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OPNAV INSTRUCTION 3722.35A

From: Chief of Naval Operations

Subj: BASELINE PLANNING CRITERIA FOR DEPARTMENT OF THE NAVY AIR TRAFFIC CONTROL FACILITIES (ASHORE)

Ref: (a) NAVAIR 00-80T-114, NATOPS Air Traffic Control Manual, February 2013
(b) FAAO JO 7110.65V, Air Traffic Control, 3 April 2014
(c) UFC 4-133-01N, United Facility Criteria - Design: Navy Air Traffic Control Facilities, February 2005
(d) OPNAVINST 3721.5L
(e) PMA213 Naval Air Traffic Management Systems Office of Primary Responsibility Configuration Management Plan, August 2011
(f) 14 CFR 65
(g) OPNAVINST 1000.16K

Encl: (1) Baseline Planning Criteria for Department of the Navy Air Traffic Control Facilities (Ashore)

1. Purpose

a. To provide standardized baseline planning criteria, including both staffing and equipment standards, for Department of the Navy (DON) air traffic control (ATC) facilities ashore.

b. This instruction is a complete revision and should be reviewed in its entirety. The most significant change is the addition of ATC staffing formulas in paragraph 5 of enclosure (1). The formulas identify the appropriate controller manning for the type facility, traffic demand, and workload complexity which enables each air station, air facility, or base to successfully execute their aviation mission.

2. Background. Naval ATC facilities provide ATC services and airspace management in support of the safe, orderly, and expeditious movement of aircraft, per references (a) and (b). To execute these duties, these ATC facilities serve as air

navigation service providers for Department of Defense, allied, and civil aircraft in support of national objectives throughout en route, terminal, special use airspace (SUA), tactical, and international environments with a properly equipped, fully trained, and federally certified workforce. A properly aligned ATC organizational structure, with the right equipment and technology, is critical to safely and skillfully support the naval aviation enterprise.

3. Cancellation. OPNAVINST 3722.35.

4. Scope. All echelons of commands with ATC facilities use enclosure (1) during development, review, and update of manpower authorizations. In-service engineering agents (ISEA) with the responsibility for the life-cycle support of ATC equipment use enclosure (1) during the design, renovation, modernization, or modification of various classes of DON ATC facilities. Enclosure (1) provides an engineering tool to determine type, quantity, configuration, and staffing of operating positions and corresponding equipment to support a specific ATC facilities mission. This enclosure should be used in conjunction with reference (c) during the design planning of DON ATC facilities ashore. Reference (d) provides policy and guidance for planning, programming, budgeting, and management of naval ATC, air navigation aids (NAVAID) and landing systems assets under the cognizance of the Office of the Chief of Naval Operations (OPNAV), Director, Naval Airspace and Air Traffic Control Standards and Evaluation Agency (N980A). Reference (e) describes the policies and procedures under which the Program Manager, Air, Naval Air Traffic Management Systems Program Office (PMA213) shall apply configuration management for all air NAVAIDs and landing systems. Reference (f) provides guidance for controller work hours, rest hours and work days further clarified in paragraph 3.3.7.1 of reference (a). Reference (g) provides the total force manpower policy. The formulas and variables used in this document are in compliance with the Navy standard workweek and standard productive workweek.

5. Action

a. Commanders, Commanding Officers (CO), and Officers in Charge (OIC) of Installations with DON ATC Facilities shall:

(1) Use enclosure (1) for baseline staffing and equipment planning to ensure the right resources are identified to develop and deliver safe and capable ATC services and airspace management.

(2) Actively participate in ATC facilities planning and validate that the final staffing and equipment configuration meets mission requirements.

b. COs of Engineering Field Activities Comprised of ISEAs Responsible for the Life-cycle Support of ATC equipment shall:

(1) Use enclosure (1) for baseline equipment planning.

(2) Actively participate in ATC facilities planning in conjunction with regional commanders and COs and OICs of installations with DON ATC facilities.

6. Records Management. Records created as a result of this instruction, regardless of media and format, shall be managed per Secretary of the Navy Manual 5210.1 of January 2012.



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BASELINE PLANNING CRITERIA

FOR

DEPARTMENT OF THE NAVY

AIR TRAFFIC CONTROL

FACILITIES

(ASHORE)

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1. General

a. Operating position staffing requirements and equipment types listed herein reflect baseline planning configurations. Equipment configuration increases due to site-unique mission requirements shall be validated using an operational capability improvement request, per reference (a). Equipment configuration reductions can be accommodated with ATC training and readiness office approval via the chain of command with copies to OPNAV N980A and Headquarters, Marine Corps, Deputy Commandant for Aviation, Aviation Expeditionary Enablers, ATC (APX-25), as applicable. Facilities are not to accomplish modifications solely for the purpose of compliance with this instruction.

b. Type, quantity, and configuration of staffing requirements and corresponding equipment are based on the following ATC services associated with DON shore-based ATC facility classes as shown in figure 1.

ATC Facility Classes	ATC Services
I - Flight Planning Facility	flight planning service
II - ATC Tower (ATCT) Facility	airport traffic control
III - Combined ATCT and Radar Air Traffic Control Facility (RATCF)	airport traffic control and low approach and landing services
IV - Approach Control Facility	airport traffic control and terminal area control
V - Joint Control Facility	airport traffic control, terminal area control, and SUA control services
VI - Fleet Area Control and Surveillance Facility (FACSFAC)	en route control and SUA control services
VII - Combined Center and Radar Approach Control (CERAP)	en route and terminal approach control

Figure 1 - ATC Facility Class and ATC Service

c. The relationships between these ATC services and ATC facility classes are summarized in figure 2. The various ATC services and ATC facility classes are described in paragraphs 2 and 3, respectively.

ATC Facility Classes		ATC Services					
		flight planning	airport traffic control	low approach and landing	terminal area control	SUA control	en route control
I	Flight Planning Facility	X					
II	ATCT Facility	O	X				
III	ATCT and RATCF	O	X	X			
IV	Approach Control Facility	O	X	O	X	O	
V	Joint Control Facility		O	O	O	X	
VI	FACSFAC					X	O
VII	CERAP	O	X	O	X	O	X
X = Required ATC service							
O = ATC service that may be required for mission support							

Figure 2 - ATC Facility Class and ATC Service Relationships

2. ATC Service Descriptions. Six distinct ATC services exist and are provided singularly or in combination at every ATC facility:

a. Flight Planning Service. The planning of a flight is the first element of an air operation. Safety of flight is dependent upon thorough flight planning covering itinerary, times, and weather. Flight planning service provides an interface between the flight crew and the ATC system and includes work space, personnel, equipment, and information related to:

- (1) Planning the flight.
- (2) Processing flight plans for entry into the ATC system.
- (3) Processing flight plans for closeout from the ATC system.

b. Airport Traffic Control Service. Airport traffic control encompasses those services provided to aircraft operating within class B, C, D, or E surface area and class G airspace or on the airport surface. These include:

- (1) Issuing control instructions for sequencing and orderly and expeditious movement of approaching, landing, or departing aircraft.
- (2) Furnishing information to pilots concerning clearances to operate aircraft, weather and field conditions, and pertinent operating and procedural instructions.
- (3) Relaying aircraft operation and control messages between pilots and other air traffic facilities.
- (4) Notifying crash and rescue agencies during actual or potential accidents on or in the vicinity of the airport.
- (5) Issuing clearances and information to aircraft and vehicular traffic operating on runways, taxiways, and other designated areas of the airfield.

c. Low Approach and Landing Service. This service permits aircraft to be recovered when ceiling and or visibility are less than the prescribed minimums for non-precision instrument approaches. This service encompasses:

- (1) Issuing control instructions to provide separation to aircraft approaching for landing under marginal weather conditions.
- (2) Providing information to guide the aircraft in azimuth and altitude to an optimum touchdown point on the landing surface.

d. Terminal Area Control Service. Terminal area control service provides separation and control of aircraft operating in the relatively dense air traffic environment surrounding major airports. Service is exclusive of those performed as part of airport traffic control and low approach and landing services. This service encompasses:

(1) Separation and control of departing and arriving aircraft operating under instrument flight rules (IFR).

(2) Separation and control of transiting aircraft operating under IFR.

(3) Separation and control of aircraft operating under visual flight rules (VFR), but desire the added margin of safety afforded by such control.

e. SUA Control Service. This service combines both ATC in the classic sense (i.e., separating aircraft from each other, airspace boundaries, and or obstructions) and the provision of combat direction and or SUA surveillance and scheduling. Service is mission oriented and includes:

(1) Providing direction and flight following of mission aircraft.

(2) Providing advisory control to aircraft conducting VFR operations within radar surveillance areas, including navigational assistance to ensure integrity of adjacent controlled airspace.

(3) Interfacing with the national airspace system, including positive control of IFR aircraft arriving and departing SUA.

f. En route Control Service. This service provides separation and control of aircraft operating between departure and destination terminal areas. Service is exclusive of terminal area control, airport traffic control, and low approach and landing services. This service encompasses:

(1) Separation and control of transiting aircraft under IFR.

(2) Separation and control of aircraft operating under VFR, but desire the added margin of safety by such control when equipment, capabilities, and workload permit.

3. DON Shore-based ATC Facilities Class Descriptions. The ATC facility classification scheme, by segregating ATC services into groups, establishes seven shore-based classes:

a. Class I - Flight Planning Facility. Provides only flight planning service.

b. Class II - ATCT Facility. Provides airport traffic control service. Unless modified by letter of agreement, ATC clearance authority is limited to VFR, although IFR and special VFR clearances originated by authorized facilities may be relayed. Flight planning service may also be provided.

c. Class IIIA and IIIB - Combined ATCT and RATCF. Provides both airport traffic control and low approach and landing services. Class IIIA low approach and landing service is limited to control on the final approach course; class IIIB includes full pattern control (i.e., arrival control) in addition to control on the final approach course. Flight planning service may also be provided.

d. Class IVA and IVB - Approach Control Facility. Provides airport traffic control and terminal area control services. Class IVA facilities are not airport surveillance radar (ASR) equipped (manual approach control); class IVB facilities are ASR equipped (radar approach control). These facilities may originate IFR and special VFR ATC clearances. Low approach and landing and flight planning services may be provided. For the purposes of this instruction, class IVA and class IVB facilities are functionally the same and are not sub-classified.

e. Class V - Joint Control Facility. A combined ATC facility and range operations center, fleet area control, and surveillance facility that may provide airport traffic control, low approach and landing, terminal area control, and SUA control services.

f. Class VI - FACSFAC. Radar ATC facility certified to provide full range of SUA control service. Real-time scheduling of military operating areas may also be provided. En route control service may be provided.

g. Class VII - CERAP. An ATC facility which combines the functions of an air route traffic control center and a radar approach control facility.

4. Operating Position Descriptions and Staffing Requirements. Various position operators perform the functions associated with each ATC service. These operating position requirements are grouped according to their respective ATC service, and basic responsibilities, taken from reference (a). Operating position requirements for each ATC service at all shore-based classes of ATC facilities are described below. To safely and efficiently perform different ATC services, various requirements exist. ATC efficiency is realized by balancing the quantity of operating position requirements to expected air traffic workload and complexity.

a. Facility Watch Officer (FWO) (United States Marine Corps (USMC) only). USMC facilities shall have an FWO designated in writing by the air traffic control facility officer (ATCFO) on duty at the facility at all times during hours of operation. The FWO shall be responsible to the ATCFO for the operational performance of the watch crew on duty. Duties, responsibilities, and authority include:

(1) Assure an equipment checkout is performed at the beginning of each shift, report any malfunction of equipment to electronics maintenance, and report any degradation of essential services to appropriate agencies.

(2) Assure proper crew briefing and orderly watch turnover.

(3) Prepare operating position assignments.

(4) Monitor position currency and training documentation.

(5) Assure use of proper control procedures and techniques by assigned personnel; assure effective coordination within the facility and between facilities; and assure corrective action is taken whenever control deficiencies are found.

(6) Receive complaints from pilots, adjacent facilities, and general public regarding services or procedures provided by the facility and accumulation of initial data for forwarding to the ATCFO.

(7) Capture and secure initial mishap and hazard records and forward such records to the ATCFO promptly. In the absence of the ATCFO, assistant ATCFO, or ATC non-commissioned OIC, the FWO shall make the necessary mishap and hazard notification as required by local directive.

(8) Check and sign daily facility logs and forward to the appropriate branch chief.

(9) Physical security.

b. Facility Watch Supervisor (FWS). The FWS is required at class II through class VII facilities, per reference (a). The FWS and tower supervisor (TS) positions are combined at class II facilities. The FWS is responsible for the proper functioning of the ATC watch team. Duties and responsibilities include:

(1) Properly man and train within the watch team.

