations			X
33.	Preview Areas		X	
34.	Velocity Vector Lines (on/off)	X		
35.	Velocity Vector Lines ratio		X	
36.	Safety Alerts			X
37.	Suspend List Contents			X
38.	System Health Indicator Location			X
39.	System Mode Indicator Location			X
40.	System Recovery Parameters		X	
41.	System Startup Parameters			X
42.	Target Icons			X
43.	Display Control Bar display (on/off)		X	
44.	Display Control Bar Location		X	
45.	Trackball Button Assignment			X
46.	Window Attributes (Size, Location)	X		
47.	Hold Bars			X
48.	Alert Message Text Box		X[1]	
49.	Runway Configuration			X
50.	Arrival Alert Suppression		X[2]	
51.	Track Alert Inhibit			X
52.	Tower Configuration			X
53.	Position Name		X[3]	
54.	Temp. Track Drop Areas			X

[1] see 3.1.17.2; Alerts are associated with a controller position.

[2] see 3.1.17.2; Alerts are associated with a controller position.

[3] see 3.1.17.2; A controller position can be associated with more than one display channel.

3.1.17 Safety Alerts

3.1.17.1 Safety Alert Logic Airport Configurations

[R350 Deleted] [R351 Deleted] [R352 Deleted] [R353 Deleted] [R354 Deleted] The Airport Surface Application shall [R532] [SL] be capable of processing tracks in safety logic based on at 60 different airport traffic configurations defined as part of site configuration parameters. The title of the currently selected airport traffic configuration shall [R641] [SL] be highlighted on the DCB with "DCB Toggle Selected Option Text Color" (see 3.1.2). Each safety logic airport configuration shall [R533] [SL] be adaptable in system configuration parameters to provide alert scenario and cautionary scenario information to the user for each of the alert situations listed below in TABLE XV.

TABLE XV: Critical alert situations

Situation Name	Sample Animation	Sample Textual Alert Message Configuration	Sample Audible Alert Message Configuration
1. Arrival Chasing Departure	FIGURE 46	RWY < > <Arrival>, <Departure> RWY OCCUPIED	"Warning, Runway < >, Occupied"
2. Arrival Chasing Lander	FIGURE 47	RWY < > <Arrival>, <Lander> RWY OCCUPIED	"Warning, Runway < >, Occupied"
3. Arrival Chasing Taxi	FIGURE 48	RWY < > <Arrival>, <Taxi> RWY OCCUPIED	"Warning, Runway < >, Occupied"
	FIGURE 49 (Vehicle on Runway)	RWY < > <Vehicle>, <Arrival> VEHICLE ON RWY	"Warning, Runway < >, Vehicle On Runway"
4. Arrival Chasing Departure Abort	FIGURE 50	RWY < > <Arrival>, <Abort> RWY OCCUPIED	"Warning, Runway < >, Occupied"

TABLE XV: Critical alert situations – Continued.

Situation Name	Sample Animation	Sample Textual Alert Message Configuration	Sample Audible Alert Message Configuration
5. Arrival Head-On Departure	FIGURE 51 (Opposite Direction Departure)	RWY < > <Arrival>, <Departure> OPP DIR DEPARTURE	"Warning, Runway < >, Opposite Direction Departure"
	FIGURE 52 (Opposite Direction Arrival)	RWY <*> <Arrival>, <Departure> OPP DIR ARRIVAL	"Warning, Runway <*>, Opposite Direction Arrival"
6. Arrival Head-On Lander	FIGURE 53 (Opposite Direction Lander)	RWY < > <Arrival>, <Lander> OPP DIR LANDER	"Warning, Runway < >, Opposite Direction Lander"
	FIGURE 54 (Opposite Direction Arrival)	RWY <*> <Arrival>, <Lander> OPP DIR ARRIVAL	"Warning, Runway <*>, Opposite Direction Arrival"
7. Arrival Head-On Taxi	FIGURE 55 (Opposite Direction Taxi)	RWY < > <Arrival>, <Taxi> OPP DIR TAXI	"Warning, Runway < >, Opposite Direction Taxi"
	FIGURE 56 (Opposite Direction Arrival)	RWY <*> <Arrival>, <Taxi> OPP DIR ARRIVAL	"Warning, Runway <*>, Opposite Direction Arrival"
	FIGURE 57 (Vehicle on Runway)	RWY < > <Vehicle>, <Arrival> VEHICLE ON RWY	"Warning, Runway < >, Vehicle On Runway"
8. Arrival on Closed Surface	FIGURE 58	RWY <†> <Arrival> RWY CLOSED	"Warning, Runway <†>, Closed"

*In this case, the Runway that is displayed in the alert message text box and annunciated in the voice alert is the opposite of the active runway (*i.e.*, the runway corresponding to the arrival).

†The Runway that is displayed in the alert message text box and annunciated in the voice alert corresponds to the direction of the track.

TABLE XV: Critical alert situations – Continued.

Situation Name	Sample Animation	Sample Textual Alert Message Configuration	Sample Audible Alert Message Configuration
9. Arrival with a Stopped (Track of) Target	FIGURE 59	RWY < > <Arrival>, <Stopped> RWY OCCUPIED	"Warning, Runway < >, Occupied"
	FIGURE 60 (Vehicle on Runway)	RWY < > <Vehicle>, <Arrival> VEHICLE ON RWY	"Warning, Runway < >, Vehicle On Runway"
10. Departure Chasing Departure	FIGURE 61	RWY < > <Departure 1>, <Departure 2> RWY OCCUPIED	"Warning, Runway < >, Occupied"
11. Departure Chasing Lander	FIGURE 62	RWY < > <Departure>, <Lander> RWY OCCUPIED	"Warning, Runway < >, Occupied"
12. Departure Chasing Taxi	FIGURE 63	RWY < > <Departure>, <Taxi> RWY OCCUPIED	"Warning, Runway < >, Occupied"
	FIGURE 64 (Vehicle on Runway)	RWY < > <Vehicle>, <Departure> VEHICLE ON RWY	"Warning, Runway < >, Vehicle On Runway"
13. Departure Head-On Departure	FIGURE 65 (Opposite Direction Departure 2)	RWY < > <Departure 2>, <Departure 1> OPP DIR DEPARTURE	"Warning, Runway < >, Opposite Direction Departure"

TABLE XV: Critical alert situations – Continued.

Situation Name	Sample Animation	Sample Textual Alert Message Configuration	Sample Audible Alert Message Configuration
14. Departure Head-On Lander	FIGURE 66 (Opposite Direction Lander)	RWY < > <Lander>, <Departure> OPP DIR LANDER	"Warning, Runway < >, Opposite Direction Lander"
	FIGURE 67 (Opposite Direction Departure)	RWY < > <Departure>, <Lander> OPP DIR DEPARTURE	"Warning, Runway < >, Opposite Direction Departure"
15. Departure Head-On Taxi	FIGURE 68 (Opposite Direction Taxi)	RWY < > <Taxi>, <Departure> OPP DIR TAXI	"Warning, Runway < >, Opposite Direction Taxi"
	FIGURE 69 (Opposite Direction Departure)	RWY < > <Departure>, <Taxi> OPP DIR DEPARTURE	"Warning, Runway < >, Opposite Direction Departure"
	FIGURE 70 (Vehicle on Runway)	RWY < > <Vehicle>, <Departure> VEHICLE ON RWY	"Warning, Runway < >, Vehicle On Runway"
16. Departure with a Stopped (Track of)Target	FIGURE 71	RWY < > <Departure>, <Stopped> RWY OCCUPIED	"Warning, Runway < >, Occupied"
	FIGURE 72 (Vehicle on Runway)	RWY < > <Vehicle>, <Departure> VEHICLE ON RWY	"Warning, Runway < >, Vehicle On Runway"
17. Lander Chasing Departure	FIGURE 73	RWY < > <Lander>, <Departure> RWY OCCUPIED	"Warning, Runway < >, Occupied"

TABLE XV: Critical alert situations – Continued.

Situation Name	Sample Animation	Sample Textual Alert Message Configuration	Sample Audible Alert Message Configuration
18. Lander Chasing Lander	FIGURE 74	RWY < > <Lander 1>, <Lander 2> RWY OCCUPIED	"Warning, Runway < >, Occupied"
19. Lander Chasing Taxi	FIGURE 75	RWY < > <Lander>, <Taxi> RWY OCCUPIED	"Warning, Runway < >, Occupied"
	FIGURE 76 (Vehicle on Runway)	RWY < > <Vehicle>, <Lander> VEHICLE ON RWY	"Warning, Runway < >, Vehicle On Runway"
20. (Intentionally Omitted)	(Intentionally Omitted)	(Intentionally Omitted)	(Intentionally Omitted)
21. Lander Head-On Lander	FIGURE 77 (Opposite Direction Lander 2)	RWY < > <Lander 2>, <Lander 1> OPP DIR LANDER	"Warning, Runway < >, Opposite Direction Lander"
22. Lander Head-On Taxi	FIGURE 78 (Opposite Direction Taxi)	RWY < > <Taxi>, <Lander> OPP DIR TAXI	"Warning, Runway < >, Opposite Direction Taxi"
	FIGURE 79 (Opposite Direction Lander)	RWY < > <Lander>, <Taxi> OPP DIR LANDER	"Warning, Runway < >, Opposite Direction Lander"
	FIGURE 80 (Vehicle on Runway)	RWY < > <Vehicle>, <Lander> VEHICLE ON RWY	"Warning, Runway < >, Vehicle On Runway"

TABLE XV: Critical alert situations – Continued.

Situation Name	Sample Animation	Sample Textual Alert Message Configuration	Sample Audible Alert Message Configuration
23. Lander with a Stopped (Track of) Target	FIGURE 81	RWY < > <Lander>, <Stopped> RWY OCCUPIED	"Warning, Runway < >, Occupied"
	FIGURE 82 (Vehicle on Runway)	RWY < > <Vehicle>, <Lander> VEHICLE ON RWY	"Warning, Runway < >, Vehicle On Runway"
24. Arrival Head-On Abort	FIGURE 83 (Opposite Direction Abort)	RWY < > <Arrival>, <Abort> OPP DIR DEPARTURE	"Warning, Runway < >, Opposite Direction Departure"
	FIGURE 84 (Opposite Direction Arrival)	RWY <*> <Arrival>, <Abort> OPP DIR ARRIVAL	"Warning, Runway <*>, Opposite Direction Arrival"
25. Departure Chasing Abort	FIGURE 85	RWY < > <Departure>, <Abort> RWY OCCUPIED	"Warning, Runway < >, Occupied"
26. Departure Head-On Abort	FIGURE 86 (Opposite Direction Abort)	RWY < > <Departure>, <Abort> OPP DIR DEPARTURE	"Warning, Runway < >, Opposite Direction Departure"
	FIGURE 87 (Opposite Direction Departure)	RWY < > <Departure>, <Abort> OPP DIR DEPARTURE	"Warning, Runway < >, Opposite Direction Departure"
27. Lander Chasing Abort	FIGURE 88	RWY < > <Lander>, <Abort> RWY OCCUPIED	"Warning, Runway < >, Occupied"

*In this case, the runway that is displayed in the alert message text box and annunciated in the voice alert is the opposite of the active runway (*i.e.*, the runway corresponding to the arrival).

TABLE XV: Critical alert situations – Continued.

Situation Name	Sample Animation	Sample Textual Alert Message Configuration	Sample Audible Alert Message Configuration
28. Lander Head-On Abort	FIGURE 89 (Opposite Direction Abort)	RWY < > <Lander>, <Abort> OPP DIR DEPARTURE	"Warning, Runway < >, Opposite Direction Departure"
	FIGURE 90 (Opposite Direction Lander)	RWY < > <Lander>, <Abort> OPP DIR LANDER	"Warning, Runway < >, Opposite Direction Lander"
29. Departure Converging with Taxiway Taxi	FIGURE 91	RWY < > AT TWY <##> <Departure>, <Taxi> RWY OCCUPIED	"Warning, Runway < > At "XX", Traffic Crossing"
	FIGURE 92 (Vehicle on Runway)	RWY < > AT TWY <##> <Vehicle>, <Departure> VEHICLE ON RWY	"Warning, Runway < > At "XX", Vehicle Crossing"
30. Arrival Converging with Taxiway Taxi	FIGURE 93	RWY < > AT TWY <##> <Arrival>, <Taxi> RWY OCCUPIED	"Warning, Runway < > At "XX", Traffic Crossing"
	FIGURE 94 (Vehicle on Runway)	RWY < > AT TWY <##> <Vehicle>, <Arrival> VEHICLE ON RWY	"Warning, Runway < > At "XX", Vehicle Crossing"
31. Lander Converging with Taxiway Taxi	FIGURE 95	RWY < > AT TWY <##> <Lander>, <Taxi> RWY OCCUPIED	"Warning, Runway < > At "XX", Traffic Crossing"
	FIGURE 96 (Vehicle on Runway)	RWY < > AT TWY <##> <Vehicle>, <Lander> VEHICLE ON RWY	"Warning, Runway < > At "XX", Vehicle Crossing"

TABLE XV: Critical alert situations – Continued.

Situation Name	Sample Animation	Sample Textual Alert Message Configuration	Sample Audible Alert Message Configuration
32. Departure on a Closed Runway	FIGURE 97	RWY <†> <Departure> RUNWAY CLOSED	"Warning, Runway <†>, Closed"
33. Lander on Closed Surface	FIGURE 98	RWY <†> <Lander> RWY CLOSED	"Warning, Runway <†>, Closed"
34. Arrival vs. Arrival on intersecting runway	FIGURE 99	RWY <A1>, RWY <A2> <Arrival 1>, <Arrival 2> CONVERGING *Note that arrival 1 has the higher velocity when the alert situation occurs.	"Warning, Runway <A1>, Runway <A2>, Converging" *Note that arrival 1 has the higher velocity when the alert situation occurs.
35. Arrival vs. Lander on intersecting runway	FIGURE 100	RWY <A>, RWY <L> <Arrival>, <Lander> CONVERGING	"Warning, Runway <A>, Runway <L>, Converging"
36. Arrival vs. Taxi on intersecting runway	FIGURE 101	RWY <A>, RWY <T> <Arrival>, <Taxi> CONVERGING	"Warning, Runway <A>, Runway <T>, Converging"
	FIGURE 102 (Vehicle)	RWY <V>, RWY <A> <Vehicle>, <Arrival> VEHICLE CONVERGING	"Warning, Runway <V>, Runway <A>, Vehicle Converging"
37. Arrival vs. Departure on intersecting runway	FIGURE 103	RWY <A>, RWY <D> <Arrival>, <Departure> CONVERGING	"Warning, Runway <A>, Runway <D>, Converging"

†The Runway that is displayed in the alert message text box and annunciated in the voice alert corresponds to the direction of the track.

TABLE XV: Critical alert situations – Continued.

Situation Name	Sample Animation	Sample Textual Alert Message Configuration	Sample Audible Alert Message Configuration
38. Arrival vs. Departure Abort on intersecting runway	FIGURE 104	RWY <A>, RWY <Ab> <Arrival>, <Abort> CONVERGING	"Warning, Runway <A>, Runway <Ab>, Converging"
39. Lander vs. Lander on intersecting runway	FIGURE 105	RWY <L1>, RWY <L2> <Lander 1>, <Lander 2> CONVERGING *Note that lander 1 has the higher velocity when the alert situation occurs.	"Warning, Runway <L1>, Runway <L2>, Converging" *Note that lander 1 has the higher velocity when the alert situation occurs.
40. Lander vs. Taxi on intersecting runway	FIGURE 106	RWY <L>, RWY <T> <Lander>, <Taxi> CONVERGING	"Warning, Runway <L>, Runway <T>, Converging"
	FIGURE 107 (Vehicle)	RWY <V>, RWY <L> <Vehicle>, <Lander> VEHICLE CONVERGING	"Warning, Runway <V>, Runway <L>, Vehicle Converging"
41. Lander vs. Departure on intersecting runway	FIGURE 108	RWY <D>, RWY <L> <Departure>, <Lander> CONVERGING	"Warning, Runway <D>, Runway <L>, Converging"
42. Lander vs. Departure Abort on intersecting runway	FIGURE 109	RWY <L>, RWY <Ab> <Lander>, <Abort> CONVERGING	"Warning, Runway <L>, Runway <Ab>, Converging"

TABLE XV: Critical alert situations – Continued.

