

**L MULTIPLEX TERMINALS
COMMON EQUIPMENT
CARRIER TRANSMISSION MAINTENANCE SYSTEM (CTMS)
HOT TONE SCAN (HTS) AND
QUICK HOT TONE SCAN (QHTS)**

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1. GENERAL

1.01 Two routine programs may be used in CTMS to detect noise at line access. The first, hot tone scan (HTS), scans multiplex sections at transmitting line access channel-by-channel for high-level signals. This is a very thorough program since every channel of every transmitting mastergroup is searched for high-level signals. It is also a slow program and is unlikely to detect transient noise problems. A second program, called quick hot tone scan (QHTS), makes measurements of supergroup out-of-band noise slots of both receiving and transmitting multiplex sections at line access. If the average noise in the noise slots of a mastergroup is excessive, a channel-by-channel search of that mastergroup is conducted in an

effort to locate the cause of the noise. QHTS runs much more rapidly than HTS and routinely makes noise checks on receiving multiplex sections as well as transmitting multiplex sections. The QHTS program falls back on mastergroup access points for measurements if line access is not provided. Both programs can be run on demand with parameter controls.

1.02 This section is reissued to add the QHTS program information, add access circuits, and revise the corrective action procedure. Since this issue constitutes a general revision, arrows ordinarily used to indicate changes are omitted.

2. ACCESS CIRCUITS

2.01 The following circuits provide access to multiplex sections at line and at mastergroup. Mastergroup access is used as a secondary access point for routine measurements and may be specified for an HTS demand measurement.

Fig. 1—LMX-1 and LMX-2 Multiplex Transmitting Mastergroup and Pilot Access Circuit (U600 Configuration)

Fig. 2—LMX-1 and LMX-2 Multiplex Transmitting Mastergroup Access Circuit (L600 Configuration)

Fig. 3—LMX-1 and LMX-2 Multiplex Receiving Mastergroup Access Circuit

Fig. 4—3A WLEL Transmitting Access Circuit (for TD-2, TD-3, and TH-3)

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Fig. 5—3A WLEL Receiving Access Circuit
(for TD-2, TD-3, and TH-3)

Fig. 6—TH-1 Transmitting Access Circuit

Fig. 7—TH-1 Receiving Access Circuit

Fig. 8—L3 Transmitting Access Circuit

Fig. 9—L3 Receiving Access Circuit

Fig. 10—L4 Transmitting Access Circuit

Fig. 11—L4 Receiving Access Circuit

3. HOT TONE SCAN PROGRAM

A. Scheduling HTS Program

3.01 The HTS program normally runs as a routine program to scan multiplex sections at transmitting line for abnormally high-level signals. HTS 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,HTS,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 execution and RU for demand execution, or (2) control by the auxiliary terminal monitor (ATM) program in which HTS is initialized by an IP command, scheduled by an IS command, and run as a demand program by an ON,HTS,NOW... command. The BOS and RTE system commands and the ATM program commands are described in Section 103-260-300.

3.02 HTS may be called on with parameter control to scan for hot tones at a specific access point. The command to start HTS as a demand measurement program is:

*ON,HTS[,NOW],p1,p2 [,p3,p4]

in a magnetic tape system or in a disc system when HTS is under ATM program control, or:

*RU,HTS,p1,p2 [,p3,p4]

in a disc system using only system commands.

Where:

p1 is short code assigned to a specific line or multiplex section to be scanned.

p2 is access point designation as follows:

2—receiving line

3—transmitting line

4—receiving mastergroup

5—transmitting mastergroup

p3 is always 0 (enter by default using two commas).

p4 = 0 (or absent) noise measurement threshold is 0 dBm0.

p4 > 0 number passed is noise measurement threshold in dB below 0 dbm0.

B. HTS Printout

3.03 Figure 12 illustrates a typical printout resulting from running the HTS program. When the voiceband level equals or exceeds the print level (either 0 dBm0 or optionally established by p4 when making a demand measurement), the 1-kHz test tone and 2600-Hz SF tone levels plus the group pilot deviation are measured and printed as an aid to trouble isolation. A dollar sign (\$) is printed whenever a tone to be measured is not detected.

