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AIR FORCE FLIGHT STANDARDS AGENCY  
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**AT-E-10**

## **AIR TRAFFIC CONTROL TRAINING SERIES**



### **EQUIPMENT**

**AN/GPN 20  
AND ASSOCIATED EQUIPMENT**

**21 July 1993**

## FOREWORD

**PURPOSE.** This publication is for use in the training of USAF air traffic controllers and is not intended to replace, substitute for, or supersede official regulations, procedures, or directives.

CLARENCE PONDS, LTC, USAF  
Director, Operations and Training  
Air Traffic Services Center

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## **INTRODUCTION**

This publication is designed to be used in conjunction with hands on training and classroom instruction to familiarize the air traffic controller with the operation of the **AN/GPN-20 (V)** ASR radar system and associated equipment. It does not replace TO 31P5-2GPN 24-11 (Operators Handbook) or applicable maintenance technical orders which are the official directives for this equipment.

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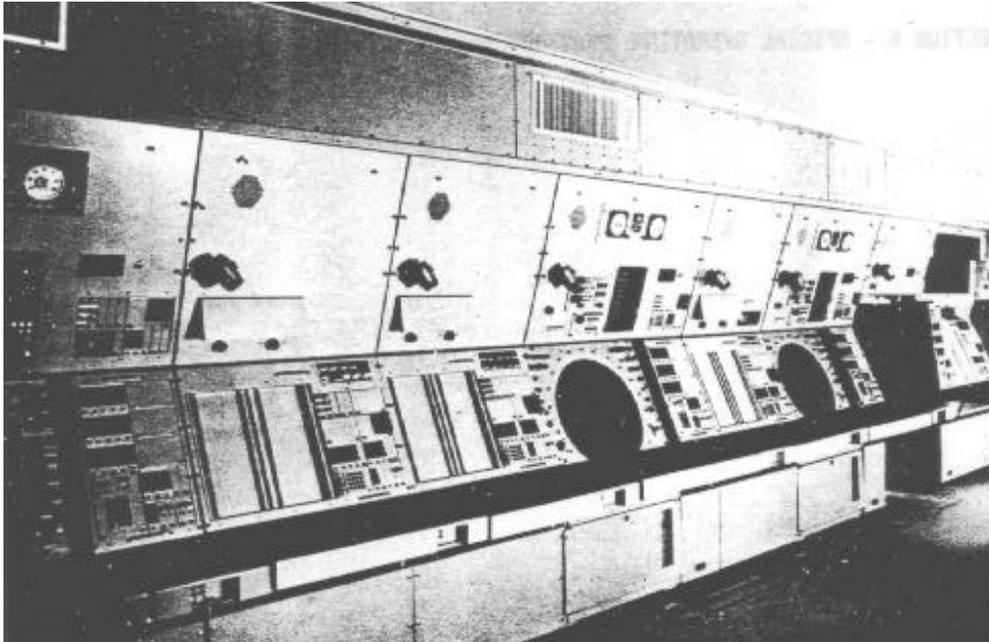
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## SECTION 1

### GENERAL DESCRIPTION

The AN/GSN-12(V) is the operations segment of the AN/GPN-24(V) terminal radar air traffic control system. The ASR radar segment of the system is the AN/GPN-20(V). Either the AN/GPN-22(V) or the AN/FPN-62 PAR radar sets may be connected to the OPS segment, through remote microwave link (RML) or landlines, to complete the system. Operator positions in the OPS segment provide controllers ASR and PAR displays, controls, and communications facilities. Landlines connect the OPS segment to the control tower, runway visual range system, weather dissemination system, wind speed and direction system, and up to 26 remote radio channels. The ASR and PAR segments are capable of 24 hour operation with minimal maintenance. Figure 1-1 shows the ASR portion of the OPS segment. Basic and expanded configurations of the OPS segment are displayed in figure 1-2. Three ASR and two PAR positions are available in the basic configuration, five ASR and three PAR in the expanded configuration. Table 1-1 provides a listing of available communications equipment.



