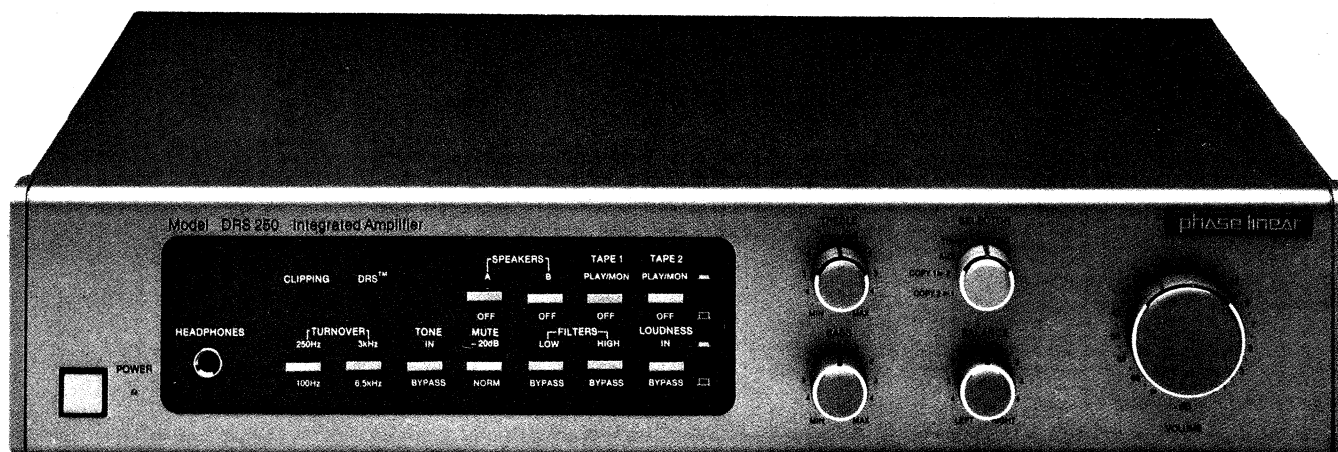


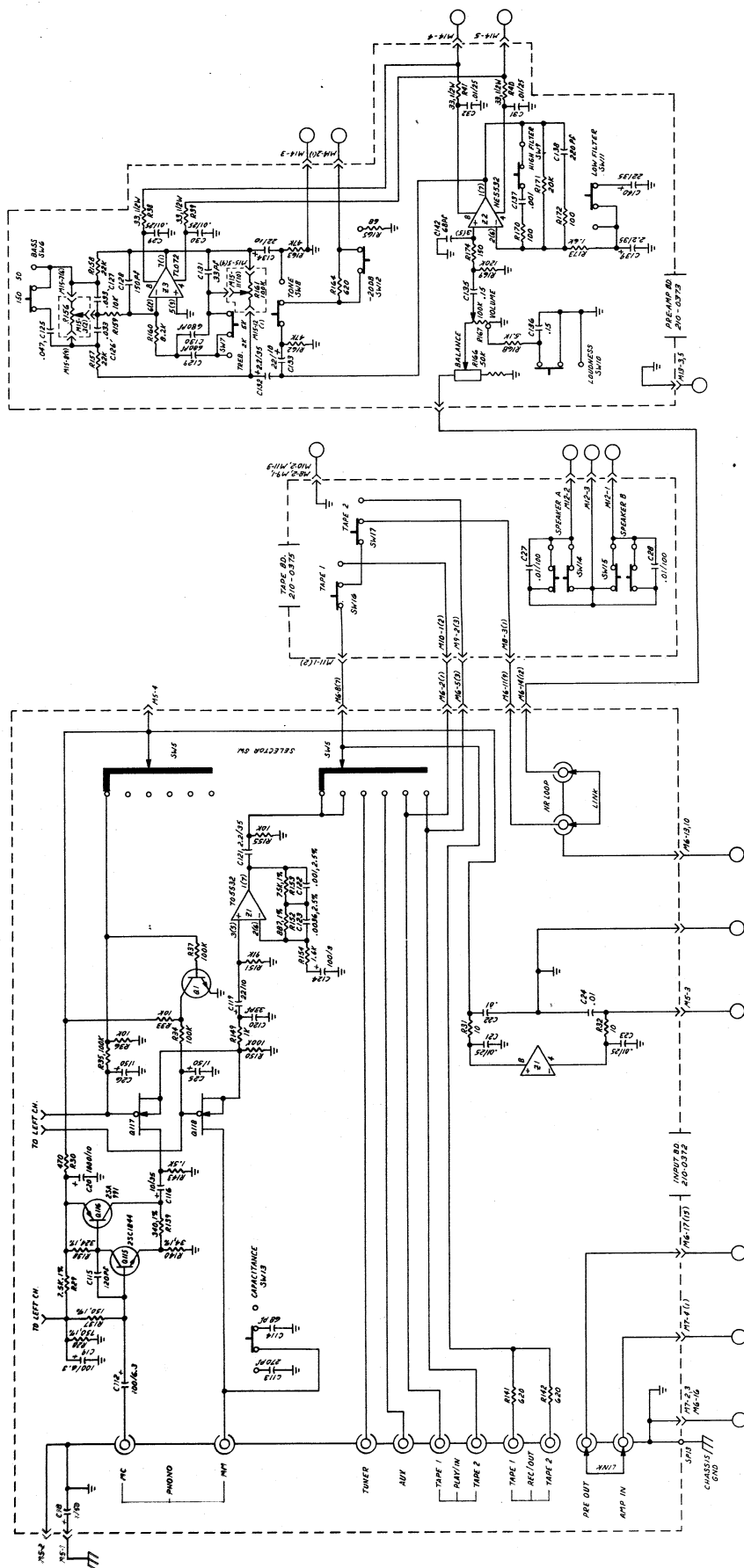
SERVICE MANUAL

