

E-TYPE TELEPHONE REPEATERS  
NETWORK STRAPPING BY USE OF CHARTS  
E13 OR E23 BRIDGED REPEATERS

CONTENTS	PAGE
1. INTRODUCTION . . . . .	1
2. CHART INDEX . . . . .	1
3. STRAPPING CHARTS . . . . .	1

1. INTRODUCTION

1.01 The E-repeater network strappings included in this section have been designed for E23 or E13 repeaters on loaded cable facilities. They are organized by loading system, as defined by inductance and spacing of loading coils; by cable capacitance per unit length, classed as "high" or "low"; by cable gauge; and by location of repeater, either "terminal" or "intermediate".

1.02 Type and length of facility, regularity of loading and location of repeater determine how much gain it is practicable to obtain. The person applying the strapping is usually furnished information as to the gain desired.

2. CHART INDEX

2.01 The index of strapping charts following this text reflects the organization mentioned above. The numerical part of the chart designation, 1, 2, 3, etc, indicates the type of loading and whether the cable is of the high or low capacitance type. These numbers have the same meanings as in the strapping charts for E1 repeaters. One or more M's following the chart number indicate strappings for intermediate repeaters, while one or more T's indicate strappings for terminal repeaters. One M or T denotes 19- or 22-gauge; 2 M's or T's 24-gauge; and 3 M's or T's 26-gauge.

2.02 Charts with M in the designation are not suitable for an intermediate repeater located between two facilities employing different types of loading. For such a repeater, strappings are selected from T charts for the facility having the lower cutoff frequency of the two.

2.03 Terminal repeaters are usually strapped for gains not exceeding 6.5 db. The gain steps above 6.5 db in the T charts are provided for intermediate repeaters, as covered in Paragraph 2.02.

2.04 Where the same type of loading but different wire sizes are used on the two sides of an intermediate repeater, the strapping chart for the finer-gauge wire (larger number) is used.

2.05 Where more than one size of wire is used on the same side of the repeater, information is usually furnished the person applying the strapping, as to which gauge controls the chart selection.

2.06 Each strapping chart is represented in the index by a rectangular space. The date in each space indicates the latest strapping chart for the particular facility represented. This date also appears on the strapping chart.

2.07 A blank space in the index indicates that no strappings have been developed as yet for the type of facility represented. The index will be brought up to date from time to time to show new or revised charts.

2.08 In order to avoid confusion when new charts are added, page numbers have been omitted. Any chart may be located easily, however, if it is remembered that all the charts are bound in the natural order in which they would be read in the index, that is, 1 M, 1 MM, 1 MMM, 1 T, 1 TT, 1 TTT, 2 M, 2 MM, etc. When the new charts are issued they should be inserted in such a way that this same order will prevail.

3. STRAPPING CHARTS

3.01 Each chart is arranged to show both the E1 or E2 and the E3 strappings. A complete E2 strapping includes E2 basic strapping and supplementary strapping for a particular end-section. The E3 strappings have been placed to the left of the others and are

**SECTION 332-200-106**

separated from them by the bold gain figures so as to minimize the chances of confusion. E3 strappings are independent of end-sections.

Supplemental Strapping

3.02 The end-section is defined as the capacitance between the repeater and the first loading coil divided by the nominal capacitance of a loading section. It is computed to the nearest tenth. The capacitance between the repeater and the first loading coil includes that of any cable building-out capacitor that may be specified.

3.03 At a terminal repeater, there is only one end-section, and it alone determines the supplementary strapping.

3.04 At an intermediate repeater, there are two end-sections. It is the larger of the two, but not necessarily the longer, that determines the supplementary strapping. Suppose the loading on the west side of a repeater is B88 with loading section capacitance of 0.048 MF and an end-section capacitance of 0.029 MF. Suppose further that the loading on the east side is H88 with loading section capacitance of 0.096 MF and an end-section capacitance of 0.042 MF. By the definition in Paragraph 3.02, the west end-section is 0.6 and the east end-section is 0.4. This situation is presented below in tabular form.

	<u>West</u>	<u>East</u>
1. Loading	B88	H88
2. Load.-Sect. Cap.	0.048 MF	0.096 MF
3. End-Sect. Cap.	0.029 MF	0.042 MF
4. End-Section (3) / (2)	0.6	0.4

According to the rule at the beginning of this paragraph, the supplemental E2 strapping is chosen for 0.6 end-section, the larger of the two. Note that the larger end-section does not necessarily have the larger capacitance. In this case the west end-section is the larger, although the west end-section capacitance is the smaller.

Building Out End-Sections

3.05 Where cable end-sections are not large enough for best operation with E-type repeaters, building-out capacitors are usually specified. It is important that each building-out capacitor be connected at the specified side of the repeater.

E1 Repeater

3.06 Where building-out capacitors are added to an E1 repeater, they are connected across the line at the line transformer terminals, either 1 and 4, or 2 and 3, as specified. In some cases, building-out capacitors are specified at both locations.

E2 Repeater

3.07 Three building-out capacitors, one of 0.01 MF and two of 0.02 MF, are furnished as a part of each E2 repeater. One terminal of each capacitor is connected permanently to terminal 42 of the repeater. The other terminals are connected permanently to terminals 43, 44, and 45 of the strapping board, respectively. The capacitors may be used in any parallel combination on either side of the repeater, but not on both sides, to add from 0.01 to 0.05 MF to the end-section. The line transformer terminals, 40-41 and 46-47, appear on the strapping board for convenience in making the connections.

3.08 If end-sections on both sides of the repeater require building-out, additional capacitors must be provided for one side, and connected to the line terminals on the strapping board, either 40-41 or 46-47.

Reused E1 Repeater Strappings

3.09 In some cases the strappings for the E2 repeaters have been taken from the tables of E1 repeater strappings. Where this has been done it is indicated by a note in the chart. It should be remembered, however, that these strappings appear under different gains in the E1 and E23 strapping charts, since the presence of the E3 repeater unit increases the gain. The following table indicates the E1 or E2 gains and the corresponding E13 or E23 gains in db.

<u>E1 or E2</u>	<u>E23</u>	<u>E1 or E2</u>	<u>E23</u>
1.0	1.9	4.0	6.5
1.5	2.7	4.5	7.3
2.0	3.5	5.0	8.0
2.5	4.3	5.5	8.6
3.0	5.0	6.0	9.2
3.5	5.8	6.5	9.8

3.10 In some cases the existing strapping of an E1 or E2 repeater may correspond to that for the E3 gain that is to be established. In such cases, it will not be necessary to change the former when the E3 unit is added, except perhaps for supplementary strapping.

#### Interconnection of 2 Strings of Capacitors

3.11 It may be noted that some of the E3 repeater strappings specify a connection between terminals 34 and 29, although no apparent use is made of the latter connection. Each of these terminals is common to a separate string of capacitors, the string common to terminal 29 consisting of relatively small capacitors. Since experience has shown that small adjustments are often required, necessitating connection to this latter string, the strapping from 34 to 29 has been specified, in effect making the two strings into one and facilitating small adjustments.

3.12 Where connections to terminal 29 but not 34 are specified, the strapping between the two strings is not called for in the charts

because small adjustments would have to be made within the "29" string.

#### External Network Elements

3.13 In a few instances it has been necessary to use, in a network, a resistance element not furnished in the repeater as part of the network. Such an element may be obtained locally and connected between the two terminals whose numbers appear adjacent to it in the strapping chart. For example (20-2,000  $\Omega$  -35) means that a 2,000-ohm resistor is to be connected between terminals 20 and 35.

3.14 Resistors should measure within two per cent of the specified resistance and should be rated at one-half watt. Western Electric Type 145B resistors or similar type should be satisfactory. The resistors should be placed so that each lead will make contact with only that terminal to which it is soldered, and close enough to the strapping panel so that they will not touch the cover of the adjacent repeater.

INDEX OF STRAPPING CHARTS

9-55

Chart Designation	→	Intermediate			Terminal		
		M	MM	MMM	T	TT	TTT
↓	Gauge	19 or 22	24	26	19 or 22	24	26
	Loading						
1	B 88HC	9-55	9-55		9-55	9-55	
2	B 88LC	9-55			9-55		
3	D 88HC	9-55	9-55		9-55	9-55	
4	D 88LC						
5	H 88HC	9-55	9-55		9-55	9-55	
6	H 88LC	9-55			9-55		
7	M 88LC						
8	B135HC	9-55			9-55		
9	B135LC				9-55		
10	D135HC						
11	D135LC						
12	H135HC						
13	H135LC						
14	B175LC						
15	D175LC						
16	H175LC	9-55			9-55		
17	H 44HC				9-55		

- Notes: 1. HC designates "high capacitance" cable.  
 2. LC designates "low capacitance" cable.  
 3. All 22-gauge cable is considered HC. HC and LC in other gauges are of the following types or their equivalent.

	<u>19</u>	<u>24</u>	<u>26</u>
HC	CNB	DSM	BST
LC	DNB	CSM	AST

Example: Select the strapping chart for an intermediate E23 repeater on 24-gauge, high-capacitance, H88-loaded facilities.

H88 HC is in the row designated by the Number 5.  
 Intermediate repeater on 24-gauge is in the column designated by the letters MM.  
 Intersection of Row 5 and Column MM contains date 9-55.

The chart desired, therefore, is 5 MM dated 9-55.

## CHART 1M

INTERMEDIATE E23 REPEATER  
(T ARRANGEMENT)

19B88-HC

22B88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION *	SUPPLEMENTAL
(5-14-29-34) (6-19) (15-18) (20-3000 Ω **-35) (27-28-36)	1.9	(4-12-20-34) (5-15-24-31) (14-39) (21-22-23-25-36) (37-38)		
			.5	(7-8-9-18)
			.6	(7-8-10-13-18)
			.7	(7-8-11-13-18)
			.8	(7-8-10-11-13-18)
(5-13-14-29-34) (6-18) (12-15) (16-17) (19-21) (20-1000 Ω **-35) (26-28-30-36)	2.7	(4-31-33) (5-12-24-26-27) (14-39) (17-25-36-38) (22-34)		
			.5	(7-9-11-13-15-16-28)
			.6	(7-9-10-11-16-28)
			.7	(7-16-18-28)
			.8	(7-9-15-16-18-28)
(5-12-29-34) (6-18) (14-16) (15-17) (20-35) (28-30-31-36)	3.5	(4-12-24-37) (8-29-30) (14-25-39) (17-19-22-32 -33-36) (27-38)		
			.5	(6-7-11-13-28)
			.6	(6-7-9-11-13-28)
			.7	(6-7-10-11-15-28)
			.8	(6-7-9-10-11-15-28)
(5-10-13-29-34) (6-16-20) (7-35) (18-19-21) (23-31-32-36)	4.3	(4-20) (8-24-37) (12-30) (14-39) (17-19-29-32 -33-34-36)		
			.5	(5-7-9-10-15)
			.6	(5-7-11)
			.7	(5-7-11-13)
			.8	(5-7-9-11-15)
(5-13-29-34) (6-16-18-21) (12-14) (17-19) (20-35) (28-30-32-36)	5.0	(4-8-20-37) (5-12) (14-39) (19-22-31-32-36) (24-30-33)		
			.5	(6-7-9-10-15)
			.6	(6-7-11)
			.7	(6-7-11-13)
			.8	(6-7-9-11-15)
(5-14-15) (6-11-16) (10-29-34) (12-17) (19-35) (33-36)	5.8	(4-20-26-34) (5-12) (14-39) (24-29-33) (25-30-31-36-37) (27-38)		
			.5	(6-7-10-13-16)
			.6	(6-7-9-10-16)
			.7	(6-7-9-10-13-16)
			.8	(6-7-11-16)

\* Use the Strapping that Corresponds to the Larger Fractional End Section Adjacent to the Repeater.

\*\* External Resistance.

CHART 1M

INTERMEDIATE E23 REPEATER  
(T ARRANGEMENT)

19B88-HC

22B88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION *	SUPPLEMENTAL
(3-17-29-34) (4-18) (12-35) (13-14) (16-19) (26-27-33-36)	6.5	(5-29-33) (6-28-34) (14-39) (25-31-36-37) (27-38)		
			.5	(7-10-13-24)
			.6	(7-9-10-24)
			.7	(7-9-10-13-24)
			.8	(7-11-24)
(3-13-15) (4-16-29-34) (12-17) (19-35) (31-33-36)	7.3	(5-29-33) (6-8-20-22) (12-24)(14-39) (19-31-32-36-37) (26-27) (34-38)		
			.5	(7-10-15-16)
			.6	(7-10-13-15-16)
			.7	(7-9-10-15-16)
			.8	(7-9-10-13-16)
(3-8-29-34) (4-15) (10-13) (16-18-21) (19-20-35) (27-31-33-36)	8.0	(4-12-22) (5-20) (9-16) (14-39) (34-38)		
			.5	(6-7-28-29-30) (17-25-36-37)
			.6	(6-7-28-31) (17-25-36-37)
			.7	(6-7-28-29-30) (21-25-36-37)
			.8	(6-7-28-30-31) (17-25-36-37)
(3-8-29-34) (4-15) (9-13) (16-18-21) (19-20-35) (24-25-27-31-33-36)	8.6	(4-24) (12-29) (16-22-28) (27-34) (31-33-35-36-37)		
			.5	(5-7-10)
			.6	(5-7-10-15)
			.7	(5-7-10-13-15)
			.8	(5-7-9-10)
(3-13-17) (4-11-15) (10-29-34) (18-20) (19-35) (32-33-36)	9.2	(4-12-22) (13-15-16) (14-39) (26-34)		
			.5	(6-7-30-33) (25-31-36-37)
			.6	(6-7-29-30) (17-25-33-36-37)
			.7	(6-7-31) (17-25-36-37)
			.8	(6-7-29-30) (21-25-36-37)
(3-11-13) (4-15-18) (8-29-34) (19-35) (27-32-33-36)	9.8	(4-12-22) (13-15-16) (14-25-39) (19-23) (26-27)		
			.5	(6-7-29-30) (31-32-36-37)
			.6	(6-7-30) (21-32-36-37)
			.7	(6-7-29-30-33) (17-32-36-37)
			.8	(6-7-29-30-33) (17-31-32-36-37)

\* Use the Strapping that Corresponds to the Larger Fractional End Section Adjacent to the Repeater.

