L MULTIPLEX TERMINALS

COMMON EQUIPMENT

MASTERGROUP CONNECTOR J68882AP (MMX-2 TO MMX-2)

OUT-OF-SERVICE TESTS

This section provides procedures for out-of-service tests of mastergroup connector J68882AP (Section 356-027-100) and associated trunk circuits. Included are overall loss adjustment, cable equalizer adjustments, and a pilot elimination test which apply to both regular and spare mastergroup connectors.

This section is reissued to correct errors, improve the test procedure, and show the production model of the mastergroup connector. Arrows are used to indicate significant changes. ***Equipment Test Lists are not affected.***

Mastergroup connector J68882AP (Fig. 1) provides two transmission paths. Each transmission path passes the basic mastergroup signal (564 to 3084 kHz) from an MMX-2 receiving bay to an MMX-2 transmitting bay. ▶At a frogging point in an L4 system, a mastergroup equalizer is provided for each mastergroup in the MMX-2C receiving bay. The mastergroup equalizer adjustment procedure is provided in Section 356-524-501.◀

These tests may be conducted either to assure that a connector circuit is operating properly prior to placing in service or to check a suspected connector that has been removed from service.

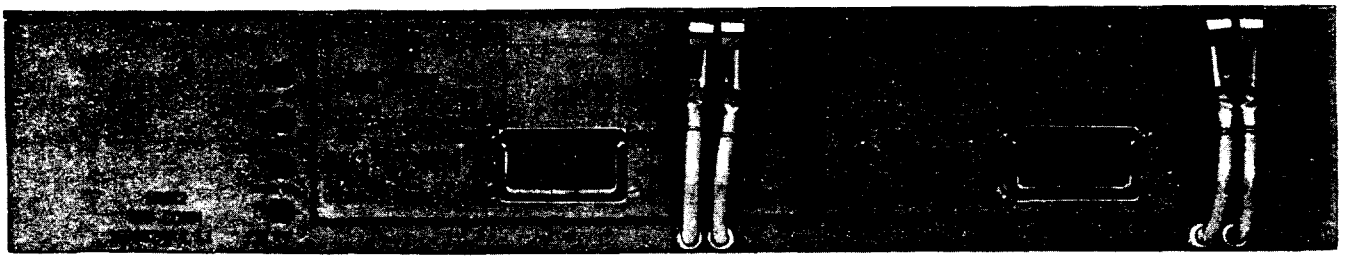

Fig. 1—Mastergroup Connector J68882AP

APPARATUS:

The tests in this section require suitable transmission measuring equipment. Refer to Section 356-010-500 and select, from available equipment, sending and receiving units having the following capabilities:

Sending test equipment capable of delivering, into 75-ohm circuits, signals between 0.5 and 3.2 MHz at -14.0 dBm

Receiving test equipment capable of detecting, from 75-ohm circuits, signals between 0.5 and 3.2 MHz at powers between -75.0 and -20.0 dBm.

Note: A frequency counter is required for the ***alternate*** method of performing the pilot elimination test in this section.

CHART 1

MASTERGROUP CONNECTOR TESTS

STEP	PROCEDURE

A. Center-Frequency Loss Adjustment and Slope Measurements

Note: There are two identical, independent transmission paths in the mastergroup connector which are designated E-W and W-E. Either transmission path can be checked first and the tests repeated, if required, for the other transmission path. Before starting this test, perform the following:

(a) Check that the transmission path to be tested is out of service.

(b) Locate the TRK IN jack (MMX-2 receiving bay) and the TRK OUT jack (MMX-2 transmitting bay) associated with the transmission path to be tested.

(c) Locate the jacks on the mastergroup connector which are in the transmission path to be tested.

CHART 1 (Cont)

STEP	PROCEDURE

(d) Locate the cable equalizer in the transmission path to be tested. ▶Two 210B cable equalizers are mounted at the left side of the mastergroup connector. The E-W equalizer is on the front panel, and the W-E equalizer is mounted directly behind.