**Figure 1-1. ASR Segment**

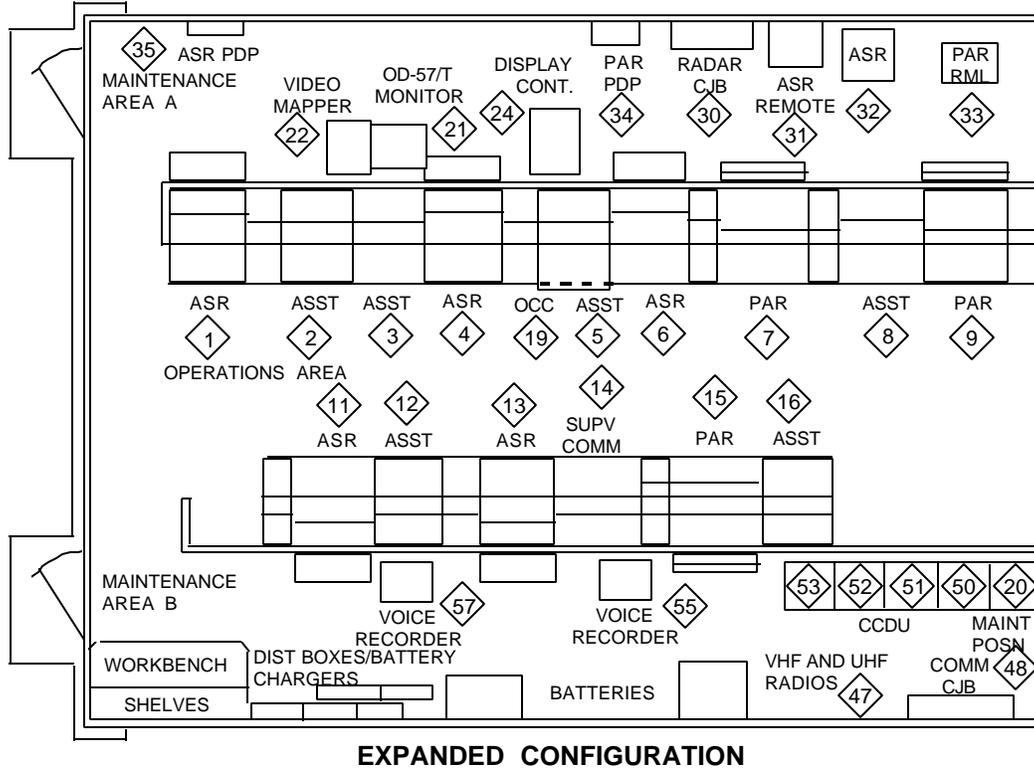
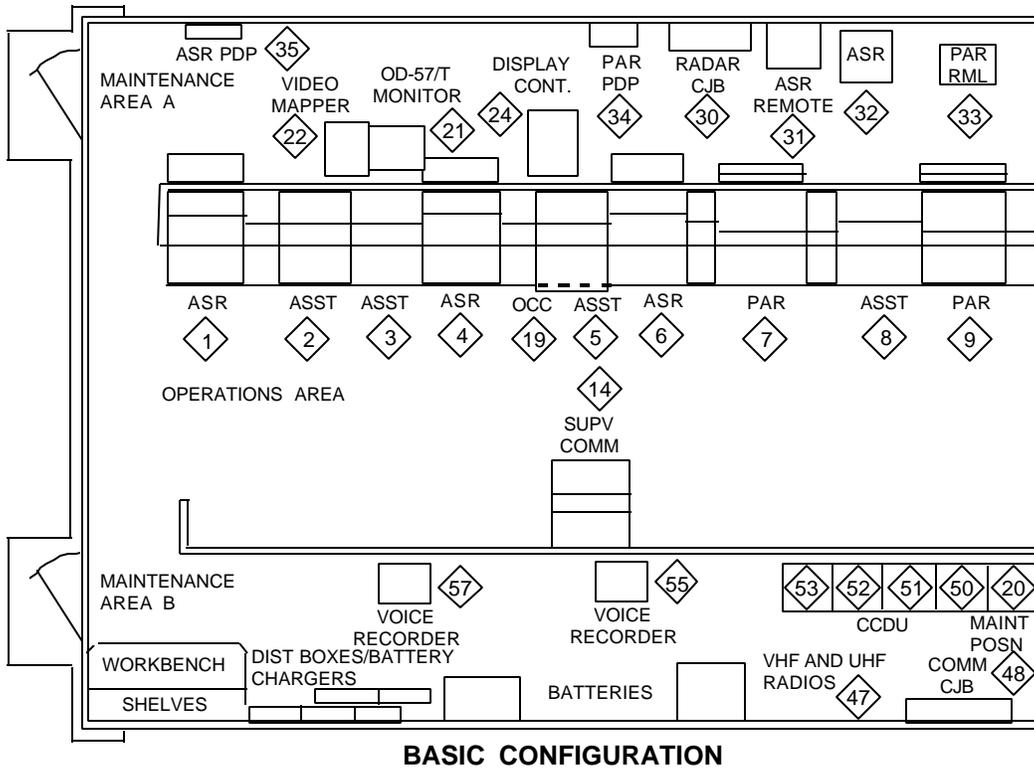


Figure 1-2.

This table describes the various communications modules available at the different operating positions shown in figure 1-2.

POSITION (code)	BASIC (Figure 1-2)	EXPANDED (Figure 1-2)
ASR (1,4, and 6)	15 radio channels 6 landline channels 4 monitor channels 11 intercom channels 1 req/acknl channel	30 radio channels 15 landline channels 7 monitor channels 17 intercom channels 1 req/ackln channel
ASR (11 and 13)		30 radio channels 15 landline channels 1 monitor channels 17 intercom channels 1 req/acknl channel
ASR Assistant (2,3, and 5)	12 landline channels 6 monitor channels 11 intercom channels	30 landline channels 9 monitor channels 17 intercom channels
ASR Assistant (10,12, and 16)		30 landline channels 9 monitor channels 17 intercom channels
PAR (7 and 9)	15 radio channels 4 monitor channels 11 intercom channels 1 req/acknl channel	30 radio channels 7 monitor channels 17 intercom channels 1 req/acknl channel
PAR (15)		30 radio channels 7 monitor channels 17 intercom channels 7 req/acknl channel
PAR Assistant (8)	12 landline channels 6 monitor channels 11 intercom channels	30 landline channels 9 monitor channels 17 intercom channels
Supervisor Console (14)	15 radio channels 12 landline channels 9 monitor channels 12 intercom channels	30 radio channels 30 landline channels 15 monitor channels 18 intercom channels

**Table 1-1 Communications Equipment at Each Position**

## SECTION 2

### CANOPY CONTROLS AND ASSOCIATED ATC EQUIPMENT

This section provides operating instructions for the controls and indicators located on the ASR canopy. Communications equipment is described in AT-E-09.

#### CANOPY CONTROLS AND INDICATORS

- WIND DIRECTION AND SPEED INDICATORS** Provides the controller wind direction (in 10 degree increments) and speed (in 2 knot increments) information.  
(1 and 2, figure 2-1)
- DIGITAL CLOCK** Provides a time readout in hours, minutes, and seconds. Set the clock (3, figure 2 -1) from the front panel by placing the S/R (set/run) toggleswitch (6, figure 2-1) to S. This activates the pushbutton switches (4, figure 2-1) and resets the seconds display to zero. The pushbutton switches advance the display digits independently without overflow into the next higher digit. Return the toggle switch to the R position for normal operation.
- CLOCK POWER** A 2 position toggle switch that controls operating power to the clock.  
(5, figure 2-1)
- BEACON INTERROGATOR CONTROL (A-BOX)** The A-Box is described in T031P4-2TPX-42-2 and AT-E-11 AN/TPX42A controller handbook.  
(7, figure 2-1)
- VIDEO MAP SELECTOR** Allows the controller to select up to 5 video maps for presentation on the ASR indicator. Each switch will light when depressed to indicate the map is in use. Depressing the switch again will turn the map off. The map selector at position 5, figure 1- 2, selects maps for the control tower BRITE II display.  
(8, figure 2-1)
- SPOTLIGHT** A moveable spotlight is used to light the work area. Intensity is controlled by the spotlight control.  
(9, figure 2-1)
- SPEAKER** Receives audio from radiophones or the intercom.  
(10, figure 2-1)

