

SUPPORTING INFORMATION

SHEET INDEX NOTES

- ** BEFORE ISSUE 11B SHEET 2A WAS SHOWN AS SHEET 2.

21 SHEETS

SD-97272-01-A

[illegible]

CIRCUIT NOTES: (CONT'D)

101 (CONT'D)

POWER APPLICATION INFORMATION TABLE																									
POWER FOR	LOCALLY POWERED REPEATER	REMOTE POWER STRING-EAST OR WEST								INFORMATION FIGURES		BAT. USED	MAX. CABLE SIMPLEX RES (OHMS)	CURRENT (AMP) TO LINE OR LOCAL RPTR		CURRENT DRAIN-LIST 1 & 2 (AMPERES)									
		F.G. AMPL	1ST RPTR	F.G. AMPL	2ND RPTR	F.G. AMPL	3RD RPTR	4TH RPTR	PWR WEST	PWR EAST	REG.			UNREG.	REGULATED SUPPLY				UNREGULATED SUPPLY						
																	-130V	-48V	+130V	GRD	-130V	-48V	+130V	GRD	
N2 REPEATERS (USED IN A STD N2 RPTR MTG SHELF OR WITH AN ADAPTER IN AN N1 OR N1A MTG BRACKET)	②								101	-48V	-		.110									.110			.110
	③									-			.140	(.190A WITH N1A ADAPTER)								.140			.140
										170** SPECIAL	UNREGULATED ONLY	.110										.110			.110
		②							110-1	111-1	+130V	670	.085	.110					.090	.090				.110	.110
		①							110-3	111-3		400							.090	.090				.110	.110
		①		①					110-4	111-4	+130V -48V	900						.085	.090	.005		.110	.110		
		②		③		②			110-5	111-5		620						.085	.090	.005		.110	.110		
		②		③		②			110-6	111-6	+130V -130V	1450					.085	.090	.005		.110	.110			
		③		②		③						1130					.085	.090	.005		.110	.110			
		①		①		①	①		110-7	111-7		850					.085	.090	.005		.110	.110			
		②	①						112-3	113-3	+130V	470							.090	.090				.110	.110
		③	①						112-4	113-4		200							.090	.090				.110	.110
		①	①								+130V -48V	720					.085	.090	.005		.110	.110			
		①		①	①				112-7	113-7		440					.085	.090	.005		.110	.110			
		①		①	①				112-8	113-8	+130V -130V	1300				.085		.090	.005		.110	.110			
		①	①						112-1	113-1	+130V	500	.110	.135					.115	.115				.135	.135
		②	①	③					112-2	113-2	+130V -48V	670				.110	.115	.005		.135	.135				
		③	①	②					112-5	113-5		480				.110	.115	.005		.135	.135				
		③	①	②					112-6	113-6	+130V -130V	1030			.110	.115	.005		.135	.135					
		①	①		①				112-9	113-9	+130V -48V	690			.110	.115	.005		.135	.135					
		②		③	①	②			112-10	113-10	+130V -130V	950			.110	.115	.005		.135	.135					
		②	①	③		②						1100			.110	.115	.005		.135	.135					
		①	②		③		②					1200			.110	.115	.005		.135	.135					
		③		②	①	③						850			.110	.115	.005		.135	.135					
		③	①	②		③						900			.110	.115	.005		.135	.135					
		①	③		②		③					950			.110	.115	.005		.135	.135					
		①	②	①					112-3	113-3	+130V	400							.115	.115				.135	.135
		①	③	①					112-4	113-4		200							.115	.115				.135	.135
		①	①	①							+130V -48V	600			.110	.115	.005		.135	.135					
		①	①	①	①				112-7	113-7	+130V -130V	880			.110	.115	.005		.135	.135					
		①	①	①	①				112-8	113-8	+130V -48V	650	.135	.160		.135	.140	.005		.160	.160				
		①	①	①	①				112-5	113-5	+130V -130V	1100			.135		.140	.005		.160	.160				
	①	②	①	③		②		112-9	113-9		1000			.135		.140	.005		.160	.160					
	①	②		③	①	②		112-10	113-10		850			.135		.140	.005		.160	.160					
		②	①	③	①	②					800			.135		.140	.005		.160	.160					
	①	③	①	②		③					800			.135		.140	.005		.160	.160					
	②																								
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	②																								
	③																								
							</																		

APPLICATION SCHEMATIC
FOR POWERING
N1, N1A, N1-H, N2, ON1 & ON2 REPEATERS

SD-97272-01-I

BELL TELEPHONE LABORATORIES

PRINTED IN U.S.A.

SD-97272-01-1

CIRCUIT NOTES: (CONTINUED)

101. (CONTINUED)

POWER APPLICATION INFORMATION TABLE*

POWER FOR	LOCAL REPEATER IN REMOTE POWER STRING (PWR TRMTD FROM LOCAL RPTR)								INFO. FIGURE FOR PWR TRMTD		BATT USED	MAX CABLE SIMPLEX RES (OHMS)	CURRENT TO LINE OR LOCAL RPTR		CURRENT DRAIN-LIST 1&2 (AMPERES)			
	2ND RPTR WEST	F.G. RPTR WEST	1ST RPTR WEST	F.G. RPTR WEST	LOCAL F.G. RPTR WEST	1ST RPTR EAST	F.G. RPTR EAST	2ND RPTR EAST	WEST	EAST			REG.	UNREG.	REGULATED SUPPLY			
															-130V	-48V	+130V	GRD
N2 REPEATERS (WITH LOCAL REPEATER IN REMOTE POWER STRING)					①				114-1	114-10	+130V	700	.085			.090	.090	
					①		①		114-11	114-12		300				.090	.090	
			①		①				114-2			300				.090	.090	
					②		③	②	114-15	114-16	+130V -48V	540			.085	.090	.005	
					②		③	②			+130V -130V	1400		.085		.090	.005	
					③		②	③			+130V -48V	310			.085	.090	.005	
					③		②	③			+130V -130V	1040		.085		.090	.005	
	②		③		②				114-6		+130V -48V	540			.085	.090	.005	
	②		③		②				114-7		+130V -130V	1400		.085		.090	.005	
	③		②		③						+130V -48V	310			.085	.090	.005	
	③		②		③						+130V -130V	1040		.085		.090	.005	
			①		①		①		114-4	114-13		1040		.085		.090	.005	
			①		①		①		114-5	114-14				.085		.090	.005	
	①		①		①		①		114-17, 114-18 (SEE NOTE 103)			850		.085		.090	.005	
			①		①		①	①	114-8, 114-9 (SEE NOTE 103)			850		.085		.090	.005	
					②	①			115-10	115-11	+130V	380				.090	.090	
					③	①					+130V -48V	600			.085	.090	.005	
				①	②				115-1		+130V	380				.090	.090	
				①	③				115-2		+130V -48V	600			.085	.090	.005	
				①	②	①			115-3, 115-4			800			.085	.090	.005	
				①	①	①			115-12			800			.085	.090	.005	
				①	③	①			115-4						.085	.090	.005	
				①	①	①			115-3, 115-12		+130V -130V	1000		.085		.090	.005	
				①	①	①			115-13			1000		.085		.090	.005	
					①		①	①		115-16	+130V -48V	440			.085	.090	.005	
	①	①		①				115-7			440			.085	.090	.005		
					②	①	③		115-14	115-15	+130V	310	.110			.115	.115	
					①	①	①				+130V -48V	600			.110	.115	.005	
			③	①	②				115-5		+130V	310				.115	.115	
			①	①	①				115-6		+130V -48V	600			.110	.115	.005	
					②	①	③	②	115-17	115-18	+130V -130V	1100		.110		.115	.005	
					③	①	②	③				900		.110		.115	.005	
					②		③	①	②			950		.110		.115	.005	
					③		②	①	③		+130V -130V	850		.110		.115	.005	
	②		③	①	②				115-8			1100		.110		.115	.005	
	③		②	①	③				115-9			900		.110		.115	.005	
	②	①	③		②							950		.110		.115	.005	
	③	①	②		③							850		.110		.115	.005	
	①	①	①	①				115-7			880		.110		.115	.005		
				①	①	①	①		115-16		880		.110		.115	.005		

NOTES:

1. READ NOTES 103, 105, 108, 116 & 301.
2. UNDER ALARM CONDITIONS CURRENT DRAIN IS LESS THAN VALUES SHOWN ABOVE.
3. ABOVE DRAINS APPLY TO EACH LOCAL RPTR. OR TO EACH LINE WHICH IS POWERED.
4. ABOVE DRAINS FOR +130V AND -130V ALSO APPLY FOR +136V AND -136V RESPECTIVELY IF THESE VOLTAGES ARE USED.
5. A CONSTANT CURRENT REGULATOR REQUIRES AN OPERATING CUR DRAIN OF 5mA AND MAINTAINS THE LINE CUR CONSTANT TO WITHIN ±2%. THIS 5mA CURRENT DRAIN IS ADDED TO THE LINE CURRENT AND GIVEN IN THE ABOVE TABLE UNDER "REGULATED SUPPLY".
6. IF THE POWER TO REMOTE REPEATERS IS NOT REGULATED BY A CONSTANT CUR REGULATOR, THE VALUE OF CABLE RESISTANCE GIVEN ABOVE MUST BE REDUCED 25 PERCENT.

** THIS IS NOT A STANDARD ARRANGEMENT.

CODE: ① INDICATES H-L OR L-H REPEATER ② INDICATES H-L REPEATER ONLY ③ INDICATES L-H REPEATER ONLY.
④ INDICATES 240 TYPE AMPLIFIER (F.G. AMPL) SEE NOTE 120

CIRCUIT NOTES: (CONTINUED)

101. (CONTINUED)

POWER APPLICATION INFORMATION TABLE *

POWER FOR	LOCALLY POWERED REPEATER	REMOTE POWER STRING EAST OR WEST						SEAL CUR-RENT	SEE NOTE	INFO FIGURES		BAT USED	MAX CABLE SIMPLEX RES (OHMS)	CURRENT (AMP) TO LINE OR LOCAL RPTR		CURRENT DRAIN LIST 1 & 2 (AMPERES)								
		FG AMPL	1ST RPTR	FG AMPL	2ND RPTR	FG AMPL	REG			UNREG	REGULATED SUPPLY				UNREGULATED SUPPLY									
											-130V			-48V	+130V	GRD	-130V	-48V	+130V	GRD				
N1-H REPEATERS (SEE NOTES 11 & 14)	①						NO		101			+130V			.050								.050	.050
		①					NO	10	118-1119-1				350		.050								.050	.050
		①					YES	9	118-2119-2				330		.065								.065	.065
		①					YES	9.15	118-3119-3				450		.050								.050	.050
	①	①					NO	9	120-1121-1				330		.075								.075	.075
	①	①					YES	7.9, 10	120-2121-2				270		.090								.090	.090
		①	①				NO	9	120-3121-3				270		.075								.075	.075
		①	①				YES	7.9, 10	120-4121-4				230		.090								.090	.090
		①		①			NO	8.12	122-1123-1				800 MD		.050				.050				.050	
		①		①			YES	12.13	122-2123-2				660 MD		.065				.065				.065	
		①		①			YES	12.15	122-3123-3			900 MD		.050				.050				.050		
		①	①		①		NO	12	122-4123-4			680 MD		.075				.075				.075		
		①	①		①		YES	12.13	122-5123-5			480 MD		.090				.090				.090		
		①	①	①			NO	12.13	122-6123-6			600 MD		.075				.075				.075		
		①	①	①	①		YES	12.13	122-7123-7			440 MD		.090				.090				.090		
		①		①	①		NO	12.13	122-8123-8			550 MD		.075				.075				.075		
		①		①	①		YES	12.13	122-9123-9			400 MD		.090				.090				.090		
		①					NO	16	118-1119-1			+130V	330	.050				.050	.050					
		①					YES	16	118-2119-2				330	.065				.065	.065					
		①	①				NO	16	120-1121-1				275	.075				.075	.075					
		①	①				YES	16	120-2121-2				+130V -48V	400	.090			.090	.090					
		①	①				NO	16	120-3121-3				+130V	275	.075			.075	.075					
		①	①				YES	16	120-4121-4				+130V -48V	400	.090			.090	.090					
		①		①			NO	12.17	124-1125-1				+130V	775	.060				.060	.060				
		①		①			YES	12.13, 17	124-2125-2					560	.075				.075	.075				
		①	①		①		NO	12.17	124-3125-3					600	.085				.085	.085				
		①	①		①		YES	12.13, 17	124-4125-4					420	.100				.100	.100				
		①	①	①			NO	12.13, 17	124-5125-5			510		.085				.085	.085					
		①	①	①	①		YES	12.13, 17	124-6125-6			400		.100				.100	.100					
		①		①	①		NO	12.13, 17	124-7125-7			460		.085				.085	.085					
		①		①	①		YES	12.13, 17	124-8125-8			350		.100				.100	.100					

- * SEE NOTES 1 THROUGH 5, RPTR AND FGA CODE UNDER NOTE 101 TABLE ON SHEET 2A. THE FOLLOWING ADDITIONAL NOTES APPLY TO N1-H REPEATERS.
7. (N1 REPEATERS MODIFIED WITH HINS).
 8. CABLE SIMPLEX RESISTANCE TO RPTR ONLY.
 9. MIN CABLE SIMPLEX RES = 400 OHMS WHEN POWER IS OBTAINED FROM J98703E POWER PANEL OR N1 TERMINAL.
 10. STRAP OUT FIXED 130-OHM RESISTOR IN GRD PATH IN J98703E POWER PANEL OR N1 TERMINAL.
 11. REDUCE POWER PANEL +130V EXT RESISTANCE TO 133 OHMS MAX WITH 0 OHMS IN GRD PATH.
 12. THE 25% REDUCTION OF MAX SIMPLEX RESISTANCE STATED IN NOTE 6 DOES NOT APPLY TO N1-H REPEATERS.
 13. REQUIRES REWIRING OF MTG BRACKETS AT 1ST AND 2ND REPEATERS WHEN MODIFYING EXISTING INSTALLATIONS.
 14. REQUIRES ADDITION OF CURRENT BYPASS RESISTOR CONNECTED TO MTG BRACKET OF 1ST REPEATER. SEALING CURRENT RESISTORS ARE ADDED TO 2ND REPEATER MOUNTING BRACKET, WHERE APPLICABLE.
 15. SEALING CURRENT, ASSOCIATED WITH N1-H REPEATER POWER, = 15mA, EXCEPT FOR FIGS. 118-3 AND 119-3 WHERE THE SEALING CURRENT = 50mA.
 16. THE MAX CABLE SIMPLEX RESISTANCE, WHEN USING FIGS. 118-3 AND 119-3, INCLUDES THE RESISTANCE OF THE CABLE SECTION RECEIVING 50mA SEALING CURRENT.
 17. THE CONSTANT CURRENT REGULATOR, WHEN USED WITH N1-H REPEATERS, MAY BE OPERATING OUT OF ITS REGULATING RANGE. HOWEVER, THERE IS ADEQUATE MARGIN FOR PROPER OPERATION.
 18. REQUIRES USE OF DIODE PACKS FOR VOLTAGE REGULATION AND SUPPLEMENTARY SURGE PROTECTION, AS PROVIDED IN FIG. 50 OF THIS DRAWING OR APPROPRIATE FIGS ON SD-97274-01.

FIGURES AND OPTIONS ON THIS DRAWING

CKT FIG.	APP OR WIRING
1 101	Z ZA
2 102	Y ZB
3 103	X ZF
4 104	W ZF
5 105	V ZG
6 106	ZH
7 107	ZJ
8 108	S ZK
9 109	R ZM
10 110	Q ZN
11 111	ZQ
12 112	ZR
13 113	N ZQ
14 114	M ZT
15 115	ZU
16 116	K ZV
17 117	J ZW
18 118	ZX
19 119	H ZY
20 120	G ZZ
21 121	F ZA
22 122	YB
23 123	
24	YE
25	YF
26	Y G
27	B YH
28	C YJ
29	D YK
30	YM
31	YN
	YP
33	YQ
34	YR
35	YS
36	YT
37	YU
38	YV
39	YH
40	YX
41	YY
42	YZ
43	WA
44	WB
45	WK WE
46	WJ WF
47	WH WG
48	AB
49	AC
50	AD

HIGHEST RES & CAP USED ON THIS DWG	
R34	C2
NOT USED	

APPLICATION SCHEMATIC FOR POWERING
N1, N1A, N1-H, N2, ON1 & ON2 REPEATERS

BELL TELEPHONE LABORATORIES
INCORPORATED

SD-97272-01-2A

SD-97272-01-2A

PRINTED IN U.S.A.

