

**L MULTIPLEX TERMINALS  
COMMON EQUIPMENT  
CARRIER TRANSMISSION MAINTENANCE SYSTEM (CTMS)  
THROUGH PILOTS AND  
CROSS-OFFICE TRANSMISSION**

CONTENTS	PAGE
1. GENERAL . . . . .	1
2. ACCESS CIRCUITS . . . . .	1
3. SCHEDULING PROGRAM . . . . .	1
4. PRINTOUT . . . . .	2
5. CORRECTIVE ACTION . . . . .	2

**1. GENERAL**

**1.01** This section describes the through pilots and cross-office transmission measurement program (PLXO) of CTMS and corrective action to take when measurements exceed allowable limits. PLXO is normally run by clock control to measure MG and SG pilots of through facilities at receiving line access and at transmitting line access. Measurements at each side of a mastergroup connector are compared to determine the effective cross-office gain or loss and to evaluate the performance of the connector.

**1.02** This section is reissued to reflect printout modifications and revise corrective action procedures. Since this issue constitutes a general revision, arrows ordinarily used to indicate changes are omitted.

**1.03** PLXO is a comprehensive program which evaluates the cross-office transmission of through mastergroups. It reads incoming MG and SG pilots at receiving line access and the same pilots at transmitting line access, then evaluates

the transmission discrepancies caused by equipment in the office. The right-hand column of the printout indicates the office errors found and is the most meaningful part of the printout.

**2. ACCESS CIRCUITS**

**2.01** The following circuits provide access to the receiving and transmitting line signals for pilot measurements:

Fig. 1—3A WLEL Receiving Access Circuit (for TD-2, TD-3, and TH-3)

Fig. 2—3A WLEL Transmitting Access Circuit (for TD-2, TD-3, and TH-3)

Fig. 3—TH-1 Receiving Access Circuit

Fig. 4—TH-1 Transmitting Access Circuit

Fig. 5—L3 Receiving Access Circuit

Fig. 6—L3 Transmitting Access Circuit

Fig. 7—L4 Receiving Access Circuit

Fig. 8—L4 Transmitting Access Circuit

**3. SCHEDULING PROGRAM**

**3.01** PLXO in a magnetic tape storage system is controlled by BOS commands IT (to establish an execution time), ON (to initialize the program for routine running), and ON,PLXO,NOW... (for demand execution). In a disc storage system, one of two methods of control may be used: (1) RTE system commands IT and ON as above for routine

**NOTICE**

Not for use or disclosure outside the  
Bell System except under written agreement

execution and RU for demand execution, or (2) control by the auxiliary terminal monitor (ATM) program in which PLXO is initialized by an IP command, scheduled by an IS command, and run as a demand program by an ON,PLXO,NOW... command. The BOS and RTE system commands and the ATM program commands are described in Section 103-260-300.

**3.02** When run as a demand program, PLXO is called on to measure pilots and cross-office gain of a specific through-office mastergroup. The command to start PLXO for a demand measurement is:

\*ON,PLXO[,NOW],p1 [p2,p3 ]

in a magnetic tape system or in a disc system when PLXO is under ATM program control, or;

\*RU,PLXO,p1 [,p2,p3 ]

in a disc system using only system commands.

**Where:**

p1 is short code assigned to mastergroup.

p2 is always zero (enter by default using two commas).

p3 = 0 (or absent) print only out-of-limits measurements.

p3 > 0 print all measurements.

**4. PRINTOUT**

**4.01** Figure 9 illustrates a typical routine PLXO printout. The print limit is  $\pm 0.5$  dB from nominal for a mastergroup and  $\pm 0.5$  dB from mastergroup pilot gain for a supergroup. If any supergroup pilot exceeds the print limit, the mastergroup pilot gain is printed for comparison. Because mastergroup pilots are blocked and reinserted, the measurements of receiving and transmitting mastergroup pilots are of different signal sources.

The program prints the pilot level deviations and calculates effective cross-office gain or loss from the differences between measurements. The meanings of some entries in the heading, measurement results, and summary of Fig. 9 have been identified for convenience.

**5. CORRECTIVE ACTION**

**5.01** When the right-hand column of the printout shows errors, it indicates that one of several pieces of internal office equipment is not functioning properly. Efforts to correct the trouble should be pursued in an orderly manner as follows:

- Adjust the transmitting MG pilot as necessary to obtain the proper level at the transmitting MG input, then at the output.
- Adjust the receiving MG pilot as necessary to obtain the proper level at the receiving MG output.
- Run PLXO in the demand mode to print all measurements on the circuit under adjustment (make p3 = 1). Evaluate the printout for slope or flat errors in the right-hand column.
- Make necessary gain and/or equalizer adjustments to bring the measurement within limits or as close as is possible.