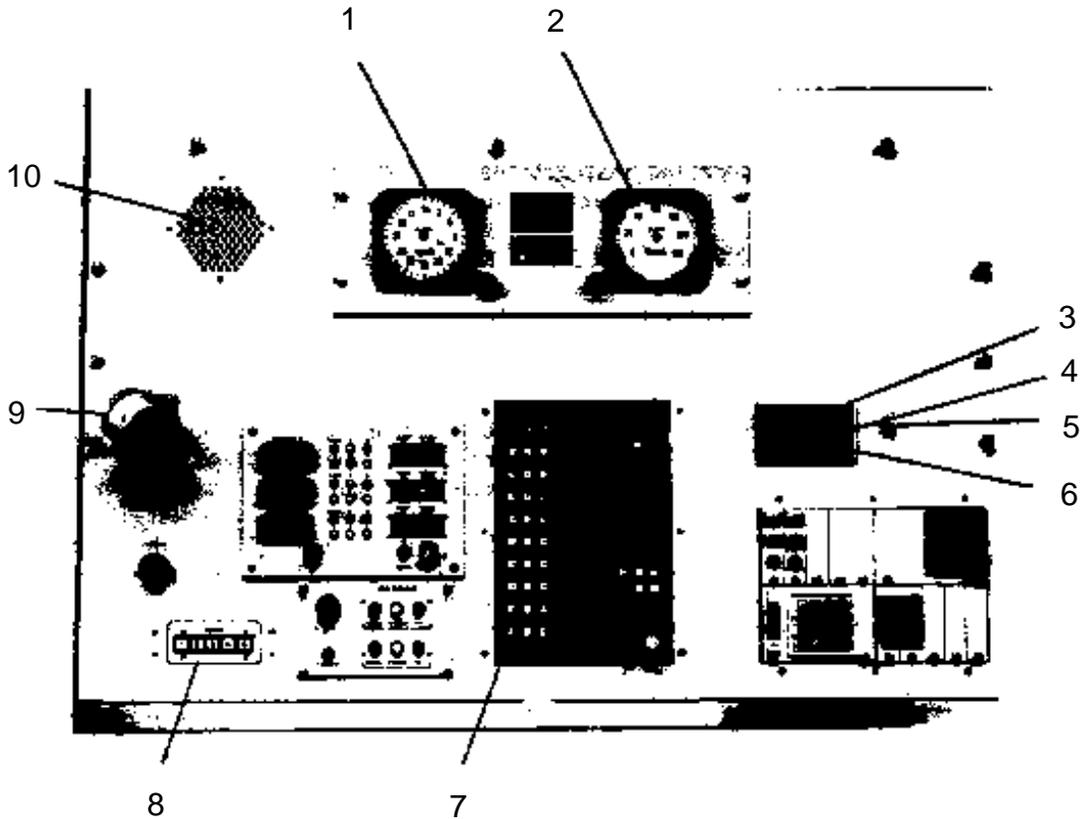


Figure 2-1. ASR Canopy

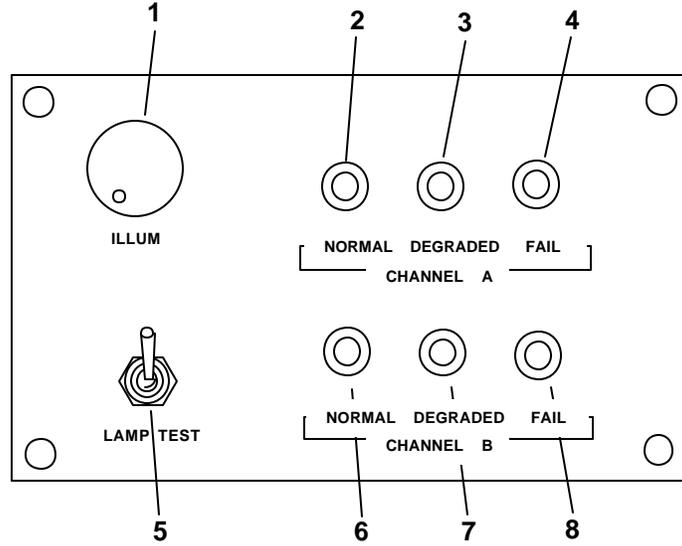


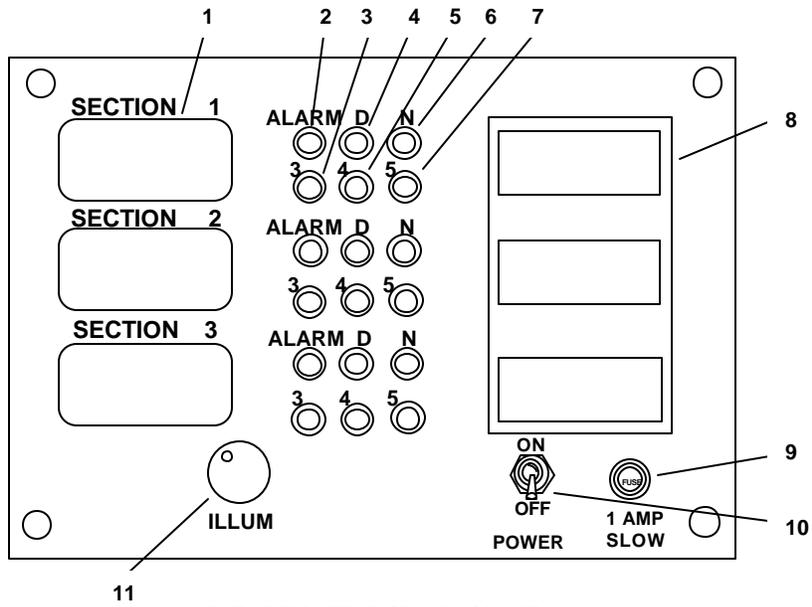
Figure 2-2. ASR Monitor

## ASR MONITOR

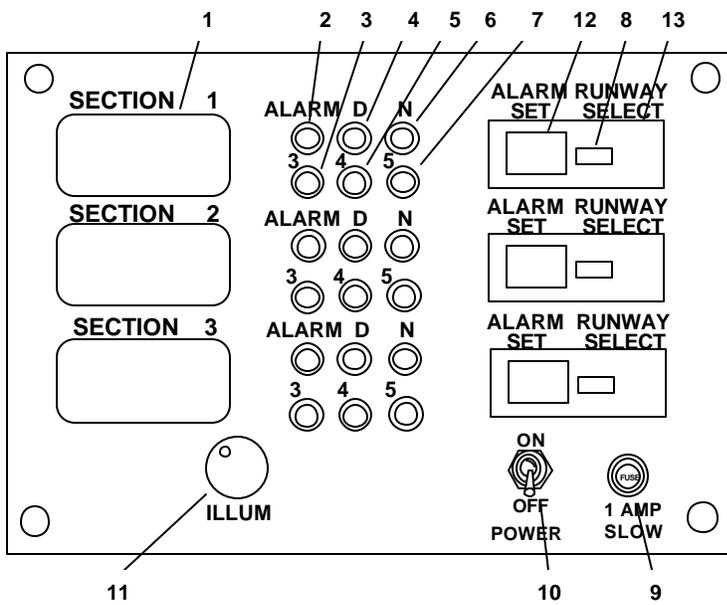
The ASR monitor (figure 2-2) provides the controller a visual indication of the surveillance radar performance. Indicator lamp intensity is controlled by the **ILLUM** control (1, figure 2-2). When channels A and B are operating properly, the green **NORMAL** lamps (2 and 7, figure 2-2 ) will be lit. When system degradation occurs, one or both of the amber **DEGRADED** lamps (3 and 6, figure 2-2 ) will light. The controller may continue to use the display or if the radar presentation is acceptable. If the display is unacceptable, or if the red **FAIL** lamps (4 and 5, figure 2-2) light, the controller should switch to single-channel operation by using the ASR System Control Panel on the supervisor console. The controller should select a channel that has a **NORMAL** indication. If both channels indicate a **DEGRADED** or **FAIL** condition when the radar is operating in the frequency diversity configuration, the controller should first select channel A, then channel B, single-channel operation. Leave the channel that has a **NORMAL** indication on-line. All **DEGRADED** or **FAIL** conditions must be reported to maintenance personnel. The controller must be aware that single-channel operation reduces the strength of radar returns and the intensity of radar video. System failure or degradation will not effect beacon target information unless the failure is in the ASR antenna rotation system. The momentary **LAMP TEST** switch (8, figure 2-2) provides a means of identifying faulty ASR Monitor lamps.

## RVR DISPLAY EQUIPMENT

The Runway Visual Range ( RVR ) Programmer and Remote Display (figure 2-3) consist of 3 sections that display the visibility of an associated runway in hundreds of feet. The 3 digit display (1, figure 2-3 ) provide a digital visibility readout for the runway selected (13, figure 2-3) on the RVR Remote display programmer located at ASR position 6. The **D** and **N** lamps (4 and 6, figure 2-3) indicate whether readout calculations are based on day (**D**) or night (**N**) light conditions. Calculations