## CHART 1MM

INTERMEDIATE E23 REPEATER  
(T ARRANGEMENT)

24B88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION *	SUPPLEMENTAL
(5-14-29-34) (6-19) (15-18) (20-3000 $\Omega$ ** -35) (25-27-36)	1.9	(4-12-20-34) (5-15-24-31) (14-39) (21-22-23-25-36) (37-38)		
			.5	(7-8-9-18)
			.6	(7-8-10-13-18)
			.7	(7-8-11-13-18)
			.8	(7-8-10-11-13-18)
(5-13-14-29-34) (6-18) (12-15) (16-17) (19-21) (20-1000 $\Omega$ ** -35) (27-28-36)	2.7	(4-31-33) (5-12-24-26-27) (14-39) (17-25-36-38) (22-34)		
			.5	(7-9-11-13-15-16-28)
			.6	(7-9-10-11-16-28)
			.7	(7-16-18-28)
			.8	(7-9-15-16-18-28)
(5-12-29-34) (6-18) (14-16) (15-17) (20-35) (27-28-36)	3.5	(4-12-24-37) (8-29-30) (14-25-39) (17-19-22-32-33-36) (27-38)		
			.5	(6-7-11-13-28)
			.6	(6-7-9-11-13-28)
			.7	(6-7-10-11-15-28)
			.8	(6-7-9-10-11-15-28)
(5-10-13-29-34) (6-16-20) (17-35) (18-19-21) (23-25-27-28-36)	4.3	(4-20) (8-24-37) (12-30) (14-39) (17-19-29-32-33-34-36)		
			.5	(5-7-9-10-15)
			.6	(5-7-11)
			.7	(5-7-11-13)
			.8	(5-7-9-11-15)
(5-13-29-34) (6-16-18-21) (12-14) (17-19) (20-35) (32-36)	5.0	(4-8-20-37) (5-12) (14-39) (19-22-31-32-36) (24-30-33)		
			.5	(6-7-9-10-15)
			.6	(6-7-11)
			.7	(6-7-11-13)
			.8	(6-7-9-11-15)
(5-14-15) (6-11-16) (10-29-34) (12-17) (19-35) (28-30-31-36)	5.8	(4-20-26-34) (5-12) (14-39) (24-29-33) (25-30-31-36-37) (27-38)		
			.5	(6-7-10-13-16)
			.6	(6-7-9-10-16)
			.7	(6-7-9-10-13-16)
			.8	(6-7-11-16)

\* Use the Strapping that Corresponds to the Larger Fractional End Section Adjacent to the Repeater.

\*\* External Resistance

CHART IMM

INTERMEDIATE E23 REPEATER  
(T ARRANGEMENT)

24B88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION *	SUPPLEMENTAL
(3-17-29-34) (4-18) (12-35) (13-14) (16-19) (30-32-36)	6.5	(5-29-33) (6-28-34) (14-39) (25-31-36-37) (27-38)		
			.5	(7-10-13-24)
			.6	(7-9-10-24)
			.7	(7-9-10-13-24)
			.8	(7-11-24)
(3-13-15) (4-16-29-34) (12-17) (19-35) (31-32-36)	7.3	(5-29-33) (6-8-20-22) (12-24) (14-39) (19-31-32-36-37) (26-27) (34-38)		
			.5	(7-10-15-16)
			.6	(7-10-13-15-16)
			.7	(7-9-10-15-16)
			.8	(7-9-10-13-16)
(3-8-29-34) (4-15) (10-13) (16-18-21) (19-20-35) (24-31-32-36)	8.0	(4-12-22) (5-20) (9-16) (14-39) (34-38)		
			.5	(6-7-28-29-30) (17-25-36-37)
			.6	(6-7-28-31) (17-25-36-37)
			.7	(6-7-28-29-30) (21-25-36-37)
			.8	(6-7-28-30-31) (17-25-36-37)
(3-8-29-34) (4-15) (9-13) (16-18-21) (19-20-35) (27-31-32-36)	8.6	(4-24) (12-29) (16-22-28) (27-34) (31-33-35-36-37)		
			.5	(5-7-10)
			.6	(5-7-10-15)
			.7	(5-7-10-13-15)
			.8	(5-7-9-10)
(3-13-17) (4-11-15) (10-29-34) (18-20) (19-35) (24-27-31-32-36)	9.2	(4-12-22) (13-15-16) (14-39) (26-34)		
			.5	(6-7-30-33) (25-31-36-37)
			.6	(6-7-29-30) (17-25-33-36-37)
			.7	(6-7-31) (17-25-36-37)
			.8	(6-7-29-30) (21-25-36-37)
(3-11-13) (4-15-18) (8-29-34) (19-35) (30-31-32-35)	9.8	(4-12-22) (13-15-16) (14-25-39) (19-23) (26-27)		
			.5	(6-7-29-30) (31-32-36-37)
			.6	(6-7-30) (21-32-36-37)
			.7	(6-7-29-30-33) (17-32-36-37)
			.8	(6-7-29-30-33) (17-31-32-36-37)

\* Use the Strapping that Corresponds to the Larger Fractional End Section Adjacent to the Repeater.

## CHART 1T

TERMINAL E23 REPEATER  
(T ARRANGEMENT)

19B88-HC

22B88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END * SECTION	SUPPLEMENTAL
(1-29-34) (2-3) (4-13) (5-14-22-24) (6-19) (15-18) (20-3000Ω** -35) (27-28-36)	1.9	(4-12-20-34) (5-15-24-31) (14-39) (21-22-23-25-36) (37-38)	.4	(7-8-9-10-11-13)
			.5	(7-8-9-18)
			.6	(7-8-10-13-18)
			.7	(7-8-11-13-18)
			.8	(7-8-10-11-13-18)
(1-7) (2-3) (4-29-34) (5-10-13-14-22-24) (6-18) (12-15) (16-17) (19-21) (20-1000Ω** -35) (26-28-30-36)	2.7	(4-31-33) (5-12-24-26-27) (14-39) (17-25-36-38) (22-34)	.4	(7-11-13-15-16-28)
			.5	(7-9-11-13-15-16-28)
			.6	(7-9-10-11-16-28)
			.7	(7-16-18-28)
			.8	(7-9-15-16-18-28)
(1-29-34) (2-3) (4-10) (5-8-12-22-24) (6-18) (14-16) (15-17) (20-35) (28-30-31-36)	3.5	(4-12-24-37) (8-29-30) (14-25-39) (17-19-22-32-33-36) (27-38)	.4	(6-7-9-10-13-15-28)
			.5	(6-7-11-13-28)
			.6	(6-7-9-11-13-28)
			.7	(6-7-10-11-15-28)
			.8	(6-7-9-10-11-15-28)
(1-8) (2-3) (4-29-34) (5-10-13-22-24) (6-16-20) (7-9) (17-35) (18-19-21) (23-31-32-36)	4.3	(4-20) (8-24-37) (12-30) (14-39) (17-19-29-32-33-34-36)	.4	(5-7-10-13-15)
			.5	(5-7-9-10-15)
			.6	(5-7-11)
			.7	(5-7-11-13)
			.8	(5-7-9-11-15)
(3-7) (4-29-34) (5-9-13-22-26) (6-16-18-21) (12-14) (17-19) (20-35) (28-30-32-36)	5.0	(4-8-20-37) (5-12) (14-39) (19-22-31-32-36) (24-30-33)	.4	(6-7-10-13-15)
			.5	(6-7-9-10-15)
			.6	(6-7-11)
			.7	(6-7-11-13)
			.8	(6-7-9-11-15)
(3-29-34) (4-9) (5-14-15) (6-11-16) (10-22-26) (12-17) (19-35) (33-36)	5.8	(4-20-26-34) (5-12) (14-39) (24-29-33) (25-30-31-36-37) (27-38)	.4	(6-7-10-16)
			.5	(6-7-10-13-16)
			.6	(6-7-9-10-16)
			.7	(6-7-9-10-13-16)
			.8	(6-7-11-16)

\* Use the Strapping that Corresponds to the Larger Fractional End Section Adjacent to the Repeater.

\*\* External Resistance

## CHART 1T

TERMINAL E23 REPEATER  
(T ARRANGEMENT)

19B88-HC

22B88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END * SECTION	SUPPLEMENTAL
(1-29-34) (2-9) (3-8-10-17-31) (4-18) (12-35) (13-14) (16-19) (26-27-33-36)	6.5	(5-29-33) (6-28-34)(14-39) (25-31-36-37) (27-38)	.4	(7-10-24)
			.5	(7-10-13-24)
			.6	(7-9-10-24)
			.7	(7-9-10-13-24)
			.8	(7-11-24)
(1-29-34) (2-9-10) (3-13-15) (4-7-11-16-30) (12-17) (19-35) (31-33-36)	7.3	(5-29-33) (6-8-20-22) (12-24) (14-39) (19-31-32-36-37) (26-27) (34-38)	.5	(7-10-15-16)
			.6	(7-10-13-15-16)
			.7	(7-9-10-15-16)
			.8	(7-9-10-13-16)
(1-29-34) (2-7) (3-8-30) (4-15) (10-13) (16-18-21) (19-20-35) (27-31-33-36)	8.0	(4-12-22) (5-20) (9-16) (14-39) (34-38)	.4	(6-7-28-29-30)(25-31-33-36-37)
			.5	(6-7-28-29-30)(17-25-36-37)
			.6	(6-7-28-31)(17-25-36-37)
			.7	(6-7-28-29-30)(21-25-36-37)
(1-29-34) (2-7) (3-8-30) (4-15) (9-13) (16-18-21) (19-20-35) (24-25-27-31-33-36)	8.6	(4-24) (12-29) (16-22-28) (27-34) (31-33-35-36-37)	.5	(5-7-10)
			.6	(5-7-10-15)
			.7	(5-7-10-13-15)
			.8	(5-7-9-10)
(1-29-34) (2-8) (3-13-17) (4-11-15) (9-10-28) (18-20) (19-35) (32-33-36)	9.2	(4-12-22) (13-15-16) (14-39) (26-34)	.5	(6-7-30-33) (25-31-36-37)
			.6	(6-7-29-30) (17-25-33-36-37)
			.7	(6-7-31) (17-25-36-37)
			.8	(6-7-29-30) (21-25-36-37)
(1-29-34) (2-7) (3-11-13) (4-15-18) (8-28) (19-35) (27-32-33-36)	9.8	(4-12-22) (13-15-16) (14-25-39) (19-23) (26-27)	.5	(6-7-29-30) (31-32-36-37)
			.6	(6-7-30) (21-32-36-37)
			.7	(6-7-29-30-33) (17-32-36-37)
			.8	(6-7-29-30-33) (17-31-32-36-37)

\* Use the Strapping that Corresponds to the Larger Fractional End Section Adjacent to the Repeater.

## CHART 1TT

TERMINAL E23 REPEATER  
(T ARRANGEMENT)

24B88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION *	SUPPLEMENTAL
(1-29-34) (2-3) (4-13) (5-14-22-24) (6-19) (15-18) (20-3000 $\Omega$ ** -35) (25-27-36)	1.9	(4-12-20-34) (5-15-24-31) (14-39) (21-22-23-25-36) (37-38)	.4	(7-8-9-10-11-13)
			.5	(7-8-9-18)
			.6	(7-8-10-13-18)
			.7	(7-8-11-13-18)
			.8	(7-8-10-11-13-18)
(1-7) (2-3) (4-29-34) (5-10-13-14-22-24) (6-18) (12-15) (16-17) (19-21) (20-1000 $\Omega$ ** -35) (27-28-36)	2.7	(4-31-33) (5-12-24-26-27) (14-39) (17-25-36-38) (22-34)	.4	(7-11-13-15-16-28)
			.5	(7-9-11-13-15-16-28)
			.6	(7-9-10-11-16-28)
			.7	(7-16-18-28)
			.8	(7-9-15-16-18-28)
(1-29-34) (2-3) (4-10) (5-8-12-22-24) (6-18) (14-16) (15-17) (20-35) (27-28-36)	3.5	(4-12-24-37) (8-29-30) (14-25-39) (17-19-22-32-33-36) (27-38)	.4	(6-7-9-10-13-15-28)
			.5	(6-7-11-13-28)
			.6	(6-7-9-11-13-28)
			.7	(6-7-10-11-15-28)
			.8	(6-7-9-10-11-15-28)
(1-8) (2-3) (4-29-34) (5-10-13-22-24) (6-16-20) (7-9) (17-35) (18-19-21) (23-25-27-28-36)	4.3	(4-20) (8-24-37) (12-30) (14-39) (17-19-29-32-33-34-36)	.4	(5-7-10-13-15)
			.5	(5-7-9-10-15)
			.6	(5-7-11)
			.7	(5-7-11-13)
			.8	(5-7-9-11-15)
(3-7) (4-23-34) (5-9-13-22-26) (6-16-18-21) (12-14) (17-19) (20-35) (32-36)	5.0	(4-8-20-37) (5-12) (14-39) (19-22-31-32-36) (24-30-33)	.4	(6-7-10-13-15)
			.5	(6-7-9-10-15)
			.6	(6-7-11)
			.7	(6-7-11-13)
			.8	(6-7-9-11-15)
(3-29-34) (4-9) (5-14-15) (6-11-16) (10-22-26) (12-17) (19-35) (28-30-31-36)	5.8	(4-20-26-34) (5-12) (14-39) (24-29-33) (25-30-31-36-37) (27-38)	.4	(6-7-10-16)
			.5	(6-7-10-13-16)
			.6	(6-7-9-10-16)
			.7	(6-7-9-10-13-16)
			.8	(6-7-11-16)

\* Use the Strapping that Corresponds to the Larger Fractional End Section Adjacent to the Repeater.

