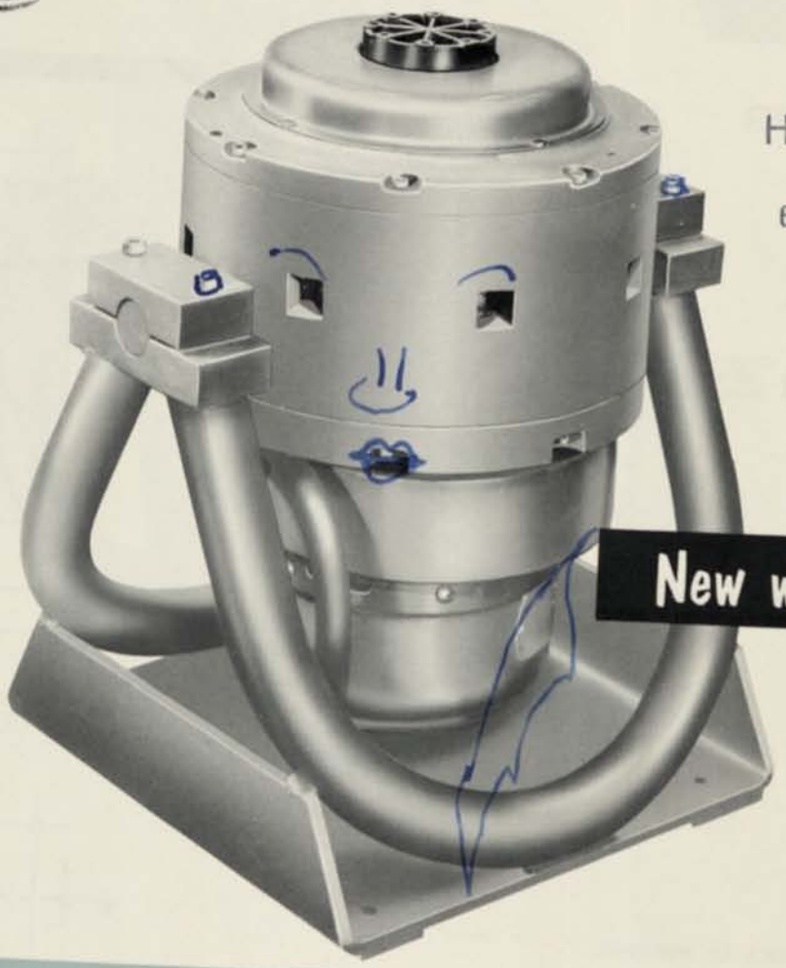
February 8, 1961

MODEL LPM 25 Shaker

Nominal Force Output:	25 lbs.
Frequency Range:	10-20,000 cps.
Total Displacement:	.5"
Weight of Moving Element:	70 grams (.15 lbs.)
Driving Rod:	3/8" Dia. 10-32 Thread
Armature Resonance with two Model 2224 Accelerometers:	Greater than 8500 cps.
Cooling:	No cooling required up to 12 lbs. force. For 12 lbs. force and greater use clean, dry air at 10 PSI and 5 CFM, filtered through a 10 micron filter.
Drive Coil Impedance:	16 Ohms
Back-to-back calibration:	Back-to-back calibration using two Model 2224 Accelerometers: 2% 50 to 5,000 cps. 5% to 7,000 cps. 10% to 9,000 cps.
Dimensions:	6-3/4" Dia. 7-3/4" High
Shaker Weight:	29 lbs.
Trunnion Weight:	9 lbs.
Special Features:	Back-to-back comparison, up to 100g, Teflon Bearing, Permanent Magnet, Low Driving Power, High Linearity. Trunnion with Rubber Shock Mounts.

LING ELECTRONICS

model 227
SHAKER
FORCE RATING
150 LBS.



HUGH MARSLAND & CO.
REPRESENTATIVES
6699 LINCOLN CHICAGO 45, ILL.
TELEPHONE ORchard 6-1100

New wide-band shaker

Maximum armature rigidity allows high first resonance above 9000 cps bare table.

Low armature weight of 1.75 pounds gives high pay load capability.

New velocity generator for displacement monitoring.

Low power requirements and low stray magnetic field provided by center gap, double field construction originated by Ling.

Simplified compensation over wide band widths to 10,000 cps.

model 227 SHAKER

SPECIFICATIONS

SPECIFICATIONS

SHAKER — GENERAL

Force Rating; vector: 150 lbs.

Maximum Load for 10g vector: 13.25 lbs.

Maximum Load for 20g vector: 5.75 lbs.

Frequency Range: 5-10,000 cps

Fundamental axial resonant mode is above 9000 CPS with table unloaded. This resonance is defined by 90° change in phase relationship between driver-coil current and table acceleration.

Stroke: 1 inch p-p continuous

Armature Weight: 1.75 lbs.

Flexure Type: Anti-gravity spring assy.

Flexure Stiffness: 150 lbs/in.

Table Size, diameter: 3.5 inches

Table mounting stainless steel insert provided as shown

Maximum Acceleration: 85.5 g's

Cooling Method: Forced Air

FIELD

Field Protection: Discharge Rectifier

Field Power: 0.95 KVA

Stray Field at table level: 5 gauss

ARMATURE

Overtravel Protection: Positive contact for electronic control

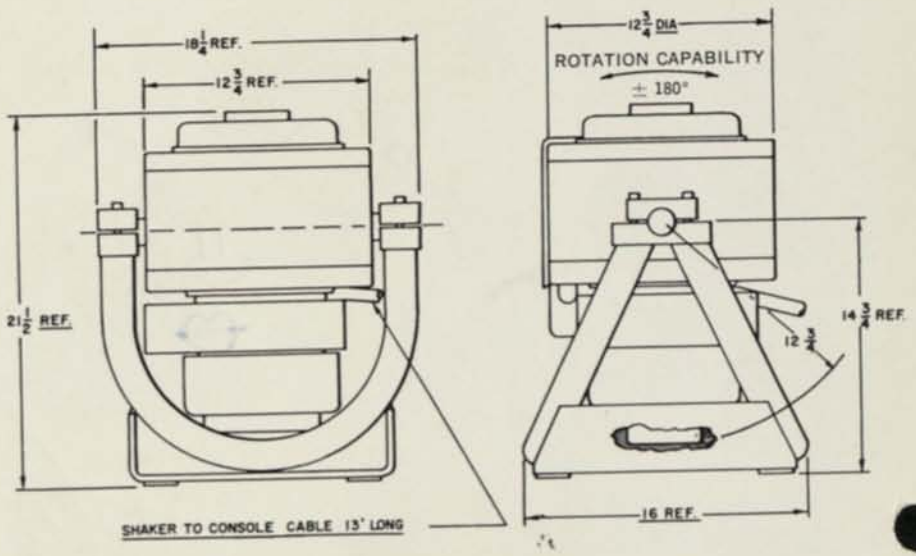
DIMENSIONS

Length: 18¼

Width: 16

Height, 21½

Weight: 350 lbs.



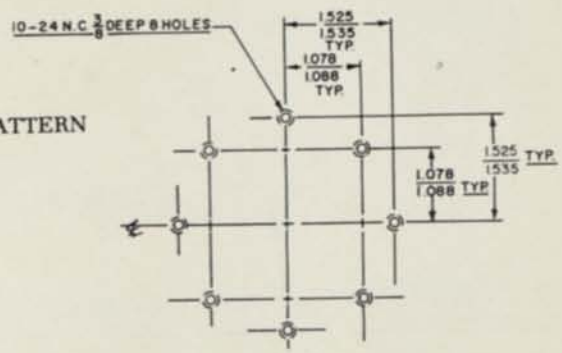


TABLE MOUNTING HOLE PATTERN

LING ELECTRONICS

BULLETIN NO. S227-860

1515 SOUTH MANCHESTER AVENUE • ANAHEIM, CALIFORNIA

10265146

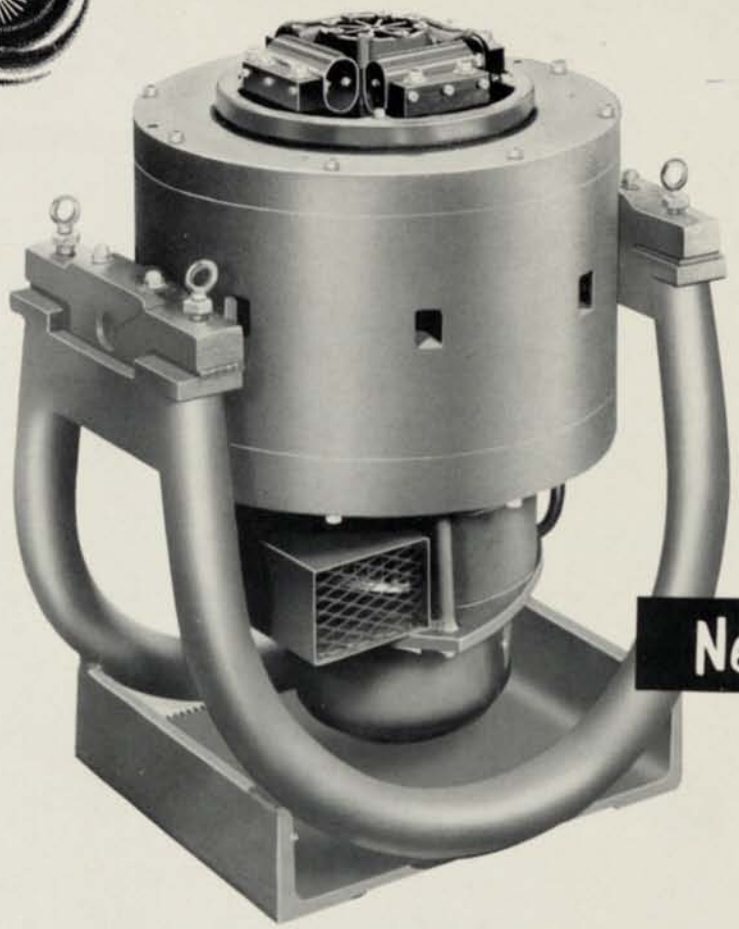
LING ELECTRONICS

HIGH POWER ELECTRONICS FOR
VIBRATION TESTING • ACOUSTICS • SONAR

model **219**

SHAKER

FORCE RATING
500 LBS.



New wide-band shaker

Maximum armature rigidity allows high first resonance above 5700 cps bare table.

Loop type flexures offers maximum lateral restraint, linear spring constants and 1" P-P continuous duty. Solid mechanical design provides long-term reliability in operation.

New velocity generator for displacement monitoring.

Low power requirements and low stray magnetic field provided by center gap, double field construction originated by Ling.

model 219 SHAKER

SPECIFICATIONS

SPECIFICATIONS

SHAKER — GENERAL

Force Rating; vector: 500 lbs.

Maximum Load for 10g vector: 42.5 lbs.

Maximum Load for 20g vector: 17.5 lbs.

Frequency Range: 5-6,000 cps

Fundamental axial resonant mode is above 5700 CPS with table unloaded. This resonance is defined by 90° change in phase relationship between driver-coil current and table acceleration.

Stroke: 1 inch p-p, continuous.

Armature Weight: 7.5 lbs.

Flexure Type: Four full loop, beryllium copper.

Flexure Stiffness: 160 lbs./in.

Table Size, diameter: 4 inches.

Table mounting stainless steel insert provided as shown.

Maximum Acceleration: 67 g's.

Cooling Method: Forced Air.

FIELD

Field Protection: Discharge Rectifier.

Field Power: 2 KVA.

Stray Field at table level: 5 gauss.

ARMATURE

Overtravel Protection: Positive contact for electronic control.