also consider the runway light intensity setting that is indicated by the lamps labeled **3**, **4**, and **5** (3, 5, and 7, figure 2-3). If the RVR falls below a range that is preset on the Display Programmer with the **ALARM SET** (12, figure 2-3 ), the **ALARM** lamp ( 2, figure 2-3 ) will illuminate and an aural alarm will sound. Intensity of the D, N, 3, 4, and 5 lamps is controlled by the **ILLUM** control (11, figure 2-3). The **SCRIBBLE STRIP** (8, figure 2-3) is used to mark the runway numbers associated with each readout section. Use a grease pencil or other suitable nonabrasive marker. The **POWER ON/OFF** switch (10, figure 2-3) controls power to the display panels. The indicating fuse holder (9, figure 2-3) will illuminate when there is a blown fuse in the display panel power line.



RVR REMOTE DISPLAY SLAVE



RVR REMOTE DISPLAY PROGRAMMER

Figure 2-3

## MONITOR SELECT UNIT

Each monitor select unit consists of three 3-position toggle switches (1, figure 2-4) to provide the controller the capability of monitoring a conversation at another position, or allows a conversation between the selecting and the selected operators. Table 1-1 lists the number of monitor channels available at each position. When the monitor select switch is held in the **AUDIO** (up) position, two-way communications (headset-to-headset) are established between the selected and selecting positions. The switch is spring loaded and returns to the off (center) position when released from the **AUDIO** position. When the switch is set to the **MON** (monitor) position, the controller is able to monitor the conversation of the selected position. **PHONE LEVEL**, **ILLU**, and **SPKR LEVEL** (2, 3, and 4, figure 2-4) controls are self explanatory.

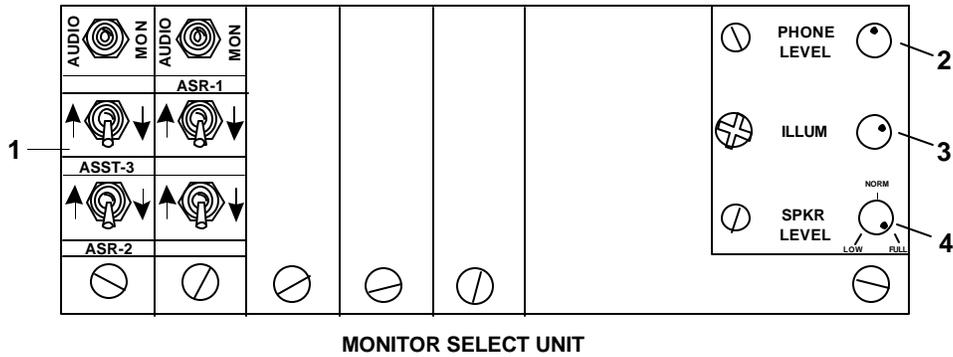


Figure 2-4, Monitor Select Unit

## SECTION 3

### MASTER COMMUNICATIONS/SUPERVISOR CONSOLE

The Master Communications/Supervisor console (figure 3-1 ) provides access to all available communications equipment, voice recorder remote monitors, and the ASR System/Receiver Control Panel. Table 1-1 lists the communications equipment available at the supervisor console. Detailed descriptions and operational procedures for the communications equipment are covered in AT-E-1 4.