CIRCUIT NOTES: (CONTINUED)

101. (CONTINUED)

EQUIVALENT FOUR-WIRE POWER APPLICATION INFORMATION TABLE *

POWER FOR	LOCALLY POWERED REPEATER	REMOTE POWER STRING EAST OR WEST						INFORMATION FIGURES		BAT. USED	MAX CABLE SIMPLEX RES (OHMS)	CURRENT (AMP) TO LINE OR LOCAL RPTR		CURRENT DRAIN LIST 1 & 2 (AMPERES)								
		F.G. AMPL	1ST RPTR	F.G. AMPL	2ND RPTR	F.G. AMPL	3RD RPTR	PWR WEST	PWR EAST			REG	UNREG	REGULATED SUPPLY				UNREGULATED SUPPLY				
														-130V	-48V	+130V	GRD	-130V	-48V	+130V	GRD	
SEALING CURRENT ONLY								102	103	-48V	940		.020						.020			.020
										+130V	940		.020						.020			.020
N1A RPTRS	②							101		-48V	-	-	.110						.110			.110
										+130V	-	-	.110						.110			.110
	③ OPT K OPT J							101		-48V	-	-	.190						.190			.190
										+130V	-	-	.110						.110			.110
		②						110-1	111-1	+130V	700	.095	.110			.100	.100		.110		.110	
		③						110-2	111-2	GRD	500					.100	.100		.110		.110	
		③								+130V	900			.095	.100	.005		.110		.110		
		①		①				110-3	111-3	-48V	570			.095	.100	.005		.110		.110		
		①		①				110-4	111-4	+130V	1260			.095	.100	.005	.110		.110			
		②		③		②		110-5	111-5	+130V	1030			.095	.100	.005	.110		.110			
		③		②		③		110-6	111-6	-130V	830			.095	.100	.005	.110		.110			
		②	①							+130V GRD	360					.100	.100		.110		.110	
		②	①					112-3	113-3	+130V	750			.095	.100	.005		.110		.110		
		③	①					112-4	113-4	-48V	550			.095	.100	.005		.110		.110		
		③	①							+130V	940			.095	.100	.005	.110		.110			
		①		①	①			112-7 112-8	113-7 113-8	-130V	910			.095	.100	.005	.110		.110			
		①	②	①						+130V	590	.120	.135		.120	.125	.005		.135		.135	
		①	③	①				112-3	113-3	-48V	430				.120	.125	.005		.135		.135	
		①	②	①				112-4	113-4	+130V	930			.120	.125	.005	.135		.135			
		①	③	①						-130V	900			.120	.125	.005	.135		.135			
		①	①					112-1	113-1	+130V GRD	360				.125	.125		.135		.135		
		①	①					112-2	113-2	+130V -48V	900			.120	.125	.005		.135		.135		
		①	①	①						+130V -48V	500			.120	.125	.005		.135		.135		
		①	①	①				112-5	113-5	+130V -130V	950			.120	.125	.005	.135	.135				
		①	①		①			112-6	113-6	+130V -48V	530			.120	.125	.005		.135		.135		
		①	①		①						980			.120	.125	.005	.135		.135			
		①	①	①	①			112-7 112-8	113-7 113-8		780			.120	.125	.005	.135		.135			
		①	②		③		②				1070			.120	.125	.005	.135		.135			
		②	①	③		②				+130V	970			.120	.125	.005	.135		.135			
		③	①	②		③		112-9	113-9	-130V	800			.120	.125	.005	.135		.135			
		②		③	①	②		112-10	113-10		840			.120	.125	.005	.135		.135			
		③		②	①	③					820			.120	.125	.005	.135		.135			
		①	①	①	①			112-5 112-6	113-5 113-6		970	.145	.160	.145	.150	.005	.160		.160			
240 TYPE AMPL		①	WITH SEALING CURRENT						104-1	105-1	+130V	800		.040				.040		.040		
		①	WITHOUT SEALING CURRENT						104-2	105-2	+130V	800		.025				.025		.025		
N2 RPTRS (USED IN A STD N2 RPTR MTG SHELF OR WITH AN ADAPTER IN AN N1 OR N1A MTG SHELF)	②									-48V	-			.110				.110		.110		
	③										-			.140	(.190 WITH N1A ADAPTER)				.140		.140	
	②							101		+130V	-			.095				.095		.095		
	③									GRD	-			.110				.110		.110		
	②									+152V	-			.110				.110		.110		
	③									GRD	-			.140				.140		.140		
		②						110-1	111-1	+130V	820	.085	.110			.090	.090		.110		.110	
		③						110-2	111-2	GRD	600					.090	.090		.110		.110	
		③								+130V	940			.085	.090	.005		.110		.110		
		①		①				110-3 110-4	111-3 111-4	-48V	810			.085	.090	.005		.110		.110		

CIRCUIT NOTES: (CONTINUED)

101. (CONTINUED)

EQUIVALENT FOUR-WIRE POWER APPLICATION INFORMATION TABLE *

POWER FOR	LOCALLY POWERED REPEATER	REMOTE POWER STRING EAST OR WEST						INFORMATION FIGURES		BAT. USED	MAX CABLE SIMPLEX RES (OHMS)	CURRENT (AMP) TO LINE OR LOCAL RPTR		CURRENT DRAIN LIST 1 & 2 (AMPERES)									
		F.G. AMPL	1ST RPTR	F.G. AMPL	2ND RPTR	F.G. AMPL	3RD RPTR	PWR WEST	PWR EAST			REG	UNREG	REGULATED SUPPLY				UNREGULATED SUPPLY					
														-130V	-48V	+130V	GRD	-130V	-48V	+130V	GRD		
N2 RPTRS (USED IN A STD N2 RPTR MTG SHELF OR WITH AN ADAPTER IN AN N1 OR N1A MTG SHELF)			①		①			110-3 110-4	111-3 111-4	+130V	1480	.085	.110	.085		.090	.005	.110			.110		
			②		③		②	110-5	111-5	-130V	1250			.085		.090	.005	.110			.110		
			③		②		③	110-6	111-6		1030			.085		.090	.005	.110			.110		
			②	①						+130V	300					.090	.090				.110	.110	
			②	①				112-3	113-3	+130V GRD	740				.085	.090	.005		.110		.110		
			③	①				112-4	113-4	+130V -48V	515				.085	.090	.005		.110		.110		
			③	①						+130V	930			.085		.090	.005	.110			.110		
			①		①		①	112-7 112-8	113-7 113-8	-130V	960			.085		.090	.005	.110			.110		
			①	②	①					+130V	555	.110	.135		.110	.115	.005		.135		.135		
			①	③	①			112-3	113-3	-48V	390				.110	.115	.005		.135		.135		
			①	②	①			112-4	113-4	+130V	940			.110		.115	.005	.135			.135		
			①	③	①					-130V	940			.110		.115	.005	.135			.135		
			①	①				112-1	113-1	+130V	440					.110	.110				.135	.135	
			①	①				112-2	113-2	+130V	780				.110	.115	.005		.135		.135		
			①	①	①					-48V	590				.110	.115	.005		.135		.135		
			①	①	①			112-5	113-5	+130V -130V	1100			.110		.115	.005	.135			.135		
			①	①		①		112-6	113-6	+130V -48V	640				.110	.115	.005		.135		.135		
			①	①		①					1140			.110		.115	.005	.135			.135		
			①	①	①	①		112-7 112-8	113-7 113-8		850			.110		.115	.005	.135			.135		
			①	②		③		②			1170			.110		.115	.005	.135			.135		
			②	①	③		②		112-9	113-9	+130V	1070			.110		.115	.005	.135			.135	
			③	①	②		③		112-10	113-10	-130V	870			.110		.115	.005	.135			.135	
			②		③	①	②				920			.110		.115	.005	.135			.135		
			③		②	①	③				820			.110		.115	.005	.135			.135		
			①	①	①	①			112-5 112-6	113-5 113-6		1070	.135	.160	.135		.140	.005	.160			.160	
			①	②	①	③		②	112-9 112-10	113-9 113-10		970			.135		.140	.005	.160			.160	

APPLICATION SCHEMATIC
FOR POWERING
N1,N1A,N1-H,N2,ON1 & ON2 REPEATERSBELL TELEPHONE LABORATORIES
INCORPORATED

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CIRCUIT NOTES: (CONTINUED)

101. (CONTINUED)

EQUIVALENT FOUR-WIRE POWER APPLICATION INFORMATION TABLE *

POWER FOR	LOCAL RPTRS IN REMOTE POWER STRING (PWR TRMTD FROM LOCAL RPTR)								INFORMATION FIG. FOR PWR TRMTD		BATT USED	MAX CABLE SIMPLEX RES (OHMS)	CURRENT TO LINE OR LOCAL RPTR		CURRENT DRAIN-LIST 1&2 (AMPERES) REGULATED SUPPLY			
	2ND RPTR WEST	1ST RPTR WEST		1ST RPTR EAST		2ND RPTR EAST	WEST	EAST	REG	UNREG			-130V	-48V	+130V	GRD		
		F.G. AMPL	RPTR	F.G. AMPL	RPTR												F.G. AMPL	RPTR
N2 RPTRS (WITH LOCAL RPTR IN REMOTE POWER STRING)					①					114-1	114-10	+130V	700	.085			.090	.090
					①		①				114-11 114-10		810			.085	.090	.005
					①					114-2 114-3		+130V -48V	810			.085	.090	.005
			①		①						114-15 114-16		580			.085	.090	.005
					②		③		②				+130V	1250		.085	.090	.005
					②		③		②				-130V	1030		.085	.090	.005
					③		②		③							.085	.090	.005
		②		③		②				114-6 114-7		+130V -48V	580			.085	.090	.005
		②		③		②						+130V -130V	1250			.085	.090	.005
		③		②		③							1030			.085	.090	.005
				②		③		②		114-4 114-5	114-13 114-14			1170		.085	.090	.005
				③		②		③						950		.085	.090	.005
						②	①				115-10 115-11	+130V	350				.090	.090
						③	①					+130V -48V	350		.085	.090	.005	
					①	②				115-1 115-2		+130V	350			.090	.090	
					①	③						+130V -48V	350		.085	.090	.005	
					①	②	①			115-3, 115-12			680		.085	.090	.005	
					①	①	②			115-4			680		.085	.090	.005	
					①	③	①			115-3, 115-12		+130V -130V	980		.085	.090	.005	
					①	①	①			115-13			980		.085	.090	.005	
						①		①	①		115-16			800		.085	.090	.005
			①	①		①				115-17			800		.085	.090	.005	
						①	①	①		115-5 115-6	115-14 115-15	+130V -48V	600	.110		.110	.115	.005
				①	①	①							600			.110	.115	.005
						①	①	①				+130V -130V	940		.110	.115	.005	
				①	①	①							940		.110	.115	.005	
						②	①	③			115-17 115-18		1070		.110	.115	.005	
						③	①	②	③				870		.110	.115	.005	
						②		③	①	②			920		.110	.115	.005	
						③		②	①	③			820		.110	.115	.005	
		②		③	①	②				115-8 115-9			1070		.110	.115	.005	
		③		②	①	③							870		.110	.115	.005	
		②	①	③		②							920		.110	.115	.005	
		③	①	②		③							820		.110	.115	.005	
						①	①	①	①		115-16		850		.110	.115	.005	
			①	①	①	①				115-7			850		.110	.115	.005	

CIRCUIT NOTES: (CONTINUED)

102. AT EACH REPEATER THE CONNECTION OF LEADS V1 AND V2 ARE DETERMINED BY THE CONDITIONS ON THE LINE TO THE WEST. THE CONNECTION OF LEADS V3 AND V4 BY THE CONDITIONS ON THE LINE TO THE EAST, AND THE CONNECTION OF LEADS P+ AND P- BY THE METHOD POWERING THE REPEATER ITSELF.
103. THE PWR APPLICATION SHOWN IN FIGS. 114-9 AND 114-18 FOR PWRG FOUR N2 RPTRS IN A COMMON LOOP IS CHARACTERISTICALLY THE SAME AS THE APPLICATION SHOWN IN FIGS. 114-8 AND 114-17. HENCE THE LATER APPLICATION ONLY IS GIVEN IN NOTE 101.
104. **N1** DESIGNATES ONE N1, ON1 OR ON2 ELECTRON TUBE REPEATER OR AN N2 REPEATER WITH ADAPTER IN AN N1 RPTR MOUNTING.
- N1A OR N2** DESIGNATES ONE N1A OR N2 TRANSISTORIZED REPEATER.
- 240** DESIGNATES A PAIR OF 240-TYPE FLAT GAIN AMPLIFIERS. THESE AMPLIFIERS ARE POWERED TWO IN SERIES ON A GIVEN SIMPLEX LINE. THEY MAY BE USED TO AMPLIFY THE TRANSMISSION CARRIER OF TWO SYSTEMS IN ONE DIRECTION OR BOTH DIRECTIONS OF A SINGLE SYSTEM. THE LOCATION OF THESE AMPLIFIERS ALONG THE REPEATERED LINE AND THE NUMBER OF AMPLIFIER PAIRS PWRD ON A COMMON PWR LOOP ARE SHOWN AS OPTIONAL ARRANGEMENTS IN FIGS. 112, 113 AND 115. EACH AMPLIFIER PAIR IS PROVIDED (OR OMITTED) TO AGREE WITH THE SPECIFIC EQUIPMENT ARRANGEMENTS LISTED IN NOTE 101, ALSO SEE NOTE 120.
- N1-H** DESIGNATES ONE N1-H REPEATER.
105. POWER MAY BE TRANSMITTED OVER THE SIMPLEX CIRCUIT OF THE CARRIER CABLE PAIRS TO REMOTE "N" OR "ON" REPEATERS FROM ONE OF SIX OFFICE FACILITIES. POWER IS TRANSMITTED FROM:
1. AN N1 RPTR BAY (FIG. 24 OR 42).
 2. AN N1A RPTR BAY (FIG. 24 OR 43).
 3. AN N2 RPTR BAY (FIG. 31).
 4. AN N1 CARR TERM (FIG. 44).
 5. AN N2 OR N3 CARR TERM (FIG. 30).
 6. A LINE BUILD-OUT BAY (FIG. 28).
106. SEALING CURRENT OF ABOUT 20 MA SHOULD BE PROVIDED OVER CABLE SECTIONS WITH UNSOLDERED JOINTS TO REDUCE JOINT TRANSMISSION TROUBLES. SEE NOTES 14 & 15 OF NOTE 101.
107. WHEN FOUR N2 RPTRS ARE TO BE POWERED IN SERIES CARE MUST BE TAKEN NOT TO EXCEED THE MAXIMUM CABLE LENGTH WHICH IS LIMITED BY THE "MAX CABLE SIMPLEX RESISTANCE" SPECIFIED IN NOTE 101.
108. TO MINIMIZE HEAT DISSIPATION IN THE LOCAL SUPPLY USED TO POWER THE LINE, THE MINIMUM AVAILABLE VOLTAGE (-48V & GRD, +130V & GRD, +130V & -48V, OR +130V & -130V) WHICH WILL SUPPLY THE REQUIRED CURRENT TO THE LOAD SHOULD BE USED.
109. IF POWER IS TRANSMITTED OVER THE LINE FROM A CARRIER TERMINAL RATHER THAN FROM A REPEATER BAY, STRAPPING AT THE REPEATERS RECEIVING POWER REMAINS THE SAME.
110. THE DIRECTION OF THE LINE CURRENT IS DETERMINED BY THE ARBITRARY RULE THAT CURRENT FLOWS IN THE SAME DIRECTION AS CARRIER TRANSMISSION. THE POLARITY (+) AND (-) IS INDICATED AT THE TERMINATING POINTS. THERE IS ONLY EXCEPTION TO THIS RULE, A SPECIAL CASE WHERE SEALING CURRENT ONLY IS FED ON THE LINE FROM AN N2 REPEATER LOCATION OR FROM A LINE BUILD-OUT BAY EQUIPPED FOR FEEDING POWER OVER THE LINE: FOR THIS CASE ONLY, THE CURRENT FLOWS IN THE REVERSE DIRECTION FROM A -48 VOLT BATTERY.

111. FURNISH OPTIONS IN FIG. 24 AS FOLLOWS:

LOCAL RPTR	BAT.	OPT.
LH N1A	-48V	Y
HL N1A	-48V	Z
N1, ON1, ON2	+130V OR +136V	X
HL N1A	+130V, +136V OR +152V	W
LH N1A	+130V, +136V OR +152V	V
N1, ON1, ON2	+152V	W

112. FURNISH OPTIONS IN FIG. 26 AND 27 AS FOLLOWS:

LOCAL RPTR	BAT.	OPT.	FIG.
LH N1A	-48V	H	26
HL N1A	-48V	G	26
N1, ON1, ON2	+130V OR +136V	J, K, M	27
LH N1A	+130V OR +136V	F, J, M	27
HL N1A	+130V OR +136V	F, M, R	27
N1, ON1, ON2	+152V	Q	27
LH N1A	+152V	F, J, N	27
HL N1A	+152V	F, N, R	27

CIRCUIT NOTES: (CONTINUED)

113. FURNISH OPTIONS IN FIG. 2, 4, 6, 8, 9, 10, 11, 13, 15, 17, 20, 21, 22 AND 46 AS FOLLOWS:

PWRG ARRANGEMENT	LOCATION	OPTIONS
N1, N1A OR N1-H RPTR	POLE TYPE CABINET	ZA, ZE, ZG, ZJ, ZN, ZQ, ZS, ZU, ZV, ZY, YM, YQ, YT, YW, YZ, WE, WH
N1, N1A, OR N1-H RPTR	ALL BUT POLE TYPE CABINET	ZB, ZF, ZH, ZK, ZN, ZR, ZT, ZV, ZX, ZZ, YN, YR, YU, YX, WA, WF, WJ
N2 RPTR	ALL	YA, YB, YE, YF, YG, YH, YJ, YK, YP, YS, YV, YY, WB, WG, WK