**5.02** In general, any pad or equalizer circuit located before or after the MG connector may be adjusted to meet cross-office requirements. Always use the CTMS measuring equipment for alignment. A portable TMS may be used for isolating other trouble conditions. Enter an Engineering Complaint on those cross-office facilities that do not have the necessary trunk equalizers to meet gain response requirements.

**5.03** Chart 1 contains the suggested procedures for clearing through-mastergroup problems. When trouble is cleared, follow local procedures to update the maintenance history file.

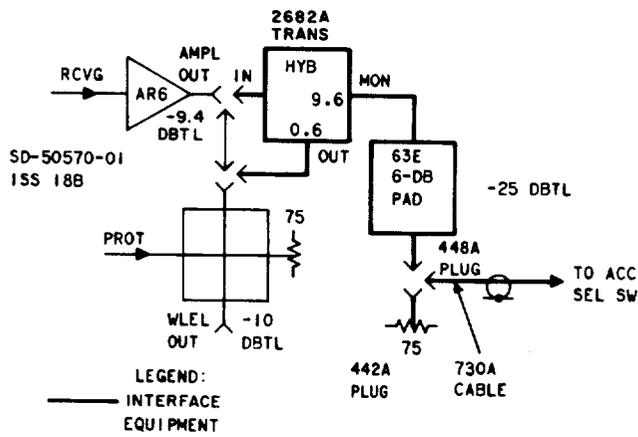


Fig. 1—3A WLEL Receiving Access Circuit (for TD-2, TD-3, and TH-3)

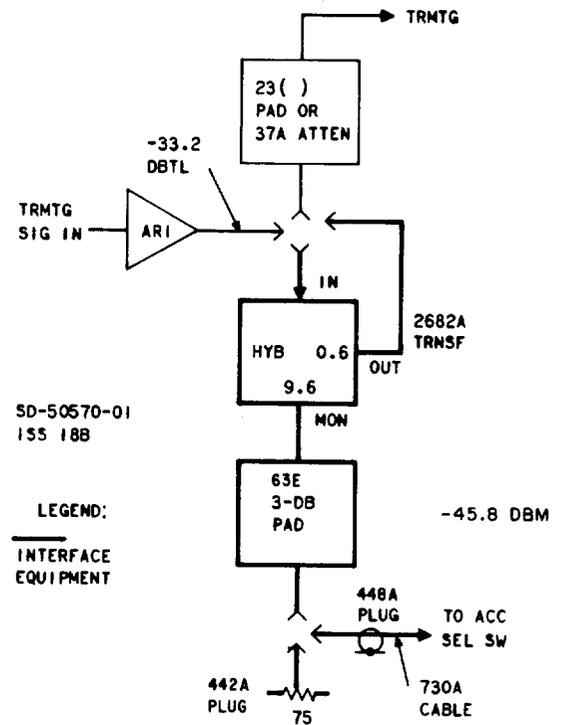


Fig. 2—3A WLEL Transmitting Access Circuit (for TD-2, TD-3, and TH-3)