Situation Name	Sample Animation	Sample Textual Alert Message Configuration	Sample Audible Alert Message Configuration
43. Departure vs. Taxi on intersecting runway	FIGURE 110	RWY <D>, RWY <T> <Departure>, <Taxi> CONVERGING	"Warning, Runway <D>, Runway <T>, Converging"
	FIGURE 111 (Vehicle)	RWY <V>, RWY <D> <Vehicle>, <Departure> VEHICLE CONVERGING	"Warning, Runway <V>, Runway <D>, Vehicle Converging"
44. Departure vs. Departure on intersecting runway	FIGURE 112	RWY <D1>, RWY <D2> <Departure 1>, <Departue 2> CONVERGING * Note that departure 1 has the higher velocity when the alert situation occurs.	"Warning, Runway <D1>, Runway <D2>, Converging" * Note that departure 1 has the higher velocity when the alert situation occurs.
45. Departure vs. Departure Abort on intersecting runway	FIGURE 113	RWY <D>, RWY <Ab> <Departure>, <Abort> CONVERGING	"Warning, Runway <D>, Runway <Ab>, Converging"

For each Alert Situation, the system shall [R534] [SL] be independently adaptable to provide one of the four combinations of cautionary and alert scenarios as long as conditions for the scenario are true: indicate neither cautionary nor alert scenarios; indicate cautionary scenario, but not alert scenarios; indicate alert scenarios, but not cautionary scenarios; indicate both cautionary and alert scenarios.

3.1.17.2 Safety Alert Logic Tower Configurations

The Airport Surface Application should display alerts only on those display channels being used by a user responsible for or interested in alerts associated with a particular runway. Each airport configuration (see 3.1.17.1) shall [R535] [SL] have an associated default tower configuration that gives each display channel one or more position name(s) (*e.g.*, LOCAL 1, GROUND, SUPER, MAINT, *etc.*), defines a position name code for each position name, and assigns a minimum set of runway alerts (audible and visual) to one or more display channels. For example, the default tower configuration could assign alerts for runways 18 and 25L to Local 1 and for runways 7, 25L, and 30 to Ground 2. The system shall [R536] [SL] allow a display channel to receive alerts (toggle on/off) assigned to other display channels in addition to those specified in the default tower configuration. In our example, Ground 2 could choose to receive alerts for the Local 1 position in addition to the ones assigned to Ground 2 in the default tower configuration, so Local 1 would receive alerts for runways 18 and 25L and Ground 2 would receive alerts for runways 7, 18, 25L and 30. The Airport Surface Application shall [R537] [SL] indicate cautionary and alert scenarios for a runway simultaneously on all display channels that should receive cautionary and alert indicators for that runway. The Airport Surface Application system shall [R538] [SL] ensure that all alert situations are mapped to at least one display channel in the tower. [R539 Deleted] Upon request, the system shall [R630] [SL] indicate to the user the position name, assigned runways, and selected runways for a display channel. If the Airport Surface Application is in maintenance mode, safety alerts shall [R540] [SL] be presented on a display channel only if a user requests them.

3.1.17.3 Visual Safety Alert Indicators

The Airport Surface Application system will provide visual indicators of information pertinent to cautionary and alert scenarios to the controller.

3.1.17.3.1 Visual Indicators for Cautionary Scenarios

3.1.17.3.1.1 Identified Target Icons

If the Airport Surface Application determines that any target meets the conditions that define a cautionary scenario at a given airport, then the system shall [R541] [SL] enclose each of the target icons in a regular octagon as shown in FIGURE 114. The type of target icon (see 3.1.6.1.1) that represents an identified target at the beginning of the cautionary scenario shall [R655] not change as long as the scenario persists. The color of the cautionary octagon shall [R542] [SL] be adaptable by selecting system configuration parameters. Twice the apothem of the octagon shall [R543] [SL] nominally represent a system configuration parameter number of feet on the display at the current map range in each window, (range 30 ft. - 400 ft. in 5-ft. increments). The Airport Surface Application shall [R544] [SL] have a minimum size (adaptable by selecting system configuration parameters) that defines twice the apothem of the octagon (nominal range 1.00 mm – 27.00 mm). [R545 Deleted] The presentation of track selection halos shall [R631] [SL] be suppressed for tracks enclosed by the cautionary octagon.

3.1.17.3.1.2 Identified Data Blocks

[R656 Deleted] Once the Airport Surface Application determines that any target meets the conditions that define a cautionary scenario at a given airport, then the contents of data block fields A, B, C, F, and G (see 3.1.4.1) for an identified target shall [R661] not change as long as the scenario persists.

3.1.17.3.2 Visual Indicators for Alert Scenarios

3.1.17.3.2.1 Identified Target Icons

If the Airport Surface Application determines that any target meets the conditions that define an alert scenario at a given airport, then the system shall [R546] [SL] enclose each of the target icons in a regular

octagon as shown in FIGURE 115. The type of target icon (see 3.1.6.1.1) that represents an identified target at the beginning of the alert scenario shall [R657] not change as long as the scenario persists. The color of the alert octagon shall [R547] [SL] be adaptable by selecting system configuration parameters. Twice the apothem of the octagon shall [R548] [SL] nominally represent a system configuration parameter number of feet on the display at the current map range in each window, (range 30 ft. - 400 ft. in 5-ft. increments). The Airport Surface Application shall [R549] [SL] have a minimum size (adaptable by selecting system configuration parameters) that defines twice the apothem of the octagon (nominal range 1.00 mm – 27.00 mm). [R550 Deleted] The presentation of track selection halos shall [R632] [SL] be suppressed for tracks enclosed by the alert octagon.

[R551 Deleted] Any target icon that represents a target in an alert scenario shall [R637] [SL] oscillate in color from its configured target icon color to the configured Alert Scenario Icon Flash Color at a rate adaptable in ½ Hz. increments from ½ - 3 Hz with a 50% duty cycle.

3.1.17.3.2.2 Identified Data Blocks

If the Airport Surface Application determines that any target meets the conditions that define an alert scenario at a given airport, then the system shall [R552] [SL] force the data block for the identified track(s) to be a full data block with all fields "on" except scratchpads 1 and 2 (Fields J and K) with an opaque, rectangular background for the identified data blocks as long as the scenario persists. Fields J and K of the data block shall [R553] [SL] be "off" for the identified data blocks as long as the scenario persists. [R658 Deleted] Once the Airport Surface Application determines that any target meets the conditions that define an alert scenario at a given airport, then the contents of data block fields A, B, C, F, and G (see 3.1.4.1) for an identified target shall [R662] not change as long as the scenario persists. The color for the data block text during an alert scenario, for the outline, and for the fill of the rectangular background shall [R554] [SL] be adaptable (RGB value set/off) by selecting system configuration parameters (*i.e.*, 3 parameters in each color palette). If the color for the rectangular background is set to "off" then the data block shall [R555] [SL] be transparent during the scenario. The identified data block(s) shall [R556] [SL] appear in a layer above all other map areas, target icons, and data blocks as long as the scenario persists.

If the Airport Surface Application determines that any target meets the conditions that define an alert scenario at a given airport, then the system shall [R557] [SL] force the data blocks for every track not meeting the conditions to display a partial data block as long as the scenario persists. Forcing the tracks to display partial data blocks will not affect the font size of the data blocks in question.

3.1.17.3.2.3 Alert Message Text Contents

The Airport Surface Application shall [R558] [SL] be adaptable to provide up to three lines of text specific to the alert scenario in an alert message text box (*i.e.*, one, two, or three lines). Each line of text shall [R559] [SL] be composed of up to six concatenated segments. Each segment shall [R560] [SL] be one of the following: pre-defined text (up to 32 characters), Runway Name, Crossing Taxiway Name, or Callsign. If a callsign is not available, but a beacon code is available, then the system shall [R561] [SL] substitute the beacon code for the callsign. If neither the callsign nor the beacon code is available, then the system shall [R562] [SL] substitute "UNKN" for the callsign.

3.1.17.3.2.4 Alert Message Text Box

If the Airport Surface Application determines that any target meets the conditions that define an alert scenario at a given airport, then the system shall [R563] [SL] display an alert message text box in a position selected by the user. The contents of the alert message text box shall [R659] not change as long as the scenario persists. The color for the alert message text and for the outline and the fill of the opaque, rectangular background shall [R564] [SL] be adaptable (RGB value set/off) by selecting system configuration parameters. The size of the alert message text box shall [R565] [SL] be configurable from 5 to 96 characters wide in system configuration parameters. The font size for text in the alert message text box shall [R566] [SL] be configurable in system configuration parameters to display text messages using one of the six font sizes described in Section 3.1.5 of this document.

The system shall [R567] [SL] not present additional text alert indicators to the user for tracks already involved in an alert scenario. If an alert scenario for a set of tracks has been detected by the system, and another alert scenario is detected involving tracks not in the first set (*i.e.*, the sets are mutually exclusive), an additional alert message shall [R568] [SL] be presented below the previous alert message text box.

3.1.17.4 Audible Safety Alert Indicators

The Airport Surface Application system shall [R569] [SL] provide audible indicators of information pertinent to cautionary and alert scenarios to the controller. The Airport Surface Application system shall [R570] [SL] provide a graphical volume control for adjusting the volume of audible indicators. The minimum and maximum volumes shall [R571] [SL] be adaptable by selecting system configuration parameters.

The system shall [R572] [SL] not present additional voice alert indicators to the user for tracks already involved in an alert scenario. [R573 Deleted] [R633 Deleted] If an alert scenario for a set of tracks has been detected by the system, and another alert scenario is detected involving tracks not in the first set (*i.e.*, the sets are mutually exclusive), an additional audible message shall [R636] [SL] be presented after the previous audible message.

The Airport Surface Application shall [R660] provide audible indicators with sound levels up to 100 dB. [R574 Deleted] The Airport Surface Applications should provide audible indicators that are at least 20 dB above the speech interference level at the operating position of the intended receiver. Audible indicators presented at display channels in the same room shall [R651] be synchronized to a tolerance of 80 ms.

3.1.17.4.1 Audible Indicators for Cautionary Scenarios

[R575 Deleted] The Airport Surface Application system shall [R643] [SL] activate a cautionary indicator at the applicable display channel(s) (adaptable by selecting system configuration parameters) when a cautionary scenario is detected. [R576 Deleted] The Airport Surface Application system shall [R644] [SL] repeat the cautionary indicator at a rate between 0.01 – 10 Hz, adaptable by selecting system configuration parameters.

3.1.17.4.2 Audible Indicators for Alert Scenarios

The Airport Surface Application system shall [R577] [SL] activate an audible safety alert indicator at the applicable display channel(s) (adaptable by selecting system configuration parameters) when an alert scenario is detected. The audible safety alert indicator shall [R578] [SL] be composed of up to twenty-five concatenated segments. Each segment shall [R579] [SL] be one of the following: non-verbal tone, pre-defined verbal message (up to 16 characters), Runway Name, Crossing Taxiway Name, or Callsign. If a callsign is not available, but a beacon code is available, then the system shall [R580] [SL] substitute the beacon code for the callsign. If neither the callsign nor the beacon code is available, then the system shall [R581] [SL] substitute “UNKN” for the callsign.

3.1.17.5 Voice Quality

The Airport Surface Application system shall [R582] [SL] generate vocal message segments using a Text-to-Speech engine that is compliant with Speech Synthesis Markup Language Version 1.0 (*e.g.*, AT&T Natural Voices, *et. al.*) as shown in FIGURE 116. The generated voice shall [R583] [SL] have a sample rate greater than or equal to 16 KHz. The Airport Surface Application shall [R584] [SL] allow authorized users to alter, check, save, and re-initialize speech engine pronunciations to comply with current FAA orders (*e.g.*, FAA 7110.65, *etc.*) without rebooting any portion of the system. For example, if there were a need to change the pronunciation of the letter "D" from "Delta" to "Dixie", an authorized user could alter the pronunciation, check that the system now pronounces the change correctly, save the change, and re-initialize the speech engine for the system to use the updated pronunciation.

3.1.18 Hardware

The Airport Surface Application should provide several mounting options for each hardware device. [R355 Deleted] Each display channel shall [R585] [SL] be adaptable by selecting system configuration parameters so that a speaker is not required for the display channel to function. Devices not configured for a display channel shall [R356] not cause system faults.

3.1.18.1 Display

The Airport Surface Application display shall [R357] support 16,777,216 distinct colors. [R358 Deleted] The display shall [R586] be readable in direct lighting conditions up to 6000 foot-candles (*e.g.*, "General Digital Genstar II" shown in FIGURE 117; "Korry HPM-2130-29430" shown in FIGURE 118, *et. al.*). The display shall [R587] implement strategies to reduce glare and reflection. The display shall [R588] have a diagonal size greater than 20 inches. The display shall [R589] be approved by representatives of the Federal Aviation Administration. The Airport Surface Application system shall [R590] provide tools to properly align each display. These tools shall [R591] be available to an authorized user who has been granted access to more extensive maintenance data while in operational mode (see 3.1.12).

3.1.18.1.1 Mounting Options

The Airport Surface Application system should have a variety of mounting options for the display.

3.1.18.1.1.1 Ceiling Mount (Articulated Arm)

An articulated ceiling mount having vertical and lateral adjustment as well as monitor tilt and swivel capability shall [R359] be provided. The vertical adjustment shall [R360] be 18 inches minimum. The range of lateral adjustment shall [R361] be anywhere within a minimum of a 40 inch radius, 180° arc about the center-post. The range of tilt shall [R362] be 0° to ± 30° minimum. The range of swivel shall [R363] be ± 90° minimum.

3.1.18.1.1.2 Desk Top Mount (Tilt/Swivel)

A freestanding table top mount having monitor tilt and swivel capability shall [R364] be provided. The range of tilt shall [R365] be 0° to ± 30° minimum. [R366 Deleted] The range of swivel shall [R592] be ±90° minimum.

3.1.18.1.1.3 Console Mount

[R367 Deleted] Mounting brackets that permit variable tilt mounting into an existing console shall [R593] be provided. [R368 Deleted] The range of tilt shall [R594] be 0° to ±30°. [R369 Deleted] An on/off switch for the display shall [R595] be accessible when mounted in the console.

3.1.18.2 Data Entry Devices and Pointing Devices

The arrangement of data entry devices and pointing devices for each display channel shall [R370] allow for either left or right handed use.

The keyboard for the Airport Surface Application system shall [R371] have design characteristics which are comparable to or better than those of the "Cortron Model 549" as shown in FIGURE 119. The keyboard shall [R372] have a QWERTY layout.

The Airport Surface Application shall [R373] have a numeric keypad.

The keypack for the Airport Surface Application system shall [R374] have design characteristics which are comparable to or better than those of the "Cortron Model 580" as shown in FIGURE 120. A trackball with no less than three buttons shall [R375] be provided.

The Airport Surface Application system shall [R376] have two mounting options for data entry devices and pointing devices: free-standing enclosure or flush mounted.