114. IN FIGURES WHERE THE N1A OR N2 REPEATER BEYOND THE 240-TYPE AMPLIFIER IS A HIGH-LOW REPEATER THERE MUST BE A MINIMUM OF 200 OHMS RESISTANCE IN THE SIMPLEX LOOP (IN ADDITION TO THE REPEATER) IN ORDER TO MAINTAIN THE REQUIRED VOLTAGE AT THE 240 TYPE AMPLIFIER. IF THE LINE RESISTANCE BETWEEN RPTR AND 240 AMPL IS LESS THAN 200 OHMS, PROVIDE AT THE RPTR A RESISTOR TERMINATION PER FIGS. 8, 11, 13 OR 14.
115. FIG. 31 GROUPS THE POWER SUPPLIES USED IN N2 RPTR BAYS OR IN MISC ARRANGEMENTS WITH N1 AND N1A RPTR BAYS. THESE SUPPLIES PROVIDE REGULATED CONSTANT CURRENT TO THE LINE FOR REMOTELY PWRD "N" & "ON" RPTRS AND PROVIDE A RESISTOR UNIT FOR TRMTG PWR TO 240 AMPLS AND/OR SEALING CURRENT.
116. THE "MAX CABLE SIMPLEX RES" IS THE RESISTANCE OF ONLY THE TOTAL CABLE SIMPLEX WHICH COMPLETES THE DC POWER LOOP FROM THE POWER SOURCE TO THE MOST REMOTE REPEATER RECEIVING POWER. THE SIMPLEX RESISTANCE OF A CABLE SECTION BEYOND THE LAST REMOTELY POWERED REPEATER WHICH HAS EITHER SEALING CURRENT OR 240 TYPE AMPLIFIERS IS NOT TO BE ACCOUNTED AS PART OF THE "MAX CABLE SIMPLEX RESISTANCE"; THAT SECTION MAY BE ANY NORMAL CABLE SPAN BETWEEN TWO REPEATER LOCATIONS. WHEN BOTH SEALING CURRENT AND 240 TYPE AMPLIFIERS ARE USED ON THE END SECTION OF A POWER LOOP, THAT SECTION IS CONSIDERED AS ANY OTHER SPAN BETWEEN REPEATERS IN TERMS OF "MAX CABLE SIMPLEX RESISTANCE". SEE NOTES 101 & 122.
117. CHANGES IN FIGURE NUMBERS
- | ON ISSUE 58 | WAS (PRECEDING ISSUE 5) |
|-------------|-------------------------|
| FIG. 8 | FIG. 35 |
| FIG. 11 | FIG. 36 |
| FIG. 13 | FIG. 38 |
| FIG. 14 | FIG. 37 |
| FIG. 30 | FIG. 33 |
| FIG. 31 | FIG. 34 |
| A, B | FIG. 13 |
| C | FIG. 11, 12 |
| D | FIG. 30, 31, 32 |
118. LOCAL N2 REPEATERS POWERED IN SERIES WITH REMOTE REPEATERS ARE CONNECTED TO THE REGULATED POWER SOURCE PER FIG. 23, E, F, OR G, SEE FIG. 116.
119. THE SEALING CURRENT ARRANGEMENT IN FIGURES 114-119, 114-20, 115-9 AND 115-20 REPLACES THE POWER-FEED-POINT ARRANGEMENTS OF OTHER APPLICATIONS IN FIGURES 114 AND 115 WHEN SEALING CURRENT IS REQUIRED IN THE OPPOSITE DIRECTION FROM WHICH REMOTE REPEATERS ARE BEING POWERED. FIG. 115-5, FOR EXAMPLE, CAN FEED SEALING CURRENT ON LINE EAST BY RE-ARRANGING THE POWER FEED POINT PER FIG. 115-19.
120. WHEN TWO 240 TYPE AMPLIFIER LOCATIONS ARE DESIRED BETWEEN ADJACENT REPEATERS OR TERMINALS, EACH OF THE 240 TYPE AMPLIFIER LOCATIONS IS REPRESENTED BY A SEPARATE FIG. 112, 113 OR 115 AND EACH SHALL BE POWERED FROM A SEPARATE SYSTEM.
121. THE C1 CAPACITOR, FIG. 47 AND/OR FIG. 45 OR 46 ARE USED TO REDUCE 60 Hz INTERFERENCE. FIG. 45 AND 46 ARE REPLACEMENTS FOR FIG. 5 AND 22, RESPECTIVELY, TO CONNECT N1A OR N2 REPEATERS IN THE POSITIVE (+) BATTERY SUPPLY LEAD IN THE WEST DIRECTION, AS SHOWN IN FIG. 117.
122. IF SEALING CURRENT IS USED AND CONDITION (D) AND/OR (E) IS INVOLVED:
- (D) 240 TYPE AMPLIFIERS ARE USED.
 - (E) MAX CABLE SIMPLEX RESISTANCE REQUIREMENTS ARE NOT MET, USE FIG. 2, 3, 17 OR 19 AS APPROPRIATE AT THE LAST REPEATER POINT IN A POWER LOOP. IN A TANDEM POWER LOOP, FIG. 49 IS REQUIRED IN ADDITION TO FIG. 5 AT THE FIRST REPEATER POINT. THE FIG. 49 OPTIONS ARE USED AS FOLLOWS:
 - (F) SEALING CURRENT ONLY (WHEN FIG. 2 OR 17 ARE USED AT 2ND RPTR) OPTION B OR AB.
 - (G) 240 TYPE AMPLIFIER FOLLOWS 1ST OR 2ND REPEATER (SEALING CURRENT NOT PROVIDED) OPTION C OR AC.
 - (H) SEALING CURRENT PROVIDED AND 240 TYPE AMPLIFIER FOLLOWS 1ST OR 2ND REPEATER OPTION D OR AD.
123. OPTION AD REQUIRES TWO 18-TYPE RESISTORS IN PARALLEL TO MEET POWER REQUIREMENTS.

EQUIPMENT NOTES:

201. THE KS-8512, L() RESISTORS IN FIGS. 2, 4, 6, 8, 9, 10, 11, 13, 14, 15, 17, 20, 21, 22 AND 46 ARE PROVIDED ON J987030-1 ().
202. THE 18 AND 19 TYPE RESISTORS IN FIGS. 2, 4, 6, 8, 9, 10, 11, 13, 14, 15, 17, 20, 21, 22, 26, 27 AND 46 ARE PROVIDED ON ED-97265-1 ().
203. THE KS-14603, L() RESISTORS IN FIGS. 4, 6, 8, 9, 10, 11, 13, 14, 15, 20, 21 AND 46 ARE PROVIDED ON ED-3C061 AND FIGS. 33 THROUGH 40 ARE PROVIDED ON ED-3C214.
204. THE CHASSIS CONNECTIONS () SHOWN ON FIGURES 1 THROUGH 22, 45 AND 46 APPLY TO N1 OR N1A REPEATERS ONLY. THE CHASSIS CONNECTION FOR THE N2 REPEATERS IS SHOWN ON THE APPLICATION SCHEMATIC FOR N2 REPEATERS, SD-97374-01.
205. FIG. 31 MAY BE USED TO PROVIDE REGULATED CONSTANT CURRENT TO THE LINE FROM AN N1 OR N1A REPEATER BAY. FIG. 31 IN THIS CASE CONSISTS OF MISCELLANEOUS MOUNTED SHELF (S) EQUIPPED WITH CONSTANT CURRENT REGULATORS AND FUSE AND ALARM CIRCUITS.
206. TERMINAL STRIP TS1 (ED-3C049) IN FIG. D, E, F & G CONSISTS OF SCREW-DOWN TERMINALS LOCATED AT THE BACK OF EACH N2 REPEATER MOUNTING POSITION. CONNECTOR P1 IS PART OF THE PRINTED CIRCUIT PATH ON ED-3C214, ED-3C061 OR P-49X029.
207. WHEN POWER IS PROVIDED BY PANEL J993210, TS2 SHALL BE PROVIDED AND WIRED AS FOLLOWS:
- | DESIGNATION | TS2 TERM. NO. |
|-------------|----------------|
| V1 | 1, 3, 5, 7 |
| V2 | 2, 4, 6, 8 |
| V3 | 9, 11, 13, 15 |
| V4 | 10, 12, 14, 16 |
| P+ | 17, 19, 21, 23 |
| P- | 18, 20, 22, 24 |
- CIRCUIT NOTES: (CONTINUED)
- (M.D.) 124. IN TANDEM POWERING OF N1-H REPEATERS CARE MUST BE TAKEN TO APPROXIMATELY MATCH THE CURRENT DRAINS OF THE HINS USED IN THE TWO REPEATERS IN THE POWER LOOP TO PERMIT BOTH REPEATERS TO MEET VOLTAGE REQUIREMENTS. ALSO, WHEN HINS ARE CHANGED IN A REPEATER, VOLTAGE MEASUREMENTS MUST BE MADE ON BOTH TANDEM REPEATERS TO ENSURE THAT REQUIREMENTS CAN STILL BE MET. IN ADDITION SUPPLEMENTARY SURGE PROTECTORS CANNOT BE USED AT THE FIRST REPEATER IN A TANDEM POWER STRING.
125. CR1-10 ARE 521H DIODES. THE DIODES ARE BIDIRECTIONAL SO THE DIODE PACK CONNECTIONS TO P+ AND P- NEED NO POLARIZATION. ALTERNATE DIODE PACK CONNECTORS, FIGS 9, 10 OR 11 OF SD-97274-01, MAY BE USED IN PLACE OF FIG. 50.
126. ON EQUIVALENT FOUR-WIRE LINES, POLARITY REQUIREMENTS FOR PINS 4 & 5 OF THE DIRECTIONAL FILTER MUST BE MET.

PWR APPL	RPTR	WEST FILTER				EAST FILTER			
		PIN	POLARITY	V()	PIN	POLARITY	V()		
PWR RECEIVED FROM WEST	L-H	4	POS	V1	4	NEG	V4		
	H-L	5	NEG	V2	5	POS	V3		
PWR RECEIVED FROM EAST	L-H	4	NEG	V1	4	POS	V4		
	H-L	5	POS	V2	5	NEG	V3		

127. WHEN 986A PHASE EQUALIZER PANELS ARE INSTALLED IN EQUIVALENT FOUR-WIRE LINE SECTIONS, USE THOSE TABLES IN NOTE 101 DESIGNATED "EQUIVALENT FOUR-WIRE" IN CONJUNCTION WITH NOTE 23 TO DETERMINE THE VALUE OF MAXIMUM CABLE SIMPLEX RESISTANCE. LIKEWISE, USE THE FOUR-WIRE TABLES AND NOTE 23 FOR PHASE EQUALIZER PANELS INSTALLED IN FOUR-WIRE LINE SECTIONS.
128. SINCE INFORMATION FIGURES 101 THRU 125 DO NOT SHOW 986A PHASE EQUALIZER PANELS, INSTALLED AT POWER FEED POINTS, REFER TO NOTE 23 IN NOTE 101 FOR CORRECTIONS TO THE "MAX CABLE SIMPLEX RESISTANCE." WHEN 986A PHASE EQUALIZER PANELS ARE INSTALLED AT NON-POWER FEED POINTS, TREAT THE SAME AS REMOTE-POWERED FLAT GAIN AMPLIFIERS AND USE THE APPROPRIATE FIGURES.

INFORMATION NOTES:

301. FROM THE TABLE IN NOTE 101 THE APPROPRIATE INFORMATION FIGURE (101 THRU 115) MAY BE SELECTED FOR A PARTICULAR COMBINATION OF REPEATERS, 240 TYPE AMPLIFIERS AND SEALING CURRENT. THE INFORMATION FIGURES SPECIFY THE STRAPPING FIGURES 1 TO 22, 33 TO 40 TO BE USED AT EACH REPEATER. AT THE END REPEATERS OF A POWER SECTION MORE THAN ONE STRAPPING FIGURE WILL BE REQUIRED SINCE THE END REPEATERS MUST BE CONSIDERED IN RELATION TO BOTH EAST AND WEST POWER SECTIONS. THE TABLE IN NOTE 101 ALSO PROVIDES INFORMATION FOR EACH SPECIFIED SYSTEM WITHIN THE GIVEN LIMITS OF CABLE RESISTANCE.
302. SEE SD-97154-01 FOR CONNECTING INFORMATION FOR 240 TYPE AMPLIFIERS.
303. THE REPEATER MOUNTING BRACKET OF FIG. 23 IS SHOWN ON DRAWINGS SD-97124-03, SD-97260-01, SD-97261-01 AND SD-97374-01.

APPLICATION SCHEMATIC
FOR POWERING
N1, N1A, N1-H, N2, ON1 & ON2 REPEATERS

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FIG. 101

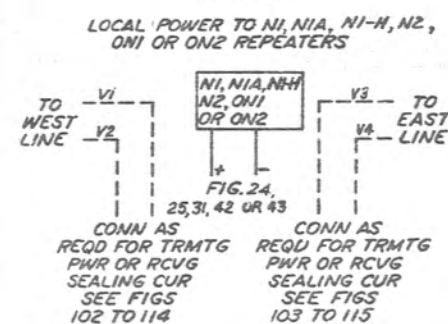


FIG. 102

SEALING CURRENT ONLY TRANSMITTED WEST
SEE NOTE 105 & 106

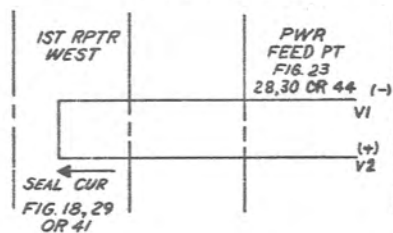


FIG. 103

SEALING CURRENT ONLY TRANSMITTED EAST
SEE NOTE 105 & 106

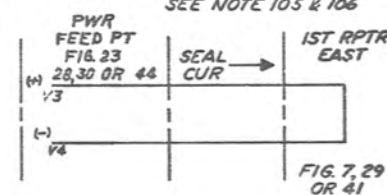


FIG. 104

POWER TRANSMITTED WEST TO 240 TYPE
AMPLIFIER ONLY
SEE NOTE 105 & 302

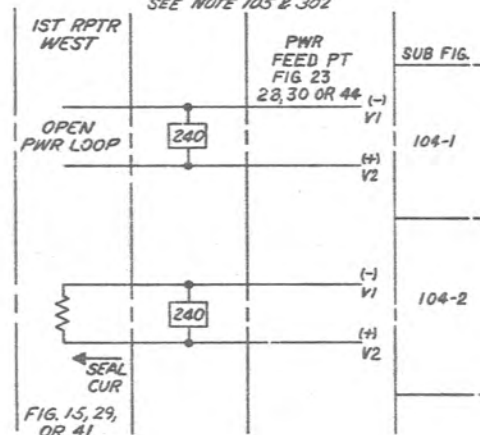


FIG. 105

POWER TRANSMITTED EAST TO 240 TYPE
AMPLIFIERS ONLY
SEE NOTES 105 & 302

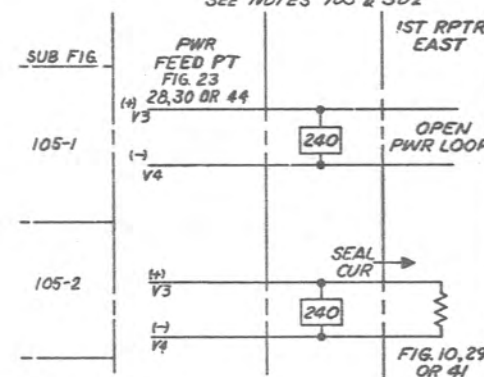


FIG. 106

POWER TRANSMITTED WEST TO NI REPEATERS ONLY
SEE NOTE 105

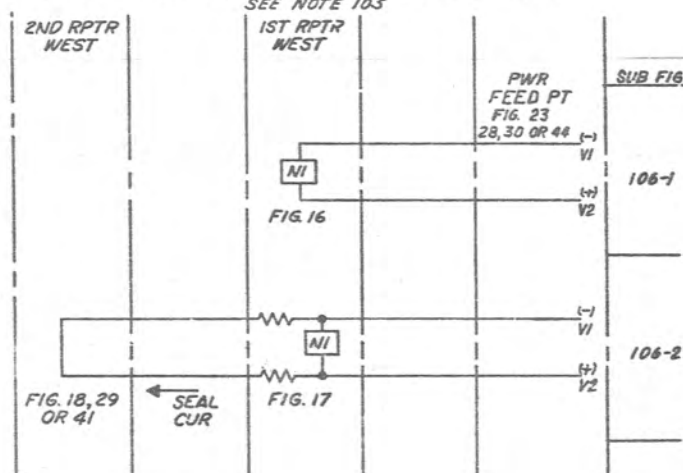
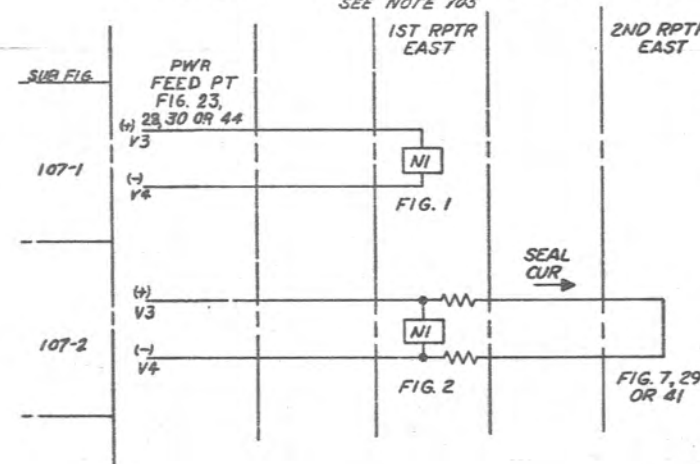