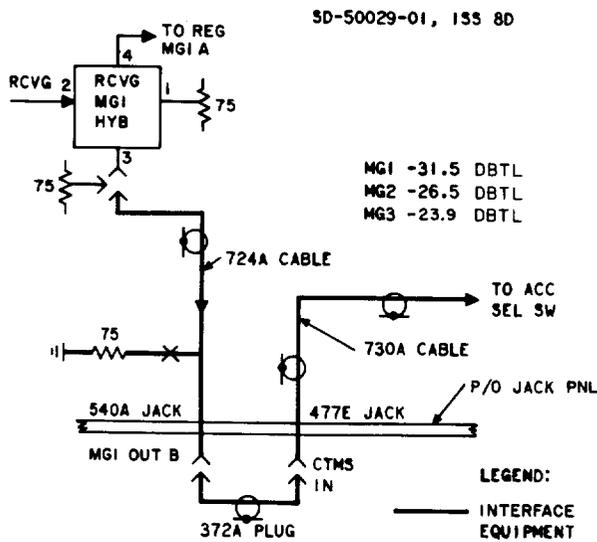


Fig. 3—TH-1 Receiving Access Circuit

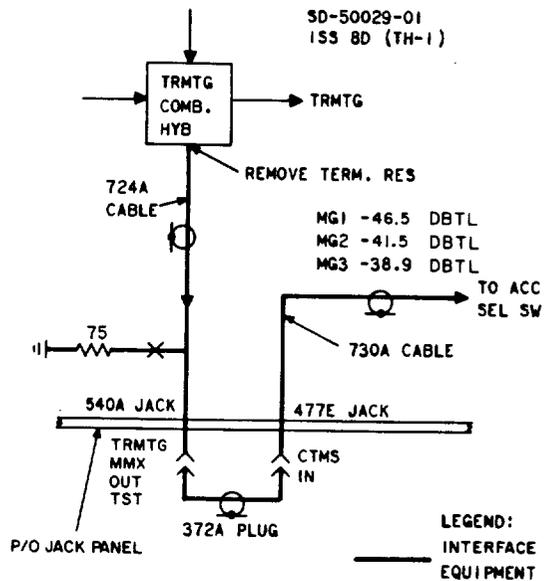


Fig. 4—TH-1 Transmitting Access Circuit

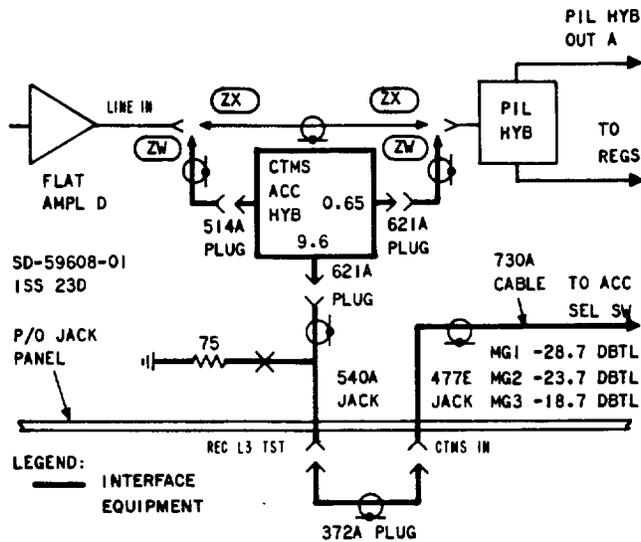


Fig. 5—L3 Receiving Access Circuit

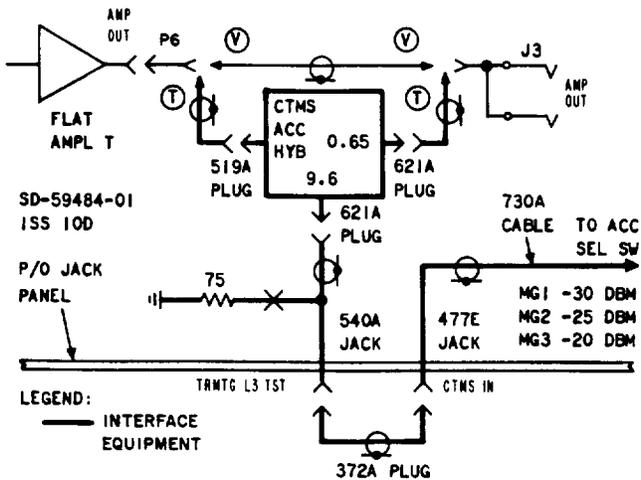