(2) Coordinate special aircraft movement, airspace operations, and restrictions.

(3) Review daily flight schedules.

(4) Coordinate with Federal Aviation Administration (FAA), local squadrons, civil entities.

(5) Orchestrate search and rescue (SAR), in flight dangers, and emergency situations.

(6) Respond to ATC facility equipment malfunctions within flight planning, tower, and radar areas.

c. Flight Planning Service

(1) Functions are distributed across two operating positions: flight planning supervisor (FS) and flight planning dispatcher (FP).

(a) FS is responsible to the FWS for the operational efficiency of the branch watch team.

(b) FP dispatch is responsible for:

1. Receiving, processing, posting, and transmitting flight plans and movement messages.

2. Coordinating with other ATC agencies and flight service stations regarding flight plans and movement messages.

3. Handling incoming and outgoing communications, aircraft flight guard, and initiating overdue actions.

(2) ATC facilities providing FP service shall include one FS requirement and one FP dispatch requirement. FP workload is affected by the quantity, length, and complexity of flight plans and notices to airmen (NOTAM) that must be filed. When workload consistently exceeds the capacity of its FP dispatch requirement such that flight delays are routinely encountered, one additional FP dispatch requirement should be added.

d. ATC Service

(1) Functions are distributed across five operating positions: TS, local control (LC), ground control (GC), flight data (FD) (tower), and clearance delivery (CD).

(a) TS is responsible to the FWS or FWO for operational efficiency of the branch watch team.

(b) LC is responsible for maintaining a continuous visual surveillance of the classes B, C, D, and E surface area or class G airspace and other movement areas. Primary duties include the following:

1. Formulating and issuing clearances and control instructions to accomplish separation between aircraft and between aircraft and vehicles operating under the jurisdiction of the tower.

2. Effecting coordination with appropriate operating position requirements and other facilities.

3. Providing flight assistance service to aircraft.

4. Operating airport lighting, lighting systems, and visual landing aids.

5. Providing initial notification and dispatch of emergency personnel and equipment for aircraft emergencies and mishaps.

(c) GC is responsible for exercising surveillance of the airport movement area. Primary duties include the following:

1. Formulating and issuing ground movement clearances to aircraft and vehicles operating on the airport.

2. Transmitting current weather and field conditions, as required.

(d) FD (tower) is responsible for:

1. Operating communications equipment associated with FD.

2. Receiving and relaying aircraft movement data.

3. Preparing and posting flight progress strips.

4. Operating flight data input and output (FDIO) equipment.

5. Operating Automatic Terminal Information Service (ATIS) equipment.

6. Monitoring NAVAID alarm systems.

(e) CD is responsible for:

1. Obtaining, posting, and relaying ATC clearances and advisories.

2. Other duties as assigned by TS.

Note: This position may be located in the FP or radar branch when local circumstances warrant, as determined by the ATCFO.

(2) The type and quantity of ATC service-related operating position requirements are affected by local airport configuration as described in figure 3.

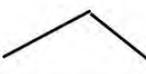
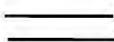
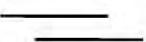
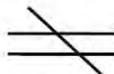
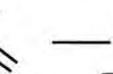
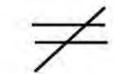
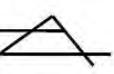
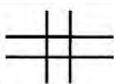
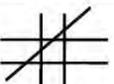
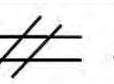
Type 0 No Runway	Type 1 One Runway 
Type 2 Crossing Runways	       
Type 3 Linked Offset Crossing Runways	 
Type 4 Parallel Runways	 
Type 5 Parallel with Crossing Runways	    
Type 6 Two Sets of Parallel Runways	   

Figure 3 - Runway Configurations

(a) ATC facilities providing ATC service shall include one TS position requirement, one LC position requirement, one GC position requirement, and one FD position requirement. At class II, III, IV, V, and VII ATC facilities, a CD position requirement may be necessary. The CD position is not required to be physically located in the ATCT, and may be located in the FP or radar branch when local circumstances warrant.

(b) When the runway configuration (typically type 4, 5, or 6) and tower placement on the airfield does not permit simultaneous observation of movement area traffic to or from both parallel runways from a single GC position, add one GC position requirement.

(c) When the runway configuration (typically type 4, 5, or 6) and tower placement on the airfield does not permit simultaneous observation of both parallel runways and the associated traffic patterns from a single LC position, add one LC position requirement.

e. Low approach and Landing Service

(1) Functions are distributed across the following five operating positions: radar supervisor (RS), arrival control (AR), final control (FC), radar flight data (RD), and radar coordinator (CI).

(a) RS is responsible to the FWS and FWO for operational efficiency of the branch watch team.

(b) AR is responsible for the following:

1. Maintaining radar surveillance of the assigned area of jurisdiction and providing radar ATC services as required.

2. Issuing clearances and control instructions to aircraft operating under AR jurisdiction.

3. Accepting radar handoffs and providing radar ATC services to aircraft as required until the aircraft reaches approach minimums or is handed off to an FC or adjacent facility.

(c) FC is responsible for the following:

1. Providing instructions necessary for an aircraft to conduct an ASR, precision approach radar (PAR), and or a precision approach and landing system (PALS) approach.

2. When required, monitoring approaches as specified per reference (e).

(d) RD is responsible for the following:

1. Operating communications equipment associated with the RD position.

2. Receiving and relaying aircraft movement data.

3. Preparing and posting flight progress strips.

4. Operating FDIO equipment.

5. Monitoring NAVAID alarm systems.

(e) CI is responsible for the following:

1. Coordinating between the ATCT, AR, and FC.

2. Assisting and supervising FCs as necessary.

(2) ATC facilities providing low approach and landing service shall include one AR position requirement, two PAR FC position requirements for each PAR system, one ASR FC position requirement, one RD position requirement, and one RS position requirement. Facilities that provide greater than 12,000 radar approaches annually may submit requests for additional final control positions to OPNAV N980A via the chain of command using the operational capability improvement request format per reference (d). The operational capability improvement request should include analysis and justification for additional equipment and manpower.

(a) When PALS capability is required, add two PALS FC position requirements.

(b) When low approach and landing service is provided to satellite airports, add one AR position requirement for each satellite airport simultaneously served.

(c) When the sum of all AR and FC (ASR, PAR, or PALS) position requirements equals or exceeds four, add one CI position requirement.

f. Terminal Area Control Service

(1) Functions are distributed across six operating positions: RS, approach control (AP), departure control (DC), radar associate (RA), CI, and RD.

(a) RS is responsible to the FWS and FWO for operational efficiency of the branch watch team.

(b) AP is responsible for coordination and control of all instrument traffic within the ATC facility area of jurisdiction. Primary duties include the following:

1. Issuing ATC clearances and advisory information to aircraft under AP jurisdiction.

2. Maintaining radar surveillance of assigned areas and providing radar service to aircraft as required.

3. Determining the separation and sequence to be used between aircraft.

4. Initiating or accepting radar handoffs to and from adjacent sectors or facilities.

5. Providing assistance and priority of services to aircraft in emergency situations.

(c) DC is responsible for maintaining radar surveillance of the assigned area of jurisdiction and providing radar ATC services as required. Duties include the following:

1. Issuing clearances and advisory information to aircraft under DC jurisdiction.

2. Initiating or accepting radar handoffs to and from adjacent sectors and facilities.

(d) RA is responsible for assisting the associated AP and DC controller in every capacity by ensuring initial aircraft separation via landline coordination, completing computer and flight strip entries, accepting or initiating handoffs or point-outs, and ensuring that the associated radar position is made immediately aware of any actions taken.

(e) CI is responsible for assisting the associated approach, departure and arrival controller in expediting the flow of traffic by relaying control instructions and accepting or initiating handoffs or point-outs as directed by AP, DC and AR; performing inter or intra-facility coordination of traffic actions; and ensuring computer entries and strip markings are completed on instructions issued or received.

(f) RD is responsible for the following:

1. Operating communications equipment associated with the RD position.

2. Receiving and relaying aircraft movement data.

3. Preparing and posting flight progress strips.

4. Operating FDIO equipment.

5. Monitoring NAVAID alarm systems.

(2) ATC facilities that provide terminal area control service shall include one AP position requirement for each AP sector, one DC position requirement for each DC sector, one AR position requirement, one RD position requirement, and one RS position requirement.

(3) Factors used to determine terminal area control service position requirements are the sector flow rate and the

number of airspace sectors established by the facility. Approach and DC sector flow rate requirements are calculated using the worksheet at table A-2 in appendix A. Sectorization is determined locally by traffic flow patterns and runway configurations; satellite airports served; traffic density; and complexity.

(a) When an AP sector flow rate exceeds 15 but is less than 20 aircraft per hour, add one AP position requirement.

(b) When an AP sector flow rate equals or exceeds 20 aircraft per hour, add one AP position requirement, in addition to the position requirement added under subparagraph 4d(2) (a).

(c) When the DC sector flow rate exceeds 16 but is less than 25 aircraft per hour, add one DC position requirement.

(d) When the DC sector flow rate equals or exceeds 25 aircraft per hour, add one DC position requirement, in addition to the position requirement added under subparagraph 4d(2) (c).

(e) When complexity of the AP and DC positions dictates the need for a two-air traffic controller team to alleviate the workload of the AP and DC positions, add one RA position requirement. Complexity of the traffic is based on number of aircraft that require active control instructions vice those aircraft that only require routine communications. Thus, AP and DC positions may not meet the traffic criteria for another AP and DC position requirement (sector), but complexity may dictate the need for an RA position requirement.

g. SUA Control Service

(1) Functions are distributed across seven operating positions: RS, SUA sector control (SC), RD, radar operations control center (ROCC) RS, ROCC SC, ROCC assistant sector control (ASC), and ROCC RD.

(a) RS is responsible to the FWS and FWO for operational efficiency of the branch watch team.

(b) SC is responsible for providing SUA control services to all aircraft within the ATC facilities' assigned SUA. Duties and responsibilities include:

1. Providing positive control to aircraft requiring and requesting IFR handling to, from SUA.

2. Providing radar advisory control to VFR aircraft on a work-load permitting basis.

3. Coordinating controlled airspace infringement and hot area containment or boundary alerts.

4. Providing mission coordination assistance.

5. Disseminating weather information.

6. Providing SAR medical evacuation (MEDEVAC) humanitarian evacuation (HUMEVAC) assistance.

7. Ensuring accuracy of information recorded on flight progress strips.

8. Coordinating with adjacent facilities.

(c) RD is responsible for the following:

1. Operating communications equipment associated with the RD position.

2. Receiving and relaying aircraft movement data.

3. Preparing and posting flight progress strips.

4. Operating FDIO equipment.

5. Monitoring NAVAID alarm systems.

(d) ROCC RS is directly responsible to the FWS for the operational control of the ROCC.

(e) ROCC SC is responsible for providing radar services to all aircraft within the FACSFAC's area of jurisdiction. Duties and responsibilities include:

1. Providing positive control to aircraft requiring or requesting IFR handling to and from SUA.

2. Providing radar advisory control to VFR aircraft on a work-load permitting basis.

3. Coordinating controlled airspace infringement and hot area containment or boundary alerts.

4. Providing mission coordination assistance.

5. Disseminating weather information.

6. Providing SAR, MEDEVAC and HUMEVAC assistance.

7. Ensuring accuracy of information recorded on flight progress strips.

8. Coordinating with adjacent facilities.

(f) ASC is responsible to effect coordination with other sectors and adjacent facilities, receive and relay aircraft movement messages, and prepare and post flight progress data. ASC is responsible for assisting SC. Duties and responsibilities include:

1. Coordinating aircraft movement with adjacent facilities or sectors.

2. Monitoring sector frequencies and assisting SC as required.

3. Posting information on flight progress strips.

4. Operating communications equipment associated with the position.

(g) ROCC RD monitors and operates equipment to provide air traffic controllers with information to maximize safe and efficient ATC services. Duties and responsibilities include:

1. Receiving and relaying aircraft movement data.
2. Preparing and posting flight progress strips.
3. Operating FDIO and ATIS equipment.
4. Monitoring and operating ship-to-shore communications.

(2) ATC facilities that provide SUA control service shall include one SUA SC requirement (or ROCC SC requirement for class VI) and one ROCC ASC (for class VI) position requirement per sector, one RD (or ROCC FD position requirement for class VI) position requirement, and one RS (or ROCC RS for class VI) requirement.

(3) The unique and diverse nature of the FACSFAC mission precludes definitive operating position quantity criteria. Position requirements are determined by the tactical mission mix and the distance between geographically separated SUA. However, sector flow rate may be considerably less than those prescribed for the terminal area control service. An individual staff study of requirements should be conducted at each new facility or when major mission changes are expected to occur to determine operating position requirements.

h. En route Control Service. The operating positions that are exclusively responsible for the affected en route airspace perform the required en route function. Class VI and class VII ATC facilities that provide en route control service shall determine the en route control position requirements. En route operations requirements are to be included in the sector flow rate AP calculations (line item 3) in appendix A and described in subparagraph 4f(2).