\*\* External Resistance

## CHART 1TT

TERMINAL E23 REPEATER  
(T ARRANGEMENT)

24B88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END * SECTION	SUPPLEMENTAL
(1-29-34) (2-9) (3-8-10-17-31) (4-18) (12-35) (13-14) (16-19) (30-32-36)	6.5	(5-29-33) (6-28-34) (14-39) (25-31-36-37) (27-38)	.4	(7-10-24)
			.5	(7-10-13-24)
			.6	(7-9-10-24)
			.7	(7-9-10-13-24)
			.8	(7-11-24)
(1-29-34) (2-9-10) (3-13-15) (4-7-11-16-30) (12-17) (19-35) (31-32-36)	7.3	(5-29-33) (6-8-20-22) (12-24) (14-39) (19-31-32-36-37) (26-27) (34-38)	.5	(7-10-15-16)
			.6	(7-10-13-15-16)
			.7	(7-9-10-15-16)
			.8	(7-9-10-13-16)
(1-29-34) (2-7) (3-8-30) (4-15) (10-13) (16-18-21) (19-20-35) (24-31-32-36)	8.0	(4-12-22) (5-20) (9-16) (14-39) (34-38)	.5	(6-7-28-29-30) (17-25-36-37)
			.6	(6-7-28-31) (17-25-36-37)
			.7	(6-7-28-29-30) (21-25-36-37)
			.8	(6-7-28-30-31) (17-25-36-37)
(1-29-34) (2-7) (3-8-30) (4-15) (9-13) (16-18-21) (19-20-35) (27-31-32-36)	8.6	(4-24) (12-29) (16-22-28) (27-34) (31-33-35-36-37)	.5	(5-7-10)
			.6	(5-7-10-15)
			.7	(5-7-10-13-15)
			.8	(5-7-9-10)
(1-29-34) (2-8) (3-13-17) (4-11-15) (9-10-28) (18-20) (19-35) (24-27-31-32-36)	9.2	(4-12-22) (13-15-16) (14-39) (26-34)	.5	(6-7-30-33) (25-31-36-37)
			.6	(6-7-29-30) (17-25-33-36-37)
			.7	(6-7-31) (17-25-36-37)
			.8	(6-7-29-30) (21-25-36-37)
(1-29-34) (2-7) (3-11-13) (4-15-18) (8-28) (19-35) (30-31-32-35)	9.8	(4-12-22) (13-15-16) (14-25-39) (19-23) (26-27)	.5	(6-7-29-30) (31-32-36-37)
			.6	(6-7-30) (21-32-36-37)
			.7	(6-7-29-30-33) (17-32-36-37)
			.8	(6-7-29-30-33) (17-31-32-36-37)

\* Use the Strapping that Corresponds to the Larger Fractional End Section Adjacent to the Repeater.

## CHART 2M

INTERMEDIATE E23 REPEATER  
(T ARRANGEMENT)

19B88-LC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END * SECTION	SUPPLEMENTAL
(5-17-29) (6-19) (20-4000 $\Omega$ ** -35) (26-28-36)	1.9	(4-12-20-38) (5-24-31) (14-39) (21-22-23-25-36 -37) (26-34)		
			.5	(7-8-18)
			.6	(7-8-9-13-18)
			.7	(7-8-9-10-18)
			.8	(7-8-11-13-18)
(5-13-29) (6-19) (20-2000 $\Omega$ ** -35) (24-27-30-36)	2.7	(5-8-24-38) (12-28-30-33) (14-39) (21-23-25-26-36)		
			.5	(6-7-9-11-13)
			.6	(6-7-10-11-13)
			.7	(6-7-9-10-11-13-15)
			.8	(6-7-13-15-18)
(5-12-29) (6-16-17) (19-21) (20-35) (26-28-30-36)	3.5	(6-8-28-37) (9-12-13-15) (14-39) (21-25-26-36) (34-38)		
			.5	(4-7-24-31)
			.6	(4-7-24-29-31)
			.7	(4-7-24-29-31-33)
			.8	(4-7-24-30-31-33)
(5-12-29-34) (6-16-18) (17-21) (20-35) (28-30-31-36)	4.3	(12-24-37) (14-39) (19-26-31-36) (20-29-30)		
			.5	(7-9-10-13-16)
			.6	(7-11-15-16)
			.7	(7-9-11-16)
			.8	(7-9-11-13-16)
(5-13-29-34) (6-16-20) (17-35) (18-19-21) (26-28-30-31-36)	5.0	(4-20-22) (5-16) (14-39) (19-31-33-36-37) (24-30) (27-38)		
			.5	(6-7-10-12-13-15)
			.6	(6-7-9-10-12-15)
			.7	(6-7-11-12)
			.8	(6-7-11-12-13)
(5-14-29-34) (6-16-19) (20-35) (23-24-30-32-36)	5.8	(5-28-34) (6-29-33) (14-39) (25-31-36-37) (27-38)		
			.5	(7-10-13-24)
			.6	(7-9-10-24)
			.7	(7-9-10-13-24)
			.8	(7-11-24)

\* Use the Strapping that Corresponds to the Larger Fractional End Section Adjacent to the Repeater.

\*\* External Resistance.

CHART 2M

INTERMEDIATE E23 REPEATER  
(T ARRANGEMENT)

19B88-LC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION *	SUPPLEMENTAL
(3-16-17) (4-18) (10-29-34) (11-12) (19-35) (30-31-32-36)	6.5	(5-29-33) (6-16-22) (12-24) (26-27) (31-35-36-37) (34-38)		
			.5	(7-8-10-13-20)
			.6	(7-8-10-13-15-20)
			.7	(7-8-9-10-15-20)
			.8	(7-8-9-10-13-15-20)
(3-9) (4-15) (8-29-34) (10-16) (12-17) (13-14) (19-35) (22-24-27-28-30-31-32-36)	7.3	(4-16-34) (5-20) (12-29) (14-39) (17-23-25-36-37)		
			.5	(6-7-10-28)
			.6	(6-7-10-13-28)
			.7	(6-7-10-13-15-28)
			.8	(6-7-9-10-15-28)
(3-8) (4-13-15) (7-16) (9-29-34) (12-17) (19-35) (30-31-33-36)	8.0	(4-16-20-27) (5-28) (12-29) (17-35-36-37) (26-34)		
			.5	(6-7-10)
			.6	(6-7-10-13)
			.7	(6-7-10-13-15)
			.8	(6-7-9-10-15)
(3-15-17) (4-16-29-34) (18-21) (19-35) (31-33-36)	8.6	(4-16-22) (12-13-15) (26-34)		
			.5	(6-7-29-30-33) (31-35-36-37)
			.6	(6-7-29-30) (17-33-35-36-37)
			.7	(6-7-31) (17-35-36-37)
			.8	(6-7-29-30) (21-35-36-37)
(3-8-29-34) (4-15) (7-12) (16-18-21) (19-20-35) (31-33-36)	9.2	(5-24) (12-13-15) (16-27-28)		
			.5	(6-7-29-30) (31-35-36-37)
			.6	(6-7-30) (21-35-36-37)
			.7	(6-7-29-30-33) (17-35-36-37)
			.8	(6-7-29-30-33) (17-31-35-36-37)
(3-12-29-34) (4-15) (16-17-20) (19-35) (30-31-33-36)	9.8	(4-24) (12-20-22) (13-15-16)		
			.5	(6-7-28-29-30) (31-35-36-37)
			.6	(6-7-28-30) (21-35-36-37)
			.7	(6-7-28-29-30-33) (17-35-36-37)
			.8	(6-7-28-29-30-33) (17-31-35-36-37)

\* Use the Strapping that Corresponds to the Larger Fractional End Section Adjacent to the Repeater.

## CHART 2T

TERMINAL E23 REPEATER  
(T ARRANGEMENT)

19B88-LC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END * SECTION	SUPPLEMENTAL
(1-29) (2-3) (4-8) (5-11-17-22-23) (6-19) (9-10) (20-4000 $\Omega$ ** -35) (26-28-36)	1.9	(4-12-20-38) (5-24-31) (14-39) (21-22-23-25 -36-37) (26-34)	.4	(7-8-10-11-13)
			.5	(7-8-18)
			.6	(7-8-9-13-18)
			.7	(7-8-9-10-18)
			.8	(7-8-11-13-18)
(1-29) (2-3) (4-14) (5-13-22-23) (6-19) (12-18) (20-2000 $\Omega$ ** -35) (24-27-30-36)	2.7	(5-8-24-38) (12-28-30-33) (14-39) (21-23-25-26-36)	.4	(6-7-11-13)
			.5	(6-7-9-11-13)
			.6	(6-7-10-11-13)
			.7	(6-7-9-10-11-13-15)*
(1-29) (2-3) (4-7) (5-10-12-22-23) (6-16-17) (9-11) (19-21) (20-35) (26-28-30-36)	3.5	(6-8-28-37) (9-12-13-15) (14-39) (21-25-26-36) (34-38)	.4	(4-7-24-29-30-33)
			.5	(4-7-24-31)
			.6	(4-7-24-29-31)
			.7	(4-7-24-29-31-33)
(1-29-34) (2-3) (4-7) (5-10-12-22-23) (6-16-18) (8-11) (17-21) (20-35) (28-30-31-36)	4.3	(12-24-37) (14-39) (19-26-31-36) (20-29-30)	.4	(7-9-10-16)
			.5	(7-9-10-13-16)
			.6	(7-11-15-16)
			.7	(7-9-11-16)
(1-29-34) (2-3) (4-12) (5-13-22-23) (6-16-20) (17-35) (18-19-21) (26-28-30-31-36)	5.0	(4-20-22) (5-16) (14-39) (19-31-33-36-37) (24-30) (27-38)	.4	(6-7-10-12-15)
			.5	(6-7-10-12-13-15)
			.6	(6-7-9-10-12-15)
			.7	(6-7-11-12)
(3-29-34) (4-9) (5-10-14-26) (6-16-19) (20-35) (23-24-30-32-36)	5.8	(5-28-34) (6-29-33) (14-39) (25-31-36-37) (27-38)	.4	(7-10-24)
			.5	(7-10-13-24)
			.6	(7-9-10-24)
			.7	(7-9-10-13-24)
			.8	(7-11-24)

\* Use the Strapping that Corresponds to the Larger Fractional End Section Adjacent to the Repeater.

\*\* External Resistance.

## CHART 2T

TERMINAL E23 REPEATER  
(T ARRANGEMENT)

19B88-LC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION *	SUPPLEMENTAL
(1-29-34) (2-7) (3-16-17) (4-18) (9-10-22-23-26) (11-12) (19-35) (30-31-32-36)	6.5	(5-29-33) (6-16-22) (12-24) (26-27) (31-35-36-37) (34-38)	.4	(7-8-10-20)
			.5	(7-8-10-13-20)
			.6	(7-8-10-13-15-20)
			.7	(7-8-9-10-15-20)
			.8	(7-8-9-10-13-15-20)
(1-29-34) (2-7) (3-9-23-25-26) (4-14-15) (10-16) (12-17) (19-35) (22-24-27-28-30-31-32-36)	7.3	(4-16-34) (5-20) (12-29) (14-39) (17-23-25-36-37)	.5	(6-7-10-28)
			.6	(6-7-10-13-28)
			.7	(6-7-10-13-15-28)
			.8	(6-7-9-10-15-28)
(1-29-34) (2-10) (3-8) (4-13-15) (7-16) (9-23-25-26) (12-17) (19-35) (30-31-33-36)	8.0	(4-16-20-27) (5-28) (12-29) (17-35-36-37) (26-34)	.5	(6-7-10)
			.6	(6-7-10-13)
			.7	(6-7-10-13-15)
			.8	(6-7-9-10-15)
(1-29-34) (2-9) (3-15-17) (4-7-11-16-23-25-26) (8-10) (18-21) (19-35) (31-33-36)	8.6	(4-16-22) (12-13-15) (26-34)	.5	(6-7-29-30-33) (31-35-36-37)
			.6	(6-7-29-30) (17-33-35-36-37)
			.7	(6-7-31) (17-35-36-37)
			.8	(6-7-29-30) (21-35-36-37)
(1-29-34) (2-9) (3-8-23-25-26) (4-15) (7-12) (16-18-21) (19-20-35) (31-33-36)	9.2	(5-24) (12-13-15) (16-27-28)	.5	(6-7-29-30) (31-35-36-37)
			.6	(6-7-30) (21-35-36-37)
			.7	(6-7-29-30-33) (17-35-36-37)
			.8	(6-7-29-30-33) (17-31-35-36-37)
(1-29-34) (2-7) (3-8-12-23-24-26) (4-15) (16-17-20) (19-35) (30-31-33-36)	9.8	(4-24) (12-20-22) (13-15-16)	.5	(6-7-28-29-30) (31-35-36-37)
			.6	(6-7-28-30) (21-35-36-37)
			.7	(6-7-28-29-30-33) (17-35-36-37)
			.8	(6-7-28-29-30-33) (17-31-35-36-37)

\* Use the Strapping that Corresponds to the Larger Fractional End Section Adjacent to the Repeater.