DIMENSIONS

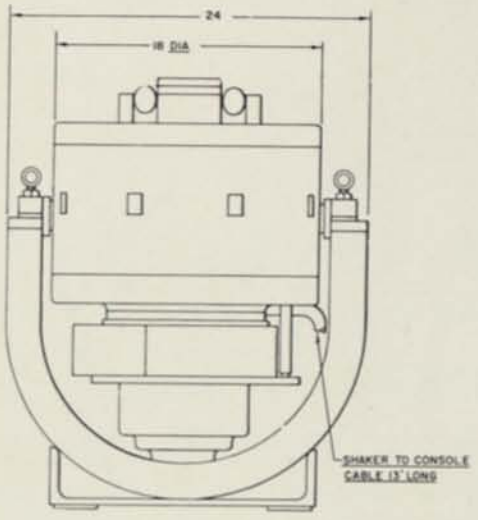
Length: 24 inches.

Width: 18 inches.

Height: 29⅞ inches.

Weight: 1,025 lbs.

Optional Flexure Stiffness: 400 lbs./in.



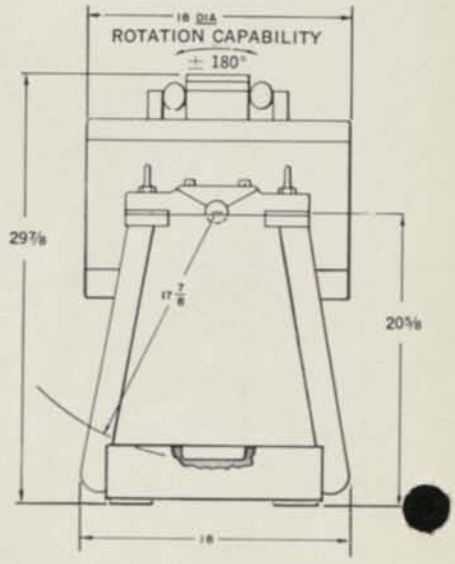
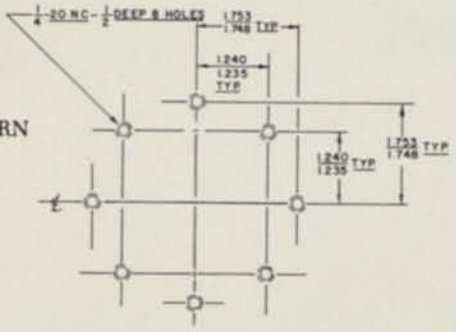


TABLE MOUNTING HOLE PATTERN



HUGH MARSLAND & CO.
REPRESENTATIVES
6699 LINCOLN CHICAGO 45, ILL.
TELEPHONE ORchard 6-1100

LING ELECTRONICS

BULLETIN NO. 5219-361

1515 SOUTH MANCHESTER AVENUE • ANAHEIM, CALIFORNIA

LING ELECTRONICS

model **A175**

SHAKER

FORCE RATING
1500 LBS.

New wide-band shaker

Maximum armature rigidity provides high first armature resonance of 3500 cps. No secondary structural resonances.

Wideband compensation simplified for bandwidths extending to 4000 cps with little compensation required to 2000 cps.

Maximum force at low power input . . . low stray magnetic field . . . improved force current linearity by means of a dual magnetic field structure.

Lever operated trunnion locks provide rapid adjustment and positive locking.

Excellent top seal isolates shaker interior from debris. Air intake protected against damaging foreign material entry.

Leaf spring trunnion and isolation support provides low, natural frequency suspension of body (approx. 8cps) . . . directional, parallel to body axis only. Springs may be locked out for transportation or low frequency tests.

model A175 SHAKER

SPECIFICATIONS

SPECIFICATIONS

SHAKER, GENERAL

Force Rating, Vector: 1500 lbs.
Maximum Load for 10 "g" vector: 128 lbs.
Maximum Load for 20 "g" vector: 53 lbs.
Frequency Range, 5-4,000 cps

Fundamental axial resonant mode is above 3500 CPS with table unloaded. This resonance is defined by 90° change in phase relationship between driver-coil current and table acceleration.

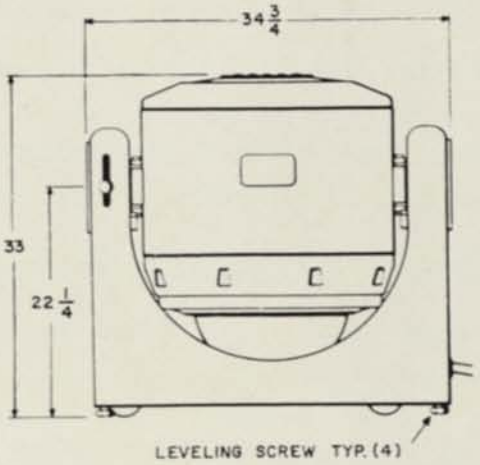
Stroke, continuous duty: 1.0 inch p-p
Armature weight: 22 lbs.
Flexure type: Roll half loop
Flexure Stiffness: 530 lbs/inch
Table size, diameter: 8-7/8 inches
Maximum acceleration: 68 g's.
Cooling method: Forced air

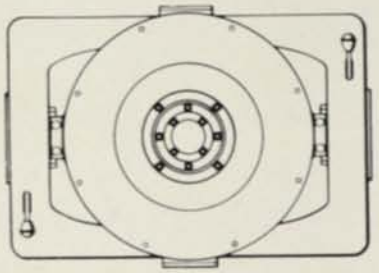
FIELD

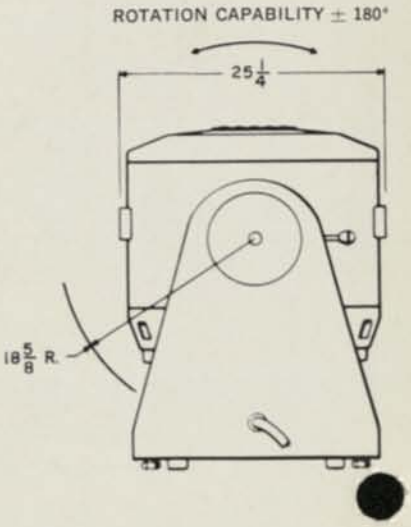
Personnel protection: Discharge Rectifier
Field Power: 3.13 KW,
Stray Field, 2" above table: Less than 5 gauss.

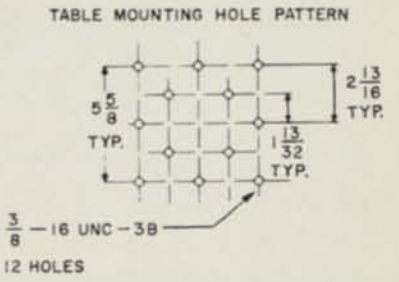
ARMATURE

Overtravel Protection: Positive contact for electronic control









DIMENSIONS

Length: 34-3/4 inches
Width: 25-1/4 inches
Height: 33 inches
Weight: 2,000 lbs.

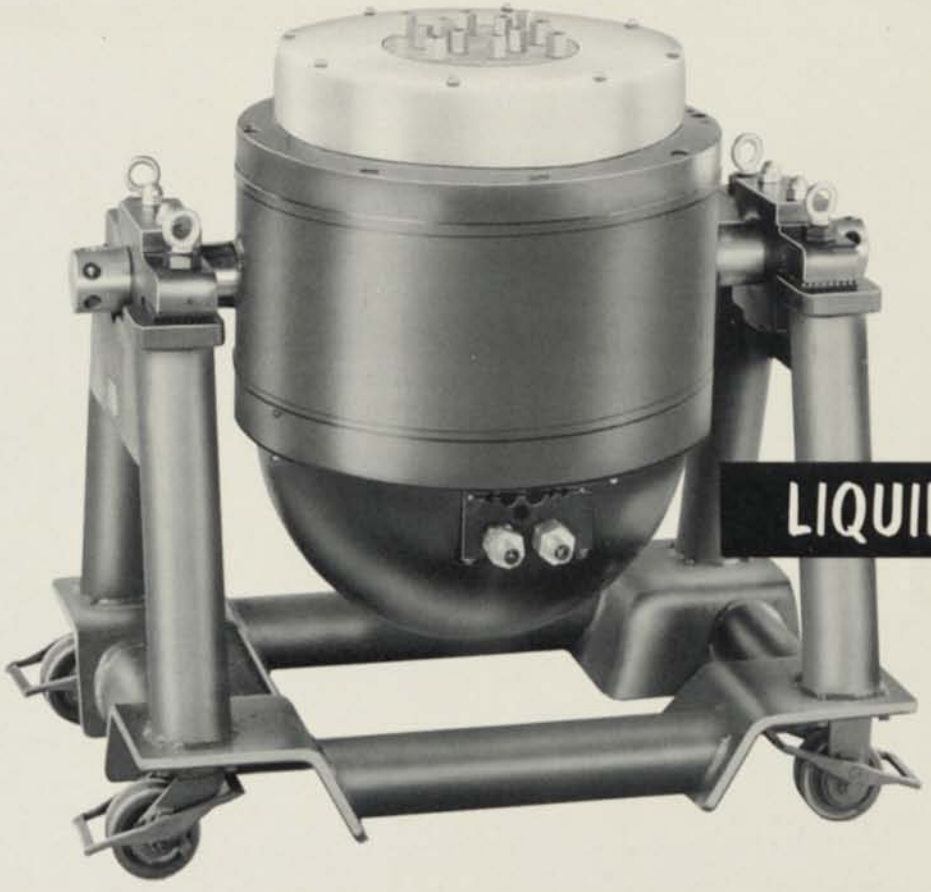
LING ELECTRONICS

BULLETIN SA175-860

LING ELECTRONICS

HIGH POWER ELECTRONICS FOR
VIBRATION TESTING • ACOUSTICS • SONAR

model 245
SHAKER
FORCE RATING
2,250 LBS.



LIQUID COOLED

Basic shaker without accessories features a unique, closed-loop cooling system for field and armature structures. This hermetically sealed system allows expanded in-chamber operation. **Unlimited** Altitude Capability, temperature range −100 to +300 degrees F, and up to 100% humidity.

Low voltage armature requirements of shaker makes it ideal for evacuated chamber applications.

Loop type flexures offers maximum lateral restraint, linear spring constants and 1" P-P continuous duty. Solid mechanical design provides long-term reliability in operation.

Frequency range of 5-5000 cps

Low power requirements and low stray magnetic field provided by center gap, double field construction originated by Ling.

New velocity generator for displacement monitoring.

Accessories available to extend temperature range, and to allow Piggy Back operation to any altitude.

Lightweight armature grants high payload testing capabilities.

100g Capability

Excellent top seal isolates shaker interior from debris.

"V" groove casters for floor or rail operation provided.

model 245 SHAKER

SPECIFICATIONS

SHAKER — GENERAL

Force Rating; vector: 2,250 lbs.
Maximum Load for 10g vector: 202.5 lbs.
Maximum Load for 20g vector: 90 lbs.
Frequency Range; 5-5,000 cps

Fundamental axial resonant mode is above 4600 CPS with table unloaded. This resonance is defined by 90° change in phase relationship between driver-coil current and table acceleration.

Stroke, continuous duty: 1 inch p-p
Armature Weight: 20 lbs. including coolant
Thermal disc and insulator: 2.5 lbs.
Flexure Type: Half loop
Flexure Stiffness: 530 lbs. inch
Table Size, diameter: 8-13/16 inches
Maximum Acceleration: 100 g's

Cooling Method: Uncomplicated closed loop cooling system circulates distilled water through the shaker at 3.5 G.P.M., and is exchanged via the water to water heat exchanger provided. Raw water supplied by customer at 7.5 G.P.M., 60 Degree, F, 10 PSI is required. Other temperature and flow rates can be accommodated where specified.

FIELD

Field Protection: Discharge rectifier
Field Power: 5KW
Stray Field: 5 gauss 2" above table
Field Coil Configuration: Center gap, double field construction

ARMATURE

Overtravel Protection: Positive contact for electronic control
Overtemperature Protection: Thermal switch
Coolant Flow Protection: Flow switch

DIMENSIONS

Length: 37-1/4 inches
Width: 25-1/4 inches
Height, with 1 in. thermal insulator: 34-1/4 inches
Weight: 1430 lbs.
Standard Cable and Hose Assembly: 20 ft. between Shaker and Heat Exchanger
Standard Cable: 30 ft. between Heat Exchanger and Amplifier.