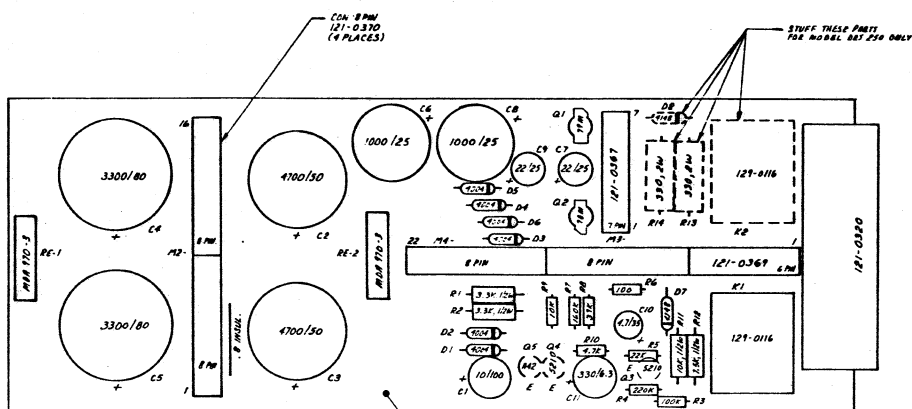
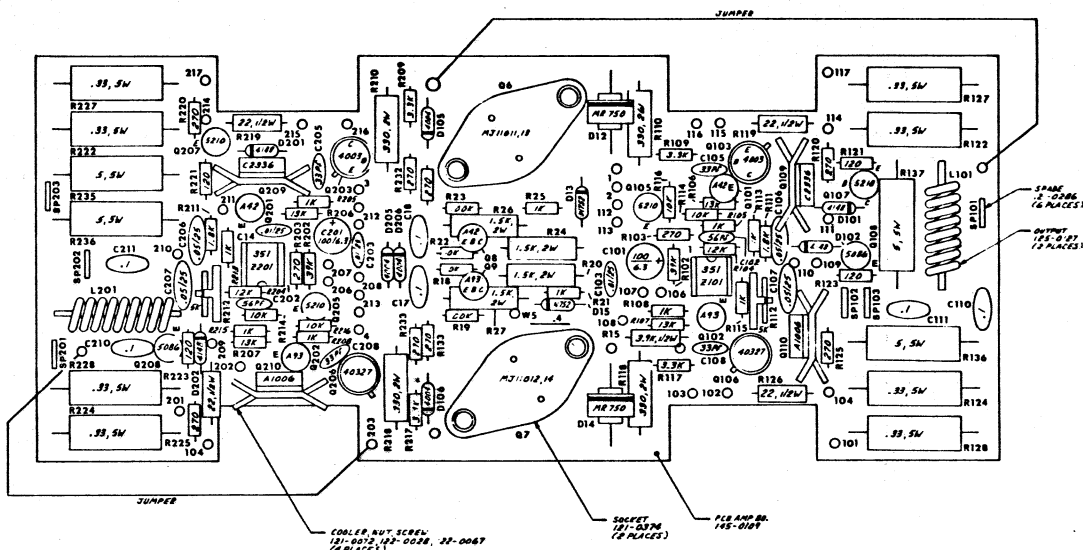