CHART 3M

INTERMEDIATE E23 REPEATER  
(T ARRANGEMENT)

19D88-HC

22D88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION * SECTION	SUPPLEMENTAL
(5-14-29)(6-18-21) (16-17) (20-2000 $\Omega$ ** - 35) (27-30-36)	1.9	(4-8-20-22) (12-15-24-31) (14-39) (21-23-25-34-36) (26-27)		
			.5	(5-7-18)
			.6	(5-7-9-13-18)
			.7	(5-7-9-10-18)
(5-12-29)(6-16-17) (18-21)(20-35) (28-30-36)	2.7	(5-12-20-38) (6-16-29-30-33) (19-39) (21-22-36) (27-34)		
			.5	(7-9-10-11-15-24)
			.6	(7-13-15-18-24)
			.7	(7-10-18-24)
(5-10-13)(6-16-17) (9-29)(12-14) (18-19-21)(20-35) (25-27-28-30-36)	3.5	(5-20-37-38) (14-25-39) (15-24-30) (19-21-22-32-36) (26-27)		
			.5	(6-7-9-11)
			.6	(6-7-10-11)
			.7	(6-7-9-10-11)
(5-12-29-34) (6-16-19)(14-15) (17-21)(20-35) (23-24-27-32-36)	4.3	(5-30-33) (6-16-28-37) (14-39) (17-19-32-36-38)		
			.5	(7-11-12-20)
			.6	(7-11-12-13-15-20)
			.7	(7-9-11-12-13-15-20)
(5-17-35)(6-18) (14-29-34)(16-19) (22-24-31-32-36)	5.0	(5-30) (6-16-28-37) (14-39) (17-22-23-25-36) (26-27)(34-38)		
			.5	(7-8-9-10-13-24)
			.6	(7-8-11-15-24)
			.7	(7-8-11-13-15-24)
(5-12-29-34) (6-16-17)(13-15) (19-35) (23-24-27-31-32-36)	5.8	(4-24-30) (6-16-28-37) (14-39) (19-22-31-32-36) (26-34)		
			.5	(7-10-12-13-15)
			.6	(7-9-10-12-15)
			.7	(7-9-10-12-13-15)
			.8	(7-11-12-15)

\* Use the strapping that corresponds to the larger Fractional End Section adjacent to the Repeater.

\*\* External Resistance

CHART 3M

INTERMEDIATE E23 REPEATER  
(T ARRANGEMENT)

19D88-HC

22D88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION *	SUPPLEMENTAL
(3-12-29-34)(4-15) (16-18-21)(19-20-35) (33-36)	6.5	(4-12-20-38) (5-24)(16-30) (19-39) (31-36-37)		
			.5	(6-7-9-10)
			.6	(6-7-9-10-13)
			.7	(6-7-11)
			.8	(6-7-11-13)
(3-8-29-34)(4-14) (9-10)(11-15) (12-17-21)(18-20) (19-35)(24-33-36)	7.3	(4-12)# (9-13-24) (16-20-26) (22-34-38)		
			.5	(5-15-30-33-35)(7-21-36-37)
			.6	(5-29-31-35)(7-17-30-36-37)
			.7	(5-31-35)(7-21-36-37)
			.8	(5-31-33-35)(7-21-36-37)
(3-9-13)(4-15-29-34) (11-18)(19-35) (23-24-26-33-36)	8.0	(5-9-15)# (6-22-28)(26-38)		
			.5	(7-29-30-33-36-37)(17-24-35)
			.6	(7-31-36-37)(17-24-29-30-33-35)
			.7	(7-30-31-36-37)(17-24-35)
			.8	(7-21-36-37)(24-31-35)
(3-13)(4-15-29-34) (7-35)(9-19)(12-18) (22-25-26-27-33-36)	8.6	(5-9-15)# (6-8-24-26) (12-20)(34-38)		
			.5	(7-17-19-36-37)(16-29-30-33-35)
			.6	(7-17-19-36-37)(16-31-33-35)
			.7	(7-17-19-36-37)(16-29-31-33-35)
			.8	(7-17-19-36-37)(16-29-30-31-35)
(3-12-29-34)(4-15-18) (8-35)(9-19)(14-16) (23-24-25-30-33-36)	9.2	(4-12-24-27)# (5-28)(9-16) (34-38)		
			.5	(6-30-35)(7-21-36-37)
			.6	(6-29-30-33-35)(7-17-36-37)
			.7	(6-31-33-35)(7-17-36-37)
			.8	(6-29-31-33-35)(7-17-36-37)
(3-10-29-34) (4-15-18-21)(11-13-16) (19-35)(25-26-31-33-36)	9.8	(4-12-22-28)# (5-24)(9-16) (34-38)		
			.5	(6-30-33-35)(7-17-36-37)
			.6	(6-15-30-35)(7-21-36-37)
			.7	(6-31-35)(7-17-36-37)
			.8	(6-29-30-35)(7-21-36-37)

\* Use the strapping that corresponds to the larger Fractional End Section adjacent to the Repeater.

#Same as B.S.P. Section 332-200-107

CHART 3MM

INTERMEDIATE E23 REPEATER  
(T ARRANGEMENT)

24D88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION *	SUPPLEMENTAL
(5-14-29) (6-18-21)(16-17) (20-2000 Ω ** - 35) (25-27-36)	1.9	(4-8-20-22) (12-15-24-31) (14-39) (21-23-25-34-36) (26-27)		
			.5	(5-7-18)
			.6	(5-7-9-13-18)
			.7	(5-7-9-10-18)
(5-12-29) (6-16-17) (18-21) (20-35) (28-36)	2.7	(5-12-20-38) (6-16-29-30-33) (19-39)(21-22-36) (27-34)		
			.5	(7-9-10-11-15-24)
			.6	(7-13-15-18-24)
			.7	(7-10-18-24)
(5-10-13) (6-16-17) (9-29) (12-14) (18-19-21) (20-35) (25-28-36)	3.5	(5-20-37-38) (14-25-39) (15-24-30) (19-21-22-32-36) (26-27)		
			.5	(6-7-9-11)
			.6	(6-7-10-11)
			.7	(6-7-9-10-11)
(5-12-29-34) (6-16-19)(14-15) (17-21)(20-35) (23-27-28-36)	4.3	(5-30-33) (6-16-28-37) (14-39) (17-19-32-36-38)		
			.5	(7-11-12-20)
			.6	(7-11-12-13-15-20)
			.7	(7-9-11-12-13-15-20)
(5-17-35)(6-18) (14-29-34) (16-19) (23-24-27-28-36)	5.0	(5-30) (6-16-28-37) (14-39) (17-22-23-25-36) (26-27) (34-38)		
			.5	(7-8-9-10-13-24)
			.6	(7-8-11-15-24)
			.7	(7-8-11-13-15-24)
(5-12-29-34) (6-16-17)(13-15) (19-35) (23-28-30-36)	5.8	(4-24-30) (6-16-28-37) (14-39) (19-22-31-32-36) (26-34)		
			.5	(7-10-12-13-15)
			.6	(7-9-10-12-15)
			.7	(7-9-10-12-13-15)
			.8	(7-11-12-15)

\* Use the strapping that corresponds to the larger Fractional End Section adjacent to the repeater.

\*\* External Resistance

## CHART 3MM

INTERMEDIATE E23 REPEATER  
(T ARRANGEMENT)

24D88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION *	SUPPLEMENTAL
(3-12-29-34)(4-15) (16-18-21)(19-20-35) (32-36)	6.5	(4-12-20-38) (5-24)(16-30) (19-39) (31-36-37)		
			.5	(6-7-9-10)
			.6	(6-7-9-10-13)
			.7	(6-7-11)
			.8	(6-7-11-13)
(3-8-29-34) (4-14)(9-10) (11-15)(12-17-21) (18-20)(19-35) (22-32-36)	7.3	(4-12)# (9-13-24) (16-20-26) (22-34-38)		
			.5	(5-15-30-33-35)(7-21-36-37)
			.6	(5-29-31-35)(7-17-30-36-37)
			.7	(5-31-35)(7-21-36-37)
			.8	(5-31-33-35)(7-21-36-37)
(3-9-13) (4-15-29-34) (11-18)(19-35) (26-32-36)	8.0	(5-9-15)# (6-22-28) (26-38)		
			.5	(7-29-30-33-36-37)(17-24-35)
			.6	(7-31-36-37)(17-24-29-30-33-35)
			.7	(7-30-31-36-37)(17-24-35)
			.8	(7-21-36-37)(24-31-35)
(3-13)(4-15-29-34) (7-35)(9-19)(12-18) (24-26-32-36)	8.6	(5-9-15)# (6-8-24-26) (12-20)(34-38)		
			.5	(7-17-19-36-37)(16-29-30-33-35)
			.6	(7-17-19-36-37)(16-31-33-35)
			.7	(7-17-19-36-37)(16-29-31-33-35)
			.8	(7-17-19-36-37)(16-29-30-31-35)
(3-12-29-34) (4-15-18) (8-35)(9-19)(14-16) (24-25-26-32-36)	9.2	(4-12-24-27)# (5-28)(9-16) (34-38)		
			.5	(6-30-35)(7-21-36-37)
			.6	(6-29-30-33-35)(7-17-36-37)
			.7	(6-31-33-35)(7-17-36-37)
			.8	(6-29-31-33-35)(7-17-36-37)
(3-10-29-34) (4-15-18-21) (11-13-16)(19-35) (24-25-26-32-36)	9.8	(4-12-22-28)# (5-24)(9-16) (34-38)		
			.5	(6-30-33-35)(7-17-36-37)
			.6	(6-15-30-35)(7-21-36-37)
			.7	(6-31-35)(7-17-36-37)
			.8	(6-29-30-35)(7-21-36-37)

\* Use the strapping that corresponds to the larger Fractional End Section adjacent to the repeater.

#Same as B.S.P. Section 332-200-107

CHART 3T

TERMINAL E23 REPEATER  
(T ARRANGEMENT)

19D88-HC

22D88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION *	SUPPLEMENTAL
(1-29)(2-3)(4-13) (5-14-22-26) (6-18-21)(16-17) (20-2000 $\Omega$ ** - 35) (27-30-36)	1.9	(4-8-20-22) (12-15-24-31) (14-39) (21-23-25-34-36) (26-27)	.4	(5-7-10-11-13)
			.5	(5-7-18)
			.6	(5-7-9-13-18)
			.7	(5-7-9-10-18)
			.8	(5-7-11-13-18)
(1-29)(2-3)(4-8) (5-10-12-22-26) (6-16-17)(18-21) (20-35)(28-30-36)	2.7	(5-12-20-38) (6-16-29-30-33) (19-39) (21-22-36) (27-34)	.4	(7-9-11-13-15-24)
			.5	(7-9-10-11-15-24)
			.6	(7-13-15-18-24)
			.7	(7-10-18-24)
(1-29)(2-3)(4-7) (5-10-13)(6-16-17) (9-22-26)(12-14) (18-19-21)(20-35) (25-27-28-30-36)	3.5	(5-20-37-38) (14-25-39) (15-24-30) (19-21-22-32-36) (26-27)	.4	(6-7-11)
			.5	(6-7-9-11)
			.6	(6-7-10-11)
			.7	(6-7-9-10-11)
(1-29-34)(2-3)(4-7) (5-10-12)(6-16-19) (9-22-26)(14-15) (20-35) (23-24-27-32-36)	4.3	(5-30-33) (6-16-28-37) (14-39) (17-19-32-36-38)	.4	(7-9-10-12-15-20)
			.5	(7-11-12-20)
			.6	(7-11-12-13-15-20)
			.7	(7-9-11-12-13-15-20)
(3-29-34)(4-7) (5-17-35)(6-18)(8-11) (9-10-14-25-26)(16-19) (22-24-31-32-36)	5.0	(5-30) (6-16-28-37) (14-39) (17-22-23-25-36) (26-27) (34-38)	.4	(7-8-10-13-15-24)
			.5	(7-8-9-10-13-24)
			.6	(7-8-11-15-24)
			.7	(7-8-11-13-15-24)
(3-29-34)(4-7-11) (5-9-12-22-25-26) (6-16-17)(8-10)(13-15) (19-35) (23-24-27-31-32-36)	5.8	(4-24-30) (6-16-28-37) (14-39) (19-22-31-32-36) (26-34)	.4	(7-10-12-15)
			.5	(7-10-12-13-15)
			.6	(7-9-10-12-15)
			.7	(7-9-10-12-13-15)
			.8	(7-11-12-15)

\* Use the strapping that corresponds to the larger Fractional End Section adjacent to the Repeater.

\*\* External Resistance.

