TYPE N3 CARRIER TELEPHONE SYSTEM
VOICE-FREQUENCY AMPLIFIER
THROUGH-CHANNEL CONNECTOR AND PAD UNIT
OVERALL LINEUP

N3 voice-frequency (VF) amplifiers are used at both terminals of an N3 System to provide noncompandored channels for data or other special services (Fig. 1). VF amplifiers are used specifically at an interconnecting office for extended data service and may also be used instead of compandors for extended message service to eliminate distortions contributed by a second compressor. Compandors are beneficial at the ends of interconnected message channels for noise reduction (Fig. 2).

This section is reissued to include the testing of J99272CA through-channel connector and pad units which are used for tandem-channel connections. Tables A and B and Fig. 3, 4, 5, 6, and 7 have been added. Arrows are used to indicate major changes in the section. This reissue affects Equipment Test Lists.

►J99272CA through-channel connector and pad units are used at the interconnecting office(s) to provide the proper VF levels for channel interconnections. For an N3-to-N2, -N3, or -N3-L tandem channel connection, two J99272CA units are interconnected. The J99272CA unit for the N 3 terminal is wired to a J98703AH for an N3-to-N1 channel connection or to a J98705AF through-channel unit for an N3-to-O or -ON channel connection. The J99272CA unit is wired to the A5 channel bank for an N3-to-L channel connection at voice frequencies.◄

In the tests described here, a 1000-Hz tone is applied to the transmitting end of a channel and the appropriate adjustments are made at the transmitting and receiving end to adjust the respective VF amplifier gains. These adjustments should be made only after the high-frequency line and the modem units have been tested. Through-channel connections require the adjustment of 89-type resistor values in the J99272CA units at the interconnecting office(s). Test connections are made at the 4-wire VF jacks in the jack field located in the packaged N3 terminal, in the N3-L junction bay, or at a central location in the offices. A channel equipped with VF amplifier units should not be put into service until the following tests have been completed. If these tests are to be performed on a working channel, the channel must be removed from service prior to testing.

APPARATUS:

1—J99272W (or AH) or J98705M Test Stand (for connecting terminal without patching jacks)

1—Hewlett-Packard 400-type VTVM

1—►Centralized Transmission Measuring System (CTMS)◄ or 21A TMS

1—W2FP Cord

2—3P6 or 3P7 Cord

1—3P17 Cord

STEP	PROCEDURE
	At the Transmitting Terminal
	Note: ▶For through-channel connections, test between an N3 terminal at the interconnecting office and the distant N3 terminal, or test between terminating offices for a noncompandored channel.◀
1	Plug a 3P6 cord into the MOD IN jack of the channel under test; then patch this cord to the 1000-Hz −16 dBm 600-ohm test tone source.
	▶***Caution: The IN ADJ and OUT ADJ potentiometers (VF amplifier) must be turned fully counterclockwise before the test tone is applied for initial lineup. This precaution prevents the transmission of a high power tone which could cause a group failure.***◀
2	Use the VTVM with a W2FP cord to measure the output of the VF transmit amplifier at MI and MG (ground) jacks on the associated modem unit.
	Requirement: ▶+16.8 dB.
3	If the requirement of Step 2 is met, instruct the receiving terminal to proceed as in Step 5. If it is not met, adjust the IN ADJ potentiometer on the VF amplifier for the requirement, then proceed as in Step 5.
	Note: If the requirement cannot be met, replace the VF amplifier unit and repeat Steps 2 and 3.◀
	At the Receiving Terminal
4	Have the test tone applied at the distant end, as instructed in ▶Steps 1 through 3.◀
5	Plug a 3P6 cord into the 600Ω TST jack for the CTMS or a 3P17 cord into the DET IN 600Ω jack on the 21A TMS. Measure the output of the receive VF amplifier at the DEM OUT jack for the channel under test.
6	Adjust the OUT ADJ potentiometer for the requirement.
	Requirement: +7 dBm
	Note: ▶If the requirement cannot be met, replace the VF amplifier unit and repeat Step 6.
6.1	Remove the test tone and disconnect the CTMS.
6.2	Repeat Steps 1 through 6.1 for the reverse direction of transmission.◀
	▶***Through-Channel Connector and Pad Units (J99272CA)***
7	At interconnecting offices with jack appearances, apply the +7 dBm test tone, available on jack panels and at centralized VF jacks, to the EQ OUT jack and measure the level at the EQ IN jack for each direction of transmission with the CTMS or 21A TMS. The requirements are given in the first three rows of Table A.

