TYPE O-H AND ON-H CARRIER TELEPHONE SYSTEMS—

O-H REPEATERS

SUMMARY CHARTS—LINEUP, MAINTENANCE, AND TROUBLE SHOOTING

CONTENTS PAGE

1. GENERAL

1.01 This section provides a summary of the tests required for the initial lineup and maintenance of hybrid integrated network (HIN) modified O-H repeaters.

1.02 ▶This section is reissued to provide surge protection information for the O-H repeaters and to correct a drawing number error. Arrows are used to indicate changes. This reissue affects the Equipment Test List.◀

1.03 The information in this section is intended to be used after the repeater modifications have been installed and the equipment is ready for lineup ▶per Section 362-205-502.◀ The summary charts also apply to the maintenance of the system after it is placed in service.

1.04 Provided with the summary charts are overall diagrams for the repeater units under test with the test points and adjustments keyed to the lineup and maintenance procedure steps.

1.05 It is necessary to refer to associated sections for detailed procedures and for steps to be taken when requirements are not met. Familiarity with the sections covering the testing methods in detail is essential before this section is used.

1.06 The necessity of following the procedures without omitting any steps is stressed in order to avoid irregularities which are likely to result from the use of abbreviated or unauthorized procedures.

2. SYSTEM LINEUP

2.01 System lineup tests are performed either when the system is first lined up after HIN-modification or when significant changes in transmission have been observed.

2.02 The lineup and maintenance test charts and their associated diagrams are as follows:

Chart 1—Lineup and Maintenance Tests—Type OA-H Repeaters (associated with Fig. 1)

Chart 2—Lineup and Maintenance Tests—OB-H, OC-H, and OD-H Repeaters (associated with Fig. 2)

3. APPARATUS

3.01 The apparatus list indicates the equipment needed to perform the lineup or maintenance tests. Additional equipment required for trouble investigation is as listed in the sections referenced in the summary charts.

1—2J Repeater Test Set

1—KS-14510, L5, Volt-Ohm-Milliammeter (VOM), or equivalent (20,000 ohms per volt)

2—KS-9290 Test Leads

4. TROUBLE INVESTIGATION

4.01 Trouble investigation tests specified in the summary chart references apply to HIN-modified repeater equipment with minor changes. References to heater supply adjustments and electron tube tests are not applicable to HIN-modified repeaters.

4.02 When substitution of plug-in units is used as a means of trouble investigation, the substituted units must also be HIN-modified. No mixture of HIN and tube units can exist in a pair of repeater amplifiers and associated oscillator.

4.03 Fault location can also be done by HIN device substitution. HIN devices cannot be interchanged between like tube types. Each must be substituted with a matching HIN-coded device.

4.04 HIN devices cannot be tested with a KS-type tube tester. The reverse voltage, plate-to-ground, will damage the HIN devices. Out-of-service tests on HIN devices may be performed using a HIN test set if desired.

4.05 A HIN test set can be locally assembled based on information provided in the March, 1974 issue of ***T&R Notes,*** modified by the September, 1974 issue. The test specifications in Table A are based on the use of the HIN test set shown in ***T&R Notes*** for the HIN devices used in O-H repeaters.

4.06 A new WE HIN test set, coded KS-21697, is available to test all KS numbered HIN devices. It is portable and equipped with a roll chart listing HIN devices and test limits applicable to this test set. Section 103-469-100 describes this set.

4.07 In-service tests on HIN-equipped circuits used in O-H repeaters may be made as shown in Table B.

TABLE A

HIN TEST SPECIFICATIONS (HIN TEST SET)

KS-CODE	V_P VOLTS, MAX	I_{DSR}, mA	I_{DSS}, mA
21060	8.5	4.5 to 9.5	—
21066	8.5	3.5 min	17.0 max
21073	8.5	4.5 to 9.5	—
21702	8.5	—	3.0 to 9.0 (pins 2, 3, 4)
	8.5	—	5.0 to 11.0 (pins 6, 7, 8)

TABLE B

IN-SERVICE HIN TEST LIMITS

UNIT	SOCKET NO.	CONNECT VOM LEADS TO	LIMITS
Repeater Amplifier	V2	K2 and GRD	0.9 to 2.0 Vdc
	V3	K3 and GRD	0.9 to 2.0 Vdc

