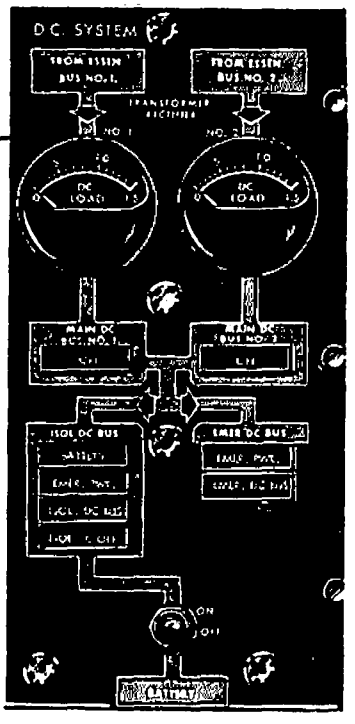
C141A

DC POWER SUPPLY

NO1	M	MAIN AC BUSES 1THRU4
#2	E	ESSENTIAL AC BUSES 1&2
#3	I	ISOLATED BUSES AC & DC
#4	D	DC MAINS 1&2

ANYTIME YOU LOOSE ESS#1 BUS, THE EMERGENCY GEN WILL COME ON. ANYTIME THE EMER GEN COMES INTO OPERATION, YOU WILL LOOSE NAV BUS #1. IT WILL POWER EMER AC, ISO AC



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Objectives:

When you have completed this program, you should be able to:

1. Locate and identify the following DC buses.

    a. Main DC Buses No. 1 and No. 2
    b. Isolated DC Bus
    c. Emergency DC Bus
    d. Main DC Avionics Buses No. 1 and No. 2
    e. Isolated DC Avionics Bus

2. Locate and identify the DC power sources.

    a. Transformer/Rectifier (TR) Units
    b. Battery
    c. Emergency Generator

3. Locate the following DC components.

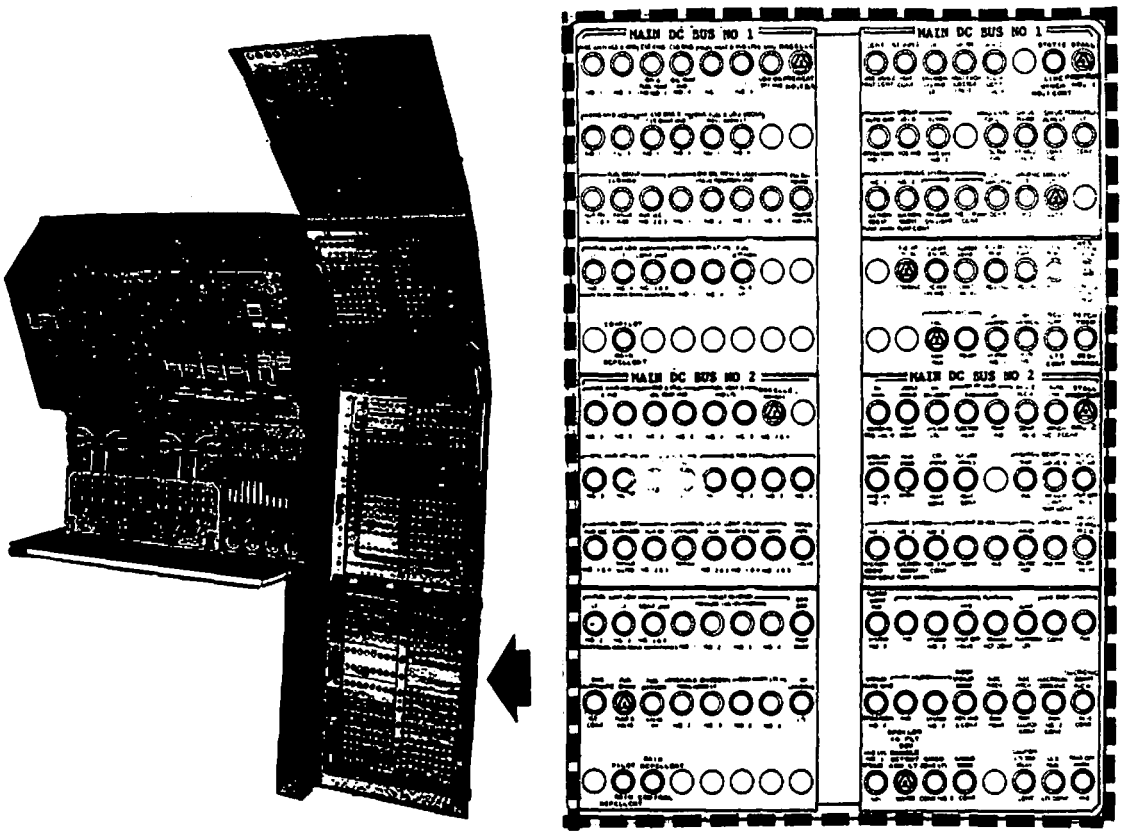
    a. Battery Relay
    b. Current Limiters
    c. Reverse Current Relays

4. (Applicable to Flight Enigneers only) Determine from panel indications when the following malfunctions exist.

    a. Single Transformer/Rectifier (TR) Unit failure
    b. Dual Transformer/Rectifier (TR) Unit failure
    c. Current Limiter failure
    d. Combination of Transformer/Rectifier (TR) Unit and Current Limiter failures

The DC system is a parallel system normally powered by two Transformer/ Rectifier Units. The two Transformer/Rectifier Units send DC power to the MAIN DC BUSES, located on the Flight Engineer's Circuit Breaker Panel No. 4.

Study the picture of the Flight Engineer's Circuit Breaker Panel No. 4 and determine *how many* MAIN DC BUSES there are.

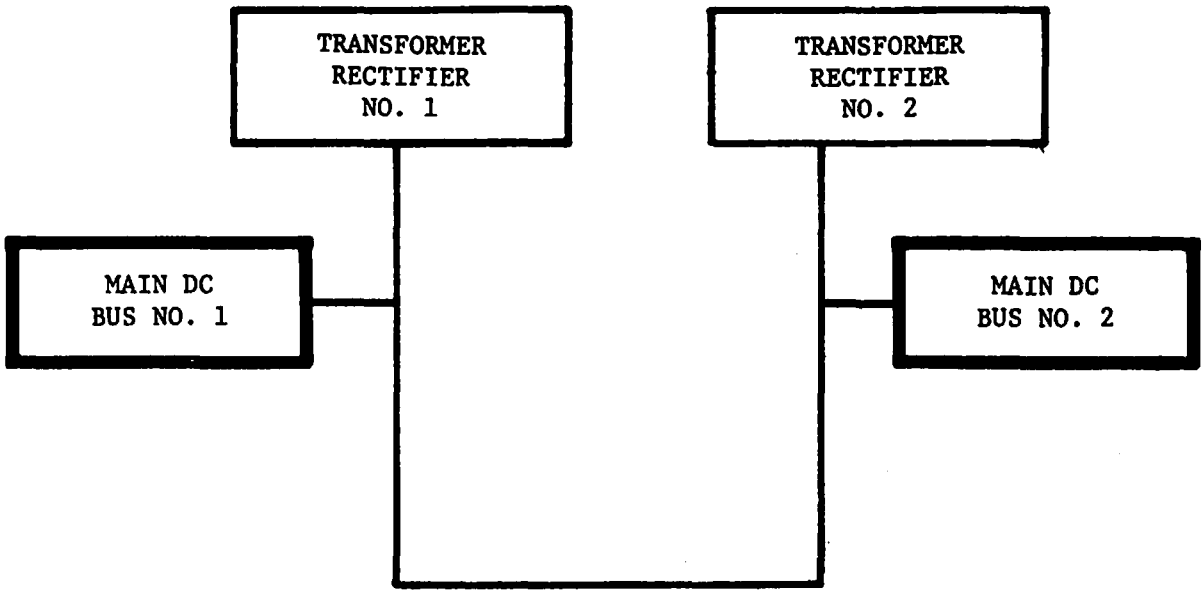


Flight Engineer's
Circuit Breaker Panel No. 4

( ) One (1) Main DC Bus.

( ) Two (2) Main DC Buses.

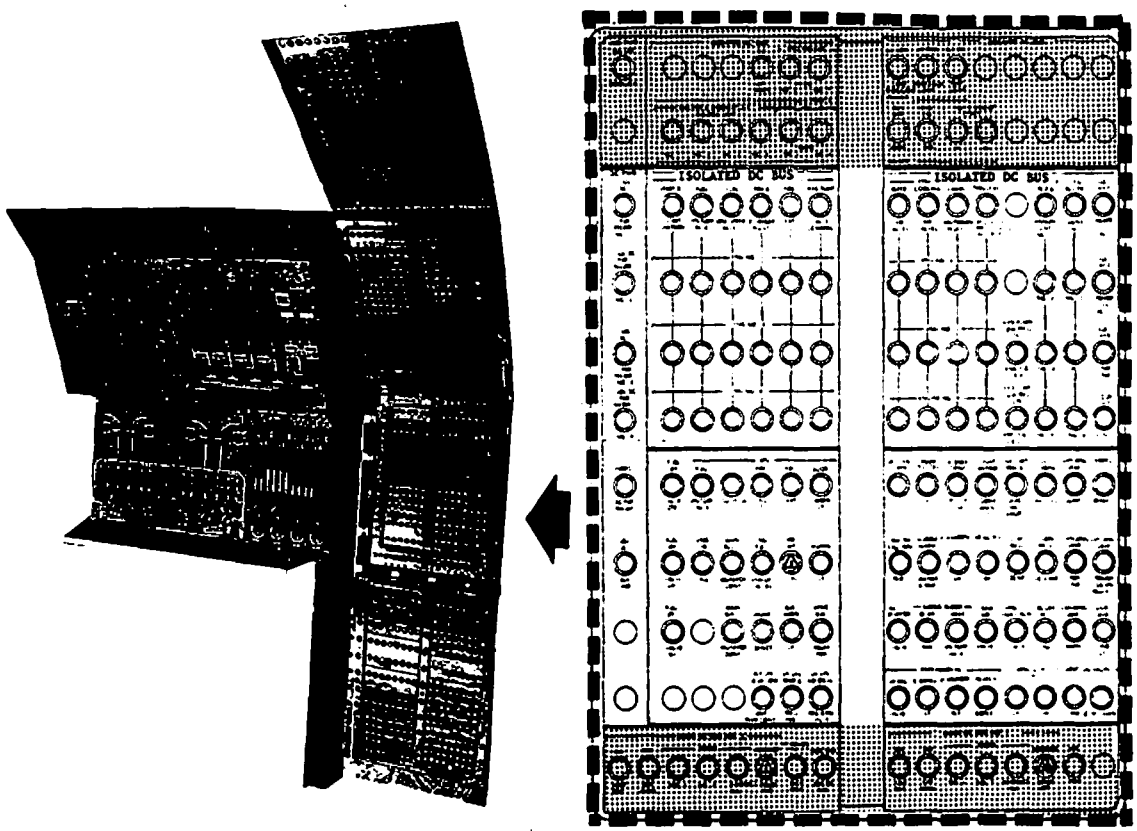
Two! Sure, a MAIN DC BUS for each Transformer/Rectifier Unit. Both MAIN DC BUSES are on the Flight Engineer's Circuit Breaker Panel No. 4. Let's lay out our MAIN DC BUSES like this.



Now, just as we had AC Buses that were more important than the Main AC Buses, we have DC Buses that are more important than the Main DC Buses. For the first of these, let's go to the next page.

The first DC Bus that is more important than the Main DC Buses is the ISOLATED DC BUS.

Study the picture of the Flight Engineer's Circuit Breaker Panel No. 3 and locate the ISOLATED DC BUS.



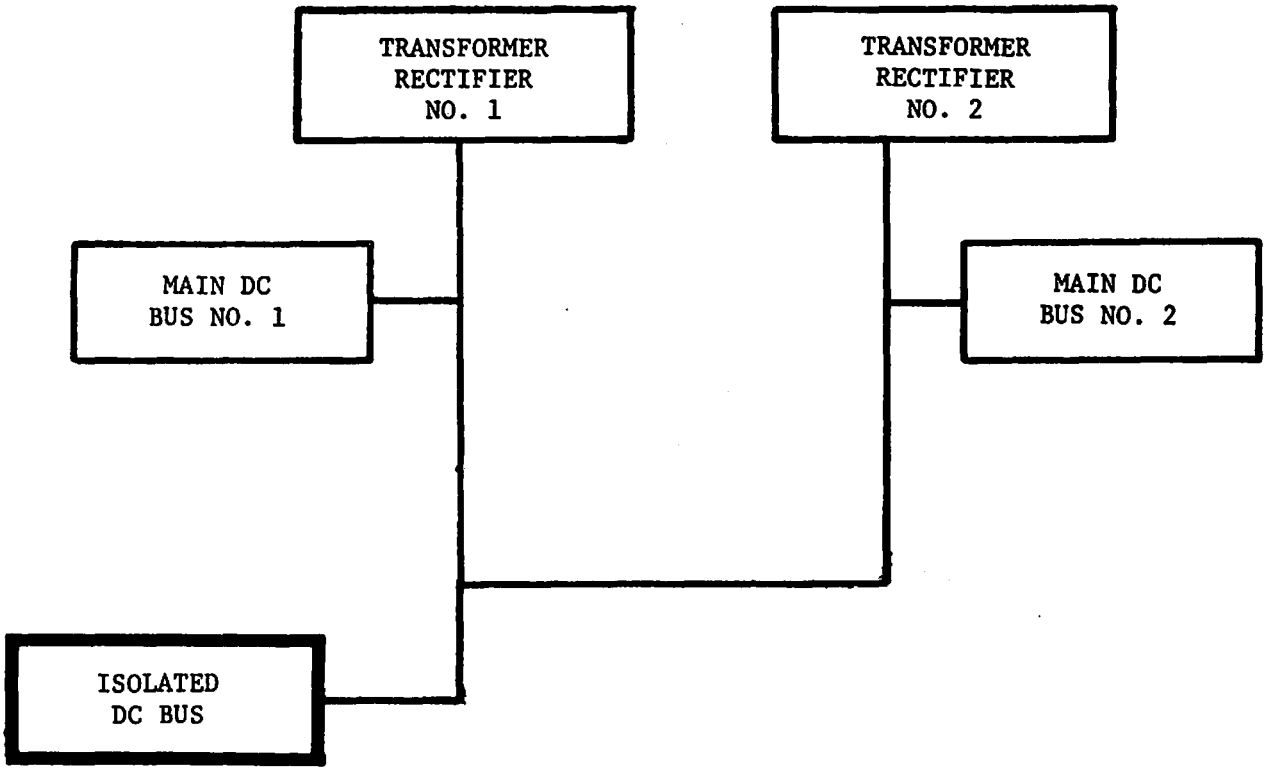
Flight Engineer's
Circuit Breaker Panel No. 3

The ISOLATED DC BUS is:

( ) The two top rows of Flight Engineer's Circuit Breaker Panel No. 3.

( ) The two middle portions of Flight Engineer's Circuit Breaker No. 3.

Sure, the ISOLATED DC BUS is the two middle portions of the Flight Engineer's Circuit Breaker Panel *No. 3.* It starts just below the Isolated AC Bus. Let's add the ISOLATED DC BUS to our diagram.