STEP	PROCEDURE
8	Figures 3, 4, and 5 show the regular 89-type resistor loss values in the through-channel connector and pad units but wiring losses may necessitate the use of slightly different values. Substitute resistors in the immediate range of the regular values to obtain the requirements of Table A.

STEP	PROCEDURE

TABLE A

FIGURE	DIRECTION OF TRANSMISSION	REQUIREMENT (EQ IN JACKS)
3	N3 toward N2 or N3 and N2 or N3 toward N3	-16 dBm
4	N3 toward N1, 0, or ON N1, 0, or ON toward N3	-13 dBm +4 dBm
5	N3 toward A-Type Channel Bank and A-Type Channel Bank toward N3	-16 dBm
6	N3 toward N2 and N2 toward N3	-23 dBm
7	N3 toward N1, 0, or ON N1, 0, or ON toward N3	-20 dBm -3 dBm

9 If patching jacks are not provided for the N2, N1, 0, or ON terminal, remove the unit involved in a channel interconnection and mount the unit in the appropriate test stand. See Table B.

TABLE B

UNIT	TEST STAND
N2 VF Amplifier or Compandor	J99272W or J99272AH
N1, 0, or ON Through-Channel Unit	J98705M

10 Apply the 1-mW test tone to the EQ OUT jack and measure the level at the EQ IN jack for each direction of transmission with the CTMS or 21A TMS. Refer to Fig. 6 or 7 and apply the appropriate requirements given in the last two rows of Table A.

11 Figures 6 and 7 show the regular 89-type resistor loss values in the through-channel connector and pad units but wiring losses may necessitate the use of slightly different values. Substitute resistors in the immediate range of the regular values to obtain the requirements.◀