5. ATC Facility Staffing Requirements Formula (United States Navy Only)

a. ATC staffing standards shall be used to calculate ATC facility staffing requirements to support the warfighter and execute the command mission. Changes to ATC facility staffing requirements and activity manning document billet titles shall be coordinated with OPNAV N980A as endorsed by the chain of command. Each ATC facility is unique in its staffing requirement and the factors used to develop the staffing standard include:

(1) Shift duration which is limited by the number of hours each day and week per references (a) and (f) and normally is no more than 8 hours per ATC watch due to fatigue and safety. ATC personnel meet the accompanying dependent criteria, per reference (g), to support compliance with FAA and Naval Air Systems Command requirements.

(2) Airfield hours required to support warfighter and command mission.

(3) ATC management personnel requirements identified in figure 3 based on ATC facility classification (note 1).

(4) Initial position requirements based on ATC facility classification.

(5) Position requirement allocation based on (appendix A) sector flow per hour and runway configuration as determined by paragraph 4.

(6) Maintaining continuous position requirement staffing throughout the course of the shift (i.e., cannot take breaks).

(7) Air traffic controller-in-training requirements necessary to properly staff operating positions (note 2).

(8) Aeromedical short or long-term grounding and non-ATC duties (note 3).

Note 1: Requirements include, but not limited to: ATCFO, leading chief petty officer (LCPO), Naval Air Training and Operating Procedures Standardization (NATOPS) evaluator -

training chief, NATOPS instructor - tower, NATOPS instructor - radar, NATOPS instructor - ATC, airspace officer, and airspace chief.

Note 2: Newly reported personnel (air traffic controllers-in-training) at each command are required by the FAA to train with a qualified air traffic controller on each separate operating position within the ATC facility prior to obtaining qualification. Based on Navy ATC facility analysis, 33 percent of the time an operating position was staffed, and air traffic controller-in-training was paired with a qualified air traffic controller. Each air traffic controller-in-training can normally take 6 months to 2 years to achieve full-facility qualification.

Note 3: Aeromedical groundings and other military duties affect the ability to properly staff operating positions. On average, 4 percent of ATC facility authorizations are either in a grounded status and unable to perform ATC duties or performing non-ATC duties.

Class Facility	Number of Staff	Normal Staffing
I	3	ATCFO, LCPO, NATOPS evaluator - training chief
II	4	ATCFO, NATOPS evaluator - training Chief, NATOPS instructor - tower, NATOPS instructor - ATC
III/IV/V	6	ATCFO, LCPO, NATOPS evaluator - training chief, NATOPS instructor - tower, NATOPS instructor - radar NATOPS instructor - ATC
VI/VII	6	ATCFO, LCPO, NATOPS evaluator - training chief, NATOPS instructor - radar, NATOPS instructor - tower, airspace officer, airspace chief

Figure 4 - ATC Management Personnel

b. The following formula shall be used to determine proper ATC staffing requirements. A worksheet is provided for staffing analysis and comparison on <https://atc.navy.mil>.

(1) ATC Manpower Requirement:
 $(X1 + (152.532 * (X2 + X3 + X4) + 38.133 * (X5 + X6 + X7 + X8 + X9 + X10 + X11 + X12 + X13)) / 145.136) * 1.37.$

(2) ATC Manpower Requirement (Excel format):
 $=ROUND((X1 + (152.532 * (X2 + X3 + X4) + 38.133 * (X5 + X6 + X7 + X8 + X9 + X10 + X11 + X12 + X13)) / 145.136) * 1.37, 0).$

X1	Number of administrative personnel based on ATC facility classification as indicated in figure 4.
152.532	Number of hours per shift position is staffed on a monthly basis for 4 days of the week. 38.133*4=152.532.
38.133	Number of hours per shift position is staffed on a monthly basis for 1 day. (Shift position is 8 hours per shift and 7 days a week). One shift position per month and 7 days a week=266.931. 266.931/7=38.133.
145.136	Numbers of productive workweek hours per individual per month. Reference (g).
X2	Positions staffed during a day watch, Monday through Thursday.
X3	Positions staffed during an eve watch, Monday through Thursday.
X4	Positions staffed during a mid-watch, Monday through Thursday.
X5	Positions staffed during a day watch, Friday.
X6	Positions staffed during an eve watch, Friday.
X7	Positions staffed during a mid-watch, Friday.
X8	Positions staffed during a day watch, Saturday.
X9	Positions staffed during an eve watch, Saturday.
X10	Positions staffed during a mid-watch, Saturday.
X11	Positions staffed during a day watch, Sunday.
X12	Positions staffed during an eve watch, Sunday.
X13	Positions staffed during a mid-watch, Sunday.
1.37	Air traffic controller-in-training requirements/aeromedical groundings/non-ATC duties

Figure 5 - Manpower Variables

c. Civilian personnel (GS-2152) are hired to provide operating position staffing compliance with the ATC facility manning requirements. The total amount of civilian personnel

providing operating position staffing shall be deducted from the military personnel requirement to operate the ATC facility.

d. Additional staffing requirements at individual ATC facilities should be addressed through proper regional and total force manpower management procedures per reference (g). Overall Navy rating staffing requirements should be considered when requesting additional staffing requirements. Temporary additional duty staffing requirements should be coordinated with appropriate regional ATC training and readiness office if additional staffing requirements are needed for extended operations.

6. Operating Position Equipment Capability Standards

a. The criteria for establishing equipment requirements for operating positions at all shore-based classes of ATC facilities are described in this paragraph. This criterion is designed to provide a mechanism for translating standard operating position capability into basic equipment requirements. Specific nomenclature equipment that best fulfills the position requirement capability is derived from these basic requirements. Thus, a requirement for ground to air radio communications would indicate a need for a transmitter and receiver (or transceiver), antenna, recording capability, associated communications switching equipment, remote communications air to ground (RCAG) equipment, and interconnecting cabling.

b. The same required capability for several operating positions can be met by a single system. Therefore, an "X" in the operational communications system or emergency communications system (ECS) columns in appendix B does not mean each capability will have an independent system to meet the listed requirement.

c. In order to establish equipment requirements, four equipment categories were created: communications, aircraft control displays, ancillary information displays, and flight progress displays and documentation. Each equipment category was subcategorized by operational purpose. By ATC facility class, the applications of each equipment category and subcategory (operational purpose) were plotted on charts to determine the capabilities required by the air traffic controller. These capability standards are presented in

appendix B. Required capabilities are expressed in generic terms to avoid limiting results to current equipment inventories. Thus, the resulting standards remain valid regardless of equipment changes. The detailed list of equipment categories and subcategories (operational purpose) including function are identified below:

(1) Communications. Communications systems include the operational communications system (OCS), ECS, and RCAG. The OCS consists of radio, voice switch, and ancillary equipment which enable the ATC facility to perform its mission based on the stated operational requirement, providing communications coverage within the entire required operational service volume. Ultra high frequency (UHF), very high frequency (VHF), and high frequency (HF) radios are all used depending on the required function. VHF radios can be required in either frequency modulation (FM) or amplitude modulation (AM) frequency range.

(a) The ECS is an independent auxiliary communications system for installation in ATC facilities. The system is capable of providing limited ground-to-air communications in the event of catastrophic failures of the OCS and its components.

(b) The RCAG provides the capability to configure, control, and monitor remotely located ATC radios directly from the ATC facility. Control of such radios may include frequency, mode, squelch, power, and scan features. Employed by all operating positions, the communications category is presented according to the following subcategories and associated functions:

1. Aircraft control communications: Used to forward to and receive from pilots operational information concerning aircraft movement and safety, issue ATC clearances, provide advisory information, issue control instructions, and relay weather information.

2. Vehicle control communications: Used to forward and receive operational information concerning emergency aircraft or situations and vehicle movement on the airport surface, issue clearances to enter an area or cross a runway, and determine vehicle position or intentions.

3. Inter-facility communications: Used to forward and receive (between ATC facilities) operational information concerning aircraft movement and safety, relay ATC clearances, execute handoffs, and relay flight plan information.

4. Intra-facility communications: Used to forward and receive (between operating positions within the ATC facility) operational and administrative information concerning aircraft movement and safety messages; aircraft departure release authorizations; handoffs; verbal and non-verbal aircraft position and clearance information; and aircraft parking or fuel requirements.

(2) Aircraft Control Displays. Employed by operating positions in the ATCT and radar branches, the aircraft control display category is presented according to the following subcategories and associated functions:

(a) Aircraft identification: Used to determine individual aircraft call sign, type, and altitude.

(b) Aircraft position (surveillance): Used to determine aircraft position in two dimensions (range and azimuth) to provide aircraft sequencing and separation.

(c) Aircraft position (precision): Used to determine aircraft position in three dimensions (range, azimuth, and elevation) to provide precision approach guidance.

(d) Visual communications: Used to effect non-verbal, two-way, recorded communication between LC, all FC, and the RS and TS.

(e) Automation keyboard and trackball: Used to provide data and command entry; and display cursor control and window and menu entry control for radar processing and display system.

(3) Ancillary Information Displays. Employed by operating positions in the ATCT, radar, and FP branches, the 'ancillary information displays' category is presented according to the following subcategories and associated functions:

(a) Altimeter setting display: Provides altimeter setting (barometric pressure) to air traffic controllers.

(b) Time display: Provides coordinated universal time to air traffic controllers.

(c) Wind speed and direction display: Provides wind speed and magnetic direction to air traffic controllers.

(d) Weather data display: Provides weather observations and forecasts to air traffic controllers.

(e) NOTAM display: Provides capability to access the defense Internet NOTAM service Web site to view, query, and create NOTAMs.

(f) ATIS: Continuously broadcasts to aircraft a recorded report of NOTAMs, airfield and environmental data.

(g) Airfield lighting control system display: Provides air traffic controllers with capability to operate all airfield lighting.

(h) Wave-off lighting control: Provides air traffic controllers with capability to activate runway wave-off lights.

(i) ATC signal lamp: Provides air traffic controllers with capability to communicate with aircraft experiencing radio difficulties or not radio equipped.

(j) Airfield status board: Provides air traffic controllers with quick visual reference regarding status of various airfield facilities and equipment.

(k) Backlit map panel: Provides air traffic controllers with quick reference to backlit maps or charts of local area and airspace.

(l) Air traffic activity analyzer: Provides air traffic controllers with the means to record and managers with the means to analyze and report air activity.

(m) Evacuation alarm control: Provides air traffic controllers with capability to activate evacuation alarms at

remote sites within the airfield area when impending aircraft mishap or incident requires personnel evacuation in the interest of safety.

(n) Crash alarm control: Provides air traffic controllers with capability to activate crash alarm to notify appropriate station agencies of an aircraft crash or mishap.

(o) Crash phone: Provides air traffic controllers with an immediate capability to alert aircraft fire and rescue units as well as other command-designated agencies of crash, mishap or incident information.

(p) Remote video camera display: Provides air traffic controllers with capability to view or observe an area under surveillance of a remote camera(s).

(q) Remote monitoring and control: Provides air traffic controllers with capability to remotely monitor status of automation system, ASR system, PAR system, and NAVAIDS as well as a means to control specific features of each of these systems.

(4) Flight Progress Displays and Documentation.

Employed by operating positions in the ATCT, radar, and FP branches, the flight progress displays and documentation category is presented according to the following subcategories and associated functions:

(a) Flight data progress, entry, and display: Provides flight progress information to air traffic controllers and allows air traffic controllers to enter flight progress information.

(b) Flight data progress printer: Provides air traffic controllers with capability to print flight progress information.

(c) Flight progress record holder: Permits the viewing, arranging, and marking of flight progress strips.

(d) Audio recording: Preserves a record of aircraft control, vehicle control, inter-facility coordination, and intra-facility coordination communications.

(e) Radar data recording: Preserves a record of aircraft identity and position (surveillance) data and display set-up data.

d. Appendix C depicts typical elevation view for each operating position to provide familiarity regarding specific placement of equipment.

7. ATC Facility Training Systems

a. The ATC facility radar training system (automation) provides the capability for basic and advanced concentrated hands-on ATC training scenarios in a simulated but realistic ATC environment without endangering aircraft or personnel. This system is hosted and run on a training simulator and general purpose workstations at classes III, IV, V, and VII ATC facilities.

b. Training simulator equipment serves as the instructor platform, the general purpose workstations serve as the pseudo-pilot platforms, and the aircraft control displays serve as the student workstations. To enhance training, pseudo-pilot workstations at classes IV, V, and VII shall be equipped with OCS position equipment.

c. The ATC facility radar training system provides the capability for proficiency and currency simulator training of RCs. One simulator shall be installed at ATC facilities with PAR capability.

d. The ATCT training system provides the capability for proficiency and currency simulator training of ATCT air traffic controllers. When required and approved by OPNAV N980A, one simulator shall be installed at ATC facilities with an ATCT.