ENVIRONMENT CAPABILITIES

Basic Shaker In-Chamber Installation

Temperature Range: —100 to +300 deg. F

Pressure Range (Altitude Operation): Unlimited
Humidity Range: Up to 100%

(With Model 255 Thermal Barrier)

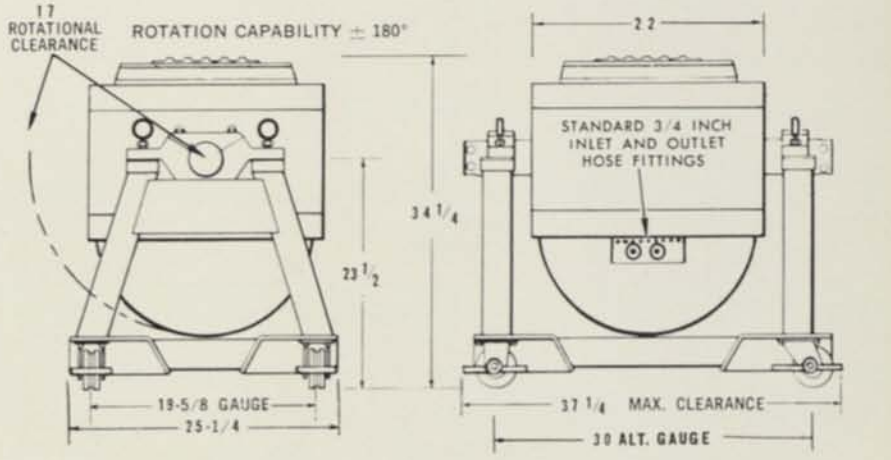
Temperature Range: —100 to +350 deg. F

Piggy-Back Installation

(With Model 270 Pressure/Thermal Barrier)

Temperature Range: —100 to +350 deg. F
Pressure Range (Altitude Operation): Unlimited
Humidity Range: Up to 100%

ALL DIMENSIONS IN INCHES



HEAT EXCHANGER

BASE DIMENSIONS 29 x 29 APP.
HT. 25
CABINET 36 x 43 x 31 HIGH

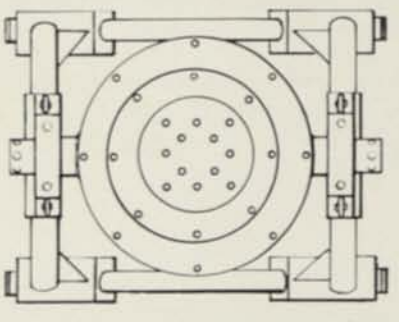
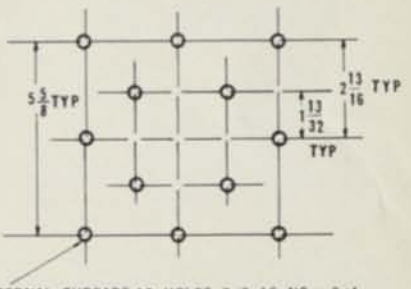


TABLE MOUNTING HOLE PATTERN



INTERNAL THREADS 12 HOLES 3/8 16 NC x 3/4
REPLACEABLE STAINLESS STEEL INSERTS.

ACCESSORIES

Piggy-Back Pressure/Thermal Barrier, Model 270
Thermal Barrier, Model 255
Chamber "Feed-Through" Assemblies (Wall Feedthru)
Special cable and hose assemblies
Floor tie down assembly

HUGH MARSLAND & CO.
REPRESENTATIVES
6699 LINCOLN CHICAGO 45, ILL.
TELEPHONE ORchard 6-1100

LING ELECTRONICS

BULLETIN NO. S245-261

1515 SOUTH MANCHESTER AVENUE • ANAHEIM, CALIFORNIA

LING-TEMCO ELECTRONICS, INC.

LING ELECTRONICS DIVISION

model 300
SHAKER
FORCE RATING
5000 LBS.

LIQUID COOLED

Basic shaker without accessories features a unique, closed-loop cooling system for field and armature structures. This hermetically sealed system allows expanded in-chamber operation. **Unlimited** Altitude Capability, temperature range —100 to +300 degrees F, and up to 100% humidity. **Direct application to piggy-back** chamber is provided by the shaker body which is hermetically sealed from the atmosphere.

Low voltage armature requirements of shaker makes it ideal for evacuated chamber applications.

Loop type flexures offer maximum lateral restraint, linear spring constants and 1" P-P continuous duty. Solid mechanical design provides long-term reliability in operation.

New velocity generator for displacement monitoring.

Lightweight armature of only 47.5 pounds permits high payload testing capabilities.

Maximum acceleration 100g's

Frequency range of 5-3000 cps

Casters are provided for ease of movement.

Leaf spring trunnion and isolation support provides low, natural frequency suspension of body (approx. 8cps)...directional, parallel to body axis only. Springs may be locked out for transportation or low frequency tests.

model 300 SHAKER

SPECIFICATIONS

SHAKER — GENERAL

Force Rating; vector: 5,000 lbs.
Maximum Load for 10g vector: 450 lbs.
Maximum Load for 20g vector: 200 lbs.
Frequency Range: 5 - 3,000 cps
Fundamental axial resonant mode is above 3000 CPS with table unloaded. This resonance is defined by 90° change in phase relationship between driver-coil current and table acceleration.
Stroke, continuous duty: 1 inch p-p
Armature, weight including coolant: 49.5 lbs.
Flexure Type: Half loop
Flexure Stiffness: 1000 lbs. per inch
Table Size, diameter: 13¼ inches
Maximum Acceleration: 100 g's
Cooling Method: Uncomplicated closed loop cooling system circulates distilled water through the shaker at 5 G.P.M.; heat is exchanged via the water to water heat exchanger provided. Raw water supplied by customer at 7.5 G.P.M., 60 Degree, F, 20 PSI is required. Other temperature and flow rates can be accommodated where specified.

FIELD

Personnel Protection: Discharge rectifier
Field Power: 25KW
Stray Field, 3" above table: Less than 6 gauss
Field Coil Configuration: Center gap, double field construction

ARMATURE

Overtemperature Protection: Thermal switch
Overtravel Protection: Positive contact for Electronic control

DIMENSIONS

Length: 43½ inches
Width: 30½ inches
Height: 46⅛ inches
Weight: 4000 lbs.
Standard Cable and Hose: 20 ft. Shaker to Heat Exchanger
Standard Cable: 30 ft. Heat Exchanger to Amplifier

ENVIRONMENTAL CAPABILITIES

Basic Shaker In-Chamber Installation

Temperature Range: −100 to +300 deg. F (1" Fiberglass on cable and hose only)
Pressure Range (Altitude Operation): Unlimited
Humidity Range: Up to 100%

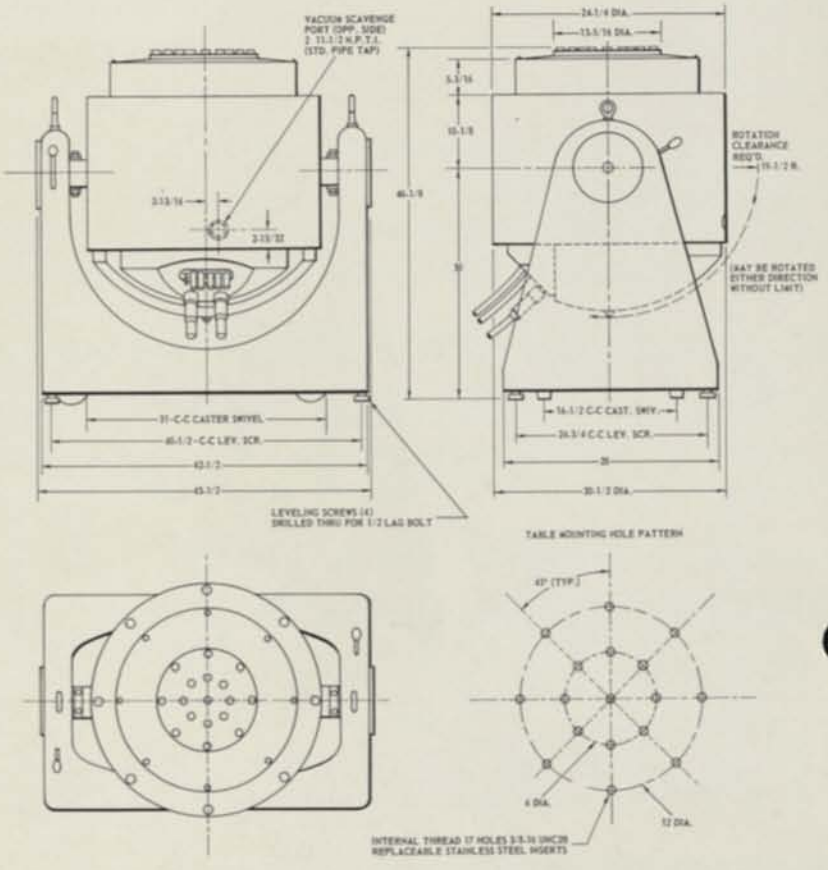
Full Chamber Installation

(With Model 273 Thermal Barrier Accessory)
Temperature Range: −100 to +350 deg. F
Pressure Range (Altitude Operation): Unlimited
Humidity Range: Up to 100%

Piggy-Back Installation (No Accessories Required)

Temperature Range: −100 to +350 deg. F
Pressure Range (Altitude Operation): Unlimited
Humidity Range: Up to 100%

ALL DIMENSIONS IN INCHES



HEAT EXCHANGER CABINET
57" LONG, 36" WIDE, 34" HIGH

OPTIONAL ACCESSORIES

Full Chamber Thermal Barrier, Model 273
Full Chamber "Feed-Through" Assemblies
Special cables and plugs to suit design

HUGH MARSLAND & CO.
REPRESENTATIVES
6699 LINCOLN CHICAGO 45, ILL.
TELEPHONE ORchard 6-1100

LING-TEMCO ELECTRONICS, INC.
BULLETIN NO. 300 - 361
LING ELECTRONICS DIVISION • 1515 S. MANCHESTER AVE. • ANAHEIM, CALIF. TELE. PROSPECT 4-2900

LING ELECTRONICS

model **A246**

SHAKER

FORCE RATING
7500 LBS.

LIQUID COOLED

Basic shaker without accessories features a unique, closed-loop cooling system for field and armature structures. This hermetically sealed system allows expanded in-chamber operation. **Unlimited** Altitude Capability, temperature range −100 to +300 degrees F, and up to 100% humidity.

Low voltage armature requirements of shaker makes it ideal for evacuated chamber applications.

Loop type flexures offers maximum lateral restraint, linear spring constants and 1" P-P continuous duty. Solid mechanical design provides long-term reliability in operation.

New velocity generator for displacement monitoring.

Lightweight armature grants high payload testing capabilities.

Maximum acceleration 100g's

Accessories available to extend temperature range, and to allow Piggy Back operation to any altitude.

Frequency range of 5-3000 cps

Excellent top seal isolates shaker interior from debris.

"V" groove casters for floor or rail operation provided.

model A246 SHAKER

SPECIFICATIONS

SHAKER — GENERAL

Force Rating; vector: 7,500 lbs.
Maximum Load for 10g vector: 678 lbs.
Maximum Load for 20g vector: 303 lbs.
Frequency Range; 5 - 3,000 cps

Fundamental axial resonant mode is above 2500 CPS with table unloaded. This resonance is defined by 90° change in phase relationship between driver-coil current and table acceleration.

Stroke, continuous duty: 1 inch p-p
Armature, weight including coolant: 68 lbs.
Thermal disc and insulator: 3.8 lbs.
Flexure Type: Half loop
Flexure Stiffness: 1400 lbs. inch
Table Size, diameter: 16-1/4
Maximum Acceleration 100 g's
Cooling Method: Uncomplicated closed loop cooling system circulates distilled water through the shaker at 5.7 G.P.M., and is exchanged via the water to water heat exchanger provided. Raw water supplied by customer at 7.5 G.P.M., 60 Degree, F, 10 PSI is required. Other temperature and flow rates can be accommodated where specified.