FIG. 107

POWER TRANSMITTED EAST TO NI REPEATERS ONLY
SEE NOTE 105



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FIG. 108

POWER TRANSMITTED WEST TO NI REPEATERS AND 240 TYPE AMPLIFIERS
SEE NOTES 105 & 302

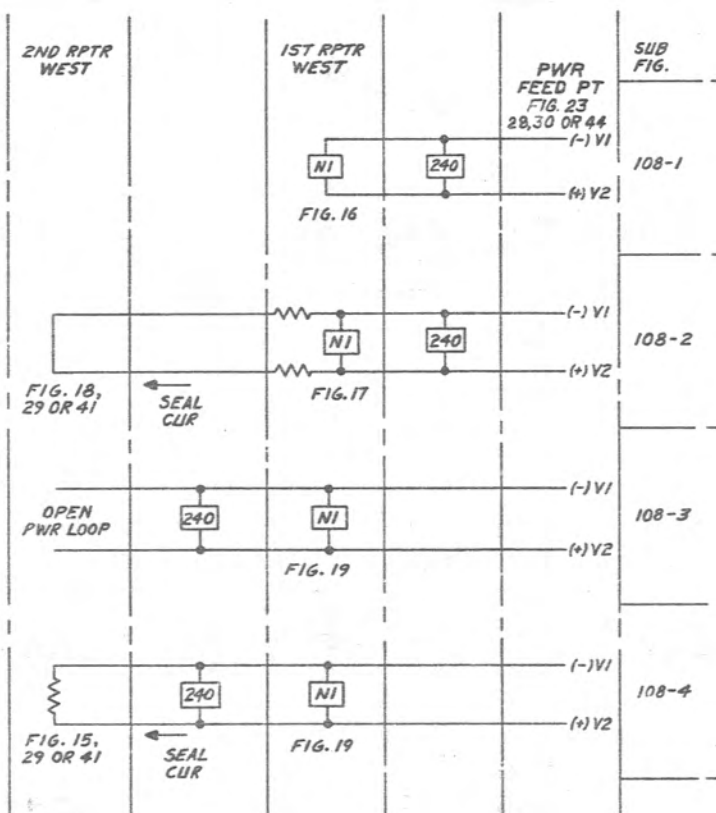
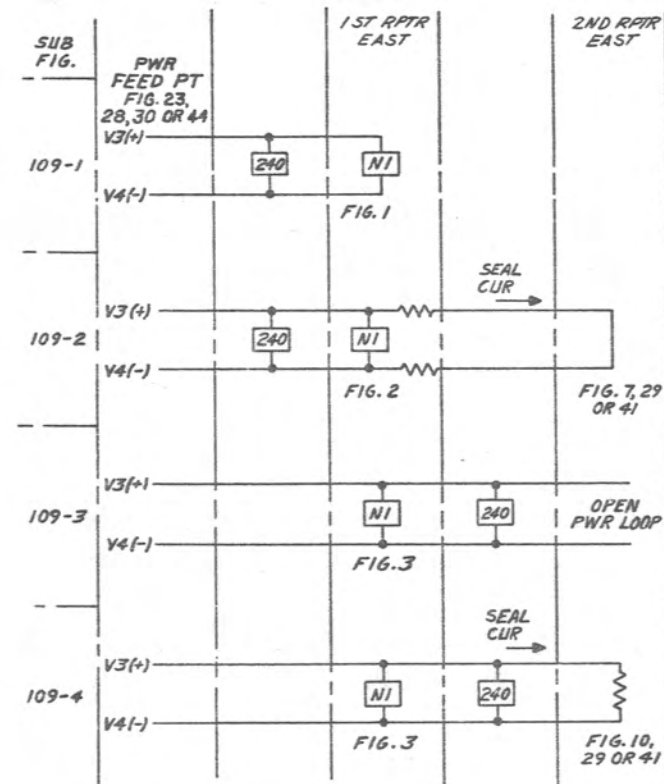
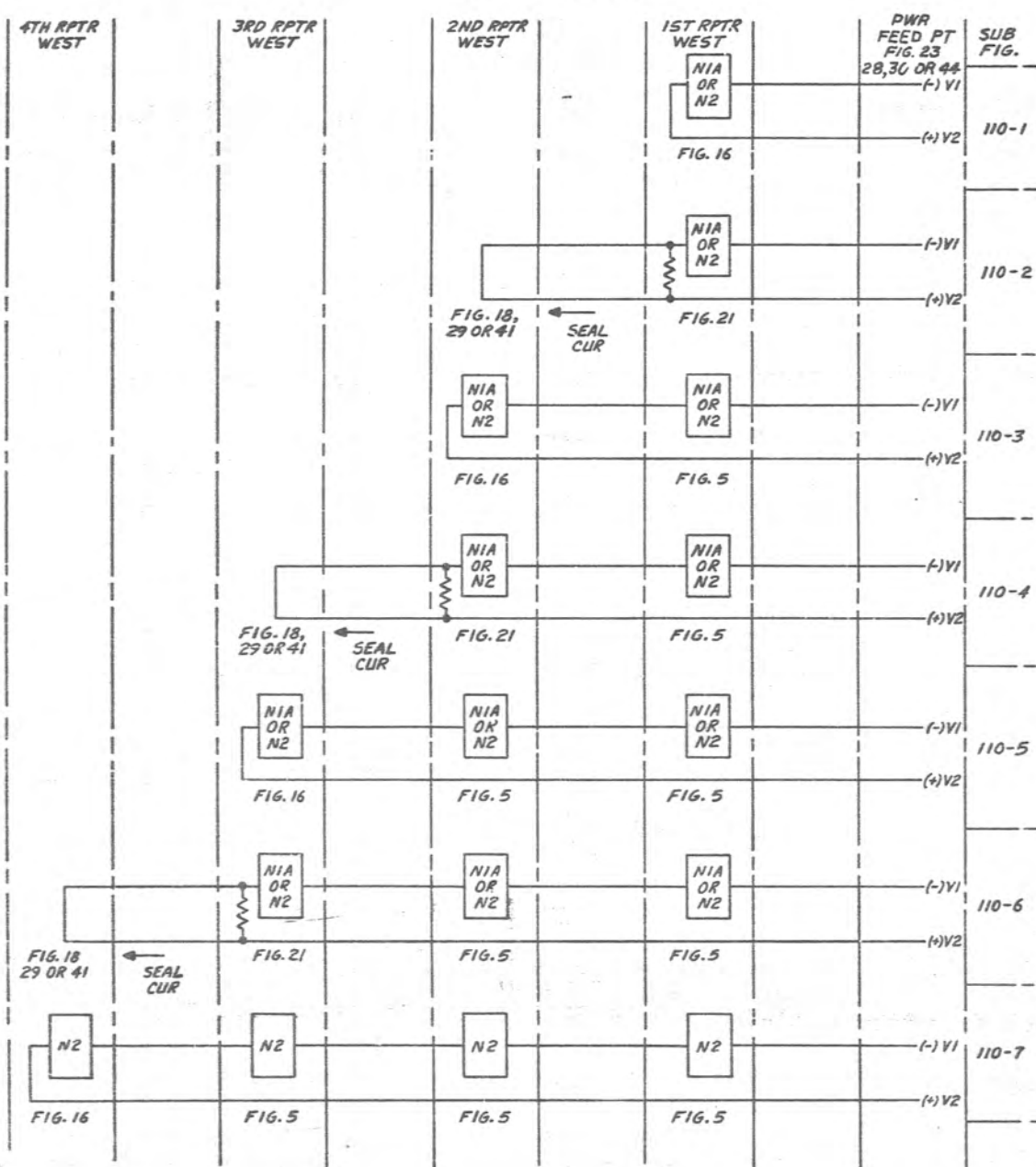


FIG. 109

POWER TRANSMITTED EAST TO NI REPEATERS AND 240 TYPE AMPLIFIERS
SEE NOTES 105 & 302



POWER TRANSMITTED WEST TO N1A OR N2 REPEATERS ONLY
SEE NOTES 105 & 121



POWER TRANSMITTED EAST TO N1A OR N2 REPEATERS ONLY
SEE NOTE 105

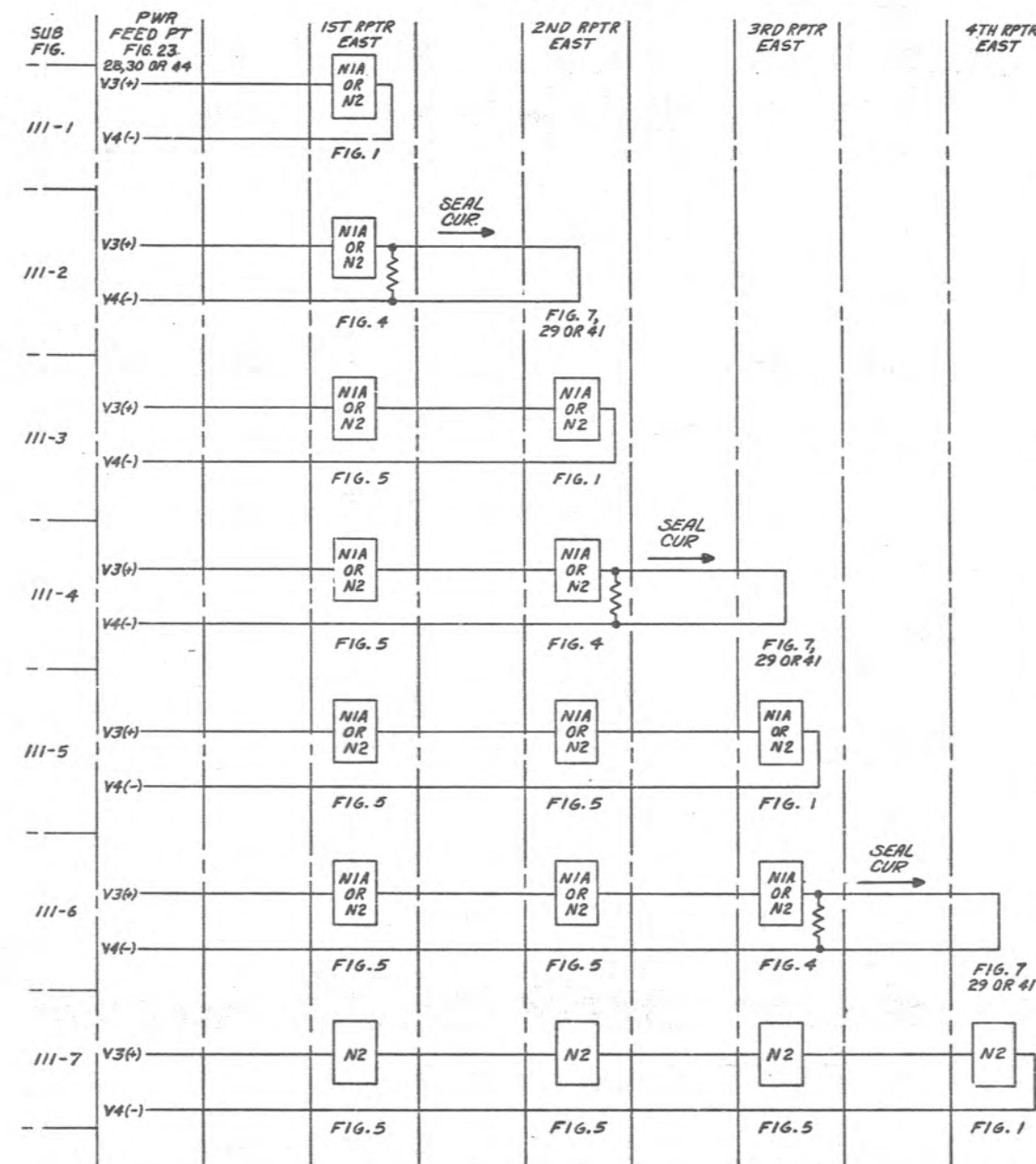


FIG. 112
POWER TRANSMITTED WEST TO N1A OR N2 REPEATERS AND 240 TYPE AMPLIFIERS
SEE NOTES 104, 105, 121 & 302

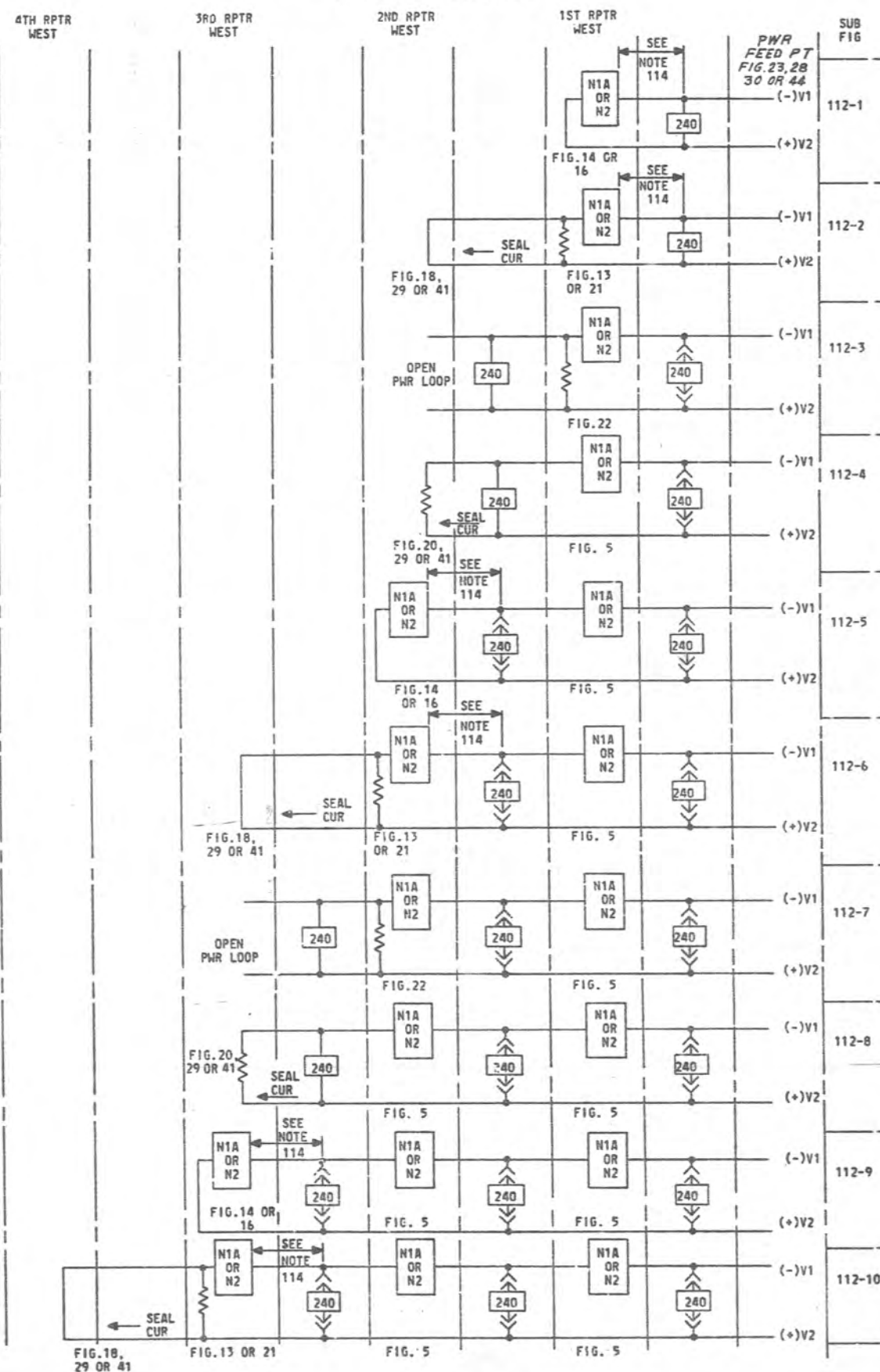


FIG. 113
POWER TRANSMITTED EAST TO N14 OR N2 REPEATERS AND 24G TYPE AMPLIFIERS
SEE NOTES 104, 105 & 302

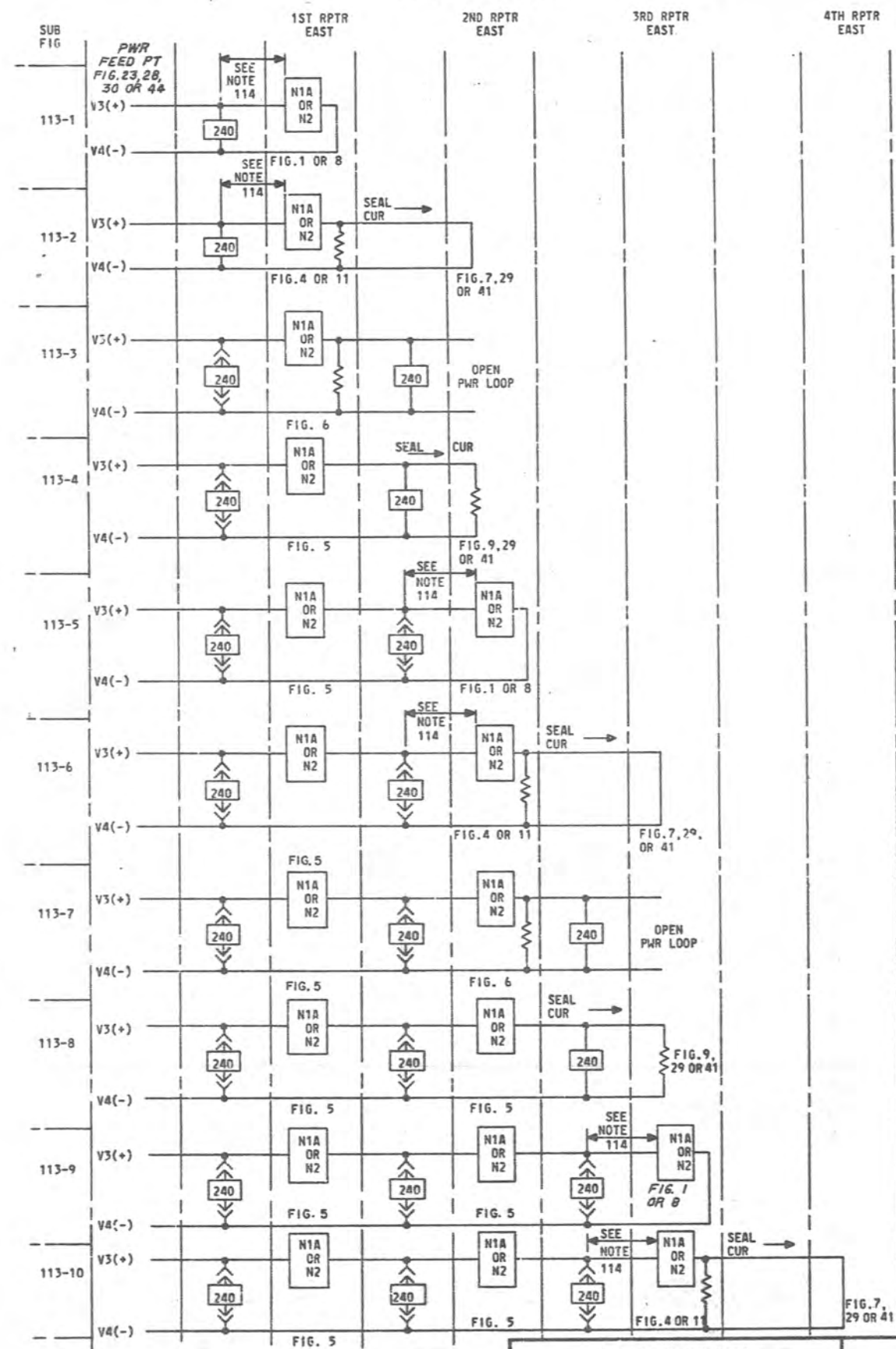
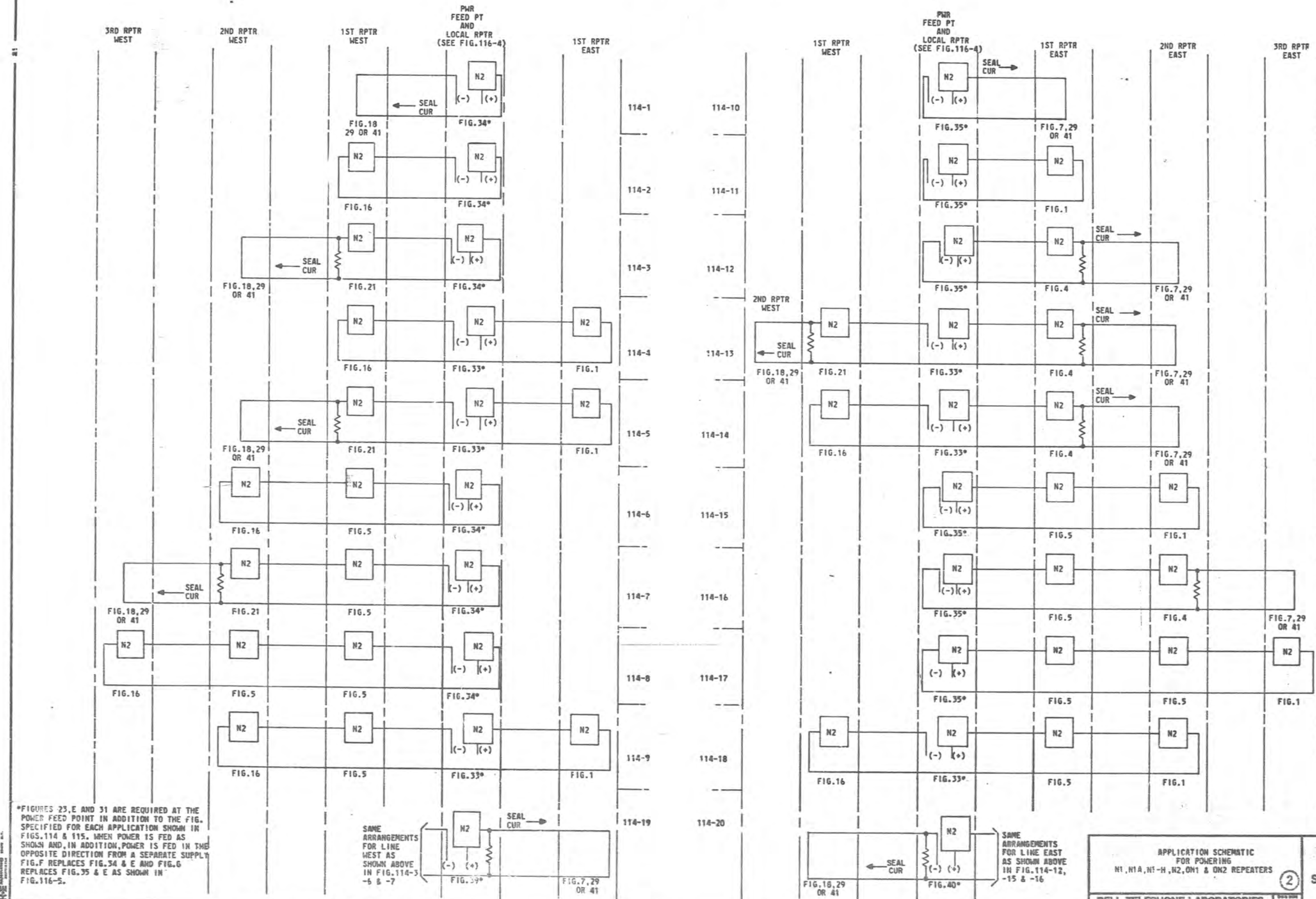