4. QUICK HOT TONE SCAN PROGRAM

A. Scheduling QHTS

4.01 The QHTS program normally runs by clock control to detect high-level signals that by intermodulation are causing excessive noise in the supergroup out-of-band noise slots of a multiplex section. If the average noise exceeds the print limit (normally 0 dBm0), or has increased by 3 dB since the last time measured (in a disc system only), the multiplex section is searched channel-by-channel for the high-level signals and significant results are printed. QHTS must be scheduled for routine running by the process described in 3.01 for the HTS program.

4.02 QHTS may be called on to run as a demand program; however, only the device to which the output is to be directed is under parameter control. The command to run QHTS as a demand program is:

*ON,QHTS[,NOWI,p1,p2,p3,p4,p5]

in a magnetic tape system or in a disc system when QHTS is under ATM control, or:

*RU,QHTS[,p1,p2,p3,p4,p5]

in a disc system using only system commands.

Where:

p1 through p4 are always zero (enter by default using commas).

p5 is the logical unit number of the desired list device if other than the standard list device.

B. QHTS Printout

4.03 Figure 13 is a typical printout of the QHTS program. Often only the multiplex section is printed as being noisy. However, if voiceband (VB) power of a channel in a noisy multiplex section is found to exceed -6 dBm0, that measurement plus those at 1000 Hz and 2600 Hz (SF) plus the group pilot deviation are printed as a troubleshooting aid.

5. CORRECTIVE ACTION

5.01 Chart 1 is a suggested procedure for correcting channel noise detected by HTS or QHTS. When trouble has been cleared, follow local procedures to update the maintenance history file.