APPENDIX A
 SECTOR FLOW RATES WORKSHEET

TABLE A-1. SHIFT TABLE

Shift Table			
	Standard Shift		
	Day	Eve	Mid
1	1	-	-
2	2	-	-
3	3	-	-
4	4	-	-
5	5	-	-
6	6	-	-
7	7	-	-
8	8	-	-
9	9	-	-
10	10	-	-
11	6	5	-
12	7	5	-
13	8	5	-
14	8	6	-
15	8	7	-
16	8	8	-
17	9	8	-
18	9	9	-
19	10	9	-
20	10	10	-
21	8	8	5
22	8	8	6
23	8	8	7
24	8	8	8

TABLE A-2. WORKSHEET I (SECTOR FLOW RATES PER HOUR)

Sector Flow Rates		Worksheet I	
1	enter terminal area control (approach control) total daily hours of operation	Hours	
2	enter standard shift durations from shift table (table A-2)	Day	Eve
3	enter total annual IFR approach control operations*		
4	normalizing factor**	2.05	1.2
5	multiply line 3 by line 4		
6	enter number of approach sectors		
7	enter number of departure sectors		
8	multiply line 2 by line 6		
9	divide line 5 by line 8 to determine approach sector flow rate per hour		
10	multiply line 2 by line 7		
11	divide line 5 by line 10 to determine departure sector flow rate per hour		

* Enter in thousands to one decimal, i.e., 105,238 = 105.2

** The Normalization Factor is a mathematical weighting of the day versus evening shift that equates to 63 percent versus 37 percent and is provided as a general planning weight. Any facility experiencing significantly different weights may need to adjust the factor based on actual traffic counts.

OPNAVINST 3722.35A
20 May 2014

APPENDIX B
CAPABILITY STANDARDS

TABLE B-1. OPERATING POSITION STANDARD

Operating Positions	Class of Facility						
	I	II	III	IV	V	VI	VII
Facility Watch Supervisor		X	X	X	X	X	X
Flight Planning Supervisor	X	X	X	X	X		X
Flight Planning Dispatch	X	X	X	X	X		X
Tower Supervisor		X	X	X	X		X
Local Control		X ³	X ³	X ³	X ³		X ³
Ground Control		X ³	X ³	X ³	X ³		X ³
Flight Data (Tower)		X	X	X	X		X
Clearance Delivery			X ¹	X ²	X ²		X ²
Radar Supervisor			X	X	X		X
Approach Control				X ⁴	X ⁴		X ⁴
Departure Control				X ⁴	X ⁴		X ⁴
Radar Associate				X ⁴	X ⁴		X ⁴
Radar Coordinator			X ⁴	X ⁴	X ⁴		X ⁴
Arrival Control			X ⁴	X ⁴	X ⁴		X ⁴
Final Control (ASR)			X ⁴	X ⁴	X ⁴		X ⁴
Final Control (PAR)			X ⁴	X ⁴	X ⁴		X ⁴
Final Control (PALS)			X ⁴	X ⁴	X ⁴		X ⁴
Flight Data (Radar)			X	X	X		X
SUA Sector Control					X ⁵		X ⁵
ROCC (Radar) Supervisor					X	X	
ROCC Sector Control						X	
ROCC Asst Sector Control						X	
ROCC Flight DATA						X	
En Route Control						X	X

Note:

1. Typically located in the ATCT.
2. Typically located in the IFR room.
3. Additional position requirements based on runway configuration.
4. Additional position requirements based on increased radar operations.
5. Additional position requirements based on increased tactical mission mix and distance between geographically separated SUA.

TABLE B-2. COMMUNICATIONS (AIRCRAFT CONTROL) CAPABILITY STANDARD

REQUIRED CAPABILITY								Application		Class of Facility							
System			Frequency				Transmit			Receive	I	II	III	IV	V	VI	VII
OCS	ECS ¹	RCAG	UHF (AM)	VHF (AM)	VHF (FM)	HF											
X			X				X	X	Pilot-to-Dispatch	X	X	X	X	X		X	
X						X	X	X	Ship-to-Shore ²	X	X	X	X	X		X	
X			X	X			X	X	Clearance Delivery		X	X	X	X		X	
X			X	X			X	X	Ground Control		X	X	X	X		X	
X			X				X	X	ATIS		X	X	X	X		X	
X	X		X	X			X	X	Tower Primary		X	X	X	X		X	
X			X	X			X	X	Single Frequency Approach (All)		X	X	X	X		X	
X			X				X	X	LSO Primary ³		X	X	X	X		X	
X	X		X	X			X	X	Emergency		X	X	X	X		X	
X			X				X	X	On-scene SAR Primary (282.8) ⁴		X	X	X	X		X	
X	X		X	X			X	X	Approach Control Primary				X	X		X	
X			X	X			X	X	Approach Control Secondary				X	X		X	
X			X	X			X	X	Departure Control Primary				X	X		X	
X			X	X			X	X	Departure Control Secondary				X	X		X	
X		X	X	X			X	X	En Route Control Primary						X	X	
X		X	X	X			X	X	En Route Control Secondary						X	X	
X		X	X	X			X	X	Sector Control Primary				X	X	X	X	
X		X	X	X			X	X	Sector Control Secondary				X	X	X	X	
X	X		X	X			X	X	Quick-shift Multi-frequency-ATCT		X	X	X	X		X	
X	X		X	X			X	X	Quick-shift Multi-frequency-IFR Room			X	X	X	X	X	

Notes:

1. Two consoles in ATCT, two consoles in IFR room, one console in ATC equipment room.
2. For ATCFs supporting aircraft carrier divert field requirement.
3. For ATCFs supporting a landing signals officer (LSO) and field carrier landing practice requirement.
4. For ATCFs supporting SAR requirement.

TABLE B-3. COMMUNICATIONS (VEHICLE CONTROL) CAPABILITY STANDARD

REQUIRED CAPABILITY							Application ¹	Class of Facility							
System		Frequency				Transmit		Receive	I	II	III	IV	V	VI	VII
OCS	ECS	UHF (AM)	VHF (AM)	VHF (FM)	HF										
X	X			X		X	X		X	X	X	X		X	
X				X		X	X		X	X	X	X		X	
X				X		X	X		X	X	X	X		X	
X				X		X	X		X	X	X	X		X	

Note: Typically, these applications are not routinely accessed via the voice communications system. They are normally accessed via stand-alone base stations.

TABLE B-4. COMMUNICATIONS (INTER-FACILITY/INTRA-FACILITY)
CAPABILITY STANDARD

REQUIRED CAPABILITY				Application	Class of Facility						
System					I	II	III	IV	V	VI	VII
OCS	ECS	Landline	Intercom								
X		X		Interfacility Communications Circuits	X	X	X	X	X	X	X
X			X	Intrafacility Communications Circuits (between operating positions)		X	X	X	X	X	X
X		X		Intrafacility Communications Circuits (to non-operating positions)	X	X	X	X	X	X	X
		X		Primary Aircraft Emergency Alarm Intercommunication System (Crash Phone)	X	X	X	X	X		X

TABLE B-5. AIRCRAFT CONTROL DISPLAYS CAPABILITY STANDARD

Aircraft Control Displays	Flight Planning Supervisor	Flight Planning Dispatch	Tower Supervisor	Local Control	Ground Control	Flight Data (Tower)	Clearance Delivery	Radar Supervisor	ROCC (Radar) Supervisor	Approach Control	Departure Control	Radar Associate	Radar Coordinator	Arrival Control	Final Control (ASR)	Final Control (PAR)	Final Control (PALS)	Flight Data (Radar)	SUA Sector Control	ROCC Sector Control	ROCC Asst. Sector Control	ROCC Flight Data	En Route Control
Aircraft Identification			X ¹	X				X	X	X	X	X ⁴		X	X				X	X	X		X
Aircraft Position (Surveillance)			X ¹	X				X	X	X	X	X ⁴		X	X	X ⁵	X ⁵		X	X	X		X
Aircraft Position (Precision)																X	X						
Visual Communications				X ²				X							X	X	X						
Automation Keyboard/Trackball				X						X ³	X ³	X		X	X			X ⁶	X	X	X	X	X

Notes:

1. When tower supervisor position is located such that local control aircraft control display is not easily visible to the tower supervisor, a slaved supplemental display monitor may be installed at the tower supervisor position.
2. Except class II ATCFs.
3. When local requirements dictate, an additional automation keyboard and trackball may be provided.
4. Uses associated control position's display.
5. Uses adjacent ASR display.
6. Only at classes IV, V, and VII ATCFs.

TABLE B-6. ANCILLARY INFORMATION DISPLAYS

Ancillary Information Displays	Operating Positions																							
	Flight Planning Supervisor	Flight Planning Dispatch	Tower Supervisor	Local Control	Ground Control	Flight Data (Tower)	Clearance Delivery	Radar Supervisor	ROCC Radar Supervisor	Approach Control	Departure Control	Radar Associate	Radar Coordinator	Arrival Control	Final Control (ASR)	Final Control (PAR)	Final Control (FALS)	Flight Data (Radar)	SUA Sector Control	ROCC Sector Control	ROCC Asst. Sector Control	ROCC Flight Data	En Route Control	
Altimeter Setting Display	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Time Display	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Wind Speed and Direction Display	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Weather Data Display	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOTAM Display	X																							
Automatic Terminal Information Service (1)						X																	X	
Airfield Lighting Control System Display (2, 3)	X			X																				
Waveoff Lighting Control			X																					
Air Traffic Control Signal Lamp			X	X																				
Airfield/Equipment Status Board	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Backlit Map Panel (4)											X										X			
Air Traffic Activity Analyzer (5)			X																					
Evacuation Alarm Control (5)			X																					
Crash Alarm Control			X																					
Crash Phone	X	X																						
Remote Video Camera Display	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Automation System Remote Monitoring and Control								X	X															
ASR Remote Monitoring and Control (6)								X	X															
PAR Runway Selection Remote Control																X								
Navigational Aids Remote Monitoring and Control(7)																								

Notes:

1. FD is the preferred location.
2. When necessary for closed control tower operations.
3. GC is the preferred location.
4. Recommended location.
5. LC is the preferred location.
6. At class VI, ARSR remote monitoring and control
7. Location not associated with a specific operating position and is dictated by local requirements.

TABLE B-7. FLIGHT PROGRESS DISPLAYS AND DOCUMENTATION
CAPABILITY STANDARD

Flight Progress Displays and Documentation	Operating Positions																							
	Flight Planning Supervisor	Flight Planning Dispatch	Tower Supervisor	Local Control	Ground Control	Flight Data (Tower)	Clearance Delivery	Radar Supervisor	ROCC Radar Supervisor	Approach Control	Departure Control	Radar Associate	Radar Coordinator	Arrival Control	Final Control (ASR)	Final Control (PAR)	Final Control (PALS)	Flight Data (Radar)	SUA Sector Control	ROCC Sector Control	ROCC Asst. Sector Control	ROCC Flight Data	En Route Control	
Flight Data Progress, Entry, and Display	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Flight Data Progress Printer ^{1,2}	X					X	X																	
Flight Progress Record Holder	X		X	X	X	X	X		X	X	X	X	X	X			X	X	X	X	X	X	X	X
Audio Recording	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Radar Data Recording									X	X				X	X	X	X	X	X	X	X		X	

Note:

1. When local requirements dictate.
2. At classes IV, V, and VII ATCFs the preferred location for clearance delivery is the IFR room.