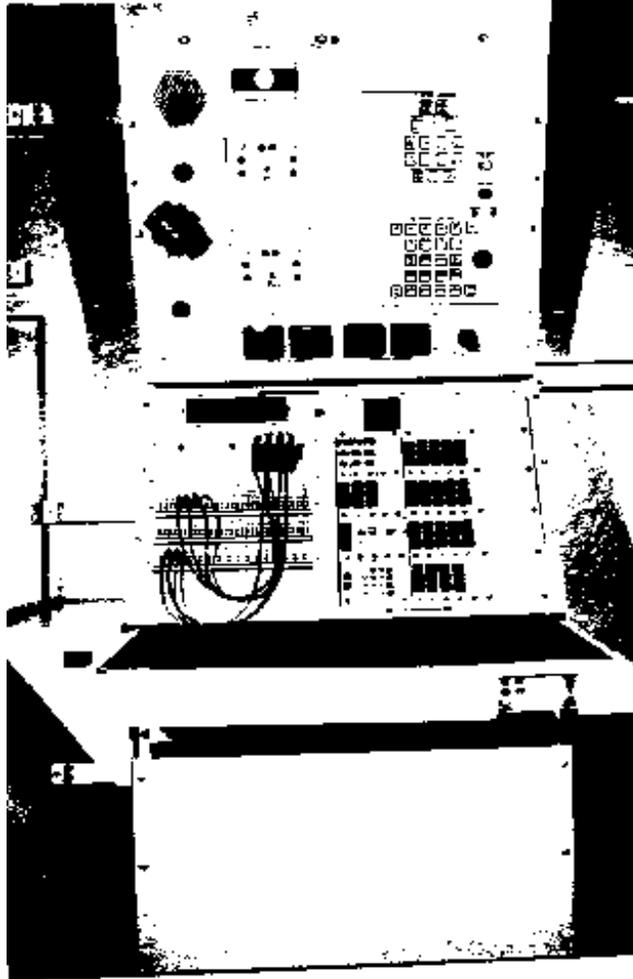


Figure 3-1, Master Communications/Supervisor Console

The supervisor console has several controls that apply to general conditions within the AN/GSN-12 Operations shelter. All controllers within the shelter should be aware of the location and the specific function of these controls.

**OVERHEAD LIGHT**

The **OVERHEAD LIGHT DIMMER** control (1, figure 3-1) turns on, turns off, and varies the intensity of the operations shelter overhead fluorescent lamps.

**LISHT SW ADJ**

The **LIGHT SWITCH ADJ** (Light Switch Adjust) control (2, figure 3-1) turns on, turns off, and varies the intensity of the floorlights within the operations shelter. These lights are a safety feature designed to prevent personnel from tripping over objects on or near the shelter floor.

**FUSE OUT ALARM  
MUTE CONTROL**

The fuse out alarm mute control (3, figure 3-1) is a momentary lighted pushbutton switch used to distinguish between the fuse out alarm and the bail-out alarm as both of the alarms sound the same. If the fuse out alarm comes on, pressing the alarm mute switch will immediately shut off the alarm and fuse out light will remain on. Notify maintenance personnel as the light will remain on until the fuse is replaced. If it is the bail-out alarm that comes on, pressing the alarm mute switch will not shut off the alarm.

**WARNING**

If pressing the fuse out alarm mute switch does not shut off the alarm, evacuate the shelter immediately as it may be the bail-out alarm.

**RECEIVER CONTROL  
SELECTOR**

A six position rotary switch (4, figure 3-1) that is located below the SYSTEM CONTROL PANEL. The switch is labeled SUPVR, 1, 4, 6, 11 and 13, corresponding to the Supervisor's position and each of the ASR positions. The switch is used to transfer control of the ASR receiver sensitivity to any one of the ASR controller positions. When set to the SUPV position, the ASR receiver sensitivity is controlled by receiver sensitivity settings on the Receiver Control Panel.

## SYSTEM/RECEIVER CONTROL PANEL

The System/Receiver Control Panel (figure 3-2) consists of several switch-indicators (lighted pushbuttons) and indicator lights that control and display the status of the surveillance radar. Controls to transfer control of the system between the operations shelter and the maintenance shelter are provided. Channel selection functions are also performed at the panel.

- 1 **RELEASE CONTROL/NO CONTROL:** A two-section momentary pushbutton switch lamp. The switch is used to transfer control of the ASR radar from the supervisor's position to maintenance. The RELEASE CONTROL switch at the supervisor's position and the TAKE CONTROL switch in the maintenance segment must be pressed in that order to transfer control. The audible alarm (20) will sound during transfer. The NO CONTROL lamp at the supervisor's position will light to indicate the transfer is complete.
- 2 **TAKE CONTROL/IN CONTROL:** A two-section momentary pushbutton switch lamp. The switch is used to transfer ASR radar control from maintenance to the supervisor's panel. The RELEASE CONTROL switch in the maintenance segment and the TAKE CONTROL switch at the supervisor's position must be pressed in that order to transfer control. The audible alarm (20) will sound during transfer. The IN CONTROL lamp at the supervisor's position will light to indicate the transfer is complete.
- 3 **NO CONTROL:** Lights YELLOW to indicate the corresponding channel is in the maintenance mode. There is one indicator each for channel A and B.
- 4 **READY/MASTER DIV ON:** A two-section indicator, one indicator each for channel A and B. The upper section (READY) lights GREEN to indicate that all units in that channel are available for normal operation. The lower section (MASTER DIV ON) lights WHITE to indicate the corresponding channel is selected as the master channel and both channels are available for operation in the diversity mode.
- 5 **ALARM:** Lights RED to indicate a fault has occurred in the corresponding ASR channel. If the ALARM indicator lights RED, the standby channel (A or B) must be selected by using the ON LINE/OFF LINE switches (6), the ANTENNA ON/ANTENNA OFF switch (8), and the HV ON/HV OFF switches (7) on the panel. Notify maintenance personnel.
- 6 **ON LINE/OFF LINE:** A two-section momentary pushbutton switch lamp, one switch each for channel A and B, used to apply the transmitted signal to either the antenna or the dummy load. The upper section (ON LINE) lights GREEN to indicate the signal is applied to the antenna. The lower section (OFF LINE) lights WHITE to indicate the signal is applied to the dummy load. Pressing the switch alternately selects the antenna and the dummy load.