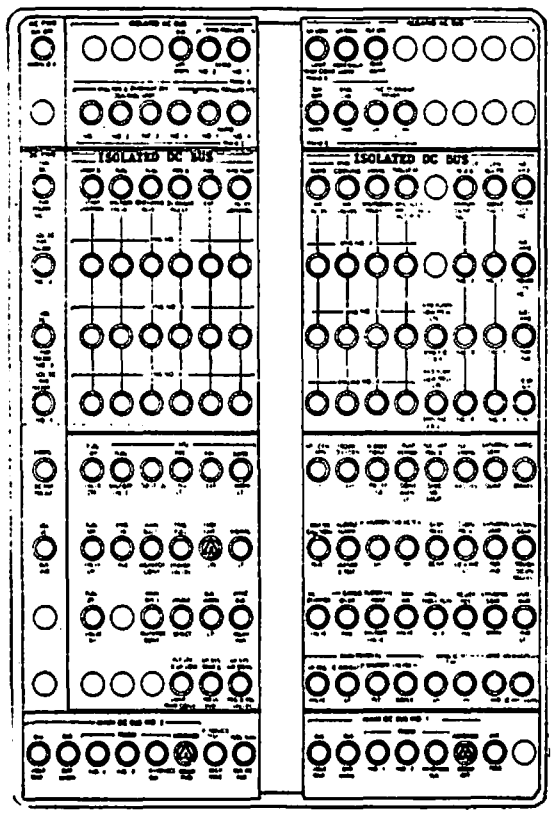


Now, can we say the *Isolated Buses* are on Flight Engineer's Circuit Breaker Panel *No. 3* and the Main DC Buses are on Flight Engineer's Circuit Breaker Panel No. 4?

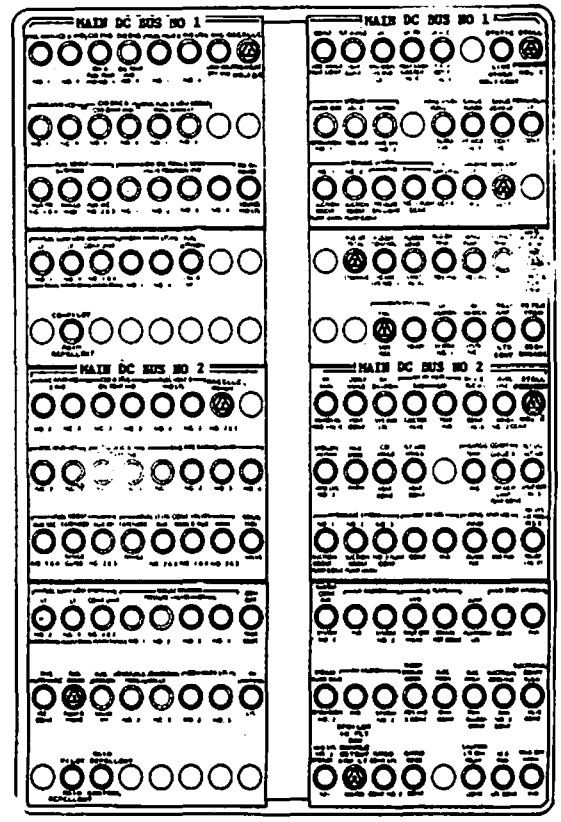
( ) Yes

( ) No

Yes, we can say, "the *ISOLATED BUSES* are on Flight Engineer's Circuit Breaker Panel *No. 3* and the Main DC Buses are on Flight Engineer's Circuit Breaker Panel No. 4," because they are. Check the picture below.



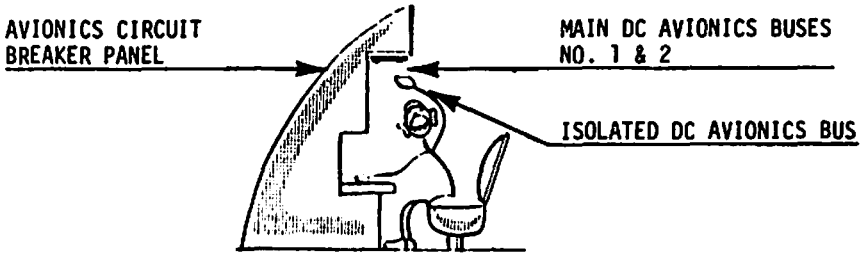
Flight Engineer's
Circuit Breaker Panel *No. 3*



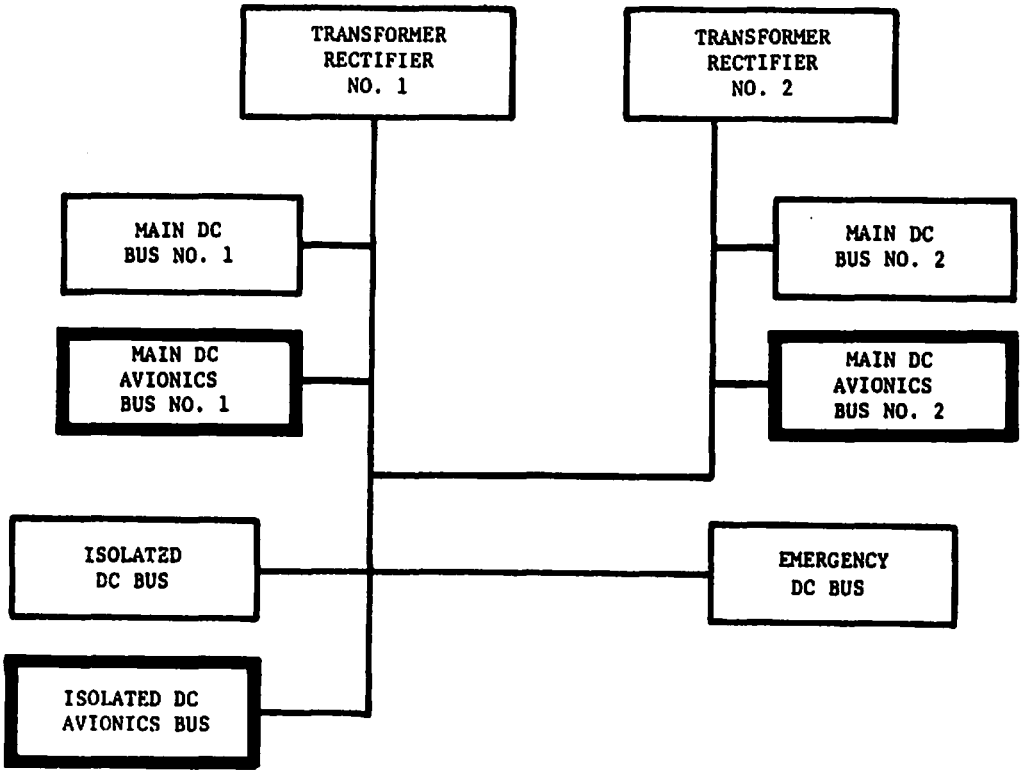
Flight Engineer's
Circuit Breaker Panel No. 4

Okay, now that we have the Main DC Buses and the Isolated DC Bus pinned down, let's look at a Bus that is even more important.

There are three more DC Buses. Remember the Avionics Circuit Breaker Panel above the Navigator's Station? On this panel, we will find two (2) MAIN DC AVIONICS BUSES and one (1) ISOLATED DC AVIONICS BUS.



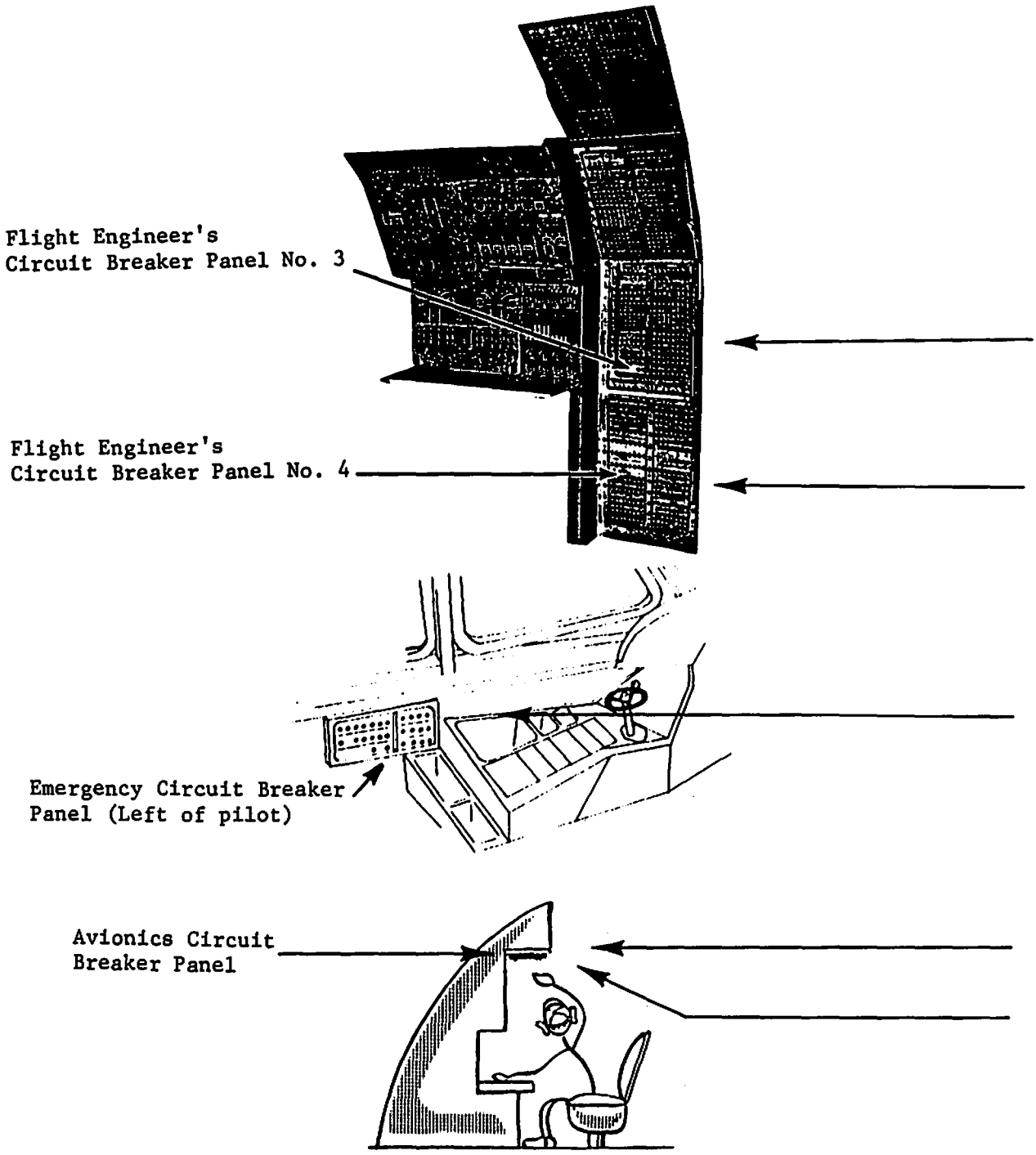
The Avionics Buses receive power from the same sources as their corresponding DC Buses. Let's add them to our diagram.

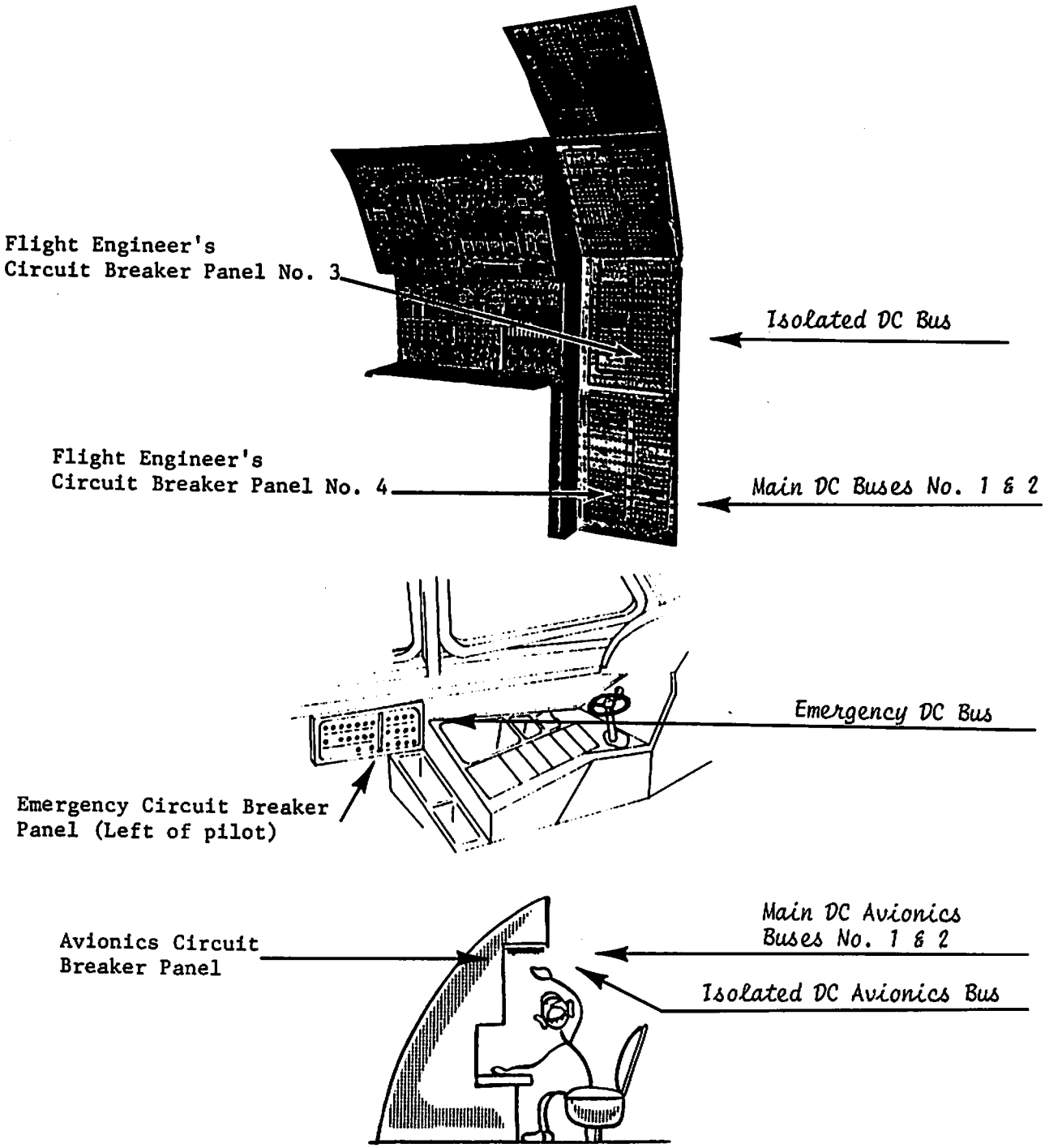


This is all of the DC Buses. Before we see how these DC Buses are powered, let's review their locations.

From Page 12

Fill in the NAMES of the DC BUSES located on the panels shown.




Flight Engineer's
Circuit Breaker Panel No. 3
Isolated DC Bus
Flight Engineer's
Circuit Breaker Panel No. 4
Main DC Buses No. 1 & 2
Emergency DC Bus
Emergency Circuit Breaker
Panel (Left of pilot)
Avionics Circuit
Breaker Panel
Main DC Avionics
Buses No. 1 & 2
Isolated DC Avionics Bus

Now that you have named and located the DC Buses, let's power them.

The DC System is normally powered by TWO (2) TRANSFORMER/RECTIFIERS. Each unit is just what its name implies, a transformer to *step down* the voltage and a rectifier to give us the *DC* output. The Transformer/Rectifier (TR) Units receive 200/115 V three-phase AC power from each essential bus system and give us 5-200 amperes at 29-25 volts DC, *varying inversely* with the load.

A power feed circuit breaker is located on the Main AC Distribution Center for each TRANSFORMER/RECTIFIER Unit.

Let's start our diagram of the DC System with the Transformer/Rectifiers.