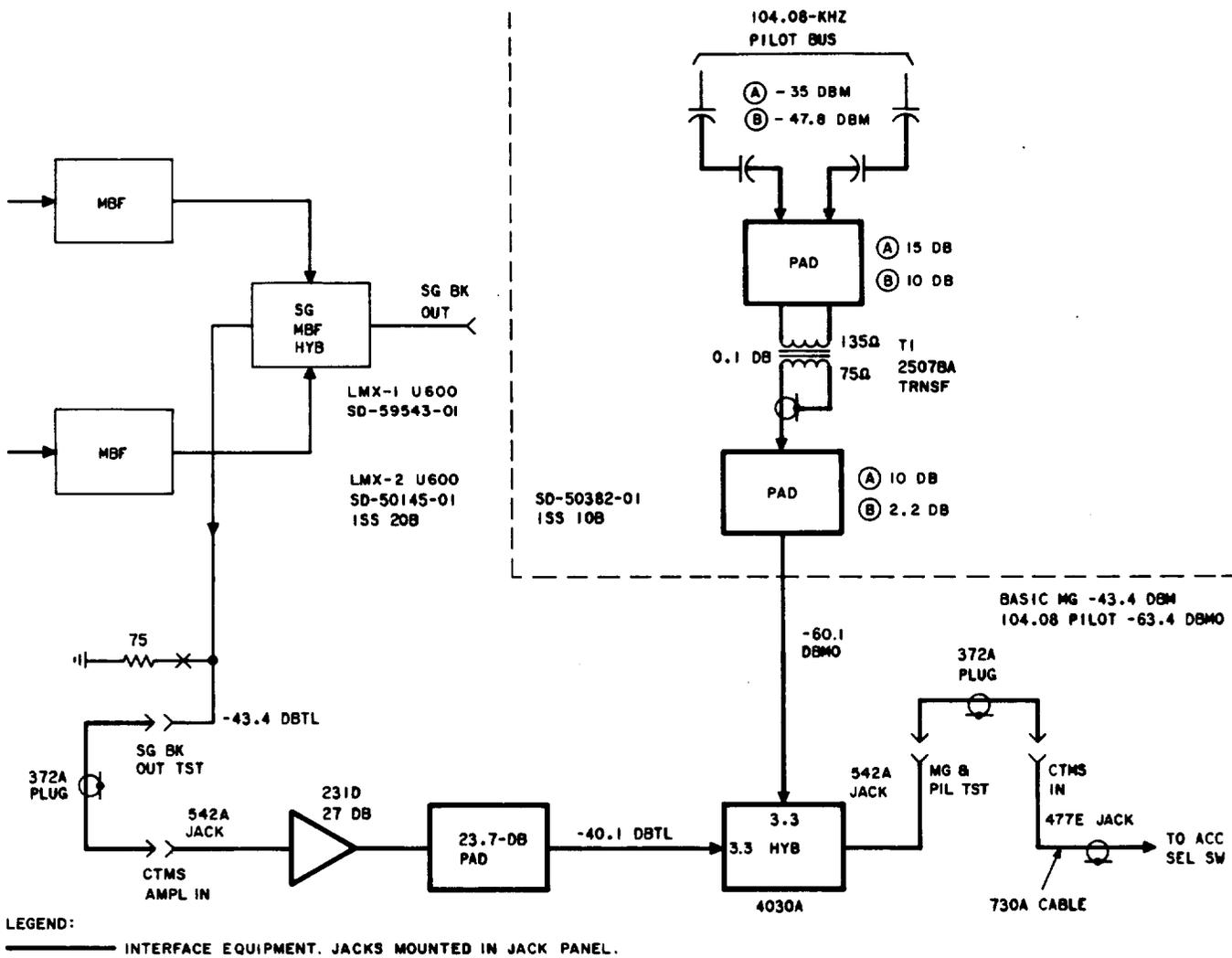


Fig. 1—LMX-1 and LMX-2 Multiplex Transmitting Mastergroup and Pilot Access Circuit (U600 Configuration)

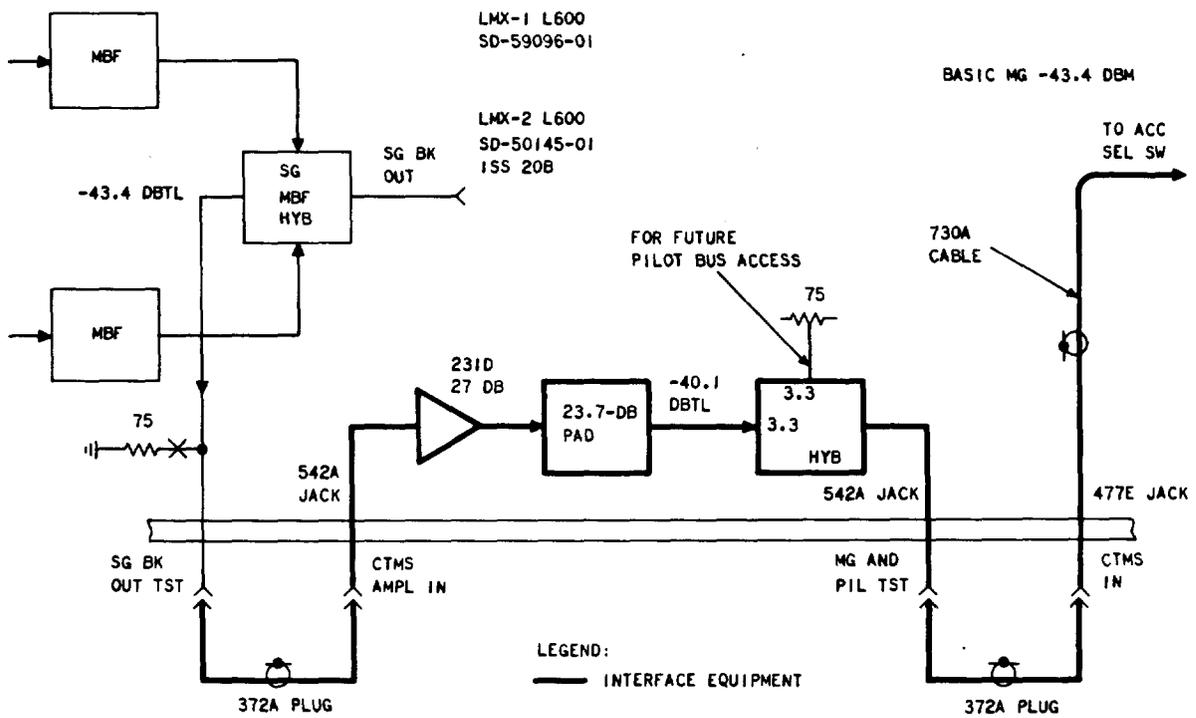


Fig. 2—LMX-1 and LMX-2 Multiplex Transmitting Mastergroup Access Circuit (L600 Configuration)