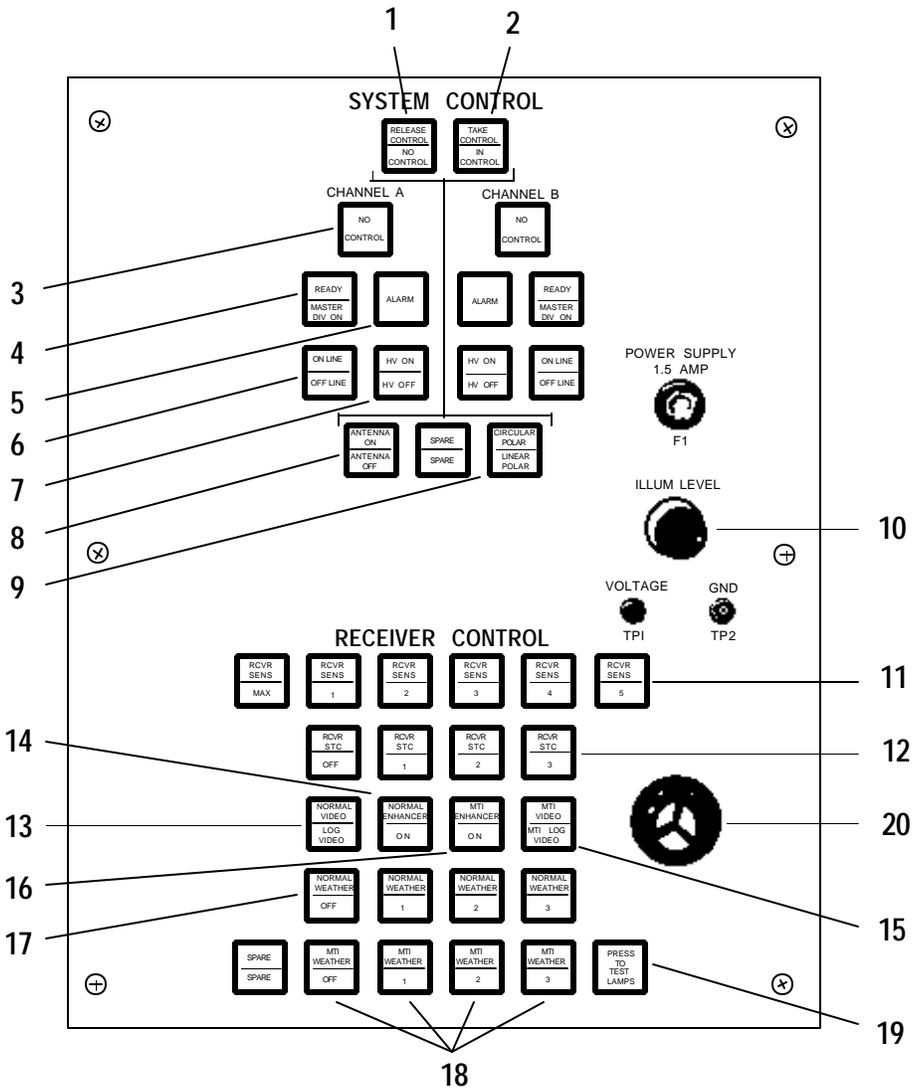


Figure 3-2, System/Receiver Control Panel

- 7 **HV ON/HV OFF:** A two-section momentary pushbutton switch lamp. There is one switch each for channel A and B. The switch is used to either turn on or turn off the transmitter high voltage. The upper section (HV ON) lights GREEN to indicate the high voltage is on. The lower section (HV OFF) lights WHITE to indicate the high voltage is off. (**NOTE:** Pressing the switch alternately turns the high voltage on and off. Whenever an ASR fault occurs or a channel is changed, the transmitter high voltage automatically turns off. )
- 8 **ANTENNA ON/ANTENNA OFF:** A two-section momentary pushbutton switch lamp. The switch is used to either apply or remove power to the ASR antenna drive motor. The upper section (ANTENNA ON) lights GREEN to indicate the antenna is rotating. The lower section (ANTENNA OFF) lights WHITE to indicate antenna is not rotating. Pressing the switch alternately turns the antenna rotation on and off.
- 9 **CIRCULAR POLAR/LINEAR POLAR:** A two- section momentary pushbutton switch lamp which is used to select circular polarization or linear polarization of the transmitted signal. Linear polarization is used for good target returns in fair weather. During inclement weather, circular polarization may be used to reduce or eliminate most weather returns. The upper section (CIRCULAR POLAR) lights YELLOW to indicate this function is activated. The lower section (LINEAR POLAR) lights GREEN to indicate this function is activated. Pressing the switch alternately selects CIRCULAR POLAR and LINEAR POLAR. After selection is made with the switch, approximately 8 seconds is required for the polarizer on the ASR antenna to change position and light the corresponding indicator.
- 10 **ILLUM LEVEL:** Varies the intensity of the switch lamps and indicators on the ASR System and Receiver Control Panel. A counter-clockwise rotation decreases the intensity of the switch lamps and indicators, while a clockwise rotation increases the intensity of the switch lamps and indicators.
- 11 **RCVR SENS- MAX/1/2/3/4/5:** Consist of six two-section momentary pushbutton switch lamps labeled RCVR SENS-MAX) 1, 2, 3, 4 and 5. The switches are used to select any one of six preset receiver sensitivities for both channel A and B. RCVR SENS-MAX represents maximum receiver sensitivity, while RCVR SENS-5 represents minimum receiver sensitivity. ( **NOTE:** These switches are functional when the RECEIVER CONTROL SELECTOR switch is set to SUPV. The lower section of the pressed switch lights while the remaining switches are extinguished to indicate the selected sensitivity level.)

- 12 **RCVR STC-OFF/1/2/3:** Consists of four two-section momentary pushbutton switch lamps labeled RCVR STC-OFF, 1, 2 and 3. The switches are used to select any one of three preset SENSITIVITY TIME CONTROL functions or off position for both channel A and B. RCVR STC-1 represents minimum STC operation, while RCVR STC-3 represents maximum STC operation. The STC function allows full target strength at distant ranges while gradually weakening signals at closer ranges. The lower section of the pressed switch lights while the remaining switches are extinguished to indicate the selected STC function.
- 13 **NORMAL VIDEO/LOG VIDEO:** A two-section momentary pushbutton switch lamp. The switch is used to select NORMAL VIDEO or LOG VIDEO for both channel A and B. NORMAL VIDEO function presents a normal display with moving targets, stationary targets and clutter. LOG VIDEO function presents a normal display with a reduction in clutter. The upper section of the switch (NORMAL VIDEO) lights GREEN to indicate that function is activated. The lower section (LOG VIDEO) lights YELLOW to indicate that function is activated. Pressing the switch alternatively selects NORMAL VIDEO and LOG VIDEO.
- 14 **NORMAL ENHANCER-ON:** A two-section momentary pushbutton switch lamp. The switch is used to enhance normal video. The enhance function eliminates weak target returns while intensifying strong target returns to saturation level. The lower section (ON) lights GREEN to indicate that function is activated. Pressing the switch alternately turns the function on and off.
- 15 **MTI VIDEO/MTI LOG VIDEO:** A two-section momentary pushbutton switch lamp. The switch is used to select MTI VIDEO or MTI LOG VIDEO for both channel A and B. MTI VIDEO function presents only moving targets on the display, while MTI LOG VIDEO function presents moving targets with a reduction in moving target clutter. The upper section of the switch (MTI VIDEO) lights GREEN to indicate that function is activated. The lower section (MTI LOG VIDEO) lights YELLOW to indicate that function is activated. Pressing the switch alternately selects MTI VIDEO and MTI LOG VIDEO.
- 16 **MTI ENHANCER-ON:** A two-section momentary pushbutton switch lamp. The switch is used to enhance MTI video. The enhance function eliminates weak radar target returns such as noise, while intensifying strong target returns to saturation level. The lower section (ON) lights GREEN to indicate that function is activated. Pressing the switch alternately turns the function on and off.