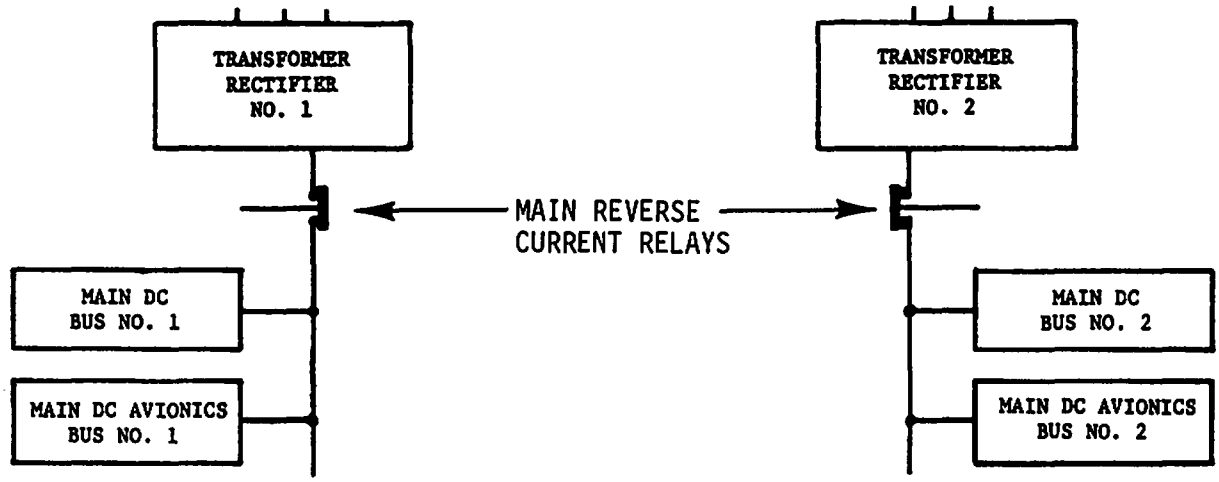
Now we must connect the Transformer/Rectifiers to their Buses. What would you use to do this?

( ) Switch Controlled Relays

( ) Reverse Current Relays

Reverse Current Relays - SURE! We have REVERSE CURRENT RELAYS working just like a one-way check valve to connect each Transformer/Rectifier to its Main DC Buses, and will open if the associated Transformer/Rectifier fails.

Let's add the Main Reverse Current Relays to our diagram.



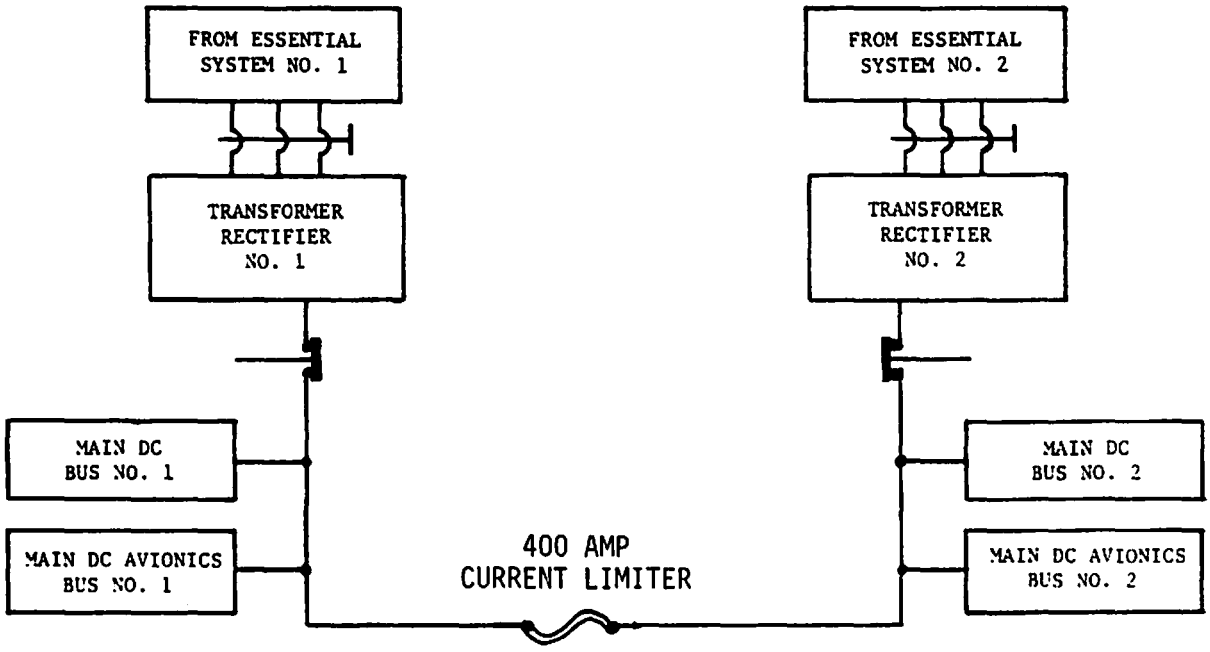
Now that we have our Reverse Current Relays in place to automatically connect the Transformer/Rectifiers to the Buses, let's go on.

Earlier we stated that this was a parallel DC System. In order to have a parallel system, we must connect the two Main DC Buses together. This could be accomplished by using a:

( ) Current Limiter.

( ) Bus Bar.

Current Limiter - this is exactly what Lockheed used, a 400 Amp Current Limiter, to connect the two Main DC Buses together. Take a look.



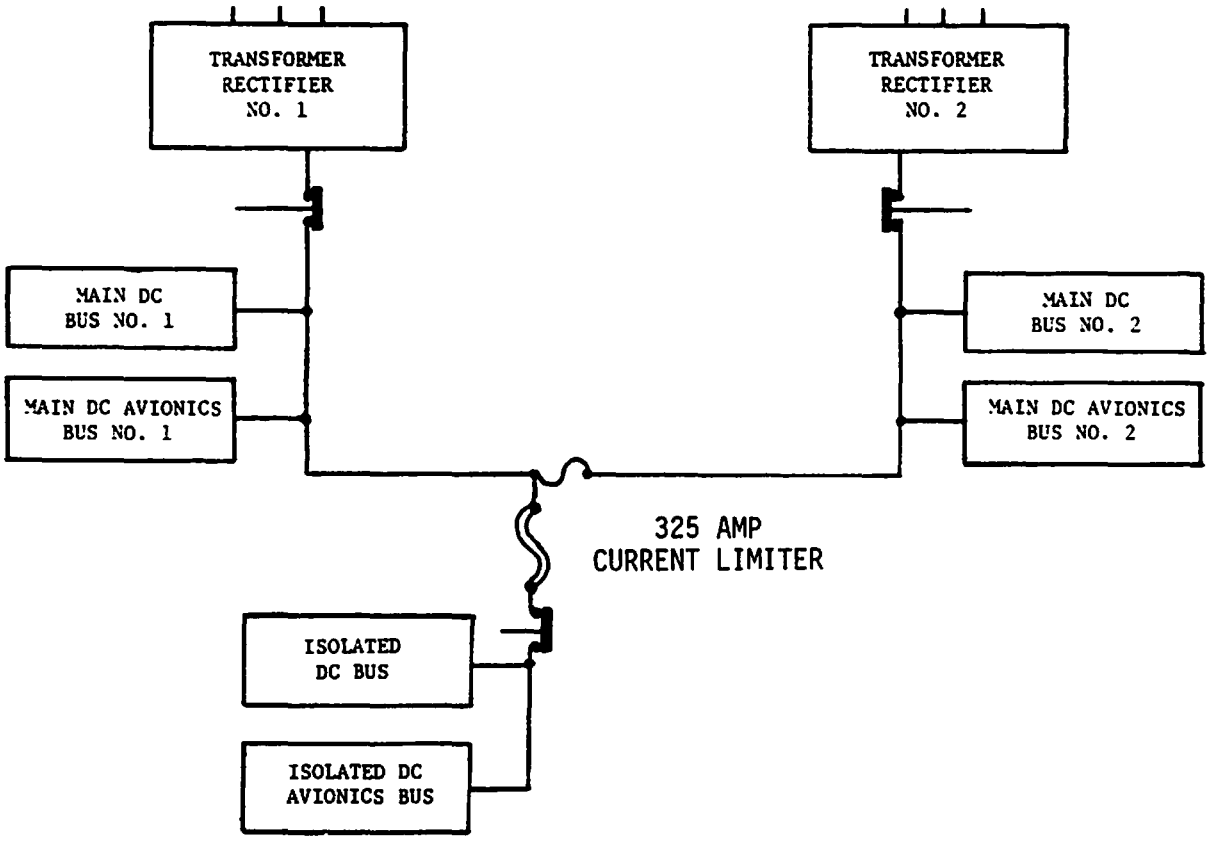
Now you can see if *either* Transformer/Rectifier *fails*, the *other can feed* the Main DC Bus through the 400 Amp Curren- Limiter.

What would happen if you lost one of the Transformer/Rectifiers and the 400 Amp Current Limiter was  .

That's simple, we would still have one Main DC Bus and one Main DC Avionics Bus in operation. Right? . . . Right.

Now let's see how the Isolated DC and Isolated DC Avionics Buses are powered.

The Isolated DC and Isolated DC Avionics Buses are normally powered by the Transformer/Rectifiers through a 325 Amp Current Limiter and a Reverse Current Relay. First, take a look at the 325 Amp Current Limiter.



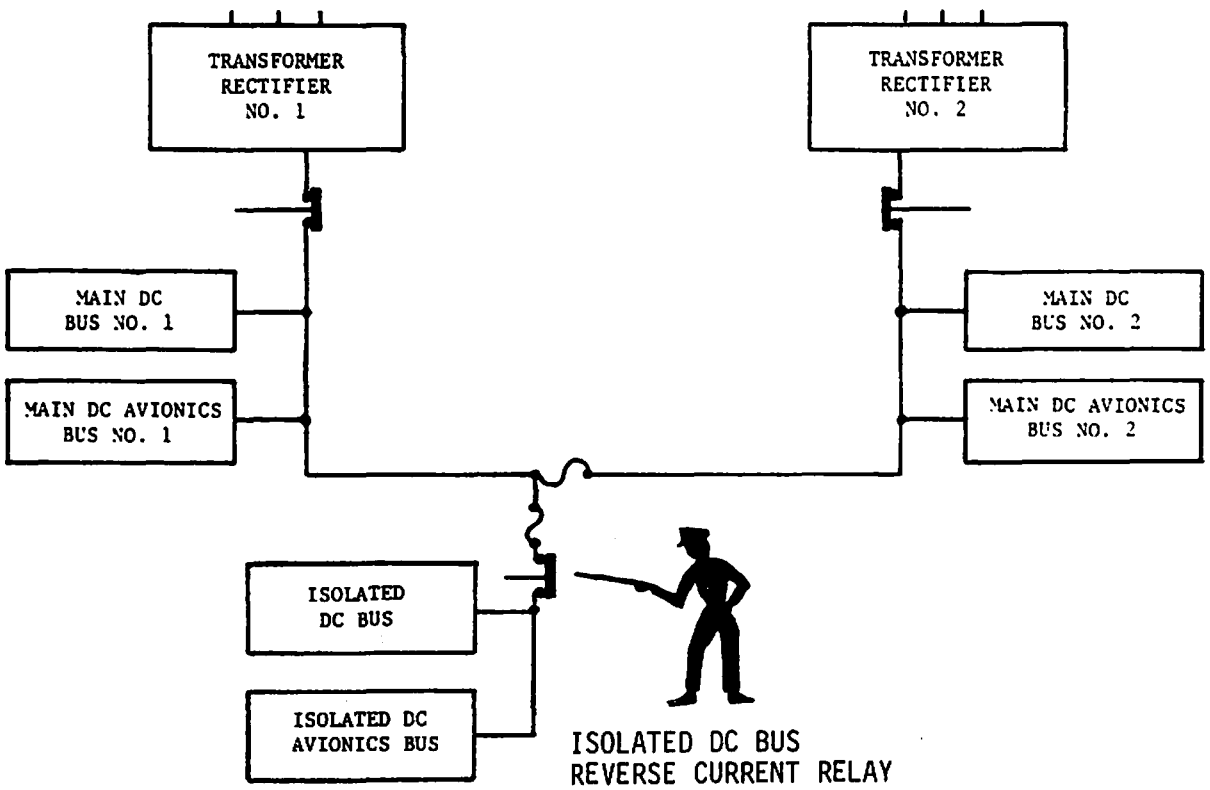
Why do you think a 325 Amp Current Limiter was placed between the Isolated Buses and the Main DC Buses?

( ) To prevent the Emergency Generator or Battery from powering the Main DC Buses.

( ) To allow use of the Main DC Buses and Main Avionics DC Buses should a short occur in either of the Isolated Buses.

That's right, the sole purpose of the 325 Amp Current Limiter is to prevent losing the Main DC Buses due to a *shorted circuit to either* of the Isolated DC Buses.

Now for the RELAY we mentioned. It is called the Isolated DC Bus Reverse Current Relay. It is located just downstream of the 325 Amp Current Limiter - now look at the diagram and answer the question below:

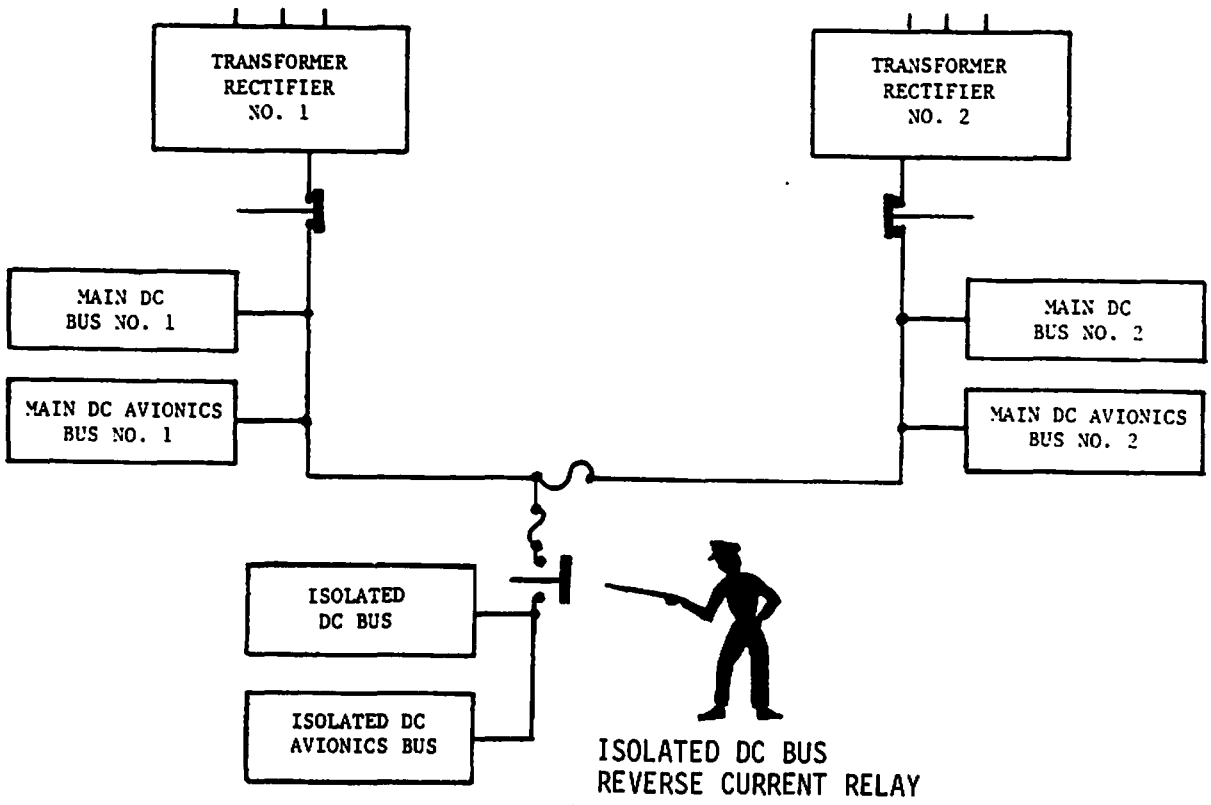


Why do you think the Isolated DC Bus Reverse Current Relay was placed between the Main DC Buses and Isolated Buses?

( ) To prevent the Transformer/Rectifiers from powering the Isolated DC Buses.