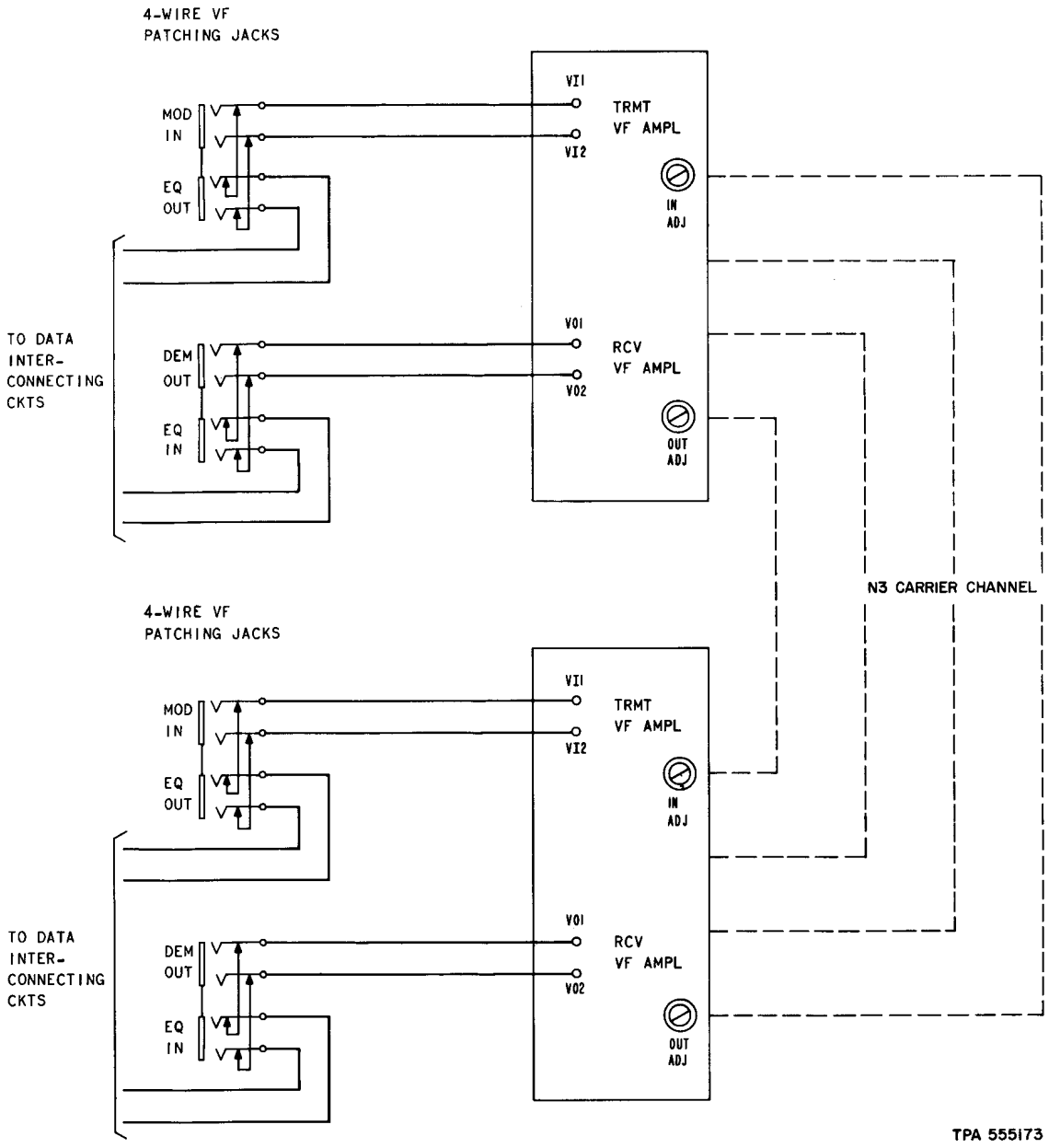

Fig. 1—VF Amplifier—Used to Provide a Noncompandored Channel for Data Transmission