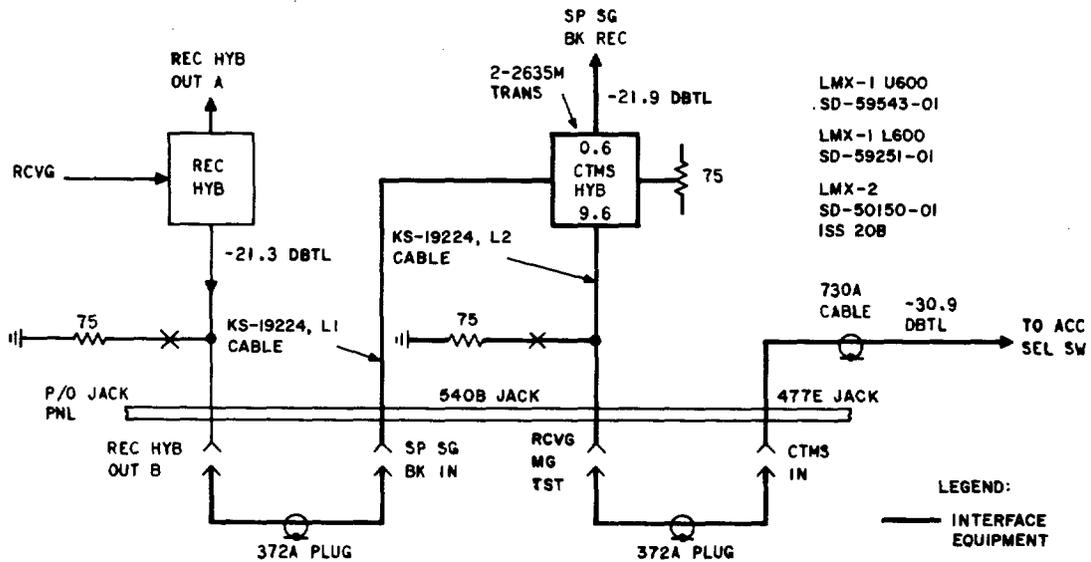


Fig. 3—LMX-1 and LMX-2 Multiplex Receiving Mastergroup Access Circuit

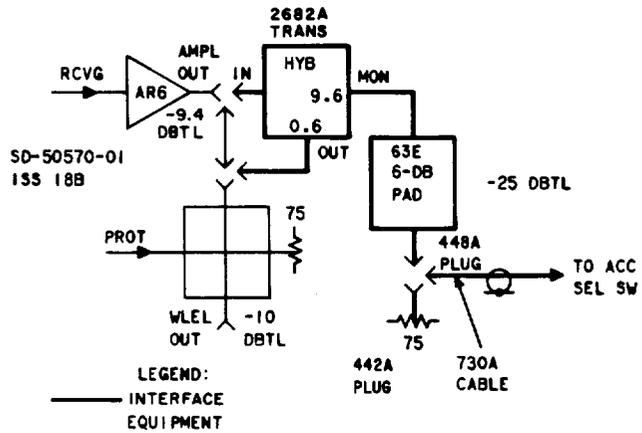
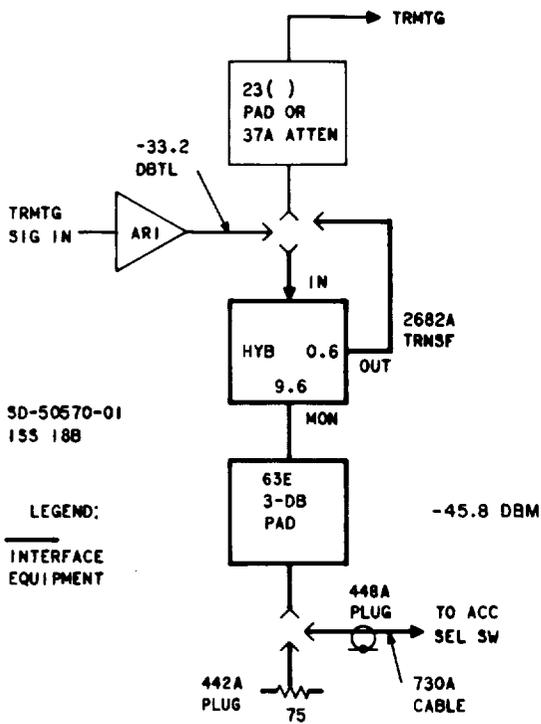


