

## PUBLIC ADDRESS SYSTEM

### GENERAL

The public address (PA) system is provided so messages or instructions from any interphone station may be heard in the cargo compartment with the use of loudspeakers. It can also be used to monitor standard radio broadcasts for entertainment purposes.

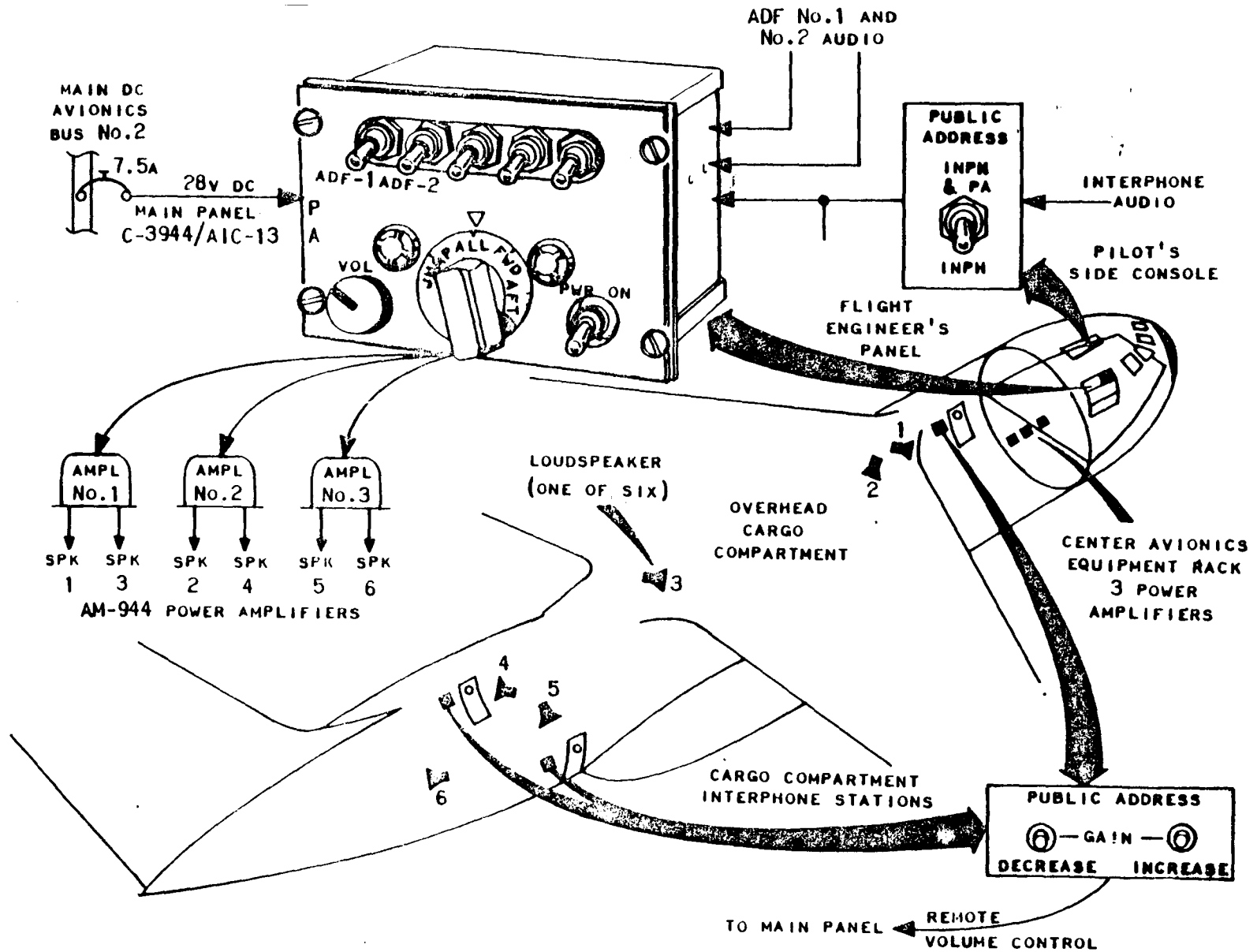
### AIRCRAFT INSTALLATION

The main control panel, C-3944/AIC-13, is located at the flight engineer's station. Three auxiliary control panels are located at the cargo compartment interphone stations. Three amplifiers, AM-944/AIC-13, are installed in the center avionics equipment rack. Six speakers, LS-211/AIC-13, are located overhead in the cargo compartment. The relays associated with the PA system are located on the interphone junction box. The INTERPHONE-INTERPHONE PA switch is located on the pilot's side console. All amplifiers are transistorized and require 28-volt DC for operation. The required voltage is supplied through a circuit breaker on the avionics circuit breaker panel, from the main D-C avionics bus No. 2.

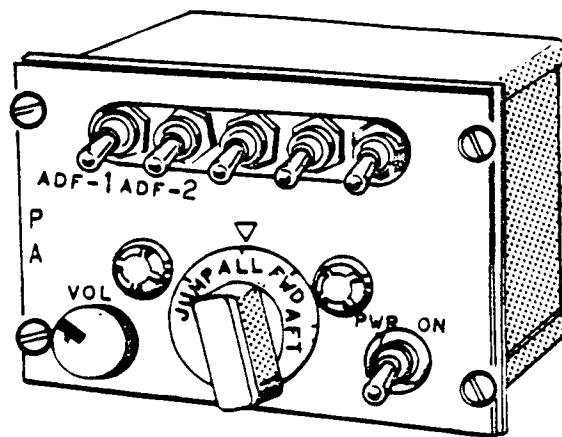
### SYSTEM OPERATION

When the system is energized by placing the PWR switch, on the main control panel, "ON" and with the pilot's switch in "INPH & PA" position, interphone transmissions by any station will be heard through the selected cargo loudspeakers.

In addition, when the rotary selector switch on any interphone control panel in the cargo compartment is set to the PA position, a crew member at that station may talk over the PA system regardless of the pilot's switch position. Two push button switches at each of the cargo panels enable volume (gain) to be increased or decreased.



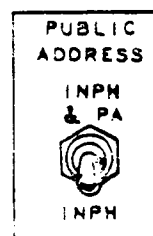
AIRCRAFT INSTALLATION



MAIN CONTROL PANEL

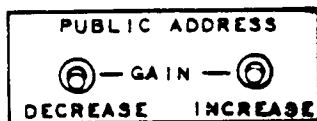