CHART 1

LINEUP AND MAINTENANCE TESTS—TYPE OA-H REPEATERS

TEST	PURPOSE OF TEST	MEASURING EQUIPMENT TESTING END	MEASUREMENT POINT TO GRD OR BETWEEN TEST POINTS	REQUIRED VALUE		ADJUST	TEST CONDITIONS AND REMARKS	SECTION REFERENCE
				TEST	READJUST			
1	WE AMP repeater output level	2J	OUT Jack	TWO CARRIERS +17.0 to +19.0 dB	+18.0 dB	OUT Potentiometer	REG Pot set max CCW	362-215-505
				ONE CARRIER +14.0 to +16.0 dB	+15.0 dB			
2A	EW AMP Set regulating amplifier input	VOM	Reg Jack and (+) FIL CUR Jack on fuse panel	0.7 to 10.0 Vdc	1.5 Vdc	REG Pot	Ground all T Jacks at LGT terminal	
2B	EW AMP repeater output level	2J	OUT Jack	TWO CARRIERS +17.0 to +19.0 dB	+18.0 dB	OUT Potentiometer	Repeat 2A and 2B until requirement is met. Adjustments interact.	
				ONE CARRIER +14.0 to +16.0 dB	+15.0 dB			

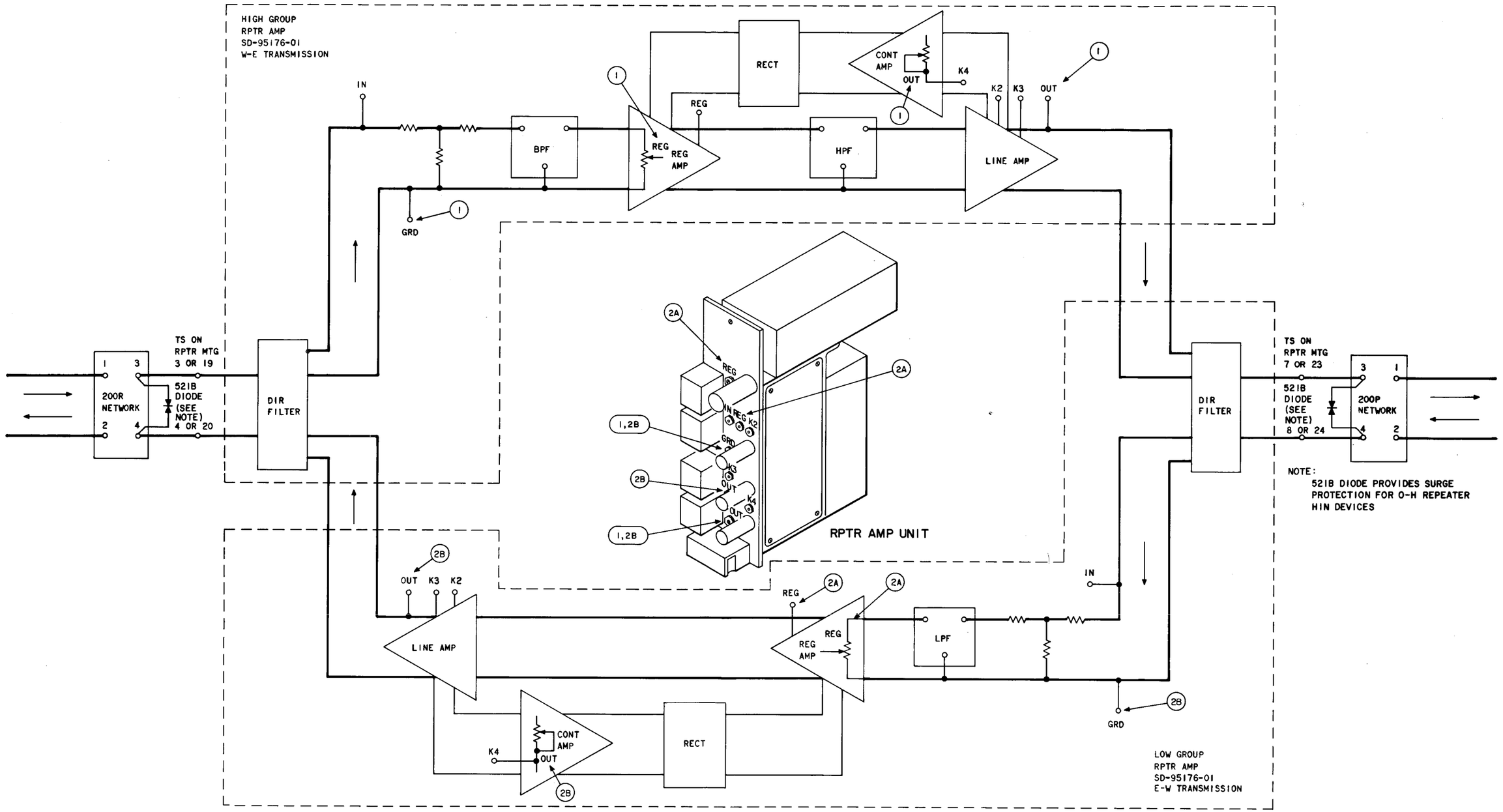

Fig. 1—Test Points—OA-H Repeater

CHART 2

LINEUP AND MAINTENANCE TESTS – TYPE OB-H, OC-H, AND OD-H REPEATERS

TEST	PURPOSE OF TEST	MEASURING EQUIPMENT TESTING END	MEASUREMENT POINT TO GRD OR BETWEEN TEST POINTS	REQUIRED VALUE		ADJUST	TEST CONDITIONS AND REMARKS	SECTION REFERENCE
				TEST	READJUST			
1	Repeater osc output	2J	OUT Jack	+0.5 to +7.5 dB	—	—	Replace HIN and retest if requirements are not met	362-215-501
2	Repeater amplifier	2J	OUT Jack	TWO CARRIERS		OUT Potentiometer	Fault locate by substituting HIN devices and retest	
				+9.0 to +11.0 dBm	+10.0 dBm			
				ONE CARRIER				
				+6.0 to +8.0 dBm	+7.0 dBm			

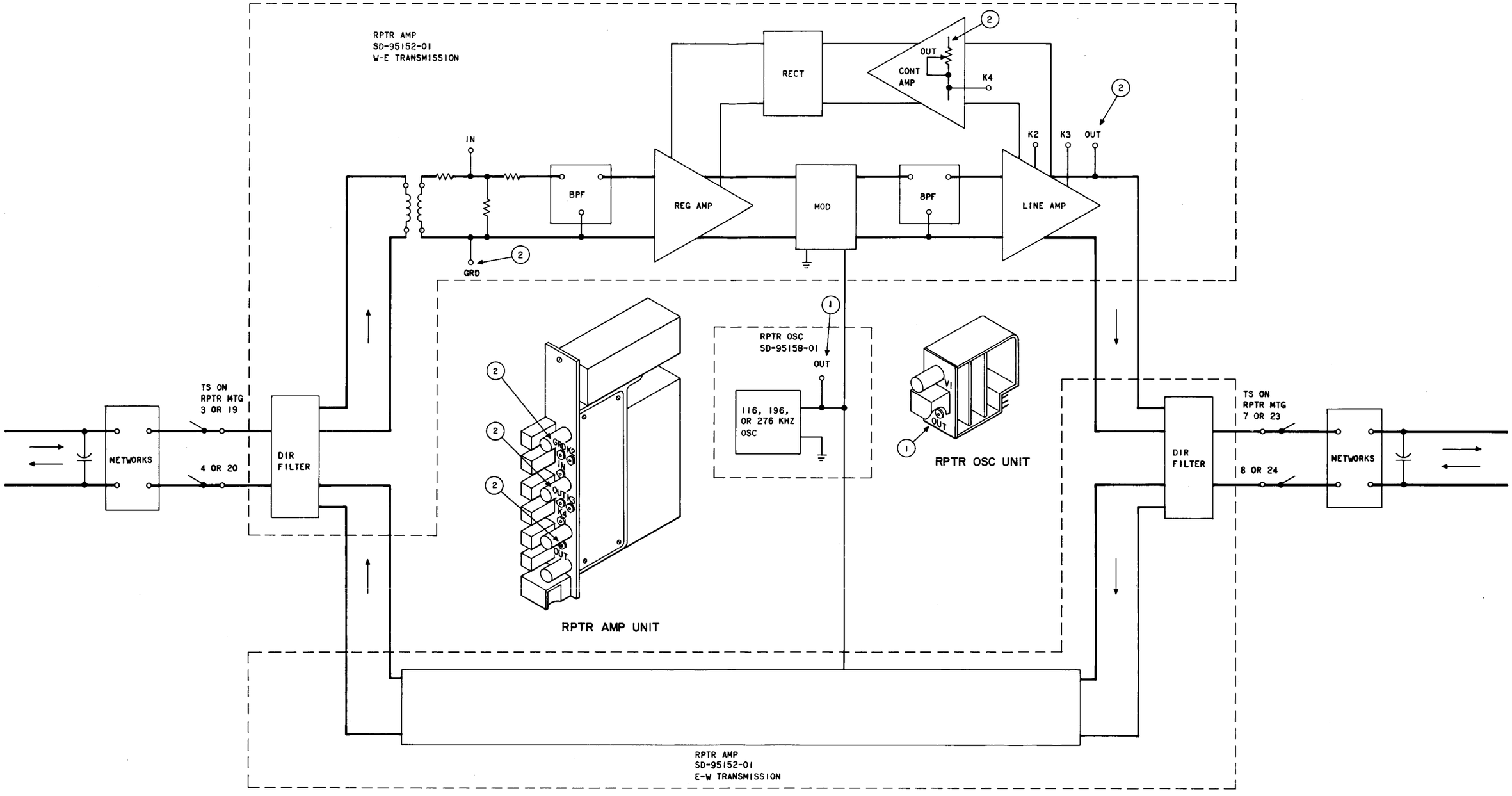

Fig. 2—Test Points—OB-H, OC-H, or OD-H Repeater