3.1.18.3 Speakers

[R377 Deleted] One independent speaker shall [R596] [SL] be provided for each display channel. The Airport Surface Application shall [R597] [SL] be able to address audible safety alert indicators to an individual signal path corresponding to a display channel. If a distributed speaker network is used, the voltage shall [R598] [SL] not exceed 24V DC. Each speaker shall [R599] [SL] have a minimum frequency response of 100 Hz – 20 KHz. [R600 Deleted] [R601 Deleted] Each signal path shall [R638] [SL] be comprised of shielded cables and shielded or low magnetic field speakers in order to protect against adverse effects from electromagnetic interference. Excepting the speaker enclosure, all audio components needed for audio alerts shall [R602] [SL] be located in the equipment room unless a cable run of greater than 500 ft. is required to reach the ATCT. [R378 Deleted] Each speaker shall [R603] [SL] be able to be mounted hanging from the ceiling, on the console, in the console, or on the wall. The Airport Surface Application shall [R604] [SL] perform Built in Test (BIT) on each signal path to ensure proper operation of the signal path. For example, the BIT should monitor a computer sound card, an amplifier, the speaker, and the cable connecting them, if that equipment is used in a signal path.

3.2 Remote Tower Display Requirements

3.2.1 Maps

3.2.1.1 Map Attributes

3.2.1.1.1 Viewable Maps

The Airport Surface Application Viewable map shall [R1001] represent five map areas in the coverage volume. No map area shall [R1002] cover or interfere with the presentation of a target icon or data block. Each area shall [R1003] have an independent color to represent it. Each area shall [R1004] be filled with a color defined by standard RGB value sets. Each area shall [R1005] have an outline with an independent color defined by standard RGB value sets. Each outline and fill color shall [R1006] be independently adaptable (*e.g.*, RGB value set/off) by changing system configuration parameters. The option of no fill or no outline shall [R1007] be available in the system configuration parameters. Areas that are configured to have no fill shall [R1008] burn through to the root color. The map areas in the coverage volume are shown in FIGURE 121 and shall [R1009] consist of the following:

1. Runways – this area shall [R1010] consist of all runway areas and includes helicopter landing areas. Runways are shown in FIGURE 122 with fill only, FIGURE 123 with outline only, and FIGURE 124 with outline and fill.

2. Taxiways – this area shall [R1011] consist of all taxiway areas and non-taxiway movement areas and includes helicopter taxiing areas. Taxiways are shown in FIGURE 125 with fill only, FIGURE 126 with outline only, and FIGURE 127 with outline and fill.

3. Ramps – Ramps shall [R1012] include loading ramps, parking areas, and other areas near the terminal. Ramps are shown in FIGURE 128 with fill only, FIGURE 129 with outline only, and FIGURE 130 with outline and fill.

4. Background area "1" – background area "1" shall [R1013] include islands between runways and taxiways and areas outside of runways and taxiways.

5. Background area "2" – background area "2" shall [R1014] be used to define other significant geographical landmarks (*e.g.*, bodies of water, roadways, buildings, bridges) depending upon site specific requirements.

Any region not defined by one of the five map areas shall [R1015] default to the root color.

3.2.1.2 Map Functions

3.2.1.2.1 Map Range

The Airport Surface Application shall [R1016] display ranges from 300 ft. to 10 nautical miles. The displayed range scale shall [R1017] be measured horizontally across the Airport Surface Application display. For example, if the main window and a secondary window are both set to the same range scale, then objects in both windows should appear to be the same size.

The Airport Surface Application shall [R1018] have a zoom function to change the range scale in the active window. The zoom function shall [R1019] change the range scale in increments calculated as a percentage of the current range scale. The percentages used in calculation shall [R1020] be selected as part of the system configuration parameters. The minimum selectable value shall [R1021] be 1%. The maximum selectable value shall [R1022] be 99%. The user shall [R1023] also be able to specify a particular range scale in hundreds of feet. All range scale adjustment increments shall [R1024] be rounded to one hundred

feet, or to the nearest one hundred foot increment, whichever is greater. The zoom function is illustrated in FIGURE 131.

3.2.1.2.2 Map Reposition

The Airport Surface Application system shall [R1025] be capable of repositioning the current map in the active window without altering the range scale as shown in FIGURE 132. The user shall [R1026] be able to reposition the map in any direction. The map reposition increment shall [R1027] be calculated as a percentage of the current range scale. The percentage used in calculation shall [R1028] be selected as part of the system configuration parameters. The minimum selectable value shall [R1029] be 1%. The maximum selectable value shall [R1030] be 99%.

3.2.1.2.3 Map Rotation

The Airport Surface Application system shall [R1031] be capable of rotating the current map in the active window without altering the range scale as shown in FIGURE 133. The Airport Surface Application shall [R1032] be capable of rotating to any map orientation. The axis of rotation shall [R1033] be the center of the active window.

3.2.1.2.4 Default Function

The Airport Surface Application shall [R1034] have a default function which restores the display channel settings to the values contained in the system startup parameters.

3.2.2 Colors

All colors shall [R1035] be constructed using standard RGB value sets. The defined RGB value set for each display component shall [R1036] be at 100% brightness.

The system configuration parameters shall [R1037] be able to contain at least two different colors for each display component. These colors shall [R1038] be selectable by the user as two different color palettes. The display components contained in each palette shall [R1039] include:

1. Root Color
2. Runways (filled)
3. Runways (outlined)
4. Taxiways (filled)
5. Taxiways (outlined)
6. Arrival Corridors
7. Ramps (filled)
8. Ramps (outlined)
9. Background area 1 (filled)
10. Background area 1 (outlined)
11. Background area 2 (filled)
12. Background area 2 (outlined)
13. Aircraft Icon
14. Heavy Aircraft Icon
15. Vehicle Icon
16. Unknown Icon
17. Heavy Indicator
18. Cursor
19. DCB Text
20. DCB Toggle Selected Option Text Color
21. DCB Toggle not Selected Option Text Color
22. Data Block Text
23. Unpressed DCB button Color 1
24. Unpressed DCB button Color 2
25. Depressed DCB button Color 1
26. Depressed DCB button Color 2
27. DCB Dwell Emphasis Color
28. DCB Border Color
29. List Text
30. Inactive Window Border Color
31. Active Window Border Color
32. New Window Outline Color
33. Velocity Vector Lines
34. Coast List Text Color
35. Target Dwell Emphasis Color
36. Predefined Surface Closure Color
37. Predefined Surface Restriction Color
38. Single-Track Selection Halo and Data Block Border

3.2.3 Brightness Controls

The Airport Surface Application system shall [R1040] allow users to independently control the brightness of the following groups of display components:

1. Map Foreground – Runways, Taxiways, Ramps, and Background Area 2
2. Map Background – Background 1, Root Color
3. Target Icons – Aircraft, Heavy Aircraft, Heavy Indicator, Vehicle, Unknown, Predefined Surface Closures and Restrictions
4. Data Blocks – Data Block Text, Leader Line
5. Lists – Preview Area Text
6. Display Control Bar – DCB Text, DCB toggle Selected Option Text, DCB Toggle not Selected Option Text, Unpressed DCB button Color 1 & 2, Depressed DCB button Color 1 & 2, DCB Dwell Emphasis Color, DCB Border Color

Brightness controls shall [R1041] be defined as a multiplying factor of an RGB value set. For example, if an RGB value set at 100% brightness of (1.00)*[200, 200, 200] is changed to 75% brightness, then (0.75)*[200, 200, 200] = [150, 150, 150]. The Airport Surface Application system shall [R1042] have a minimum brightness multiplier for each group defined above. Each minimum brightness multiplier shall [R1043] be adaptable as part of the system configuration parameters.

3.2.4 Data Blocks

The Airport Surface Application shall [R1044] be capable of displaying a data block for each target in the coverage volume. A data block for an aircraft shall [R1045] contain the fields as shown below in TABLE XVI and in FIGURE 134. The display of data blocks for targets represented by a vehicle icon (see 3.2.6.1.1) shall [R1046] be adaptable for a display channel by selecting system configuration parameters. When configured for display, a data block for a vehicle shall [R1047] contain the fields as shown below in TABLE XVII and in FIGURE 134. A target represented by an unknown icon (see 3.2.6.1.1) shall [R1048] not display an associated data block. All fields shall [R1049] be left justified. Selected fields (see 3.2.4.4.1) shall [R1050] be shifted left so there is one space between fields on the same line. A selected field occupies an interior position if there is another selected field to its right. Any selected field in an interior position, except Fields B, J, or K, shall [R1051] be padded to the right with spaces up to the full width specified for the field in TABLE XVI. Any field which contains at least one visible character and which is the rightmost selected field shall [R1052] occupy space within the data block up to and including the rightmost visible character. Any field, except Fields B, J or K, which contains no visible characters and which is the rightmost selected field shall [R1053] occupy space within the data block up to the full width specified for the field in TABLE XVI. A line shall [R1054] terminate at the end of the extent taken up by its rightmost selected field. If line 2 is involved in timesharing, then the line shall [R1055] terminate at the longer of the two alternating set of fields.

TABLE XVI: Aircraft data block field descriptions

Field	Line # and Character Position	Field Content
A	Line 0; Characters 1-16	Track Status
B	Line 1; Characters 1-8	Callsign (timeshare with field C)
C	Line 1; Characters 1-8	Beacon Code (timeshare with field B)
D	Line 1; Characters 10-12	Altitude
E	Line 1; Characters 14-16	Sensor Coverage
F	Line 2; Characters 1-4	Aircraft Type (Timeshare with Fields J and K)
G	Line 2; Character 6	Aircraft Category (Timeshare with Fields J and K)
H	Line 2; Characters 8-10	Paired Fix or Departure Gate Information (Timeshare with Fields J and K)
I	Line 2; Characters 12-13	Velocity (Timeshare with Fields J and K)
J	Line 2; Characters 1-7	Scratchpad Area 1 (Timeshare with Fields F, G, H, and I)
K	Line 2; Characters 9-15	Scratchpad Area 2 (Timeshare with Fields F, G, H, and I)

TABLE XVII: Vehicle data block field descriptions

Field	Line # and Character Position	Field Content
A	Line 0; Characters 1-16	Track Status
B	Line 1; Characters 1-8	Callsign
E	Line 1; Characters 10-12	Sensor Coverage
F	Line 2; Characters 1-4	Aircraft/Vehicle Type (Timeshare with Fields J and K)
I	Line 2; Characters 6-7	Velocity (Timeshare with Fields J and K)
J	Line 2; Characters 1-7	Scratchpad Area 1 (Timeshare with Fields F and I)
K	Line 2; Characters 9-15	Scratchpad Area 2 (Timeshare with Fields F and I)

3.2.4.1 Data Block Fields

3.2.4.1.1 Field A – Track Status

Field A – Track Status: Field A shall [R1056] be an alphanumeric field consisting of 16 characters. Field A shall [R1057] display the status of the track in special situations. (Examples of special situations may include potential multipath, conflicting data block information, conflict alert status, or coast situations, *etc.*) If Field A contains data, then the system shall [R1058] force the track's data block to be displayed.

3.2.4.1.2 Field B – Callsign

Field B – Callsign: Field B shall [R1059] be an alphanumeric field containing the aircraft identification (ACID). Field B shall [R1060] consist of 8 characters. The ACID shall [R1061] be displayed as the user default. If the ACID is not available, the beacon code shall [R1062] be displayed. If both the ACID and the beacon code are available, the user shall [R1063] be able to toggle between the ACID and the beacon code.

3.2.4.1.3 Field C – Beacon Code

Field C – Beacon Code: Field C shall [R1064] be an alphanumeric field containing the aircraft beacon code. Field C shall [R1065] consist of 8 characters. The ACID shall [R1066] be displayed as the user default. If the ACID is not available the beacon code shall [R1067] be displayed. If both the ACID and the beacon code are available, the user shall [R1068] be able to toggle between the ACID and the beacon code for four seconds. If there is no beacon code for a given track, and the user attempts to view the beacon code, the words "NO BCN" shall [R1069] be displayed for four seconds in field C.

3.2.4.1.4 Field D – Altitude

Field D – Altitude; Field D shall [R1070] be an alphanumeric field consisting of three characters that indicate the aircraft or vehicle altitude above Mean Sea Level (MSL) in hundreds of feet. The least significant digit shall [R1071] represent 100 ft. If the altitude is available but is tagged as invalid, then each character of the field shall [R1072] be filled with an uppercase X, (*i.e.*, “XXX”).

3.2.4.1.5 Field E – Sensor Coverage

Field E – Sensor Coverage: Field E shall [R1073] be an alphanumeric field consisting of three characters that indicates the sensor coverage for a target as shown below in TABLE XVIII.

TABLE XVIII: Sensor coverage

Sensor	Coverage							
Mode-S, ATCRBS, or Primary from ASR-9	X	0	X	X	0	X	0	0
Mode-S or ATCRBS from Multilateration, or ADS-B	0	0	X	0	X	X	X	0
ASDE-X Radar Subsystem Primary	0	0	0	X	X	X	0	X
Sensor Coverage Label →	**ASR**	**CST**	**FUS**	**FUS**	**FUS**	**FUS**	**MUL**	**RDR**
Legend	X	Detected By Sensor						
	0	Not Detected By Sensor						

3.2.4.1.6 Field F – AC/Vehicle Type

Field F – AC/Vehicle Type: Field F shall [R1074] be an alphanumeric field consisting of four characters that indicate the aircraft/vehicle type. The AC/Vehicle Type (together with fields G, H, and I) shall [R1075] timeshare with Scratchpad areas 1 and 2 for a period of between 1 and 4 seconds, adaptable by selecting system configuration parameters if there is data in either Scratchpad Area 1 or 2. The Airport Surface Application shall [R1076] have a generic aircraft type (*e.g.*, ACFT) adaptable by selecting system configuration parameters. The Airport Surface Application shall [R1077] have a generic vehicle type (*e.g.*, VEH) adaptable by selecting system configuration parameters. Any entry in Field F not defined as a generic vehicle or generic aircraft type shall [R1078] indicate an aircraft type.

3.2.4.1.7 Field G – Aircraft Category

Field G – Aircraft Category: Field G shall [R1079] be an alphanumeric field consisting of 1 character. The system shall [R1080] recognize valid entries as defined in TABLE XIX. If Field G contains a valid entry, and Field F contains no data, then the system shall [R1081] automatically fill Field F with the generic aircraft type. The Aircraft Category (together with fields F, H, and I) shall [R1082] timeshare with Scratchpad areas 1 and 2 for a period of between 1 and 4 seconds, adaptable by selecting system configuration parameters if there is data in either Scratchpad Area 1 or 2.

TABLE XIX: Aircraft categories and their corresponding target icons

Aircraft Category	Description	Target Type
T	TCAS	Aircraft
H	Heavy	Heavy Aircraft
B	Heavy and TCAS	Heavy Aircraft
F	B757	Heavy Aircraft
L	B757 and TCAS	Heavy Aircraft
U	Heavy	Heavy Aircraft
V	VFR and Not Heavy	Aircraft
W	Heavy and VFR	Heavy Aircraft
X	High Performance Propeller Aircraft	Aircraft

3.2.4.1.8 Field H – Paired Fix or Departure Gate Information

Field H – Paired Fix or Departure Gate Information: Field H shall [R1083] be an alphanumeric field consisting of three characters that indicate the paired fix or departure gate information. The Paired Fix or Departure Gate Information (together with fields F, G, and I) shall [R1084] timeshare with Scratchpad areas 1 and 2 for a period of between 1 and 4 seconds, adaptable by selecting system configuration parameters if there is data in either Scratchpad Area 1 or 2.

3.2.4.1.9 Field I – Velocity

Field I – Velocity: Field I shall [R1085] be an alphanumeric field consisting of two characters that indicate the speed of a target in tens of knots. The velocity shall [R1086] be rounded to the nearest 10 knots. For example, an actual velocity of 112 knots would be displayed as "11". The Velocity (together with fields F, G, and H) shall [R1087] timeshare with Scratchpad areas 1 and 2 for a period of between 1 and 4 seconds, adaptable by selecting system configuration parameters if there is data in either Scratchpad Area 1 or 2.