Volume is manually controlled at the main control panel by rotation of the volume control knob. The main control panel contains all other facilities necessary for system operation and control.

When the pilot's switch is set to "INPH" the interphone line is not connected to the PA system. With the pilot's switch set to "INPH" and no PA transmissions are being made from the cargo stations the Automatic Direction Finder (ADF) receivers may be heard, through the cargo loudspeakers, as they are selected at the main control



PILOT'S SWITCH

panel. This provides music listening for passenger entertainment. Speaker selection is also made at the main control panel. With the main control panel



rotary switch set to "JUMP" only the two speakers facing the jump doors will operate. In the "ALL" position all speakers operate. Only the forward speaker operates with the rotary selector set to "FWD". When "AFT" is selected only the speaker over the ramp area will operate.

## SPECIFICATIONS

### PUBLIC ADDRESS SYSTEM AIC-13

CHARACTERISTIC	SPECIFICATION
<b>OVERALL</b>	
Nominal power input voltage required	27.5 volts, DC
Maximum current required (at 17 watts output with 12 decibels of clipping)	1.0 amperes
Effective frequency range	500 to 5000 Hz
<b>CONTROL PANEL UNIT</b>	
Input impedance (all but auxiliary input)	Suitable to bridge a 150 ohm line (one 39,000 and five 47,000-ohm bridging type inputs)
Input impedance (auxiliary input)	Varies between 10 to 500 ohms depending on the setting of volume control
Output impedance	150 ohms
Gain (all but auxiliary input)	10 decibels
Gain (auxiliary input)	60 decibels with volume control maximum
Frequency response (nominal)	300 to 3000 Hz
Distortion at maximum output (300 Hz at 11 volts across 150-ohm line)	12 percent
Signal input voltage for full output	1.0 volts
<b>AMPLIFIER UNIT</b>	
Input No. 1 impedance	150 ohms
Input No. 2 impedance	200 ohms
Output impedance	4, 8 and 16 ohms
Input No. 1 gain	35 decibels
Input No. 2 gain	21 decibels