Fig. 6—L3 Transmitting Access Circuit

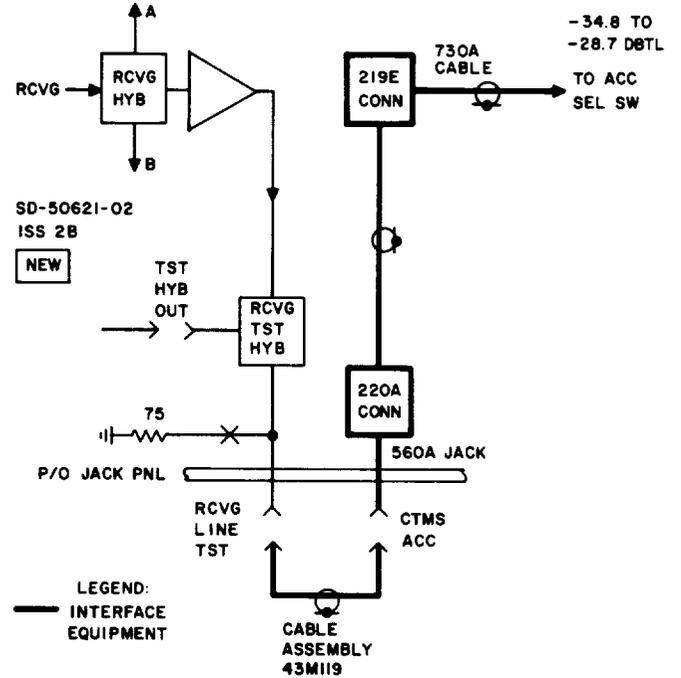
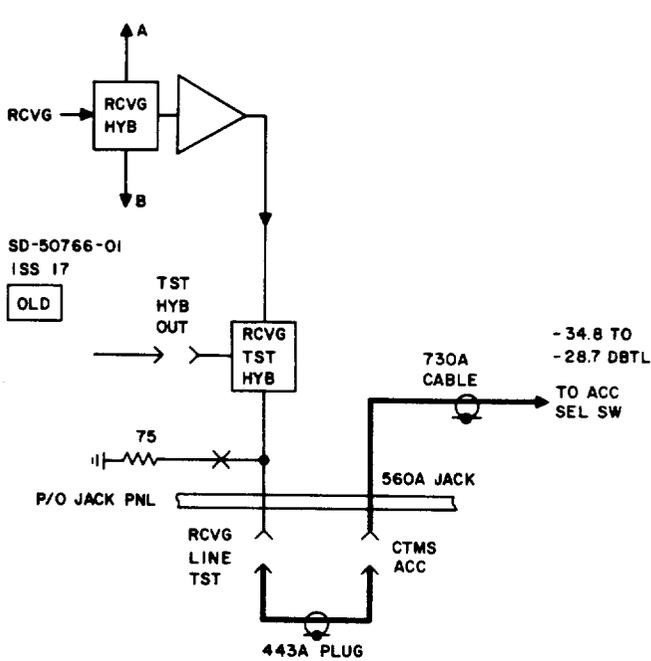


Fig. 7—L4 Receiving Access Circuit

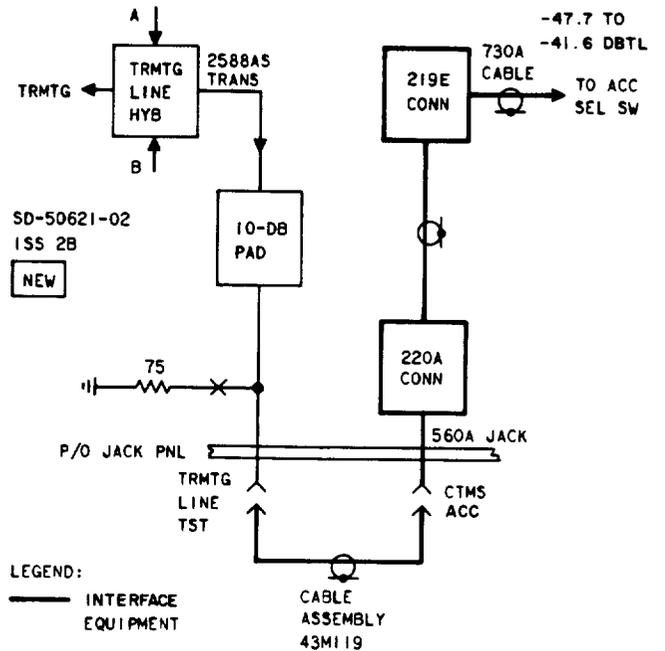
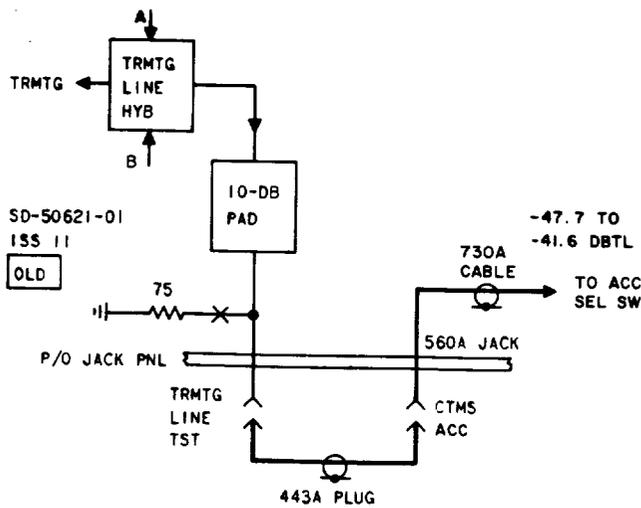


Fig. 8—L4 Transmitting Access Circuit

PROGRAM NAME

ISSUE NO.