3.2.4.1.10 Field J - Scratchpad Area 1

Field J - Scratchpad Area 1: Field J shall [R1088] be an alphanumeric field consisting of seven characters. The user shall [R1089] be able to enter free-format alphanumeric data in scratchpad area 1. Scratchpad Areas 1 and 2 shall [R1090] timeshare with fields F, G, H, and I for a period of between 1 and 4 seconds, adaptable by selecting system configuration parameters if there is data in either Scratchpad Area 1 or 2.

3.2.4.1.11 Field K – Scratchpad Area 2

Field K – Scratchpad Area 2: Field K shall [R1091] be an alphanumeric field consisting of seven characters. The user shall [R1092] be able to enter free-format alphanumeric data in scratchpad area 2. The Scratchpad Areas 1 and 2 shall [R1093] timeshare with fields F, G, H, and I for a period of between 1 and 4 seconds, adaptable by selecting system configuration parameters if there is data in either Scratchpad Area 1 or 2.

3.2.4.2 Data Block Positions

The information in the data block shall [R1094] always be horizontal and readable from left to right when the display is upright. The Data Block shall [R1095] be in one of eight positions relative to the centroid of the target icon as shown in FIGURE 135: up, down, left, right, diagonally up to the right, diagonally down to the right, diagonally up to the left, diagonally down to the left. The user shall [R1096] be able to select the position of the data block relative to the target icon.

3.2.4.3 Leader Lines

Each leader line shall [R1097] originate at the centroid of its corresponding target icon and terminate at the data block at a point determined as specified below in TABLE XX.

TABLE XX: Leader line termination point

Leader Line Direction	Termination Point
Up	Center of Beginning of Line 1
Down	Center of Beginning of Line 1
Left	Center of End of Longest, Highest Line
Right	Center of Beginning of Line 1
Diagonally up to the Right	Center of Beginning of Line 1
Diagonally down to the Right	Center of Beginning of Line 1
Diagonally up to the Left	Center of End of Longest, Lowest Line
Diagonally down to the Left	Center of End of Longest, Highest Line

3.2.4.3.1 Leader Line Lengths

The default length of the leader line shall [R1098] be adaptable by selecting system startup parameters. The selectable range shall [R1099] be between 0" and 1.5" long. The user shall [R1100] be able to adjust the leader line length within the selectable range to the nearest 0.1 inch.

3.2.4.4 Data Block Customization

The Airport Surface Application shall [R1101] have the capability to display full data blocks, partial data blocks, and no data blocks. If data blocks are turned off, there shall [R1102] be no leader line.

3.2.4.4.1 Full Data Block

Fields A, B, and C shall [R1103] always be part of the full data block. The user shall [R1104] be able to customize the full data block by selecting (from the remaining fields) which fields will be displayed. Selectable fields are D, E, F, G, H, I, J, and K. The two scratchpad areas (J and K) shall [R1105] only be selectable to toggle together.

3.2.4.4.2 Partial Data Block

A partial data block shall [R1106] consist of only Fields A, B, and C. The user shall [R1107] not be able to customize the partial data block.

3.2.4.5 Data Block Toggle

The Airport Surface Application system shall [R1108] provide a default toggle state for data blocks upon system startup. The default toggle state shall [R1109] be adaptable by selecting system startup parameters.

The user shall [R1110] be able to toggle (on/off) all data blocks in a window. The data block toggle state shall [R1111] be independent for each window.

3.2.4.5.1 Individual Data Block Toggle

The user shall [R1112] be able to toggle (on/off) the display of a target's data block as shown in FIGURE 136. For example, if data tags are not displayed (off), the user could toggle on the display of an individual target's data block (on/off).

3.2.4.6 Automatic Data Block Association

The Airport Surface Application shall [R1113] automatically associate flight plan information with a target whenever the system detects a beacon code or a Mode-S transponder identification code for which it has flight plan information. The Airport Surface Application shall [R1114] automatically associate flight plan information with a target whenever the user enters an ACID for which the system has flight plan information.

3.2.5 Fonts

All fonts shall [R1115] be a non-proportionally spaced font in the sans serif class of fonts. All display components which utilize text shall [R1116] have the same font type. Six font sizes shall [R1117] be available for these display components. The nominal size of each character in the font shall [R1118] be as specified below in TABLE XXI[§].

TABLE XXI: Airport surface application character sizes

Character Size	Nominal Character Width (mm)	Nominal Character Height (mm)
1	1.56	2.18
2	2.18	3.12
3	2.50	3.74
4	3.12	4.68
5	3.74	5.30
6	4.68	5.62

The Airport Surface Application system shall [R1119] be able to independently change font sizes of the following items:

1. Data Blocks
2. Coast/Suspend List
3. Temporary Map Data
4. Preview Area
5. Display Control Bar

Control of the font size of alphanumeric data on target icons shall [R1120] be linked to the data block font size. The DCB shall [R1121] only be able to utilize character sizes 1, 2, and 3.

The selected font should allow users to easily distinguish among all characters at all six font sizes. Particular areas of confusion tend to be distinguishing among the letters D and O and the numbers 0 and 8 (D, O, 0, 8); the letter Z from the number 2 (Z, 2); the letter O from the letter Q (O, Q); and the letter I from the number 1 (I, 1). It is preferred that the zero in the selected font have a diagonal slash (top right to bottom left) internal to the zero.

[§] It is assumed that the fonts will be tested on a display that meets the requirements of Section 3.2.18.1.

3.2.6 Icons

3.2.6.1 Target Icons

3.2.6.1.1 Operational Target Icons

The Airport Surface Application system shall [R1122] display four different types of icons:

A. Aircraft
B. Vehicle
C. Unknown
D. Heavy Aircraft

All target icons are depicted in FIGURE 137. The aircraft icon shall [R1123] look like icon (A) in FIGURE 137. The Airport Surface Application shall [R1124] indicate a heavy aircraft as shown in icon (D) of FIGURE 137. The color of the filled circle indicating a heavy aircraft type shall [R1125] be independently adaptable by changing system configuration parameters.

The vehicle icon shall [R1126] look like icon (B) of FIGURE 137. The unknown icon shall [R1127] look like icon (C) of FIGURE 137.

Each icon shall [R1128] be filled with a color that can be defined by standard RGB values. Each icon shall [R1129] have an outline with an independent color defined by standard RGB values. Each outline and fill color shall [R1130] be adaptable (*e.g.*, off/RGB value set) by changing system configuration parameters. The option of no fill or no outline shall [R1131] be available in the system configuration parameters.

The Airport Surface Application shall [R1132] select the target icon for a track (from one of the icons depicted in FIGURE 137) based upon Beacon Code (Field C of the Data Block), the contents of the AC/Vehicle Type (Field F of the Data Block) and the Aircraft Category (Field G of the Data Block). TABLE XXII depicts selection of icon type based on AC/Vehicle type and track state.

TABLE XXII: Selection of target icon

Valid Beacon Code	Yes	Yes	Don't Care	Don't Care	No	No
Type	None	None	Aircraft	Aircraft	Vehicle	None
Heavy	Not	Heavy	Not	Heavy	Don't Care	N/A
Suspended	Not	Not	Not	Not	Not	Not
Icon	**A**	**D**	**A**	**D**	**B**	**C**

The length of each operational icon type shall [R1133] nominally represent a system configuration parameter number of feet on the display at the current map range in each window, (range 30 ft. - 300 ft. in 10-ft. increments). For example, the length of icon (A) could represent 70 ft., the length of icon (B) could represent 30 ft., *etc*. However, each Airport Surface Application target icon type shall [R1134] have a

minimum size adaptable by selecting system configuration parameters (nominal range 1.00 mm - 25.00 mm).

When the calculated velocity for a track is greater than or equal to a system configuration parameter number of knots, then the orientation of each icon shall [R1135] represent the calculated heading for the track. When the calculated velocity for a track is less than the system configuration parameter number of knots, then the orientation of each icon shall [R1136] represent the calculated heading for the track as long as the calculated heading does not change more than a system configuration parameter number of degrees (X = ±1° - ±45°) per display update. If the calculated heading for the track does change more than the selected parameter number of degrees per display update, then the icon shall [R1137] only rotate the parameter number of degrees per display update until it has caught up with the calculated track heading.

3.2.6.2 Functional Feedback Indicators

3.2.6.2.1 Cursors

3.2.6.2.1.1 Cursor Icons

The Airport Surface Application system shall [R1138] be capable of displaying seven distinct cursor icons. The cursor icons shall [R1139] be adaptable by selecting system configuration parameters. The cursor shall [R1140] not travel off of the display area. For example, the cursor should not wrap from top to bottom or side to side.

The nominal cursor size shall [R1141] be 6.35 mm wide by 6.35 mm high. Cursor icons are shown in FIGURE 138. Cursor (A) shall [R1142] be used as a default. The point of focus for cursor (A) shall [R1143] be where the lines cross. Cursor (B) shall [R1144] indicate a selectable item that has no other specified cursor (*e.g.*, temporary map areas, trait areas, off areas, *etc.*). The point of focus for cursor (B) shall [R1145] be the dot in the middle. Cursor (C) shall [R1146] indicate DCB focus when the cursor is not trapped. Cursor (D) shall [R1147] indicate DCB focus when the cursor is trapped. The point of focus for cursors (C) and (D) shall [R1148] be the tip of the arrow. Cursor (E) shall [R1149] indicate that the user may adjust a horizontal secondary window border up or down. The point of focus for cursor (E) shall [R1150] be the center of the vertical line between the arrowheads. Cursor (F) shall [R1151] indicate that the user may adjust a vertical secondary window border left or right. The point of focus for cursor (F) shall [R1152] be the center of the horizontal line between the arrowheads. Cursor (G) shall [R1153] indicate that the user may adjust a corner of a secondary window in any direction. Cursor (G) shall [R1154] also indicate that a secondary window, the coast/suspend list, or the preview area can be repositioned in any direction. The point of focus for cursor (G) shall [R1155] be where the lines cross.

When the point of focus for the cursor is positioned over a selectable object (e.g., target icon, suspend list entry, DCB button, etc.), the object shall [R1156] be highlighted by dwell emphasis.

3.2.6.2.1.2 Cursor Home

The Airport Surface Application shall [R1157] have a Cursor Home function, which can be toggled (on/off) by the user. When the cursor home function is toggled on, and focus is not in the DCB, the cursor shall [R1158] warp to the home position defined by selecting system configuration parameters and is hidden from view when a command is completed. If the cursor home function is toggled on, and the DCB is not in a submenu, the cursor shall [R1159] warp to the defined home position and hide from view after it has been idle for a system configuration parameter number of seconds. When the cursor home function is toggled off, and focus is not in the DCB, the cursor shall [R1160] remain in position when a command is completed and is hidden from view at that location. If the cursor home function is toggled off, and the DCB is not in a submenu, the cursor shall [R1161] remain in position and hide from view at that location after it has been idle for a system configuration parameter number of seconds.

3.2.6.2.2 Track Selection Indicators

3.2.6.2.2.1 Single-Track Selection Halo

The Airport Surface Application shall [R1162] encircle a target icon with a single-track selection halo (with optional data block border and background) when the user can select the track for initiating or completing a function. The radius of the single-track selection halo shall [R1163] be adaptable by selecting system configuration parameters (range 20 ft. – 300 ft. in 5-ft. increments) and whose center point is located at the centroid of the track. The color of the single-track selection halo shall [R1164] be adaptable by selecting system configuration parameters. The radius of the single-track selection halo shall [R1165] have a minimum size adaptable by selecting system configuration parameters (nominal range 1.00 mm - 27.00 mm). A rectangular border having the same color as the single-track selection halo shall [R1166] be adaptable by selecting system configuration parameters (*i.e.*, toggle (on/off)) to be displayed around the track's data block when the single-track selection halo is visible.

3.2.6.2.2.2 Target Icon Layering

When the Airport Surface Application displays the track selection halo for a track, it shall [R1167] display the track, the track's data block, and all associated selection indicators (*e.g.*, track selection halo, border around the data block, data block background) in a plane above other targets in the active window as shown in FIGURE 139.

3.2.7 Reserved

3.2.8 Lists

3.2.8.1 Preview Area

The system shall [R1168] have a preview area which provides alphanumeric feedback (*i.e.*, keystrokes and interpretations of the functional accelerators entered by the user) to users. For example, the key sequence "F7" "B" "ENTER" would appear as "MULT B" in the Preview Area as shown in FIGURE 140. The first line of the preview area shall [R1169] be reserved to display system responses to user interactions (*e.g.*, INVALID ENTRY, *etc.*). The system shall [R1170] [SL] have an airport traffic configuration status line that shows the title of the currently selected airport configuration. The airport traffic configuration status line shall [R1171] [SL] appear above the functional feedback resulting from user interactions. Unless otherwise specified, all system responses to user interactions, including dwell emphasis and functional feedback, shall [R1172] occur with no discernible time lag (not to exceed 100 msec). The preview area shall [R1173] have no border. The preview area shall [R1174] have a transparent background capable of simultaneously showing through to multiple windows.

3.2.8.1.1 Preview Area Interaction

When the cursor is present in a suggested entry, that entry will be referred to as the active entry. Whenever the Airport Surface Application presents the active entry to the user, the cursor shall [R1175] initially appear to the right of the last character of the active entry. The Airport Surface Application shall [R1176] allow a user to accept a suggested entry and move to the next field when the user depresses either the <ENTER> key, the <TAB> key, or the <down arrow> key, unless specified otherwise elsewhere in this document.

The Airport Surface Application shall [R1177] allow the user to edit a suggested entry when the user depresses the <BACKSPACE> key, the <DELETE> key, the <left arrow> key, or the <right arrow> key. Depressing the <BACKSPACE> key shall [R1178] delete the character immediately to the left of the cursor from the active entry. Depressing the <DELETE> key shall [R1179] delete the character immediately to the right of the cursor from the active entry. Depressing the <left arrow> key shall [R1180] move the cursor one character to the left in the active entry. Depressing the <right arrow> key shall [R1181] move the cursor one character to the right in the active entry. Once the system allows the user to modify a suggested entry, any printable characters shall [R1182] be inserted in the active entry at the cursor location until the entry is accepted.

If the user has not chosen to edit the active entry, the Airport Surface Application shall [R1183] allow the user to replace the active entry by typing any printable character (including the spacebar). The system shall [R1184] accept the entry when the user depresses the <ENTER> key or the <TAB> key.

The Airport Surface Application System shall [R1185] allow the user to return to the previous field when the user depresses the <up arrow> key, allowing the user to re-accept, replace, or edit the previous entry.

The Airport Surface Application shall [R1186] respond to trackball movement during preview area interaction as synonymous with using the arrow keys as specified above. For example, rolling the trackball left is synonymous with depressing the <left arrow> key; rolling the trackball right is synonymous with depressing the <right arrow> key; rolling the trackball up is synonymous with depressing the <up arrow> key; and rolling the trackball down is synonymous with depressing the <down arrow> key.

The cursor shall [R1187] not wrap from one end of a suggested entry to the other, from the top entry to the bottom, or from the bottom entry to the top.

3.2.9 Reserved

3.2.10 Temporary Maps

3.2.10.1 Predefined Surface Closures and Restrictions

Active predefined surface closures and restrictions shall [R1188] appear on all display channels.

