TD-3 MICROWAVE RADIO
J68386G AND J68386H TRANSMITTER-RECEIVER BAYS
COMMON EQUIPMENT TESTS
IMPULSE NOISE TROUBLESHOOTING

Caution: This is an out-of-service test. Switch service to the protection channel. Be very careful of hazardous voltages when checking wiring, power cables, and plugs. When checking coaxial cables and waveguide connections, make certain that they are left properly aligned and tightened.

1. GENERAL

1.01 Defective components, loose connections, and dirty or poor connections in TD-3 radio equipment can cause impulse noise which, in turn, can cause data errors. These noise impulses, generally, are so short in duration that normal noise measurements and the noise detectors of the Protection Switching System do not detect them. However, if the switching system is occasionally showing a larger number of switches on one channel, compared to the other channels, then that channel may have a large number of noise impulses being generated at different times or noise pulse of longer duration. In either case, this type of noise can produce large numbers of data errors and steps should be taken to locate the source of impulse noise in the TD-3 transmitter-receiver bays.

1.02 This section should also be performed when 6G noise meters or portable 1A RDT monitoring terminals indicate that impulse noise problems exist in a particular switching section. This issue will affect the Equipment Test List.

1.03 First, the procedure of this section requires that out-of-service impulse monitoring be set up for the radio channel under investigation in the switching section (from Section 411-100-504). Second, it requires that a quiet IF carrier be inserted on the radio channel at the transmitting end of the switching section. Finally, at the receiving end of the switching section, an FMR/6G noise measuring set combination is used to monitor for impulse noise. Direct communication is maintained between the personnel monitoring the 6G noise set and those applying this trouble shooting procedure at the radio bays. The personnel at the 6G noise set location should immediately inform the personnel working on the radio bay when noise impulses appear, to aid in isolating a defective unit or poor contact which may be causing noise impulses.

1.04 When tapping a unit to check for defective components, tap lightly. If a unit is hit sufficiently hard, errors could be produced falsely. With experience, maintenance personnel should be able to determine if the unit contains a defective component that should be replaced.

1.05 Generally, the procedure to be followed will require maintenance personnel to inspect, feel, tighten, clean, adjust, and lubricate components of various units in the bay. All cables and connections should be pulled, pushed, and wiggled to make sure that they are tight and are making good contact. When intermittent connections are found, inspect to see that the connector is properly and securely seated and then check to see that the contacting surfaces are clean.

1.06 When spare units or assemblies are available, and the unit in the bay seems excessively microphonic or erratic, the spare unit may be used to replace the bay unit. The bay unit can then be sent to the test bench for detailed troubleshooting and cleaning. Be sure that complete information is sent to the test bench with the unit. When a unit comes back from the test bench and goes into the bay, further bay tests should be performed to ensure that the trouble is cleared (the 24-hour monitoring chart of Section 411-100-504).

1.07 Power plugs should be checked to see if their retaining clips are holding tightly enough so that no errors are produced when pulling on the plug and connecting wires. If necessary, bend the retaining clips to make them hold the power plugs more securely.

2. BAY TESTS

2.01 With the 6G sets operating at each end of the section to be tested as given in Section 411-100-504, and with direct communication between the two monitoring sets, start the tests. Monitoring at the transmitting end will ensure that errors produced in that station will not be confused with errors produced by the tests. Start the tests in the bay at the head end and work back to the end of the section through each repeater. The 6G set at the end of the section will see all incoming hits.

2.02 Testing procedures will start with the −19 volt regulator and microwave generator/s at the bottom of the bay and work their way up to the top of the bay.

A −19 volt regulator is checked as follows:

(a) Check all power cables and connections for tightness.

(b) Vary the voltage adjustment control slightly to see if it is dirty or erratic. Be sure to return it to the −19 volt reference on the bay meter −19 volt position.

(c) Tap the unit lightly for microphonic or loose components.

A microwave generator is checked as follows:

(a) Check the following cables as suggested in 1.05.

(1) All coaxial cables running between the 500-MHz generator, filter, isolators, and the 1- and 4-GHz multipliers. Be careful with the small, rigid coaxial cables. Be sure that the special connectors are tight and seated properly but do not overtighten.

(2) The output coaxial cable and associated connectors.

(3) The power cable.

(b) Tap around the 500-MHz generator unit. Check for variations in the oscillator level by monitoring the appropriate position on the bay control panel meter.

2.03 Check the TWT amplifier, receiver modulator-IF preamplifier, and the alarm and meter panels as follows:

(a) The TWT and its associated power supply cannot be readily accessed for any extensive testing due to the isolation of its hazardous voltages and fields. However, tap lightly around the TWT power plug and the case of the tube to ensure tightness of connections. Check waveguide flanges for alignment and tightness.

(b) Open the alarm and meter panels and check the cables and plugs for intermittent troubles as outlined in Part 1 of this section.

(c) Check the receiver modulator-IF preamplifier as follows:

(1) Check the power plug and cable wires.

(2) Check the IF output cable and plug for intermittents.

(3) With a light screwdriver or tuning tool, lightly tap the panel around the four controls: DIODE BIAS, SHAPE, SLOPE and LEVEL.

(4) Check the waveguide flanges for alignment and tightness.

2.04 Check the 40-MHz oscillator-shift modulator as follows:

(a) Check the power plug and cable wires.

(b) Check the waveguide flanges for alignment and tightness.

(c) Tap lightly around the PWR ADJ control to see if it is dirty or erratic.

(d) Tap the whole shifter assembly for microphonics.

2.05 Check the IF driver-amplifier and transmitter-modulator as follows:

(a) Check the power plug and cable wires.

(b) Check the waveguide flanges for alignment and tightness.

(c) With a light screwdriver or tuning tool, lightly tap the unit, especially around the RL1, RL2, BIAS, SLOPE, and GAIN controls for microphonics.

2.06 Check the IF main amplifier and the IF limiter/carrier resupply assemblies as follows:

(a) Swing the framework assembly open and check all of the power plugs and cables.

(b) Check all of the IF cables and plugs.

(c) With a light screwdriver or tuning tool, tap lightly around the units and especially around the area of the various controls to check for microphonic components.

(d) Check all connections to filters and equalizers for tightness.

2.07 The waveguide and the channel dropping and combining networks at the top of the bay should be checked to see that all flanges are aligned and tightened.