APPENDIX C
OPERATING POSITION TYPICAL ELEVATION VIEWS

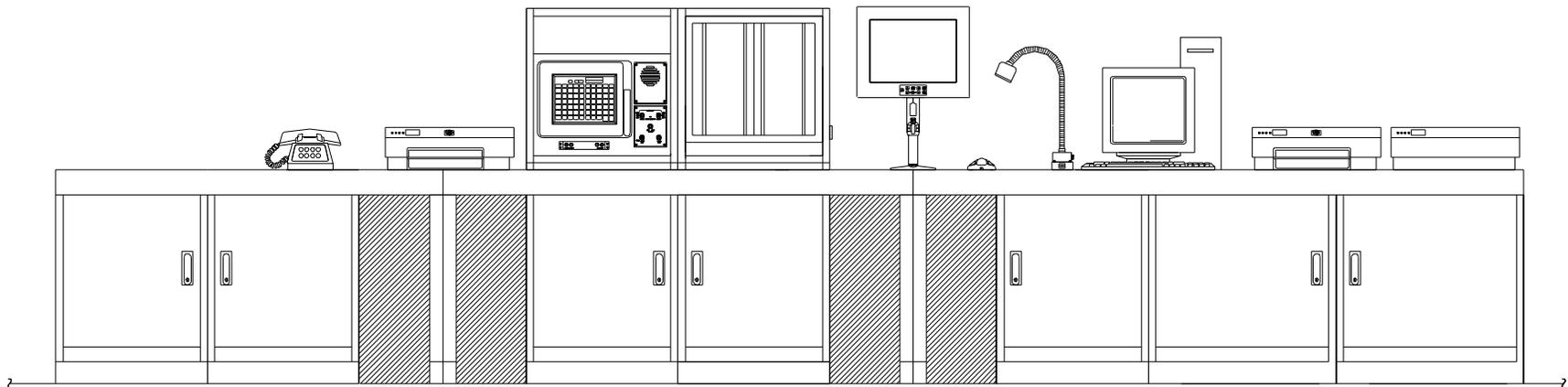


Figure C-1. Flight Planning Dispatch

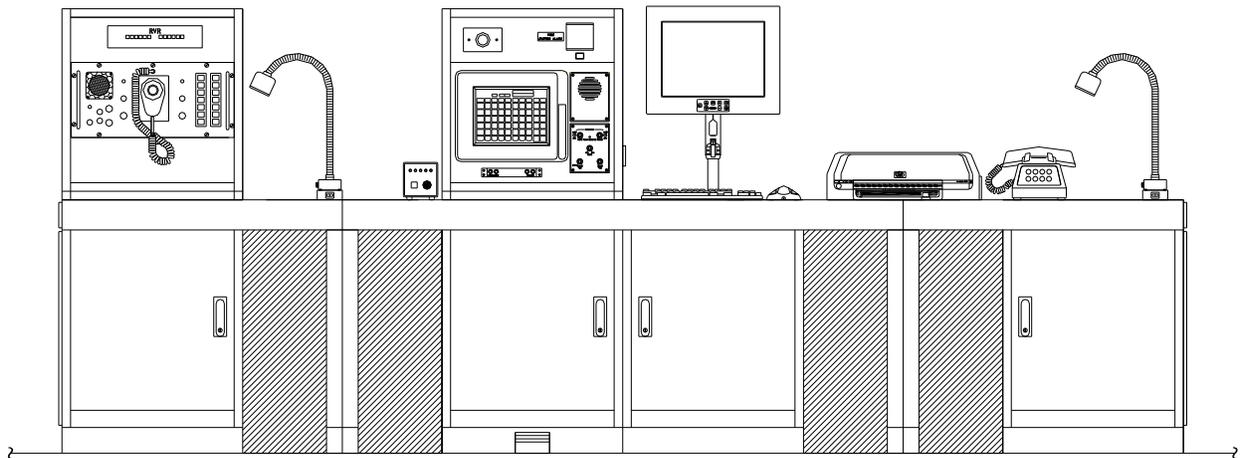


Figure C-2. Tower Supervisor

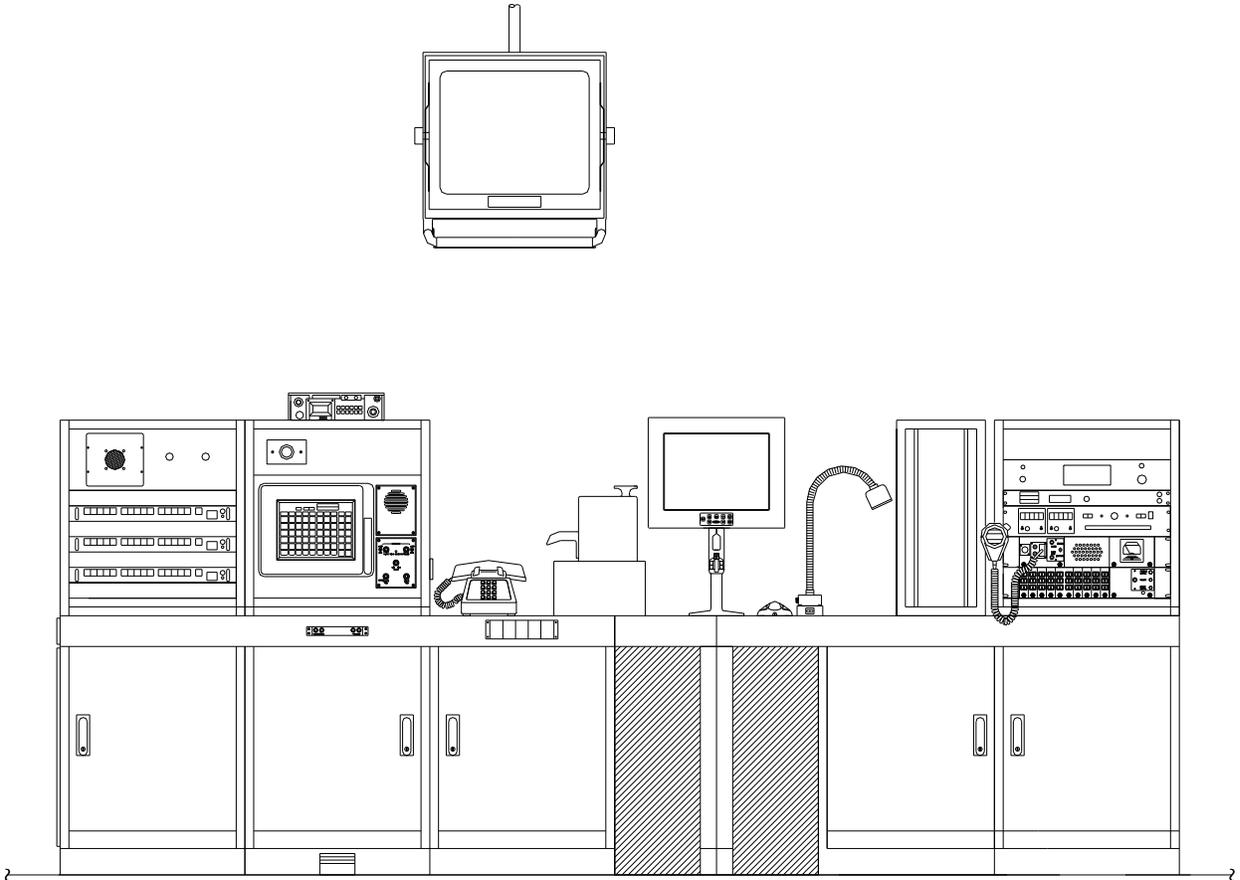


Figure C-3. Local Control

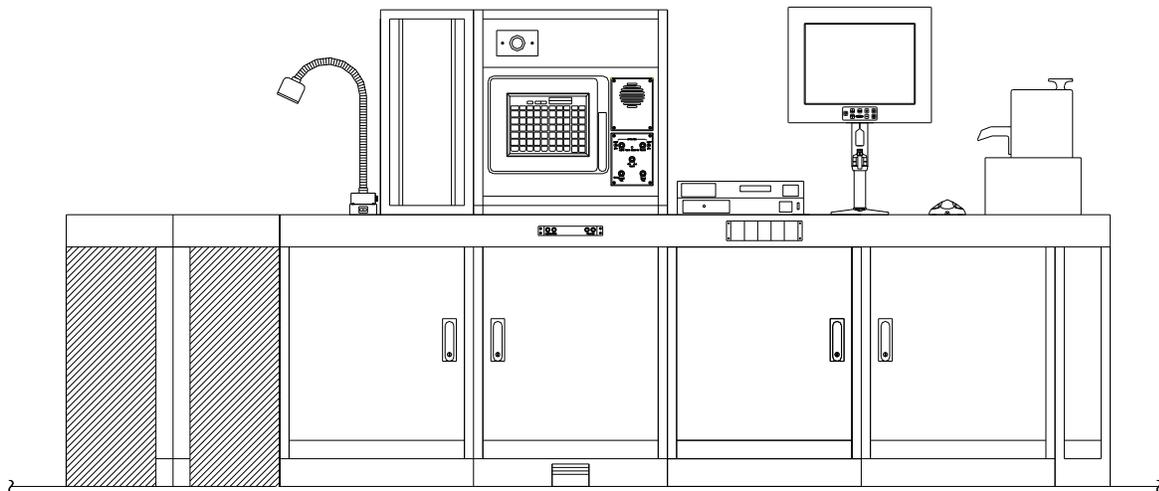


Figure C-4. Ground Control

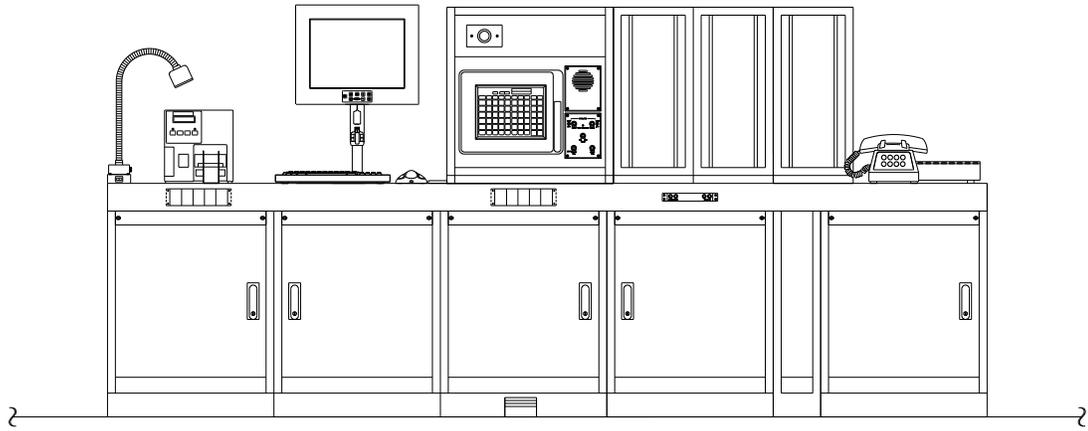


Figure C-5. Flight Data (Tower)