CHART 3T

TERMINAL E23 REPEATER  
(T ARRANGEMENT)

19D88-HC

22D88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING	
		BASIC	END. SECTION * SUPPLEMENTAL
(1-29-34)(2-10) (4-15) (3-9-11-12-24-25-26-27) (16-18-21)(19-20-35) (33-36)	6.5	(4-12-20-38) (5-24)(16-30) (19-39) (31-36-37)	.4 (6-7-10-13)
			.5 (6-7-9-10)
			.6 (6-7-9-10-13)
			.7 (6-7-11)
			.8 (6-7-11-13)
(1-29-34)(2-7) (3-8-22-27-28) (4-14)(9-10)(11-15) (12-17-21)(18-20) (19-35)(24-33-36)	7.3	(4-12)# (9-13-24) (16-20-26) (22-34-38)	.5 (5-15-30-33-35)(7-21-36-37)
			.6 (5-29-31-35)(7-17-30-36-37)
			.7 (5-31-35)(7-21-36-37)
			.8 (5-31-33-35)(7-21-36-37)
(1-29-34)(2-8) (3-11-13)(4-15-18) (9-22-27-28)(19-35) (23-24-26-33-36)	8.0	(5-9-15)# (6-22-28) (26-38)	.5 (7-29-30-33-36-37)(17-24-35)
			.6 (7-31-36-37)(17-24-29-30-33-35)
			.7 (7-30-31-36-37)(17-24-35)
			.8 (7-21-36-37)(24-31-35)
(1-29-34)(2-8) (3-13)(4-10-15) (9-22-27-28)(12-18) (19-35)(24-31-33-36)	8.6	(5-9-15)# (6-8-24-26) (12-20) (34-38)	.5 (7-17-19-36-37)(16-29-30-33-35)
			.6 (7-17-19-36-37)(16-31-33-35)
			.7 (7-17-19-36-37)(16-29-31-33-35)
			.8 (7-17-19-36-37)(16-29-30-31-35)
(1-29-34)(2-9) (3-7-12)(4-15-18) (8-22-27-28)(14-16) (19-35) (23-24-25-30-33-36)	9.2	(4-12-24-27)# (5-28)(9-16) (34-38)	.5 (6-30-35)(7-21-36-37)
			.6 (6-29-30-33-35)(7-17-36-37)
			.7 (6-31-33-35)(7-17-36-37)
			.8 (6-29-31-33-35)(7-17-36-37)
(1-29-34)(2-7) (3-9-10)(4-15-18-21) (8-22-27-30)(11-13-16) (19-35) (25-26-31-33-36)	9.8	(4-12-22-28)# (5-24)(9-16) (34-38)	.5 (6-30-33-35)(7-17-36-37)
			.6 (6-15-30-35)(7-21-36-37)
			.7 (6-31-35)(7-17-36-37)
			.8 (6-29-30-35)(7-21-36-37)

\* Use the strapping that corresponds to the larger Fractional End Section adjacent to the Repeater.

#Same as B.S.P. Section 332-200-107

## CHART 3TT

TERMINAL E23 REPEATER  
(T ARRANGEMENT)

24D88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION *	SUPPLEMENTAL
(1-29)(2-3)(4-13) (5-14-22-26)(6-18-21) (16-17) (20-2000- $\Omega$ ** - 35) (25-27-36)	1.9	(4-8-20-22) (12-15-24-31) (14-39) (21-23-25-34-36) (26-27)	.4	(5-7-10-11-13)
			.5	(5-7-18)
			.6	(5-7-9-13-18)
			.7	(5-7-9-10-18)
			.8	(5-7-11-13-18)
(1-29)(2-3)(4-8) (5-10-12-22-26) (6-16-17)(18-21) (20-35)(28-36)	2.7	(5-12-20-38) (6-16-29-30-33) (19-39) (21-22-36) (27-34)	.4	(7-9-11-13-15-24)
			.5	(7-9-10-11-15-24)
			.6	(7-13-15-18-24)
			.7	(7-10-18-24)
(1-29)(2-3)(4-7) (5-10-13)(6-16-17) (9-22-26)(12-14) (18-19-21)(20-35) (25-28-36)	3.5	(5-20-37-38) (14-25-39) (15-24-30) (19-21-22-32-36) (26-27)	.4	(6-7-11)
			.5	(6-7-9-11)
			.6	(6-7-10-11)
			.7	(6-7-9-10-11)
(1-29-34)(2-3)(4-7) (5-10-12)(6-16-19) (9-22-26)(14-15) (20-35)(23-27-28-36)	4.3	(5-30-33) (6-16-28-37) (14-39) (17-19-32-36-38)	.4	(7-9-10-12-15-20)
			.5	(7-11-12-20)
			.6	(7-11-12-13-15-20)
			.7	(7-9-11-12-13-15-20)
(3-29-34)(4-7) (5-17-35)(6-18)(8-11) (9-10-14-25-26)(16-19) (23-24-27-28-36)	5.0	(5-30) (6-16-28-37) (14-39) (17-22-23-25-36) (26-27)(34-38)	.4	(7-8-10-13-15-24)
			.5	(7-8-9-10-13-24)
			.6	(7-8-11-15-24)
			.7	(7-8-11-13-15-24)
(3-29-34)(4-7-11) (5-9-12-22-25-26) (6-16-17)(8-10) (13-15)(19-35) (23-28-30-36)	5.8	(4-24-30) (6-16-28-37) (14-39) (19-22-31-32-36) (26-34)	.4	(7-10-12-15)
			.5	(7-10-12-13-15)
			.6	(7-9-10-12-15)
			.7	(7-9-10-12-13-15)
			.8	(7-11-12-15)

\* Use the strapping that corresponds to the larger Fractional End Section adjacent to the repeater.

\*\* External Resistance.

CHART 3TT

TERMINAL E23 REPEATER  
(T ARRANGEMENT)

24D88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION *	SUPPLEMENTAL
(1-29-34)(2-10) (3-9-11-12-24-25-26-27) (4-15)(16-18-21) (19-20-35)(32-36)	6.5	(4-12-20-38) (5-24)(16-30) (19-39)(31-36-37)	.4	(6-7-10-13)
			.5	(6-7-9-10)
			.6	(6-7-9-10-13)
			.7	(6-7-11)
			.8	(6-7-11-13)
(1-29-34)(2-7) (3-8-22-27-28)(4-14) (9-10)(11-15) (12-17-21)(18-20) (19-35)(23-32-36)	7.3	(4-12)# (9-13-24) (16-20-26) (22-34-38)	.5	(5-15-30-33-35)(7-21-36-37)
			.6	(5-29-31-35)(7-17-30-36-37)
			.7	(5-31-35)(7-21-36-37)
			.8	(5-31-33-35)(7-21-36-37)
(1-29-34)(2-8) (3-11-13)(4-15-18) (9-22-27-28)(19-35) (26-32-36)	8.0	(5-9-15)# (6-22-28)(26-38)	.5	(7-29-30-33-36-37)(17-24-35)
			.6	(7-31-36-37)(17-24-29-30-33-35)
			.7	(7-30-31-36-37)(17-24-35)
			.8	(7-21-36-37)(24-31-35)
(1-29-34)(2-8)(3-13) (4-10-15) (9-22-27-28)(12-18) (19-35)(24-26-32-36)	8.6	(5-9-15)# (6-8-24-26) (12-20)(34-38)	.5	(7-17-19-36-37)(16-29-30-33-35)
			.6	(7-17-19-36-37)(16-31-33-35)
			.7	(7-17-19-36-37)(16-29-31-33-35)
			.8	(7-17-19-36-37)(16-29-30-31-35)
(1-29-34)(2-9) (3-7-12)(4-15-18) (8-22-27-28)(14-16) (19-35) (24-25-26-32-36)	9.2	(4-12-24-27)# (5-28)(9-16) (34-38)	.5	(6-30-35)(7-21-36-37)
			.6	(6-29-30-33-35)(7-17-36-37)
			.7	(6-31-33-35)(7-17-36-37)
			.8	(6-29-31-33-35)(7-17-36-37)
(1-29-34)(2-7) (3-9-10)(4-15-18-21) (8-22-27-30) (11-13-16)(19-35) (24-25-26-32-36)	9.8	(4-12-22-28)# (5-24)(9-16) (34-38)	.5	(6-30-33-35)(7-17-36-37)
			.6	(6-15-30-35)(7-21-36-37)
			.7	(6-31-35)(7-17-36-37)
			.8	(6-29-30-35)(7-21-36-37)

\* Use the strapping that corresponds to the larger Fractional End Section adjacent to the Repeater.

#Same as B.S.P. Section 332-200-107

CHART 5M

INTERMEDIATE E23 REPEATER  
(T ARRANGEMENT)

19H88-HC

22H88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION *	SUPPLEMENTAL
(5-18-29) (6-19) (20-2000 $\Omega$ ** -35) (23-25-26-30-36)	1.9	(4-8-20-34) (12-24-30-31) (14-39) (21-22-23-25-36) (26-27)(37-38)		
			.5	(5-7-9-10-13-18)
			.6	(5-7-9-11-13-15-18)
			.7	(5-7-17-18)
(5-13-22-24-27-28) (6-16-18) (20-35) (29-36)	2.7	(8-20-38) (12-29-30-33) (14-19-39) (21-22-25-36-37) (26-27)		
			.5	(7-9-10-11-13-24)
			.6	(7-9-18-24)
			.7	(7-10-13-18-24)
(5-12-22-24-27-28) (6-16-18) (13-14) (17-19) (20-35) (29-36)	3.5	(5-24-37-38) (14-19-39) (17-22-31-32-36) (20-29-30-33) (26-34)		
			.5	(6-7-10-11)
			.6	(6-7-9-10-11-15)
			.7	(6-7-15-18)
(5-12-29-34) (6-18-19-21) (13-17) (20-35) (28-30-31-36)	4.3	(5-29-30) (6-12-20-37-38) (14-19-39) (17-22-32-33-36)		
			.5	(7-11-13-15-16-28)
			.6	(7-9-11-13-15-16-28)
			.7	(7-10-11-13-16-28)
(5-12-29-34) (6-16-19) (13-15) (17-35) (23-27-31-32-36)	5.0	(5-29-30) (6-8-24-38) (14-39) (17-22-23-25-33-36)		
			.5	(7-11-13-16-28)
			.6	(7-9-11-15-16-28)
			.7	(7-10-11-15-16-28)
(5-15)(6-9-29-34) (10-16)(12-18) (19-35)(33-36)	5.8	(4-12-24-37) (6-28-30-33) (14-39) (17-19-26-32-36) (34-38)		
			.5	(7-11-16)
			.6	(7-11-13-15-16)
			.7	(7-9-11-13-16)
			.8	(7-10-11-15-16)

\* Use the Strapping that Corresponds to the Larger Fractional End Section Adjacent to the Repeater.

\*\* External Resistance.

## CHART 5M

INTERMEDIATE E23 REPEATER  
(T ARRANGEMENT)

19H88-HC

22H88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION *	SUPPLEMENTAL
(5-15) (6-16-29-34) (14-18) (19-35) (25-26-33-36)	6.5	(5-20) (9-13-16) (12-22-24) (19-39)		
			.5	(6-7-15-29-30) (21-23-36-38)
			.6	(6-7-29-30-31-33) (17-23-36-38)
			.7	(6-7-31-33) (21-23-36-38)
			.8	(6-7-15-29-31) (21-23-36-38)
(3-13-29-34) (4-15-17) (18-20) (19-21-35) (31-33-36)	7.3	(5-12)# (6-16-20-37) (9-13-15-24)		
			.5	(4-29-31-35) (7-17-22-33-36)
			.6	(4-30-31-33-35) (7-17-22-29-36)
			.7	(4-31-33-35) (7-21-22-36)
			.8	(4-29-31-35) (7-21-22-36)
(3-14) (4-9-29-34) (11-12) (16-17-21) (18-20-35) (27-31-33-36)	8.0	(5-22-24)# (6-29-33) (7-21-36-37) (27-38)		
			.5	(10-13-15-28-35)
			.6	(9-10-15-28-35)
			.7	(9-10-13-15-28-35)
			.8	(11-13-28-35)
(3-12-29-34) (4-15-18) (14-16) (19-35) (22-26-27-31-33-36)	8.6	(5-9-13)# (6-24-26) (27-34-38)		
			.5	(7-21-36-37) (15-28-30-33-35)
			.6	(7-29-31-36-37) (17-28-30-35)
			.7	(7-29-30-31-33-36-37) (17-28-35)
			.8	(7-21-36-37) (28-31-33-35)
(3-12-29-34) (4-15-18-21) (14-16) (19-35) (28-30-33-36)	9.2	(5-12-22)# (6-29-33) (7-21-36-37) (16-20) (26-38)		
			.5	(10-13-24-35)
			.6	(9-10-24-35)
			.7	(9-10-13-24-35)
			.8	(11-24-35)
(3-7-9-29-34) (4-15-19-21) (8-12) (13-14) (17-20-35) (28-30-33-36)	9.8	(5-20)# (6-16-28-34) (7-21-36-37) (9-12-15) (22-38)		
			.5	(4-30-33-35)
			.6	(4-29-30-35)
			.7	(4-29-30-33-35)
			.8	(4-31-35)

\* Use the Strapping that Corresponds to the Larger Fractional End Section Adjacent to the Repeater.