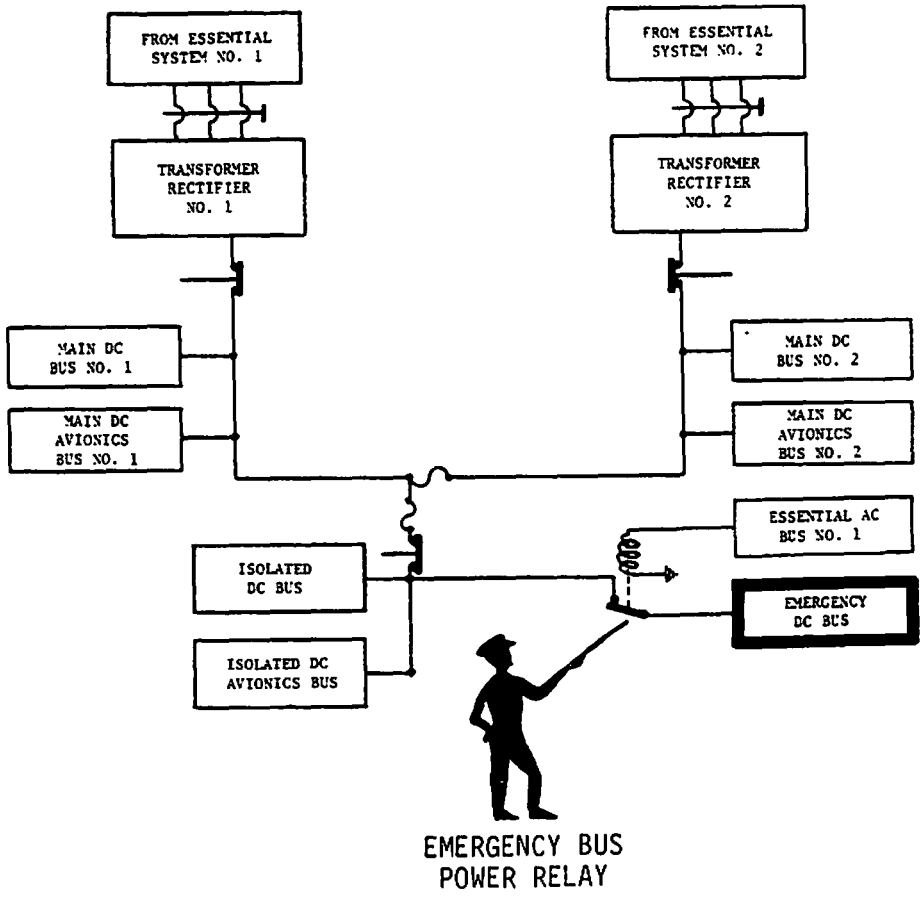
( ) To prevent the Emergency Generator or Battery from powering the Main DC Buses.

The purpose of the Isolated DC Bus Reverse Current Relay is to prevent the Emergency Generator or Battery from powering the Main DC Buses. This is *necessary* because the output of the Emergency Generator or Battery is NOT sufficient to power the entire DC Bus System. Therefore when using the Emergency Generator or Battery to power the Isolated DC Buses, the Isolated DC Bus Reverse Current Relay *separates* the Main DC Buses from the Isolated DC Buses.



Move on to see about the most important DC bus of all. The Emergency DC Bus.

The EMERGENCY DC BUS is normally powered with the Isolated DC Bus like this.



You notice that we added a *relay* in the wiring to the Emergency DC Bus. This relay is called the Emergency Bus Power Relay and *selects* either *normal* or *emergency* power for the Emergency DC Bus. This relay is normally energized closed by Essential AC Bus No. 1 as shown.

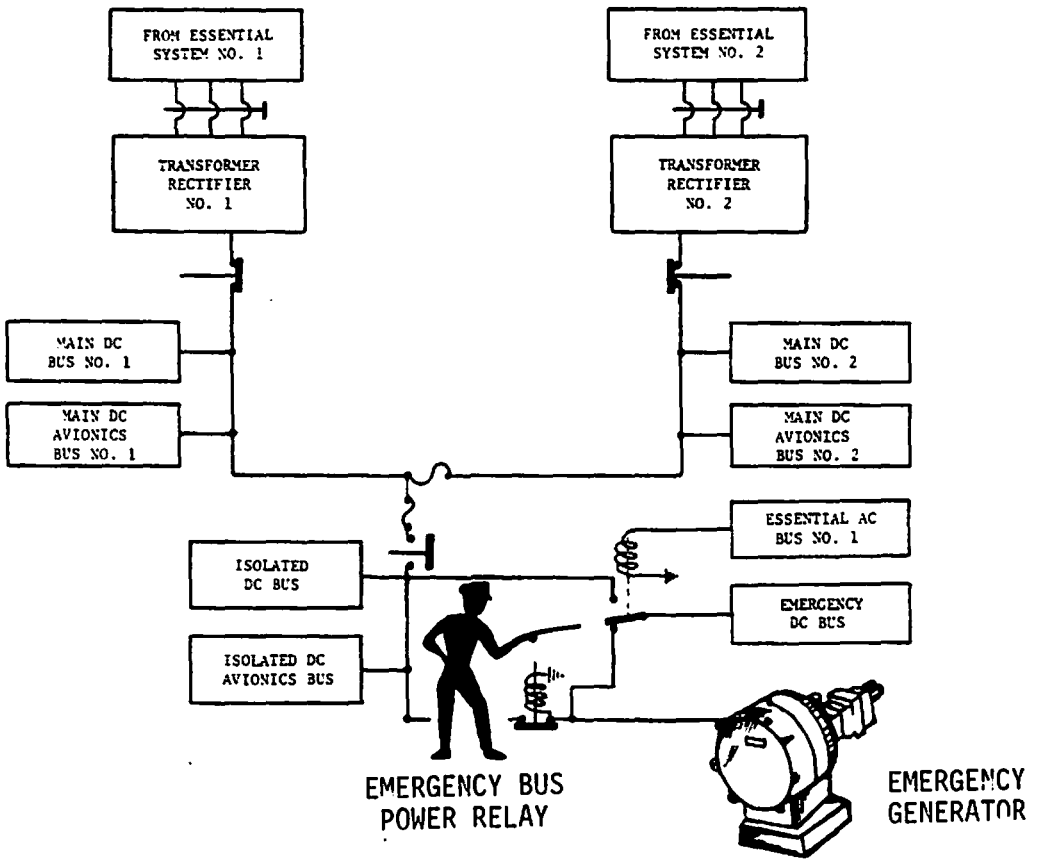
The normal power source for the Emergency DC Bus is the:

( ) Transformer/Rectifier Units.

( ) Emergency Generator.

That's right! The EMERGENCY DC BUS is *normally* powered by the Transformer/ Rectifier Units through the Emergency Bus Power Relay, which *selects* either *normal* OR *emergency* power to the Emergency DC Bus. How does it do this?

Remember that the Emergency Generator operates *automatically* when Essential AC Bus No. 1 is *lost*, or *manually* by the pilot's instrument power switch; therefore in either case, automatically or manually, the EMERGENCY BUS POWER RELAY will deenergize and let the Emergency Generator power the EMERGENCY DC BUS. Let's deenergize the relay on our diagram and see.



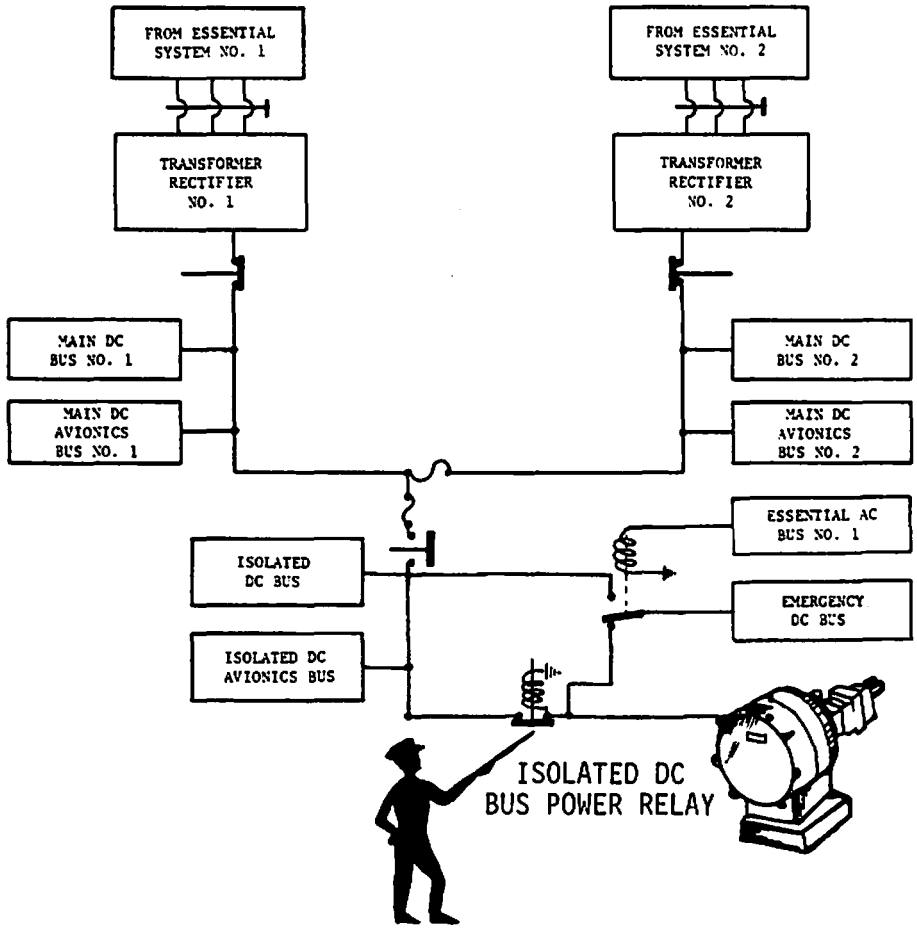
Does it seem logical that the Emergency Generator would also be the emergency power source for the Isolated DC Bus and Isolated DC Avionics Bus?

( ) Yes.

( ) No.

Yes, the Emergency Generator is the *Emergency Power Source* for the Isolated DC Bus and Isolated DC Avionics Bus.

Any time the Emergency Generator is operating, it *automatically energizes* the Isolated DC Bus Power Relay which connects the Emergency Generator to the Isolated DC Buses.



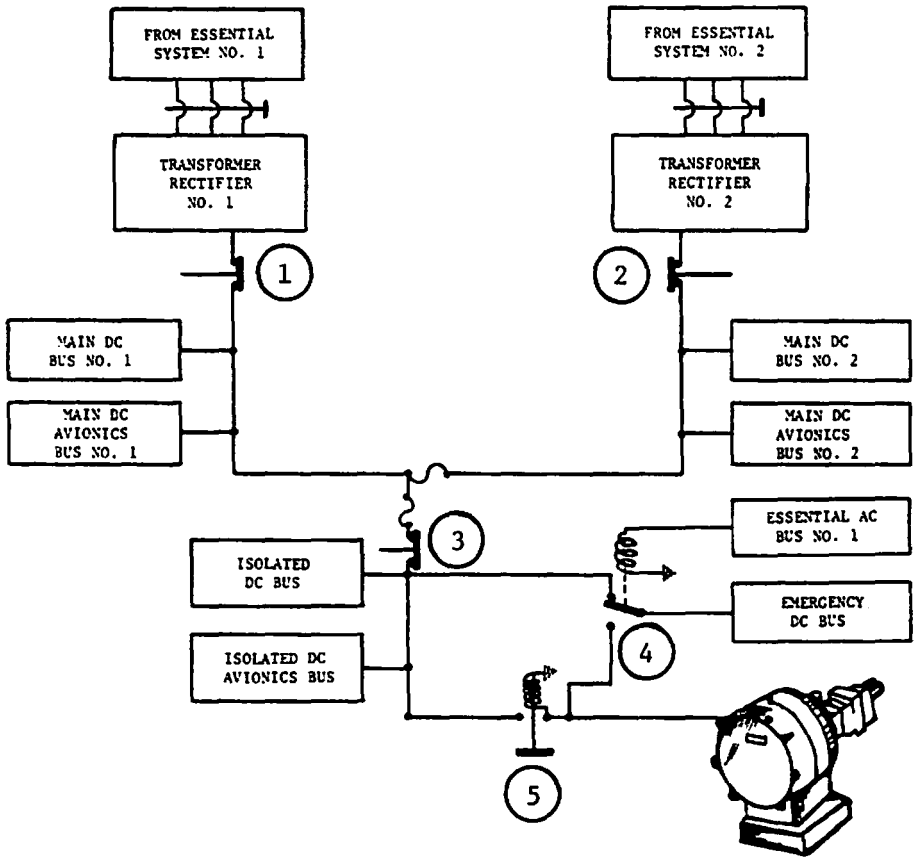
When the Emergency Generator comes ON, does it also power the Main DC Buses?

( ) Yes.

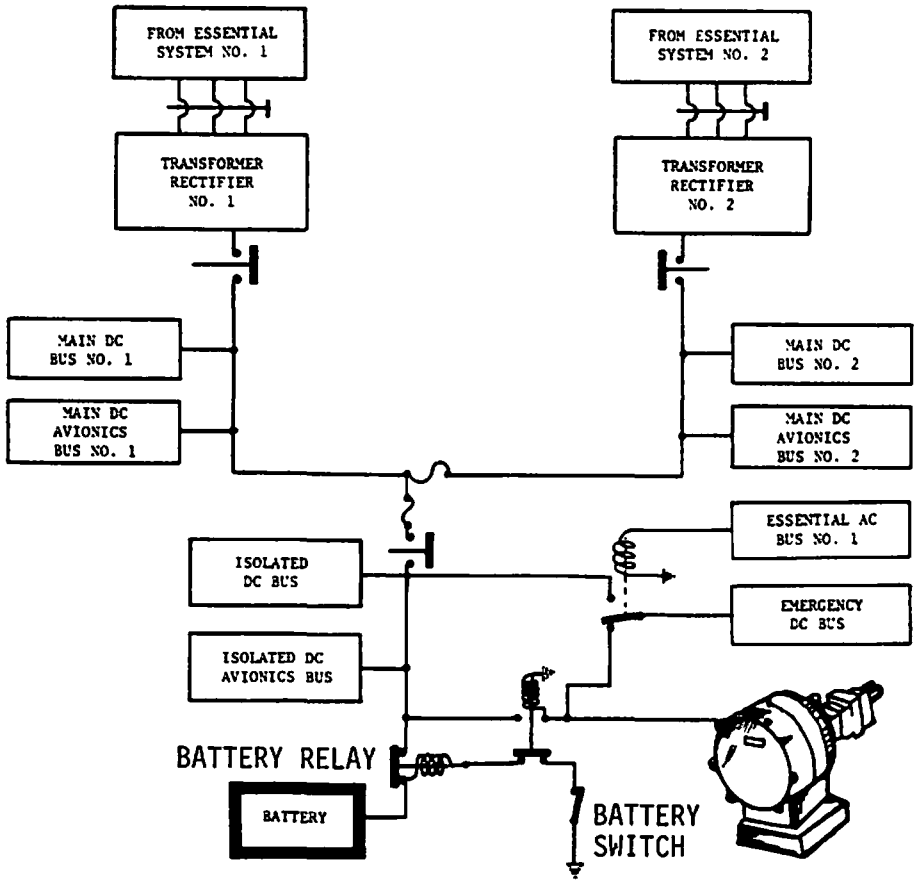
( ) No.

You're right. The Emergency Generator will NOT power the Main DC Bus Systems. You remembered about the Isolated DC Bus Reverse Current Relay.

Take a good look at our DC system in NORMAL OPERATION.



Now--the latest with the leastest - a 24 volt, 11 ampere-hour lead-acid BATTERY *located* by the Under Deck Electrical Equipment Rack forward of the crew latrine. The Battery Switch on the electrical control panel *controls* the Battery Relay which connects the BATTERY to the Isolated DC Bus and the Isolated DC Avionics Bus. Battery power is used primarily for APU starting control. The diagram below shows how the BATTERY connects to the system.