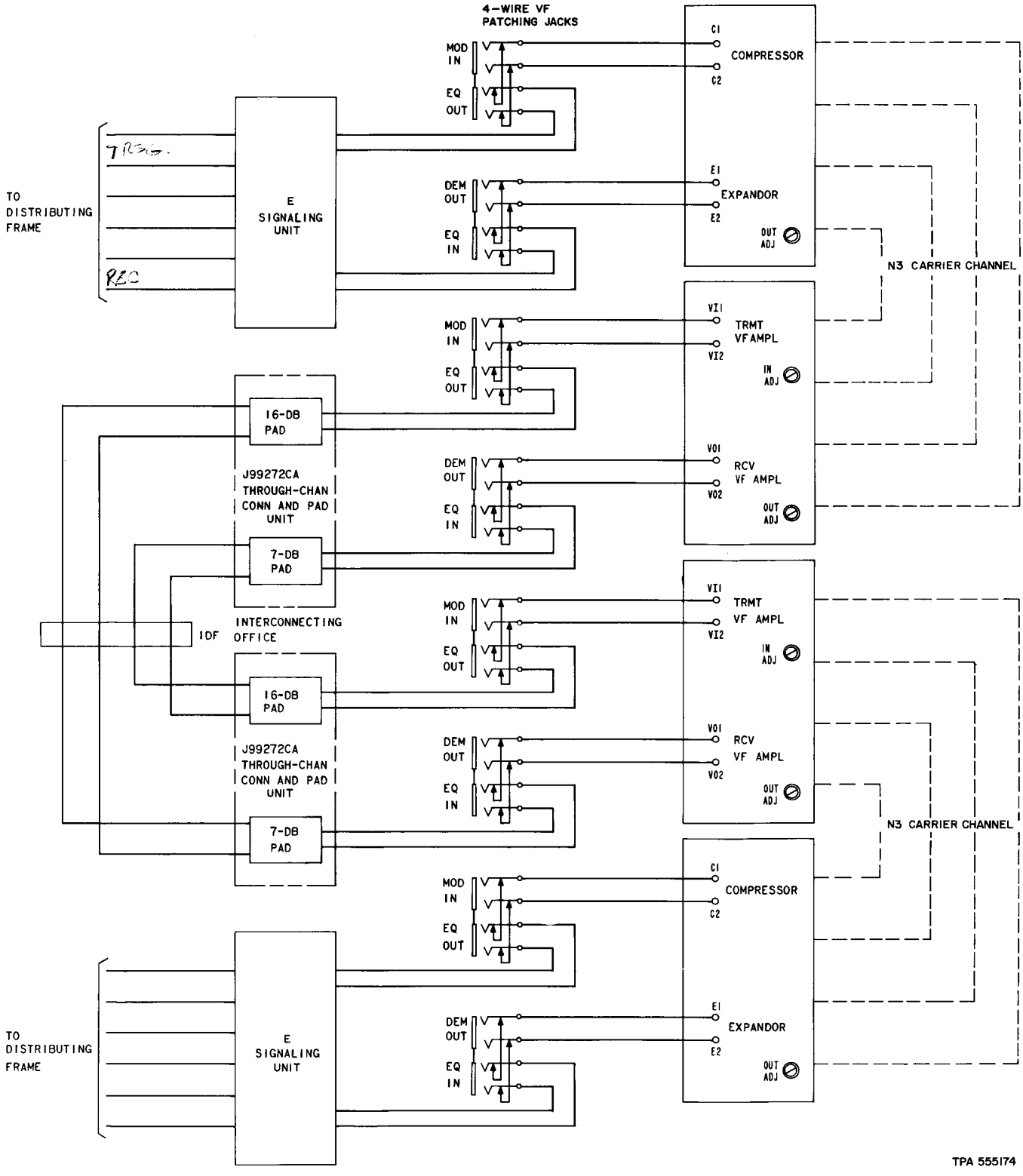

Fig. 2—VF Amplifiers and Through-Channel Connector and Pad Units—Used to Provide Through-Channel Message Service

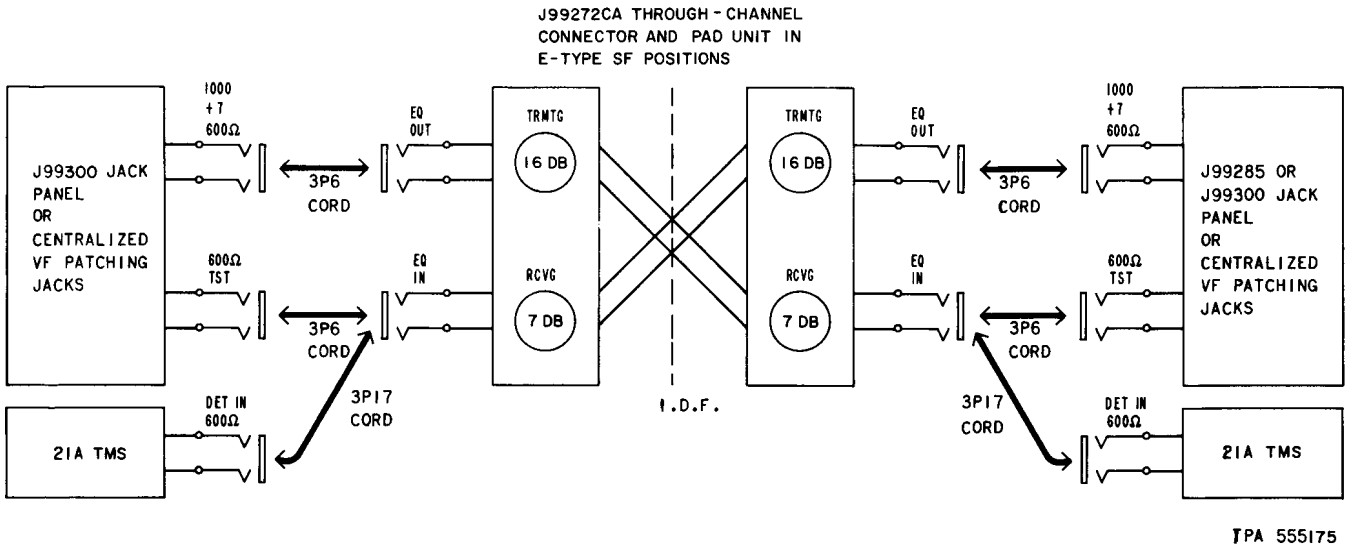

Fig. 3—Method of Measuring Levels and Adjusting Pad Values for an N3- to -N2 or -N3 Interconnection