FIELD

Personnel Protection: Discharge rectifier
Field Power: 23KW
Stray Field, 3" above table: Less than 6 gauss
Field Coil Configuration: Center gap, double field construction

ARMATURE

Overtemperature Protection: Thermal switch
Overtravel Protection: Positive contact for electronic control

DIMENSIONS

Length: 56-9/16 inches
Width: 41-1/2 inches
Height, with 1 in. thermal insulator: 50-5/8 inches
Weight: 6,000 lbs.
Standard Cable and Hose Assembly: 20 ft. between Shaker and Heat Exchanger
Standard Cable: 30 ft. between Heat Exchanger and Amplifier.

ENVIRONMENT CAPABILITIES

Basic Shaker In-Chamber Installation

Temperature Range: — 100 to + 300 deg. F (1" Fiberglass on cable and hose only)
Pressure Range (Altitude Operation): Unlimited
Humidity Range: Up to 100%

Full Chamber Installation

(With Model A256 Thermal Barrier Accessory)

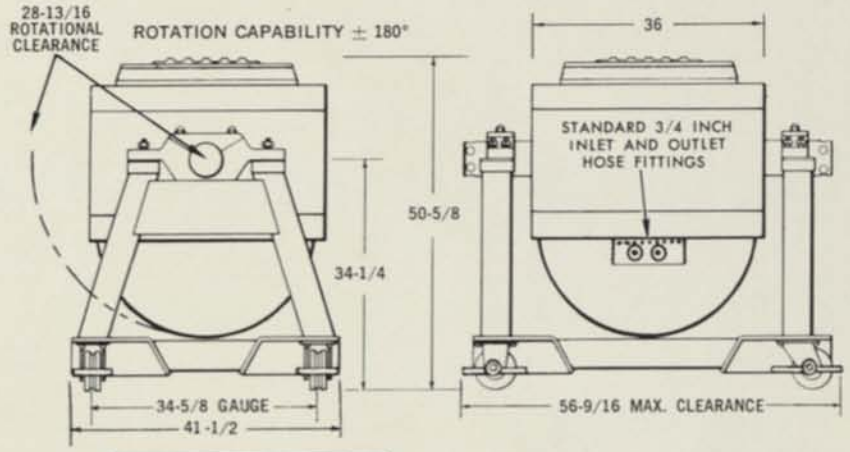
Temperature Range: — 100 to + 350 deg. F
Pressure Range (Altitude Operation): Unlimited
Humidity Range: Up to 100%

Piggy-Back Installation

(With Model A271 Pressure/Thermal Barrier)

Temperature Range: — 100 to + 350 deg. F
Pressure Range (Altitude Operation): Unlimited
Humidity Range: Up to 100%

ALL DIMENSIONS IN INCHES



HEAT EXCHANGER
BASE DIMENSIONS 29 x 29 APP.
HT. 25
CABINET 36 x 43 x 31 HIGH

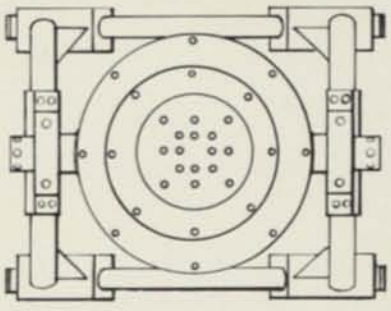
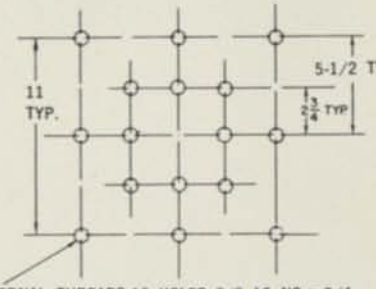


TABLE MOUNTING HOLE PATTERN



INTERNAL THREADS 16 HOLES 3/8 16 NC x 3/4
REPLACEABLE STAINLESS STEEL INSERTS.

ACCESSORIES

Piggy-Back Pressure/Thermal Barrier, Model A271
Full Chamber Thermal Barrier, Model A256
Full Chamber "Feed-Through" Assemblies
Special cables and plugs to suit design

HUGH MARSLAND & CO.
REPRESENTATIVES
6699 LINCOLN CHICAGO 45, ILL.
TELEPHONE ORchard 6-1100

LING ELECTRONICS

BULLETIN NO. SA246-860

1515 SOUTH MANCHESTER AVENUE • ANAHEIM, CALIFORNIA

LING ELECTRONICS

model 275 SHAKER

FORCE RATING
10,000 LBS.

LIQUID COOLED

Basic shaker without accessories features a unique, closed-loop cooling system for field and armature structures. This hermetically sealed system allows expanded in-chamber operation. **Unlimited** Altitude Capability, temperature range −100 to +300 degrees F, and up to 100% humidity.

Low voltage armature requirements of shaker makes it ideal for evacuated chamber applications.

Loop type flexures offer maximum lateral restraint, linear spring constants and 1" P-P continuous duty. Solid mechanical design provides long-term reliability in operation.

Low power requirements and low stray magnetic field provided by center gap, double field construction originated by Ling.

Excellent top seal isolates shaker interior from debris.

"V" groove casters for floor or rail operation provided.

New velocity generator for displacement monitoring.

Accessories available to extend temperature range, and to allow Piggy Back operation to any altitude.

Frequency range of 5-3000 cps

model 275 SHAKER

SPECIFICATIONS

SHAKER — GENERAL

Force Rating; vector: 10,000 lbs.
Maximum Load for 10g vector: 898 lbs.
Maximum Load for 20g vector: 398 lbs.
Frequency range: 5 — 3000 cps
Fundamental axial resonant mode is above 2800 CPS with table unloaded. This resonance is defined by 90° change in phase relationship between driver-coil current and table acceleration.
Stroke, continuous duty: 1 inch p-p
Armature, weight including coolant: 102 lbs.
Thermal disc and insulator: 3.8 lbs.
Flexure Type: Half loop
Flexure Stiffness: 1800 lbs. inch
Table Size, diameter: 16-1/4 inches
Maximum Acceleration: 98 g's
Cooling Method: Uncomplicated closed loop cooling system circulates distilled water through the shaker at 5.7 G.P.M., and is exchanged via the water to water heat exchanger provided. Raw water supplied by customer at 12.2 G.P.M., 60° F. 10 PSI is required. Other temperature and flow rates can be accommodated where specified.

FIELD

Personnel Protection: Discharge rectifier
Field Power: 23KW
Stray Field, 3" above table: less than 6 gauss
Field Coil Configuration: Center gap, double field construction

ARMATURE

Overtemperature Protection: Thermal switch
Overtravel Protection: Contact type for electronic control

DIMENSIONS

Length: 56-9/16 inches
Width: 41-1/2 inches
Height, with 1 in. thermal insulator: 50-5/8 inches
Weight: 6,000 lbs.
Standard cable: Shaker to Heat Exchanger, 20 ft.
Heat Exchanger to Amplifier, 30 ft.

ENVIRONMENT CAPABILITIES

Basic Shaker In-Chamber Installation

Temperature Range: —100 to +300 deg. F (1" Fiberglass on cable and hose only)
Pressure Range (Altitude Operation): Unlimited
Humidity Range: Up to 100%

Full Chamber Installation

(With Model B256 Thermal Barrier)

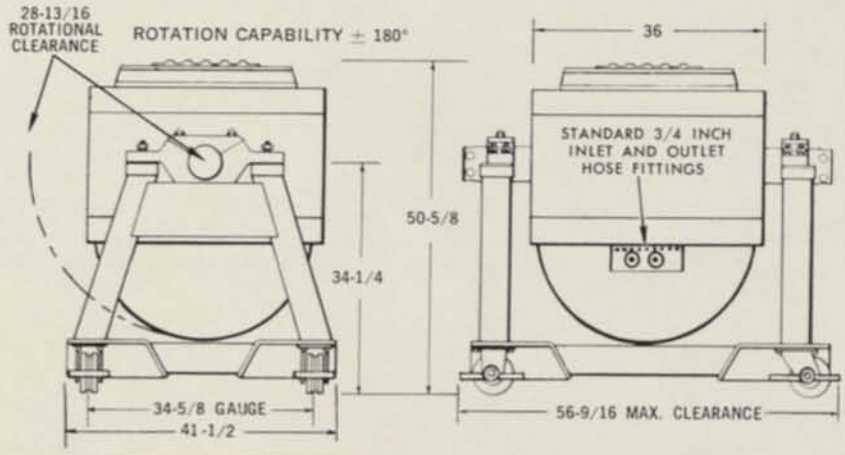
Temperature Range: —100 to +350 deg. F
Pressure Range (Altitude Operation): Unlimited
Humidity Range: Up to 100%

Piggy-Back Installation

(With Model B271 Pressure-Thermal Barrier)

Temperature Range: —100 to +350 deg. F
Pressure Range (Altitude Operation): Unlimited
Humidity Range: Up to 100%

ALL DIMENSIONS IN INCHES



HEAT EXCHANGER
BASE DIMENSIONS 29 x 29 APP.
HT. 25
CABINET 36 x 43 x 31 HIGH

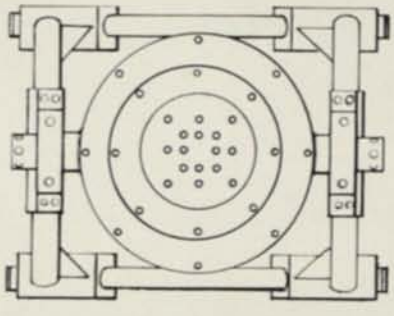
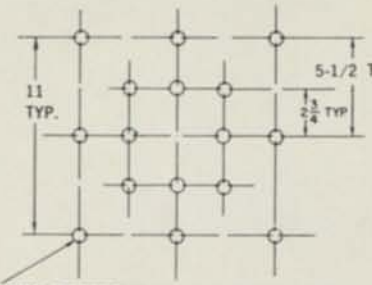


TABLE MOUNTING HOLE PATTERN



INTERNAL THREADS 16 HOLES 3/8 16 NC x 3/4
REPLACEABLE STAINLESS STEEL INSERTS.

