TYPE N1, O, AND ON CARRIER TELEPHONE SYSTEMS—OVERALL CHANNEL LINEUP

O AND ON CARRIER—MESSAGE CHANNEL UNIT

SUMMARY CHARTS—LINEUP AND MAINTENANCE

This section consists of an overall diagram of the channel unit (Fig. 1) and charts giving the tests required for the lineup and maintenance of the message channel unit. Tests 1 through 4 include the transmitting portion of the channel unit and Tests 5 through 13 include the receiving portion. Test 14 includes the alarm and terminal-to-terminal loop signaling path check. Complete the lineup tests in numerical sequence. Chart 1 is provided for the standard test arrangement; Chart 2 is provided for locations where the mobile carrier test bay is used. Figure 2 shows some cords used in these tests.

▶This section is being reissued to change the noise measuring set requirement from 3A to 3 type and to delete the obsolete +4.0 dBm voice frequency output level. Shaded areas indicate changes in the charts. Revision arrows have been used to denote significant changes in the text. This reissue affects Equipment Test Lists.◀

Refer to associated sections for the detailed procedures and for steps to be taken where requirements are not met. Familiarity with the sections including the testing methods in detail is essential before this section is used.

APPARATUS:

1—Hewlett-Packard 400-Type Vacuum Tube Voltmeter (VTVM)

1—KS-14510, Volt-Ohm-Milliammeter, or equivalent (VOM)

1—▶3-Type Noise Measuring Set (NMS)◀

1—KS-19260 or KS-19353 Oscillator (600 Ohms), or equivalent

1—Centralized Transmission Measuring System or 21A TMS

1—2B Signaling Test Set

1—J98705M Channel Unit Test Stand

5—P1M Cords with Hubbell 708S29 Alligator Clips (used to ground T jacks, etc)

2—2P1D Cords (to connect 2B test set to channel unit test stand)

1—3P6F Cord (to connect 1000-Hz tone to test stand)

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APPARATUS:

1—P19A Cord (used with channel unit test stand)

1—W2DW Cord (to connect VTVM to test points)

1—2W17C Cord (to connect oscillator to test stand)

1—262B Plug (to provide 600-ohm termination)