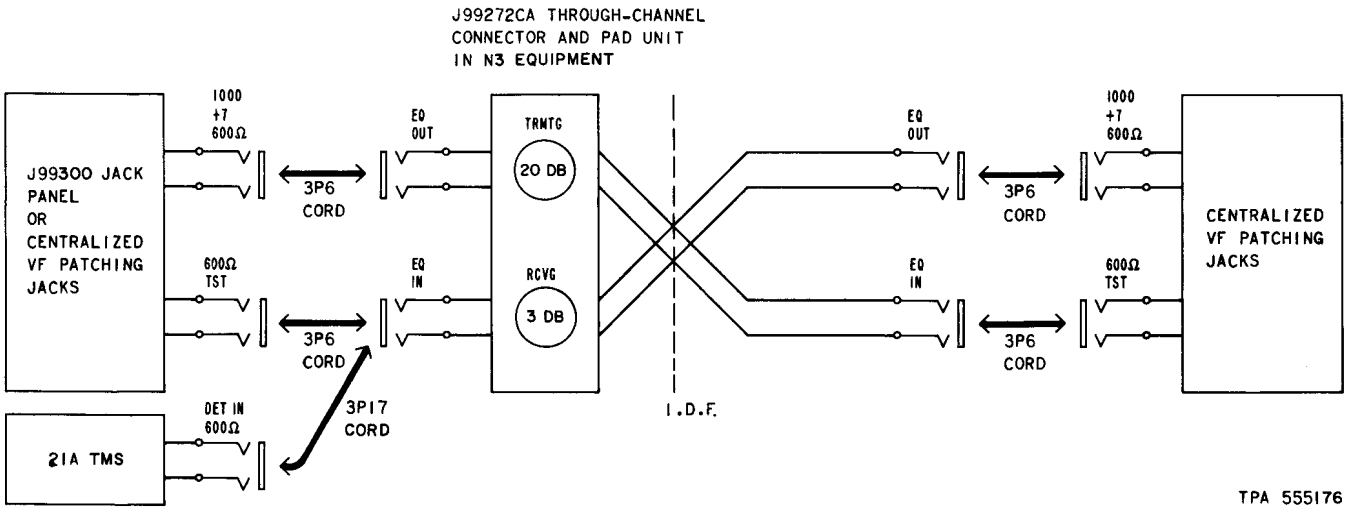

Fig. 4—Method of Measuring and Adjusting Pad Values for an N3-to-N1, -O, or -ON Interconnection