PLXO: THRU PILOTS - CROSS OFFICE TRANSMISSION ISSUE 4

LIM: TRMG MG=0.5DB; SG GAIN/MG GAIN=0.5DB ← PRINT LIMIT  
 \*\*\*\*\*

PLXO: DATE 344 12:34 ← DATE AND TIME  
 05MXS ARTNVA45T20FLKNMD01 ← MG IDENTIFICATION  
 RCVG= 501 ← NO REG TRMTG= 1206 ← MG REG  
 ← RECEIVING SHORT CODE ← TRANSMITTING SHORT CODE

SG...RCVG...TRMTG..GAIN...GAIN/MG PILOT
MG .0 -.4 -.4
18 1.2 .2 -1.0 -.6
26 -1.8 -1.3 .4 .8
27 -2.7 -2.3 .4 .8
28 -1.0 -.5 .6 .9

OUT-OF-LIMITS MEASUREMENTS

\*\*\*\*\*

PLXO: DATE 344 12:35  
 03MXS APJTAZ01 BLCSMA02  
 RCVG= 502 NO REG TRMTG= 1302 MG REG

SG...RCVG...TRMTG..GAIN...GAIN/MG PILOT
MG .0 -.9 -.9
28 4.1 4.1 -.1 .8

\*\*\*\*\*

PLXO: DATE 344 12:35  
 05MXS ARTNVA45T20FLKNMD01  
 RCVG= 1206 MG REG TRMTG= 501 NO REG

SG...RCVG...TRMTG..GAIN...GAIN/MG PILOT
MG -2.3 .0 2.3
26 -.9 2.2 3.1 .7
27 -2.0 1.0 2.9 .6

\*\*\*\*\*

PLXO: DATE 344 12:35  
 03MXS APJTAZ01 BLCSMA02  
 RCVG= 1302 MG REG TRMTG= 502 NO REG

SG...RCVG...TRMTG..GAIN...GAIN/MG PILOT
MG -2.9 .0 2.9
28 -1.7 1.8 3.5 .7

\*\*\*\*\*

PLXO SUMMARY	DATE 344 12:35	PROGRAM SUMMARY
TRMTG MG PILOTS=	2	TRMTG SG PILOTS= 40
#>LIMIT=	1	#>LIMIT= 8
Z>LIMIT=	50	Z>LIMIT= 20
FIG/MERIT=	60.40	FIG/MERIT= 88.79
		NO. OF PILOTS MEASURED
		NO. OUT-OF-LIMITS
		PERCENT OUT-OF-LIMITS
		FIGURE OF MERIT