Loss Adjustment◀

At MMX-2 receiving bay,

1 Apply a 1.8-MHz test signal at -14.0 dBm to the TRK IN jack [patch (1), Fig. 2].

Note: Remove the patch plug between this jack and the adjacent MG OUT A jack for the tests in this section.

At MMX-2 transmitting bay,

2 Measure and record the 1.8-MHz power at the TRK OUT jack [patch (2), Fig. 2].

Note: Remove the patch plug between this jack and the adjacent MG IN A jack. This action removes the 2840-kHz mastergroup pilot and a loss-of-pilot alarm results. Depress the alarm cutoff pushbutton lamp, located between the carrier and pilot test panels, to silence the alarm.

Requirement: -21.0 dBm ±0.1 dB

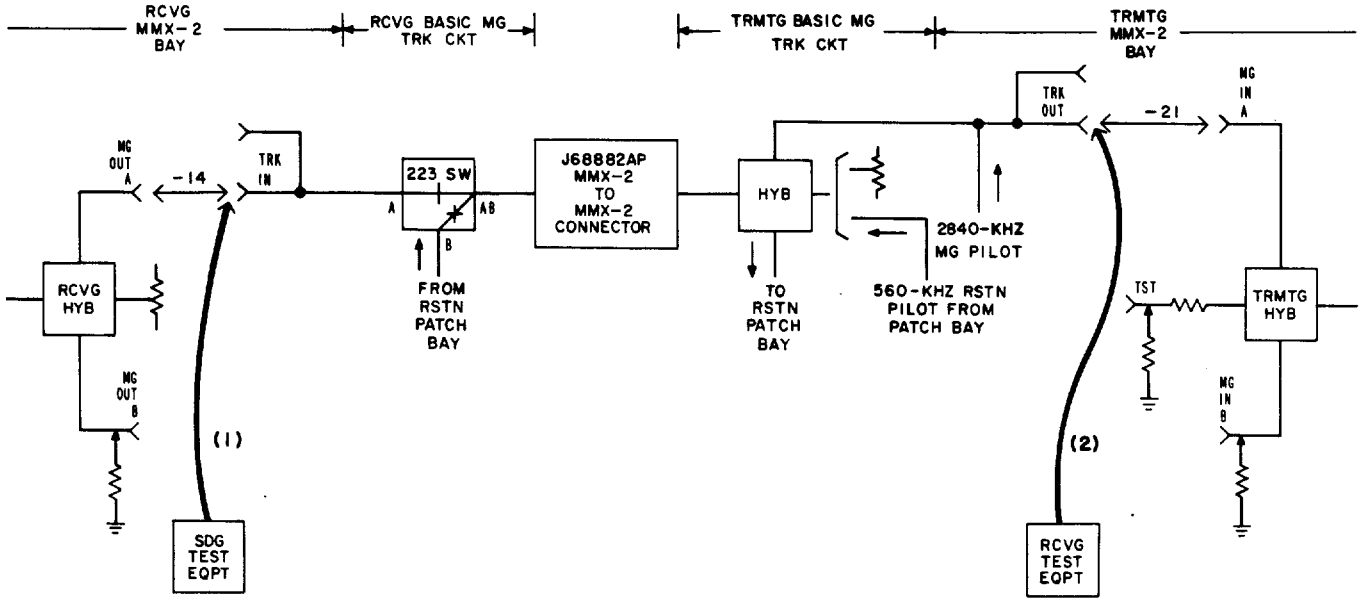

Fig. 2—▶Mastergroup Connector Test Connections◀

CHART 1 (Cont)