SPECIFICATIONS (continued)

CHARACTERISTIC	SPECIFICATION
AMPLIFIER UNIT (continued)	
Frequency Response (nominal	300 to 6000 Hz
Distortion at maximum output (300 Hz at 18 volts across 16-ohm load)	9 percent
Input No. 1 signal voltage for full output at clipping threshold (1000 Hz)	0.9 volts
Input No. 2 signal voltage for full output at clipping threshold (1000 Hz)	2.8 volts
Input No. 2 signal voltage for full output with 12 decibels of clipping (1000 Hz)	11.0 volts
LOUDSPEAKER UNIT	
Frequency Range	500 to 5000 Hz
Input impedance	16 ohms
Power handling capacity	25 watts

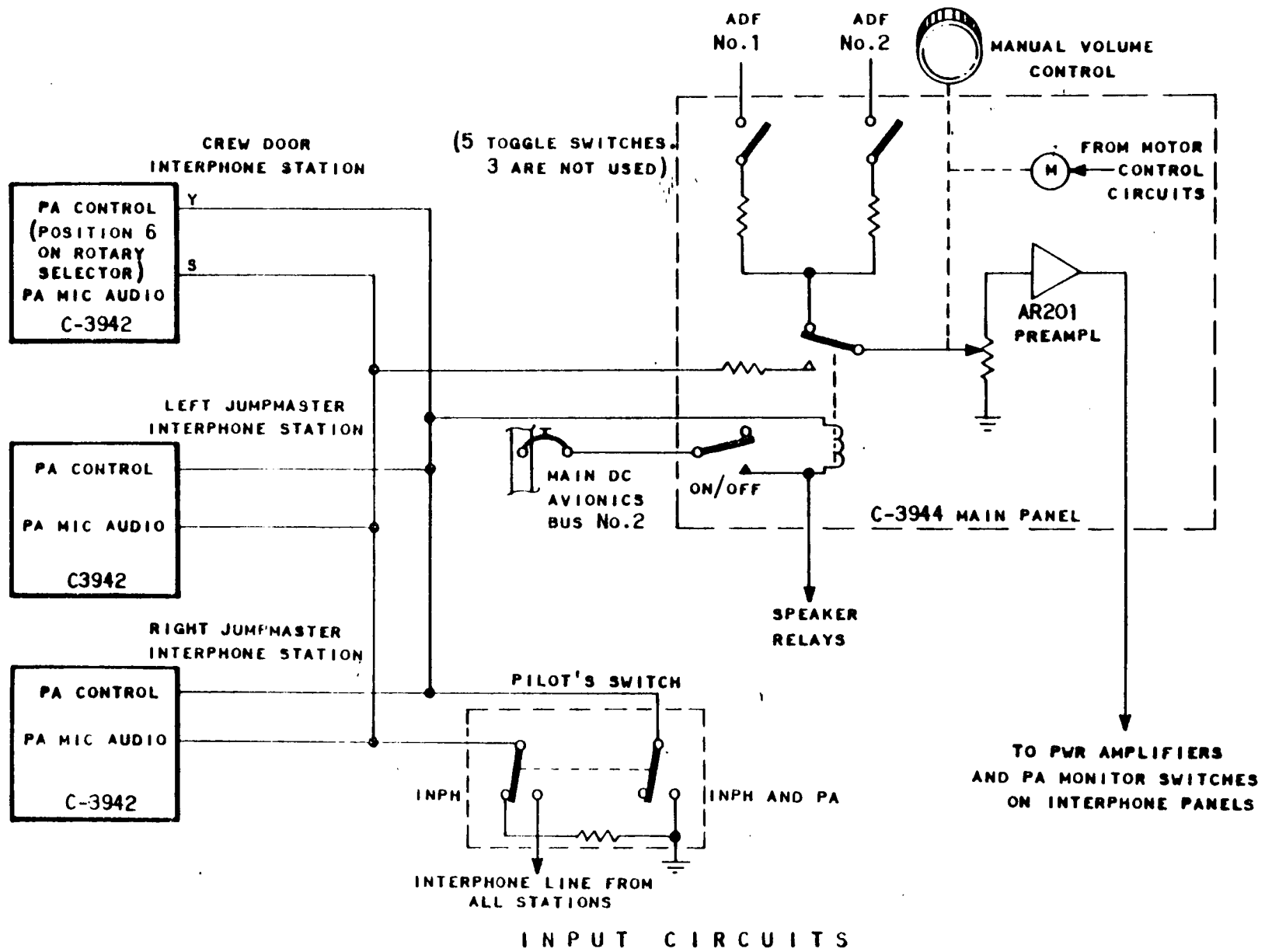
BLOCK DIAGRAM THEORY OF OPERATION

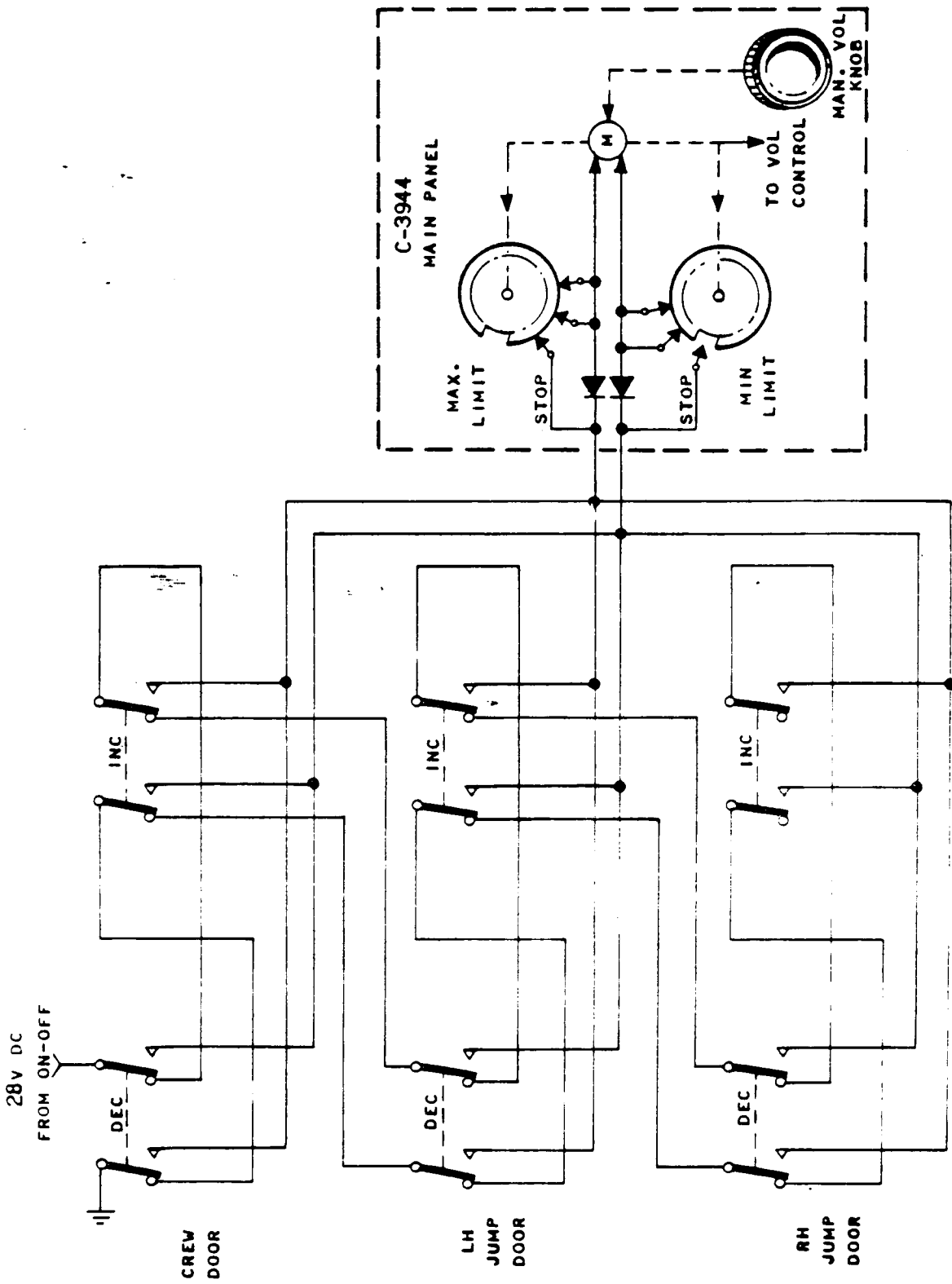
It can be seen from the "Input Circuits" diagram, with the power switch "on," that if the pilot or any cargo station operator has not selected "PA" the main panel relay will be deenergized allowing the selected ADF receiver to pass to the volume control and be amplified by the main panel preamplifier.