- 17 **NORMAL WEATHER-OFF/1/2/3:** Consist of four two-section momentary pushbutton switch lamps labeled NORMAL WEATHER-OFF, 1, 2 and 3. The switches are used to select any one of three preset NORMAL weather functions or off position for both channel A and B. These switches are functional only when the NORMAL VIDEO/LOG VIDEO switch (13) is set to LOG VIDEO. NORMAL WEATHER-1 provides minimum intensity of the center of a storm radar return. NORMAL WEATHER- 3 provides maximum intensity of the center of a storm radar return. The NORMAL WEATHER function is used during inclement weather to help eliminate target clutter caused by precipitation in the normal radar video. The lower section of the pressed switch lights WHITE while the remaining switches are extinguished re indicate the selected NORMAL WEATHER function.
- 18 **MTI WEATHER-OFF/1/2/3:** Consists of four two-section momentary pushbutton switch lamps labeled MTI WEATHER- OFF, 1, 2 and 3. The switches are used to select any one of three preset MTI weather functions or off position for both channel A and B. These switches are functional only when the MTI VIDEO/MTI LOG VIDEO switch (15) is set to MTI LOG VIDEO. MTI WEATHER-1 provides minimum intensity of the center of a moving storm radar return. The MTI WEATHER-3 provides maximum intensity of +he center of a moving storm radar return. The MTI WEATHER function is used during inclement weather to help eliminate weak or slow moving target returns such as precipitation. The lower section of the pressed switch lights WHITE while the remaining switches are extinguished to indicate the selected MTI WEATHER FUNCTION.
- 19 **PRESS TO TEST LAMPS:** A momentary pushbutton switch lamp. The switch is used to identify burned out lamps on the ASR System and Receiver Control Panel. Pressing the switch lights all the switch lamps and indicators, allowing any burned out lamps to be identified.
- 20 **AUDIBLE ALARM:** Sounds during transfer of ASR radar control between the supervisor's position and the maintenance segment.

## SECTION 4

### DISPLAY CONTROLLER (980B COMPUTER) OPERATION

The display controller (figure 4-1) is located at position 24 in the maintenance area. It requires a one-time set up procedure and further control setting changes are not required during normal operation. However, if a power failure occurs, the 980B computer may need to be restarted by performing the following procedures. Post a copy of these procedures near the computer.

1. Set the switches to the position indicated, and in the following sequence.
  - a. **LOCK-UNLOCK** key switch: **UNLOCK**.
  - b. **MODE** switch: **HALT**.
  - c. **RESET** switch: Momentarily down.
  - d. Data switches 0-11: Down.
  - e. Data switches 12- 15: Up.
  - f. **PC** switch: Momentarily up.
  - g. **MODE** switch: **RUN**.
  - h. **LOAD** switch: Momentarily up.

Verify that the **IDLE** lamp is lit.

- i. **MODE** switch: HMT.
- j. **SENSE** switches 1, 2, and 4: Down. (NOTE: for display controller operation without low altitude alerting capability, and a transition altitude of 18,000 it, set all 4 **SENSE** switches to the down position and skip step k.)
- k. **SENSE** switch 3: Up.
1. **RESET** switch: Momentarily down.
- m. Data switches 0-12 and 14: Down.
- n. Data switches 13 and 15: Up.
- o. **PC** switch: Momentarily up.
- p. **MODE** switch: **RUN**.
- q. **LOAD** switch: Momentarily up.

Verify the **IDLE** and **RUN** lamps are blinking. The computer is now operational.

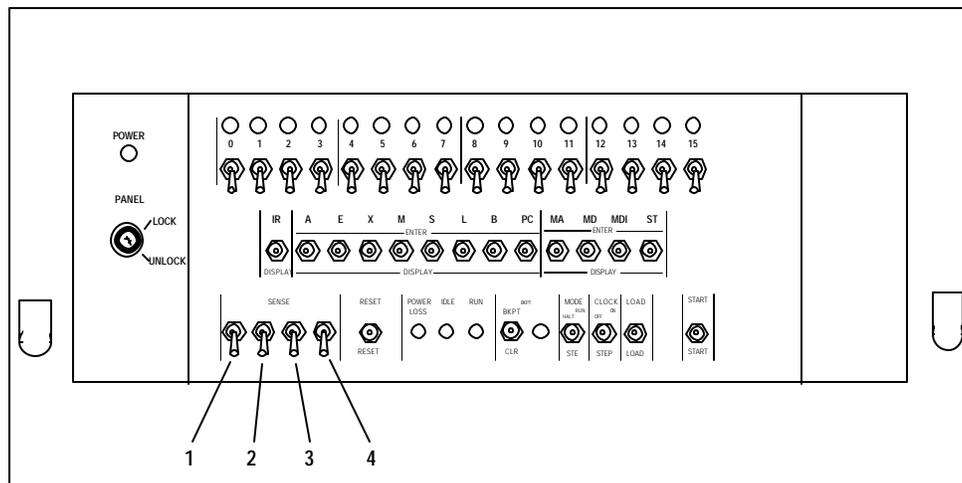


Figure 4-1

## **SECTION 5**

### **ASR CONTROL OPERATION**

The Following procedures provide instructions for remote (OPS segment) operation of Radar Set under normal operating conditions.

#### **TRANSFER OF ASR CONTROL**

ASR system control may be transferred between the maintenance segment and the operations segment system control panels. Control transfer requires coordination between personnel at both locations. This feature is provided to prevent equipment status changes during operation or maintenance by personnel in the location not in control. Perform the following procedures, in the sequence listed, to transfer control of the system.

1. Establish intercom communications between the maintenance segment and the operations segment.
2. To release control, depress and hold the RELEASE CONTROL switch on the active SYSTEM CONTROL panel (panel that has the IN CONTROL indicator).
3. Depress the TAKE CONTROL switch on the other SYSTEM CONTROL panel. The IN CONTROL indicator lights and the NO CONTROL indicator extinguishes when the transfer is complete. The SYSTEM CONTROL panel audible alarm sounds during transfer.
4. Release the RELEASE CONTROL switch on the panel that has released control when the audible alarm terminates. The NO CONTROL indicator on this panel will now be lighted and the IN CONTROL indicator extinguished. Transfer is now complete.