#Same as B.S.P. Section 332-200-107

## CHART 5MM

INTERMEDIATE E23 REPEATER  
(T ARRANGEMENT)

24H88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END * SECTION	SUPPLEMENTAL
(5-18-29) (6-19) (20-2000 $\Omega$ ** -35) (23-26-36)	1.9	(4-8-20-34) (12-24-30-31) (14-39) (21-22-23-25-36) (26-27) (37-38)		
			.5	(5-7-9-10-13-18)
			.6	(5-7-9-11-13-15-18)
			.7	(5-7-17-18)
(5-13-25-26) (6-16-18) (20-35) (29-36)	2.7	(8-20-38) (12-29-30-33) (14-19-39) (21-22-25-36-37) (26-27)		
			.5	(7-9-10-11-13-24)
			.6	(7-9-18-24)
			.7	(7-10-13-18-24)
(5-12-22-24-26) (6-16-18) (13-14) (17-19) (20-35) (29-36)	3.5	(5-24-37-38) (14-19-39) (17-22-31-32-36) (20-29-30-33) (26-34)		
			.5	(6-7-10-11)
			.6	(6-7-9-10-11-15)
			.7	(6-7-15-18)
(5-12-29) (6-18-19-21) (13-17) (20-35) (24-25-28-36)	4.3	(5-29-30) (6-12-20-37-38) (14-19-39) (17-22-32-33-36)		
			.5	(7-11-13-15-16-28)
			.6	(7-9-11-13-15-16-28)
			.7	(7-10-11-13-16-28)
(5-12-29) (6-16-19) (13-15) (17-35) (28-30-36)	5.0	(5-29-30) (6-8-24-38) (14-39) (17-22- 23-25-33-36)		
			.5	(7-11-13-16-28)
			.6	(7-9-11-15-16-28)
			.7	(7-10-11-15-16-28)
(5-15) (6-9-29-34) (10-16) (12-18) (19-35) (27-32-36)	5.8	(4-12-24-37) (6-28-30-33) (14-39) (17-19-26-32-36) (34-38)		
			.5	(7-11-16)
			.6	(7-11-13-15-16)
			.7	(7-9-11-13-16)
			.8	(7-10-11-15-16)

\* Use the Strapping that Corresponds to the Larger Fractional End Section Adjacent to the Repeater.

\*\* External Resistance.

CHART 5MM

INTERMEDIATE E23 REPEATER  
(T ARRANGEMENT)

24H88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING	
		BASIC	END SECTION * SUPPLEMENTAL
(5-15) (6-16-29-34) (14-18) (19-35) (27-28-30-31-36)	6.5	(5-20) (9-13-16) (12-22-24) (19-39)	.5 (6-7-15-29-30) (21-23-36-38)
			.6 (6-7-29-30-31-33) (17-23-36-38)
			.7 (6-7-31-33) (21-23-36-38)
			.8 (6-7-15-29-31) (21-23-36-38)
(3-13-29-34)(4-15-17) (18-20) (19-21-35) (22-23-31-32-36)	7.3	(5-12)# (6-16-20-37) (9-13-15-24)	.5 (4-29-31-35) (7-17-22-33-36)
			.6 (4-30-31-33-35) (7-17-22-29-36)
			.7 (4-31-33-35) (7-21-22-36)
			.8 (4-29-31-35) (7-21-22-36)
(3-14) (4-9-29-34) (11-12) (16-17-21) (18-20-35) (27-31-32-36)	8.0	(5-22-24)# (6-29-33) (7-21-36-37) (27-38)	.5 (10-13-15-28-35)
			.6 (9-10-15-28-35)
			.7 (9-10-13-15-28-35)
			.8 (11-13-28-35)
(3-12-29-34) (4-15-18) (14-16) (19-35) (24-26-28-32-36)	8.6	(5-9-13)# (6-24-26) (27-34-38)	.5 (7-21-36-37) (15-28-30-33-35)
			.6 (7-29-31-36-37) (17-28-30-35)
			.7 (7-29-30-31-33-36-37) (17-28-35)
			.8 (7-21-36-37)(28-31-33-35)
(3-12-29-34) (4-15-18-21) (14-16) (19-35) (25-27-31-32-36)	9.2	(5-12-22)# (6-29-33) (7-21-36-37) (16-20) (26-38)	.5 (10-13-24-35)
			.6 (9-10-24-35)
			.7 (9-10-13-24-35)
			.8 (11-24-35)
(3-7-9-29-34) (4-15-19-21) (8-12) (13-14) (17-20-35) (33-36)	9.8	(5-20)# (6-16-28-34) (7-21-36-37) (9-12-15) (22-38)	.5 (4-30-33-35)
			.6 (4-29-30-35)
			.7 (4-29-30-33-35)
			.8 (4-31-35)

\* Use the Strapping that Corresponds to the Larger Fractional End Section Adjacent to the Repeater.

#Same as B.S.P. Section 332-200-107

## CHART 5T

TERMINAL E23 REPEATER  
(T ARRANGEMENT)

19H88-HC

22H88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION *	SUPPLEMENTAL
(1-29) (2-3) (4-13) (5-14-18-22-27) (6-19) (20-2000Ω** -35) (23-25-26-30-36)	1.9	(4-8-20-34) (12-24-30-31) (14-39) (21-22-23-25-36) (26-27)(37-38)	.4	(5-7-9-15-18)
			.5	(5-7-9-10-13-18)
			.6	(5-7-9-11-13-15-18)
			.7	(5-7-17-18)
			.8	(5-7-10-13-17-18)
(1-29) (2-3) (4-9-11) (5-10-13-25-27) (6-16-18) (20-35) (23-24-26-28-36)	2.7	(8-20-38) (12-29-30-33) (14-19-39) (21-22-25-36-37) (26-27)	.4	(7-10-11-24)
			.5	(7-9-10-11-13-24)
			.6	(7-9-18-24)
			.7	(7-10-13-18-24)
			.8	(7-11-18-24)
(1-29) (2-3) (4-9-11) (5-10-12-24-26) (6-16-18) (13-14) (17-19) (20-35) (23-25-27-28-36)	3.5	(5-24-37-38) (14-19-39) (17-22-31-32-36) (20-29-30-33) (26-34)	.4	(6-7-11-13-15)
			.5	(6-7-10-11)
			.6	(6-7-9-10-11-15)
			.7	(6-7-15-18)
			.8	(6-7-9-13-18)
(1-29-34) (2-3) (4-9-11) (5-10-12-22-23-26) (6-18-19-21) (13-17) (20-35) (28-30-31-36)	4.3	(5-29-30) (6-12-20-37-38) (14-19-39) (17-22-32-33-36)	.4	(7-9-10-13-15-16-28)
			.5	(7-11-13-15-16-28)
			.6	(7-9-11-13-15-16-28)
			.7	(7-10-11-13-16-28)
			.8	(7-9-10-11-13-16-28)
(3-8) (4-29-34) (5-7-12-22-24-25-26) (6-16-19) (13-15) (17-35) (23-27-31-32-36)	5.0	(5-29-30) (6-8-24-38) (14-39) (17-22-23-25-33-36)	.4	(7-9-10-13-15-16-28)
			.5	(7-11-13-16-28)
			.6	(7-9-11-15-16-28)
			.7	(7-10-11-15-16-28)
			.8	(7-9-10-11-16-28)
(3-29-34) (4-8) (5-15) (6-9-22-24-25-26) (10-16) (12-18) (19-35) (33-36)	5.8	(4-12-24-37) (6-28-30-33) (14-39) (17-19-26-32-36) (34-38)	.4	(7-9-10-15-16)
			.5	(7-11-16)
			.6	(7-11-13-15-16)
			.7	(7-9-11-13-16)
			.8	(7-10-11-15-16)

\* Use the Strapping that Corresponds to the Larger Fractional End Section Adjacent to the Repeater.

\*\* External Resistance.

CHART 5T

TERMINAL E23 REPEATER  
(T ARRANGEMENT)

19H88-HC

22H88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION *	SUPPLEMENTAL
(3-29-34) (4-8) (5-15) (6-9-16-28) (14-18) (19-35) (25-26-33-36)	6.5	(5-20) (9-13-16) (12-22-24) (19-39)	.4	(6-7-31) (17-23-36-38)
			.5	(6-7-15-29-30) (21-23-36-38)
			.6	(6-7-29-30-31-33) (17-23-36-38)
			.7	(6-7-31-33) (21-23-36-38)
			.8	(6-7-15-29-31) (21-23-36-38)
(1-29-34) (2-7-9) (3-8-13-28-30) (4-15-17) (18-20) (19-21-35) (31-33-36)	7.3	(5-12)# (6-16-20-37) (9-13-15-24)	.5	(4-29-31-35) (7-17-22-33-36)
			.6	(4-30-31-33-35) (7-17-22-29-36)
			.7	(4-31-33-35) (7-21-22-36)
			.8	(4-29-31-35) (7-21-22-36)
(1-29-34) (2-8) (3-14) (4-7-9-28-30) (11-12) (16-17-21) (18-20-35) (27-31-33-36)	8.0	(5-22-24)# (6-29-33) (7-21-36-37) (27-38)	.5	(10-13-15-28-35)
			.6	(9-10-15-28-35)
			.7	(9-10-13-15-28-35)
			.8	(11-13-28-35)
(1-29-34) (2-7-9) (3-8-12-28-30) (4-15-18) (14-16) (19-35) (22-26-27-31-33-36)	8.6	(5-9-13)# (6-24-26) (27-34-38)	.5	(7-21-36-37) (15-28-30-33-35)
			.6	(7-29-31-36-37) (17-28-30-35)
			.7	(7-29-30-31-33-36-37) (17-28-35)
			.8	(7-21-36-37) (28-31-33-35)
(1-29-34) (2-7-9) (3-8-12-28-30) (4-15-18-21) (14-16) (19-35) (23-26-27-31-33-36)	9.2	(5-12-22)# (6-29-33) (7-21-36-37) (16-20) (26-38)	.5	(10-13-24-35)
			.6	(9-10-24-35)
			.7	(9-10-13-24-35)
			.8	(11-24-35)
(1-29-34) (2-7-9) (3-8-12-23-24-25-26-28) (4-15-19-21) (13-14) (17-20-35) (30-31-33-36)	9.8	(5-20)# (6-16-28-34) (7-21-36-37) (9-12-15) (22-38)	.5	(4-30-33-35)
			.6	(4-29-30-35)
			.7	(4-29-30-33-35)
			.8	(4-31-35)

\* Use the Strapping that Corresponds to the Larger Fractional End Section Adjacent to the Repeater.

#Same as B.S.P. Section 332-200-107

## CHART 5TT

TERMINAL E23 REPEATER  
(T ARRANGEMENT)

24H88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION *	SUPPLEMENTAL
(1-29) (2-3) (4-13) (5-14-18-22-27) (6-19) (20-2000 $\Omega$ ** -35) (23-26-36)	1.9	(4-8-20-34) (12-24-30-31) (14-39) (21-22-23-25-36) (26-27) (37-38)	.4	(5-7-9-15-18)
			.5	(5-7-9-10-13-18)
			.6	(5-7-9-11-13-15-18)
			.7	(5-7-17-18)
			.8	(5-7-10-13-17-18)
(1-29) (2-3) (4-9-11) (5-10-13-25-27) (6-16-18) (20-35) (24-26-36)	2.7	(8-20-38) (12-29-30-33) (14-19-39) (21-22-25-36-37) (26-27)	.4	(7-10-11-24)
			.5	(7-9-10-11-13-24)
			.6	(7-9-18-24)
			.7	(7-10-13-18-24)
			.8	(7-11-18-24)
(1-29) (2-3) (4-9-11) (5-10-12-24-26) (6-16-18) (13-14) (17-19) (20-35) (22-23-27-36)	3.5	(5-24-37-38) (14-19-39) (17-22-31-32-36) (20-29-30-33) (26-34)	.4	(6-7-11-13-15)
			.5	(6-7-10-11)
			.6	(6-7-9-10-11-15)
			.7	(6-7-15-18)
			.8	(6-7-9-13-18)
(1-29) (2-3) (4-9-11) (5-10-12-22-23-26) (6-18-19-21) (13-17) (20-35) (24-25-28-36)	4.3	(5-29-30) (6-12-20-37-38) (14-19-39) (17-22-32-33-36)	.4	(7-9-10-13-15-16-28)
			.5	(7-11-13-15-16-28)
			.6	(7-9-11-13-15-16-28)
			.7	(7-10-11-13-16-28)
			.8	(7-9-10-11-13-16-28)
(3-8) (4-29) (5-7-12-22-24-25-26) (6-16-19) (13-15) (17-35) (28-30-36)	5.0	(5-29-30) (6-8-24-38) (14-39) (17-22-23-25-33-36)	.4	(7-9-10-13-15-16-28)
			.5	(7-11-13-16-28)
			.6	(7-9-11-15-16-28)
			.7	(7-10-11-15-16-28)
			.8	(7-9-10-11-16-28)
(3-29-34) (4-8) (5-15) (6-9-22-24-25-26) (10-16) (12-18) (19-35) (27-32-36)	5.8	(4-12-24-37) (6-28-30-33) (14-39) (17-19-26-32-36) (34-38)	.4	(7-9-10-15-16)
			.5	(7-11-16)
			.6	(7-11-13-15-16)
			.7	(7-9-11-13-16)
			.8	(7-10-11-15-16)

\* Use the Strapping that Corresponds to the Larger Fractional End Section Adjacent to the Repeater.

\*\* External Resistance.