FIG. 114
POWER TRANSMITTED EAST AND/OR WEST TO N2 REPEATERS ONLY
INCLUDING THE LOCAL N2 RPTR IN THE PWR LOOP
(SEE NOTES 103, 105, 119 & 121)



SD-97272-01-8

REVISIONS

REVISIONS

APPLICATION SCHEMATIC
FOR POWERING
N1, N1A, N1-H, N2, ON1 & ON2 REPEATERS
BELL TELEPHONE LABORATORIES
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2

6S

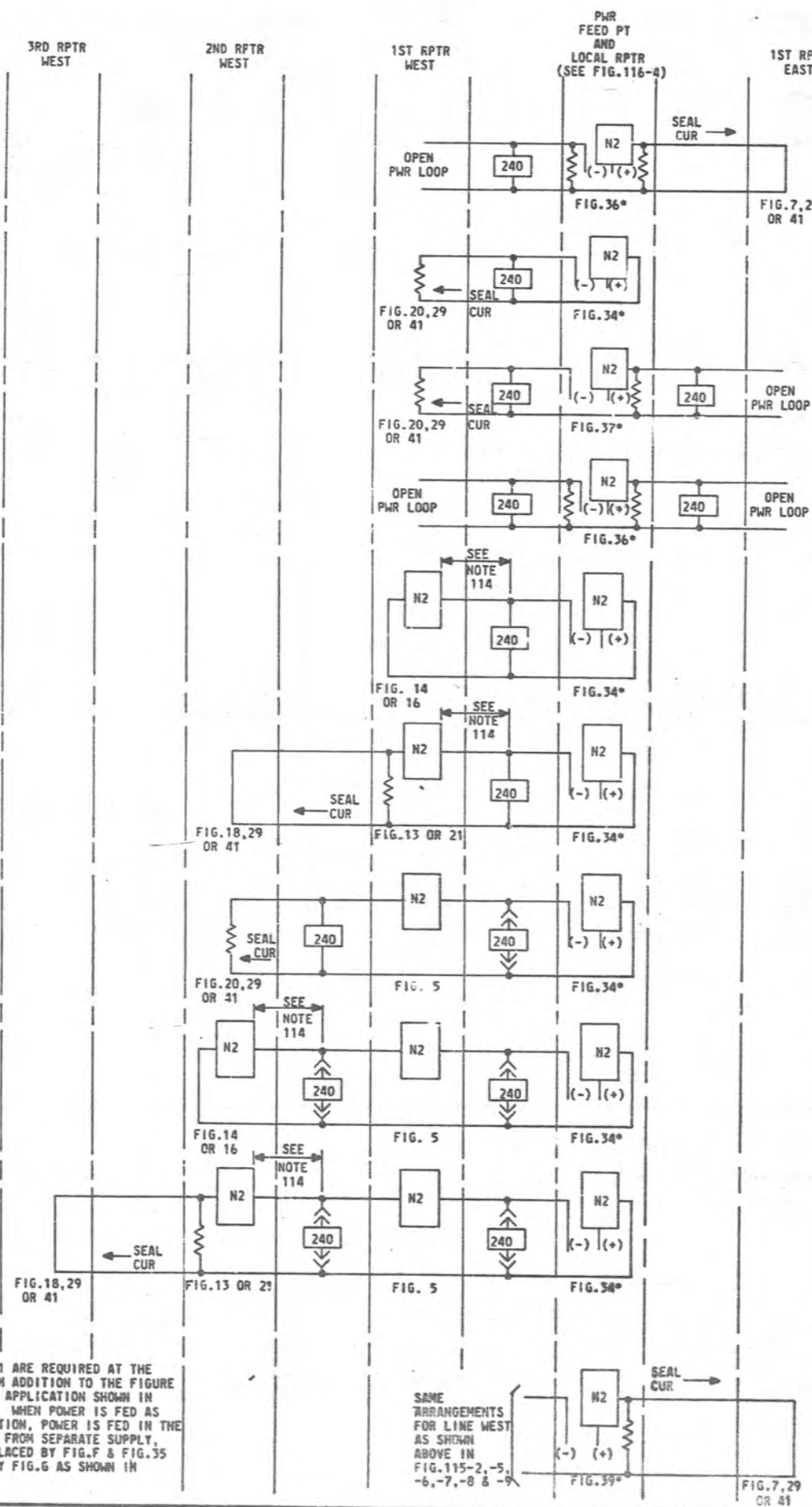
SD-97272-01-8

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DRAWING
ISSUE
58-
68
88

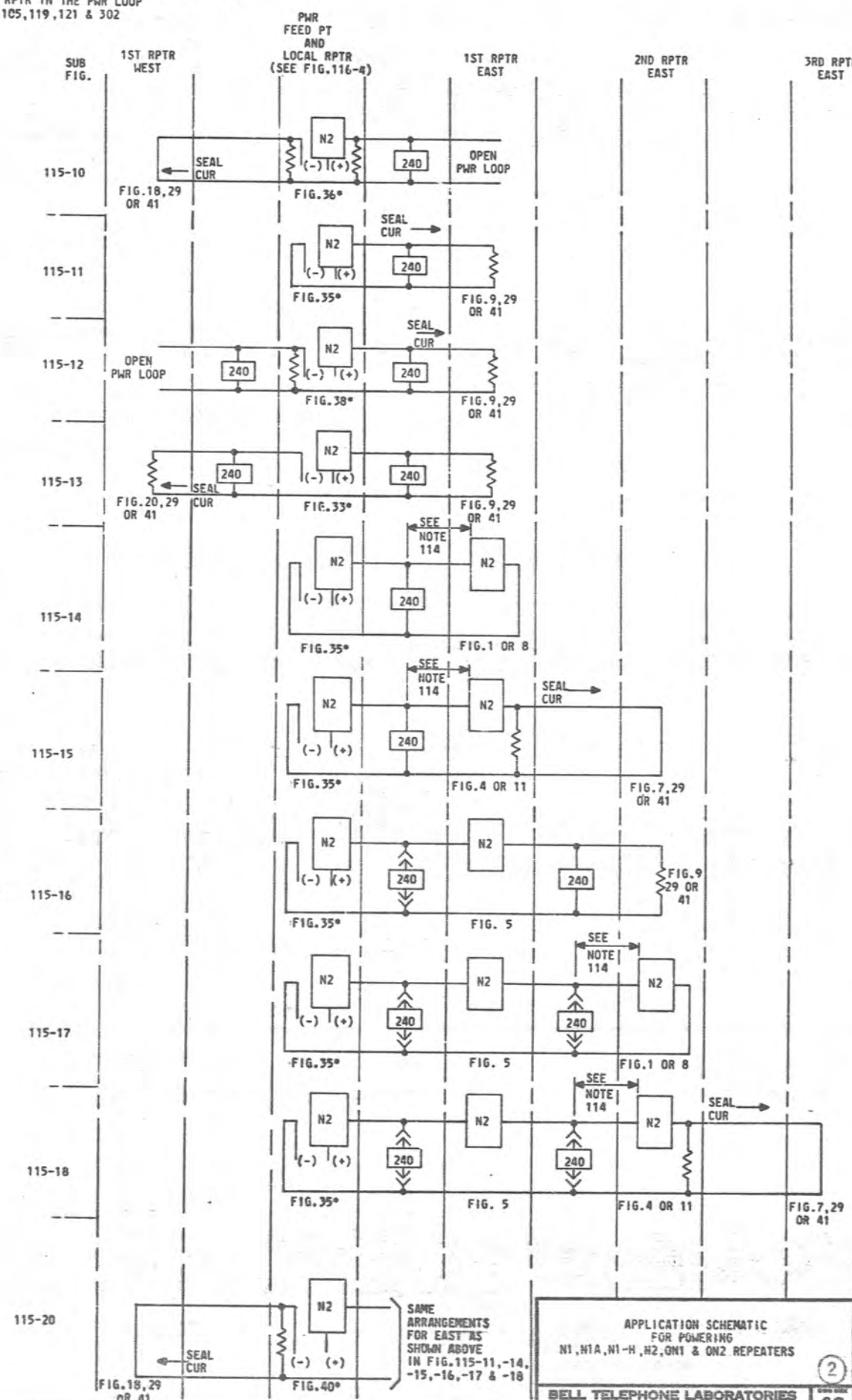
9B

FIG.115
POWER TRANSMITTED EAST AND/OR WEST TO N2 REPEATERS AND 240 TYPE AMPLIFIERS
INCLUDING THE LOCAL N2 RPTR IN THE PWR LOOP
SEE NOTES 104,105,119,121 & 302



*FIGURES 23, E AND 31 ARE REQUIRED AT THE POWER FEED POINT IN ADDITION TO THE FIGURE SPECIFIED FOR EACH APPLICATION SHOWN IN FIGURES 114 & 115. WHEN POWER IS FED AS SHOWN AND, IN ADDITION, POWER IS FED IN THE OPPOSITE DIRECTION FROM SEPARATE SUPPLY, FIG. 34 & E ARE REPLACED BY FIG. F & FIG. 35 & E ARE REPLACED BY FIG. G AS SHOWN IN FIG. 116-5.

SAME
ARRANGEMENTS
FOR LINE WEST
AS SHOWN
ABOVE IN
FIG. 115-2.-5.
-6.-7.-8 & -9



SAME
ARRANGEMENTS
FOR EAST AS
SHOWN ABOVE
IN FIG. 115-1
-15, -16, -17

APPLICATION SCHEMATIC
FOR POWERING
N1, N1A, N1-H, N2, ON1 & ON2 REPEATERS

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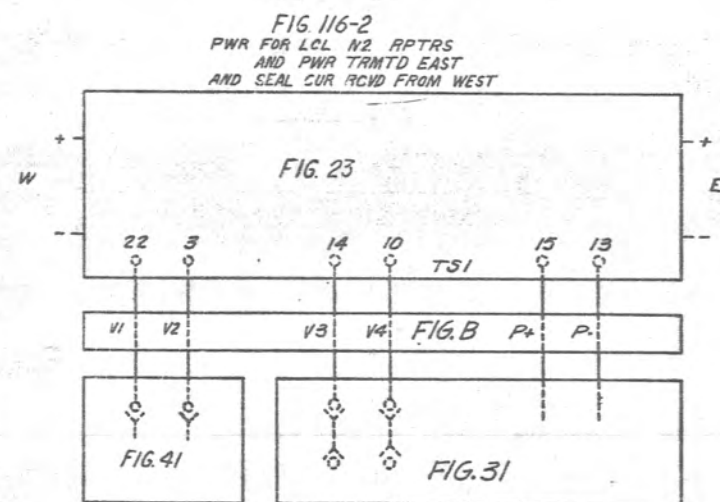
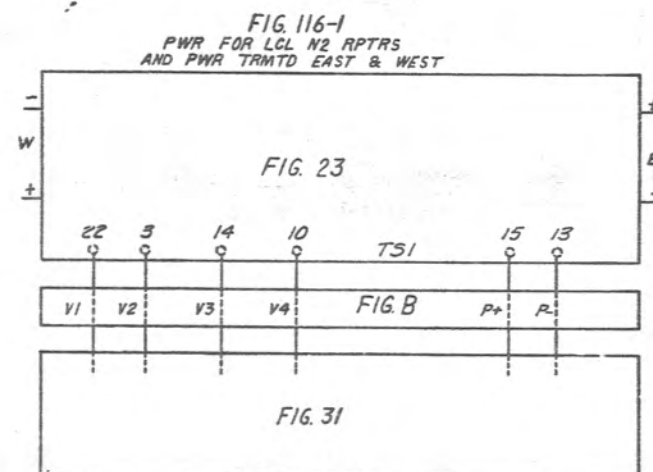


FIG. 116
POWER CONNECTIONS AT LOCAL N2 REPEATER

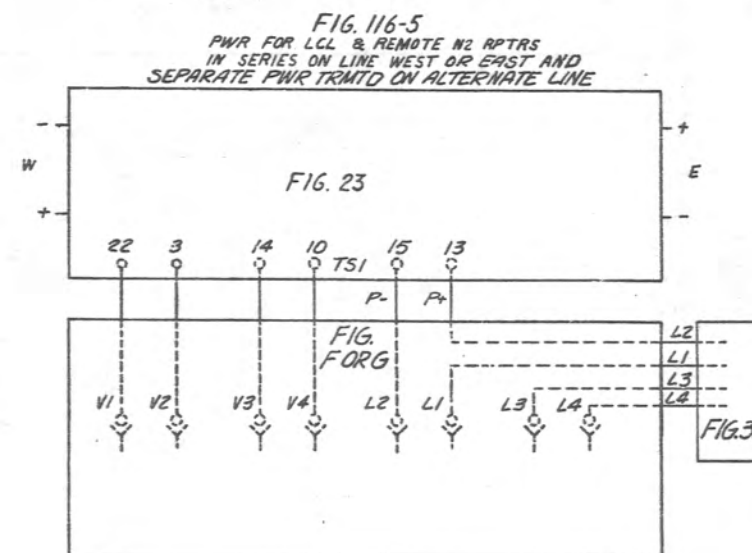
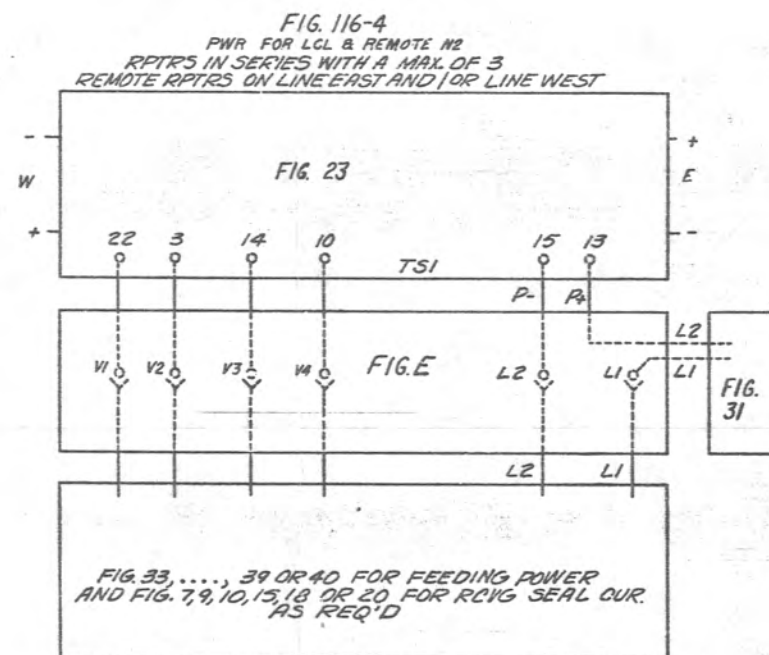
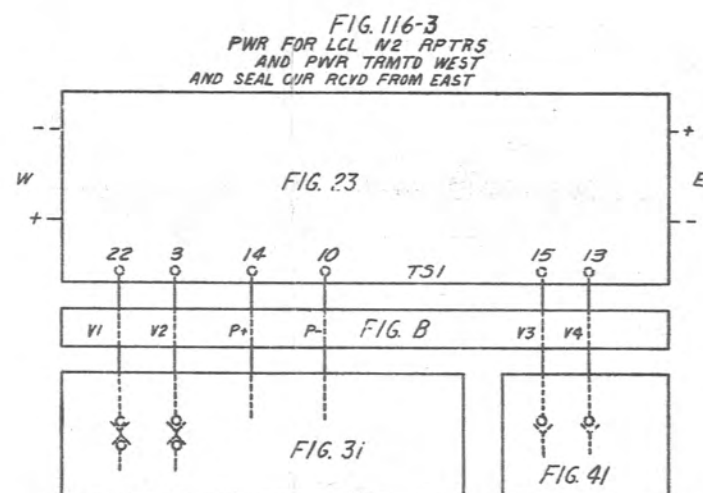


