

MODULE 46
SPEECH-PLUS CHANNEL UNIT FAULT ISOLATION

OBJECTIVE

Given TO 31S1-2TSC60-12, isolate faults in the speech-plus channel Unit IAW Table 5-51.

PREREQUISITES

1. Must complete QTP Modules 1, 8, and 42 thru 45.
2. Must be able to operate a PSM-6 Multimeter and HP-204C Audio Oscillator.

INFORMATION

Isolating faults within the speech-plus channel unit consists of doing the performance test outlined in Table 5-51 of the -12 TO and applying your knowledge of operation to the results. Read the performance test procedures now, and then we'll discuss them.

The speech-plus channel unit combines two signals (FSK and voice) into one channel on the send side and separates the two on the receive side. After verifying that the voltage from the power supplies are present, the procedures in Table 5-51 test these two signals separately, starting with the speech circuits. The speech test consists of patching a loopback (FSK and Voice OUT jack to FSK and Voice IN jack), injecting audio at the input, and measuring the output. Look at Figure 28 in your Diagrams booklet.

As illustrated at the top of Figure 28, you will be injecting an audio signal from the 204C Audio Oscillator into the voice channel input jack. The audio will be coupled through the transformer into the band reject filter. From here the signal goes to the combiner, then through the transformer to the FSK and Voice OUT jack.

The procedure instructs you to either patch the FSK and Voice OUT jack to FSK and Voice IN jack or connect pin 32 to 14 and pin 38 to 18. Either method will accomplish the same results. However, using the patch panel allows you to test the wiring between the circuit card and the jackfield. Either way, the signal will be connected through the transformer to the band reject filter.

From the band reject filter the signal is coupled through the transformer to the voice channel output. This is where you patch the 600-Ohm Meter on the teletype test panel. The meter should read 2dB below the level injected from the Audio Oscillator.

There are a few things that could cause the level to be incorrect. Any one of the circuits shown on the block diagram that we just traced the signal through could be defective. In order to isolate the defective section, you should first determine whether the problem is in the send circuits or the receive circuits. This can easily be accomplished by connecting the meter to the FSK and Voice OUT jack in place of the loopback. The signal loss through the send path should be 0 to 4dB.

If the send circuits check good you can test the receive circuits by connecting the Audio Oscillator to the FSK and Voice IN jacks. Connect the meter to the voice channel output jack. The signal loss should be 0 to 4dB.

Steps 8 and 9 of the performance test check the operation of the band reject filter. You will inject a signal to simulate the output of the FSK channel card and then measure the audio at the Voice OUT jack. The band reject filter should attenuate the FSK signal at least 47dB.

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. If the speech-plus channel unit fails the first audio test, what should you do first to isolate the malfunction?
2. Where should you look to find which jack on the jackfield is connected to J1-22 on the circuit card?
3. How much should the band reject filter attenuate the FSK signal from the receive audio signal?
4. What advantage is there to connecting the test equipment to the audio jackfield instead of the test points on the circuit cards?

PERFORMANCE PROCEDURES

Have your trainer demonstrate performance of the speech-plus channel unit performance test. Then 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.