ACCESSORIES

Piggy-Back Pressure/Thermal Barrier, Model B271
Full Chamber Thermal Barrier, Model B256
Full Chamber "Feed-Through" Assemblies
Special cables and hose assemblies

HUGH MARSLAND & CO.
REPRESENTATIVES
6699 LINCOLN CHICAGO 45, ILL.
TELEPHONE ORchard 6-1100

ELECTRONICS

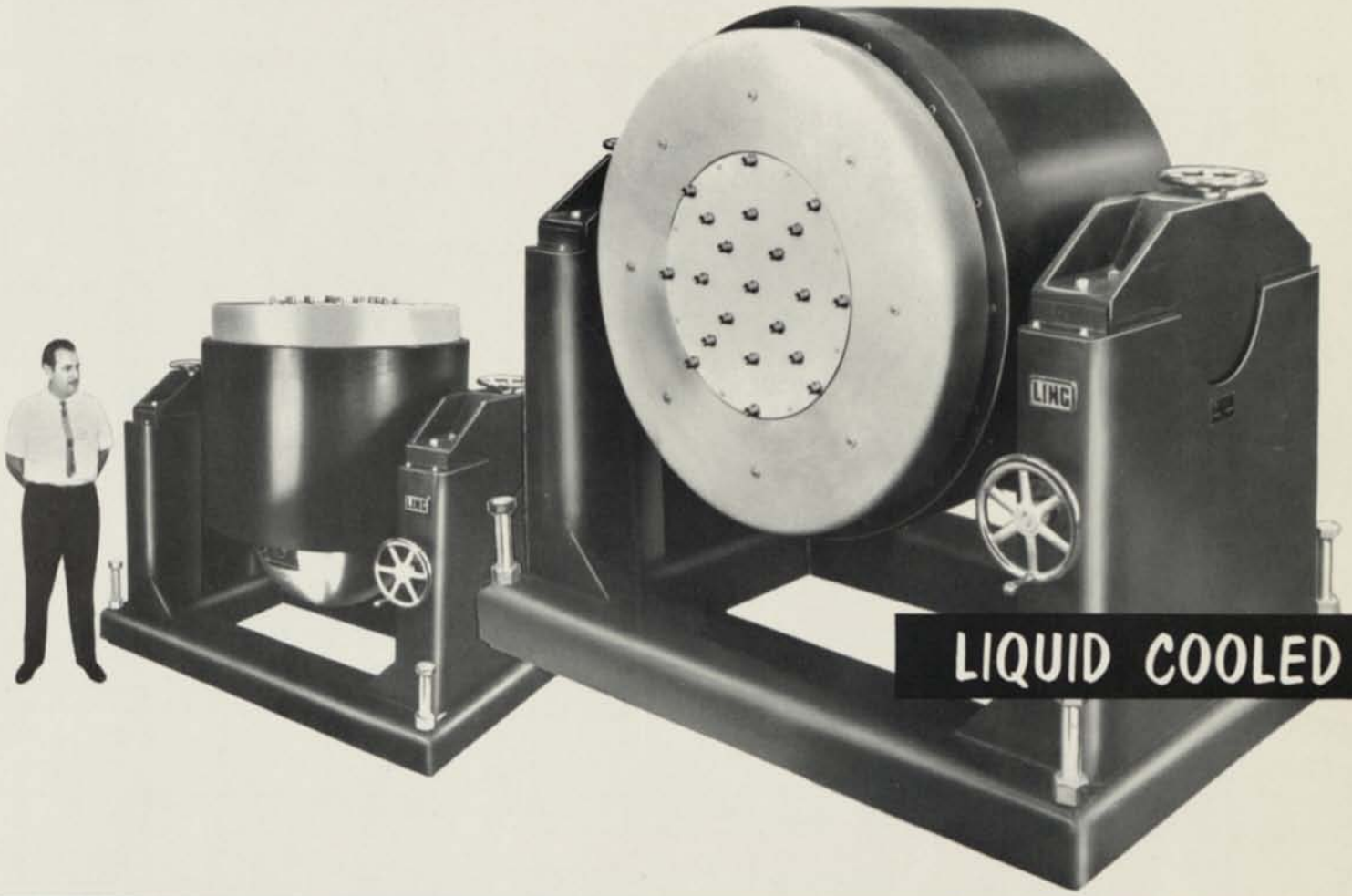
BULLETIN NO. S275-860

1515 SOUTH MANCHESTER AVENUE ANAHEIM, CALIFORNIA

LING-TEMCO ELECTRONICS, INC.

LING ELECTRONICS DIVISION

model 249
SHAKER
FORCE RATING
30,000 LBS.



Basic shaker without accessories features a unique, closed-loop cooling system for field and armature structures. This hermetically sealed system allows expanded in-chamber operation. **Unlimited** Altitude Capability, temperature range −100 to +300 degrees F, and up to 100% humidity.

Low voltage armature requirements of shaker makes it ideal for evacuated chamber applications.

New velocity generator for displacement monitoring.

Excellent top seal isolates shaker interior from debris.

Loop type flexures offer maximum lateral restraint, linear spring constants and 1" P-P continuous duty. Solid mechanical design provides long-term reliability in operation.

Low power requirements and low stray magnetic field provided by center gap, double field construction originated by Ling.

Accessories available to extend temperature range, and to allow Piggy Back operation to any altitude.

Frequency range of 5-2000 cps

"V" groove casters for floor or rail operation provided.

model 249 SHAKER

SPECIFICATIONS

ALL DIMENSIONS IN INCHES

SHAKER — GENERAL

Force Rating, vector: 30,000 lbs.
Maximum Load for 5g vector: 5604 lbs.
Maximum Load for 10g vector: 2604 lbs.
Maximum Load for 20g vector: 1104 lbs.
Frequency Range: 5 - 2,000 cps

Fundamental axial resonant mode is above 2000 CPS with table unloaded. This resonance is defined by 90° change in phase relationship between driver-coil current and table acceleration, measured at the table center.

Stroke: 1 inch p-p
Armature Weight: 396 lbs. including coolant
Thermal Disc and Insulator: 20 lbs.
Flexure Type: Full loop octagonal array
Flexure Stiffness: 12,000 lbs./inch
(optional) 5,800 lbs./inch
Table Size, diameter: 28⅜ inches
Maximum Acceleration: 75 g's

Cooling Method: Uncomplicated closed loop cooling system circulates distilled water through the shaker at 27 G.P.M., and is exchanged via the water to water heat exchanger provided. Raw water supplied by customer at 24 G.P.M., 65 Degree, F, 10 PSI is required. Other temperature and flow rates can be accommodated where specified.

FIELD

Field Protection: Discharge rectifier
Field Power: 42KW
Stray Field: 5 gauss 6" above table
Field Coil Configuration: Center gap, double field construction

ARMATURE

Overtravel Protection: Positive contact for electronic control
Overtemperature Protection: Thermal switch
Coolant Flow Protection: Flow switch

DIMENSIONS

Length: 91⅝ inches
Width: 62 inches
Height: 78 inches
Weight: 28,700 pounds.
Standard Cable and Hose Assembly: 30 ft. between Shaker and Heat Exchanger
Standard Cable: 30 ft. between Heat Exchanger and Amplifier.

ENVIRONMENT CAPABILITIES

Basic Shaker In-Chamber Installation

Temperature Range: —100 to +300 deg. F
Pressure Range: (Altitude Operation): Unlimited
Humidity Range: Up to 100%

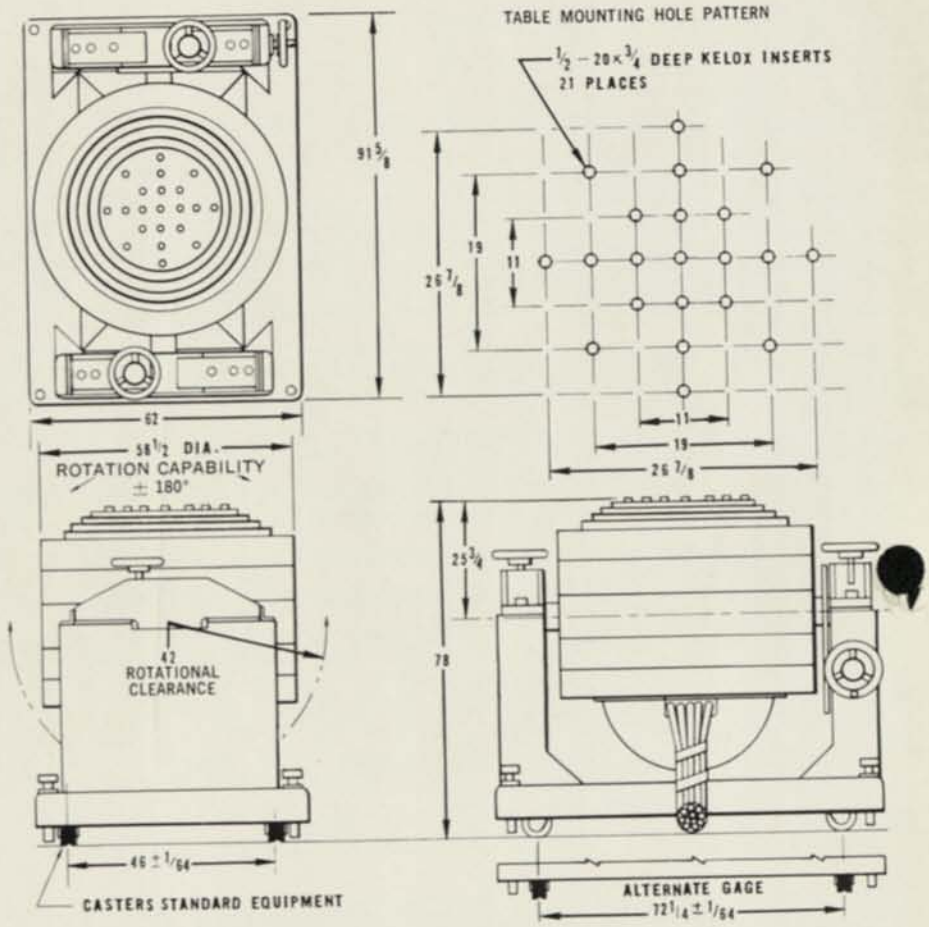
With Model 262 Thermal Barrier

Temperature Range: —100 to +350 deg. F

Piggy-Back Installation

(With Model 272 Pressure/Thermal Barrier)

Temperature Range: —100 to +350 deg. F
Pressure Range (Altitude Operation): Unlimited
Humidity Range: Up to 100%



OPTIONAL ACCESSORIES:

Piggy-Back Pressure/Thermal Barrier, Model 272
Thermal Barrier, Model 262
Chamber "Feed-Through" Assemblies (Wall Feedthru)
Special cable and hose assemblies
Floor tie down assembly

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REPRESENTATIVES
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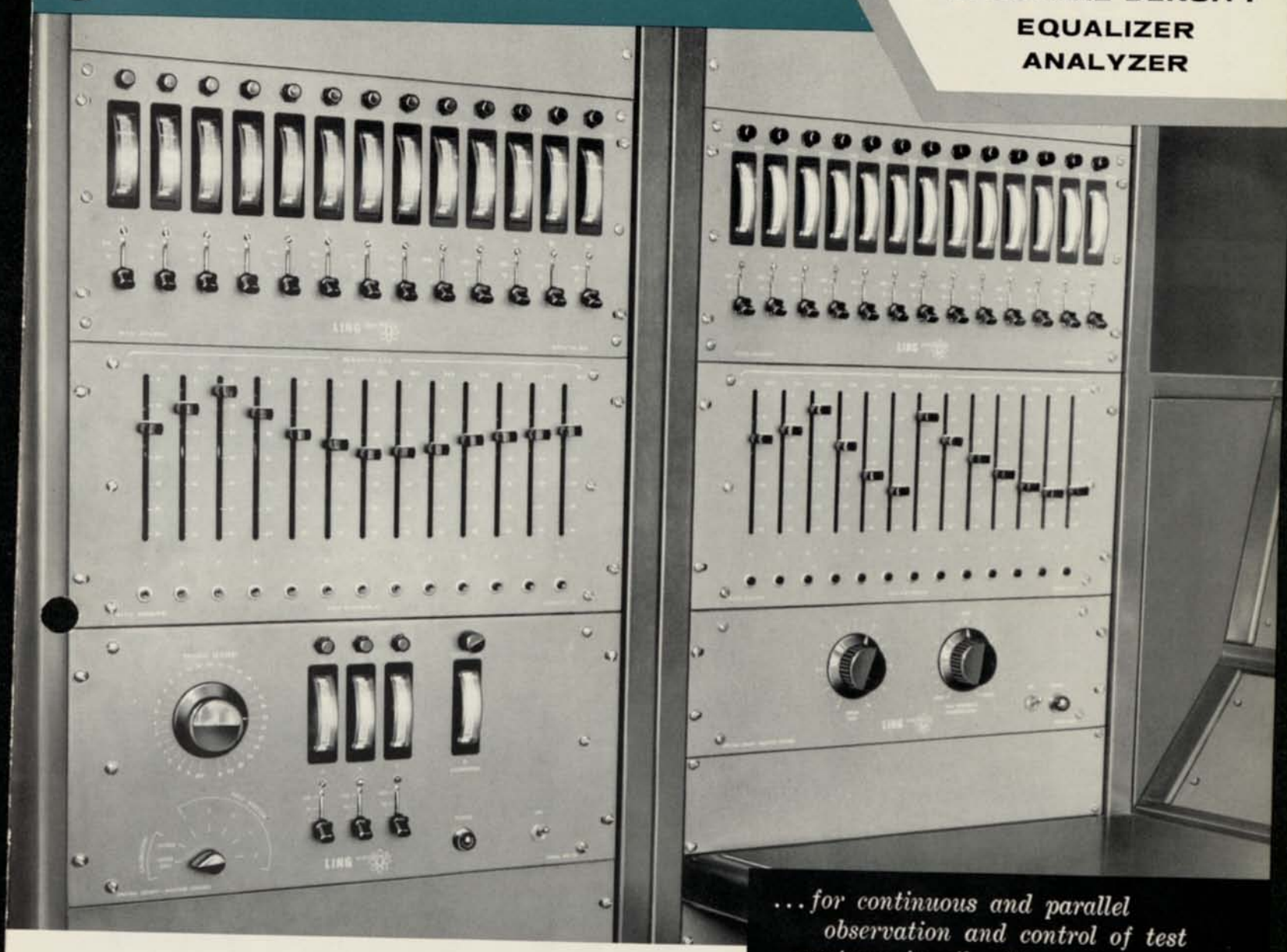
LING-TEMCO ELECTRONICS, INC.
BULLETIN NO. S249-561
LING ELECTRONICS DIVISION • 1515 S. MANCHESTER AVE. • ANAHEIM, CALIF. TELE. PROSPECT 4-2900