STEP	PROCEDURE
3	Proceed to Step 4 if the requirement is ***not*** met. Otherwise, proceed to Step 8.
	At mastergroup connector,
4	Adjust the ADJ control on the filter-amplifier module for the transmission path under test to meet the requirement.
	Note: Adjust the ADJ control only on the 231D amplifier, if necessary, to meet the requirement.
5	Proceed to Step 6 if the requirement is ***not*** met. Otherwise proceed to Step 8.
6	Replace the 231D amplifier.
7	Repeat Steps 2 through 4, as required.
	▶Slope Measurements◀
8	Repeat Steps 1 and 2, first using a 0.6-MHz test signal and then using a 3.0-MHz test signal at the TRK IN jack.
	Requirement: The 0.6-MHz signal power and the 3.0-MHz signal power at the TRK OUT jack should be within ±0.2 dB of the 1.8-MHz signal power measured in Step 2.
9	Proceed to Part C to check the pilot elimination filter if the requirement is met at ***both*** frequencies. Otherwise, proceed to Part B to adjust the 210B cable equalizer for the transmission path under test.
	B. Cable Equalizer Adjustments
10	Set the cable equalizer screw switches as indicated on the top line in Table A to provide 0.0—dB slope correction.
	▶***Note:*** Screws for the E-W cable equalizer are accessible from the front of the mastergroup connector after a plate is removed. Screws for the W-E cable equalizer are accessible from the rear.◀
11	Apply a 0.6-MHz test signal at -14.0 dBm to the TRK IN jack.
12	Measure and record the 0.6-MHz signal power at the TRK OUT jack.
13	Repeat Steps 11 and 12 for a 3.0-MHz test signal.
14	Determine the amount of slope correction required.

TABLE A

210B EQUALIZER SETTING

SLOPE IN DB (0.5 TO 3.0 MHZ)	● INDICATES SCREWS TIGHTENED DOWN (ALL OTHERS WELL UP)																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
0.0	●	●	●	●	●	●	●									●		●		●		●		
0.125		●	●	●	●	●	●		●							●		●		●		●		
0.250			●	●	●	●	●		●	●						●		●		●		●		
0.375				●	●	●	●		●	●	●					●		●		●		●		
0.50					●	●	●		●	●	●	●				●		●		●		●		
0.625						●	●		●	●	●	●	●			●		●		●		●		
0.75	●	●	●	●	●	●		●							●	●			●			●		
0.875		●	●	●	●	●		●	●						●	●			●			●		
1.0			●	●	●	●		●	●	●					●	●			●			●		
1.125				●	●	●		●	●	●	●				●	●			●			●		
1.25					●	●		●	●	●	●	●			●	●			●			●		
1.375						●		●	●	●	●	●	●		●	●			●			●		
1.50	●	●	●	●	●	●	●									●			●		●		●	
1.625		●	●	●	●	●	●		●							●			●		●		●	
1.75			●	●	●	●	●		●	●						●			●		●		●	
1.875				●	●	●	●		●	●	●					●			●		●		●	
2.0					●	●	●		●	●	●	●				●			●		●		●	
2.125						●	●		●	●	●	●	●			●			●		●		●	
2.25	●	●	●	●	●	●	●										●		●			●		●
2.375		●	●	●	●	●	●		●								●		●			●		●
2.50			●	●	●	●	●		●	●							●		●			●		●
2.625				●	●	●	●		●	●	●						●		●			●		●
2.75					●	●	●		●	●	●	●					●		●			●		●
2.875						●	●		●	●	●	●	●				●		●			●		●
3.0							●		●	●	●	●	●	●			●		●			●		●

Caution: Use a torque screwdriver for closing screw switches to ensure a good electrical contact. Tighten 5 to 7 inch-pounds for original 4-40 screws and 7 to 9 inch-pounds for replacement 5-40 screws.

CHART 1 (Cont)

STEP	PROCEDURE

Note: Slope correction required equals the difference between the 0.6-MHz power and the 3.0-MHz power.

Example:

Power of 3.0-MHz signal = -22.3 dBm

Power of 0.6-MHz signal = -20.7 dBm

Difference = 1.6 dB

15 Set the 210B cable equalizer screw switches according to Table A to provide the slope correction required.

Example: Slope correction required is 1.6 dB. Screws to be tightened down are 2 through 7, 9, 16, 19, 21, and 23.