If the pilot selects "INPH & PA" a ground will energize the relay. The same occurs when the cargo operators select "PA." With the relay energized it is seen that the cargo PA mic line or the interphone line is connected to the PA input. The volume control can be adjusted manually at the main panel or turned by the remotely controlled motor.

The volume control motor is 28-volt, D-C operated. Whether the motor increases or decreases volume depends on the polarity of the DC applied.

The volume control diagram is shown in the minimum volume position. If any cargo INCREASE GAIN button is pressed it is seen that ground is applied to the motor through the bottom diode bypassing the open contact of the minimum limit switch. Power of +28-volt, DC is applied through the closed contacts of the





VOLUME CONTROL CIRCUITS

maximum limit switch to the motor. The motor will turn the volume control until the maximum limit switch, rotating clockwise, opens circuits at the maximum limit stop contact. The motor will not drive pass this point.

Now picture the maximum limit switch open and the minimum limit switch closed. Operating "DECREASE GAIN" will apply ground to the motor through the top diode bypassing the open contact of the maximum limit switch. Power of +28-volt, DC is applied through the closed contacts of the minimum limit switch to the motor. The motor will turn the volume control until the minimum limit switch, rotating counterclockwise, open circuits at the minimum limit stop contact.

Close examination of the volume control circuit will show that the left jump door panel has priority over the right jump door panel and that the crew door panel has highest priority. "DECREASE GAIN" has priority over "INCREASE GAIN."