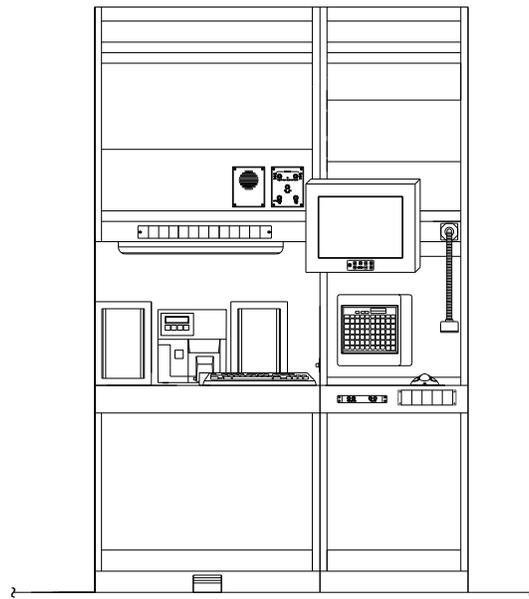


Figure C-6. Clearance Delivery

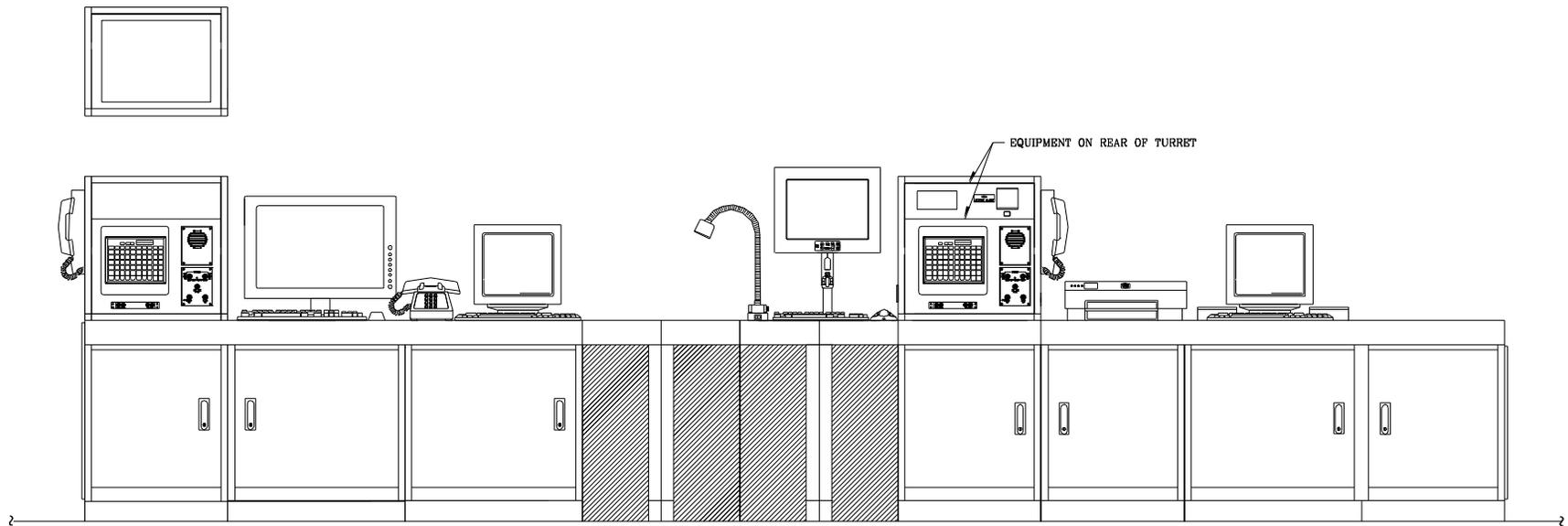


Figure C-7. Radar Supervisor

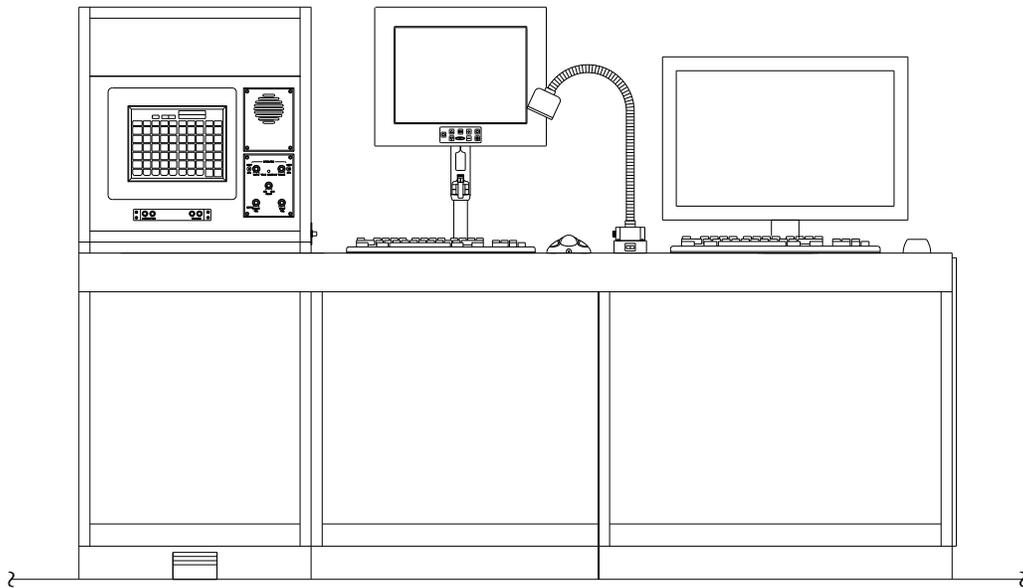


Figure C-8. ROCC (Radar) Supervisor

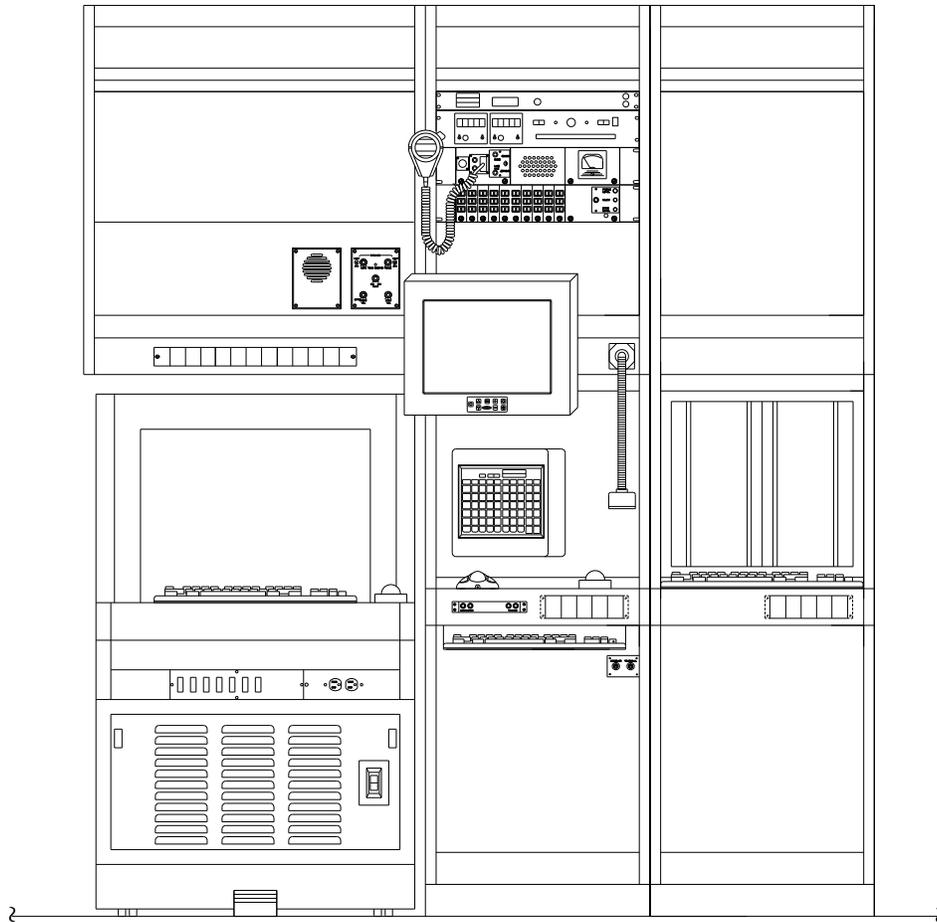


Figure C-9. Approach Control

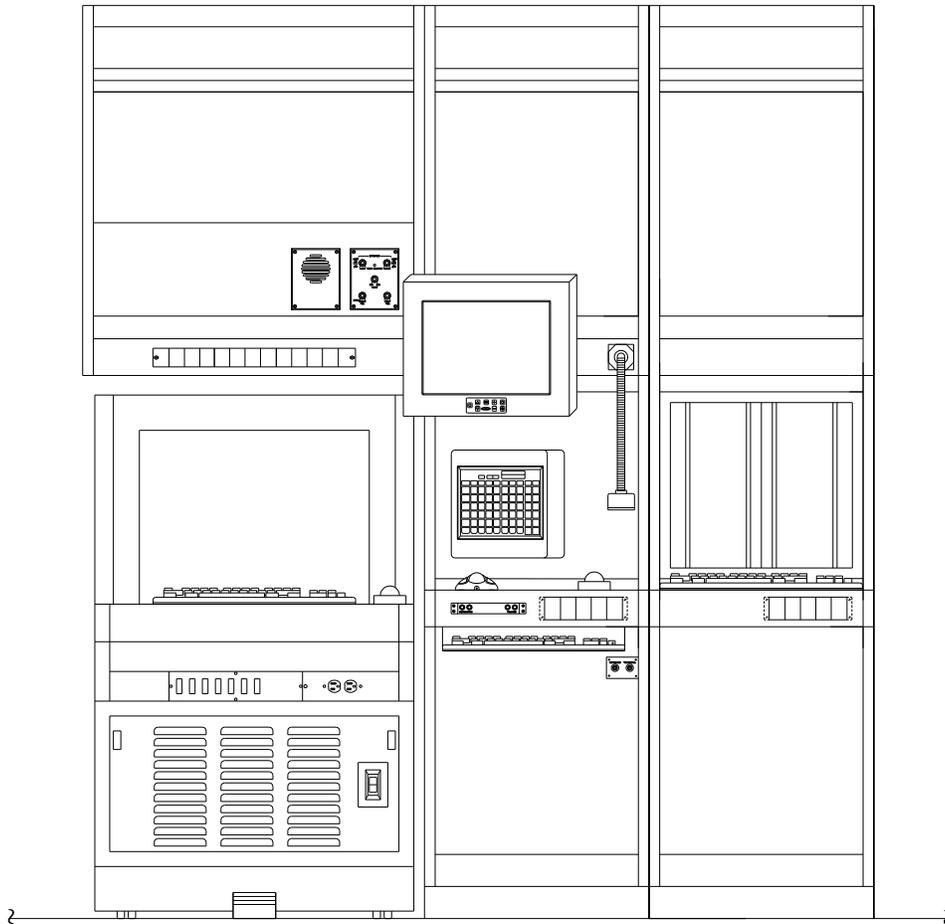


Figure C-10. Departure Control

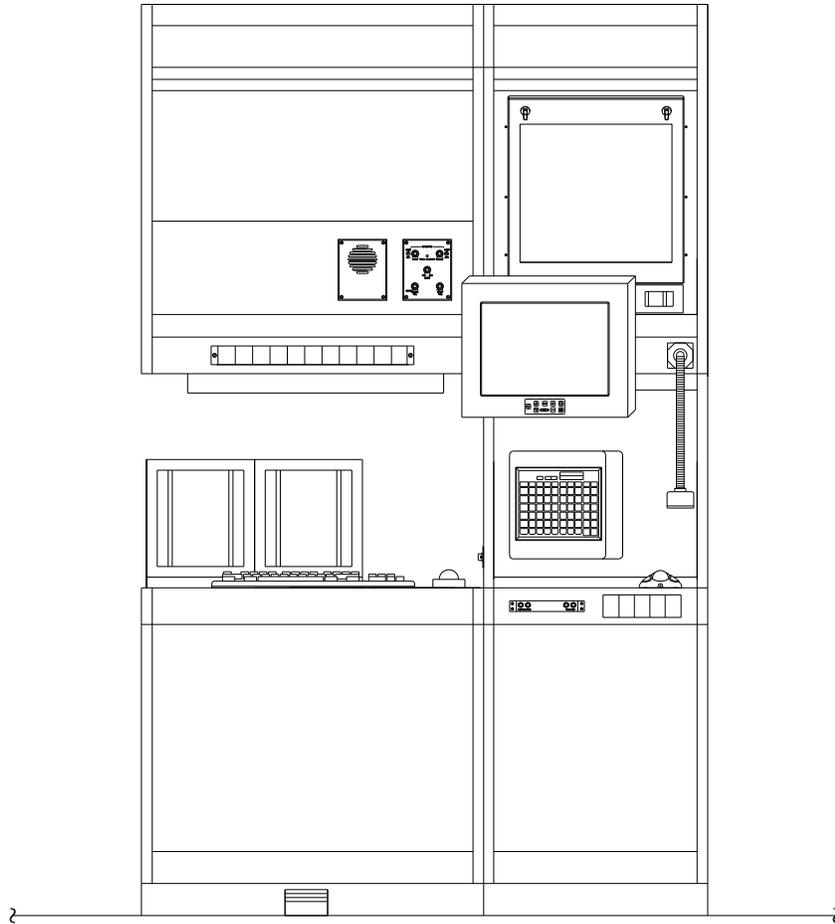


Figure C-11. Radar Associate