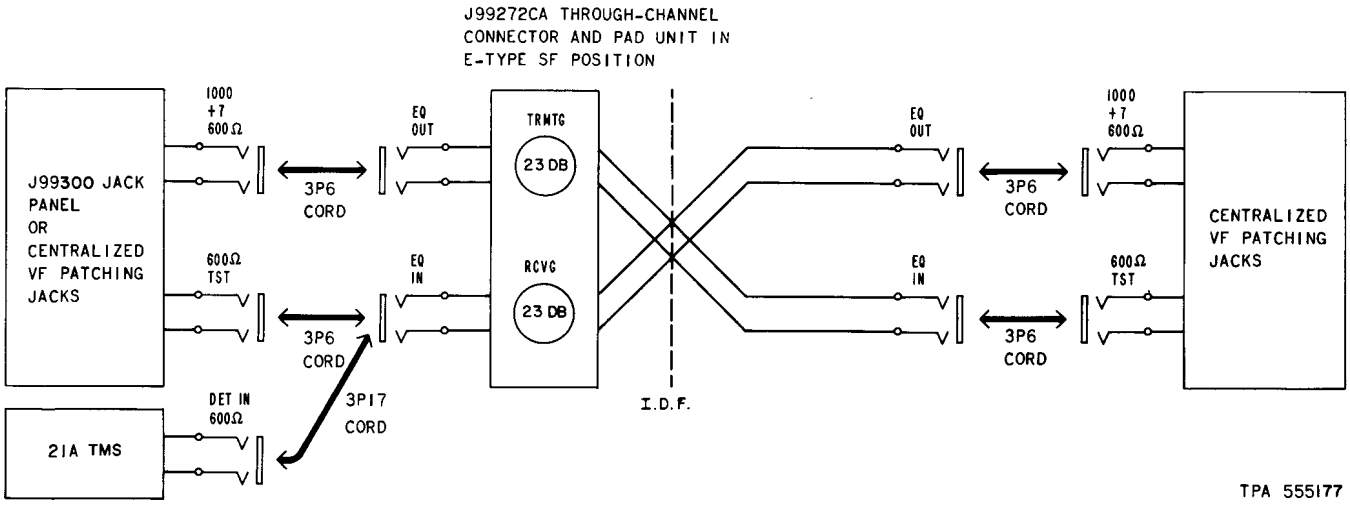

Fig. 5—Method of Measuring Levels and Adjusting Pad Values for an N3 Channel Connected in Tandem with an A-Type Channel Bank

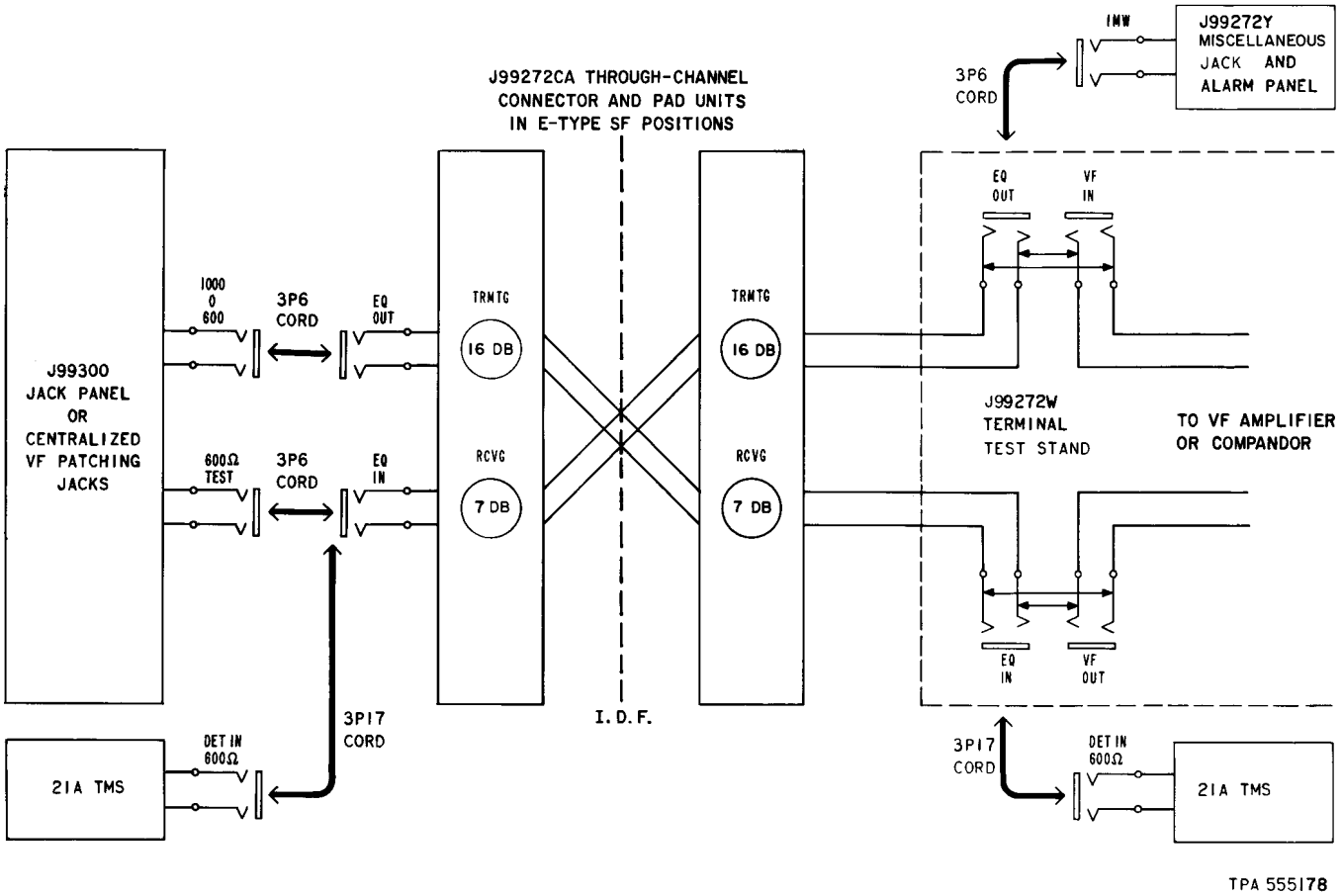

Fig. 6—Method of Using Test Stands to Measure Levels and Adjust Pad Values for an N3-to-N2 Interconnection