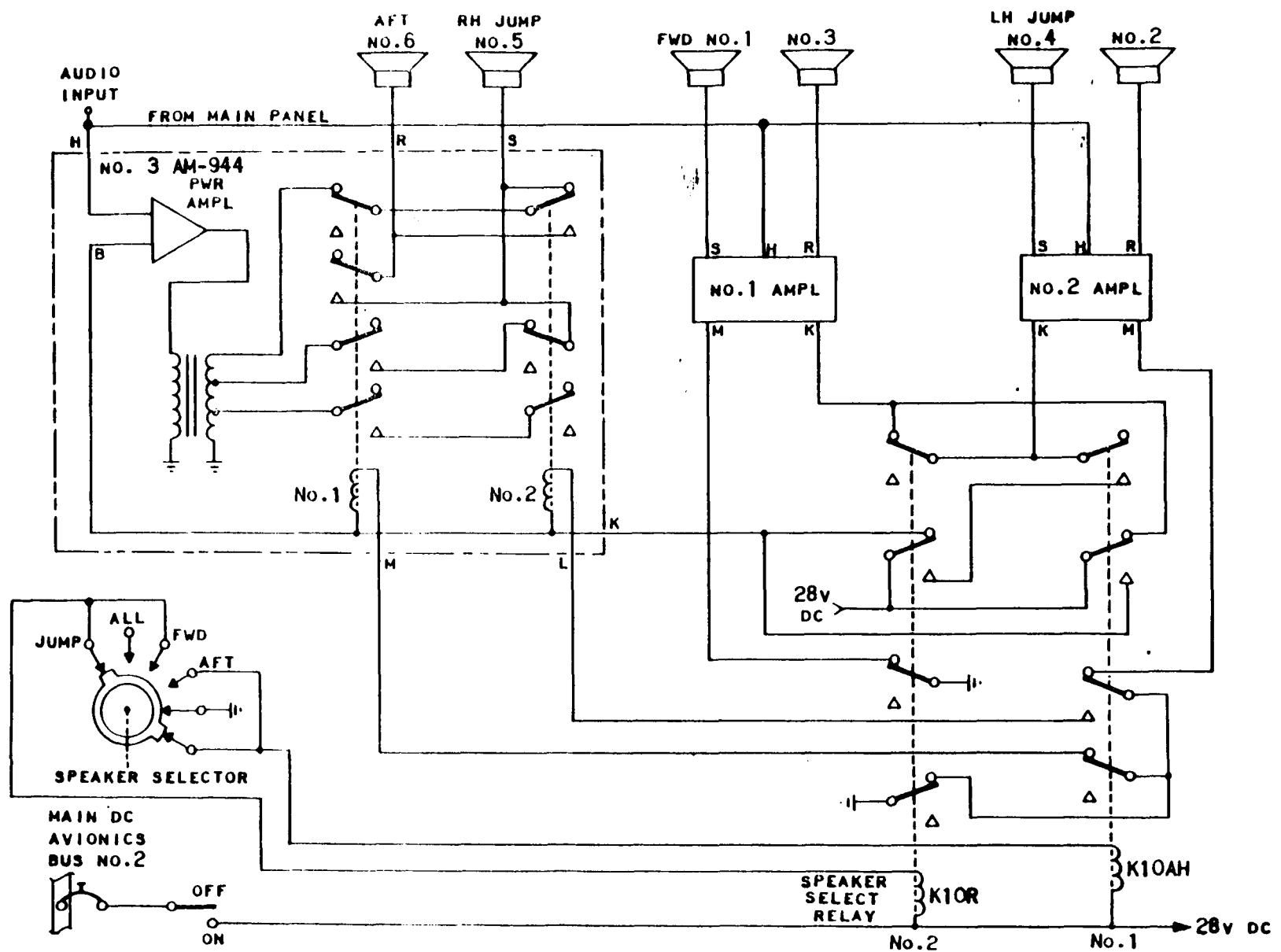
The three power amplifiers receive the selected input audio signal from the main control panel preamplifier. The power amplifiers raise the level of the signal sufficiently to drive the loudspeakers.

Referring to the output circuits diagram it is seen that each power amplifier drives two speakers.