LING ELECTRONICS

HIGH POWER ELECTRONICS FOR
VIBRATION TESTING • ACOUSTICS • SONAR

model
ESD-20 / ASD-20
SPECTRAL DENSITY EQUALIZER ANALYZER



. . . for continuous and parallel observation and control of test spectrum in vibration and testing programs

Now DYNAMIC EQUALIZATION AND SIMULTANEOUS CALIBRATED READ OUT

AN ORIGINAL LING BREAKTHROUGH in the random noise testing field. Only Ling's new Dynamic Equalizer/Analyzer System permits you to set up a shaped input faster, analyze unknown spectral density at a glance, and equalize spectrum variations rapidly even while the test is in progress. Ling engineering makes the difference! This remarkable system features simplified controls. A series of separate filters split the entire bandwidth of 10 to 2,000 cps into segments of 100 cps or less, providing the operator independent control over each segment with separate adjustable attenuators. Band pass characteristics of the analyzer filters are matched to those of the equalizer giving the operator a continuous picture of the shaker acceleration output. The analyzer continuously and simultaneously reads out each channel in g^2/cps. Corrections in energy distributions can be made immediately by simply adjusting the filter attenuators. Ling provides fast set up, sure control, and continuous readout directly calibrated in g^2/cps on individual meters.

LING'S NEW EQUALIZER-ANALYZER CONCEPT YEAR'S AHEAD OF THE FIELD

This new system allows *continuous, parallel* observation and control of the entire spectrum of energy distribution during random wave vibration testing.

The Ling ESD-20/ASD-20 System eliminates tedious adjustments . . . makes continuous equalization possible at any vibration level.

In the Ling Spectral Density System, the random source output is divided into 26 frequency bands — each independently controlled by a simple vertical attenuator. Outputs from all 26 bands are displayed to provide the operator with a continuous view of the spectrum during the test. This new dynamic equalization system may be incorporated into new or existing random wave vibration test systems.

LING DESIGN • LING ENGINEERING • LING RELIABILITY • provide these advantages: • • •

Calibrated Readout: Accurate meter readout in g^2/cps on each channel.

Narrow Band Filters: 1/5 octave or 100 cps (whichever is narrower) filters provide excellent band shaping and equalization. Minimum filter bandwidth 14 cps.

Fast Random Equalization: Set up time reduced to seconds.

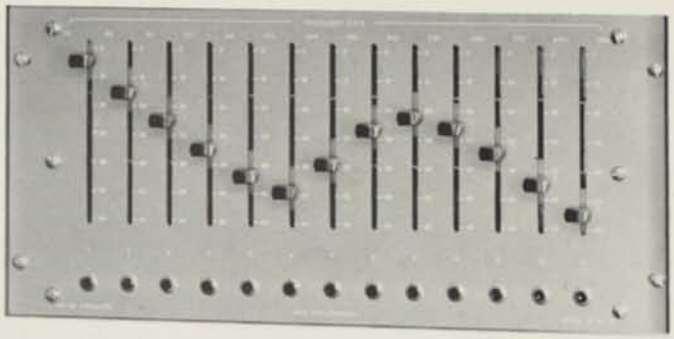
High Stability Filters: Passive filter networks insensitive to temperature variations. No beat frequency oscillator drift and resultant bandwidth or center frequency drift!

Wide Dynamic Range: 30 db single channel rejection.

Low Maintenance: Use of simple reliable vacuum tube amplifiers (only one is employed in the equalizer section) together with passive filters and non-critical potentiometers minimize costly downtime.

model
ESD-20
ASD-20
EQUALIZER-ANALYZER

SPECIFICATIONS



SPECTRAL DENSITY EQUALIZER

The Ling Spectral Density Equalizer consists essentially of 26 sharp cutoff bandpass filters and a low frequency compensating control that are driven from a common source. The filters cover the 10-2000 cps frequency range and separate the input test signal into 26 narrow frequency bands. By individually adjusting the filter outputs, the spectrum of the input signal can be shaped to compensate for any undesirable transfer characteristics in the shaker, fixture, or the specimen being tested.

Frequency Range: 10-2000 cps

Number of Filters: 26 (plus low frequency compensation)

Filter Attenuation Characteristics: Bandwidth ratio of 2:1 at 30 db to 3 db response; 4:1 at 60 db to 3 db response

Input Level: 1 volt

Input Impedance: 500,000 ohms

Output Level: 1 volt (nominal)

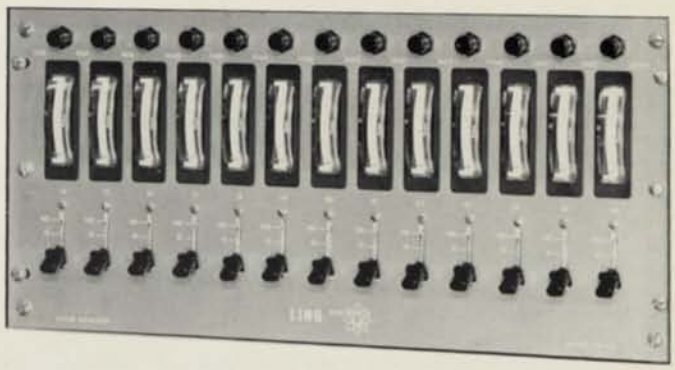
Output Impedance: 600 ohms

Hum and Noise: 60 db below 1 volt

Power Requirements: 110 volt, 60 cycle, 35 watts

Dimensions: Standard 19" relay rack mount
Height: 22-3/4" (overall for three chassis)
Depth: 19-1/2"

Weight: 185 pounds



SPECTRAL DENSITY ANALYZER

The Ling Spectral Density Analyzer includes 30 sharp cutoff bandpass filters all driven from a common source. Twenty-six of the filters duplicate the frequency bands of the ESD-20 Equalizer. Each filter output signal may then be read directly calibrated to g^2/cps on the analyzer meters. Three of the other four filters serve as indicators for the spectrum from 10 to 70 cps and one reads total rms g above 2000 cps. No time consuming conversion is necessary.

Frequency Range: 10-2000 cps

Number of Filters: 26

Bandpass Filter Attenuation Characteristics:
Bandwidth ratio of 2:1 at 30 db to 3 db response; 4:1 at 60 db to 3 db response

Additional Filters: Four to serve as indicators for spectrum outside range of 70-2000 cps

Acceleration Power Spectral Density Ranges:
Three ranges; 10 to 1 scale factor between ranges. By adjustment of accelerometer sensitivity, full scale calibration from .01 to 100 g^2/cps is obtainable. 141 millivolts RMS will produce .02 g^2/cps deflection on all meters on the most sensitive range.

Input Impedance: 100,000 ohms

Input Selector: The input selector provides a choice of five signal inputs and an input for a noise generator for system calibration.

Output Impedance: 500 ohms nominal for vertical deflections of x-y plotter

Channel Selector: The channel selector provides 30 individual channel output selections for recorder.

Power Requirements: 110 volt, 60 cycle, 200 watts for ASD-20

Dimensions: Standard 19" relay rack mount
Height: 26-1/4" (Total for three chassis)
Depth: 20-1/2" including connectors

Weight: 225 pounds

Operating as a System, the ESD-20 Equalizer and ASD-20 Analyzer provide the operator a continuous picture of the shaker acceleration output. Necessary corrections in energy distribution can be made immediately at the Equalizer by means of simple level adjustments of the filter attenuators. Mixed sine-random wave testing can be easily accomplished by the use of the Ling S-11-D1 or S-14 Servo Systems in conjunction with the ESD-20 Equalizer.

SPECIFICATIONS

EQUALIZER FILTER SPECIFICATIONS

Filter No.	Lower Frequencies (— 3db attenuation)	Upper Frequencies (— 3db attenuation)	Bandwidth
1	LOW PASS	84	84
2	84	101	17
3	101	121	20
4	121	145	24
5	145	174	29
6	174	209	35
7	209	250	41
8	250	300	50
9	300	360	60
10	360	430	70
11	430	510	80
12	510	600	90
13	600	700	100
14	700	800	100
15	800	900	100
16	900	1000	100
17	1000	1100	100
18	1100	1200	100
19	1200	1300	100
20	1300	1400	100
21	1400	1500	100
22	1500	1600	100
23	1600	1700	100
24	1700	1800	100
25	1800	1900	100
26	1900	2000	100

Peak to Valley Ratio in Passband:
±1.5 db or less

Bandwidth tolerance at —3 db attenuation:
±3 percent

Attenuation outside Passband:
Band width ratio of 2:1 at 30db,
4:1 at 60 db.

ANALYZER FILTER SPECIFICATIONS

Filter No.	Lower Frequencies (— 3db attenuation)	Upper Frequencies (— 3db attenuation)	Bandwidth
1	70	84	14
2	84	101	17
3	101	121	20
4	121	145	24
5	145	174	29
6	174	209	35
7	209	250	41
8	250	300	50
9	300	360	60
10	360	430	70
11	430	510	80
12	510	600	90
13	600	700	100
14	700	800	100
15	800	900	100
16	900	1000	100
17	1000	1100	100
18	1100	1200	100
19	1200	1300	100
20	1300	1400	100
21	1400	1500	100
22	1500	1600	100
23	1600	1700	100
24	1700	1800	100
25	1800	1900	100
26	1900	2000	100

A	25	Center Frequency
B	40	Center Frequency
C	55	Center Frequency
D	2 KC to 5 KC	

Peak to Valley Ratio in Passband: ±1.5 db or less
Bandwidth tolerance at —3 db attenuation: ±3 percent
Attenuation outside Passband:
Band width ratio of 2:1 at 30db, 4:1 at 60 db.

ESD-20 CHASSIS
1—AM-20 Amplifier Mixer
1—FE-20A Filter Equalizer
1—FE-20B Filter Equalizer

ASD-20 CHASSIS
1—SDS-20 Spectral Density Switch
1—FA-20A Filter Analyzer
1—FA-20B Filter Analyzer

HUGH MARSLAND & CO.
REPRESENTATIVES
6699 LINCOLN CHICAGO 45, ILL
TELEPHONE ORchard 6-1100

LING ELECTRONICS

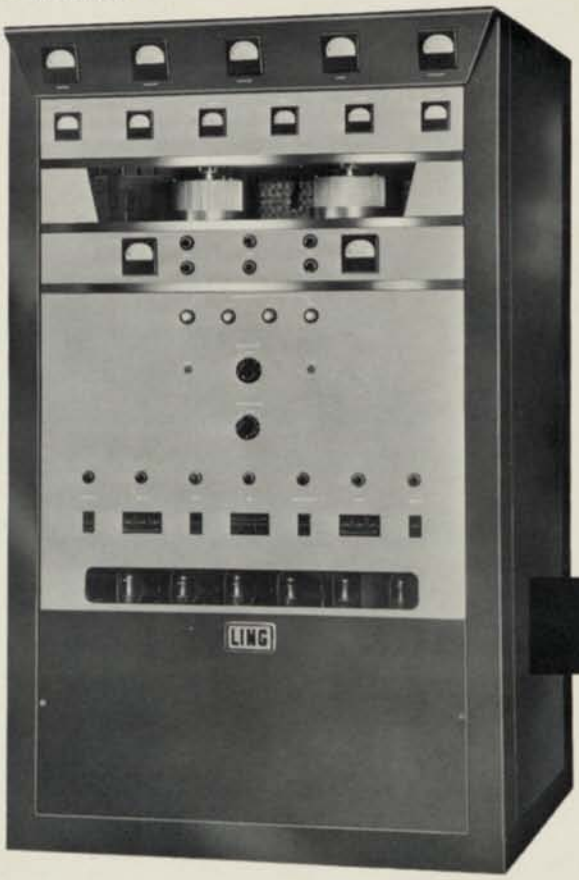
BULLETIN NO. E/A-20 960

1515 SOUTH MANCHESTER AVENUE • ANAHEIM, CALIFORNIA

LING-TEMCO ELECTRONICS, INC.