CHART 1
O AND ON CARRIER - ESSAGE CHANNEL UNIT – LINEUP AND MAINTENANCE TESTS

TEST	PURPOSE OF TEST	TEST STAND REQUIRED		EQUIPMENT REQUIRED		MEASURE TEST POINT TO GRD OR BETWEEN TEST POINTS	REQUIRED VALUE		ADJUST	TEST CONDITIONS AND REMARKS		SECTION REFERENCE
		LINEUP	MTCE	TESTING END	DISTANT END		TEST	READJUST				
1	Compressor Output	Yes	Yes	VTVM 2B Sig Set	—	TP6	At least +9.5 dB	—	—	COMP pot. at max. output	Send 1000 Hz at VF IN jack 0 dBm (2W); —16 dBm (4W) OFF-HOOK at testing end.	362-115-501
							+8.3 to +9.7 dB	+9.0 dB	COMP	—		362-115-502
2	Message Output	Yes	For Adj	VTVM 2B Sig Set	—	T Jk	—42.0 to —40.0 dB	—41 dB	T	Selector switch on 01 TERM.		
3	Signaling Output	Yes	No	VTVM 2B Sig Set 262B Plug	—	T Jk	3-dB Reduced Level	—	—	Terminate VF IN with 600 ohms. ON-HOOK at testing end.		
							—50.5 to —42.5 dB					
							Old Level					
							—47.5 to —39.5 dB					
4	Carrier Leak	Yes	Yes	VTVM 2B Sig Set 262B Plug	—	T Jk	Less than —66 dB	—	—	Turn selector on test stand 01 TERM. Terminate VF IN with 600 ohms. OFF-HOOK at testing end.		
							Less than —54 dB			Selector switch to N1-01 NORM.		
5	Expandor Output	Yes	For Adj	VTVM 262B Plug	1000-Hz Tone 2B Sig Set	E1-E2	+8.5 to +11.5 dB	+10 dB	R	*Distant End:* OFF-HOOK Send 1000 Hz (2W) 0 dBm; (4W) —16 dBm. *Testing End:* See Note 1.		362-305-501
6	Receiving Level	Yes	No	VTVM	1000-Hz Tone 2B Sig Set	R Jk	+8 to +14 dB	—	—			
7	Signaling Receiver Level	Yes	No	VTVM	2B Sig Set	S1 Jk	3-dB Reduced Level	—	—	*Distant End :* ON-HOOK		362-305-515
							—15 to +7 dB					
							Old Level					
							—12 to +10 dB					
8	Signaling Relay Current	Yes	Yes	VOM	2B Sig Set	TP1 to TP2	14 to 16V	15V	REL CUR	*Testing End:* BRK and SIG potentiometers to midposition.		
9	Signaling Receiver Sensitivity	Yes	Yes	2B Sig Set	2B Sig Set	E_G Jack of Test Stand	Signal relay (K41) just operates as indicated by lamp on 2B Sig Set.		SIG	*Distant End:* ON-HOOK *Testing End:* Strap S1 to TP3, turn SIG potentiometer to extreme counterclockwise and then clockwise slowly until L lamp on 2B Sig Test Set just lights.		
10	Percent Break	Yes	For Adj	2B Sig Set	2B Sig Set	SIG L Jack of Patch Bay or E_G Jack of Test Stand	56 to 64 % Red Scale	62% Red Scale	BRK	*Distant End:* Adjust 2B Sig Test Set to send 12 PPS at 58% break on black scale.		
11	Minimum Length of Pulse	Yes	For Adj	2B Sig Set	2B Sig Set	SIG L Jack of Patch Bay or E_G Jack of Test Stand	Minimum 12%	—	—	*Distant End:* At trsg end, operate ADJ % BRK switch to S. Send 12 PPS and adjust ADJ % BRK potentiometer on 2B Sig Set slowly from extreme counterclockwise until a deflection just appears on 2B Sig Set at testing end. Read % break at distant end.		

CHART 1 (Contd)
O AND ON CARRIER – MESSAGE CHANNEL UNIT – LINEUP AND MAINTENANCE TESTS

TEST	PURPOSE OF TEST	TEST STAND REQUIRED		EQUIPMENT REQUIRED		MEASURE TEST POINT TO GRD OR BETWEEN TEST POINTS	REQUIRED VALUE		ADJUST	TEST CONDITIONS AND REMARKS	SECTION REFERENCE
		LINEUP	MTCE	TESTING END	DISTANT END		TEST	READJUST			
12	Channel Net Gain	No	No	TMS	2B Sig Set 1000-Hz Tone	(2W) MOD IN (4W) DEMOD OUT	–	Value Circuit Order	REC	*Distant End:* OFF-HOOK Send 1000 Hz (2W) 0 dBm; (4W) –16 dBm. *Testing End:* Set spare 2-wire channels to –10 dBm or terminate. See Note 2.	362-305-512
13	Channel Noise	No	No	NMS	2B Sig Set 262B Plug	(2W) MOD IN (4W) DEMOD OUT	See Section 362-305-510 for requirements.		–	*Distant End:* OFF-HOOK, terminate channel with 600 ohms.	362-305-510
14	Alarm and Loop Signaling Path Check	–	–	–	–	–	–	–	–	Make tests at each terminal.	362-105-503

Note 1: The test and readjust values shown are for use when the EXP potentiometer is strapped out. If the EXP potentiometer is not strapped out, refer to reference section for adjustment procedures.

Note 2: The Channel net gain should be remeasured and adjusted to the required net gain one week after channel alignment if tubes were changed, and one day after alignment if no tubes were changed.