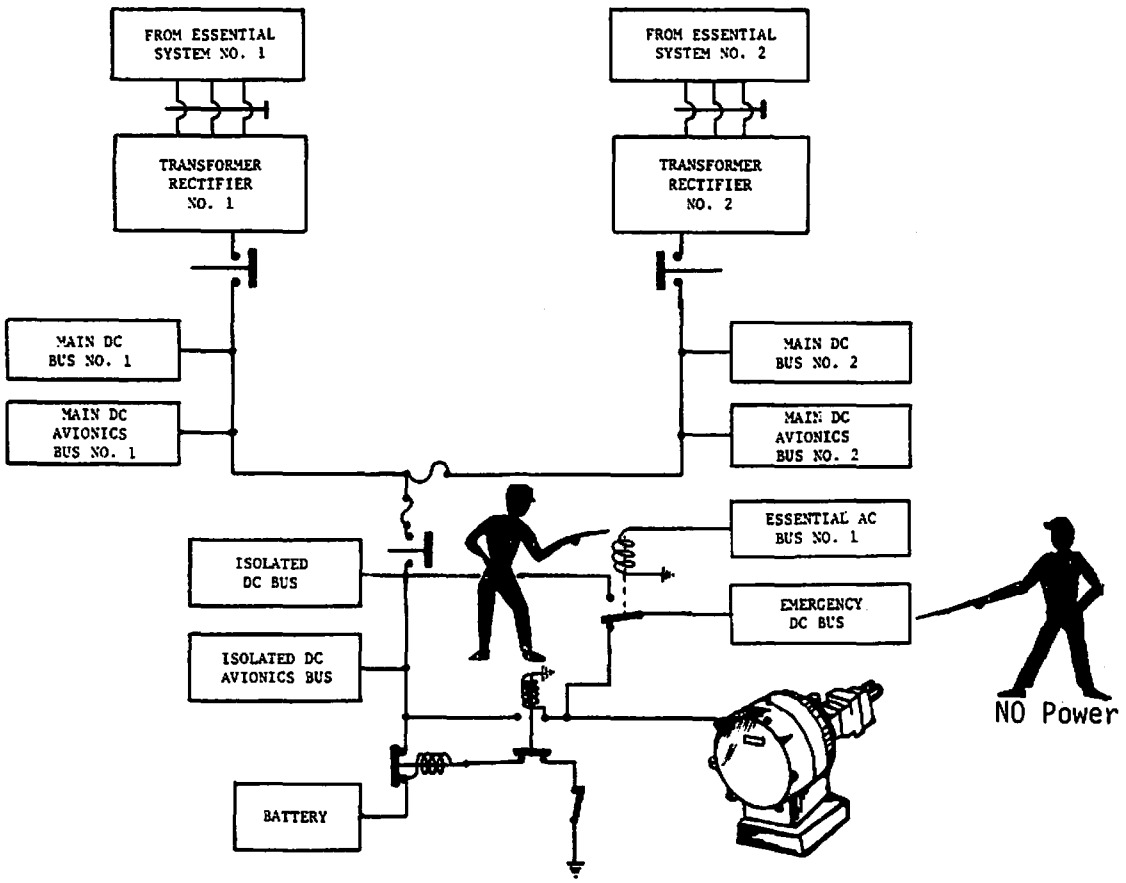
In the above diagram, NO engines are running, NO External or Auxiliary power is connected and the Battery Switch is "ON." Will the Emergency DC Bus receive power?

( ) Yes.

( ) No.

You're right. With NO other power on the aircraft the Emergency DC Bus will NOT receive power from the BATTERY. Let's see why. Without AC power the Emergency Bus Power Relay is *deenergized,* thereby preventing Battery power from reaching the Emergency DC Bus.

This condition is shown on the diagram below.



Now can we say that the BATTERY will power the Isolated DC Buses for APU starting when no other power is on the aircraft?

( ) Yes.

( ) No.

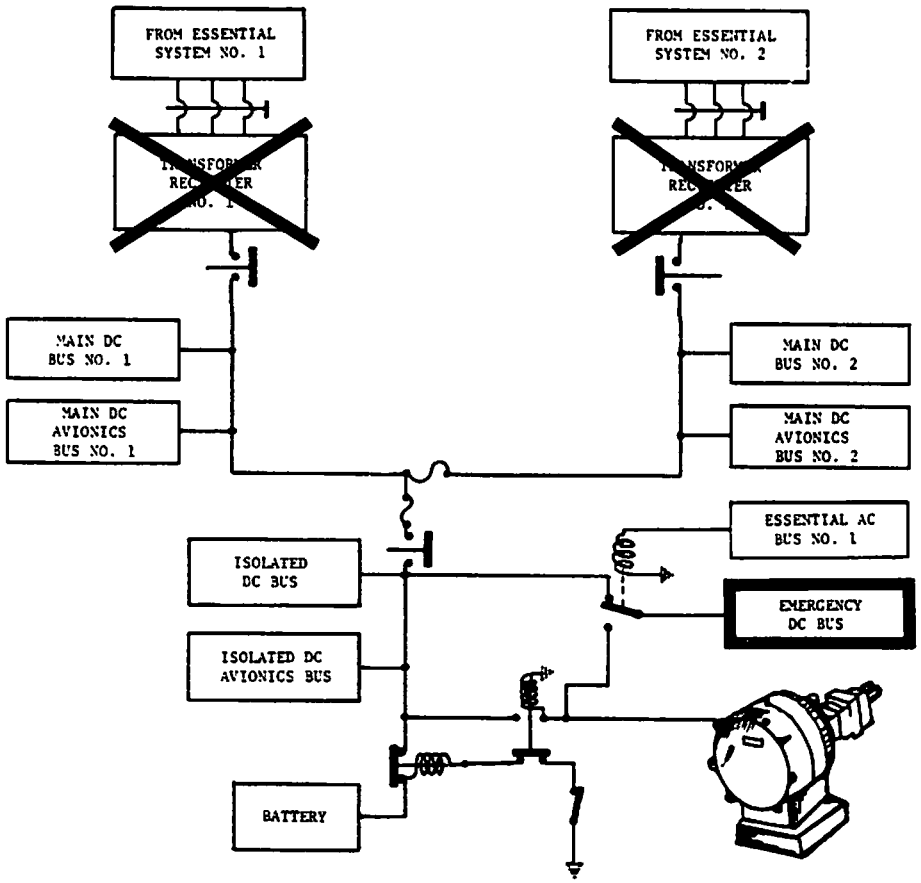
Yes, this is the primary purpose of the BATTERY - to power the Isolated DC Bus and the Isolated DC Avionics Bus when no other power source is available for starting the Auxiliary Power Unit.

Do you think that it is possible for the battery to power the Emergency DC Bus under certain conditions?

( ) Yes.

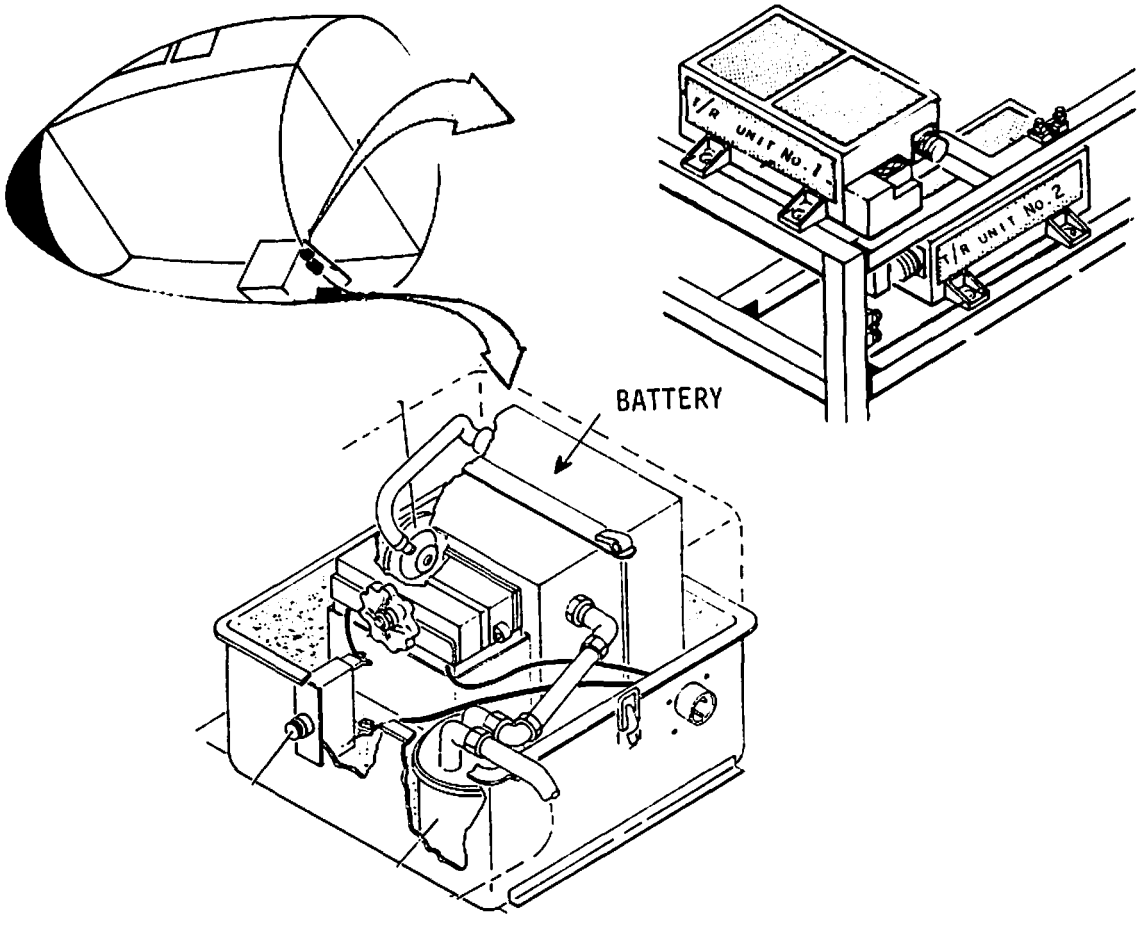
( ) No.

Yes, the Battery CAN power the Emergency DC Bus under a certain condition. This condition is: Loss of both Transformer/Rectifiers with normal AC power available. This condition is shown on the schematic below.



Now that we know the BATTERY will power the Emergency DC Bus if you lose both Transformer/Rectifiers and normal AC power is still available, let's locate the BATTERY and Transformer/Rectifiers.

To effectively troubleshoot the system, we should know where the units are physically located. The BATTERY and TRANSFORMER/RECTIFIERS are on/or by the UNDERDECK ELECTRICAL EQUIPMENT RACK.



List the DC power sources located on/or by the UNDERDECK ELECTRICAL EQUIPMENT RACK.

1. _____

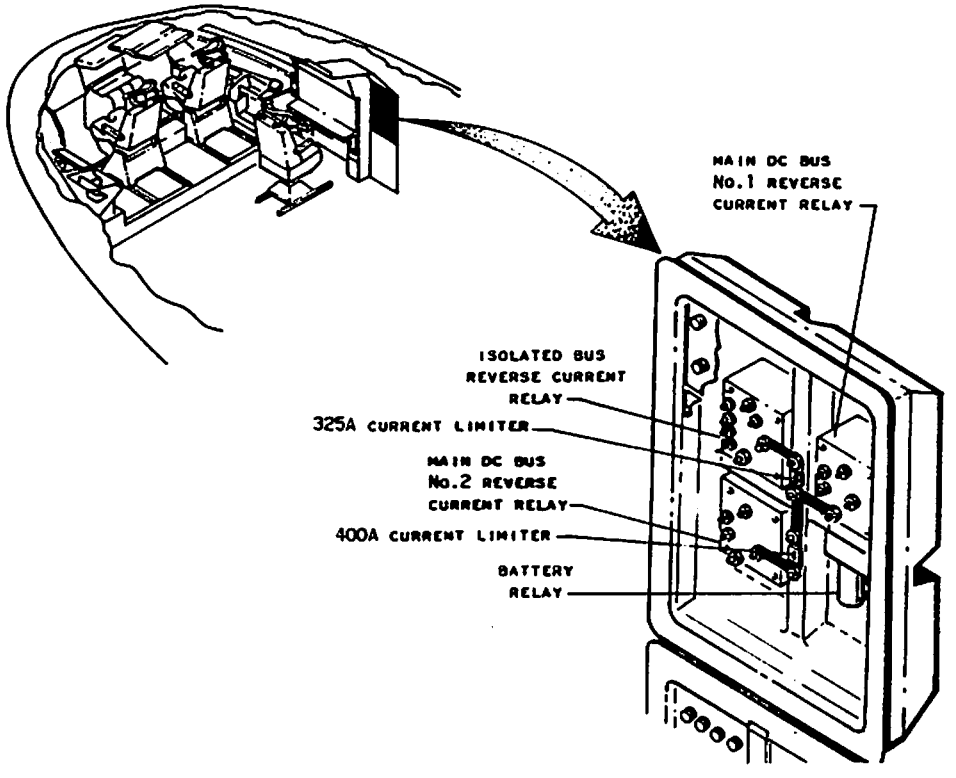
2. _____

The DC power sources that you should have listed are:

1. *Transformer/Rectifiers*

2. *Battery*

This leaves our CURRENT LIMITERS, REVERSE CURRENT RELAYS and BATTERY RELAY. These items are found behind the FLIGHT ENGINEER'S CIRCUIT BREAKER PANEL No. 3.



Look at the picture above and list the six DC components located behind the Flight Engineer's Circuit Breaker Panel No. 3.

1. _____ 4. _____

2. _____ 5. _____

3. _____ 6. _____

The six DC components located behind the Flight Engineer's Circuit Breaker Panel No. 3 are:

1. *Main DC Bus No. 1 Reverse Current Relay*
2. *Main DC Bus No. 2 Reverse Current Relay*
3. *Isolated Bus Reverse Current Relay*
4. *400 Amp Current Limiter*
5. *325 Amp Current Limiter*
6. *Battery Relay*

Oh, you say you didn't have them in this order? That's OK, just so we know where they are.

Now, before proceeding to the panel and indicators, let's review.

For a review let's play the match game. In the following passages match the number or numbers of the statements that apply to the units identified by the letter. Some statements may apply to more than one unit.

A. Transformer/Rectifiers
Purpose ( ) Location ( )

B. Main Reverse Current Relays
Purpose ( ) Location ( )

C. 400 Amp Current Limiter
Purpose ( ) Location ( )

D. 325 Amp Current Limiter
Purpose ( ) Location ( )

E. Emergency Bus Power Relay
Purpose ( ) ///////

F. Isolated DC Bus Reverse Current Relay
Purpose ( ) Location ( )

G. Battery
Purpose ( ) Location ( )

H. Battery Relay
Purpose ( ) Location ( )

1. Supplies normal DC power.

2. Protects Main DC Buses against shorts on Isolated DC Buses.

3. Located on or by underdeck electrical equipment rack.

4. Powers Isolated DC Buses for APU starting.

5. Connects Transformer/Rectifiers to Main DC Buses.

6. Behind Flight Engineer's Circuit Breaker Panel No. 3.

7. Connects Main DC Buses together.

8. Prevents Emergency Power or Battery Power from being supplied to Main DC Buses.

9. Connects battery to Isolated DC Buses.

10. Selects normal or emergency power for the Emergency DC Bus.

A. Transformer/Rectifiers
Purpose (1) Location (3)

B. Main Reverse Current Relays
Purpose (5) Location (6)

C. 400 Amp Current Limiter
Purpose (7) Location (6)

D. 325 Amp Current Limiter
Purpose (2) Location (6)

E. Emergency Bus Power Relay
Purpose (10) ///////

F. Isolated DC Bus Reverse Current Relay
Purpose (8) Location (6)

G. Battery
Purpose (4) Location (3)

H. Battery Relay
Purpose (9) Location (6)

1. Supplies normal DC power.

2. Protects Main DC Buses against shorts on Isolated DC Buses.

3. Located on or by underdeck electrical equipment rack.

4. Powers Isolated DC Buses for APU starting.

5. Connects Transformer/Rectifiers to Main DC Buses.

6. Behind Flight Engineer's Circuit Breaker Panel No. 3.

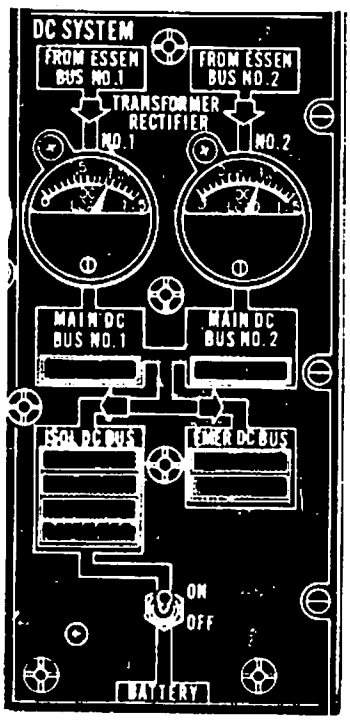
7. Connects Main DC Buses together.