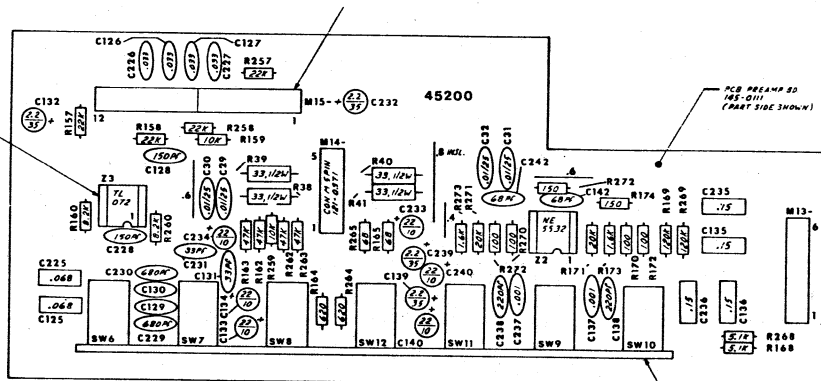
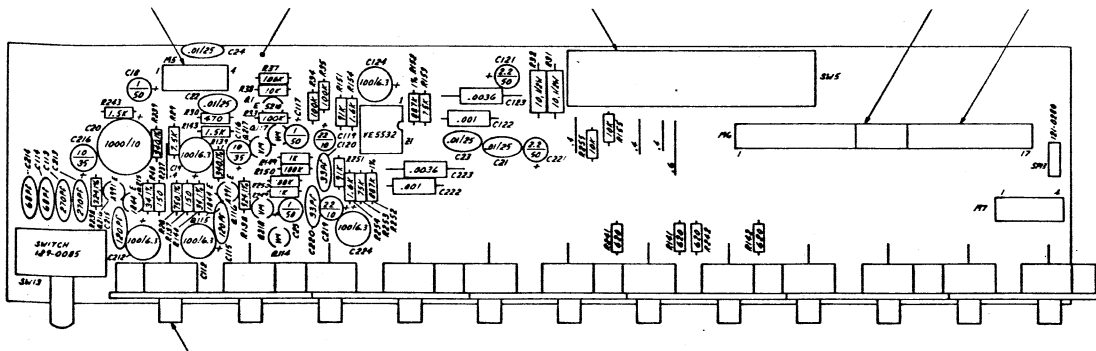
MODEL DRS 250