Fig. 4—3A WLEL Transmitting Access Circuit (for TD-2, TD-3, and TH-3)

Fig. 5—3A WLEL Receiving Access Circuit (for TD-2, TD-3, and TH-3)

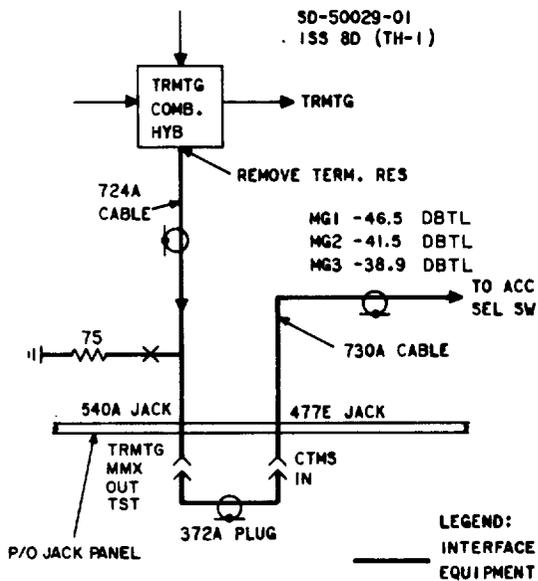


Fig. 6—TH-1 Transmitting Access Circuit

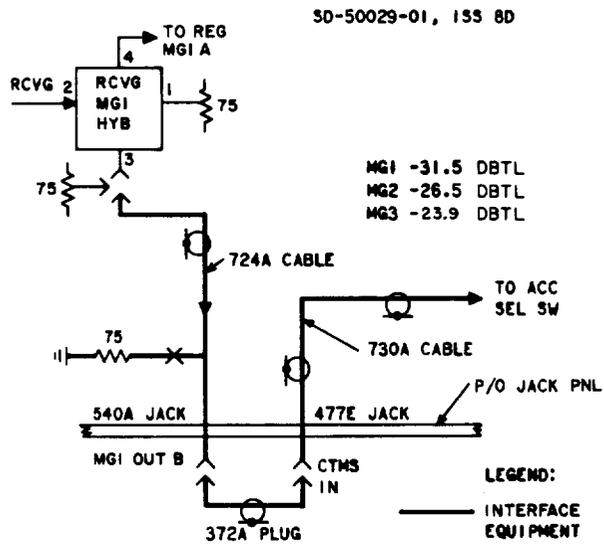


Fig. 7—TH-1 Receiving Access Circuit