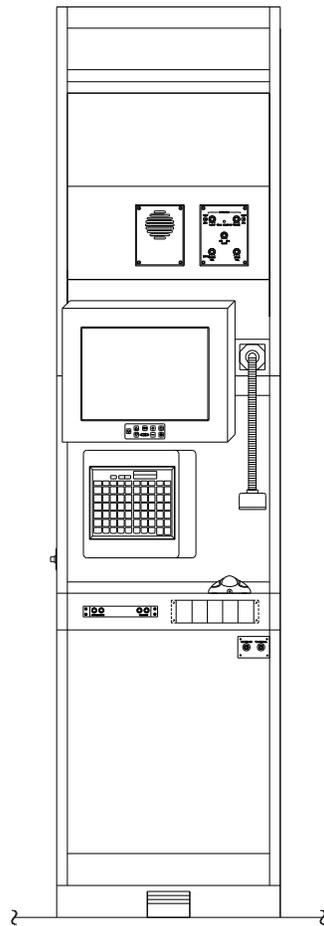


Figure C-12. Radar Coordinator

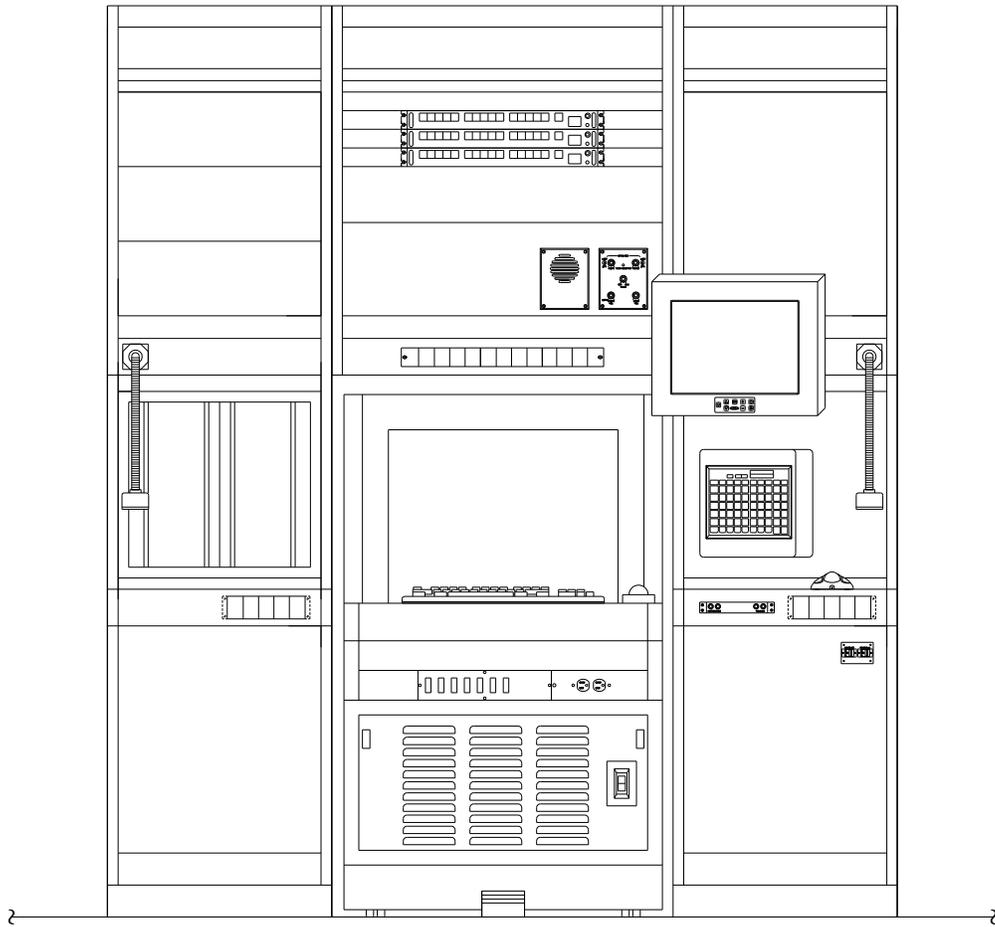


Figure C-13. Arrival Control

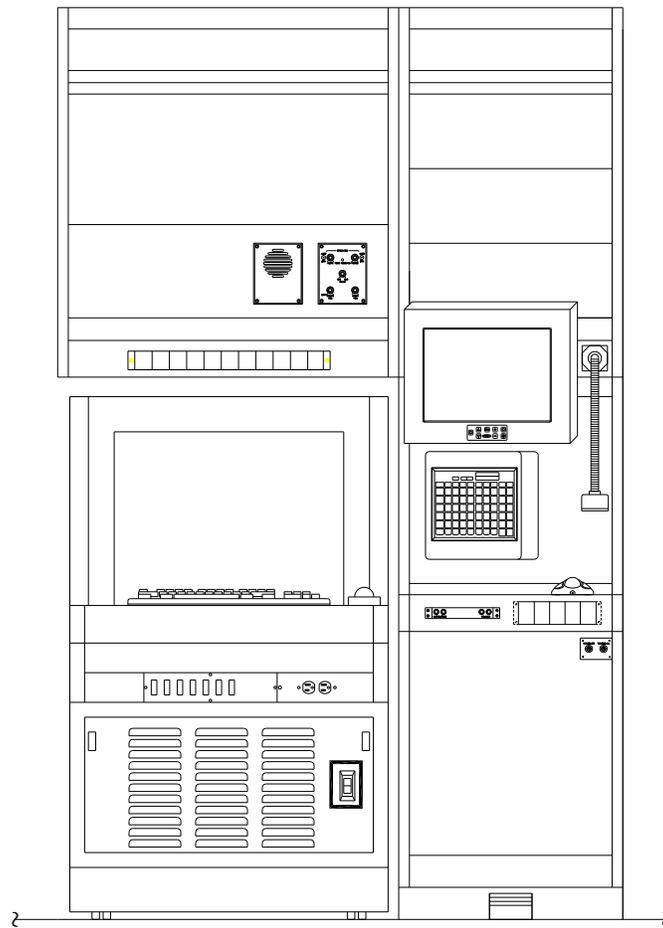


Figure C-14. Final Control (ASR)

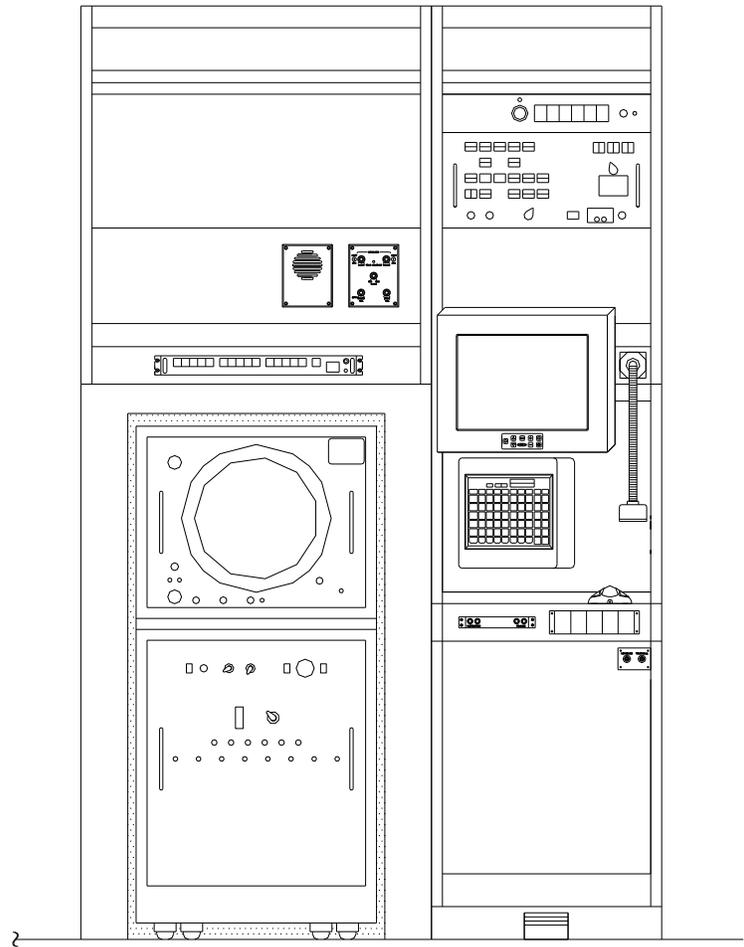


Figure C-15. Final Control (PAR)

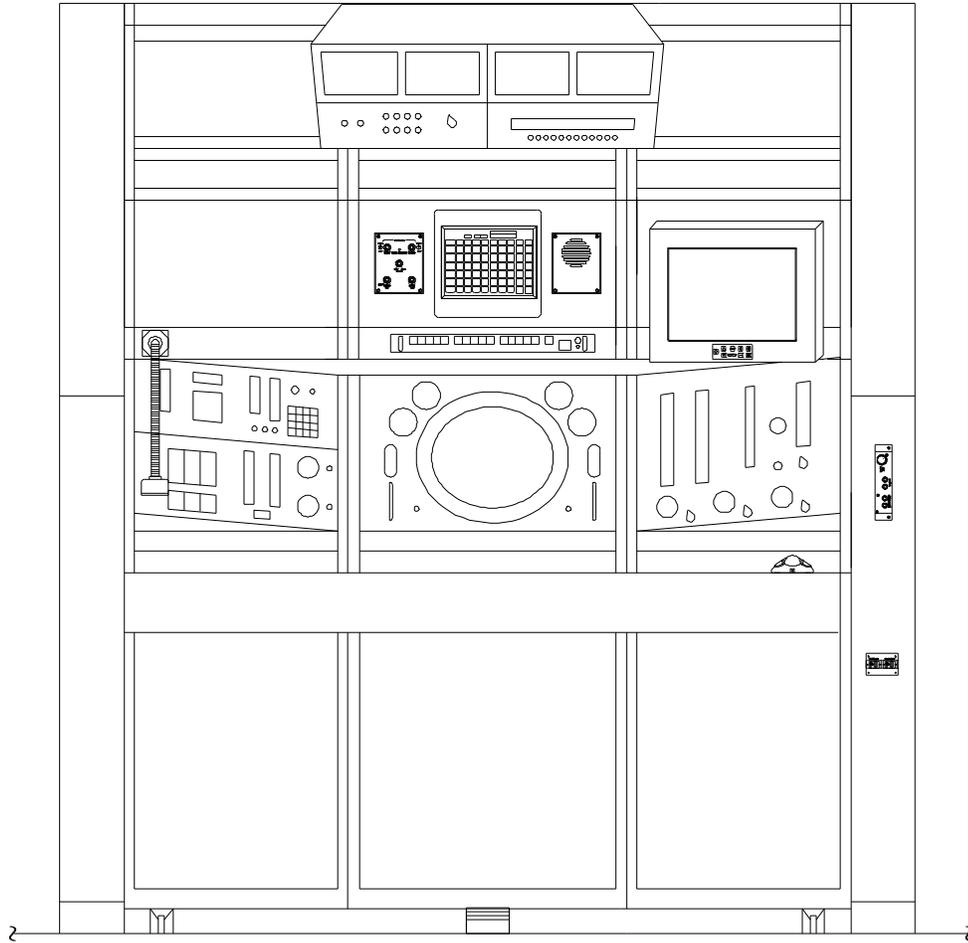


Figure C-16. Final Control (PALS)

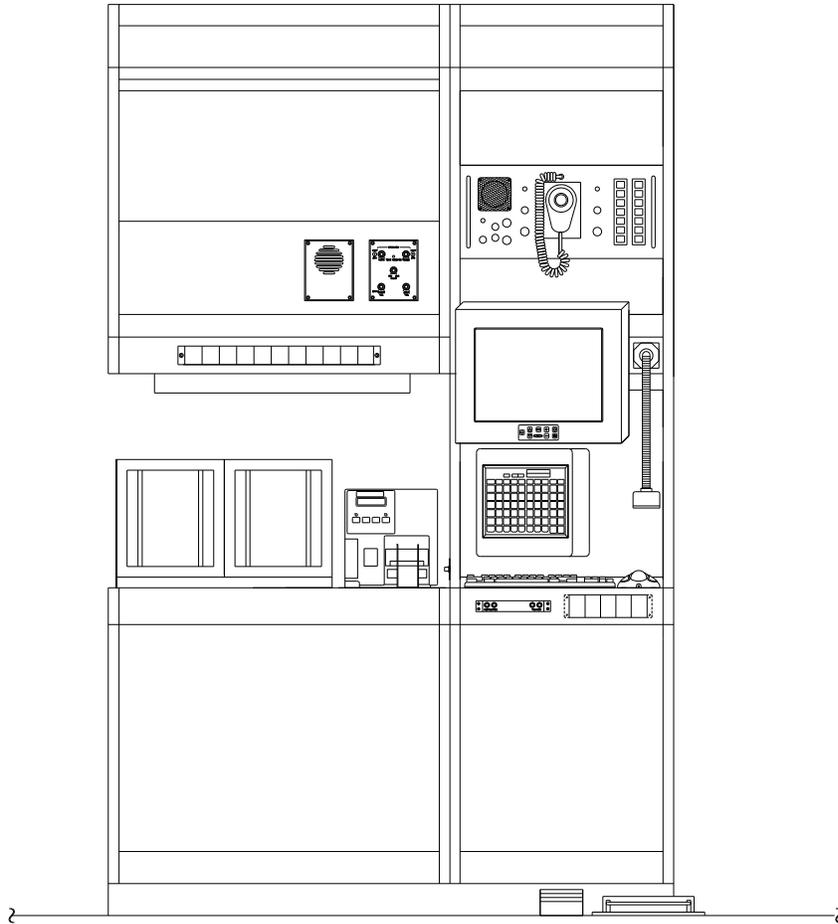


Figure C-17. Flight Data (Radar)