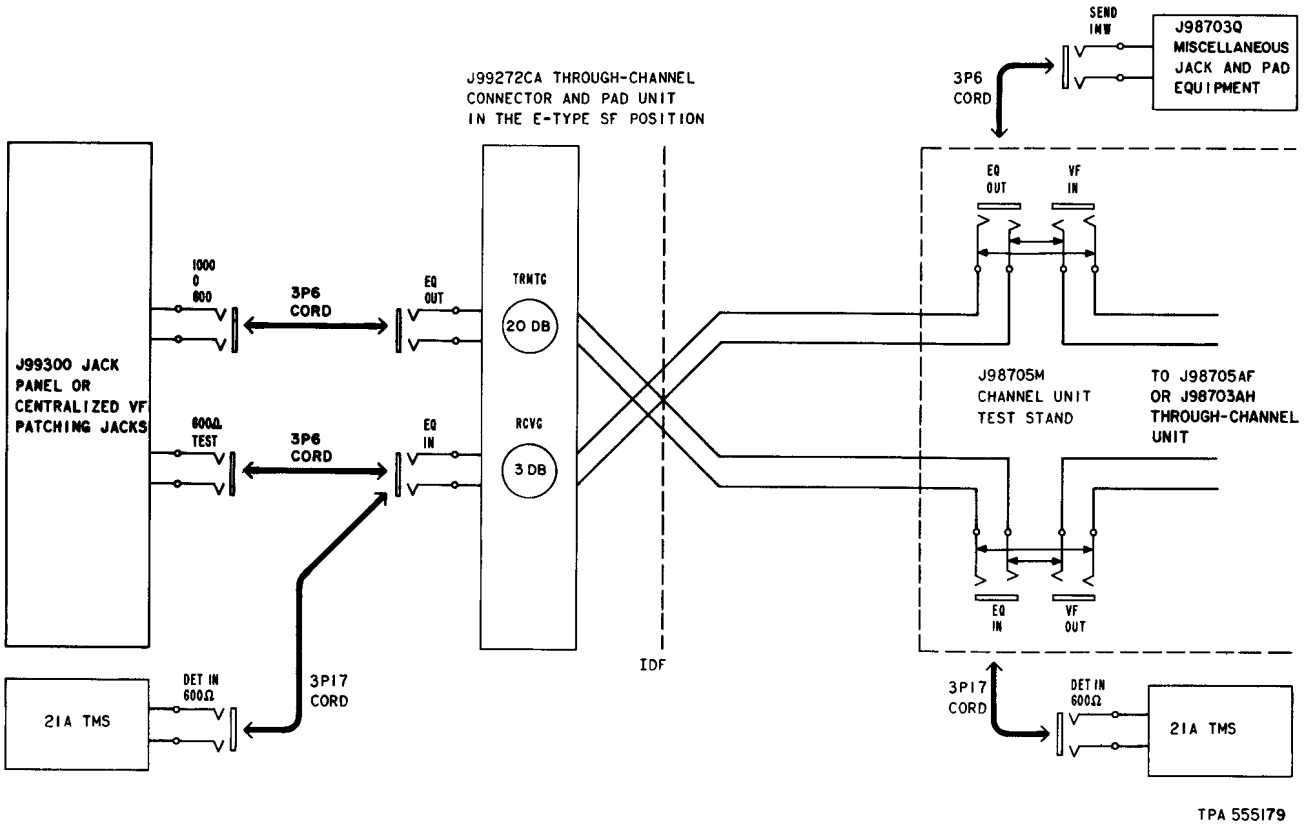

Fig. 7—Method of Using Test Stands to Measure Levels and Adjust Pad Values for an N3-to-N1, -O, or -ON Interconnection