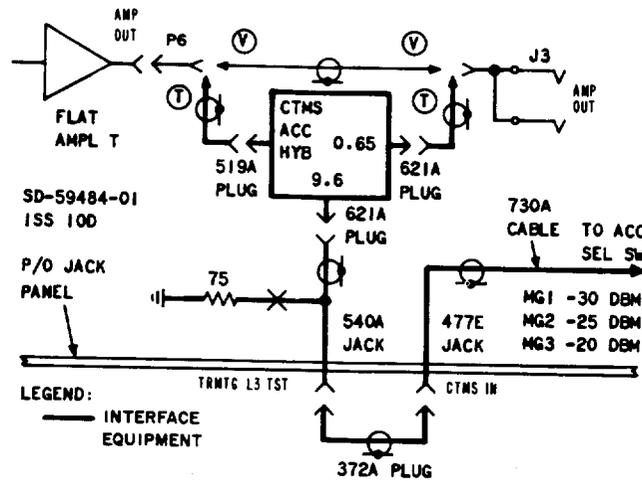


Fig. 8—L3 Transmitting Access Circuit

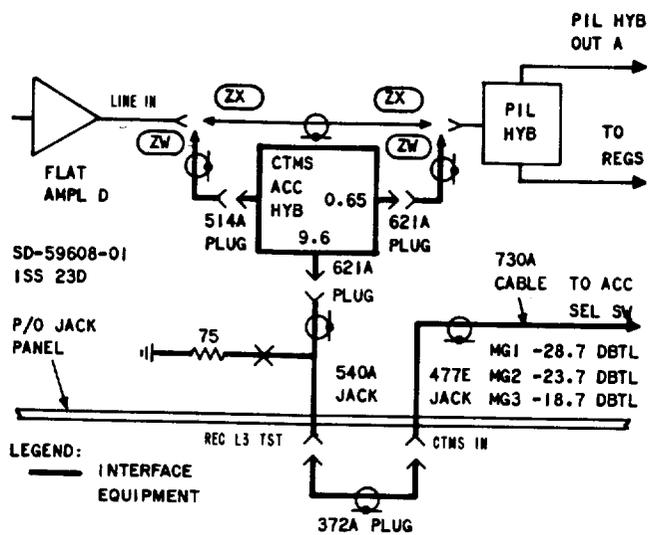


Fig. 9—L3 Receiving Access Circuit

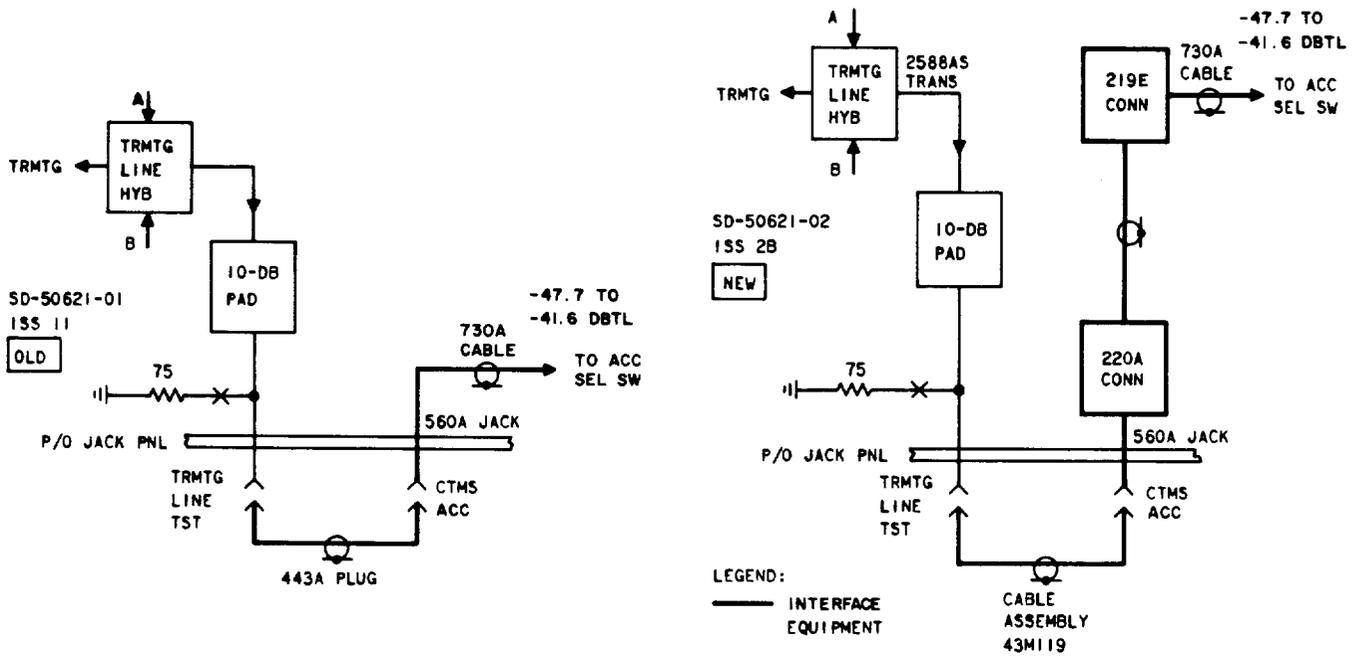


Fig. 10—L4 Transmitting Access Circuit

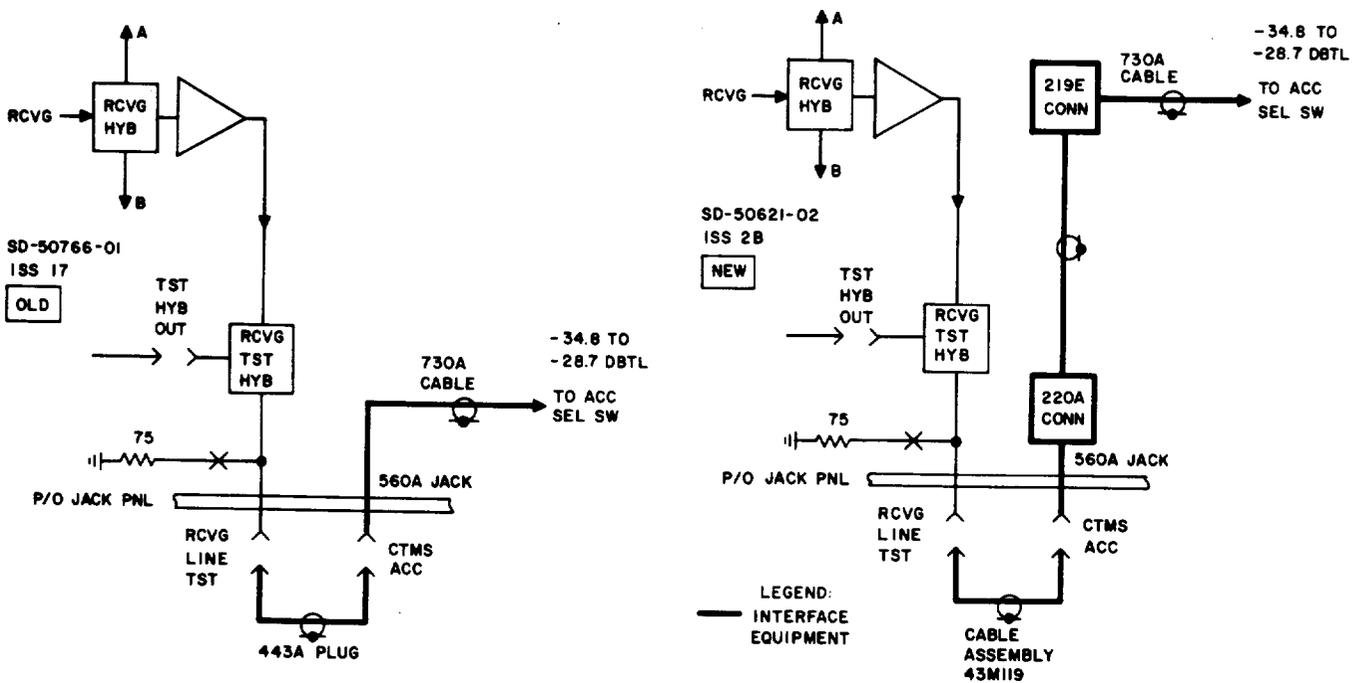


Fig. 11—L4 Receiving Access Circuit

HTS:SC..SG..GP..CH	--LEVELS(DBMØ)--	DEV(DB)
606 25 4 6	VB...1KHZ.....SF..GP PLT..TIME..	
	0 -14 \$ \$	16:40 TRMTG
HTS:SC..SG..GP..CH	--LEVELS(DBMØ)--	DEV(DB)
704 13 4 3	VB...1KHZ.....SF..GP PLT..TIME..	
	5 \$ -8 -11	16:50 TRMTG
HTS:SC..SG..GP..CH	--LEVELS(DBMØ)--	DEV(DB)
1305 14 1 4	VB...1KHZ.....SF..GP PLT..TIME..	
	5 -23 -36 -1	17:41 TRMTG