LING ELECTRONICS DIVISION

Model PP 10/12C POWER AMPLIFIER



AIR COOLED

10,000 VA

ELECTRONIC VIBRATION POWER GENERATOR

A Ling conception — Ling Electronics was first to conceive and build high power amplifiers to drive electrodynamic shakers. Ling continues its leadership by offering power generators of proven design and reliability . . . the direct result of employing sound engineering practices and highest quality components and workmanship.

Completely self contained—One attractively styled, compact cabinet houses the transformers, field supply and armature protector. This amplifier built for driving an electrodynamic shaker presents the finest in LING quality engineering, design experience and personal production line attention.

All control circuitry included in amplifier — No console is required for amplifier operation. If remote control is desired, all the important amplifier controls and meters may be duplicated in a LING control console.

Complete front panel metering of all important operating functions.

Foolproof interlock system — Ling engineering provides full safeguards for personnel and equipment safety. Opening the door automatically turns off power, shorts out all high voltages and energizes convenience outlet and service light

Instantaneous overload protection designed into critical circuits to protect all system components . . . yet permits rapid reset to normal operation, insuring minimum downtime.

Rated Conservatively — Conservative 10 KVA rating insures longer component and tube life with minimum maintenance.

Walk in accessibility provided at the rear of the cubicle allows easy inspection and maintenance. A break away panel is also provided in the front of the cubicle.

Maximum reliability — The Ling Model PP 10/12C Amplifier, like all Ling Amplifiers, is designed, built and rated for continuous operation at full output.

Model
PP 10/12C POWER AMPLIFIER

SPECIFICATIONS

POWER OUTPUT: 10 KVA at any load power factor from 0.1 leading or lagging to unity, 20 to 3,000 cps. 10 KVA into resistive load 20 to 5,000 cps. Output voltage decreases proportional to frequency 20 to 5 cps at rated current.

PLATE DISSIPATION: 24 KW continuously.

TOTAL HARMONIC DISTORTION: Less than 1% 50 to 2,000 cps
Less than 3% 20 to 5,000 cps

FREQUENCY RESPONSE: ±1 db 10 to 10,000 cps

NOISE AND HUM: At least 70 db below rated output. Direct current on output amplifier filaments eliminates 60 cps intermodulation.

DUTY: Rated for continuous duty at full output.

INPUT VOLTAGE: 1.0 volts rms max. for full power output

INPUT IMPEDANCE: 10K ohms. Source impedance should be 600 ohms or less.

OUTPUT AMPLIFIER TUBES: 2 Machlett type ML 5531.

OUTPUT VOLTAGE TAPS: Taps are provided to drive the selected shaker for proper sine or random wave operation. Taps can be selected either from the power amplifier or a control console.

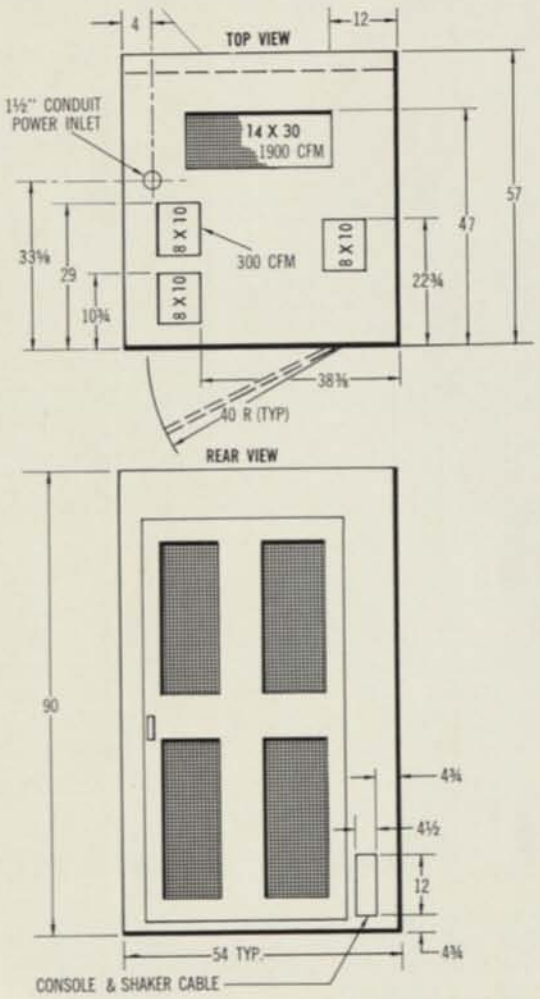
METERING: The following panel meters are provided
(1) Output Current
(1) Output Voltage
(1) Field Current
(2) Power Amplifier Plate Current
(1) Power Amplifier Plate Voltage
(2) Power Amplifier Bias Voltage
(2) Power Amplifier Filament Voltage
(1) Driver Amplifier Plate Voltage
(1) Pre-Amplifier Plate Voltage
(1) Filament Running Time

POWER REQUIREMENTS: 420, 440, 460, 480 Volts 3∅, 60 cps, 68 KVA amplifier and field supply.

COOLING REQUIREMENTS: Air cooling of cubicles, vacuum tubes and heat generating components is afforded through self-contained fans exhausting approximately 2200 cubic feet per minute.

TOTAL WEIGHT: 4,000 pounds.

ALL DIMENSIONS IN INCHES



OPTIONAL ACCESSORIES:

1. Field and Degaussing Supply
2. Armature Protector

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TELEPHONE ORchard 6-1100

LING-TEMCO ELECTRONICS, INC.
BULLETIN NO. A 10/12C-1260
LING ELECTRONICS DIVISION • 1515 S. MANCHESTER AVE. • ANAHEIM, CALIF. TELE. PROSPECT 4-2900

LING ELECTRONICS

HIGH POWER ELECTRONICS FOR
VIBRATION TESTING • ACOUSTICS • SONAR

Model PP20/24c POWER AMPLIFIER

AIR COOLED

20,000 VA

ELECTRONIC VIBRATION POWER GENERATOR

A Ling conception — Ling Electronics was first to conceive and build high power amplifiers to drive electrodynamic shakers. Ling continues its leadership by offering power generators of proven design and reliability . . . the direct result of employing sound engineering practices and highest quality components and workmanship.

Completely self contained — Two attractively styled, compact cabinets house transformers, field supply and armature protector. This amplifier built for driving an electrodynamic shaker presents the finest in LING quality engineering, design experience and personal production line attention.

All control circuitry included in amplifier — No console is required for amplifier operation. If remote control is desired, all the important amplifier controls and meters may be duplicated in a LING control console.

Complete front panel metering of all important operating functions.

Foolproof interlock system — Ling engineering provides full safeguards for personnel and equipment safety. Opening any door automatically turns off power, shorts out all high voltages and energizes convenience outlets and service lights.

Instantaneous overload protection designed into critical circuits to protect all system components . . . yet permits rapid reset to normal operation, insuring minimum downtime.

Walk in accessability provided at rear of each cubicle allows easy inspection and maintenance. A break away panel is also provided in the front of each cubicle.

Rated Conservatively — Conservative 20 KVA rating insures longer component and tube life with minimum maintenance.

Maximum reliability — The Ling Model PP 20/24C Amplifier, like all Ling Amplifiers, is designed, built and rated for continuous operation at full output.

Model PP20/24c POWER AMPLIFIER

SPECIFICATIONS

POWER OUTPUT: 20 KVA at any load power factor from 0.2 leading or lagging to unity, 20 to 3,000 cps. 20 KVA into resistive load 20 to 5,000 cps. Output voltage decreases proportional to frequency 20 to 5 cps at rated current.

PLATE DISSIPATION: 24 KW continuously.

TOTAL HARMONIC DISTORTION: Less than 1% 100 to 2,000 cps
Less than 2% 20 to 5,000 cps

FREQUENCY RESPONSE: ±1 db 10 to 10,000 cps

NOISE AND HUM: At least 70 db below rated output. Direct current on output amplifier filaments eliminates 60 cps intermodulation.

DUTY: Rated for continuous duty at full output.

INPUT VOLTAGE: 1.0 volts rms max. for full power output

INPUT IMPEDANCE: 10K ohms. Source impedance should be 600 ohms or less.

OUTPUT AMPLIFIER TUBES: 2 Machlett type ML 5531.

OUTPUT VOLTAGE TAPS: Taps are provided to drive the selected shaker for proper sine or random wave operation. Taps can be selected either from the power amplifier or a control console.

METERING: The following panel meters are provided

(1) Output Current
(1) Output Voltage
(1) Field Voltage
(1) Field Current
(1) Degaussing Current
(2) Power Amplifier Plate Current
(1) Power Amplifier Plate Voltage
(2) Power Amplifier Bias Voltage
(2) Power Amplifier Filament Voltage
(2) Driver Amplifier Cathode Current
(2) Driver Amplifier Plate Voltage
(1) Pre-Amplifier Plate Voltage
(1) Filament Running Time
(1) Power Amplifier Plate Dissipation

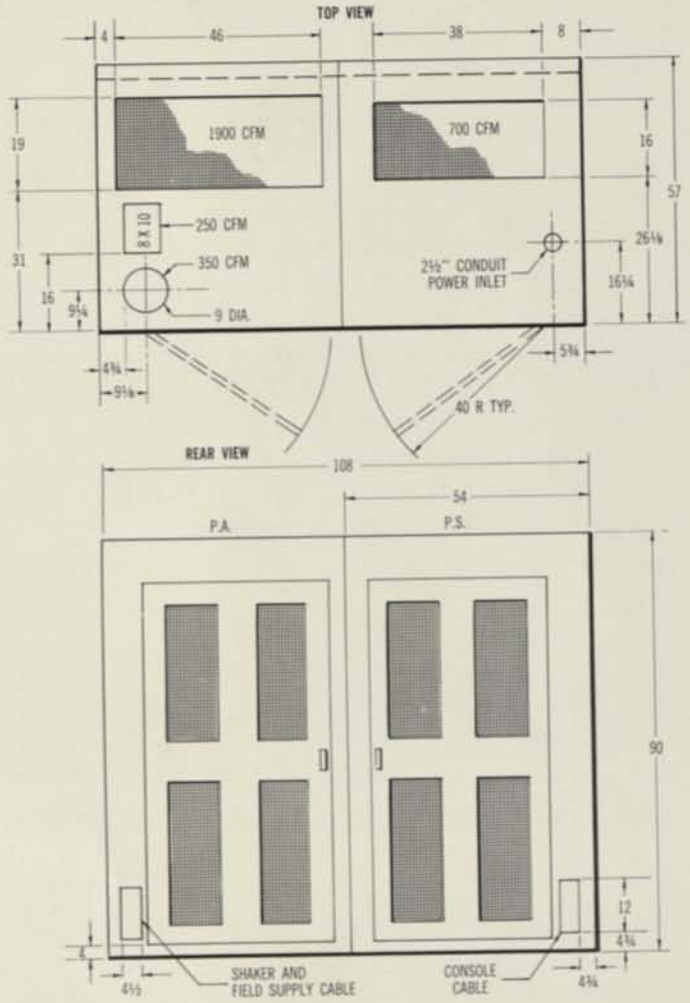
The complete metering supplied greatly simplifies maintenance and eliminates the necessity of hazardous checking procedures involving the bypassing of protective interlocks.