#### **FREQUENCY DIVERSITY OPERATION**

The following instructions are for changing the ASR mode of operation from single-channel operation to dual-channel frequency-diversity operation.

1. Depress ANTENNA ON/ANTENNA OFF switch on the SYSTEM CONTROL panel to the ANTENNA ON position (ANTENNA ON indicator will light).
2. Observe that the CHANNEL A and B READY indicators are lighted on the SYSTEM CONTROL panel.
3. Depress CHANNEL A and B HV ON/OFF switches to HV ON ( HV ON indicator will light) for 10 seconds. Then depress CHANNEL A and B HV ON/OFF to HV OFF (HV OFF indicators will light).

4. Depress the CHANNEL A and B ON LINE/OFF LINE switches to the ON LINE position (ON LINE indicators will light).
5. Depress the CHANNEL A and B HV ON/HV OFF switches to the HV ON (HV ON indicators will light) position. The channel's HV ON/HV OFF switch that is depressed first selects that channel as the Master Channel. The ASR system is now operating in frequency diversity.

#### **MASTER CHANNEL CHANGEOVER OPERATION**

The following procedures provide instructions for changing the Master Channel when the ASR system is operating in frequency diversity.

1. Depress the Master Channel HV ON/HV OFF switch to HV OFF (HV OFF indicator is lighted). Note that the Master Channel ALARM indicator is lighted. The system now automatically selects the other channel as the Master Channel.
2. Again depress the same Master Channel HV ON/HV OFF switch to HV ON (HV ON indicator will light). The Master Channel ALARM indicator will extinguish. The MASTER DIV ON indicator on the new Master Channel will light and the MASTER DIV ON on the previous Master Channel will extinguish. The Master designation is now changed over to the other channel.

#### **SINGLE CHANNEL OPERATION**

The following procedures provide instructions for changing the ASR mode of operation from frequency diversity or off-line maintenance to single-channel operation.

1. Depress the ANTENNA ON/ANTENNA OFF switch to the ANTENNA ON position and observe that the READY indicator for the selected channel is lighted.
2. Depress the HV ON/HV OFF switch of the selected channel to HV ON and the other channel HV ON/HV OFF switch to HV OFF.
3. Depress the ON LINE/OFF LINE switch of the selected channel to the ON LINE (ON LINE indicator will light) position. Depress the other channel ON LINE/OFF LINE switch to the OFF LINE position as follows: if the alternate channel is to be placed in the standby mode, select OFF LINE at the SYSTEM CONTROL panel; if the alternate channel is to be placed in the maintenance mode, select OFF LINE at the SYSTEM CONTROL panel and then have maintenance personnel in the maintenance segment press OFF LINE at Maintenance Control Panel.

## SECTION 6

### SPECIM OPERATING PROCEDURES

#### GENERAL

This section provides a listing of required actions when certain emergency alarm conditions or equipment malfunctions occur:

When an equipment failure occurs, notify maintenance personnel as soon as possible to restore system operation.

#### OPS SEGMENT BAIL-OUT ALARM

The OPS Segment Bail-Out Alarm is activated by personnel from a remote site (normally the control tower) to warn personnel in the Ops Segment of an impending hazard that would jeopardize their safety. When the alarm sounds, it may be the Bail-Out Alarm or the communications equipment fuse-out alarm as they both sound the same. Immediately press the Fuse-Out Alarm Mute Switch at the supervisor's console. If the alarm continues to sound when the switch is pressed, **all personnel must evacuate the OPS Segment immediately.** If the alarm is silenced after pressing the switch, notify maintenance personnel of the communications system fuse failure.

#### OPS SEGMENT AC POWER FAILURE

A back-up emergency power battery system is provided in the OPS segment in case of an AC power failure. The battery system provides continued operation of the communications equipment, bail-out alarm system, and the obstruction lights for up to 10 minutes. Additionally, the OPS segment emergency lights will operate for 12 minutes.

#### ASR FAILURES

Table 6-1 lists possible fault indications, caused by partial equipment failure, that can be observed on ASR display consoles, performance monitors, or the system and receiver control panel. The remedial actions listed in table 6-1 provide instructions for the controller if a failure occurs. If a complete failure to the primary (ASR) or secondary (Beacon) radar occurs, the operating radar system can be used for controlling aircraft until the other radar system is operational. The controller observing the fault indication should promptly notify the supervisor, in addition to performing the remedial action listed in table 6-1.

ASR FAULT ISOLATION	REMEDIAL ACTION
One of the ASR Monitor lamps light.	Perform the single channel operation procedure contained in section 5 to switch to the properly operating ASR channel.
One of the ASR Monitor FAIL lamps light.	Perform the single channel operation procedure contained in section 5 to switch to the properly operating ASR channel.
Active ASR channel ALARM lamp lights on the ASR System and Receiver control panel at the supervisor's position.	Perform the single channel operation procedure contained in section 5 to switch to the properly operating ASR channel.
Erratic or loss of PPI sweep on all ASR displays.	<ol style="list-style-type: none"> <li>1. Set the SYSTEMAPG SHAPER switch to the position, 1 or 2, that it is not presently in. This switch is located on the Remote Site Unit, at position 31 in the maintenance area.</li> <li>2. Perform the single channel operation procedure contained in section 5 to switch to the properly operating ASR channel.</li> </ol>
Erratic or loss of radar Video (MTI or normal ) on all ASR displays.	<ol style="list-style-type: none"> <li>1. Set the SYSTEM LINE COMP video switch to the position, 1 or 2, that it is not presently in. This switch is located on the ASR Remote Site Unit at position 32 in the maintenance area.</li> <li>2. Perform the single channel operation procedure contained in section 5 to switch to the properly operating ASR channel.</li> </ol>
Erratic or loss of Alphanumeric presentation on all ASR displays.	Notify maintenance of loss of Alphanumerics or erratic condition.
Erratic or loss of PPI sweeps and radar video or Alphanumeric presentation on one ASR display.	Transfer aircraft responsibility to another controller and notify maintenance of the display failure.
ASR display console OVERHEAT lamp lights and AUDIBLE ALARM sounds.	Transfer aircraft responsibility to another controller. Settle display console POWER switch to OFF and notify maintenance.

**Table 6-1. ASR Faults and Remedial Action**