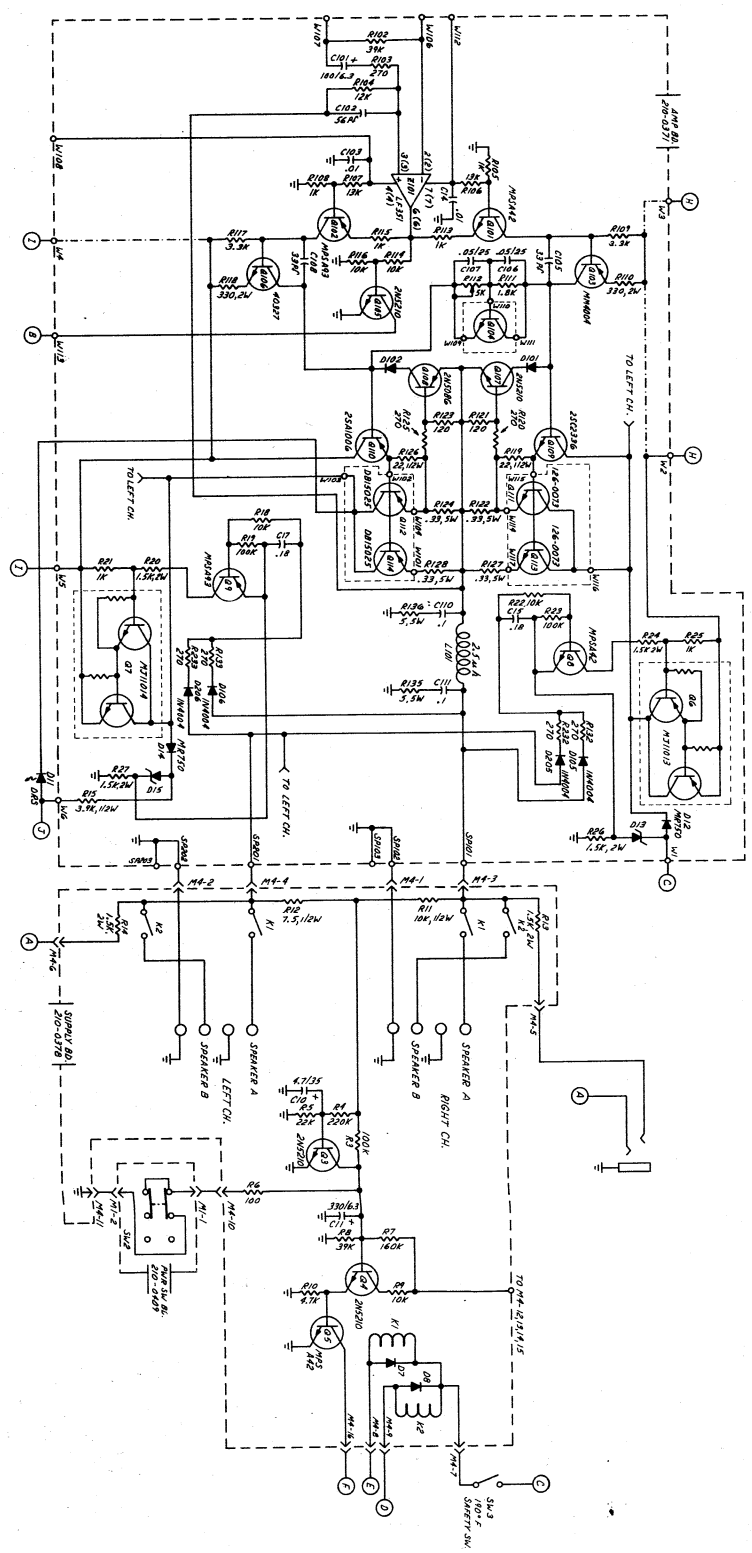
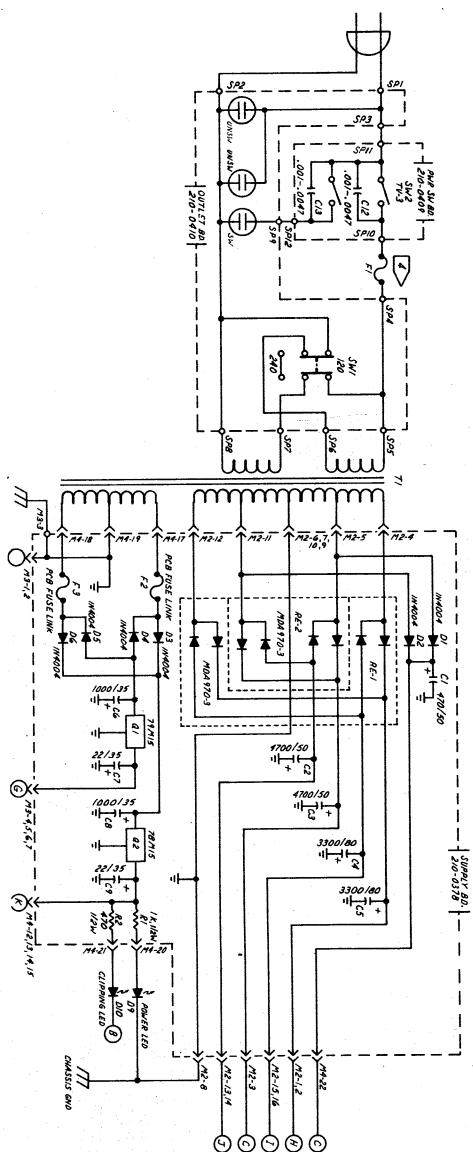


phase linear™

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AMPLIFIER TEST PROCEDURE:

Before energizing, check for proper line fuse (MDL 1.8 amp SLO-BLO, AGC 4 amp for sine wave testing)

- 1) Energizing the unit: Plug the line cord into a variable transformer, bring up slowly to 117 VAC or 220 VAC as required. If a line transformer is not available, plug the line cord into a working AC outlet of the proper line voltage. Verify that the power indicator lights up.
- 2) Output signal, no load: Monitor the L. channel output with a 'scope and AC voltmeter. Do not connect any other load at this time. Drive the L. channel input with a 2KHz sine wave until the output is well into clipping. Verify that clipping is symmetrical. Repeat for R. channel.
- 3) Display: Monitor the L channel output with an AC voltmeter (no load). Drive the L channel with a 2KHz sine wave. Verify that the DRS indicator lights at 50 Watts RMS (20.0 VRMS) and that the clipping indicator lights a 200 Watts RMS (40 VRMS). Repeat for R. channel.
- 4) Output with 8 ohm load: Connect an 8 ohm/250 watt load resistor to the L. channel output terminals and monitor the L. channel output. Apply a 2KHz signal and verify at least 38 VRMS before clipping. Repeat for R. channel.
- 5) Distortion: Monitor the L channel output on a THD analyzer with low residual distortion (typ. .002%) and an 8 ohm load connected also. Drive the L. channel to 20 VRMS a THD of .015% 20Hz-20KHz. Repeat for R. channel.
This procedure may also be used for IM distortion testing (SMPTE method) of less than .009%
Note: It may be necessary to use the high pass filter in the THD analyzer if it is so equipped.
- 6) Output offset: Measure across the output terminals of each channel and verify less than 10 mV with no input connections.
- 7) Short circuit test: Drive the L. channel with a 200Hz sine wave to an output of 20 VRMS. Short the output terminals together with a jumper wire for 2-4 seconds. Verify that the output returns to normal after removing the jumper. Repeat for R. channel.
- 8) Bias current adjustment: Drive both channels with a 20KHz sine wave to an output level of 1 watt (2.8 VRMS) into an 8 ohm load and verify THD of 0.2%.
Alternate technique: with no input connections verify 0.38-0.40 VDC across R119 for R. channel and R219 for L. channel.
- 9) Supply switching: Drive both channels with a 2KHz sine wave, increase level and verify supply switching at the collector (case) of the positive and negative output banks.
low supply voltage ± 50 VDC
high supply voltage ± 80 VDC
- 10) Speaker switching: Drive both channels and verify that there is no output with "A" and "B" switches out. Select "A" speaker and verify that there is now output at the left and right speaker terminals. Repeat for "B" speaker switch.

SPECIFICATIONS:

Power Output: 50 Watts RMS min. per channel, with no more than 0.015% THD (400 Watts peak per channel with no more than 0.02% THD) into an 8 ohm load.

IM Distortion: Less than 0.009% (SMPTE 60Hz, 7KHz @ 4:1)

Damping Factor: 330:1 @ 1000Hz

Speaker Impedance: No less than 4 ohms

Slew Rate: 100 Volts per microsecond

Protection: Electronic limiters with power supply fuse prevent excursions into unsafe operating areas.
Output relay disconnects speakers...
for approx. 5 sec. after turn-on
immediately after turn-off
in the presence of DC or high level subsonic signals

Frequency Response: Phono MM & MC RIAA deviation +0.1dB
High Level: 10Hz-100KHz +0, -3dB

Signal to Noise Ratio: Phono MM: 91dB below 2.0 volts
(A-weighted) Phono MC: 91dB below 2.0 volts

Input Impedance: Phono MM: 47Kohm shunted by switch selectable
50pF, 120pF, or 320pF
Phono MC: 100 ohm
High Level: 20Kohm

Input Sensitivity For Rated Output: Phono MM: 2.5mV
Phono MC: 250uV
High Level: 150mV