CHART 2
O AND ON CARRIER – MESSAGE CHANNEL UNIT USING MOBILE CARRIER TEST BAY
LINEUP AND MAINTENANCE TESTS

TEST	PURPOSE OF TEST	METER SWITCH	VF PATH SWITCH 2W	VF PATH SWITCH 4W	MEASURE TEST POINT TO GRD OR BETWEEN TEST POINTS	REQUIRED VALUE TEST	REQUIRED VALUE READJUST	ADJUST	TEST CONDITIONS AND REMARKS		SECTION REFERENCE
1	Compressor Output	5	1	5	TP6	At least +9.5 dB	—	—	COMP pot. at max. output	OFF-HOOK at testing end.	362-115-501
						+8.3 to +9.7 dB	+9.0 dB	COMP			
2	Message Output	5	1	5	T Jk	—42.0 to —40.0 dB	—41 dB	T	Selector switch on 01 TERM.		
3	Signaling Output	5	3		T Jk	3-dB Reduced Level	—	—	ON-HOOK at testing end.		362-115-502
						—50.5 to —42.5 dB					
						Old Level					
						—47.5 to —39.5 dB					
4	Carrier Leak	5	3		T Jk	Less than —66 dB	—	—	Turn selector on test stand 01 TERM. OFF-HOOK at testing end.		
						Less than —54 dB			Selector switch to N1-01 NORM.		
5	Expandor Output	6	3	5	E1-E2	+8.5 to + 11.5 dB	+10 dB	R	*Distant End:* OFF-HOOK Send 1000 Hz (2W) 0 dBm (4W) —16 dBm. *Testing End:* See Note 3.		362-305-501
6	Receiving Level	5	See Note 1.		R Jk	+8 to +14 dB	—	—			
7	Signaling Receiver Level	5	See Note 1.		S1 Jk	3-dB Reduced Level	—	—	*Distant End:* ON-HOOK		362-305-515
						—15 to +7 dB					
						Old Level					
						—12 to +10 dB					
8	Signaling Relay Current	4	See Note 1.		TP1 to TP2	14 to 16V	15V	REL CUR	*Testing End:* BRK and SIG Potentiometers to midposition.		
9	Signaling Receiver Sensitivity	—	—		E_G Jack of Test Stand	Signal relay (K41) just operates as indicated by lamp on 2B Sig Test Set.		SIG	*Distant End:* ON-HOOK *Testing End:* Strap S1 to TP3, turn SIG potentiometer to extreme counterclockwise and then clockwise slowly until L lamp on 2B Sig Test Set just lights.		
10	Percent Break	—	—		E_G Jack of Test Stand	56 to 64% Red Scale	62% Red Scale	BRK	*Distant End:* Adjust 2B Sig Test Set to send 12 PPS at 58% break on black scale.		
11	Minimum Length of Pulse	—	—		E_G Jack of Test Stand	Minimum 12%	—	—	*Distant End:* At trsg end, operate ADJ % BRK switch to S. Send 12 PPS and adjust ADJ % BRK potentiometer on 2B Test Set slowly from extreme counterclockwise until a deflection just appears on 2B Test Set at testing end. Read % break at distant end.		
12	Channel Net Gain See Note 2.	7	2	6	4W (VF OUT)	—	4 Wire +7.0	REC	*Distant End:* OFF-HOOK Send 1000 Hz (2W) 0 dBm; (4W) —16 dBm. *Testing End:* Set IDLE 2-wire channels to —10 dBm.		362-305-512
					2W (VF IN)		2 Wire Value Circuit Order See Note 4.				
13	Channel Noise	THIS TEST TO BE MADE ONLY AT VF PATCH BAY									362-305-510

Note 1: VF PATH switch, not used for these tests, can be left in any position except 2 or 6.

Note 2: Make final adjustment with TMS at the VF patch bay.

Note 3: The test and readjust values shown are for use when the EXP potentiometer is strapped out. If the EXP potentiometer is not strapped out, refer to the reference section for adjustment procedures.

Note 4: The channel net gain should be remeasured and adjusted to the required net gain one week after channel alignment if tubes were changed, and one day after alignment if no tubes were changed.