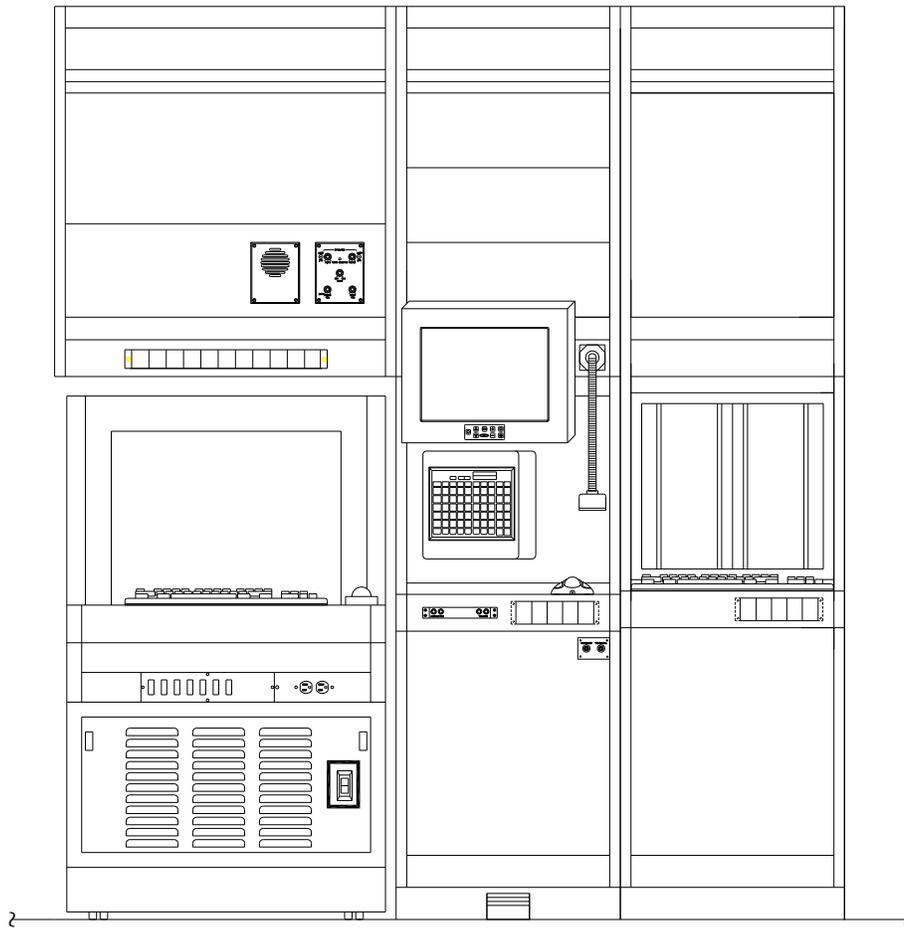


Figure C-18. SUA Sector Control

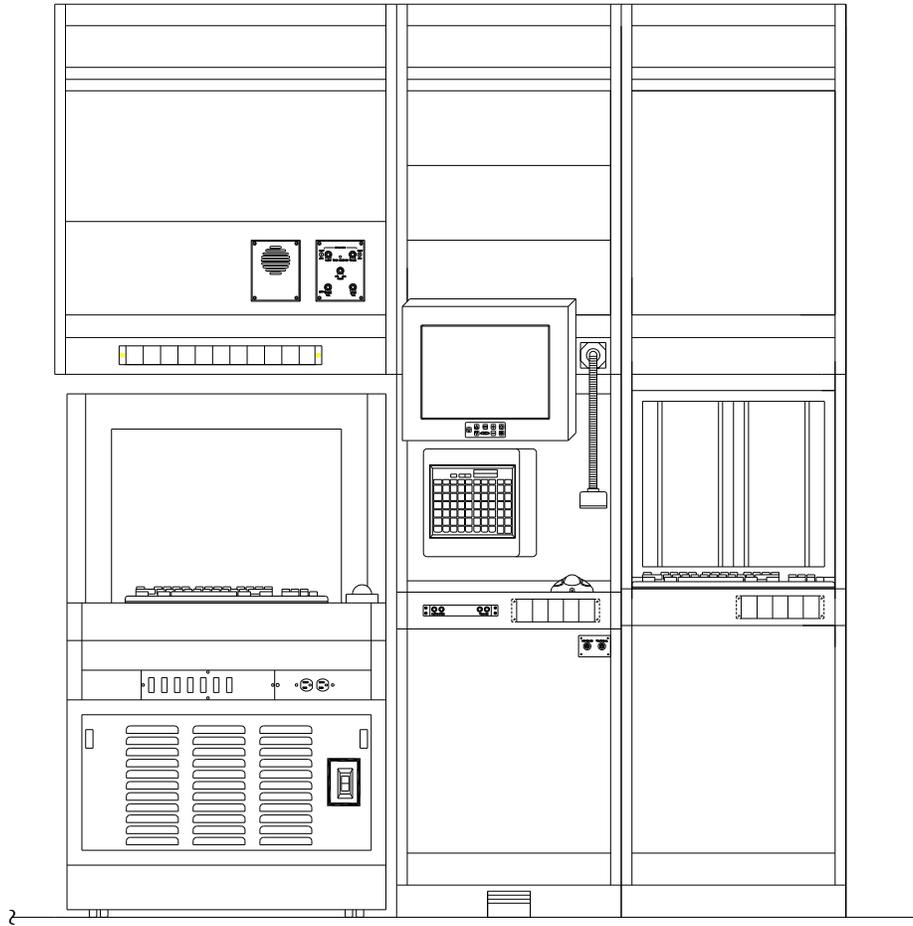


Figure C-19. ROCC Sector Control

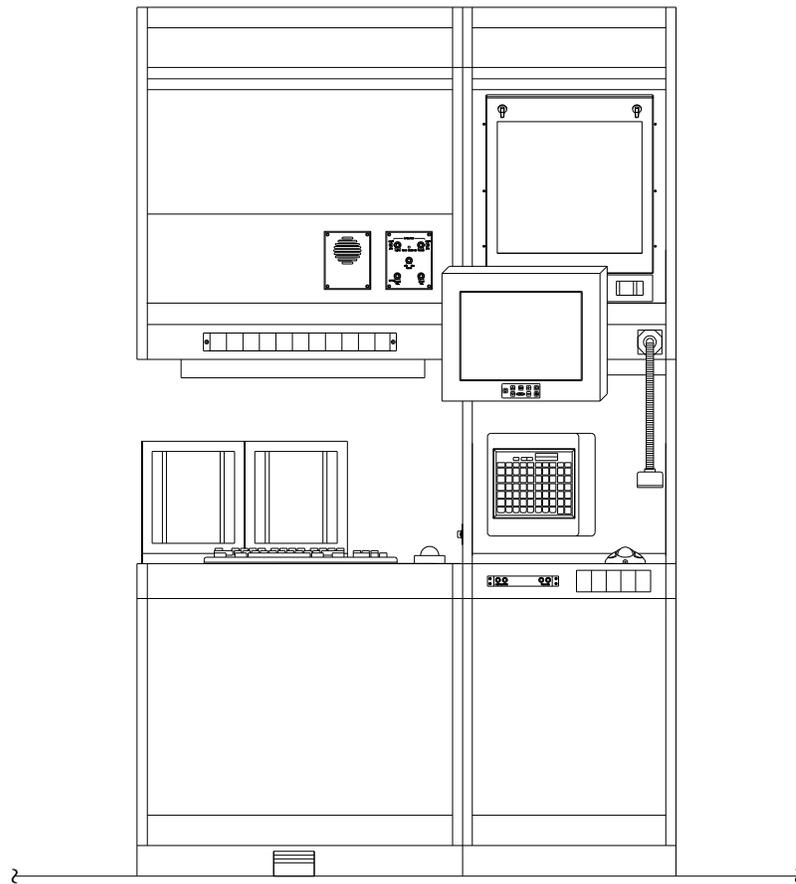


Figure C-20. ROCC Assistant Sector Control

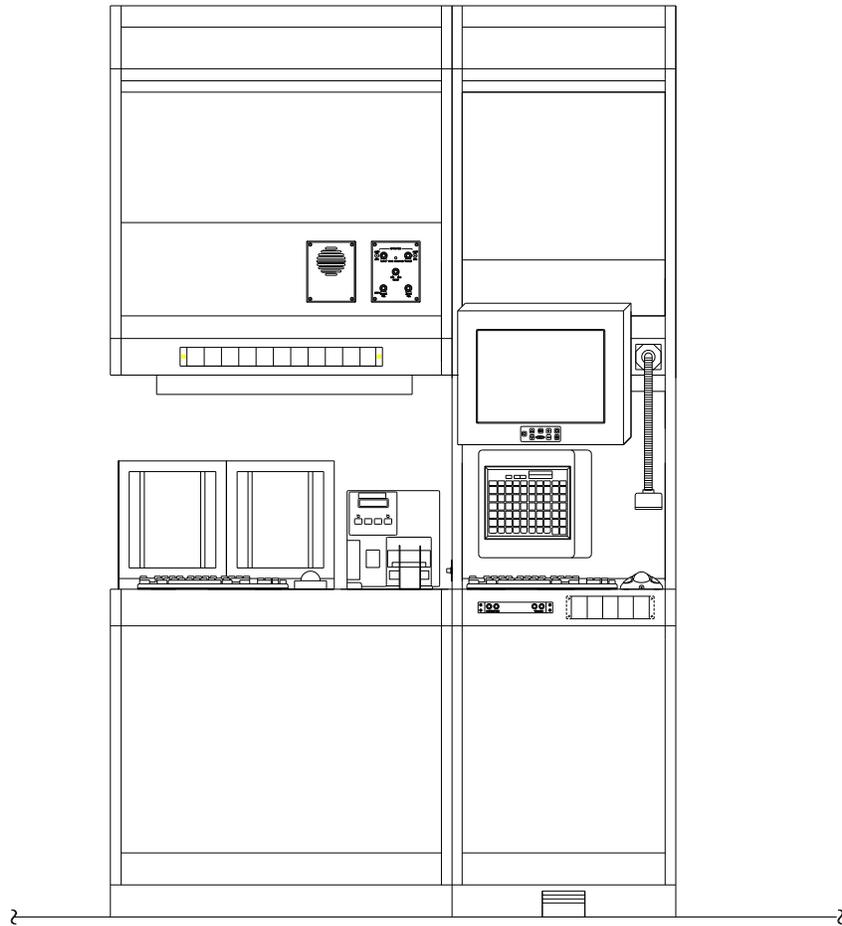


Figure C-21. ROCC Flight Data

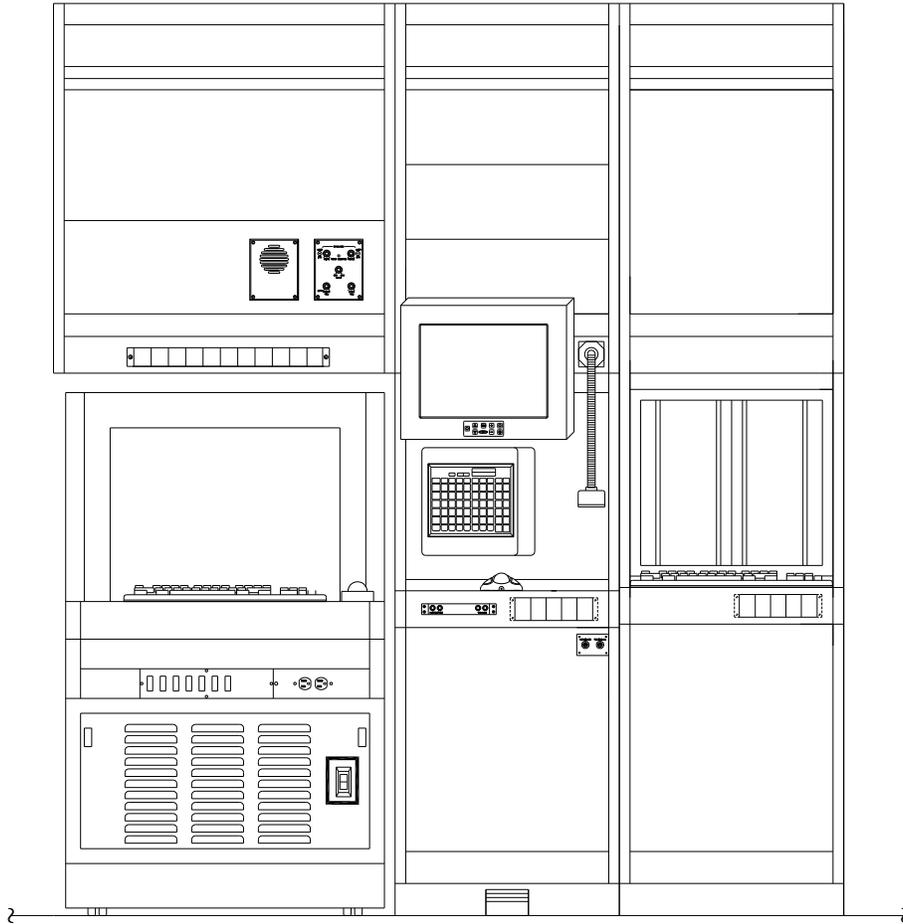


Figure C-22. En route Control