3.2.11 System Startup Parameters

The system shall [R1189] be adaptable to startup in a predetermined display state after a system cold start as defined by a set of system startup parameters. One set of System Startup Parameters shall [R1190] apply to all display channels. The system startup parameters shall [R1191] [SL] define the initial state of the following user functions:

1. System Mode
2. Number of secondary windows
3. Location and size of each secondary window
4. Coast/Suspend List On/Off
5. Coast/Suspend List Location
6. DCB Location
7. DCB On/Off
8. Data Blocks On/Off
9. Data Block State (Full/Partial)
10. Selected Fields in Full Data Block
11. Default Data Block Position
12. All Brightness Controls
13. All character sizes
14. Range Scale in each window
15. Center Point for each window
16. Map Orientation for each window
17. Leader Line Length
18. History Trail Length
19. Cursor Location
20. Cursor Speed
21. Alert Volume
22. Alert Window Location
23. Preview Area Location
24. Color Palette Choice
25. Velocity Vector Lines (on/off) for each window
26. Velocity Vector Lines Length

After an unplanned system shutdown, the system shall [R1192] be able to restart with each display channel in the display configuration that was present not more than one minute before the unplanned shutdown.

3.2.12 System Modes

3.2.12.1 Operational Mode

In the operational mode, the user shall [R1193] be able to access all functions needed for operational use of the Airport Surface Application system. The Airport Surface Application system shall [R1194] be able to display basic system health data while in Operational Mode. In the operational mode, users shall [R1195] also be able to view more extensive maintenance data without affecting the operational integrity of another channel. The user shall [R1196] be prompted for a password before being able to view additional maintenance data. Each channel shall [R1197] be able to independently access the additional maintenance data without affecting the system mode of another channel. The Airport Surface Application shall [R1198] provide functions for users to gracefully restart and to gracefully shut down a display channel.

3.2.13 System Indicators

3.2.13.1 System Mode Indicator

The Airport Surface Application shall [R1199] have an indicator of the current system mode (*e.g.*, operational).

TABLE XXIII: System mode indicators

System Mode	Accessible Functions	Illustration
Operational	Operational	FIGURE 141

3.2.14 User Control

3.2.14.1 Display Control Bar

The Airport Surface Application system shall [R1200] have a Display Control Bar as a means for the user to select or alter data for display, adjust the display channel settings, and access system level data as shown in FIGURE 142. The Display Control Bar shall [R1201] be made up of selectable buttons and other graphical controls (*e.g.,* sliders, radio buttons, check boxes, *etc.*). Labels for any graphical controls shall [R1202] be in upper case letters. The user shall [R1203] be able to select (from the font sizes defined in Section 3.2.5) the character size used in the Display Control Bar. The overall size of the Display Control Bar shall [R1204] remain unchanged as a result of character size selection.

All buttons shall [R1205] be center justified (left to right) when the DCB is in a horizontal position and center justified (up and down) when the DCB is in a vertical position. A submenu is considered to be bounded by the buttons in the submenu. That is, the blank space around the submenu buttons is not considered to be part of the submenu. The user shall [R1206] be able to access submenus using the main Display Control Bar, if necessary. If the user does not need to use the cursor outside of the DCB to complete a submenu function, then the cursor shall [R1207] be contained within the bounds of that submenu. The cursor shall [R1208] be released when the user returns to the main DCB, or if a function requiring its release is invoked. The user shall [R1209] be able to place the Airport Surface Application Display Control Bar in one of four positions as shown in FIGURE 142 and as shown in FIGURE 143: 1) horizontally at the top of the display, 2) horizontally at the bottom of the display 3) vertically on the left side of the display, or 4) vertically on the right side of the display. The user shall [R1210] be able to hide the Display Control Bar from view. When the DCB is hidden from view, the DCB on/off button, system health indicator and system mode indicator shall [R1211] appear in the upper right-hand corner of the display. When the DCB is hidden from view, the system shall [R1212] allow the user to restore the DCB to the last viewed location.

When the Display Control Bar is displayed horizontally, the nominal overall size shall [R1213] be the width of the display by no more than 23.40 mm high. When the Display Control Bar is displayed vertically the nominal overall size shall [R1214] be the height of the display by no more than 23.40 mm wide. The minimum Display Control Bar button size shall [R1215] be 23.40 mm wide by 11.54 mm high.

Toggle buttons on the DCB depicting two options shall [R1216] indicate to the user which option is currently selected as shown in FIGURE 144. DCB buttons that invoke a function shall [R1217] be shaded differently than DCB buttons that do not invoke a function (e.g., opens a submenu, changes the options in a list, etc.)

When a submenu is visible, any higher-level menus and higher-level submenus shall [R1218] be hidden from view until the user exits the submenu (higher).

DCB buttons that indicate the value of a parameter (*e.g.*, RANGE 130) shall [R1219] indicate the correct value for the active window.

3.2.14.1.1 Display Control Bar Buttons

The DCB buttons and controls shall [R1220] [SL] be organized and have the functionality as defined in TABLE XXIV below:

TABLE XXIV: DCB buttons and controls

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
1.	RANGE				1. Depressing the primary trackball button over the "RANGE" DCB button, the user may decrease the range scale in the active window (zoom in) by rolling the trackball down, or the user may increase the range scale in the active window (zoom out) by rolling the trackball up. The range scale in the active window changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current range. The current range is displayed on the second line of the range button in hundreds of feet during range scale adjustment and after range scale selection. 2. Depressing the primary trackball button over the "RANGE" DCB button, the user may select the range scale in the active window by typing in the desired range in hundreds of feet. Depressing the "ENTER" key on the data entry device selects the range. The selected range is displayed on the second line of the range button in hundreds of feet.		a) Method 1: (blank system response line) RANGE b) Method 2: (blank system response line) RANGE <Entry> c) Invalid Entry: INVALID RANGE
2.	MAP RPOS				1. Depressing the primary trackball button over the "MAP RPOS" DCB button, the user may reposition the map in the active window in any direction by rolling the trackball in the desired direction. The map position in the active window changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current map position. 2. Depressing the <configured function accelerator sequence (*e.g.*, F8 key)> on the data entry device, the user may	F8	a) All Methods: (blank system response line) MAP RPOS

TABLE XXIV: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					reposition the map in the active window in any direction by rolling the trackball in the desired direction. The map position in the active window changes as the user manipulates the trackball. Depressing the primary trackball button selects the current map position.		
3.	ROTATE				1. Depressing the primary trackball button over the "ROTATE" DCB button, the user may rotate the map in the active window clockwise to any map orientation by rolling the trackball to the right, or the user may rotate the map in the active window counter clockwise to any map orientation by rolling the trackball to the left. The map orientation in the active window changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current map orientation. 2. Depressing the primary trackball button over the "ROTATE" DCB button, the user may type in the desired heading. The map orientation in the active window changes to the user selected map heading. Depressing the "ENTER" key on the data entry device selects the current map orientation.		a) Method 1: (blank system response line) ROTATE b) Methods 2: (blank system response line) ROTATE <Entry> c) Invalid Entry: INVALID ENTRY
4.	UNDO				1. Depressing the primary trackball button over the "UNDO" DCB button, the user may restore the display channel settings to the values immediately preceding the most recent system function. 2. Depressing <configured function accelerator sequence (*e.g.*, F10 key)> on the data entry device, , the user may restore the display channel settings to the values immediately preceding the most recent system function.	F9	c) Valid Entry: (No Feedback) d) Invalid Entry: NOTHING TO UNDO
5.	DEFAULT				1. Depressing the primary trackball button over the "DEFAULT" DCB button, the user may restore the display channel settings to the values contained in the system startup parameters excepting system mode, DCB position, and alert volume,	HOME	(No Feedback)

TABLE XXIV: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					which will not change. 2. Depressing <configured function accelerator sequence (*e.g.*, Default key)> on the data entry device, the user may restore the display channel settings to the values contained in the system startup parameters excepting system mode, DCB position, and alert volume, which will not change.		
6.	PREF <TITLE>				1. The "PREF" DCB button should be disabled. That is, depressing the primary trackball button over the "PREF" DCB button should not execute a function, and the "PREF" button should not be highlighted with dwell emphasis when the cursor is over the button.		(No Feedback)
7.	BRITE				1. Depressing the primary trackball button over the "BRITE" DCB button, the DCB will change to display the brightness submenu.		a) All Methods: (blank system response line) BRITE
8.	BRITE	HOLD BARS <##>			1. The "HOLD BARS" DCB button should be disabled. That is, depressing the primary trackball button over the "HOLD BARS" DCB button should not execute a function, and the "HOLD BARS" button should not be highlighted with dwell emphasis when the cursor is over the button.		(No Feedback)
9.	BRITE	MVMENT AREA <##>			1. Depressing the primary trackball button over the "MVMENT AREA" DCB button, the user may increase the brightness of the movement areas in the active window by rolling the trackball up, or the user may decrease the brightness of the movement areas by rolling the trackball down. The brightness of movement areas in the active window changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current brightness (range 1-99). The current brightness is displayed on the second line of the MVMENT AREA button during brightness adjustment and after brightness selection. 2. Depressing the primary trackball button over the "MVMENT AREA" DCB button, the user may select the brightness of the movement areas in the active window by typing in the desired		a) Method 1: (blank system response line) BRITE MVMENT AREA b) Method 2: (blank system response line) BRITE MVMENT AREA <Entry> c) Invalid Entry: INVALID ENTRY BRITE

TABLE XXIV: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					brightness. Depressing the "ENTER" key on the data entry device selects the brightness. The selected brightness is displayed on the second line of the MVMENT AREA button after brightness selection.		
10.	BRITE	BAKGND <##>			1. Depressing the primary trackball button over the "BAKGND" DCB button, the user may increase the brightness of the background map areas in the active window by rolling the trackball up, or the user may decrease the brightness of the background map areas by rolling the trackball down. The brightness of background map areas in the active window changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current brightness (range 1-99). The current brightness is displayed on the second line of the BAKGND button during brightness adjustment and after brightness selection. 2. Depressing the primary trackball button over the "BAKGND" DCB button, the user may select the brightness of the background map areas in the active window by typing in the desired brightness. Depressing the "ENTER" key on the data entry device selects the brightness. The selected brightness is displayed on the second line of the BAKGND button after brightness selection.		a) Method 1: (blank system response line) BRITE BAKGND b) Method 2: (blank system response line) BRITE BAKGND <Entry> c) Invalid Entry: INVALID ENTRY BRITE
11.	BRITE	TRACK <##>			1. Depressing the primary trackball button over the "TRACK" DCB button, the user may increase the brightness of the target icons in the active window by rolling the trackball up, or the user may decrease the brightness of the target icons by rolling the trackball down. The brightness of target icons in the active window changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current brightness (range 1-99). The current brightness is displayed on the second line of the target icon button during brightness adjustment and after brightness selection. 2. Depressing the primary trackball button over the "TRACK"		a) Method 1: (blank system response line) BRITE TRACK b) Method 2: (blank system response line) BRITE TRACK <Entry> c) Invalid Entry: INVALID ENTRY

TABLE XXIV: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					DCB button, the user may select the brightness of the target icons in the active window by typing in the desired brightness. Depressing the "ENTER" key on the data entry device selects the brightness. The selected brightness is displayed on the second line of the target icon button after brightness selection.		BRITE
12.	BRITE	DATA BLOCKS <##>			1. Depressing the primary trackball button over the "DATA BLOCKS" DCB button, the user may increase the brightness of the target data blocks in the active window by rolling the trackball up, or the user may decrease the brightness of the target data blocks by rolling the trackball down. The brightness of target data blocks in the active window changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current brightness (range 1-99). The current brightness is displayed on the second line of the data block button during brightness adjustment and after brightness selection. 2. Depressing the primary trackball button over the "DATA BLOCKS" DCB button, the user may select the brightness of the target data blocks in the active window by typing in the desired brightness. Depressing the "ENTER" key on the data entry device selects the brightness. The selected brightness is displayed on the second line of the data block button after brightness selection.		a) Method 1: (blank system response line) BRITE DATA BLOCKS b) Method 2: (blank system response line) BRITE DATA BLOCKS <Entry> c) Invalid Entry: INVALID ENTRY BRITE
13.	BRITE	LISTS <##>			1. Depressing the primary trackball button over the "LISTS" DCB button, the user may increase the brightness of the preview area by rolling the trackball up, or the user may simultaneously decrease the brightness of the preview area by rolling the trackball down. The brightness of the lists changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current brightness (range 1-99). The current brightness is displayed on the second line of the lists button during brightness adjustment and after brightness selection.		a) Method 1: (blank system response line) BRITE LISTS b) Method 2: (blank system response line) BRITE LISTS <Entry> c) Invalid Entry:

TABLE XXIV: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					2. Depressing the primary trackball button over the "LISTS" DCB button, the user may select the brightness of the preview area by typing in the desired brightness. Depressing the "ENTER" key on the data entry device selects the brightness. The selected brightness is displayed on the second line of the lists button after brightness selection.		INVALID ENTRY BRITE
14.	BRITE	TEMP MAP AREAS <##>			1. The "TEMP MAP AREAS" DCB button should be disabled. That is, depressing the primary trackball button over the "TEMP MAP AREAS" DCB button should not execute a function, and the "TEMP MAP AREAS" button should not be highlighted with dwell emphasis when the cursor is over the button.		(No Feedback)
15.	BRITE	TEMP MAP TEXT <##>			1. The "TEMP MAP TEXT" DCB button should be disabled. That is, depressing the primary trackball button over the "TEMP MAP TEXT" DCB button should not execute a function, and the "TEMP MAP TEXT" button should not be highlighted with dwell emphasis when the cursor is over the button.		(No Feedback)
16.	BRITE	DCB <##>			1. Depressing the primary trackball button over the "DCB" DCB button, the user may increase the brightness of the display control bar by rolling the trackball up, or the user may decrease the brightness of the display control bar by rolling the trackball down. The brightness of the display control bar changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current brightness (range 1-99). The current brightness is displayed on the second line of the DCB button during brightness adjustment and after brightness selection. 2. Depressing the primary trackball button over the "DCB" DCB button, the user may select the brightness of the display control bar by typing in the desired brightness. Depressing the "ENTER" key on the data entry device selects the brightness. The selected brightness is displayed on the second line of the		a) Method 1: (blank system response line) BRITE DCB b) Method 2: (blank system response line) BRITE DCB <Entry> c) Invalid Entry: INVALID ENTRY BRITE

TABLE XXIV: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					DCB button after brightness selection.		
17.	BRITE	DONE			1. Depressing the primary trackball button over the "DONE" DCB button, the DCB will change to display the main DCB.	ESC	(No Feedback)
18.	DAY/NITE				1. Depressing the primary trackball button over the "DAY/NITE" DCB button, the display channel will assume the values contained in the selected color palette. 2. Depressing the <configured function accelerator sequence (*e.g.*, F9 key)> on the data entry device, the display channel will assume the values contained in the selected color palette.	F10	(No Feedback)
19.	CHAR SIZE				1. Depressing the primary trackball button over the "CHAR SIZE" DCB button, the DCB will change to display the character size submenu.		a) All Methods: (blank system response line) CHAR SIZE
20.	CHAR SIZE	DATA BLOCK <#>			1. Depressing the primary trackball button over the "DATA BLOCK" DCB button, the user may increase the size of text in the target data blocks by rolling the trackball up, or the user may decrease the size of text in the target data blocks by rolling the trackball down. The size of text in the target data blocks changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current size of text in the target data blocks (range 1-6). The current size of text in the target data blocks is displayed on the second line of the target data block button during character size adjustment and after character size selection. 2. Depressing the primary trackball button over the "DATA BLOCK" DCB button, the user may select the size of text in the target data blocks by typing in the desired text size (range 1-6). Depressing the "ENTER" key on the data entry device selects the size of text in the target data blocks. The selected text size is displayed on the second line of the target data block button after character size selection.		a) Method 1: (blank system response line) CHAR SIZE DATA BLOCK b) Method 2: (blank system response line) CHAR SIZE DATA BLOCK <Entry> c) Invalid Entry: INVALID SIZE CHAR SIZE
21.	CHAR SIZE	DCB <#>			1. Depressing the primary trackball button over the "DCB" DCB button, the user may increase the size of text in the DCB by rolling the trackball up, or the user may decrease the size of		a) Method 1: (blank system response line) CHAR SIZE