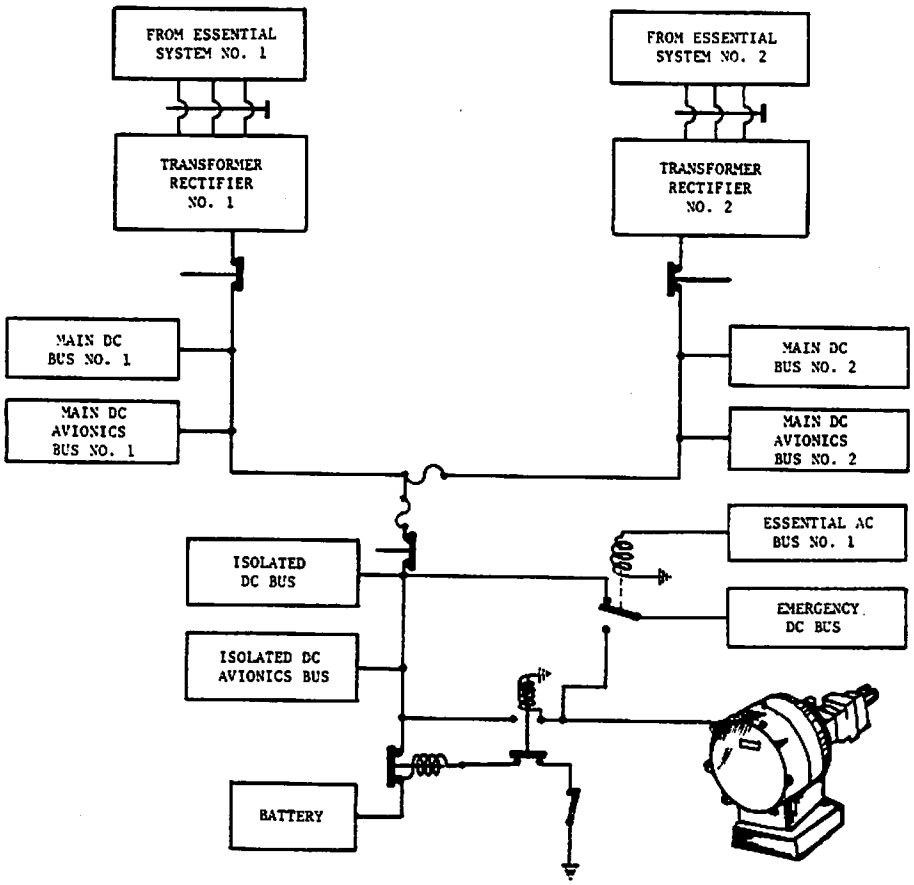
8. Prevents Emergency Power or Battery Power from being supplied to Main DC Buses.

9. Connects battery to Isolated DC Buses.

10. Selects normal or emergency power for the Emergency DC Bus.

Let's take the DC portion of the Electrical Control Panel and compare it with our diagram.





The first big *difference* that you will notice is probably the addition of *loadmeters* so that we can tell the load on each Transformer/Rectifier Unit. If you remember the rating of our Transformer/Rectifiers you should have no difficulty with this question.

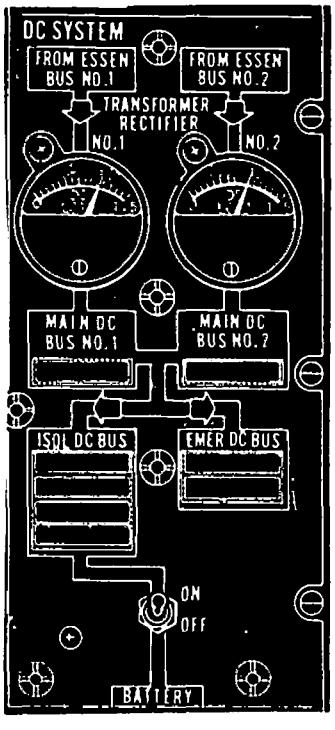
What ampere load does a 1.0 reading on the loadmeter indicate?

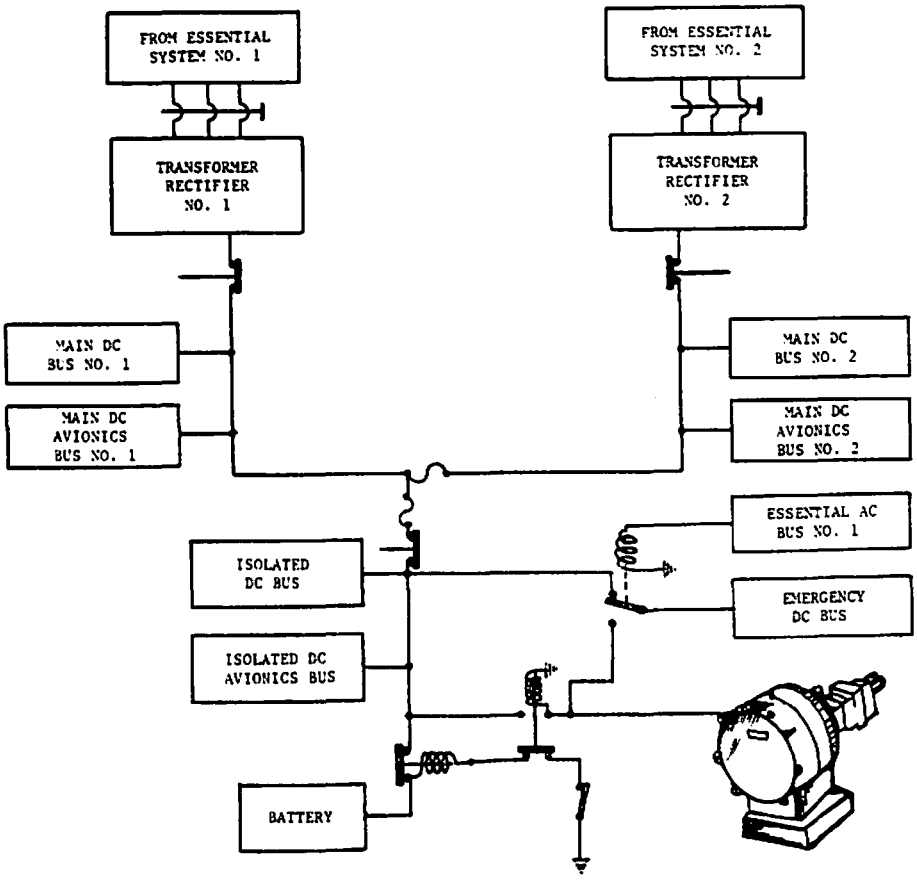
( ) 200 amperes

( ) 300 amperes

200 amperes is correct. 200 amperes is the rating of each Transformer/ Rectifier Unit. If you had chosen 300 amperes, you would have had the 1.5 reading or maximum (red line) load. Now the reverse, a '0' (zero) reading would indicate that the Transformer/Rectifier is NOT sending power to the Main DC Bus.

The second big *difference* is that the Main DC Avionics Bus and Isolated DC Avionics Bus depend on their related Main or Isolated DC Buses for power indications.



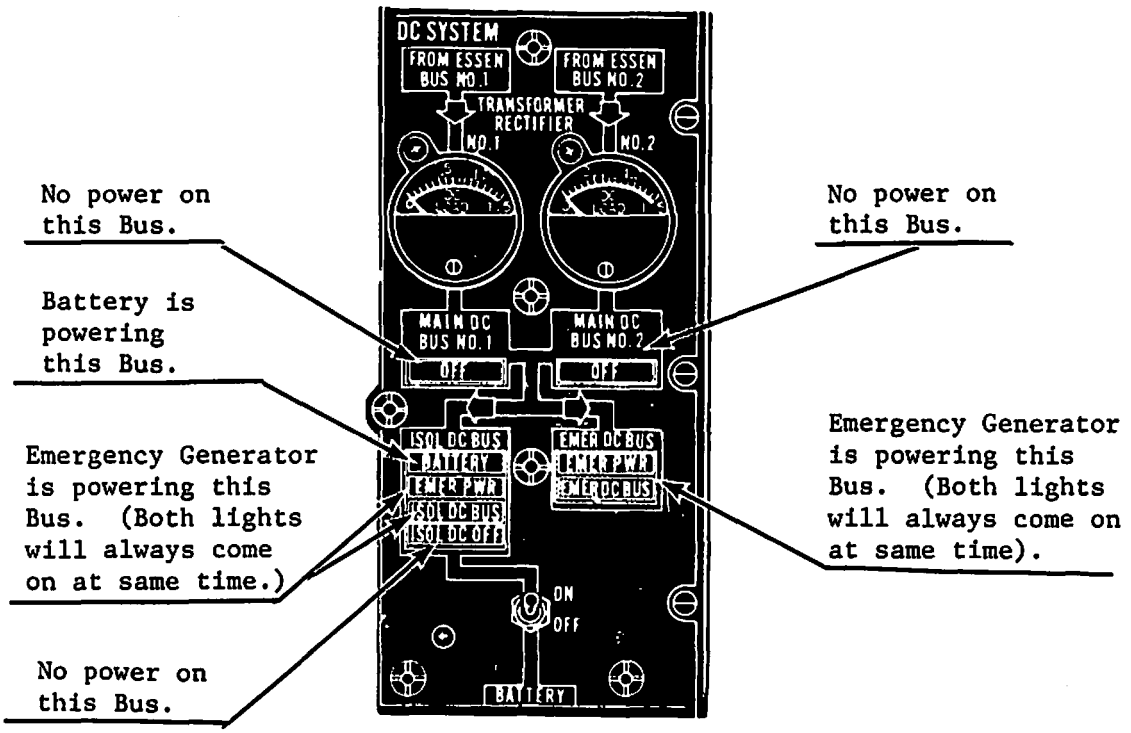


Pilots - This completes the Programmed Text on DC Power.

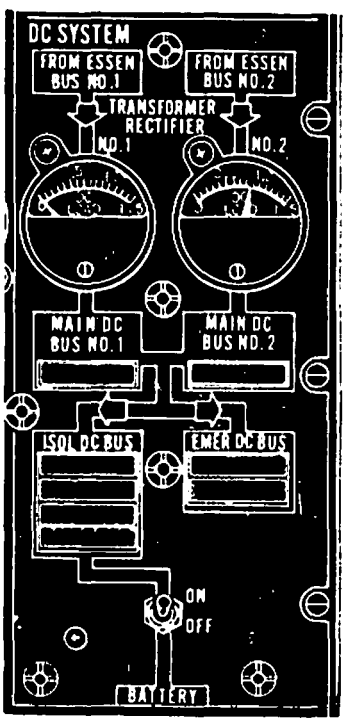
Flight Engineers - The remaining section contains trouble shooting problems.

NOTE: Pilots may continue at their discretion.

When an indicator light comes ON, you can interpret it to mean:



Now that we have our indicator lights in mind, let's check some panel indications and malfunctions shown on them. For example, look at this panel. List the indications and probable causes.



1. Indication

   Loadmeter No. 1 *"0"* No. 2 *Normal*

   Main Bus No. 1 *Normal* No. 2 *Normal*

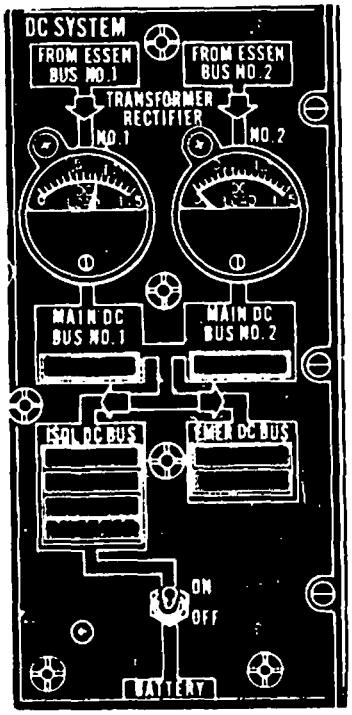
   Isolated Buses *Normal*

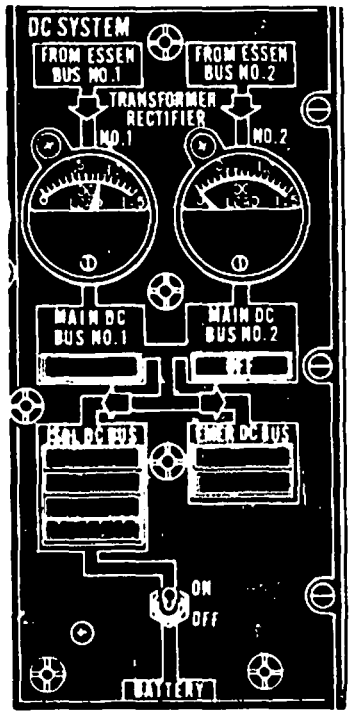
   Emergency Bus *Normal*

2. These indications are probably caused by:

   Power Failure - No. 1 Transformer/ Rectifier

Look at the two panels below and list their indications and probable causes: (All situations considered as In Flight)





1. Indication

   Loadmeter No. 1_____No. 2_____

   Main Bus No. 1 _____No. 2_____

   Isolated Buses _____

   Emergency Bus _____

2. These indications are probably caused by:

   _____

1. Indication

   Loadmeter No. 1_____No. 2_____

   Main Bus No. 1 _____No. 2_____

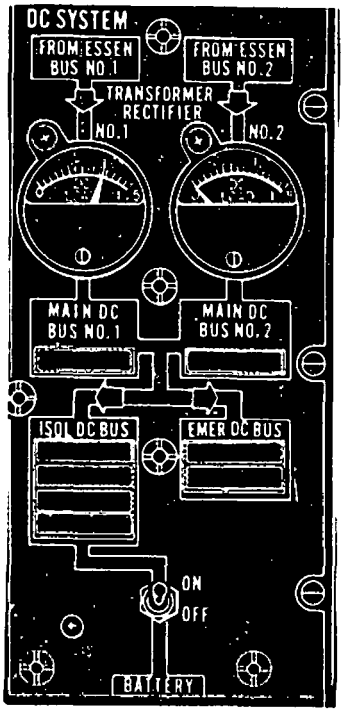
   Isolated Buses _____

   Emergency Bus _____

2. These indications are probably caused by:

   _____

   _____



1. Indication

   Loadmeter No. 1 *Normal* No. 2 *"0"*

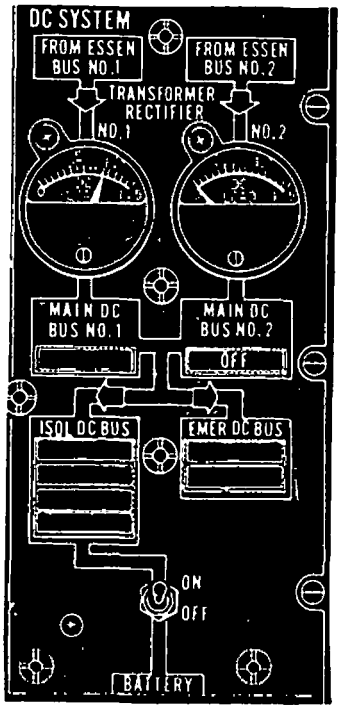
   Main Bus No. 1 *Normal* No. 2 *Normal*

   Isolated Buses *Normal*

   Emergency Bus *Normal*

2. These indications are probably caused by:

   Failure of T/R Unit No. 2.