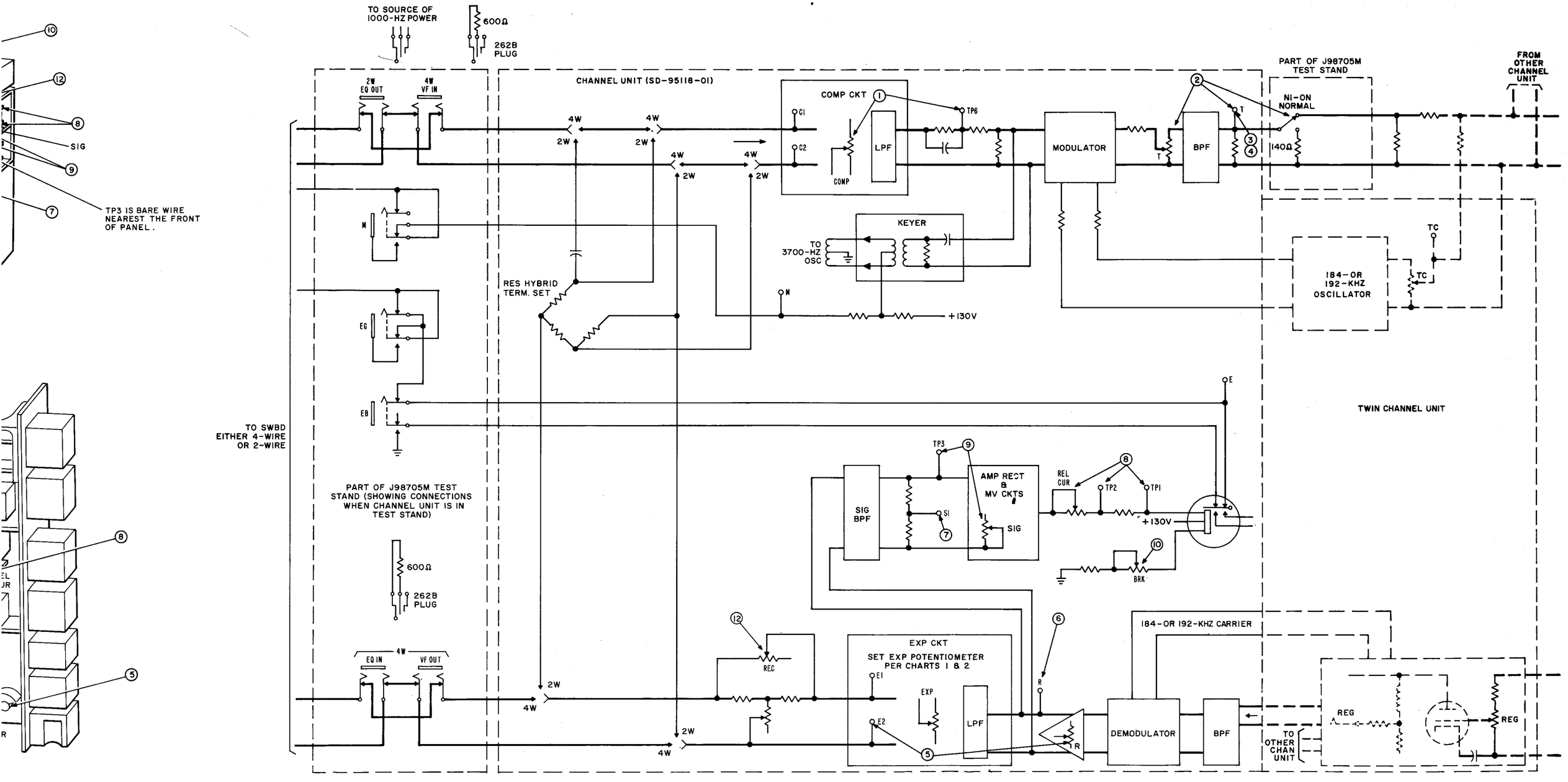
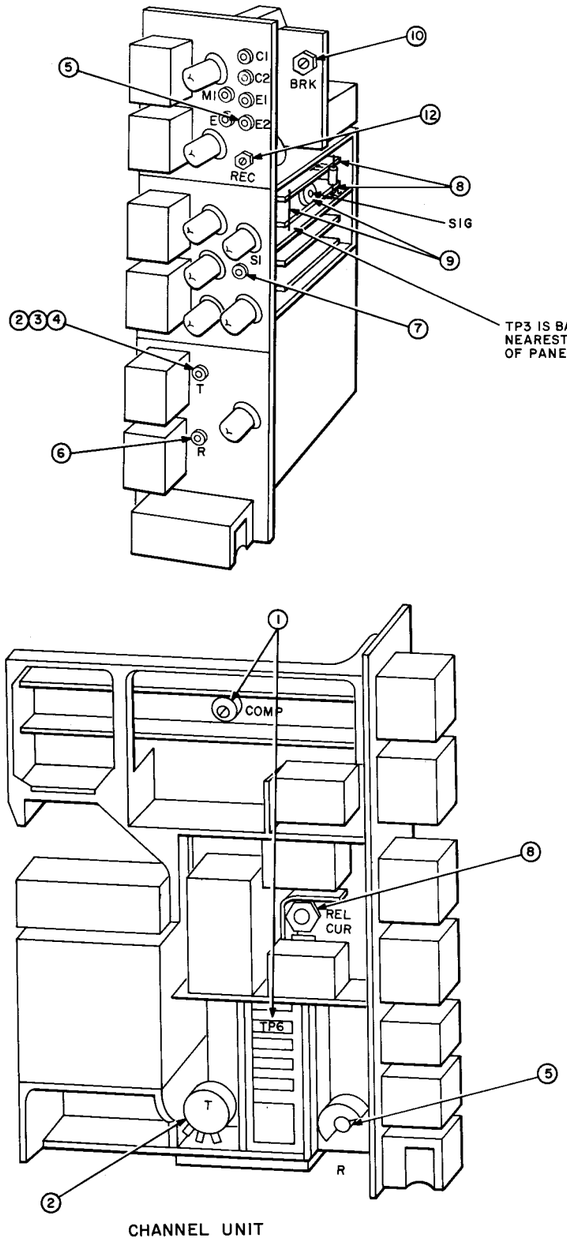