Phono Overload Level (1KHz): MM: 150mV MC: 15mV

Volume Control Tracking: ± 0.25 dB

Tone Controls: Max. range of ± 14 dB
Bass turnover points: 100Hz & 250Hz
Treble turnover points: 3KHz & 6.5KHz

Power Requirements: 120 VAC @ 60Hz
220 VAC @ 50/60Hz
Power consumption: 100 Watts

PARTS LIST - DRStm250

TRANSISTORS:		DESCRIPTION	PART NO.		
TP9054/MJ15024		Q111,113	126-0073	10/35V	LYTIC 127-0101
DB15025/MJ15025		Q112,114	126-0123	4.7/35V	LYTIC 127-0121
2SC2607		Q111,113	126-0165	2.2/50V	LYTIC 127-0154
2SA1116		Q112,114	126-0166	1/50V	LYTIC 127-0153
2SD555		Q111,113	126-0068	.15/100V	MYLAR 127-0097
2SB600		Q112,114	126-0069	.1/100V	MYLAR 127-0210
MJ11011		Q6	126-0151	.05/25V	DISC 127-0007
MJ11013		Q6	126-0161	.068/100V	MYLAR 127-0026
MJ11012		Q7	126-0150	.033/100V	MYLAR 127-0025
MJ11014		Q7	126-0162	.01/25V	DISC 127-0095
2SC2336		Q109	126-0095	.0036/63V	POLY 127-0192
2SA1106		Q110	126-0094	.001-.0049:CSA	C12,13 127-0134
40327		Q106	126-0007	.001/100V	POLY 127-0106
MM4003		Q103	126-0006	.001/100V	MYLAR 127-0062
MPS-A42		Q101,5	126-0052	.001/100V	DISC 127-0006
MPS-A93		Q102	126-0028	680pf/100V	DISC 127-0177
2N3403		Q104	126-0018	270pf/100V	DISC 127-0179
2N5210		Q105,107,3,4	126-0127	220pf/100V	DISC 127-0042
2N5086		Q108	126-0128	150pf/100V	DISC 127-0055
2SA991		Q116	126-0096	120pf/100V	DISC 127-0020
2SC1884		Q115	126-0097	68pf/100V	DISC 127-0003
VM13RM		Q117,118	126-0142	56pf/100V	DISC 127-0044
				33pf/100V	DISC 127-0002
INTEGRATED CIRCUITS:			RESISTORS AND POTS:		
LF351	Z101	126-0114	1.5k/2W		128-0385
NE5532	Z1,2	126-0115	330/2W		128-0379
TL072	Z3	126-0116	5/5W		128-0381
79M15	Q1	126-0112	.33/5W		128-0344
78M15	Q2	126-0111	5k:B	TRIM	129-0001
			100kX2	VOLUME	129-0223
DIODES:			50k:M-N	BALANCE	129-0222
MDA970A3	RE-1,2	126-0143	100k:B	TONE	129-0224
MR750	D12,14	126-0144	ALL 1/2W		BY VALUE
1N752:5.6V	D13,15	126-0049	ALL 1/4W		BY VALUE
1N4004	D1-8,105,106	126-0003			
	205,206				
1N4148	D101,102	126-0002	SWITCHES AND RELAYS:		
LED:GRN	D9	126-0159	SW:90°	SELECT CNTL.	129-0225
LED:YEL	D11	126-0160	SW:	SELECTOR	129-0218
LED:RED	D10	126-0138	CABLE DRIVE	SELECTOR	129-0239
			SW:	PWR	129-0144
CAPACITORS:			SW:	THERMAL:NC	129-0163
4700/50V	LYTIC	127-0213	SW:	CAP SELECT	129-0085
3300/80V	LYTIC	127-0214	SW:	7 ST. ASSY.	129-0219
1000/25V	LYTIC	127-0098	SW:	4 ST. ASSY.	129-0221
1000/10V	LYTIC	127-0158	SW:	120/240V	129-0169
470/50V	LTYIC	127-0038	RELAY:	OUTPUT	129-0116
330/6.3V	LYTIC	127-0193			
100/6.3V	LYTIC	127-0033			
22/25V	LYTIC	127-0117			
22/10V	LYTIC	127-0078			