Fig. 12—HTS Printout of Hot Tone Scan Noise

QHTS: QUICK HOT TONE SCAN	ISSUE 1	DATE 21	LIMIT -6 DBMØ
SHORT CODE= 2301	NOISE= 41	LIMIT= 34	CHANGE= 0 RCVG
...SC*SG*G*CH...VB.1KHZ...SF..GP PLT.DAY.TIME			
2301*25*5* 6	-3 -99 -47	0 21 9: 8	
SHORT CODE= 5301	NOISE= 35	LIMIT= 31	CHANGE= 0 RCVG
SHORT CODE= 6002	NOISE= 31	LIMIT= 28	CHANGE= 0 RCVG
SHORT CODE= 9003	NOISE= 41	LIMIT= 37	CHANGE= 0 RCVG
QHTS : STOP	0000		

Fig. 13—QHTS Printout of Quick Hot Tone Scan Noise

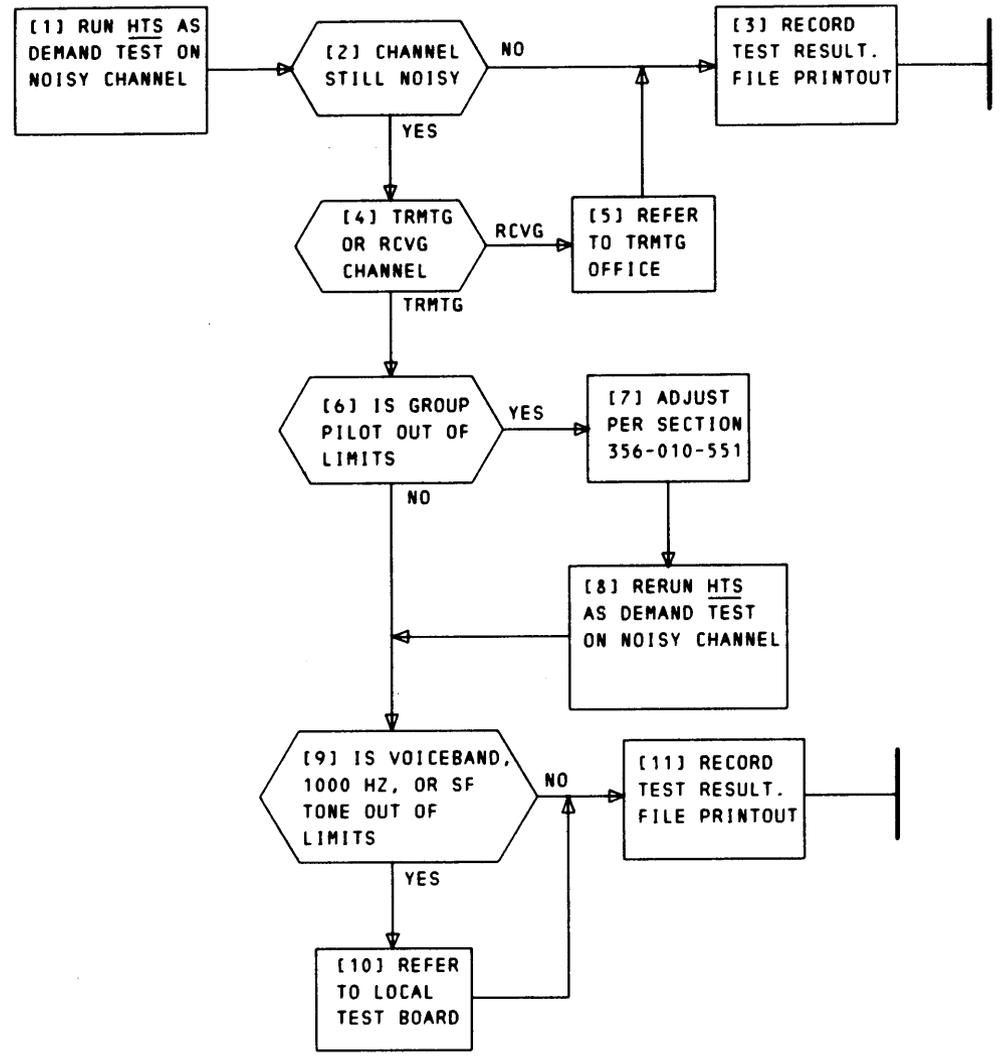


Chart 1—Clear Channel Noise Problem