## CHART 5TT

TERMINAL E23 REPEATER  
(T ARRANGEMENT)

24H88-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION *	SUPPLEMENTAL
(3-29-34) (4-8) (5-15) (6-9-16-28) (14-18) (19-35) (30-32-36)	6.5	(5-20) (9-13-16) (12-22-24) (19-39)	.4	(6-7-31) (17-23-36-38)
			.5	(6-7-15-29-30) (21-23-36-38)
			.6	(6-7-29-30-31-33) (17-23-36-38)
			.7	(6-7-31-33) (21-23-36-38)
			.8	(6-7-15-29-31) (21-23-36-38)
(1-29-34) (2-7-9) (3-8-13-28-30) (4-15-17) (18-20) (19-21-35) (22-23-31-32-36)	7.3	(5-12)# (6-16-20-37) (9-13-15-24)	.5	(4-29-31-35) (7-17-22-33-36)
			.6	(4-30-31-33-35) (7-17-22-29-36)
			.7	(4-31-33-35) (7-21-22-36)
			.8	(4-29-31-35) (7-21-22-36)
(1-29-34) (2-8) (3-14) (4-7-9-28-30) (11-12) (16-17-21) (18-20-35) (27-31-32-36)	8.0	(5-22-24)# (6-29-33) (7-21-36-37) (27-38)	.5	(10-13-15-28-35)
			.6	(9-10-15-28-35)
			.7	(9-10-13-15-28-35)
			.8	(11-13-28-35)
(1-29-34) (2-7-9) (3-8-12-28-30) (4-15-18) (14-16) (19-35) (24-26-31-32-36)	8.6	(5-9-13)# (6-24-26) (27-34-38)	.5	(7-21-36-37) (15-28-30-33-35)
			.6	(7-29-31-36-37) (17-28-30-35)
			.7	(7-29-30-31-33-36-37) (17-28-35)
			.8	(7-21-36-37) (28-31-33-35)
(1-29-34) (2-7-9) (3-8-12-28-30) (4-15-18-21) (14-16) (19-35) (25-27-31-32-36)	9.2	(5-12-22)# (6-29-33) (7-21-36-37) (16-20) (26-38)	.5	(10-13-24-35)
			.6	(9-10-24-35)
			.7	(9-10-13-24-35)
			.8	(11-24-35)
(1-29-34) (2-7-9) (3-8-12-23-24-25-26-28) (4-15-19-21) (13-14) (17-20-35) (33-36)	9.8	(5-20)# (6-16-28-34) (7-21-36-37) (9-12-15) (22-38)	.5	(4-30-33-35)
			.6	(4-29-30-35)
			.7	(4-29-30-33-35)
			.8	(4-31-35)

\* Use the Strapping that Corresponds to the Larger Fractional End Section Adjacent to the Repeater.

#Same as B.S.P. Section 332-200-107

CHART 6M

INTERMEDIATE E23 REPEATER  
(T ARRANGEMENT)

19H88-LC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION * SECTION	SUPPLEMENTAL
(5-18)(6-19) (17-2000 $\Omega$ ** - 35) (20-29) (27-28-36)	1.9	(4-12-24-34-38) (8-20-31-33) (14-39) (21-22-23-25-36-37)	.5	(5-7-13-15-18)
			.6	(5-7-10-13-18)
			.7	(5-7-11-15-18)
			.8	(5-7-10-11-18)
(5-12-35) (6-16-17) (10-29)(11-20) (19-21) (23-28-30-36)	2.7	(8-20-38) (12-29-30-33) (14-39) (21-22-23-25-36-37) (26-27)	.5	(7-15-18-24)
			.6	(7-9-13-15-18-24)
			.7	(7-9-10-13-18-24)
			.8	(7-11-13-18-24)
(5-14-29)(6-8) (7-16)(9-10)(11-20) (17-19)(18-35) (24-25-26-28-30-36)	3.5	(4-16-20-22) (17-33-36-38) (19-39) (24-29-30) (27-34)	.5	(6-7-11-12-13-15)
			.6	(6-7-9-11-12-13-15)
			.7	(6-7-10-11-12-13)
			.8	(6-7-9-10-11-12-13)
(5-12-35)(6-16-20) (9-29-34)(10-19) (14-15) (31-32-36)	4.3	(4-12-25-28)# (5-10-13) (7-21-23-36) (14-19)	.5	(16-20-29-31-35)
			.6	(16-20-30-31-35)
			.7	(16-20-29-30-31-35)
			.8	(16-17-20-35)
(5-13)(6-16-35) (9-29-34) (11-19)(12-17) (14-15) (27-31-32-36)	5.0	(5-29-30) (6-8-24-37) (14-39) (23-25-27-31-33-36) (34-38)	.5	(7-9-10-13-16-28)
			.6	(7-11-15-16-28)
			.7	(7-11-13-15-16-28)
			.8	(7-9-11-13-16-28)
(5-14-35) (6-16-17) (13-15) (19-29-34) (30-31-32-36)	5.8	(4-9-13-24) (6-16-28-37) (14-39) (26-34)	.5	(7-12-29-31)(17-22-23-25-33-36)
			.6	(7-12-30-31-33)(17-22-23-25-29-36)
			.7	(7-12-15-31)(21-22-23-25-36)
			.8	(7-12-15-31-33)(21-22-23-25-36)

\* Use the strapping that corresponds to the larger fractional end section adjacent to the repeater.

#Same as B.S.P. Section 332-200-107

\*\* External resistance.

## CHART 6M

INTERMEDIATE E23 REPEATER  
(T ARRANGEMENT)

19H88-LC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION *	SUPPLEMENTAL
(5-9-29-34) (6-16-17-21) (8-15) (19-35) (33-36)	6.5	(5-20)(9-15-16) (12-24-26-27) (19-39) (22-34-38)		
			.5	(6-7-31)(14-17-23-36-37)
			.6	(6-7-29-31)(14-17-23-33-36-37)
			.7	(6-7-29-30-31)(14-17-23-36-37)
			.8	(6-7-31)(14-21-23-36-37)
(3-15-35)(4-8) (7-13)(11-17) (18-20) (19-21-29-34) (22-27-33-36)	7.3	(5-12)# (6-16-20-32) (9-15-24) (23-25)		
			.5	(4-17-35)(7-29-30-33-36)
			.6	(4-17-35)(7-31-33-36)
			.7	(4-17-30-35)(7-29-31-36)
			.8	(4-17-29-35)(7-30-31-33-36)
(1-13-35)(2-3) (4-15-17) (7-29-3.) (9-19) (18-20) (31-33-36)	8.0	(5-12)# (9-15-24) (16-20-22) (26-38)		
			.5	(4-29-30-35)(7-17-36-37)
			.6	(4-31-35)(7-17-36-37)
			.7	(4-29-31-35)(7-17-36-37)
			.8	(4-29-30-33-35)(7-21-36-37)
(1-15-35)(2-3) (4-10)(8-18)(11-13) (14-16)(19-29-34) (27-31-33-36)	8.6	(5-9-15)# (6-24-26) (34-38)		
			.5	(7-21-36-37)(28-30-35)
			.6	(7-29-30-33-36-37)(17-28-35)
			.7	(7-29-30-33-36-37)(17-28-31-35)
			.8	(7-29-31-36-37)(17-28-33-35)
(1-15-35)(2-3) (4-8-13) (7-9-19) (18-21-29-34) (22-24-27-31-33-36)	9.2	(5-12-27)# (6-9-15) (16-20) (34-38)		
			.5	(24-29-30-35)(7-17-33-36-37)
			.6	(24-31-35)(7-17-36-37)
			.7	(24-29-31-35)(7-17-36-37)
			.8	(24-29-30-33-35)(7-21-36-37)
	9.8			

\* Use the strapping that corresponds to the larger fractional end section adjacent to the repeater.

#Same as B.S.P. Section 332-200-107

CHART 6T

TERMINAL E23 REPEATER  
(T ARRANGEMENT)

19H88-LC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION *	SUPPLEMENTAL
(1-29) (2-3)(4-13) (5-18)(6-19) (14-20-27) (17-2000 Ω ** - 35) (22-26-28-36)	1.9	(4-12-24-34-38) (8-20-31-33) (14-39) (21-22-23-25-36-37)	.4	(5-7-9-10-11)
			.5	(5-7-13-15-18)
			.6	(5-7-10-13-18)
			.7	(5-7-11-15-18)
			.8	(5-7-10-11-18)
(1-27)(2-3)(4-7) (5-12-35)(6-16-17) (10-22-26)(11-20) (19-21) (23-28-30-36)	2.7	(8-20-38) (12-29-30-33) (14-39) (21-22-23-25-36-37) (26-27)	.4	(7-10-11-13-24)
			.5	(7-15-18-24)
			.6	(7-9-13-15-18-24)
			.7	(7-9-10-13-18-24)
			.8	(7-11-13-18-24)
(1-29)(2-3)(4-12) (5-13-14-27)(6-8) (7-16)(9-10)(11-20) (17-19)(18-35) (24-25-26-28-30-36)	3.5	(4-16-20-22) (17-33-36-38) (19-39) (24-29-30) (27-34)	.4	(6-7-9-10-12-13-15)
			.5	(6-7-11-12-13-15)
			.6	(6-7-9-11-12-13-15)
			.7	(6-7-10-11-12-13)
			.8	(6-7-9-10-11-12-13)
(1-29-34)(2-3) (4-7)(5-12-35) (6-16-20) (9-24-25) (10-19)(14-15) (31-32-36)	4.3	(4-12-25-28)# (5-10-13) (7-21-23-36) (14-19)	.4	(16-20-31-35)
			.5	(16-20-29-31-35)
			.6	(16-20-30-31-35)
			.7	(16-20-29-30-31-35)
			.8	(16-17-20-35)
(1-29-34)(2-3) (4-7)(5-13) (6-16-35) (9-23-26) (11-19)(12-17) (14-15) (27-31-32-36)	5.0	(5-29-30) (6-8-24-37) (14-39) (23-25-27-31-33-36) (34-38)	.4	(7-10-13-15-16-28)
			.5	(7-9-10-13-16-28)
			.6	(7-11-15-16-28)
			.7	(7-11-13-15-16-28)
			.8	(7-9-11-13-16-28)
(1-29-34) (2-3)(4-8-9) (5-14-35) (6-16-17) (7-11) (10-19-24-25) (13-15) (30-31-32-36)	5.8	(4-9-13-24) (6-16-28-37) (14-39)(26-34)	.4	(7-12-30-33)(21-22-23-25-36)
			.5	(7-12-29-31)(17-22-23-25-33-36)
			.6	(7-12-30-31-33)(17-22-23-25-29-36)
			.7	(7-12-15-31)(21-22-23-25-36)
			.8	(7-12-15-31-33)(21-22-23-25-36)

\* Use the strapping that corresponds to the larger fractional end section adjacent to the repeater.

#Same as B.S.P. Section 332-200-107

\*\* External resistance.

CHART 6T

TERMINAL E23 REPEATER  
(T ARRANGEMENT)

19H88-LC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION * SECTION	SUPPLEMENTAL
(3-29-34) (4-10) (5-9-11-22-23-25-26) (6-16-17-21) (8-15)(19-35) (33-36)	6.5	(5-20)(9-15-16) (12-24-26-27) (17-32) (22-34-38)	.4	(6-7-29-30)(14-17-23-36-37)
			.5	(6-7-31)(14-17-23-36-37)
			.6	(6-7-29-31)(14-17-23-33-36-37)
			.7	(6-7-29-30-31)(14-17-23-36-37)
			.8	(5-7-31)(14-21-23-36-37)
(1-29-34)(2-7) (3-8-23-26-28) (4-14)(9-10)(11-15) (12-19)(17-21-35) (18-20) (22-27-33-36)	7.3	(5-12)# (6-16-20-32) (9-15-24) (23-25)	.5	(4-17-35)(7-29-30-33-36)
			.6	(4-17-35)(7-31-33-36)
			.7	(4-17-30-35)(7-29-31-35)
			.8	(4-17-29-35)(7-30-31-33-36)
(1-29-34)(2-8) (3-10-13)(4-15-17) (9-23-26-28) (18-20)(19-35) (31-33-36)	8.0	(5-12)# (9-15-24) (16-20-22) (26-38)	.5	(4-29-30-35)(7-17-36-37)
			.6	(4-31-35)(7-17-36-37)
			.7	(4-29-31-35)(7-17-36-37)
			.8	(4-29-30-33-35)(7-21-36-37)
(1-29-34)(2-7) (3-10-13)(4-15-18) (8-23-26-28) (19-35) (27-31-33-36)	8.6	(5-9-15)# (6-24-26) (34-38)	.5	(7-21-36-37)(28-30-35)
			.6	(7-29-30-33-36-37)(17-28-35)
			.7	(7-29-30-33-36-37)(17-28-31-35)
			.8	(7-29-31-36-37)(17-28-33-35)
(1-29-34)(2-7) (3-13)(4-15) (8-23-26-28) (9-12)(16-17) (18-35) (24-27-31-33-36)	9.2	(5-12-27)# (6-9-15) (16-20) (34-38)	.5	(24-29-30-35)(7-17-33-36-37)
			.6	(24-31-35)(7-17-36-37)
			.7	(24-29-31-35)(7-17-36-37)
			.8	(24-29-30-33-35)(7-21-36-37)
	9.8			

\* Use the strapping that corresponds to the larger fractional end section adjacent to the repeater.