FIG. 117
POWER TRANSMITTED WEST TO N1A OR N2 REPEATERS
AND 240 TYPE AMPLIFIERS TO REDUCE 60Hz INTERFERENCE
SEE NOTES 104, 105, 121 & 302

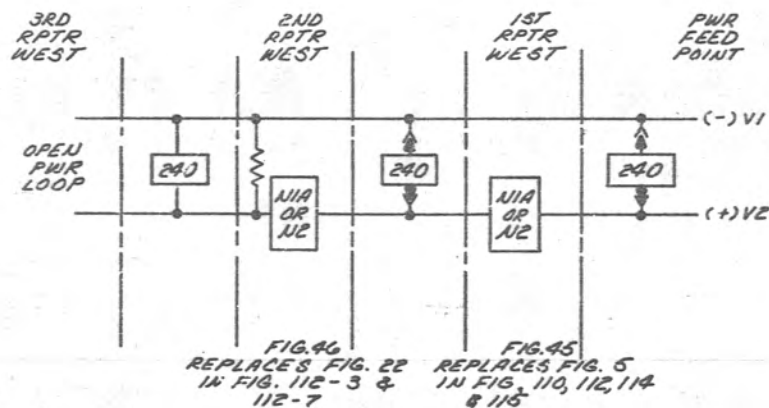


FIG. 118

POWER TRANSMITTED WEST TO N1-H REPEATERS ONLY
SEE NOTES 105 & 122

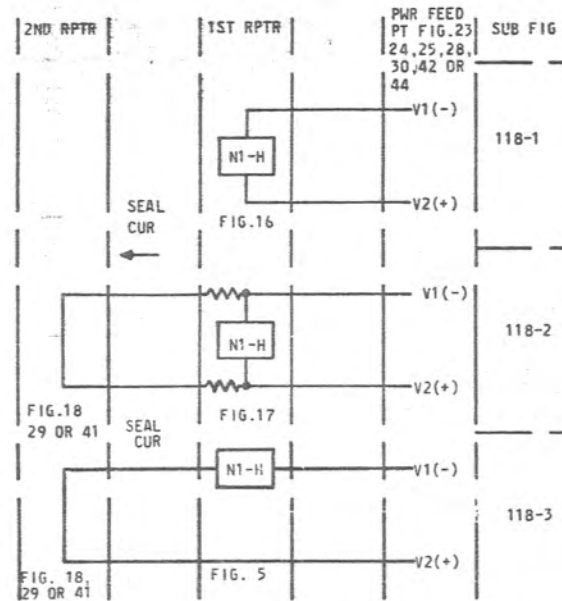


FIG. 119

POWER TRANSMITTED EAST TO N1-H REPEATERS ONLY
SEE NOTES 105 & 122

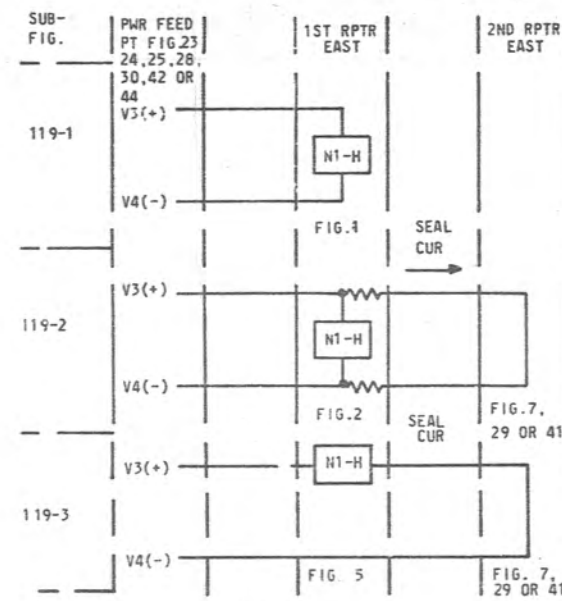


FIG. 120

POWER TRANSMITTED WEST TO N1-H REPEATERS
AND 240 TYPE AMPLIFIERS
SEE NOTES 105 & 302

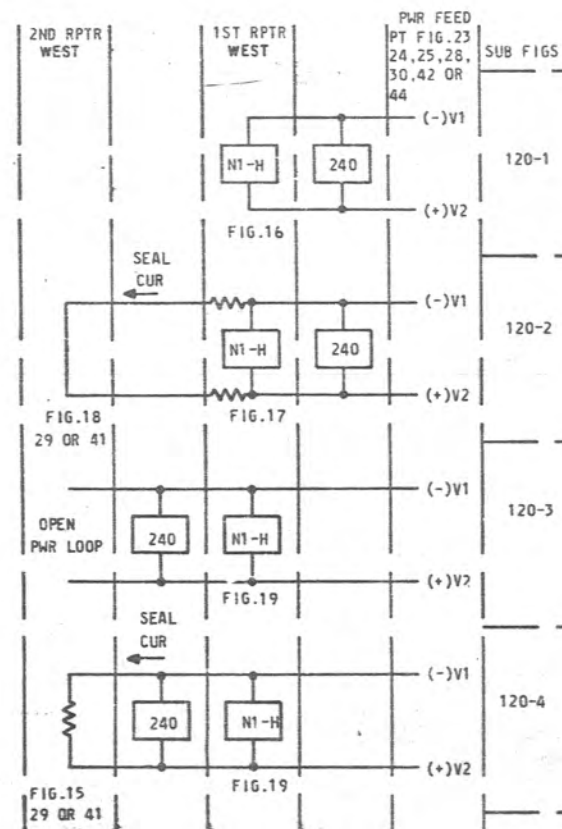


FIG. 121

POWER TRANSMITTED EAST TO N1-H REPEATERS
AND 240 TYPE AMPLIFIERS
SEE NOTES 105 & 302

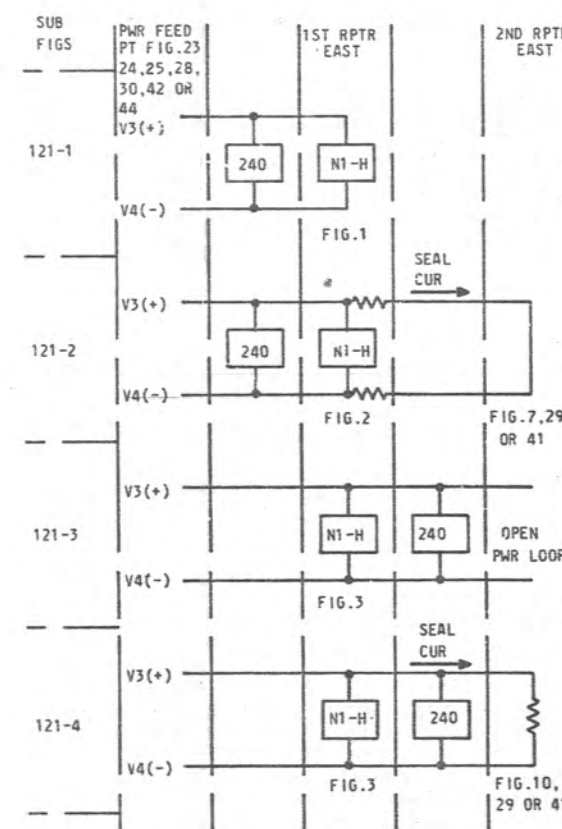


FIG 122 (SPECIAL) (MD)

POWER TRANSMITTED WEST TO TWO TANDEM POWERED
N1-H REPEATERS WITH OR WITHOUT 240 TYPE AMPLIFIER
AND/OR SEALING CURRENT
SEE NOTES 104,119,121,122,124 & 302

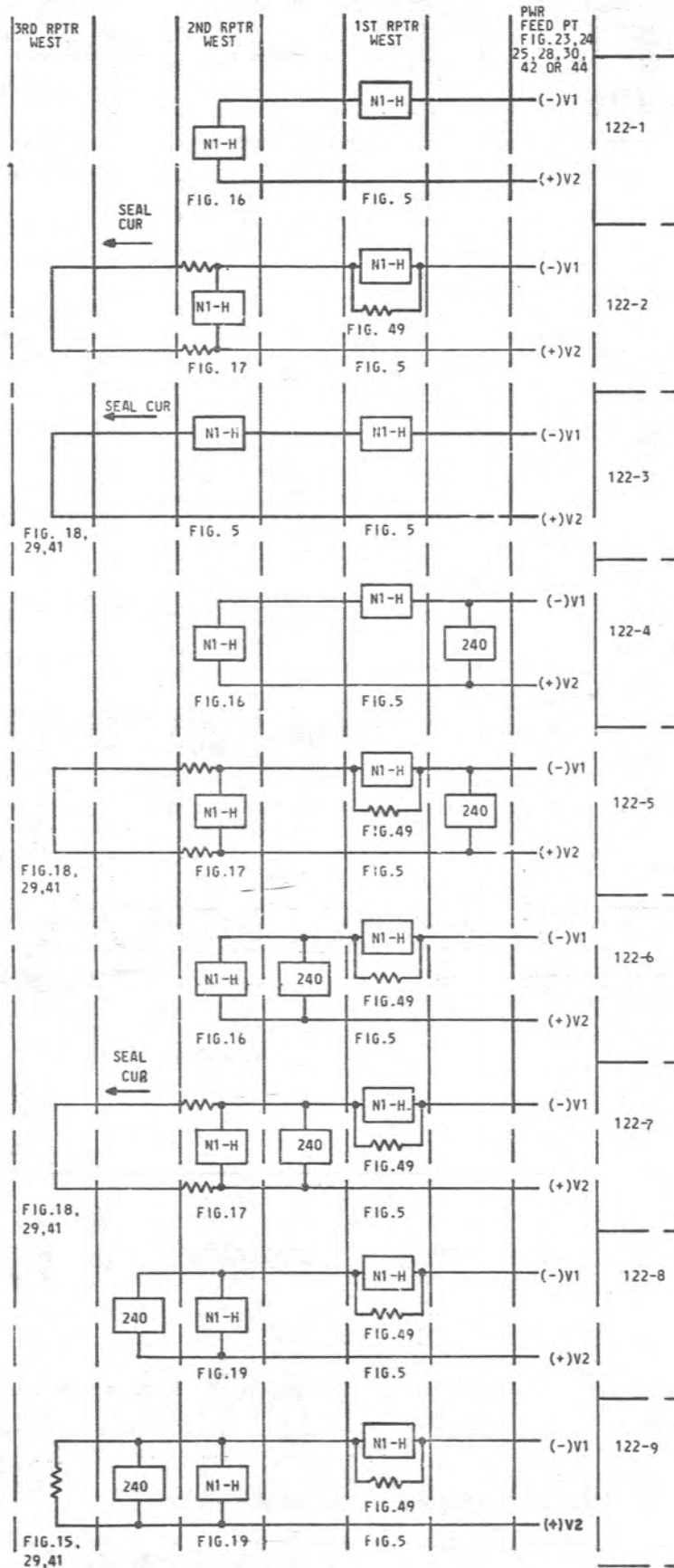
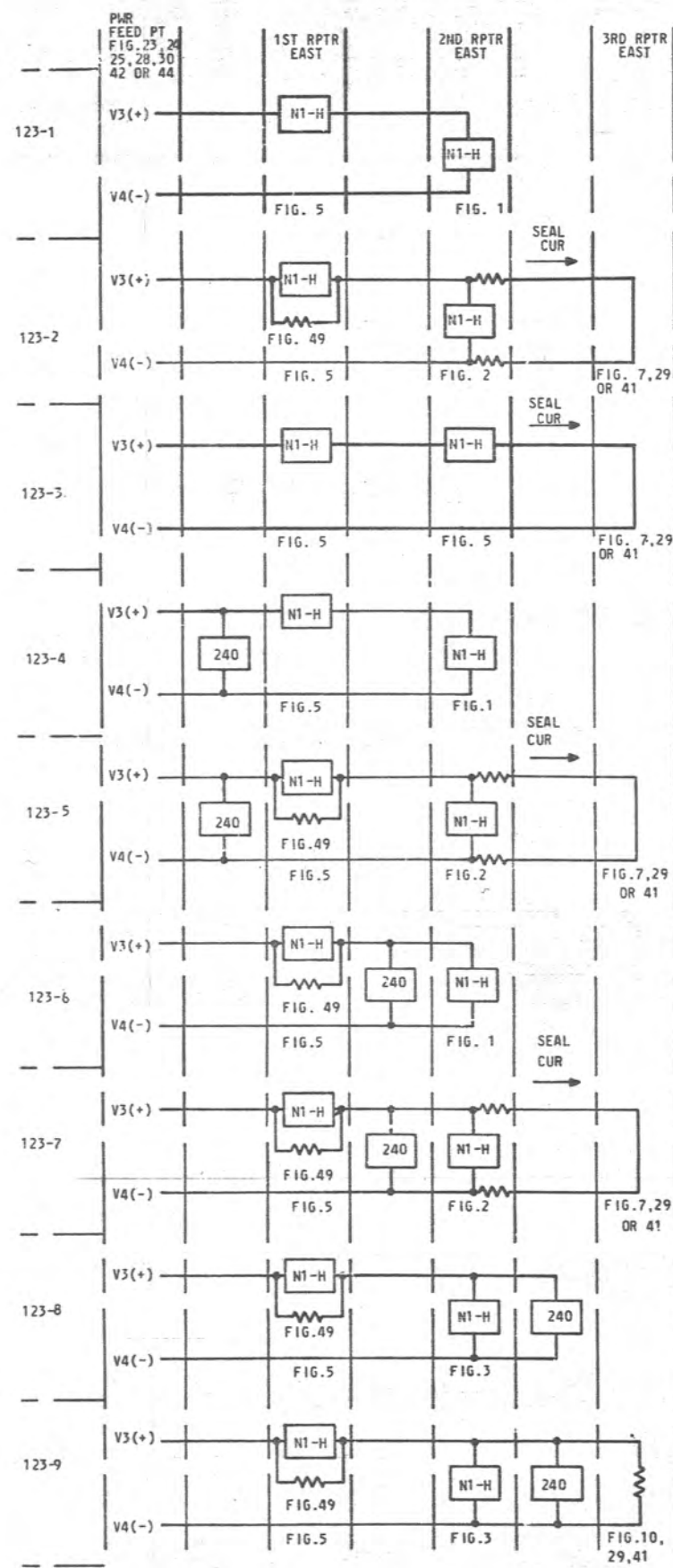
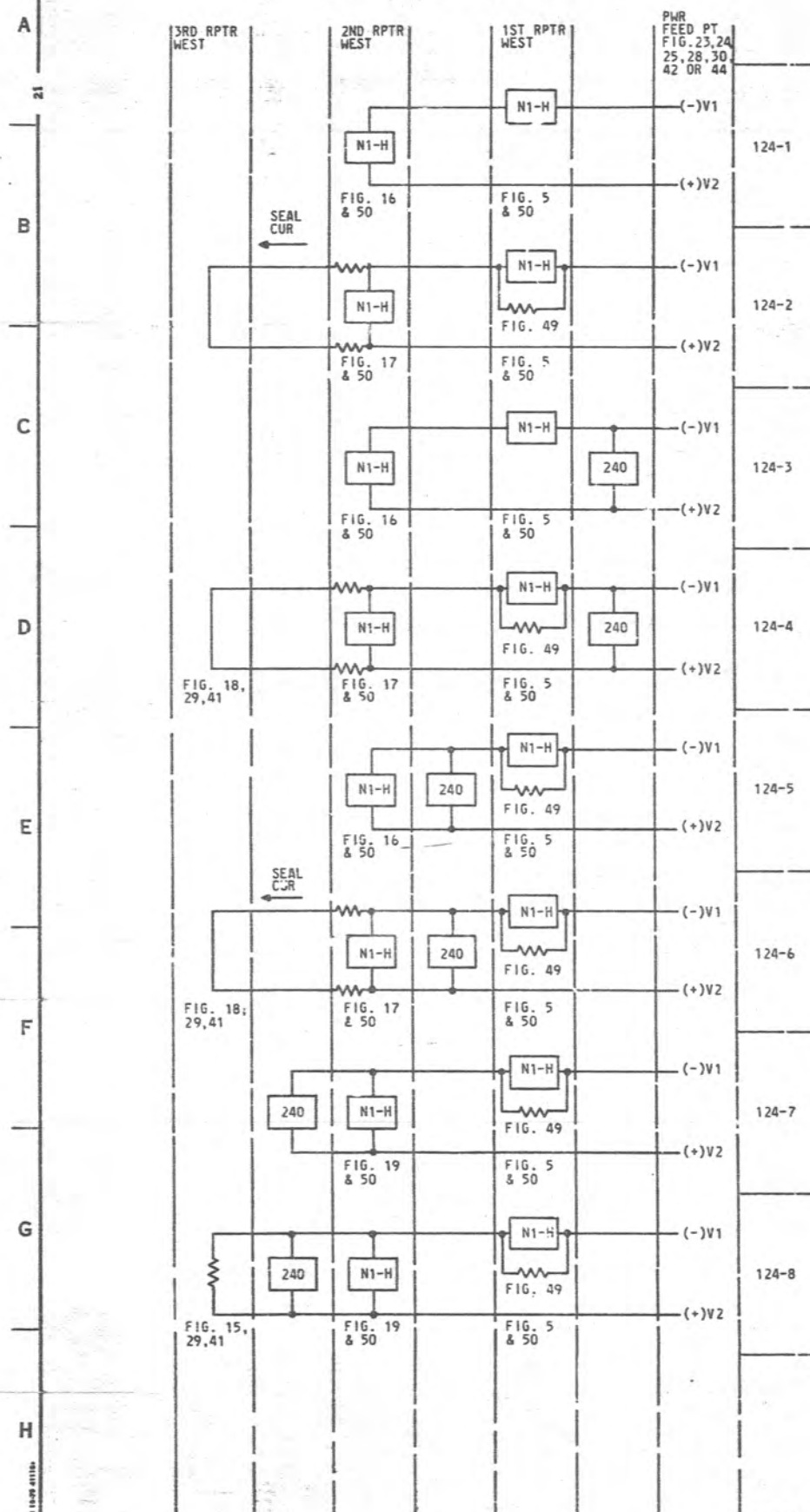