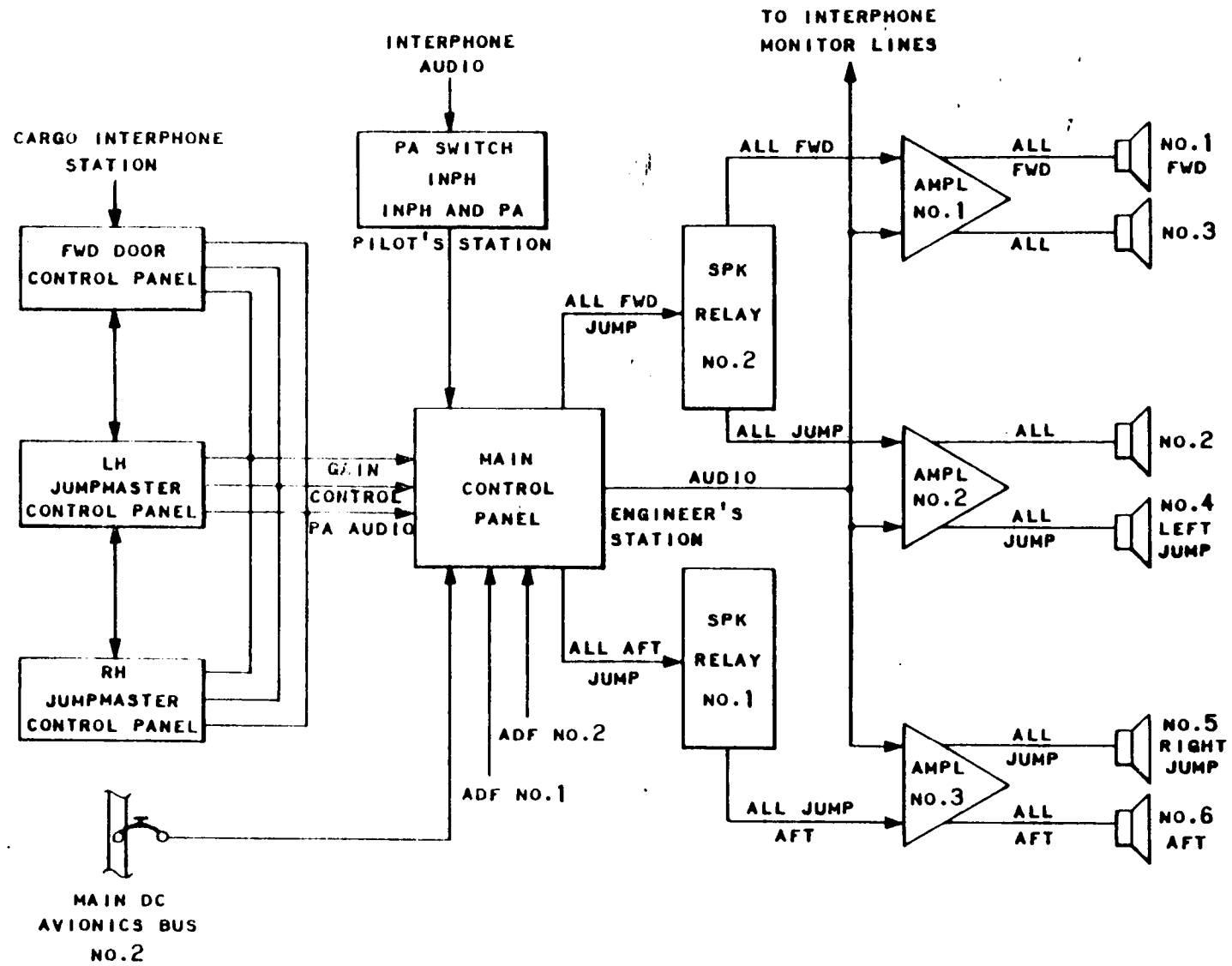
Placing the speaker selector switch in the "ALL" position results in both speaker selector relays remaining deenergized. Operating voltage is applied to all amplifiers and relay No. 1 in all amplifiers is energized.

The output of each amplifier is connected to two parallel speakers; therefore, all six PA speakers are operational. When the SPEAKER SELECTOR switch is placed in the "JUMP" position both speaker selector relays are energized. Operating voltage is applied to amplifiers No. 2 and 3. Both relays in each amplifier are deenergized, and each amplifier output is coupled to one speaker. Amplifier No. 2 drives the left jump door speaker (speaker No. 4) and amplifier No. 3 drives the right jump door speaker (speaker No. 5). Placing the SPEAKER SELECTOR switch in the "AFT" position, energizes speaker selector relay No. 1. Operating voltage is applied to amplifier No. 3 amplifier. The No. 2 amplifier relay is energized to connect the No. 3 amplifier output to the aft speaker (speaker No. 6). Placing the SPEAKER SELECTOR switch in the FWD position energizes speaker selector relay No. 2. Operating voltage is applied to amplifier No. 1. Both amplifier relays are deenergized to connect the amplifier output to the forward speaker (speaker No. 1).





OUTPUT CIRCUITS



A I C - 1 3 B L O C K D I A G R A M