#Same as B.S.P. Section 332-200-107

CHART 8M

INTERMEDIATE E23 REPEATER  
(T ARRANGEMENT)

19B135-HC

22B135-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION *	SUPPLEMENTAL
(5-14-29-34) (6-19-21)(15-17) (20-5000Ω ** - 35) (25-27-28-36)	1.9	(8-31-33) (12-24-38) (17-22-36) (19-39) (27-34)		
			.5	(7-10-11-20)
			.6	(7-9-10-11-20)
			.7	(7-13-15-18-20)
			.8	(7-10-18-20)
(5-12-29-34) (6-18-21) (13-14)(16-17) (20-2000Ω ** - 35) (32-36)	2.7	(5-30) (6-12-20-38) (19-39) (21-27-36)		
			.5	(7-11-15-16-28)
			.6	(7-9-11-16-28)
			.7	(7-10-11-16-28)
			.8	(7-10-11-13-15-16-28)
(5-15-29-34) (6-18-21)(16-17) (20-1000Ω ** - 35) (28-30-31-36)	3.5	(4-9-13-24) (6-16-28-37) (19-39)		
			.5	(7-12-29-31)(17-33-34-36)
			.6	(7-12-30-31-33)(17-29-34-36)
			.7	(7-12-31-33)(21-34-36)
			.8	(7-12-29-31)(21-34-36)
(5-12-29-34) (6-18)(13-14) (15-17)(19-21) (20-35)(31-32-36)	4.3	(4-12-20-38) (5-24) (9-15-16) (19-39)		
			.5	(6-7-31)(17-36-37)
			.6	(6-7-29-31-33)(17-36-37)
			.7	(6-7-30-31-33)(17-29-36-37)
			.8	(6-7-31)(21-36-37)
(5-8-29-34) (6-16-20)(7-12) (13-14)(17-35) (18-19) (24-25-27-28-30-31-36)	5.0	(5-8) (6-28-34) (9-12) (19-39) (26-38)		
			.5	(7-24-29-30)(17-36-37)
			.6	(7-24-31)(17-36-37)
			.7	(7-24-29-30)(21-36-37)
			.8	(7-24-30-31)(17-36-37)
	5.8			

\* Use the strapping that corresponds to the larger fractional end section adjacent to the repeater.

\*\* External resistance.

CHART 8M

INTERMEDIATE E23 REPEATER  
(T ARRANGEMENT)

19B135-HC

22B135-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END * SECTION	SUPPLEMENTAL
6.5	6.5			
7.3	7.3			
8.0	8.0			
8.6	8.6			
9.2	9.2			
9.8	9.8			

CHART 8T

TERMINAL E23 REPEATER  
(T ARRANGEMENT)

19B135-HC

22B135-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION * SECTION	SUPPLEMENTAL
(1-29-34)(2-3) (4-12)(5-14-22-26) (6-19-21)(15-17) (20-5000 $\Omega$ ** - 35) (25-27-28-36)	1.9	(8-31-33) (12-24-38) (17-22-36) (19-39) (27-34)	.4	(7-9-11-20)
			.5	(7-10-11-20)
			.6	(7-9-10-11-20)
			.7	(7-13-15-18-20)
			.8	(7-10-18-20)
			.4	(7-9-10-13-16-28)
			.5	(7-11-15-16-28)
			.6	(7-9-11-16-28)
(1-29-34)(2-3) (4-9-22-26) (5-11-12) (6-18-21)(13-14) (16-17) (20-2000 $\Omega$ ** - 35) (32-36)	2.7	(5-30) (6-12-20-38) (19-39) (21-27-36)	.7	(7-10-11-16-28)
			.8	(7-10-11-13-15-16-28)
			.4	(7-12-30-33)(21-34-36)
			.5	(7-12-29-31)(17-33-34-36)
			.6	(7-12-30-31-33)(17-29-34-36)
			.7	(7-12-31-33)(21-34-36)
			.8	(7-12-29-31)(21-34-36)
			(1-29-34)(2-3) (4-13) (5-14-15-22-26) (6-18-21)(16-17) (20-1000 $\Omega$ ** - 35) (28-30-31-36)	3.5
.5	(6-7-31)(17-36-37)			
.6	(6-7-29-31-33)(17-36-37)			
.7	(6-7-30-31-33)(17-29-36-37)			
.8	(6-7-31)(21-36-37)			
.4	(5-8) (6-28-34) (9-12) (19-39) (26-38)			
.5	(7-24-29-30)(31-33-36-37)			
.6	(7-24-29-30)(17-36-37)			
(1-29-34)(2-3) (4-7)(5-11-12)(6-18) (10-22-26)(13-14) (15-17)(19-21) (20-35)(31-32-36)	4.3	(4-12-20-38) (5-24) (9-15-16) (19-39)	.6	(7-24-31)(17-36-37)
			.7	(7-24-29-30)(21-36-37)
			.8	(7-24-30-31)(17-36-37)
			.4	(5-8) (6-28-34) (9-12) (19-39) (26-38)
			.5	(7-24-29-30)(31-33-36-37)
			.6	(7-24-29-30)(17-36-37)
			.7	(7-24-31)(17-36-37)
			.8	(7-24-29-30)(21-36-37)
(1-29-34)(2-3) (4-10)(5-8-22-26) (6-16-20)(7-12) (13-14)(17-35) (18-19) (24-25-27-28-30-31-36)	5.0	(5-8) (6-28-34) (9-12) (19-39) (26-38)	.7	(7-24-29-30)(21-36-37)
			.8	(7-24-30-31)(17-36-37)
			.4	(5-8) (6-28-34) (9-12) (19-39) (26-38)
			.5	(7-24-29-30)(31-33-36-37)
			.6	(7-24-29-30)(17-36-37)
			.7	(7-24-31)(17-36-37)
			.8	(7-24-29-30)(21-36-37)
				5.8

\* Use the strapping that corresponds to the larger fractional end section adjacent to the repeater.

\*\* External resistance.

CHART 8T  
 TERMINAL E23 REPEATER  
 (T ARRANGEMENT)  
 19B135-HC      22B135-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING	
		BASIC	END * SECTION
6.5			
7.3			
8.0			
8.6			
9.2			
9.8			

CHART 9T

TERMINAL E23 REPEATER  
(T ARRANGEMENT)

19B135-LC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION * SECTION	SUPPLEMENTAL
(1-29) (2-3) (4-12) (5-14-15-26)(6-19) (7-16)(11-17) (20-5100Ω ** - 35) (22-23-27-36)	1.9	(4-8-29-30) (5-16-24-37-38) (14-39) (19-21-22-32-36) (26-34)	.4	(7-11-13-20)
			.5	(7-9-11-13-20)
			.6	(7-10-11-13-20)
			.7	(7-9-10-11-13-15-20)
			.8	(7-13-15-18-20)
(1-29)(2-3)(4-11) (5-10-26)(6-18) (8-12)(16-17) (19-5100Ω ** - 21-35) (22-30-36)	2.7	(4-12-24-26) (8-30) (14-39) (21-25-36-38)	.4	(6-7-9-10-28)
			.5	(6-7-9-10-13-15-28)
			.6	(6-7-11-13-28)
			.7	(6-7-9-11-15-28)
			.8	(6-7-10-11-28)
3.5				
4.3				
5.0				
5.8				

\* Use the strapping that corresponds to the larger fractional end section adjacent to the repeater.

\*\* External Resistance.

CHART 9T  
 TERMINAL E23 REPEATER  
 (T ARRANGEMENT)

19B135-LC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END * SECTION	SUPPLEMENTAL
6.5	6.5			
7.3	7.3			
8.0	8.0			
8.6	8.6			
9.2	9.2			
9.8	9.8			

CHART 16M

INTERMEDIATE E23 REPEATER  
(T ARRANGEMENT)

19H175-LC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION * SECTION	SUPPLEMENTAL
	1.9			
	2.7			
(5-15-29-34) (6-18) (8-35) (10-600 $\Omega$ ** -20) (16-17)(19-21) (31-32-36)	3.5	(12-29-30-33) (16-28-37) (17-22-36) (19-39) (26-27)(34-38)	.5 .6 .7 .8	(7-9-11-24) (7-10-11-24) (7-9-10-11-24) (7-18-24)
(5-13-14)(6-18) (12-29-34) (15-17) (19-21) (20-35) (27-31-32-36)	4.3	(5-20) (6-12-28-37) (16-29-30-33) (17-27-36) (19-39)	.5 .6 .7 .8	(4-7-11-13) (4-7-9-11-13) (4-7-10-11-15) (4-7-9-10-11-15)
(5-16-29-34) (6-14) (12-17) (18-19) (20-35) (30-31-32-36)	5.0	(4-24-26) (19-25-39) (22-34-38) (28-29-30) (31-32-36-37)	.5 .6 .7 .8	(6-7-9-10-13) (6-7-11-15) (6-7-9-11) (6-7-9-11-13)
(5-12-29-34) (6-16-18-21) (14-15) (17-19) (20-35) (33-36)	5.8	(6-12) (9-13-15-24) (16-26-28) (19-39) (34-38)	.5 .6 .7 .8	(4-7-8-30-31) (17-25-33-36-37) (4-7-8-31-33) (21-25-36-37) (4-7-8-29-31) (21-25-36-37) (4-7-8-29-31-33) (21-25-36-37)

\* Use the Strapping that Corresponds to the Larger Fractional End Section Adjacent to the Repeater.

\*\* External Resistance.

CHART 16M

INTERMEDIATE E23 REPEATER  
(T ARRANGEMENT)

19H175-LC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING	
		BASIC	END * SECTION
6.5			
7.3			
8.0			
8.6			
9.2			
9.8			

CHART 16T

TERMINAL E23 REPEATER  
(T ARRANGEMENT)

19H175-LC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION * SECTION	SUPPLEMENTAL
	1.9			
	2.7			
(1-29-34) (2-3) (4-13) (5-14-15-30) (6-18) (8-35) (10-600Ω** -20) (16-17) (19-21) (31-32-36)	3.5	(12-29-30-33) (16-28-37) (17-22-36) (19-39) (26-27) (34-38)	.4 .5 .6 .7 .8	(7-11-24) (7-9-11-24) (7-10-11-24) (7-9-10-11-24) (7-18-24)
(1-29-34) (2-3) (4-7) (5-13-14) (6-18) (8-12-22-23-24-26) (15-17) (19-21) (20-35) (27-31-32-36)	4.3	(5-20) (6-12-28-37) (16-29-30-33) (17-27-36) (19-39)	.4 .5 .6 .7 .8	(4-7-9-10-13-15) (4-7-11-13) (4-7-9-11-13) (4-7-10-11-15) (4-7-9-10-11-15)
(1-29-34) (2-3) (4-8) (5-7-9-16-22-26-27) (6-14) (12-17) (18-19) (20-35) (30-31-32-36)	5.0	(4-24-26) (19-25-39) (22-34-38) (28-29-30) (31-32-36-37)	.4 .5 .6 .7 .8	(6-7-9-10) (6-7-9-10-13) (6-7-11-15) (6-7-9-11) (6-7-9-11-13)
(1-29-34) (2-3) (4-7) (5-8-12-22-23-24-27) (6-16-18-21) (14-15) (17-19) (20-35) (33-36)	5.8	(6-12) (9-13-15-24) (16-26-28) (19-39) (34-38)	.4 .5 .6 .7 .8	(4-7-8-31-33) (17-25-36-37) (4-7-8-30-31) (17-25-33-36-37) (4-7-8-31-33) (21-25-36-37) (4-7-8-29-31) (21-25-36-37) (4-7-8-29-31-33) (21-25-36-37)

\* Use the Strapping that Corresponds to the Larger Fractional End Section Adjacent to the Repeater.

\*\* External Resistance.

CHART 16T  
 TERMINAL E23 REPEATER  
 (T ARRANGEMENT)  
 19H175-LC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END * SECTION	SUPPLEMENTAL
6.5	6.5			
7.3	7.3			
8.0	8.0			
8.6	8.6			
9.2	9.2			
9.8	9.8			

CHART 17T

TERMINAL E23 REPEATER  
(T ARRANGEMENT)

19H44-HC

22H44-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING		
		BASIC	END SECTION *	SUPPLEMENTAL
	1.9			
	2.7			
	3.5			
(1-29-34) (2-8) (3-9-12-28) (4-15) (16-17-20) (19-21-35) (30-31-36)	4.3	(4-12-24-37-38) (5-28-29-30-31) (14-39) (17-22-25-36) (27-34)	.4 .5 .6 .7 .8	(7-8-10-11) (7-8-9-10-11-13) (7-8-9-18) (7-8-10-13-18) (7-8-11-18)
(1-29-34) (2-7) (3-13-14) (4-8-30) (9-10) (11-15) (12-18) (19-35) (33-36)	5.0	(4-8-29-31) (5-16-24-37-38) (14-39) (17-19-22-32-33-36) (26-34)	.4 .5 .6 .7 .8	(7-9-11-13-20) (7-10-11-15-20) (7-9-10-11-13-20) (7-13-15-18-20) (7-10-18-20)
(1-29-34) (2-7) (3-13) (4-8-15-30) (12-17-20) (19-35) (27-33-36)	5.8	(5-8-24-37-38) (10-12-13-15-28) (14-39) (19-21-22-32-36) (26-27)	.4 .5 .6 .7 .8	(6-7-29-31) (6-7-30-31) (6-7-29-30-31-33) (6-7-17-33) (6-7-17-29-33)

\* Use the strapping that corresponds to the larger fractional end section adjacent to the repeater.

CHART 17T  
 TERMINAL E23 REPEATER  
 (T ARRANGEMENT)

19H44-HC      22H44-HC

E3 STRAPPING	NOMINAL GAIN DB	E1 OR E2 STRAPPING	
		BASIC	* END SECTION SUPPLEMENTAL
6.5	6.5		
7.3	7.3		
8.0	8.0		
8.6	8.6		
9.2	9.2		
9.8	9.8		