FIG 123 (SPECIAL) (MD)

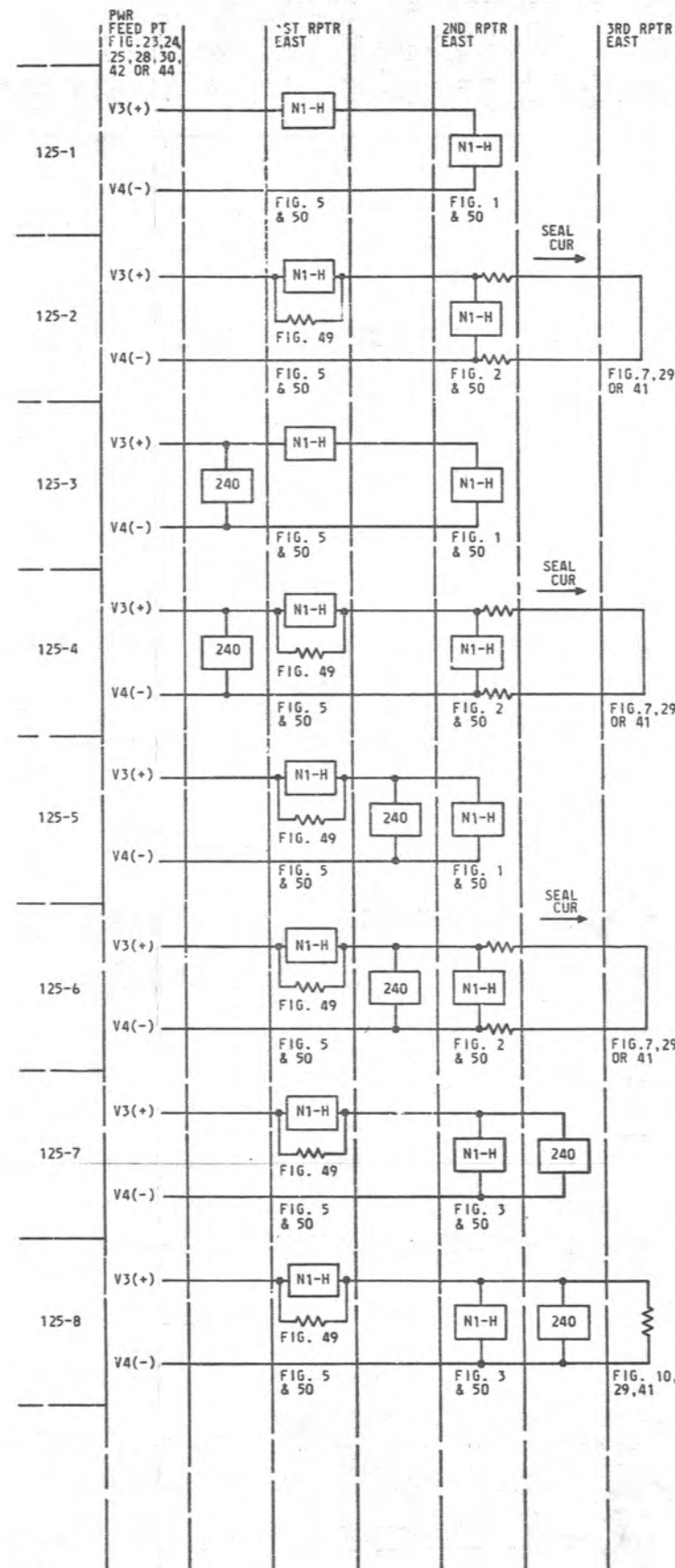
POWER TRANSMITTED EAST TO TWO TANDEM POWERED
N1-H REPEATERS WITH OR WITHOUT 240 TYPE AMPLIFIERS
AND/OR SEALING CURRENT
SEE NOTES 104,119,121,122,124 & 302



POWER TRANSMITTED WEST TO TWO TANDEM POWERED
N1-H REPEATERS WITH OR WITHOUT 240 TYPE AMPLIFIER
AND/OR SEALING CURRENT
SEE NOTES 104, 122, 125 & 302



POWER TRANSMITTED EAST TO TWO TANDEM POWERED
N1-H REPEATERS WITH OR WITHOUT 240 TYPE AMPLIFIERS
AND/OR SEALING CURRENT
SEE NOTES 104, 122, 125 & 302

ISSUE
11F

APPLICATION SCHEMATIC
FOR POWERING
N1,N1A,N1-H,N2,ON1 & ON2 REPEATERS

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FIG. 1

NI, NI-A, NI-H OR N2 POWER RCVD FROM WEST
(SEE NOTE 121 & 204)
TO FIG. C OR D

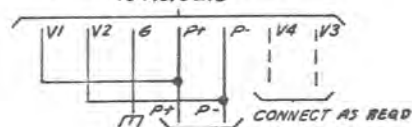


FIG. 2

NI OR NI-H POWER RCVD FROM WEST &
SEALING CURRENT TRMTD TO EAST
(SEE NOTE 113)

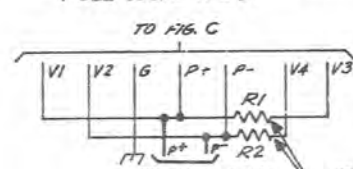


FIG. 3

NI-A OR N2 POWER RCVD FROM WEST &
AMPL POWER TRMTD TO EAST

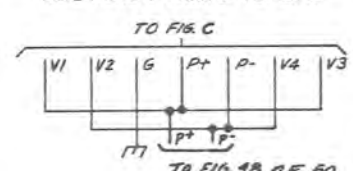


FIG. 4

NI-A OR N2 POWER RCVD FROM WEST &
SEALING CURRENT TRMTD TO EAST
(SEE NOTES 113, 121 & 204)
TO FIG. C OR D

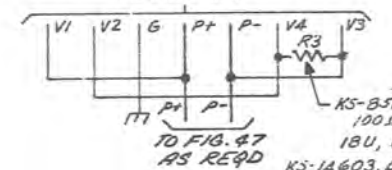


FIG. 5

NI-A, NI-H OR N2 PWR RCVD FROM WEST &
TRMTD TO EAST OR RCVD FROM
EAST & TRMTD TO WEST
(SEE NOTES 121 & 204)
TO FIG. C OR D

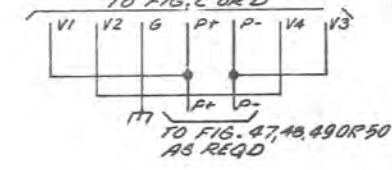


FIG. 6

NI-A OR N2 POWER RCVD FROM WEST &
FG AMPL POWER TRMTD TO EAST
WITHOUT SEALING CURRENT
(SEE NOTES 113, 121 & 204)
TO FIG. C OR D

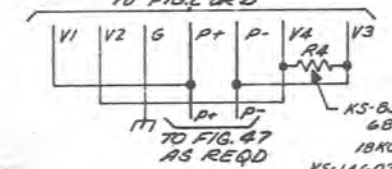


FIG. 7

SEALING CURRENT RCVD FROM WEST
TO FIG. A, C OR D

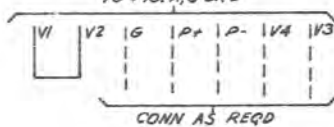


FIG. 8

NI-A OR N2 PWR RCVD FROM WEST
FROM WEST (SEE
NOTES 113, 114, 121 & 204)

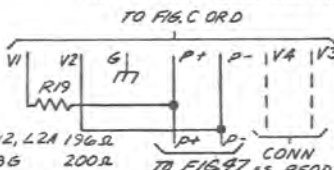


FIG. 9

SEALING CURRENT RCVD FROM WEST
(SEE NOTE 113)
TO FIG. A, C OR D

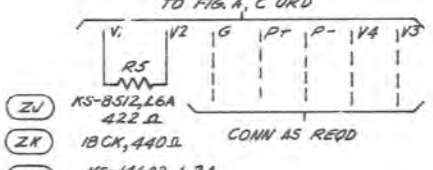


FIG. 10

SEALING CURRENT RCVD FROM WEST
(SEE NOTE 113)
TO FIG. A, C OR D

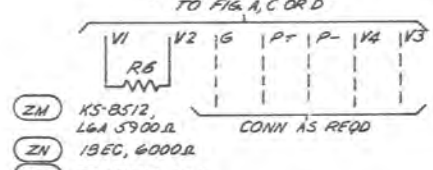


FIG. 11

NI-A OR N2 PWR RCVD FROM WEST &
SEALING CURRENT TRMTD TO WEST
TO EAST (SEE NOTES 113, 114, 121 & 204)
TO FIG. C OR D

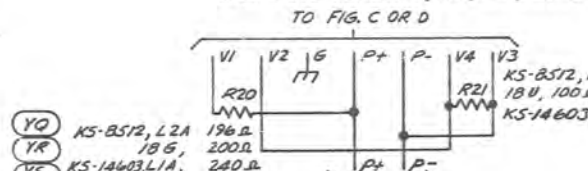


FIG. 13

NI-A OR N2 PWR RCVD FROM EAST
& SEALING CURRENT TRMTD TO
WEST (SEE NOTES 113, 114, 121 & 204)
TO FIG. C OR D

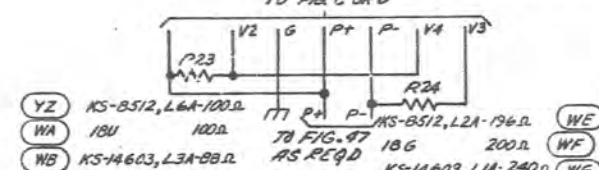


FIG. 14

NI-A OR N2 POWER RCVD FROM EAST
(SEE NOTES 113, 114, 121 & 204)

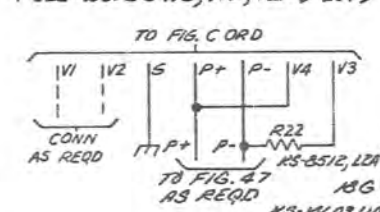


FIG. 15

SEALING CURRENT RCVD FROM EAST
(SEE NOTE 113)
TO FIG. A, C OR D

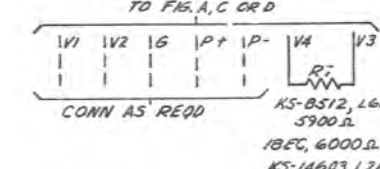


FIG. 16

NI, NI-A, NI-H OR N2 PWR RCVD FROM EAST
(SEE NOTES 121 & 204)
TO FIG. C OR D

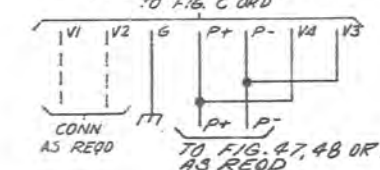


FIG. 17

NI OR NI-H POWER RCVD FROM EAST &
SEALING CURRENT TRMTD TO WEST
(SEE NOTE 113)
TO FIG. C

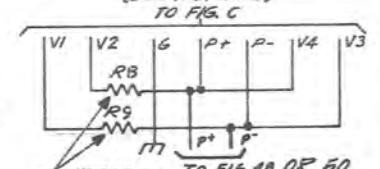


FIG. 18

SEALING CURRENT RCVD FROM EAST
(SEE NOTE 113)
TO FIG. A, C OR D

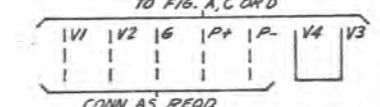


FIG. 19

NI-H PWR POWER RCVD FROM EAST & FG
AMPL POWER TRMTD TO WEST

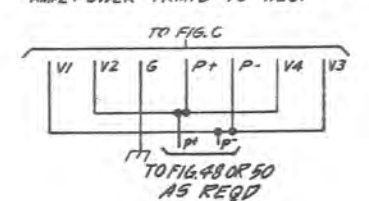


FIG. 20

SEALING CURRENT RCVD FROM EAST
(SEE NOTE 113)
TO FIG. A, C OR D

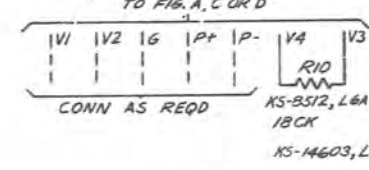


FIG. 21

NI-A OR N2 POWER RCVD FROM EAST &
SEALING CURRENT TRMTD TO WEST
(SEE NOTES 113, 121 & 204)

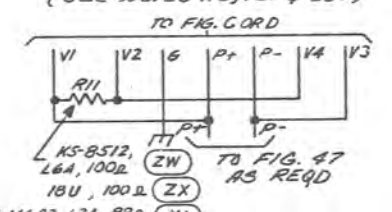


FIG. 22

NI-A OR N2 POWER RCVD FROM EAST & FG
AMPL POWER TRMTD TO WEST WITHOUT
SEALING CURRENT (SEE NOTES
113, 121 & 204)
TO FIG. C OR D

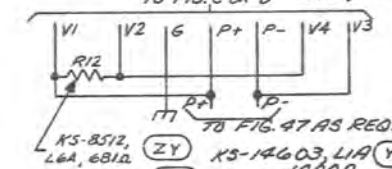


FIG. 33

POWER FOR LOCAL N2 RPTR & TRMTD
EAST & WEST TO N2 RPTR & FG AMPL
WITH SEALING CUR
TO FIG. E

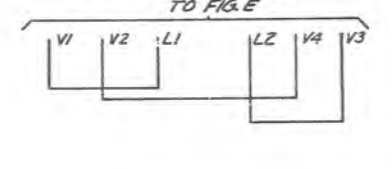


FIG. 34

POWER FOR LOCAL N2 RPTR & TRMTD
WEST TO N2 RPTR & FG AMPL
TO FIG. E

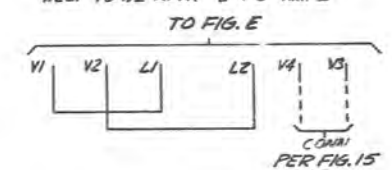


FIG. 35

POWER FOR LOCAL N2 RPTR AND
TRMTD EAST TO N2 RPTR & FG AMPL

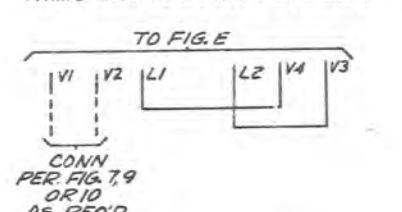


FIG. 36

POWER FOR LOCAL N2 RPTR & TRMTD
EAST & WEST TO FG AMPL
TO FIG. E

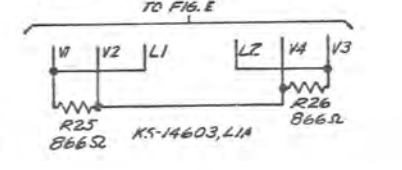


FIG. 37

POWER FOR LOCAL N2 RPTR & TRMTD
EAST TO FG AMPL & WEST TO FG AMPL & SEAL CUR
TO FIG. E

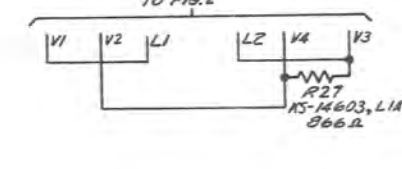


FIG. 38

POWER FOR LOCAL N2 RPTR & TRMTD
WEST TO FG AMPL & EAST TO FG AMPL & SEAL CUR
TO FIG. E

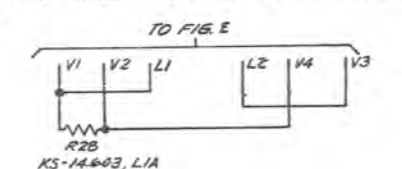


FIG. 39

POWER FOR LOCAL N2 RPTR & TRMTD
WEST TO N2 RPTR & SEAL CUR
TRMTD EAST
TO FIG. E

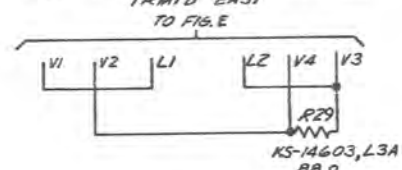


FIG. 40

POWER FOR LOCAL N2 RPTR & TRMTD
EAST TO N2 RPTR & SEAL CUR
TRMTD WEST
TO FIG. E

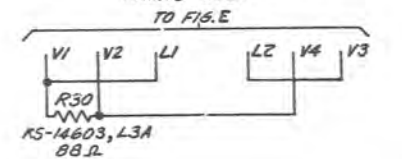


FIG. 23
POWER CONNECTIONS ON N1, N1A OR N2 REPEATER
MOUNTING BRACKET SEE NOTE 102 & 303

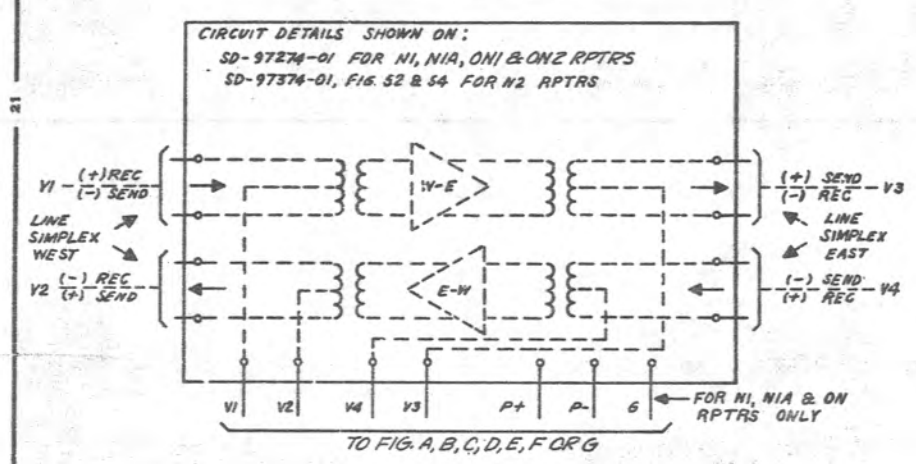


FIG. A
POWER CONNECTIONS FOR N1 OR N1A RPTRS
LOCALLY POWERED

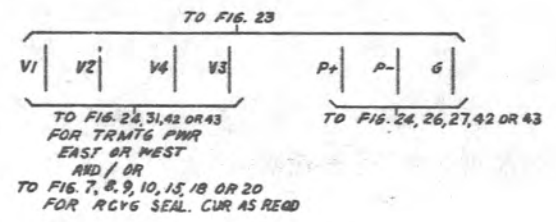


FIG. B
POWER CONNECTIONS FOR N2 REPEATERS
LOCALLY POWERED
(SEE NOTE 118 & FIG. 116)
TO FIG. 23

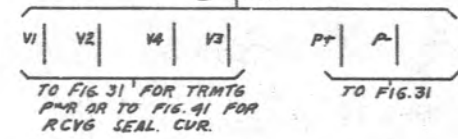


FIG. C
POWER CONNECTIONS FOR N1 OR N1A REPEATERS
REMOTELY POWERED

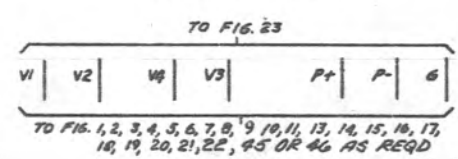


FIG. D
POWER CONNECTIONS FOR N2 REPEATERS
REMOTELY POWERED
SEE NOTE 206
TO FIG. 23

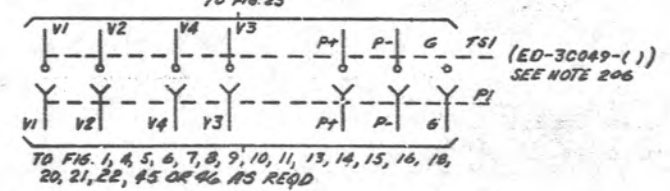


FIG. E
POWER CONNECTIONS FOR N2 REPEATERS
-LOCAL RPTR POWERED IN SERIES
WITH REMOTE REPEATERS
(SEE FIG. 116 & NOTE 207)