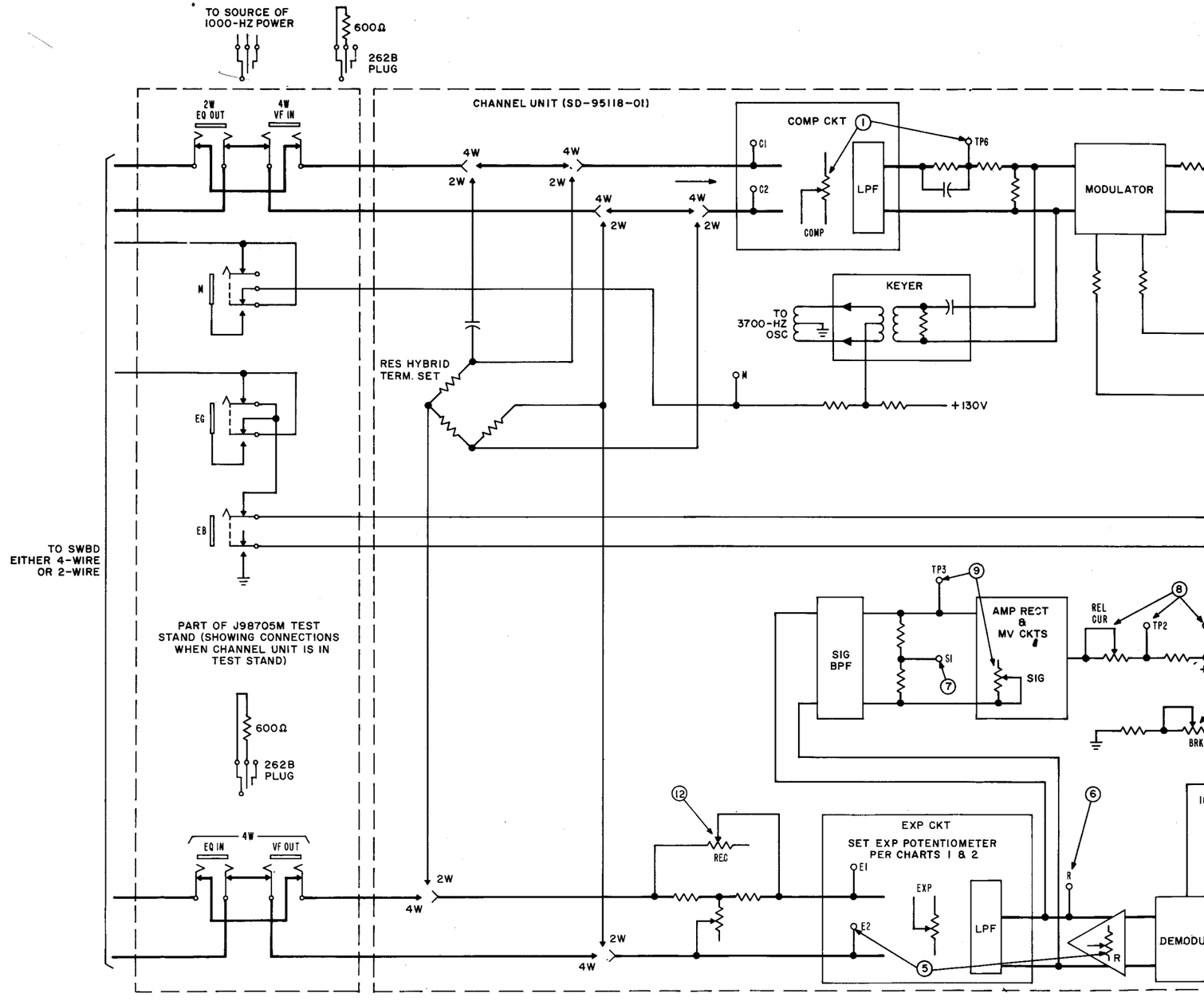