1. Indication

   Loadmeter No. 1 *Normal* No. 2 *"0"*

   Main Bus No. 1 *Normal* No. 2 *Off*

   Isolated Buses *Normal*

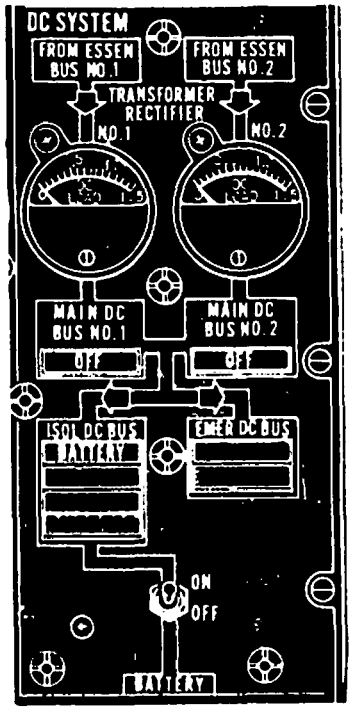
   Emergency Bus *Normal*

2. These indications are probably caused by:

   Failure of T/R Unit No. 2 and 400 Amp Current Limiter open.

How did you do? Got 'em both? Let's go to the next page and try two more.

Let's try it again.



1. Indication

   Loadmeter No. 1_____No. 2_____

   Main Bus No. 1 _____No. 2_____

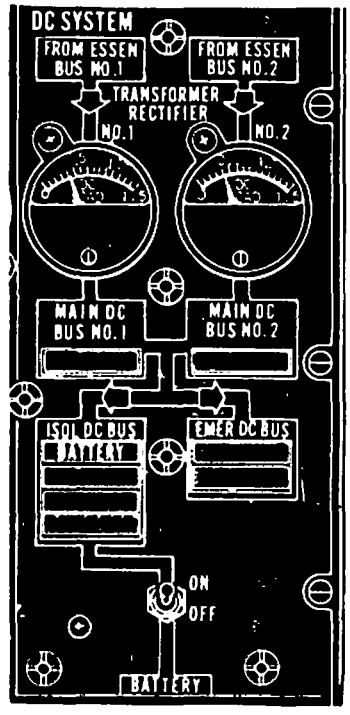
   Isolated Buses _____

   Emergency Bus _____

2. These indications are probably caused by:

   _____

   _____



1. Indication

   Loadmeter No. 1_____No. 2_____

   Main Bus No. 1 _____No. 2_____

   Isolated Buses _____

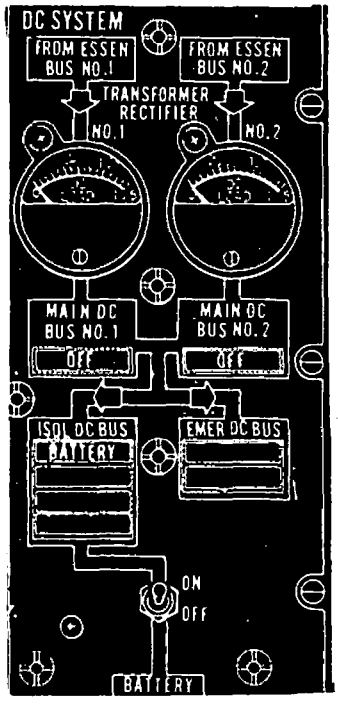
   Emergency Bus _____

2. These indications are probably caused by:

   _____

   _____

   _____



1. Indication

   Loadmeter No. 1 *"0"* No. 2 *"0"*

   Main Bus No. 1 *Off* No. 2 *Off*

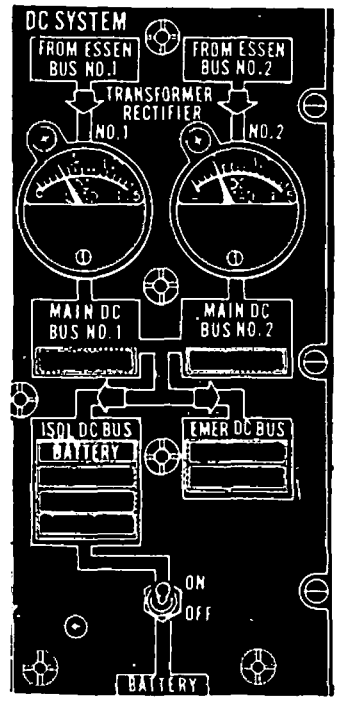
   Isolated Buses *Battery*

   Emergency Bus *Normal*

2. These indications are probably caused by:

   Both T/R units inoperative.

   Battery powering Isolated Buses.



1. Indication

   Loadmeter No. 1 *Normal* No. 2 *Normal*

   Main Bus No. 1 *Normal* No. 2 *Normal*

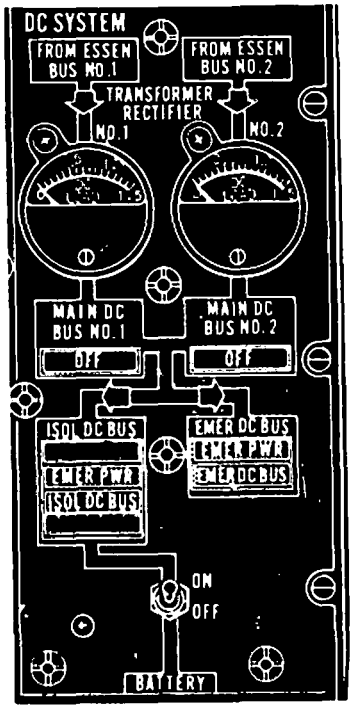
   Isolated Buses *Battery*

   Emergency Bus *Normal*

2. These indications are probably caused by:

   Either the Isolated DC Bus Reverse Current Relay OR 325 Amp Current Limiter open.

These are the last two panels.



1. Indication

   Loadmeter No. 1_____ No. 2_____

   Main Bus No. 1 _____ No. 2_____

   Isolated Buses _____

   Emergency Bus _____

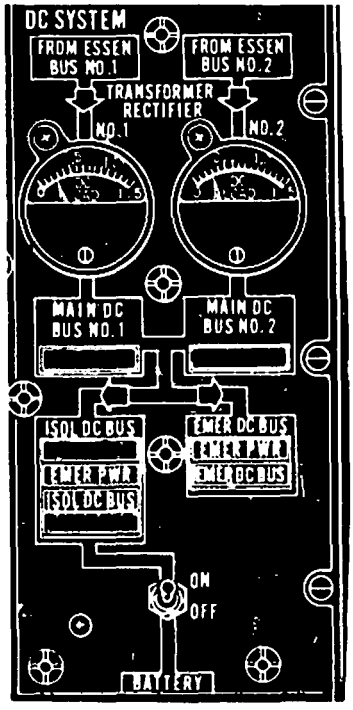
2. These indications are probably caused by:

   _____

   _____

   _____

   _____



1. Indication

   Loadmeter No. 1_____ No. 2_____

   Main Bus No. 1 _____ No. 2_____

   Isolated Buses _____

   Emergency Bus _____

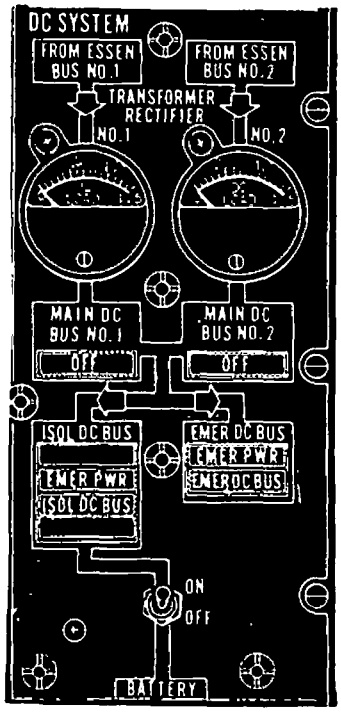
2. These indications are probably caused by:

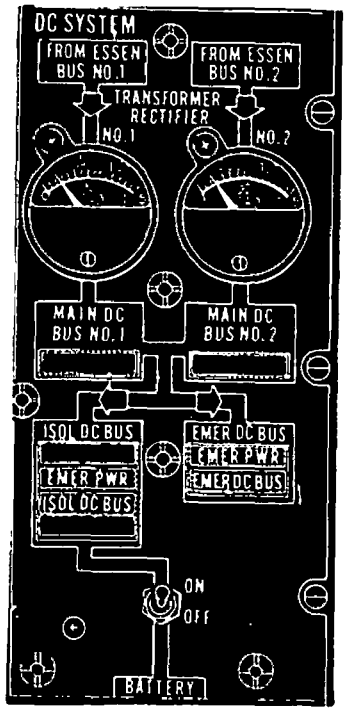
   _____

   _____

   _____

   _____





1. Indication

Loadmeter No. 1 *"0"* No. 2 *"0"*

Main Bus No. 1 *Off* No. 2 *Off*

Isolated Buses *Emergency Power*

Emergency Bus *Emergency Power*

2. These indications are probably caused by:

Failure both T/R units and Emergency Generator powering Isolated and Emergency Buses (probably caused by loss of AC power).

1. Indication

Loadmeter No. 1 *Normal* No. 2 *Normal*

Main Bus No. 1 *Normal* No. 2 *Normal*

Isolated Buses *Emergency Power*

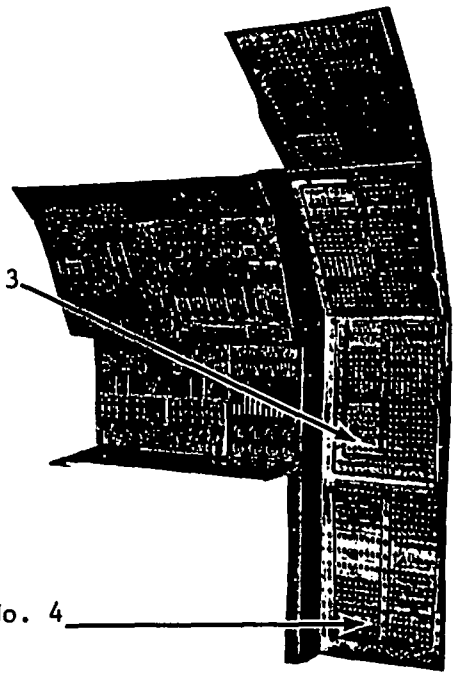
Emergency Bus *Emergency Power*

2. These indications are probably caused by:

Emergency Generator powering Isolated and Emergency Buses (Emergency Generator is operating with normal power available).

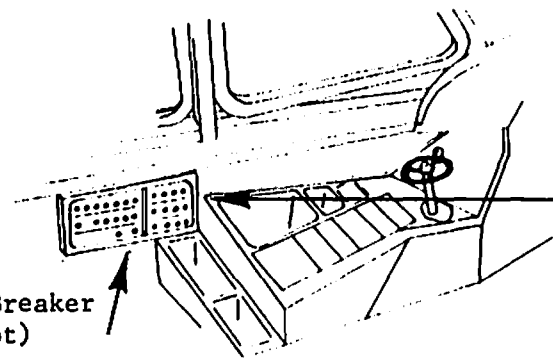
These six panels have shown our most probable indications and/or malfunctions. Now it is time to review again.

Fill in the NAMES of the DC BUSES located on the panels shown.



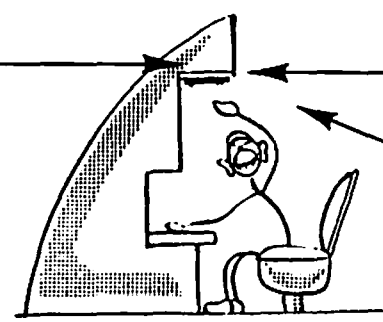
Flight Engineer's
Circuit Breaker Panel No. 3

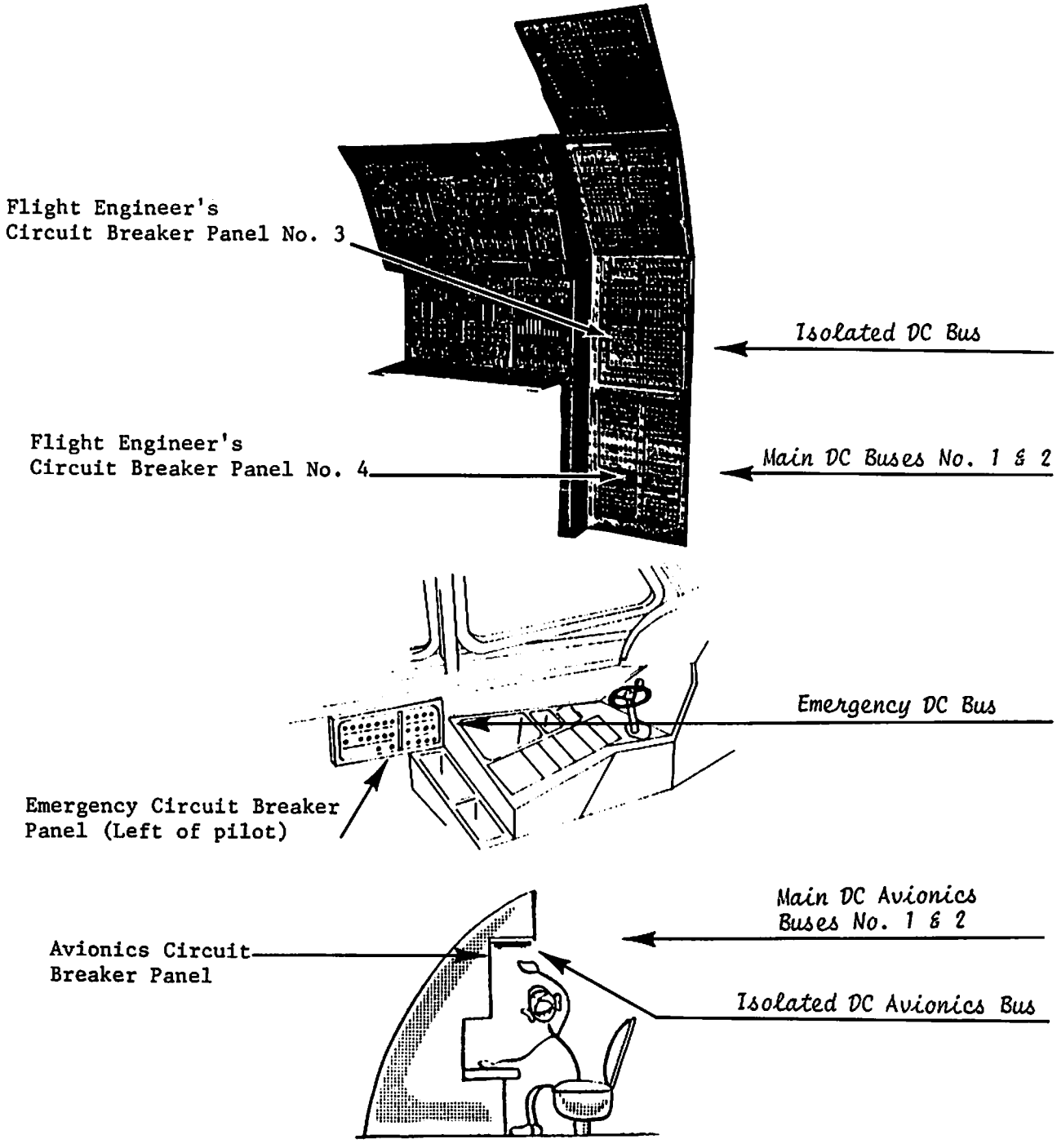
Flight Engineer's
Circuit Breaker Panel No. 4



Emergency Circuit Breaker
Panel (Left of pilot)

Avionics Circuit
Breaker Panel





Correct any wrong answers you may have had on Page 39, then CONTINUE the review on Page 41.