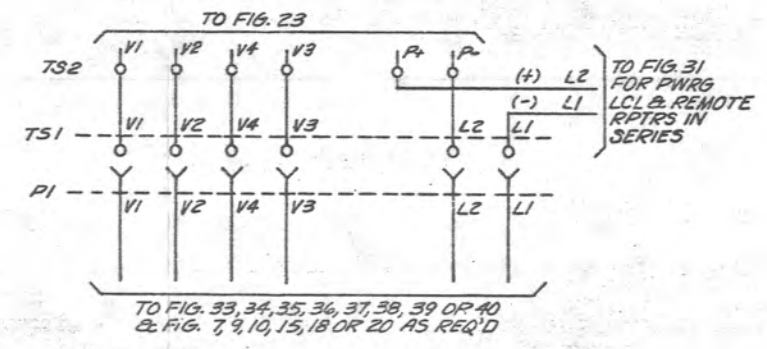


FIG. F
POWER CONNECTIONS FOR N2 REPEATERS
-LOCAL RPTR POWERED IN SERIES
WITH REMOTE RPTRS ON LINE WEST
& SEPARATE PWR TRMTD ON LINE EAST
(SEE FIG. 116)

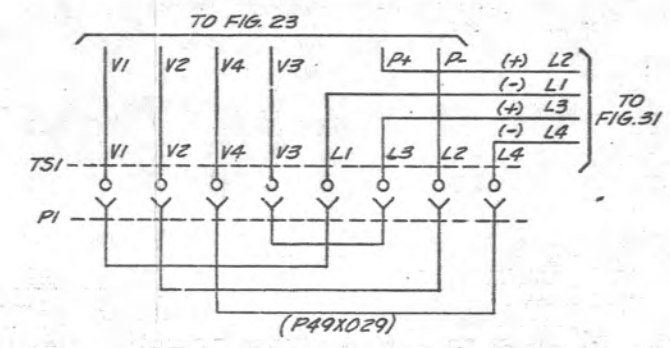


FIG. G
POWER CONNECTIONS FOR N2 REPEATERS
-LOCAL RPTR POWERED IN SERIES
WITH REMOTE RPTRS ON LINE EAST
& SEPARATE PWR TRMTD ON LINE WEST
(SEE FIG. 116)

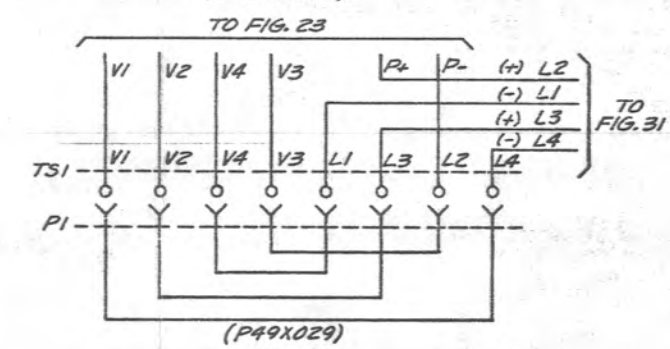
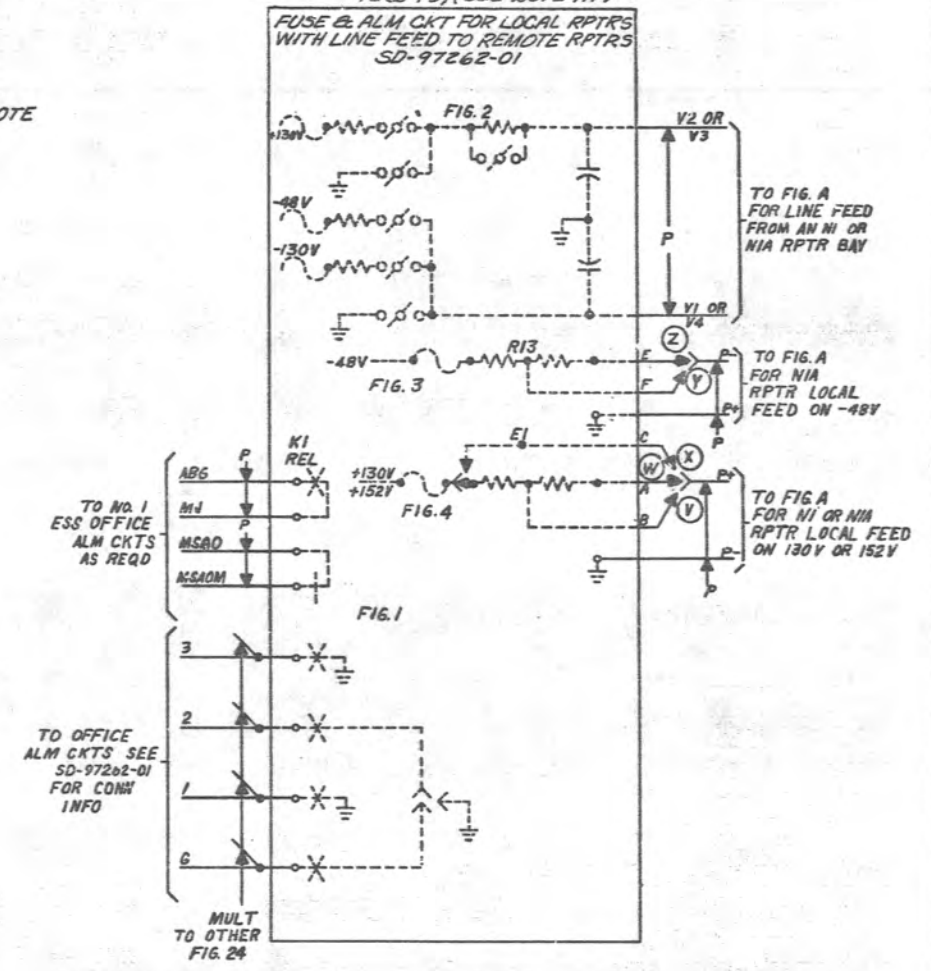


FIG. 24
LOCAL & LINE POWER CIRCUIT
IN AN N1 OR N1A RPTR BAY
(SUPERSEDES CKT SHOWN IN FIGS. 42 & 43) (SEE NOTE 111)



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FIG. 25



FIG. 3

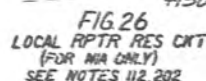


FIG. 2

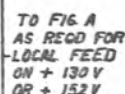


FIG. 28

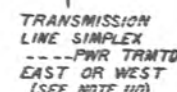


FIG. 30

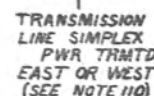


FIG. 3.

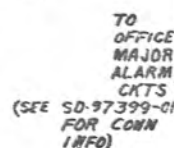


FIG. 29

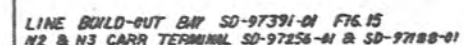


FIG. 42
LOCAL & LINE POWER CIRCUIT
IN AN NI RPTR BAY
(SUPERSEDED BY CKT SHOWN IN FIG. 24 OR 25)

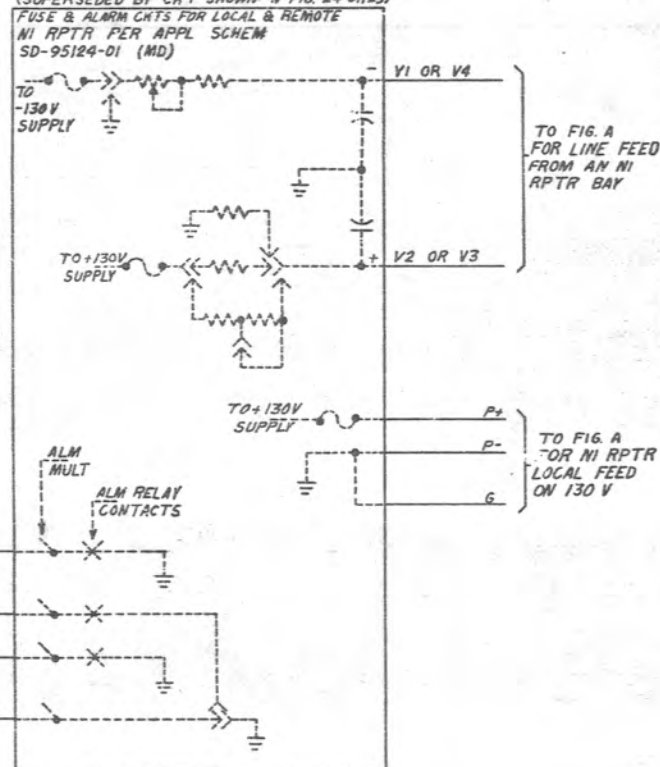


FIG. 43
LOCAL & LINE POWER CIRCUIT
IN AN NIA RPTR BAY
(SUPERSEDED BY CKT SHOWN IN FIG. 24 OR 25)

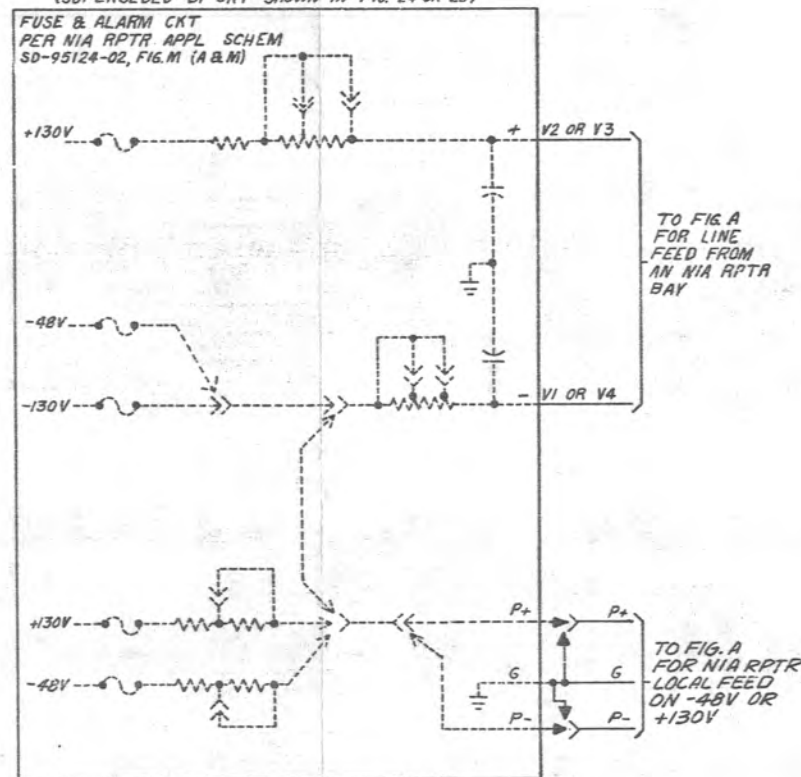


FIG. 44
LINE POWER CIRCUIT
IN AN NI CARRIER TERMINAL
FOR FEEDING REMOTE "N" RPTRS

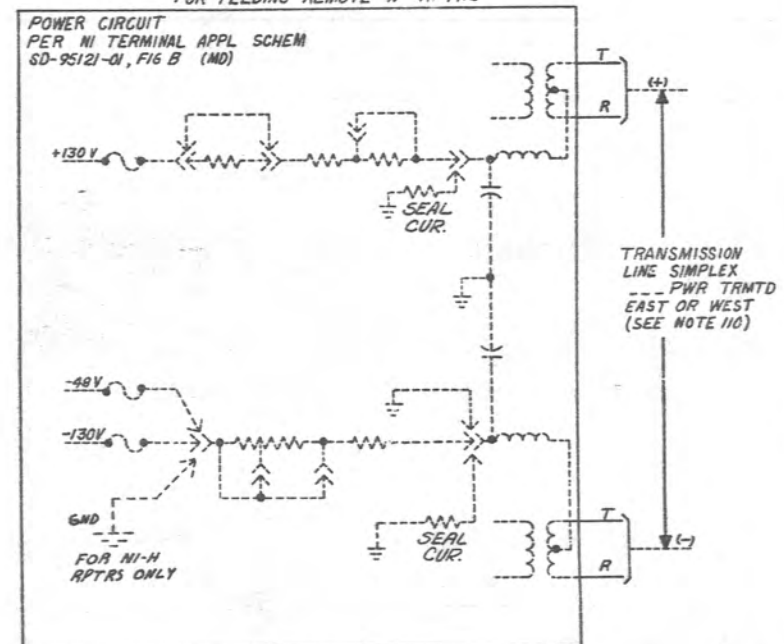


FIG. 46
NIA OR N2 PWR RCVD FROM EAST & FG AMPL
PWR TRMTD TO WEST WITHOUT SEALING CURRENT.
USED ONLY TO REDUCE 60 HZ INTERFERENCE
(SEE NOTES 113, 121, & 204)

FIG. 41
SEALING CURRENT RCVD FROM EAST
OR WEST (AT LOCALLY PWRD N2 RPTR ONLY)
SEE NOTES 106 & 110

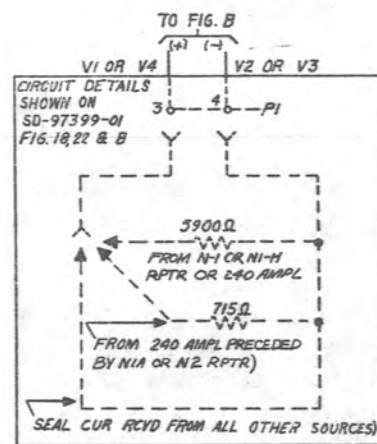


FIG. 47
60 HZ INTERFERENCE
REDUCTION CAPACITOR
NIA OR N2 RPTR ONLY
(SEE NOTE 121)

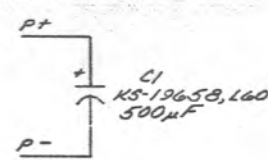


FIG. 45
NIA OR N2 PWR RCVD FROM EAST &
TRMTD TO WEST - USED ONLY TO REDUCE
60 HZ INTERFERENCE
(SEE NOTES 121 & 204)

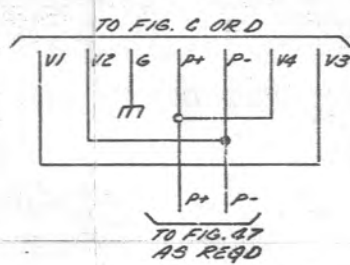


FIG. 48
60 HZ INTERFERENCE
REDUCTION CAPACITOR
NI-H RPTR ONLY

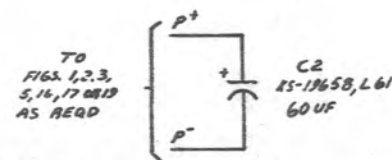


FIG. 49
CURRENT BYPASS RESISTOR
FOR TANDEM POWERING
OF NI-H RPTRS.
(SEE NOTES 122 & 123)

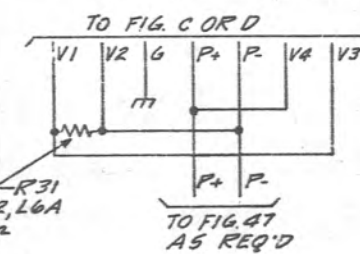
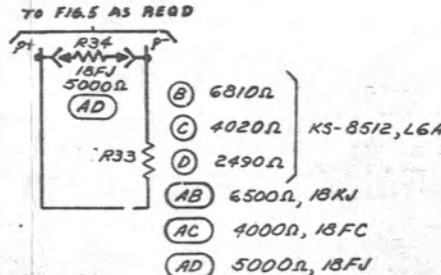


FIG. 50
VOLTAGE REGULATION AND SUPPLEMENTARY
SURGE PROTECTION DIODE PACK (FOR
CONNECTION TO REPEATER MOUNTING BRACKET NI-H
TANDEM POWERED REPEATER)
ED-30725-1 ()
(SEE NOTE 125)