TABLE XXIV: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					text in the DCB by rolling the trackball down. The size of text in the DCB changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current size of text in the DCB (range 1-3). The current size of text in the DCB is displayed on the second line of the DCB button during character size adjustment and after character size selection. 2. Depressing the primary trackball button over the "DCB" DCB button, the user may select the size of text in the DCB by typing in the desired text size (range 1-3). Depressing the "ENTER" key on the data entry device selects the size of text in the DCB. The selected text size is displayed on the second line of the DCB button after character size selection.		DCB b) Method 2: (blank system response line) CHAR SIZE DCB <Entry> c) Invalid Entry: INVALID SIZE CHAR SIZE
22.	CHAR SIZE	COAST SUSPEND <#>			1. The "COAST SUSPEND" DCB button should be disabled. That is, depressing the primary trackball button over the "COAST SUSPEND" DCB button should not execute a function, and the "COAST SUSPEND" button should not be highlighted with dwell emphasis when the cursor is over the button.		(No Feedback)
23.	CHAR SIZE	TEMP DATA <#>			1. The "TEMP DATA" DCB button should be disabled. That is, depressing the primary trackball button over the "TEMP DATA" DCB button should not execute a function, and the "TEMP DATA" button should not be highlighted with dwell emphasis when the cursor is over the button.		(No Feedback)
24.	CHAR SIZE	PREVIEW AREA <#>			1. Depressing the primary trackball button over the "PREVIEW AREA" DCB button, the user may increase the size of text in the preview area by rolling the trackball up, or the user may decrease the size of text in the preview area by rolling the trackball down. The size of text in the preview area changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current size of text in the preview area (range 1-6). The current size of text in the preview area is displayed on the second line of the preview		a) Method 1: (blank system response line) CHAR SIZE PREVIEW b) Method 2: (blank system response line) CHAR SIZE PREVIEW <Entry>

TABLE XXIV: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					area button during character size adjustment and after character size selection. 2. Depressing the primary trackball button over the "PREVIEW AREA" DCB button, the user may select the size of text in the preview area by typing in the desired text size (range 1-6). Depressing the "ENTER" key on the data entry device selects the size of text in the preview area. The selected text size is displayed on the second line of the preview area button after character size selection.		c) Invalid Entry: INVALID SIZE CHAR SIZE
25.	CHAR SIZE	DONE			1. Depressing the primary trackball button over the "DONE" DCB button, the DCB will change to display the main DCB.	ESC	(No Feedback)
26.	LDR LNG <#>				1. Depressing the primary trackball button over the "LDR LNG" DCB button, the user may increase the length of all leader lines by rolling the trackball up, or the user may decrease the length of all leader lines by rolling the trackball down. The length of the leader lines changes as the user manipulates the trackball (range 0-15). Depressing the primary trackball button again selects the current leader line length. The current leader line length is displayed on the second line of the leader line length button during leader line length adjustment and after leader line length selection. 2. Depressing <configured function accelerator key sequence (*e.g.*, "/")> <#> (range 0-15) "ENTER" on the data entry device, the user may select the length of all leader lines by typing in the desired length (range 0-15). Depressing the "ENTER" key on the data entry device selects the leader line length. The selected leader line length is displayed on the second line of the leader line length button	/ > <#> > ENTER	a) Method 1: (blank system response line) LDR LNG b) Method 2: (blank system response line) LDR LNG <Entry> c) Invalid Entry: INVALID LNG
27.	VECTOR ON/OFF				1. The "VECTOR ON/OFF" DCB button should be disabled. That is, depressing the primary trackball button over the "VECTOR ON/OFF" DCB button should not execute a function, and the "VECTOR ON/OFF" button should not be		(No Feedback)

TABLE XXIV: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					highlighted with dwell emphasis when the cursor is over the button.		
28.	TEMP DATA				1. The “TEMP DATA” DCB button should be disabled. That is, depressing the primary trackball button over the “TEMP DATA” DCB button should not execute a function, and the “TEMP DATA” button should not be highlighted with dwell emphasis when the cursor is over the button.		(No Feedback)
29.	SAFETY LOGIC <TITLE>				1. The “SAFETY LOGIC” DCB button should be disabled. That is, depressing the primary trackball button over the “SAFETY LOGIC” DCB button should not execute a function, and the “SAFETY LOGIC” button should not be highlighted with dwell emphasis when the cursor is over the button.		(No Feedback)
30.	TOOLS				1. Depressing the primary trackball button over the “TOOLS” DCB button, the DCB will change to display the tools submenu.		a) All Methods: (blank system response line) TOOLS
31.	TOOLS	RANGE			1. Depressing the primary trackball button over the “RANGE” DCB button, the user may decrease the range scale in the active window (zoom in) by rolling the trackball down, or the user may increase the range scale in the active window (zoom out) by rolling the trackball up. The range scale in the active window changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current range. The current range is displayed on the second line of the range button in hundreds of feet during range scale adjustment and after range scale selection. 2. Depressing the primary trackball button over the “RANGE” DCB button, the user may select the range scale in the active window by typing in the desired range in hundreds of feet. Depressing the “ENTER” key on the data entry device selects the range. The selected range is displayed on the second line of the range button in hundreds of feet.		a) Method 1: (blank system response line) TOOLS RANGE b) Method 2: (blank system response line) TOOLS RANGE <Entry> c) Invalid Entry: INVALID RANGE TOOLS
32.	TOOLS	MAP			1. Depressing the primary trackball button over the “MAP	F8	a) All Methods:

TABLE XXIV: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
		RPOS			RPOS" DCB button, the user may reposition the map in the active window in any direction by rolling the trackball in the desired direction. The map position in the active window changes as the user manipulates the trackball. Depressing the primary trackball button again selects the current map position. 2. Depressing the <configured function accelerator sequence (*e.g.*, F8 key)> on the data entry device, the user may reposition the map in the active window in any direction by rolling the trackball in the desired direction. The map position in the active window changes as the user manipulates the trackball. Depressing the primary trackball button selects the current map position.		(blank system response line) TOOLS MAP RPOS
33.	TOOLS	ROTATE			1. Depressing the primary trackball button over the "ROTATE" DCB button, the user may rotate the map in the active window clockwise to any map orientation by rolling the trackball to the right, or the user may rotate the map in the active window counter clockwise to any map orientation by rolling the trackball to the left. The map orientation in the active window changes as the user manipulates the trackball. 2. Depressing the primary trackball button over the "ROTATE" DCB button, the user may type in the desired heading. The map orientation in the active window changes to the user selected map heading. Depressing the "ENTER" key on the data entry device selects the current map orientation.		a) Method 1: (blank system response line) TOOLS ROTATE b) Methods 2: (blank system response line) TOOLS ROTATE <Entry> c) Invalid Entry: INVALID ENTRY TOOLS
34.	TOOLS	NEW WINDOW			1. Depressing the primary trackball button over the "NEW WINDOW" DCB button, the user places the first corner anchor of the window by pressing the primary trackball button (slew "ENTER"). A transparent frame then stretches with the cursor until the user places the opposing corner anchor (slew "ENTER"). The new secondary window assumes the current range scale of the main window and places the selected area in the new secondary window.	F11	a) Method 1: (blank system response line) TOOLS NEW WINDOW b) Method 2: (blank system response line) NEW WINDOW

TABLE XXIV: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					2. Depressing the <configured function accelerator sequence (*e.g.*, F11 key)> on the data entry device, the user places the first corner anchor of the window by pressing the primary trackball button (slew "ENTER"). A transparent frame then stretches with the cursor until the user places the opposing corner anchor (slew "ENTER"). The new secondary window assumes the current range scale of the main window and places the selected area in the new secondary window.		
35.	TOOLS	DELETE WINDOW			1. Depressing the primary trackball button over the "DELETE WINDOW" DCB button, the user can select a secondary window (slew "ENTER") to delete it.		a) All Methods: (blank system response line) TOOLS DELETE WINDOW b) Not over secondary window: NO SLEW TOOLS
36.	TOOLS	RESIZE WINDOW			1. Depressing the primary trackball button over the "RESIZE WINDOW" DCB button, the user may change the size of the active secondary window by selecting the desired side or corner of the window with the trackball (slew "Enter"). When the user moves the cursor over the active window's border, the cursor changes to one of the appropriate icons as described in Section 3.2.6.2.1.1. The user then depresses the primary trackball button to select the window border to be adjusted, moves the border to the desired position using the trackball, and presses the primary trackball button again to complete the function. 2. If the cursor is not trapped in a submenu and a function is not active, depressing <configured trackball button (*e.g.*, 4th button)> to activate the resize function, the user may change the size of the active secondary window by selecting the desired side or corner of the window with the trackball (slew "Enter"). When the user moves the cursor over the active window's border, the cursor changes to the icon described in		a) Method 1: (blank system response line) TOOLS RESIZE WINDOW b) Method 2: (blank system response line) RESIZE WINDOW c) Not over window border: NO SLEW

TABLE XXIV: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					Section 3.2.6.2.1.1. The user then depresses the primary trackball button to select the window border to be adjusted, moves the border to the desired position using the trackball, and presses the primary trackball button again to complete the function.		
37.	TOOLS	WINDOW RPOS			1. Depressing the primary trackball button over the "WINDOW RPOS" DCB button, the user may reposition the active secondary window to the desired location on the display. 2. Depressing <configured trackball button (*e.g.*, 2nd button)> over the active secondary window, the user may reposition the secondary window to the desired position. The user anchors the secondary window in the desired position by depressing the secondary trackball button.		a) All Methods: (blank system response line) TOOLS WINDOW RPOS
38.	TOOLS	HISTORY ON/OFF			1. The "HISTORY ON/OFF" DCB button should be disabled. That is, depressing the primary trackball button over the "HISTORY ON/OFF" DCB button should not execute a function, and the "HISTORY ON/OFF" button should not be highlighted with dwell emphasis when the cursor is over the button.		(No Feedback)
39.	TOOLS	HISTORY <#>			1. The "HISTORY" DCB button should be disabled. That is, depressing the primary trackball button over the "HISTORY" DCB button should not execute a function, and the "HISTORY" button should not be highlighted with dwell emphasis when the cursor is over the button.		(No Feedback)
40.	TOOLS	COAST ON/OFF			1. The "COAST ON/OFF" DCB button should be disabled. That is, depressing the primary trackball button over the "COAST ON/OFF" DCB button should not execute a function, and the "COAST ON/OFF" button should not be highlighted with dwell emphasis when the cursor is over the button.		(No Feedback)
41.	TOOLS	COAST RPOS			1. The "COAST RPOS" DCB button should be disabled. That is, depressing the primary trackball button over the "COAST RPOS" DCB button should not execute a function, and the		(No Feedback)

TABLE XXIV: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
					"COAST RPOS" button should not be highlighted with dwell emphasis when the cursor is over the button.		
42.	TOOLS	CSR SPD <#>			1. Depressing the primary trackball button over the "CSR SPD" DCB button, the user may increase the speed of the cursor by rolling the trackball up, or the user may decrease the speed of the cursor by rolling the trackball down. Depressing the primary trackball button again selects the current cursor speed. The current speed is displayed on the second line of the "CSR SPD" button during cursor speed adjustment and after cursor speed selection. 2. Depressing the primary trackball button over the "CSR SPD" DCB button, the user may select the speed of the cursor by typing in the desired cursor speed. Depressing the "ENTER" key on the data entry device selects the cursor speed. The selected cursor speed is displayed on the second line of the "CSR SPD"button.		a) Method 1: (blank system response line) TOOLS CSR SPD b) Method 2: (blank system response line) TOOLS CSR SPD <Entry> c) Invalid Entry: INVALID ENTRY TOOLS
43.	TOOLS	PREVIEW RPOS			1. Depressing the primary trackball button over the "PREVIEW RPOS" DCB button, the user may reposition the preview area to the desired position on the display. 2. Depressing <configured function accelerator sequence (*e.g.*, F7 key → "P")> slew "ENTER" on the data entry device, the preview area will be repositioned to the selected position on the display.	F7 > P > slew "ENTER"	a) Method 1: (blank system response line) TOOLS PREVIEW RPOS b) Method 2: (blank system response line) MULT P
44.	TOOLS	CSR HOME ON/OFF			1. Depressing the primary trackball button over the "CSR HOME ON/OFF" DCB button, the user may choose to have the cursor icon return to a predetermined display location (ON) or remain in the last displayed location (OFF) at the completion of functions.		a) All Methods: (blank system response line) TOOLS
45.	VECTOR <#>				1. The "VECTOR" DCB button should be disabled. That is, depressing the primary trackball button over the "VECTOR" DCB button should not execute a function, and the "VECTOR" button should not be highlighted with dwell emphasis when the cursor is over the button.		(No Feedback)

TABLE XXIV: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
46.	TOOLS	DCB TOP			1. Depressing the primary trackball button over the "DCB TOP" DCB button, the DCB will move to the horizontal position at the top of the display. The DCB will change to display the main DCB.		(No Feedback)
47.	TOOLS	DCB LEFT			1. Depressing the primary trackball button over the "DCB LEFT" DCB button, the DCB will move to the vertical position at the left of the display. The DCB will change to display the main DCB.		(No Feedback)
48.	TOOLS	DCB RIGHT			1. Depressing the primary trackball button over the "DCB RIGHT" DCB button, the DCB will move to the vertical position at the right of the display. The DCB will change to display the main DCB.		(No Feedback)
49.	TOOLS	DCB BOTTOM			1. Depressing the primary trackball button over the "DCB BOTTOM" DCB button, the DCB will move to the horizontal position at the bottom of the display. The DCB will change to display the main DCB.		(No Feedback)
50.	TOOLS	CHG PWD			1. The "CHG PWD" DCB button should be disabled. That is, depressing the primary trackball button over the "CHG PWD" DCB button should not execute a function, and the "CHG PWD" button should not be highlighted with dwell emphasis when the cursor is over the button.		(No Feedback)
51.	TOOLS	PLAY BACK			1. The "PLAY BACK" DCB button should be disabled. That is, depressing the primary trackball button over the "PLAY BACK" DCB button should not execute a function, and the "PLAY BACK" button should not be highlighted with dwell emphasis when the cursor is over the button.		(No Feedback)
52.	TOOLS	DONE			1. Depressing the primary trackball button over the "DONE" DCB button, the DCB will change to display the main DCB.	ESC	
53.	LOCAL 101-188				1. The "LOCAL 101-188" DCB button should be disabled. That is, depressing the primary trackball button over the "LOCAL 101-188" DCB button should not execute a function, and the "LOCAL 101-188" button should not be highlighted with dwell emphasis when the cursor is over the button.		(No Feedback)

TABLE XXIV: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
54.	LOCAL 189-276				1. The “LOCAL 189-276” DCB button should be disabled. That is, depressing the primary trackball button over the “LOCAL 189-276” DCB button should not execute a function, and the “LOCAL 189-276” button should not be highlighted with dwell emphasis when the cursor is over the button.		(No Feedback)
55.	INIT CNTL				1. The “INIT CNTL” DCB button should be disabled. That is, depressing the primary trackball button over the “INIT CNTL” DCB button should not execute a function, and the “INIT CNTL” button should not be highlighted with dwell emphasis when the cursor is over the button.		(No Feedback)
56.	DB AREA				1. The “DB AREA” DCB button should be disabled. That is, depressing the primary trackball button over the “DB AREA” DCB button should not execute a function, and the “DB AREA” button should not be highlighted with dwell emphasis when the cursor is over the button.		(No Feedback)
57.	TRK SUSP				1. The “TRK SUSP” DCB button should be disabled. That is, depressing the primary trackball button over the “TRK SUSP” DCB button should not execute a function, and the “TRK SUSP” button should not be highlighted with dwell emphasis when the cursor is over the button.		(No Feedback)
58.	DB EDIT				1. Depressing the primary trackball button over the “DB EDIT” DCB button, the DCB will change to display the data block editing submenu.		a) All Methods: (blank system response line) DB EDIT
59.	DB EDIT	FULL/ PART			1. Depressing the primary trackball button over the “FULL/PART” DCB button, all aircraft data blocks in the active window will toggle to display the partial data block format or the user-selected full data block format. If the full data block format is selected, then the buttons allowing the user to configure the full data block are selectable.		a) All Methods: (blank system response line) DB EDIT
60.	DB EDIT	ALTITUDE ON/OFF			1. Depressing the primary trackball button over the “ALTITUDE” DCB button, toggles on or off the display of altitude information		a) All Methods: (blank system response line) DB EDIT
61.	DB EDIT	TYPE			1. Depressing the primary trackball button over the “TYPE” DCB		a) All Methods:

TABLE XXIV: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
		ON/OFF			button, toggles on or off the display of aircraft type		(blank system response line) DB EDIT
62.	DB EDIT	SENSORS ON/OFF			1. Depressing the primary trackball button over the “SENSORS” DCB button, toggles on or off the display of sensor coverage information		a) All Methods: (blank system response line) DB EDIT
63.	DB EDIT	CAT ON/OFF			1. Depressing the primary trackball button over the “CAT” DCB button, toggles on or off the display of the aircraft category indicator in the data block		a) All Methods: (blank system response line) DB EDIT
64.	DB EDIT	FIX ON/OFF			1. Depressing the primary trackball button over the “FIX” DCB button, toggles on or off the display of fix information		a) All Methods: (blank system response line) DB EDIT
65.	DB EDIT	VELOCITY ON/OFF			1. Depressing the primary trackball button over the “VELOCITY” DCB button, toggles on or off the display of velocity information		a) All Methods: (blank system response line) DB EDIT
66.	DB EDIT	SCRATCH PAD ON/OFF			1. Depressing the primary trackball button over the “SCRATCH PAD” DCB button, toggles on or off the display of scratch pad information in area 1 and area 2		a) All Methods: (blank system response line) DB EDIT
67.	DB EDIT	DONE			1. Depressing the primary trackball button over the “DONE” DCB button, the DCB will change to display the main DCB.	ESC	(No Feedback)
68.	TERM CNTL				1. The “TERM CNTL” DCB button should be disabled. That is, depressing the primary trackball button over the “TERM CNTL” DCB button should not execute a function, and the “TERM CNTL” button should not be highlighted with dwell emphasis when the cursor is over the button.		(No Feedback)
69.	DB ON/OFF				1. Depressing the primary trackball button over the “DB ON/OFF” DCB button, the user can toggle all data blocks in the active window on or off. 2. Depressing the <configured function accelerator sequence (e.g., F6 key)> on the data entry device, the user can toggle all data blocks in the active window on or off.	F6	(No Feedback)
70.	DCB ON/OFF				1. Depressing the primary trackball button over the “DCB ON/OFF” DCB button, the user can toggle the DCB on or off.		(No Feedback)

TABLE XXIV: DCB buttons and controls – Continued.

Row Num	Main DCB	Sub Level 1	Sub Level 2	Sub Level 3	Function Manipulation	Configured Function Accelerator	Feedback (Preview Area)
71.	System Mode				1. Depressing the primary trackball button over the system mode DCB button, the DCB will change to display the system functions submenu.		(No Feedback)
72.	System Mode	DP SHUT DOWN			1. Depressing the primary trackball button over the "DP SHUT DOWN" DCB button, the user can gracefully shut down the software and hardware components of the display processor. The system prompts the user in the preview area to confirm the shut down of the display processor. If the user confirms the shut down of the display processor, then the display processor is shut down. If the user does not confirm the shut down of the display processor, then the function is canceled.		a) All Methods: (blank system response line) DP SHUT DOWN? 1 = NO 2 = YES (1 or 2):<Entry>
73.	System Mode	DP RESTART			1. Depressing the primary trackball button over the "DP RESTART" DCB button, the user can gracefully restart the software and hardware components of the display processor. The system prompts the user in the preview area to confirm the restart of the display processor. If the user confirms the restart of the display processor, then the display processor is restarted. If the user does not confirm the restart of the display processor, then the function is canceled.		a) All Methods: (blank system response line) DP RESTART? 1 = NO 2 = YES (1 or 2):<Entry>
74.	System Mode	DONE			1. Depressing the primary trackball button over the "DONE" DCB button, the DCB will change to display the main DCB.	ESC	(No Feedback)

3.2.14.1.2 Data Entry Device Keys

3.2.14.1.2.1 CLEAR Key

3.2.14.1.2.1.1 Function Cancellation

The airport surface application system data entry device shall [R1221] have a CLEAR function key (*e.g.*, ESC). When a function has been selected it is considered active until it is completed or cleared. It shall [R1222] be possible to clear any active function and return the variable to its previous condition by depressing the clear key. Incomplete adjustments, if any, shall [R1223] be discarded. Functional feedback in the preview area that is unique to the cancelled function (*i.e.*, not feedback indicating the submenu level) shall [R1224] be discarded.

3.2.14.1.2.1.2 Submenu Closure

When the user has accessed a DCB submenu and no function has been selected or is active, pressing the "CLEAR" key shall [R1225] return the DCB to the next highest menu level until the main DCB is displayed.

3.2.14.1.2.1.3 Cursor Homing

The airport surface application system shall [R1226] have a "cursor home" function. The "cursor home" shall [R1227] be activated by depressing the "CLEAR" key when no other system function has been selected or is active and the cursor is not in a DCB submenu. The cursor home function shall [R1228] be capable of repositioning the cursor to a predetermined display location adaptable by system parameters.

3.2.14.1.2.1.4 Functional Feedback Clearance

Pressing the CLEAR key shall [R1229] discard text contained in the "system response line" of the preview area.

3.2.14.1.2.2 Multifunction Key

The Airport Surface Application system data entry device shall [R1230] have a "multifunction" key (*e.g.*, F7). The system shall [R1231] interpret predefined keystroke(s) following the "multifunction" key as function accelerators for system functions. All functions invoked using the "multifunction" key shall [R1232] be completed either by depressing the "ENTER" key on the data entry device or by depressing the primary trackball button (slew "ENTER").

3.2.14.1.3 Implied Functions

Implied functions are functions or aspects of functions that cannot be executed in another way. The system shall [R1233] [SL] implement implied functions as described in TABLE XXV below:

TABLE XXV: Implied functions

Row Num	Function	Function Manipulation	Function Accelerator	Feedback (Preview Area)
1.	Leader Line Direction: Upper Left	1. Depressing the key sequence "1" "ENTER" on the data entry device, the user changes all leader lines to the upper left-hand direction. 2. Executing the sequence "1" slew "ENTER", the user changes the leader line for the selected track or temporary map text object to the upper left-hand direction	1	a) All Methods: (blank system response line) LDR DIR 1 b) No Track Selected NO SLEW
2.	Leader Line Direction: Lower Left	1. Depressing the key sequence "7" "ENTER" on the data entry device, the user changes all leader lines to the lower left-hand direction. 2. Executing the sequence "7" slew "ENTER", the user changes the leader line for the selected track or temporary map text object to the lower left-hand direction.	7	a) All Methods: (blank system response line) LDR DIR 7 b) No Track Selected NO SLEW
3.	Leader Line Direction: Upper	1. Depressing the key sequence "2" "ENTER" on the data entry device, the user changes all leader lines to the upper direction. 2. Executing the sequence "2" slew "ENTER", the user changes the leader line for the selected track or temporary map text object to the upper direction.	2	a) All Methods: (blank system response line) LDR DIR 2 b) No Track Selected NO SLEW

TABLE XXV: Implied functions – Continued.

Row Num	Function	Function Manipulation	Function Accelerator	Feedback (Preview Area)
4.	Leader Line Direction: Lower	1. Depressing the key sequence “8” “ENTER” on the data entry device, the user changes all leader lines to the lower direction. 2. Executing the sequence “8” slew “ENTER”, the user changes the leader line for the selected track or temporary map text object to the lower direction.	8	a) All Methods: (blank system response line) LDR DIR 8 b) No Track Selected NO SLEW
5.	Leader Line Direction: Upper Right	1. Depressing the key sequence “3” “ENTER” on the data entry device, the user changes all leader lines to the upper right-hand direction. 2. Executing the sequence “3” slew “ENTER”, the user changes the leader line for the selected track or temporary map text object to the upper right-hand direction. .	3	a) All Methods: (blank system response line) LDR DIR 3 b) No Track Selected NO SLEW
6.	Leader Line Direction: Lower Right	1. Depressing the key sequence “9” “ENTER” on the data entry device, the user changes all leader lines to the lower right-hand direction. 2. Executing the sequence “9” slew “ENTER”, the user changes the leader line for the selected track or temporary map text object to the lower right-hand direction.	9	a) All Methods: (blank system response line) LDR DIR 9 b) No Track Selected NO SLEW
7.	Leader Line Direction: Right	1. Depressing the key sequence “6” “ENTER” on the data entry device, the user changes all leader lines to the right-hand direction. 2. Executing the sequence “6” slew “ENTER”, the user changes the leader line for the selected track or temporary map text object to the right-hand direction	6	a) All Methods: (blank system response line) LDR DIR 6 b) No Track Selected NO SLEW

TABLE XXV: Implied functions – Continued.

Row Num	Function	Function Manipulation	Function Accelerator	Feedback (Preview Area)
8.	Leader Line Direction: Left	1. Depressing the key sequence "4" "ENTER" on the data entry device, the user changes all leader lines to the left-hand direction. 2. Executing the sequence "4" slew "ENTER", the user changes the leader line for the selected track or temporary map text object to the left-hand direction. .	4	a) All Methods: (blank system response line) LDR DIR 4 b) No Track Selected NO SLEW
9.	Cursor Home	1. Depressing the "CLEAR" key on the data entry device when no other function has been selected or is active and the cursor is not in a DCB submenu, the cursor icon will return to a predetermined display location	Clear	(No Feedback)
10.	Cursor Location Readout	1. Simultaneously depressing the key sequence <CTRL> + <SHIFT> + <C>, the system will dynamically display the cursor location (x, y) in the preview area. The (x, y) coordinate will represent the number of feet between the Air Traffic Control tower and the cursor location. The CLEAR key cancels the function.	CTRL + SHIFT + C	a) All Methods: (blank system response line) X: <Value> Y: <Value>
11.	Beacon Code Toggle	1. Executing <configured function accelerator sequence (e.g., F7 key → "B")> on the data entry device, then selecting the desired track (slew "ENTER") the system toggles on the beacon code for the selected track for 4 seconds.	F7 > B > slew "ENTER"	a) All Methods: (blank system response line) MULT B
12.	Individual Data Block Toggle	1. Using the primary trackball button to select the desired track or temporary map text object (slew "ENTER"), the user can toggle the data block for a track or temporary map text object on or off.	Slew, Primary Trackball Button	(No Feedback)
13.	Active Window Cycle	1. When in a submenu, the user may execute <configured function accelerator sequence (*e.g.*, fourth trackball button)> on the data entry device to change the active window. The user may continue to press the configured function accelerator	Fourth Trackball Button	(No Feedback)

TABLE XXV: Implied functions – Continued.

Row Num	Function	Function Manipulation	Function Accelerator	Feedback (Preview Area)
		sequence to sequentially cycle the active window through all available windows including the main window. For example, to change the brightness in two different windows, the user might select the active window, go to the brightness submenu and make changes, change the active window using this implied function, and finally make more changes before leaving the brightness submenu.		

3.2.14.2 Function Accelerators (Hotkeys)

Function accelerators shall [R1234] be adaptable by selecting system configuration parameters and accessible using the data entry device and/or the trackball or combinations of both. Executing a function using a function accelerator shall [R1235] not affect the DCB unless specified elsewhere in this document.

3.2.14.3 Trackball Button Assignment

The functionality of each track ball button shall [R1236] be adaptable to invoke any function in Sections 3.2.14.1.1 and 3.2.14.1.3 by selecting system configuration parameters. The execution of a function shall [R1237] not require a user to depress and hold a trackball button. Trackball buttons shall [R1238] only perform functions that have been explicitly defined in this document. For example, clicking the middle button on the RANGE DCB button would not invoke the range function.

3.2.14.4 Function Cancellation

The user shall [R1239] be able to cancel any function using either the pointing device or the data entry device.

3.2.14.5 Trackball Control Rates

The Airport Surface Application shall [R1240] provide a means to independently modify the trackball response (adaptable by selecting system configuration parameters) for at least the following types of functions:

- Rotate
- Parameter Adjustment (value range 0-10)
- Parameter Adjustment (value range 0-100)
- Parameter Adjustment (value range 0 - >100)
- Cursor Movement
- Object Reposition (*i.e.*, secondary windows, coast/suspend list, preview area, map reposition, *etc.*)
- Preview Area Interaction

The system shall [R1241] allow the user to adjust the overall cursor speed, which simultaneously affects all trackball responses defined by system configuration parameters.

3.2.14.6 Track Selection

The Airport Surface Application shall [R1242] have a track pick area that is centered about the point of focus for the cursor icon and that has a radius adaptable by selecting system configuration parameters (nominal range 1 mm – 51 mm). The Airport Surface Application shall [R1243] encircle the target icon that is closest to the point of focus for the cursor icon with the single-track selection halo if the closest track is within the track pick area. If no target icon is within the track pick area, then the Airport Surface Application shall [R1244] not encircle a target icon with the single-track selection halo.

3.2.15 Window Management

The Airport Surface Application shall [R1245] have a Main Window. The Main window shall [R1246] always be the size of the display area. The main window shall [R1247] appear behind the display control bar, all secondary windows and lists when such objects are selected for viewing by the user as shown in FIGURE 145.

The Airport Surface Application system shall [R1248] be able to display and manage up to 4 independent secondary windows for viewing traffic. The border for a secondary window shall [R1249] nominally measure 1.5 mm in width. The secondary windows shall [R1250] be capable of being placed in any location on the main window. The Airport Surface Application system shall [R1251] allow the user to resize or delete a secondary window. The user shall [R1252] not be able to position any portion of a secondary window off of the display area. No portion of a secondary window shall [R1253] overlap a portion of any other secondary window. Graphical objects in the window should appear to remain stationary when a user resizes a secondary window.

The Preview Area shall [R1254] [SL] be able to overlay secondary windows. The Preview Area shall [R1255] [SL] initially open in pre-defined locations adaptable by selecting system startup parameters. The user shall [R1256] [SL] not be able to position any portion of the Preview Area off of the display area.

3.2.16 Data Management

Airport Surface Application data shall [R1257] [SL] be managed as indicated in TABLE XXVI below:

TABLE XXVI: Data management

	Function	Independent for each window	Independent for each display channel
1.	Brightness	X	
2.	Color Palette		X
3.	Current Display Configuration		X
4.	Cursor Icons		X**
5.	Data Block Contents		X**
6.	Data Block Off Area	X	
7.	Data Block Trait Area	X	
8.	Data Block Size (Full/Partial)	X	
9.	Data Block View (On/Off)	X	
10.	Character Sizes	X	
11.	Font Type		X**
12.	Function Accelerators		X**
13.	Hardware Configuration		X
14.	Default Function		X**
15.	Individual Data Block Toggle	X	
16.	Leader Line Direction	X	
17.	Leader Line Length	X	
18.	Map Color Scheme		X**
19.	Map Range Scale	X	
20.	Map Rotation	X	
21.	Map Reposition	X	
22.	Operational Mode		X
23.	Preview Areas		X
24.	System Mode Indicator Location		X**
25.	System Recovery Parameters		X
26.	System Startup Parameters		X**
27.	Target Icons		X**
28.	Display Control Bar display (on/off)		X

** It is anticipated that surface surveillance displays located outside of the tower environment will have no coordinating mechanism, but some elements will be configured identically for all display channels.