1. DC power requirements are normally supplied by two Transformer/Rectifiers.

   ( ) Yes ( ) No

2. The _____ Amp Current Limiter connects the Main DC Buses together.

   ( ) 325 ( ) 400

3. Can the Battery be used to power the Isolated DC Buses for APU starting?

   ( ) Yes ( ) No

4. The 400 Amp Current Limiter is located behind Flight Engineer's Circuit Breaker Panel No. _____.

   ( ) 3 ( ) 4

5. The Emergency DC Bus is normally powered from the:

   ( ) Emergency Generator. ( ) Transformer/Rectifier Units.

6. Does the Isolated DC Bus Reverse Current Relay prevent emergency or battery power from being supplied to the Main DC Buses?

   ( ) Yes ( ) No

7. These lights 

illuminate when the Emergency Generator is supplying power to the Emergency DC Bus.

   ( ) Yes ( ) No

8. The 

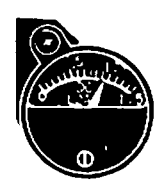
light tells us:

   ( ) To turn on the battery to power the Isolated DC Buses.

   ( ) The battery is powering the Isolated DC Buses.

9. This loadmeter indicates a load of:

   ( ) 100 Amps. ( ) 200 Amps.



CONTINUE the review on Page 42.

10. The Reverse Current Relays are located behind:

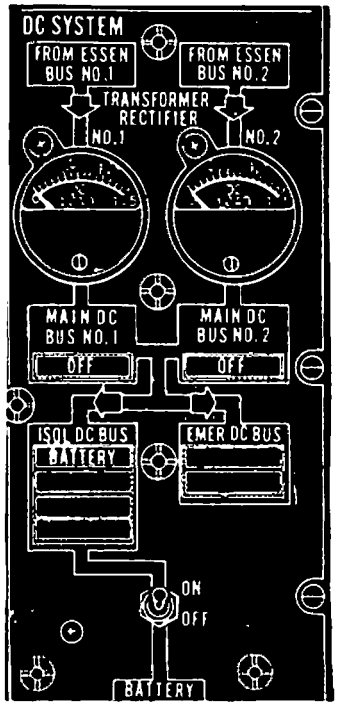
( ) Circuit Breaker Panel No. 3.

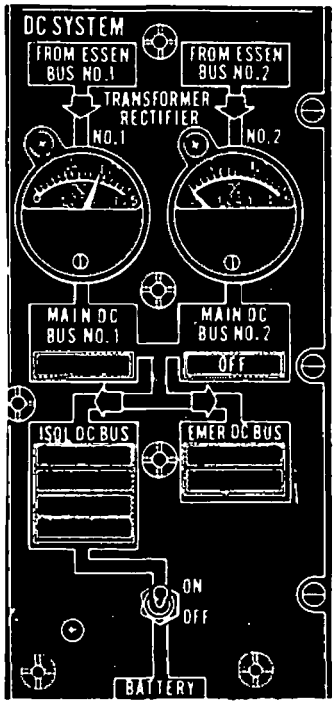
( ) Circuit Breaker Panel No. 4.

11. The Isolated DC Bus is located on Flight Engineer's Circuit Breaker Panel:

( ) No. 3. ( ) No. 4.

12. Look at the panels and list the probable malfunctions.





a. Probable Malfunction

_____

_____

b. Probable Malfunction

_____

_____

CHECK your answers on Page 43.

1. Yes

2. 400

3. Yes

4. 3

5. Transformer/Rectifier Units

6. Yes

7. Yes

8. The Battery is powering the Isolated DC Buses.

9. 200

10. Circuit Breaker Panel No. 3

11. No. 3

12.

a. Probable Malfunction:

Both T/R units inoperative. Battery powering Isolated & Emergency Buses.

b. Probable Malfunction:

No. 2 T/R inoperative plus 400 Amp Current Limiter open.

THE END

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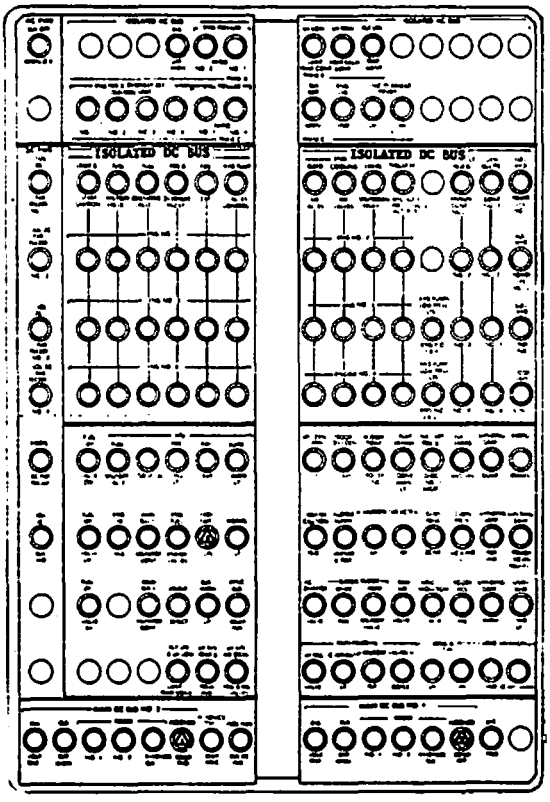
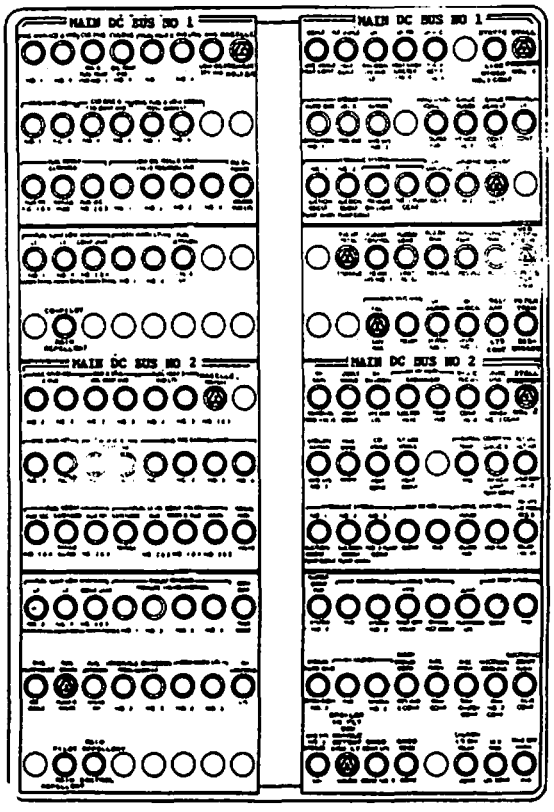
Yes, we can say, "the *ISOLATED BUSES* are on Flight Engineer's Circuit Breaker Panel *No. 3* and the Main DC Buses are on Flight Engineer's Circuit Breaker Panel No. 4," because they are. Check the picture below.



Flight Engineer's
Circuit Breaker Panel *No. 3*

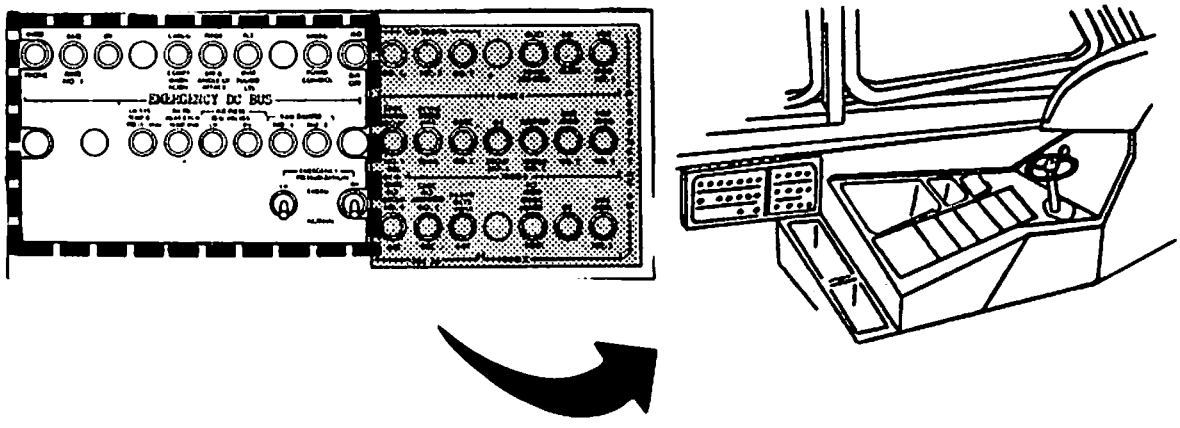


Flight Engineer's
Circuit Breaker Panel No. 4

Okay, now that we have the Main DC Buses and the Isolated DC Bus pinned down, let's look at a Bus that is even more important.

The EMERGENCY DC BUS is our *most important* DC BUS.

From the picture, determine the location of the EMERGENCY DC BUS.



The EMERGENCY DC BUS is located on the Emergency Circuit Breaker Panel, to the left of the pilot.

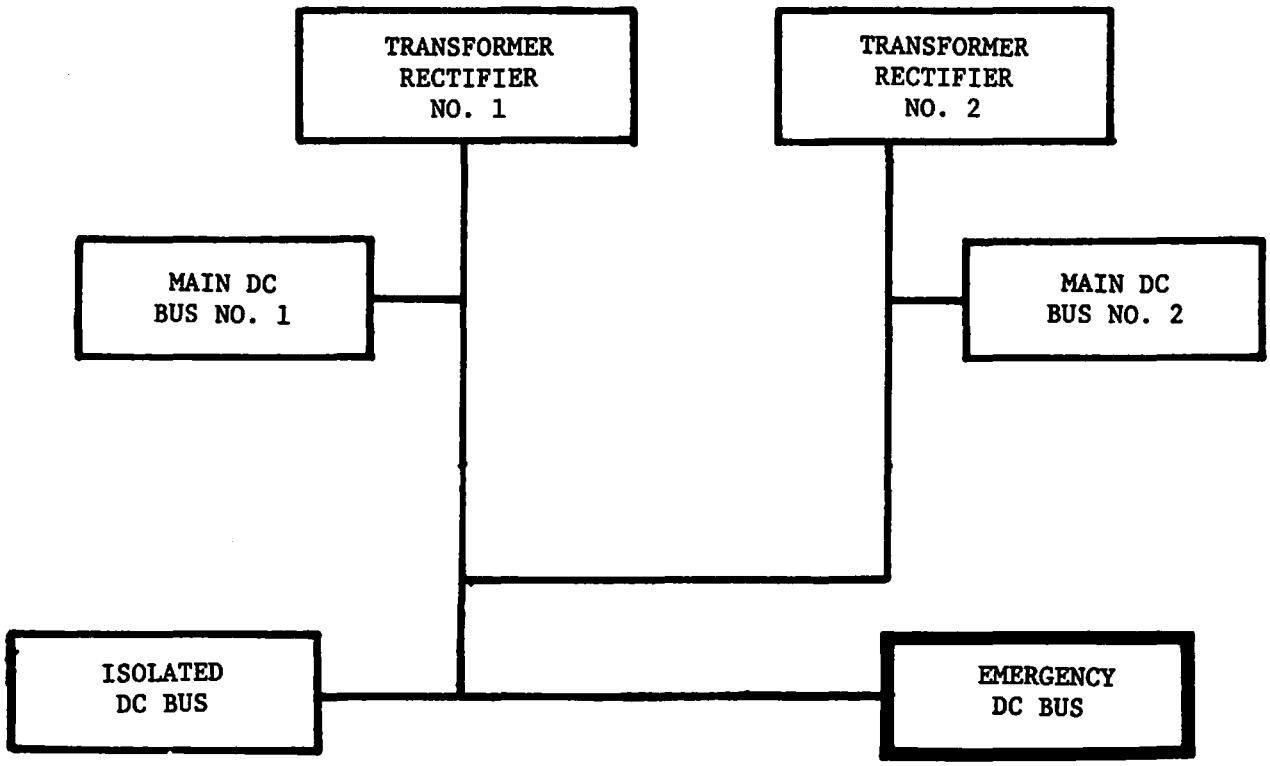
( ) No

( ) Yes

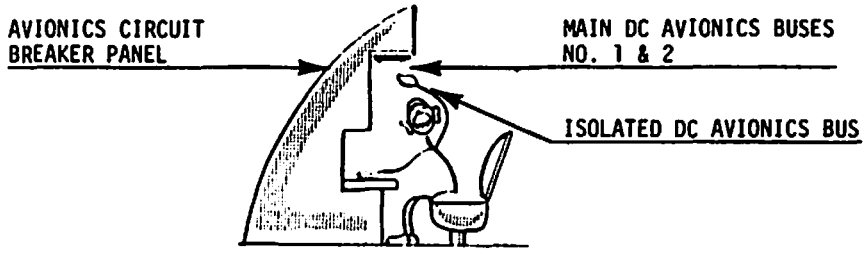
Yes, absolutely, the EMERGENCY DC BUS is located on the Emergency Circuit Breaker Panel to the left of the pilot.

The Emergency DC Bus is normally powered from the Transformer/Rectifiers along with the Main DC Bus No. 1 and the Isolated DC Bus. But in an *emergency* it can be powered by the Emergency Generator.

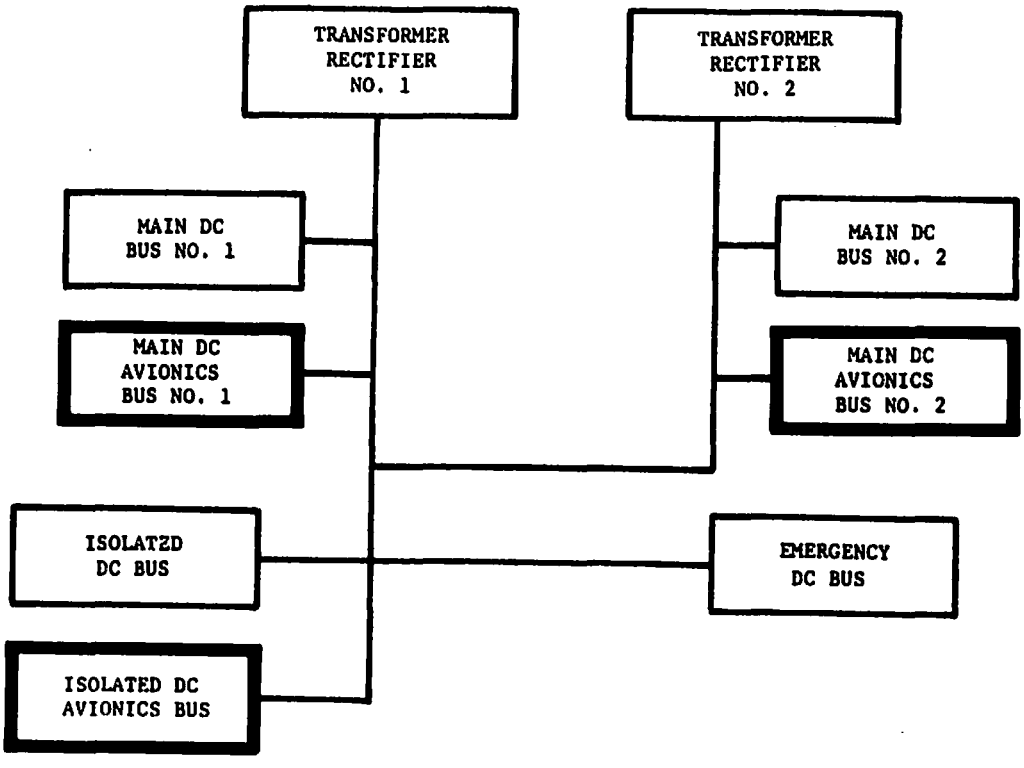
Let's add the EMERGENCY DC BUS to our diagram.



There are three more DC Buses. Remember the Avionics Circuit Breaker Panel above the Navigator's Station? On this panel, we will find two (2) MAIN DC AVIONICS BUSES and one (1) ISOLATED DC AVIONICS BUS.



The Avionics Buses receive power from the same sources as their corresponding DC Buses. Let's add them to our diagram.



This is all of the DC Buses. Before we see how these DC Buses are powered, let's review their locations.