# MODULE 31
# TRANSMITTER SELF-TEST

## OBJECTIVES

Given TO 31S1-2TSC60-16WC-1, perform the Transmitter self-test IAW cards 1-017 thru 1-021 for the 208U-3A PA and cards 1-035 thru 1-042 for the 208U-10A PA.

## PREREQUISITES

Must complete Modules 1, 2, 3, 15, 20, 21, 25, 29, and 30 for the 208U-3A PA plus Modules 5 and 6 for the 208U-10A PA.

## INFORMATION

The Transmitter self-test is a short, quick, go/no-go test to verify the condition of the Transmitter. It requires no external test equipment. The test uses the 599H-2 Audio Oscillator to provide a tone and uses the performance monitors to measure outputs. Therefore, for this test to work, the tone level and the performance monitors must be properly adjusted. But how do you know if they're properly adjusted? You're right if you say by performing other PMIs and performance tests.

Notice that the objective covers two Transmitter configurations. One is for the Transmitter utilizing the 208U-3A PA, and the other is for the Transmitter utilizing the 208U-10A PA. Read over cards 1-017 thru 1-021 in the -16WC-1 TO. If you have the 208U-10A PA, read cards 1-035 thru 1-042 also.

In the first test you enable all four sidebands and key the Transmitter. You then observe the Prove lamp and lamps 18 thru 24 on the Maintenance Display. Figure 31-1 shows the locations of the performance monitors tied to lamps 18 thru 24. A lamp that is turned off indicates adequate signal at that point. With all four sidebands turned on, and the Transmitter keyed, all seven lamps should be off. If any lamp is on, the trouble area can be quickly isolated to the defective area, providing the performance monitors are properly adjusted.

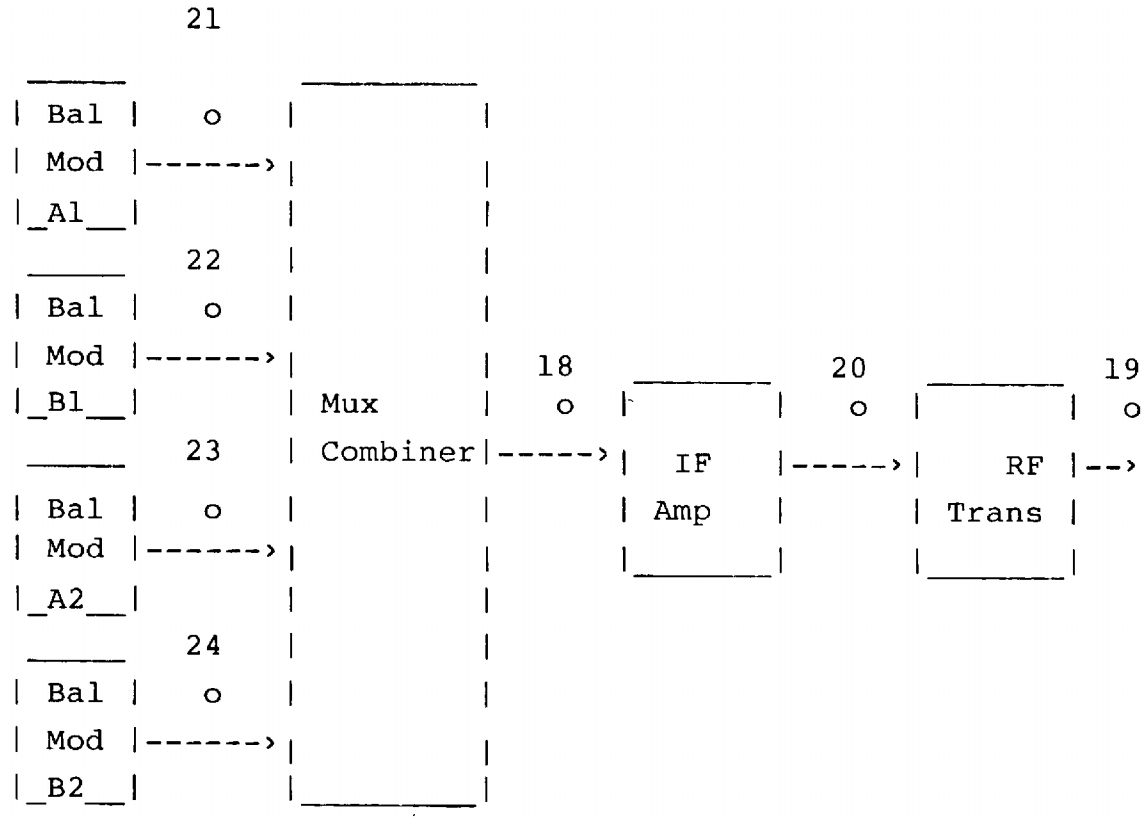


Figure 31-1. Performance Monitor Locations

For example, if lamps 19 and 20 are on, the problem is probably the IF amplifier. If only lamp 19 is on, the defect is probably in the RF translator. If lamps 18, 19, 20, and 24 are on, the most likely problem is a defective

B2 balanced modulator circuit or the audio input circuit. Now let's discuss the Prove lamp.

When you select the self-test mode on the control head, the computer analyzes all the switch positions and the performance monitor inputs. If any of the performance monitors give an incorrect reading for the switch conditions e.g., a sideband enabled, the Transmitter keyed, etc., the Prove lamp will not come on, and the Fault lamp will light. Up until now, all you've checked is the Exciter. The next part of the test examines the PA.

Instead of only stage-by-stage performance monitors, the PA has analog sensors to actually measure the voltages. These readings are converted to digital information and sent to the Maintenance Display to be read on the Digital Multimeter. Figure 11-003 in the workcards lists what the readings should be with and without input signals. Any errors in these voltages would indicate misalignment of the PA or aging of the system.

**NOTE**

When reading forward or reflected power on the Digital Multimeter, ensure the meter on the RF patch panel (local load control panel on the (V)3) is turned to the OFF position or you will get inaccurate readings.

That pretty well covers the self-test of the Transmitter. Remember, if the Prove lamp does not light, look at your other indications to isolate the malfunction to a specific area.

**ADDITIONAL INSTRUCTIONS**

Answer the review questions and check your answers with the confirmation key. Review the material in the module for any questions you missed. Next, ask your trainer for the KEP questions. After your trainer checks your answers and reviews the questions missed with you, go on to the performance procedures.

**REVIEW QUESTIONS**

1. With all four sidebands enabled and the Transmitter keyed, which Maintenance Display data lamps (lamps 18 thru 24) should be on in the self-test mode?

2. In the self-test mode with all four sidebands enabled and the Transmitter keyed, lamp 21 is on. Which circuit is most likely defective?

3. With only one sideband enabled and the Transmitter in high power self-test, you read 1200 watts on the RF patch panel meter. What, if any, is the most likely problem?

4. When taking the analog meter readings, what action should you take in addition to comparing each reading with the optimum readings on the chart?

**PERFORMANCE PROCEDURES**

Have your trainer demonstrate performance of the Transmitter self-test PMI. Practice performing this test under the supervision of your trainer until you feel confident. Your trainer will annotate your training records when he/she feels you are proficient.