TABLE XXVI: Data management – Continued.

	Function	Independent for each window	Independent for each display channel
29.	Display Control Bar Location		X
30.	Trackball Button Assignment		X[††]
31.	Window Attributes (Size, Location)	X	
32.	Display of Vehicle Data Blocks		X

[††] It is anticipated that surface surveillance displays located outside of the tower environment will have no coordinating mechanism, but some elements will be configured identically for all display channels.

3.2.17 Safety Alerts

The Airport Surface Application shall [R1258] present neither visual nor audible safety alert indicators to users at remote tower displays.

3.2.18 Hardware

The Airport Surface Application should provide several mounting options for each hardware device. Each display channel shall [R1259] [SL] be adaptable by selecting system configuration parameters so that a speaker is not required for the display channel to function. Devices not configured for a display channel shall [R1260] not cause system faults.

3.2.18.1 Display

The Airport Surface Application display shall [R1261] support 16,777,216 distinct colors. The display shall [R1262] have a diagonal size greater than 20 inches. The display shall [R1263] be approved by representatives of the Federal Aviation Administration. The Airport Surface Application system shall [R1264] provide tools to properly align each display.

3.2.18.1.1 Mounting Options

The Airport Surface Application system should have a variety of mounting options for the display.

3.2.18.1.1.1 Ceiling Mount (Articulated Arm)

An articulated ceiling mount having vertical and lateral adjustment as well as monitor tilt and swivel capability shall [R1265] be provided. The vertical adjustment shall [R1266] be 18 inches minimum. The range of lateral adjustment shall [R1267] be anywhere within a minimum of a 40 inch radius, 180° arc about the center-post. The range of tilt shall [R1268] be 0° to ± 30° minimum. The range of swivel shall [R1269] be ± 90° minimum.

3.2.18.1.1.2 Desk Top Mount (Tilt/Swivel)

A freestanding table top mount having monitor tilt and swivel capability shall [R1270] be provided. The range of tilt shall [R1271] be 0° to ± 30° minimum. The range of swivel shall [R1272] be ±90° minimum.

3.2.18.1.1.3 Console Mount

Mounting brackets that permit variable tilt mounting into an existing console shall [R1273] be provided. The range of tilt shall [R1274] be 0° to ±30°. An on/off switch for the display shall [R1275] be accessible when mounted in the console.

3.2.18.2 Data Entry Devices and Pointing Devices

The arrangement of data entry devices and pointing devices for each display channel shall [R1276] allow for either left or right handed use.

The keyboard for the Airport Surface Application system shall [R1277] have design characteristics which are comparable to or better than those of the "Cortron Model 549" as shown in FIGURE 146. The keyboard shall [R1278] have a QWERTY layout.

The Airport Surface Application shall [R1279] have a numeric keypad.

The keypack for the Airport Surface Application system shall [R1280] have design characteristics which are comparable to or better than those of the "Cortron Model 580" as shown in FIGURE 147. A trackball with no less than three buttons shall [R1281] be provided.

The Airport Surface Application system shall [R1282] have two mounting options for data entry devices and pointing devices: free-standing enclosure or flush mounted.

4.0 VERIFICATION

4.1 Verification

Verification of requirements shall be in accordance with the testing program established in the contract or order.

5.0 PACKAGING

5.1 Packaging

Packaging requirements shall be as specified in the contract or order.

6.0 NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended Use

6.1.1 General

The Visual Specification for Airport Surface Applications (VSASA) is intended to define all of the visual and interactive aspects of surface surveillance systems that affect air traffic personnel. To that end, requirements in the VSASA have been guided by representatives of the air traffic community to insure that the information that is displayed and the interactions that are required all contribute to helping air traffic personnel perform their jobs more effectively. As such, there are some terms that may be used to convey meanings not normally associated with those terms in other disciplines. Examples are words like coast and track. Please consult the glossary for terms and their usage.

Sections 3.1.14 and 3.2.14 are the only section concerned with the precise actions that a user must perform in order to invoke a function. All other sections in the document are concerned with the function that must be performed and do not contain the user actions to invoke the functions.

Included in this document are the currently identified System Enhancement (SE) requirements. System Enhancement requirements are noted with an "[SE]" marking on each sentence containing future capabilities.

Requirements pertaining to Safety Logic are noted with an "[SL]" marking.

6.1.2 Acknowledgements

The figures and animations in this document were developed by Gallium Software, Inc., Orthogon, LLC, William J. Hughes Technical Center (ACB-520), and Subsystem Technologies, Inc.

6.1.3 Software Requirements

The following software is required in order to view this document and view the included figures: Adobe Acrobat® Reader (Version 5.0), and QuickTime™ (version 6.0 or later). All figures in the document were developed using, Macromedia® Flash and are viewable using Quick Time Player™. Adobe Acrobat® Reader, can be downloaded at http://www.adobe.com/, Quick Time Player™ can be downloaded at http://www.apple.com/quicktime/, and the Macromedia Shockwave® player can be downloaded at http://www.macromedia.com/downloads/.

6.1.4 VSASA Implementations

Requirements R1 – R378 have been implemented in the First Article (CLIN 0001) Airport Surface Detection Equipment – Model X (ASDE-X) system.

6.2 Definitions

ACID – aircraft identification; synonym for callsign.

Aircraft – device(s) that are used or intended to be used for flight in the air, and when used in air traffic control terminology, may include the flight crew (FAA Order 7110.65).

Airport Configuration – flow of traffic at an airport (e.g., N, S, E, W).

Alert Scenario – an operation in which a significant potential for a collision exists between two targets.

Apothem – the perpendicular distance from the center of a regular polygon to any one of its sides

Arrival Corridor – the airspace which is used by aircraft intending to land on a particular runway or heliport. In Airport Surface Application, an arrival corridor is considered to extend five miles in the flight path from the runway threshold or the center of a heliport.

Arriving Target – an aircraft in the system coverage volume that is intending to land on a runway and is outside the landing threshold.

Arriving Track – a track that represents an arriving target.

Arrival – synonym for an arriving target.

Brightness – an attribute of visual sensation that is determined by the intensity of light radiation reaching the eye.

Calculated Heading – the heading that the Airport Surface Application calculates for a track at the displayed position based upon current and past data.

Calculated Velocity – the velocity that the Airport Surface Application calculates for a track at the displayed position based upon current and past data.

Callsign – the alphanumeric label that controllers use to identify aircraft and vehicles.

Cautionary Scenario – an operation in which the separation between two targets is not generally practiced at a given airport and there is ample time and distance to avoid a collision between the two targets.

Color – the aspect of objects or light sources that can be described in terms of hue, lightness (or brightness), or saturation.

Coverage Volume – the volume at a particular airport in which surveillance is performed, including the movement area and arrival corridors.

Data Block – the alphanumeric information associated with a target icon, including call sign.

Data Block, Full – track status, callsign, and beacon code, plus the user-selected set of the remaining eight data block fields as defined in Sections 3.1.4 or 3.2.4of this document (altitude, sensor

coverage, aircraft type, aircraft category, paired fix or departure gate, velocity, scratchpad areas 1 and 2).

Data Block Off Area – a user-defined polygon having up to 20 sides in which the data block information for any target is toggled off.

Data Block Trait Area – a user-defined polygon having up to 20 sides in which the data block information for any target displays a set of user-defined attributes.

Data Block, Partial – data block fields A, B, and C as defined in Section 3.2.4 of this document.

DCB – Display Control Bar

Departing Target – an aircraft in the process of becoming airborne.

Departing Track – a track that represents a departing target.

Departure – synonym for a departing target.

Departure Abort – an aircraft that was in the process of becoming airborne, but whose pilot intentionally did not complete the process of becoming airborne.

Display Channel – a display, its associated hardware (e.g., pointing device, data entry device, and speakers), and the portion of the display subsystem that presents surveillance information to the user and receives user input.

Display Component – any displayable attribute, including map areas, safety alerts , Display Control Bar, targets, *etc*.

Display Configuration – one or more windows and their attributes (zoom, intensities, rotation, etc.) arranged for the control of traffic in a particular airport configuration.

Display Control Bar – A set of graphical buttons, each of which can be selected using the trackball, that provides the means for the user to select data for display and adjust the settings of various aspects of the system.

Dwell Emphasis – a graphical highlight activated by placing a pointing device over an area of interest.

Function Accelerator – a series of predefined entry selections using the data entry device, trackball, or combination of the two that a user can perform to access a Display Control Bar menu or to execute a system function without having to display the Display Control Bar.

History Data Point – a point representing the location of the centroid of a target some period of time in the past.

Hotkey – a synonym for function accelerator.

Implied Functions – functions, portions of functions, or combinations of functions that cannot be executed in another way.

Landing Target – an aircraft that is in the air and has crossed the landing threshold, or an aircraft that has landed on a runway but has not decelerated enough to reach taxi speed.

Landing Track – a track that represents a landing target.

Lander – synonym for a landing target.

Leader Line – the line extending from the target icon to the data block.

Map – a visual representation of the geographical layout of the runways, taxiways, *etc.* on the airport.

Map Area – a set of spaces in the coverage volume which have similar uses, like runways, taxiways, ramps, arrival corridors, *etc*.

Map Heading – the numeric representation of a map's orientation in degrees. For example, if the 0° heading is vertical on the display, and then the user rotates the map 90° clockwise, then the 270° heading is vertical on the display, and the map heading is 270°.

Map Orientation – a relation between the position of a map as it appears on an Airport Surface Application display and the true (or magnetic) directional heading. For example, if the 0° heading is vertical on the display, then the map orientation would be north.

Movement Area – the runways, taxiways, and other areas of an airport/heliport which are utilized for taxiing/hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and parking areas. (FAA Order 7110.65)

Normal Situation – an operation in which the separation between two targets is generally practiced at a given airport and there is little or no potential for a collision between the two targets.

Offset – a synonym for reposition.

Operating Initials – a unique set of two-letters which identifies a user's preference set.

Preset Display Configuration – a saved display configuration (*i.e.*, a user preference set).

Preview Area – an area which provides functional feedback by reflecting actions, adjustments, and keystrokes entered by the user.

Ramps – a defined area on an airport or heliport intended to accommodate aircraft for purposes of loading or unloading passengers or cargo, refueling, parking, or maintenance. (FAA Order 7110.65)

Range Scale – a proportional representation of distance in a view such that a given distance in the view represents a given geographical distance in the coverage volume.

Reposition – the process of changing the view in a particular direction without affecting the map orientation; opposed to rotation.

RGB Value Set – a set of three numbers, each ranging from 0 - 255, which represent the color of a graphical element by defining the amounts of Red, Green, and Blue which are to be displayed. A full RGB palette has 16,777,216 distinct colors.

Rotation – the process of changing the map orientation around a pre-defined center point.

Rotation, Axis of – the axis normal to the airport surface around which a map is rotated. In the Airport Surface Application system, the axis of rotation is always through the center of the active window.

Safety Logic – a set of algorithms based on past and present target behavior which are used by a surveillance system to analyze the likelihood that one or more targets will perform undesirable actions.

SE – System Enhancement.

Site Configuration Files – parameters contained in files which are editable offline or in maintenance mode, and may be altered without recompiling or linking code to define the geometrical and traffic pattern characteristics specific to an airport.

slew "ENTER" – positioning the cursor over a graphical object and depressing the primary trackball button over that graphical object. Often used to apply a function to an individual track.

Stopped target – an aircraft or a vehicle that is stationary.

Stopped track – a track that represents a stopped target.

System Configuration Parameters – parameters contained in files which are editable offline or in maintenance mode, and may be altered without recompiling or linking code, defining the specific characteristics of a system, like color, cursor icons, etc.

System Enhancement – capabilities identified as desirable by Airport Surface Application users that are not within the "core" system capabilities. Identified in this document by [SE].

System Mode – operational states of the Airport Surface Application system which allow users differing levels of access to system functions. (*e.g.*, Operational Mode, Operational Playback Mode, and Maintenance Mode.)

System Startup Parameters – parameters defining the display configurations and the system mode of the Airport Surface Application system upon startup after a normal shutdown.

Target – a physical object which can be detected by one or more surveillance sensors.

Target Icon – the symbol that appears on an Airport Surface Application display to indicate to a user that a target is present in the represented location on the airport surface.

Taxiing Target – any vehicle, or an aircraft that is moving on the surface, that is not in the process of becoming airborne, and is moving slowly enough to turn onto an intersecting taxiway.

Taxiing Track – a track that represents a taxiing target.

Track – a surveillance-derived position calculated by the system, considering all surveillance data sources and a target's movement history. Includes the data necessary for the fields of a data block.

Track Pick Area – a circular region surrounding the cursor icon in which a track's centroid must be located in order for the track to be selected via a trackball button press.

Trackball Button, Primary – the button on the trackball that selects an object or completes a function.

Trouble Track – an indication to the display subsystem by the multiprocessor subsystem that unless surveillance for a target is restored within a parameterized time, the track will be automatically dropped.

Unknown Target Icon – indicates that the system does not know if the target is an aircraft or a vehicle.

Vehicle – a piece of mechanized equipment that is not capable of flying.

View – a map or part of a map in a window.

Warp – an action performed by the system to hide the cursor from view until the user moves the trackball. When the user moves the trackball, the cursor reappears and moves from a position defined by system configuration parameters.

Window – a rectangular area on the display that provides a visual means for interaction with an application.

Window, Active – the window in which a user's interactions with the system are focused.

Window, Main – the principal window of the Airport Surface Application which is the size of the display area. The user cannot close or resize the main window. Secondary windows, lists, and the DCB all appear in front of the Main Window.

Window, Secondary – user-defined windows which can be repositioned, resized, or deleted.

Zoom – the process of altering the apparent distance from which a map is seen in a window.

6.3 Subject term (key word) listing

Air Traffic Control

Safety Logic

Surveillance, Surface

6.4 Changes from previeous issue

Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

A table documenting the changes to this document can be viewed by clicking here.

6.5 Document Statistics

6.5.1 Requirements Count

Each “shall” statement in Section 3 and its subsections is counted. The sum of this tally is the total requirements count. As a check, this total should be the number of Local Tower Display Requirements (see 6.5.1.1) plus the number of Remote Tower Display Requirements (see 6.5.1.2).

Total Requirements Count: 814

6.5.1.1 Local Tower Display Requirements

Each “shall” statement in Section 3.1 and its subsections is counted. The sum of this tally is the Local Tower Display requirements count. Note that there are eight requirements that are identified with both a number and a letter: R57a, R124a, R237b, R329a, R329b, R329c, R332a, and R335b.

Local Tower Display Requirements: 532

6.5.1.2 Remote Tower Display Requirements

Each “shall” statement in Section 3.2 and its subsections is counted. The sum of this tally is the Remote Tower Display requirements count.

Remote Tower Display Requirements: 282

6.5.2 Deleted Requirements

Each requirement number that has been indicated as deleted is counted (marked with [R### Deleted]). The sum of this tally is the number of deleted requirements. Note that at this time, all deleted requirements are in sectin 3.1 and its subsections. Also note that eight requirements that were identified with both a number and a letter have been deleted: R224b, R238b, R275a, R279a, R279b, R279c, R279d, and R335a.

Total Deleted Requirements: 146

6.5.3 Safety Logic Requirements

Each "shall" statement designated as contributing to safety logic (marked with [SL]) is counted. The sum of this tally is the Safety Logic requirements count.

Total Safety Logic Requirements: 101

6.5.4 Highest Requirement Numbers

The highest requirement number used in the document. Note that requirements for the Local Tower Display begin at one and continue to the (smaller) number below. Requirements for the Remote Tower Display begin at 1001 and continue to the (larger) number below. There are no requirements between the smaller number below and 1001.

Highest Local Tower Display Requirement Number: 662

Highest Requirement Number: 1282