Fig. 1—Channel Unit Test Points



CHANNEL UNIT



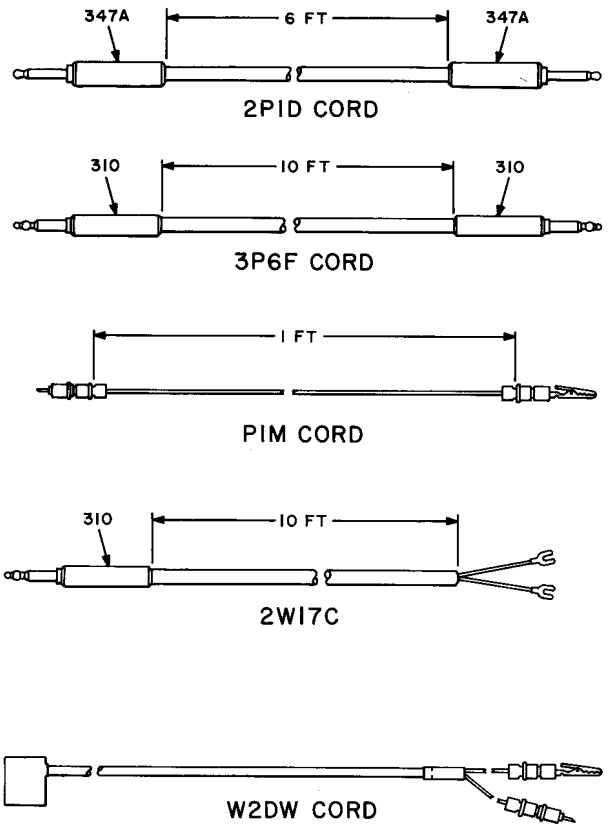


Fig. 2—Miscellaneous Cords Used for Testing Channel Unit