Fig. 9—PLXO Printout of Through Pilots and Cross-Office Transmission

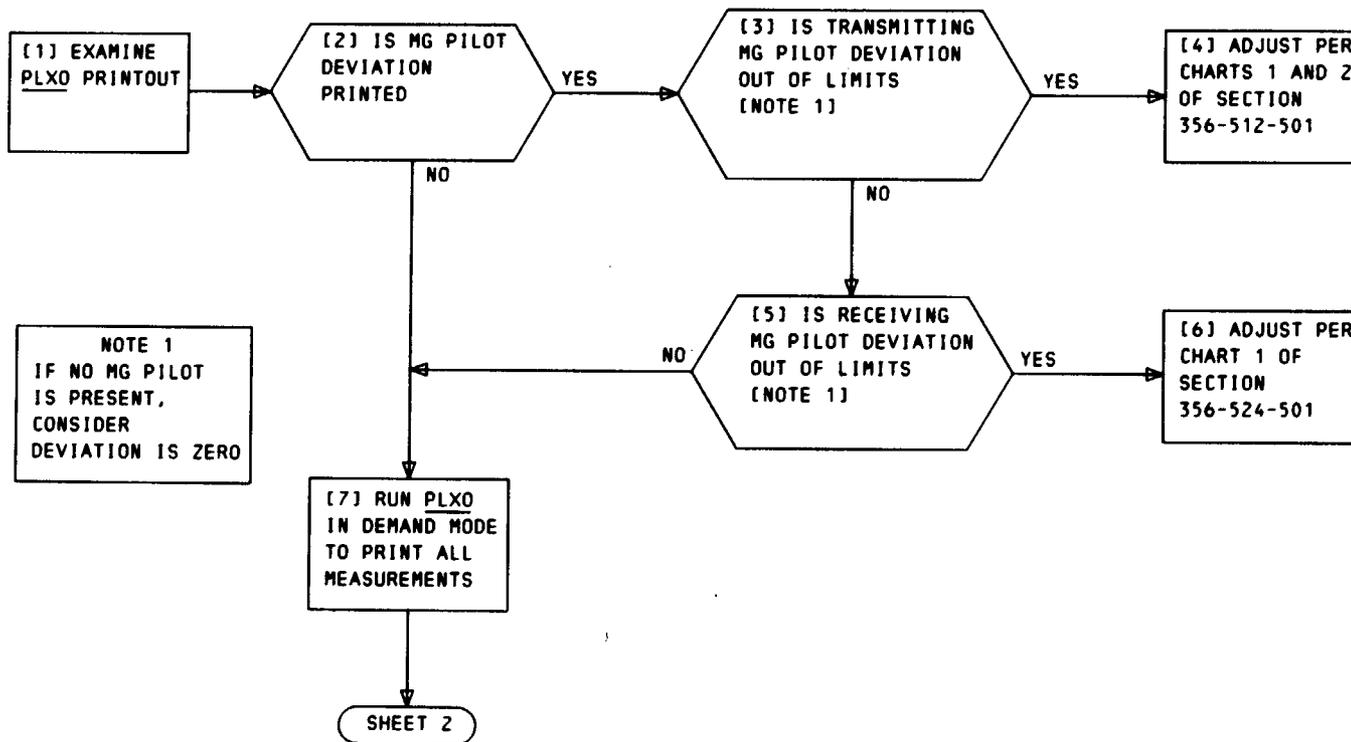


Chart 1—Adjustment of PLXO Deviations (Sheet 1 of 2)

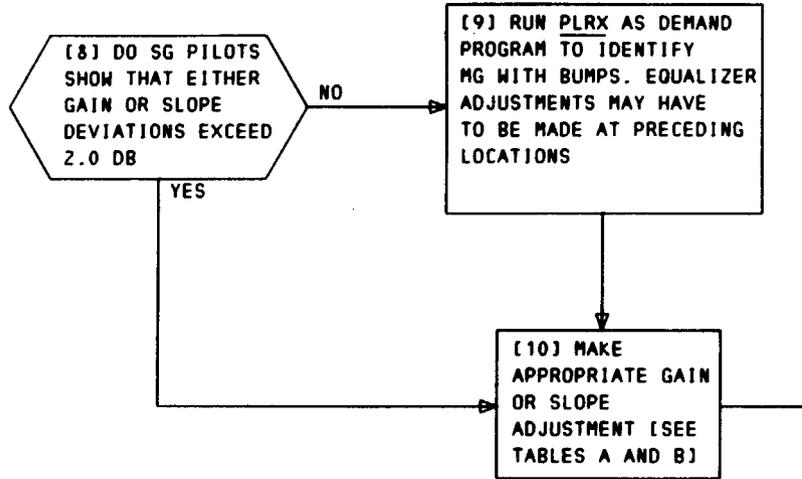


TABLE A		
CONNECTOR TYPE	FIRST ADJUSTMENT	SECOND ADJUSTMENT
J68829K (MMX-1 TO MMX-1)	ATTENUATOR	[NONE]
J68882AD (MMX-2 TO MMX-2)	ADJ	AMPL [NOTE 2]
J68882AW (MMX-1 TO MMX-2)	ADJ 1	AMPL 1 [NOTE 2]
J68882AW (MMX-2 TO MMX-1)	ADJ 2	AMPL 2 [NOTE 2]

NOTE 2
ADJUST AMPLIFIER ONLY IF NECESSARY

TABLE B		
CONNECTOR TYPE	IN-SERVICE TESTS	OUT-OF-SERVICE TESTS
J68829K (MMX-1 TO MMX-1)	SECTION 356-026-501	SECTION 356-026-502
J68882AD (MMX-2 TO MMX-2)	SECTION 356-027-501	SECTION 356-027-502
J68882AW (MMX-2 TO MMX-1) (MMX-1 TO MMX-2)	SECTION 356-028-501	SECTION 356-028-502

Chart 1—Adjustment of PLXO Deviations (Sheet 2 of 2)