SEE REVERSE SIDE FOR ORDERING INFORMATION

TRANSFORMERS AND INDUCTORS:		
XFMR:98-138-035	PWR	125-0129
COIL :2.4uh	OUTPUT	125-0127

PRINTED CIRCUIT BOARDS:		
PCB:	PWR DRIVE*	210-0371
PCB:	INPUT	210-0372
PCB:	PREAMP	210-0373
PCB:	TAPE	210-0375
PCB:	BALANCE	210-0376
PCB:	VOLUME	210-0377
PCB:	PWR SUPPLY	210-0378
PCB:	TONE	210-0379
PCB:	PWR SW.	210-0409
PCB:	AC OUTLET	210-0410
MODULE:	POWER	210-0370

FRONT PANEL COMPONENTS:		
ASSY:	FRNT PANEL	210-0468
PANEL:	SUB FRONT	220-0232
BUTTON:	POWER	142-0091
BEZEL:	PWR BUTTON	142-0060
BUTTON ASSY:	.48X.12"	129-0142
BEZEL:	.5"	142-0090
KNOB:	1.5"	142-0075
KNOB:	.75"	142-0094
END CAP:	RIGHT	142-0097
END CAP:	LEFT	142-0098
INSERT:	END CAP	142-0103
NAMEPLATE:	LOGO	146-0112

METALWORK:		
BRACKET:	XFMR:FRONT	141-0354
BRACKET:	XFMR:REAR	141-0355
COVER:	TOP	141-0362
COVER:	BOTTOM	141-0325
HEATSINK:	OUTPUT	141-0093
CHASSIS:		220-0163

ORDERING INFORMATION

All parts orders must include the model and serial number of the product(s), the device number and/or description of the part and the 7 digit Phase Linear number.

All parts orders must include payment unless an account has been established with Phase Linear (authorized dealers and service outlets only).

NO COD ORDERS

Prices include surface shipping and handling within the U.S.

Price, availability and specifications subject to change without notice.

USE ONLY REPLACEMENT PARTS ISSUED OR AUTHORIZED BY THE PHASE LINEAR SERVICE DEPARTMENT.

HARDWARE:		
BOLT:	8-32X2	122-0207
SCR:	TF:6X3/8	122-0001
SCR:	M:4-40X1/2	122-0002
SCR:	M:6-32X3/8	122-0003
SCR:	M:6-32X1/2	122-0004
SCR:	M:6-32X1/4	122-0031
SCR:	TRUSS:6X1/4	122-0091
SCR:	M:.5-5mm	122-0106
SCR:	HP-5:6X3/8	122-0123
SCR:	HH:8-32X5/8	122-0171
SCR:	PPH:6-32X3/16	122-0172
SCR:	#4X3/8	122-0206
SCR:TO-3	TF:6X5/8	122-0007
SCR:	M:4-40X5/8	122-0134
SCR:	M:4-40X1/4	122-0067
NUT:	KEP:6-32	122-0018
NUT:	KEP:8-32	122-0030
NUT:	KEP:4-40	122-0028

MISCELLANEOUS:		
SOCKET:	TO-3:PC MNT.	121-0112
SOCKET:	TO-3:NARROW	121-0374
L-BRACKET:	TO-3	141-0324
INSULATOR:	TO-3	121-0015
TERMINAL STRIP:	SPKR OUT	121-0320
JACK:	HDPHN	121-0349
JACK:	QUAD	121-0121
PLUG:	SHORTING	121-0119
BUSSING LINK:	NR LOOP	121-0120
FOOT:	VINYL	121-0165
FUSEHOLDER:	3AG/AGC:SLOT	121-0178
AC CORD:	16/2	121-0249
AC OUTLET:	3 BANK	121-0351
FUSE:	1.8A SB	121-0364
FUSE:	1.0A SB	121-0350
GROUND LUG:	CHASSIS	121-0019
MANUAL:	OWNERS	157-0088
MANUAL:	SERVICE	- -

Ordering address:
Phase Linear Service Dept.
c/o Jensen Service Dept.
3901 N. 25th Ave.
Schiller Park, IL 60176
1-800-323-0221

Technical inquiry address:
Phase Linear Service Dept.
20121 48th Ave. West
Lynnwood, WA 98036
1-206-774-8848