16 ◗Repeat the center-frequency loss adjustment in Part A and then proceed to Part C to check the pilot elimination filter.◖

C. Pilot Elimination Test

Each transmission path in the mastergroup connector includes a 761A band-elimination filter to block the 2840-kHz mastergroup pilot from the MMX-2 receiving bay. Due to the narrow bandwidth of the filter, the test signal used to check this filter must be at the correct frequency to obtain valid results. Two methods are explained for this test: the ***preferred*** method uses a pilot signal obtained from the MMX-2 receiving bay; the ***alternate*** method uses a test signal from sending test equipment set to the exact frequency by means of a frequency counter.

At MMX-2 transmitting bay,

17 Remove the receiving test equipment from the TRK OUT jack.

18 Replace the patch plug between the TRK OUT and MG IN A jacks.

Note: This restores the mastergroup pilot signal to the transmitting mastergroup circuit. Depress the pushbutton lamp between the carrier and pilot test panels to reset the alarm.

At MMX-2 receiving bay,

19 Apply a 1.8-MHz test signal at -14.0 dBm to the TRK IN jack.

At mastergroup connector,

20 Remove the T-connector cord from the OUT jack for the transmission path under test.

CHART 1 (Cont)

STEP	PROCEDURE
21	Measure and record the 1.8-MHz power at the OUT jack.
22	Determine the loss at 1.8 MHz from the TRK IN jack to the OUT jack.
23	Proceed with the preferred method in Steps 24 through 31, if possible. Otherwise, proceed with the alternate method in Steps 32 through 37.
	Preferred Method
	At MMX-2 receiving bay,
24	Measure and record the 2.840-MHz pilot power at an MG OUT B jack of a spare mastergroup.
	Note: Nominal pilot power at the MG OUT jacks is -34 dBm.
25	Remove the sending test equipment from the TRK IN jack.
26	Patch the spare MG OUT B jack to the TRK IN jack.
	At mastergroup connector,
27	Measure and record the pilot power at the OUT jack.
28	Determine the loss at the pilot frequency due to the filter in the mastergroup connector.
	Example:
	Pilot power at MG OUT B jack measured in Step 24 = -34.5 dBm Add the loss at 1.8 MHz determined in Step 22 = - 3.2 dB Reference pilot power at OUT jack = -37.7 dBm
	Actual pilot power at OUT jack measured in Step 27 = -71.8 dBm Subtract reference pilot power at OUT jack = -37.7 dBm Loss due to filter in mastergroup connector = 34.1 dB
	Requirement: A minimum loss of 33.0 dB in the filter
29	Remove the receiving test equipment and replace the T-connector cord in the OUT jack.

CHART 1 (Cont)

STEP	PROCEDURE
	At MMX-2 receiving bay,
30	Remove the patch to the TRK IN jack.
31	Proceed to Step 36.
	Alternate Method
	At MMX-2 receiving bay,
32	Apply a 2.840-MHz test signal at -14.0 dBm to the TRK IN jack.
	Note: Use a frequency counter to obtain a test signal at the exact frequency.
	At mastergroup connector,
33	Measure and record the 2.840-MHz signal power at the OUT jack.
34	Determine the loss at the pilot frequency due to the filter in the mastergroup connector.
	Example:
	Pilot power at MG OUT B jack measured in Step 24 = -34.5 dBm Add the loss at 1.8 MHz determined in Step 22 = -3.2 dB Reference pilot power at OUT jack = -37.7 dBm
	Actual pilot power at OUT jack measured in Step 27 = -71.8 dBm Subtract reference pilot power at OUT jack = -37.7 dBm Loss due to filter in mastergroup connector = 34.1 dB
	Requirement: A minimum loss of 33.0 dB in the filter
35	Remove the receiving test equipment and replace the T-connector cord in the OUT jack.
	At MMX-2 receiving bay,
36	Replace the patch plug between the MG OUT A and TRK IN jacks.
37	Restore the mastergroup connector circuit to normal.