

TROUBLE LOCATING PROCEDURES  
TOLL TANDEM TRUNKS  
NO. 4A TOLL SWITCHING SYSTEMS

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1. GENERAL

1.01 This section contains certain suggestions which will enable the maintenance forces to locate transmission trouble in toll tandem trunks terminating in 4A equipment. Charts 1 and 2 are helpful as a guide to determine cause of transmission trouble.

1.02 Toll tandem trunks terminated in 4A equipment are controlled by the originating office. These trunks shall be tested at the 17C toll testboard. However, the responsibility for setting up the circuits and obtaining tests lies with the control office.

1.03 The attendant at the originating control office shall call the 17C toll testboard. This circuit is to be used for a talking trunk.

1.04 When the tester at the 17C testboard is reached, inform him what test is required and then dial code 101 on the trunk to be tested.

1.05 The tester at the 17C testboard will proceed as outlined in Section 212-564-901PT.

1.06 If the tester at the 17C testboard reports that the circuit is in trouble, the following suggested procedure may be followed.

2. DETERMINATION OF SOURCE OF TROUBLE

2.01 The control office may call the 4A maintenance center and request that a

temporary transposition of the bad trunk circuit and a known good trunk circuit be made. Then, by having the 17C testboard retest the circuit, it can be determined whether the trouble is IN or OUT.

(A) Trouble OUT

2.02 If the trouble is OUT, the control office can isolate the trouble by successive changing of sections and having the 17C testboard retest the circuit until the bad section is found.

(B) Trouble IN

2.03 If the trouble is IN, the control office shall refer it to the 4A maintenance center personnel who may follow the procedure outlined below:

(C) Return Loss Requirements Not Met

2.04 If the return loss requirements, specified for the circuit, are not met, proceed as follows:

- (1) At the incoming trunk equipment, establish a call to the originating office and ask attendant to terminate trunk to be tested in 600-ohm termination.
- (2) Watch the relays of the trunk equipment to determine when trunk is seized. Wait until trunk goes to "reorder." Then momentarily open IS lead contacts of the C.O. relay. This drops the connection through link frames.
- (3) Connect the 21A TMS or 19C and 13A TMS to the IT and IR and IT1 and IR1 punchings on terminal strip at the back of trunk equipment.
- (4) Make return loss measurements as outlined in Test (C) of Section 212-564-901PT. This measures the return loss to the 4-wire side of the trunk circuit.

2.05 If the foregoing tests indicate that the return loss is deficient, a return loss measurement of the 2-wire section may be made with the TEST HYBRID as outlined in Test (A) of Section 212-564-902PT.

SECTION 212-564-903PT

(D) 1000-Cycle Net Loss Requirements Not Met

2.06 Access to the 2-wire IN end of the incoming trunk circuit may be had at the TST jack. In order to avoid seizing a sender, a 2 mf condenser should be inserted in series with the cord used for testing. 1MW may be obtained by patching the OS jack on

the AOCT to the SP jack. The SP jack appears in alternate bays at the incoming trunk equipment and may be patched to the TST jack. The 1000-cycle net loss from the 2-wire side to the 4-wire side of the trunk circuit can be ascertained by connecting a 12A, 13A or the DET section of a 21A TMS to the IT and IR or IT1 or IR1 punchings at the back of the trunk equipment.

CHART I

1000-CYCLE NET LOSS MEASUREMENTS

Type of Trouble	Probable Trouble
Too Long	Bad cable pair; incorrect or defective repeating coil ratio 120P coils in trunk circuit; pad wiring incorrect.
Too Short	Pads strapped out; wrong facilities.
4W IN and 4W OUT Not the Same	Pad wiring not the same; coil ratios not the same on both sides; defective repeating coils; defective series capacitor in 4W path; defective simple shunt retard in 4W path.

CHART II

RETURN LOSS MEASUREMENTS

Type of Trouble	Probable Trouble
Low Return Loss 0 to 4.0 db	Balance net open or short; open or shorted line.
4.0 to 10.0 db	Wrong type precision net or compromise net used; serious error in strapping or no strapping in B.O. capacitors; open terminating circuit at far end.
Only a Few db From Required R.L.	B.O. capacitor on the high or low tolerance side; strapping on network incorrect; modification for D88 incorrect; wrong type net; minor irregularities in facilities.