POWER REQUIREMENTS: 440, 460, 480 Volts 3∅, 60 cps, 90 KVA amplifier and field supply.

COOLING REQUIREMENTS: Air cooling of cubicles, vacuum tubes and heat generating components is afforded through self-contained fans exhausting approximately 3200 cubic feet per minute.

TOTAL WEIGHT: 6,500 pounds.

ALL DIMENSIONS IN INCHES



OPTIONAL ACCESSORIES:

1. Field and Degaussing Supply
2. Armature Protector

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TELEPHONE ORchard 6-1100

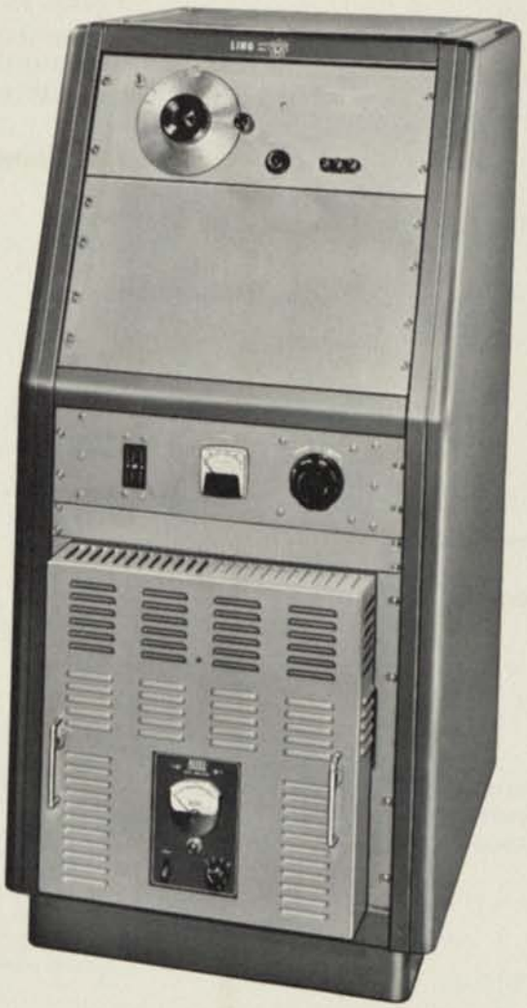
LING ELECTRONICS

BULLETIN NO. A 20/24-361

1515 SOUTH MANCHESTER AVENUE • ANAHEIM, CALIFORNIA

LING

Model RA-250 AMPLIFIER



vibration testing system

HUGH MARSLAND & CO.
REPRESENTATIVES
6699 LINCOLN CHICAGO 45, ILL.
TELEPHONE ORchard 6-1100

SMALL FLOOR SPACE REQUIREMENTS for compact laboratory installations.

COMPLETELY SELF-CONTAINED in one single vertical-rack cabinet including amplifier, oscillator, operating controls and meters—requires no console.

AIR COOLED and operates from one power source.

INTEGRATED FIELD AND DEGAUSSING SUPPLY.

NO OUTPUT IMPEDANCE TAP CHANGING REQUIRED.

MAXIMUM RELIABILITY—this unit is designed and rated for continuous operation.

See reverse side for specifications

model RA-250 amplifier

LING

SPECIFICATIONS

COMPONENTS:

1 Electronic Power Supply housed in special cabinet.
1 Field and Degaussing Supply
1 Manual Oscillator DY-2200

ELECTRONIC POWER SUPPLY SPECIFICATIONS:

Altec 260A Rack Mount Amplifier

Power Output: 250 watts 40-15,000 cps
Frequency Range: 5-70,000 cps
Frequency Response: at 10 watts output
±0.5 db 20-20,000 cps
±3 db 5-70,000 cps
Distortion: Less than 3% 10-10,000 cps
Noise Level: 70 db below rated output
Power Input: 8 amps—120 vac (+10% taps provided) 60 cps
Output Current: Full output current available 5-70,000 cps

SYSTEM SPECIFICATIONS:

Frequency Range: 5-2000 cps
Hum and Noise: Less than .1 "g"
System Operation: Continuous: This system will supply its full rated output over the entire specified frequency range without impedance changing and power correction factor

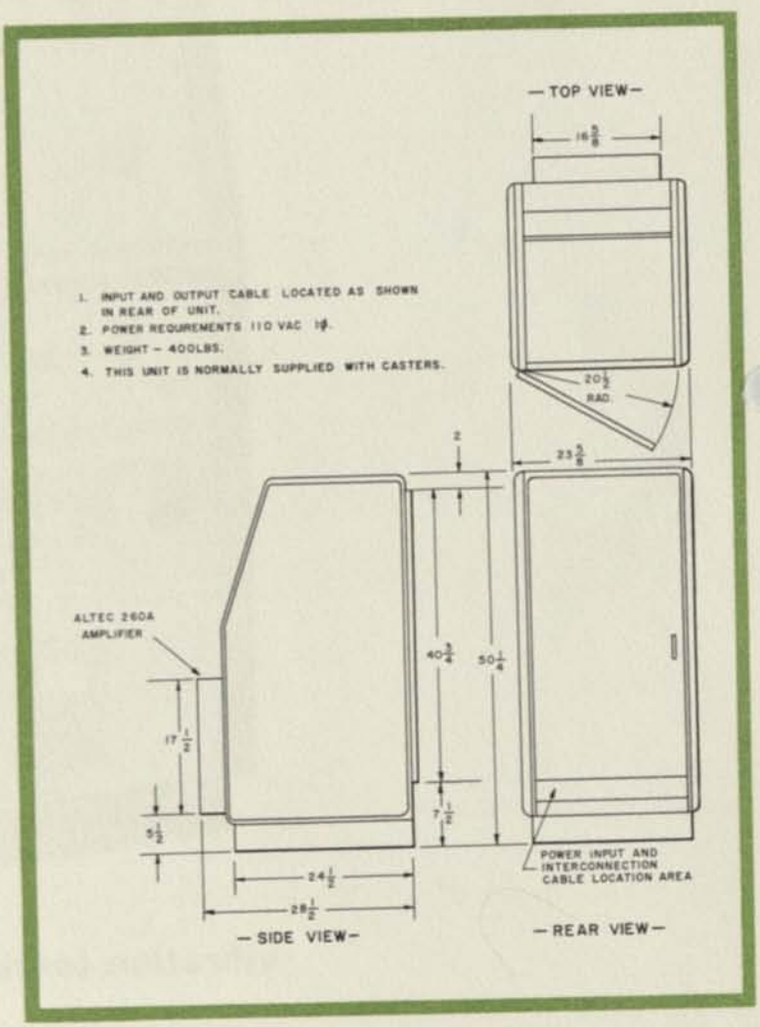
OSCILLATOR SPECIFICATIONS:

Dymec DY-2200 (Manual) Rack Mount

Frequency Range: 5-5,000 cps
Frequency Response: ± 1 db 5-5,000 cps
Distortion: Less than 1% 5-5,000 cps
Total Weight: 400 pounds

OPTIONAL EQUIPMENT

S-12-D DISPLACEMENT ACCELERATION METERING CHASSIS
225 WITH SP-225 SIGNAL MONITOR
M14 VIBRATION METER



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LING-ALTEC ELECTRONICS, INC.

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LING

Model CP-5/6 SINE-O-MATIC

HUGH MARSLAND & CO.
REPRESENTATIVES
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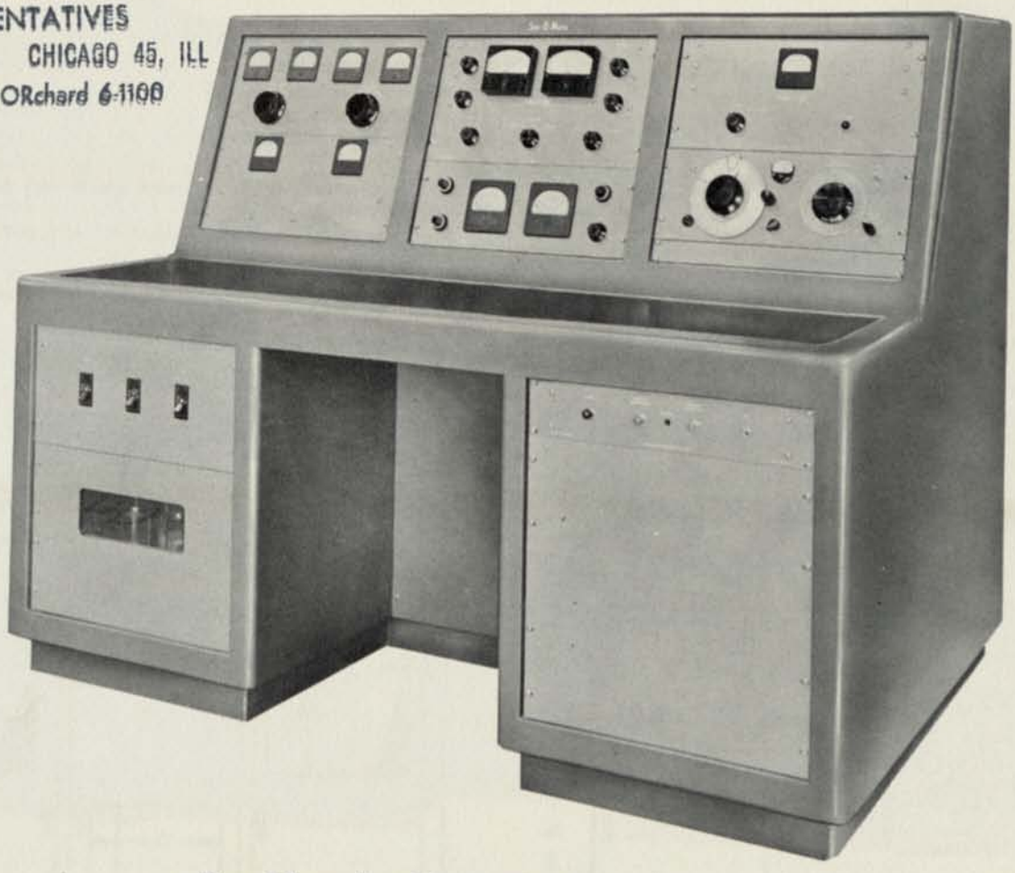
TELEPHONE ORchard 6-1100



vibration testing system

THE LING SINE-O-MATIC is a completely packaged, automatic cycling, sine wave vibration testing system. Designed for use where continuous output and fully automatic programming and operation are desired, it is ideal for production-type vibration testing and reliability programs.

A SINGLE, COMPACT UNIT contains all components of the system except the shaker itself. The power generator, field and degaussing supply, cycling oscillator, servo system, and stop-start controls are housed in the convenience of a desk-type console.

EQUIPPED WITH SWIVEL CASTERS, it is quickly and easily moved to other locations as required.

THE SINE-O-MATIC now makes it possible and economically practical for even the smaller manufacturers and sub-contractors to obtain the benefits of a vibration testing program, and for all users it provides an efficient system for conducting all tests called for under MIL-E-5272.

See other side for specifications

model CP-5/6

SINE-O-MATIC

LING

SPECIFICATIONS

COMPONENTS:

1 Electronic Power Supply housed in special console cabinet. Model CP-5/6
1 Field and degaussing supply
1 Automatic Cycling Oscillator, Model CO-10-A
1 Automatic Servo System, Model S-11-D1

ELECTRONIC POWER SUPPLY SPECIFICATIONS:

Frequency Range: 5 to 10,000 cps
Frequency Response: ±1 db, 5 to 10,000 cps
Distortion: Less than 1.5%, 5 to 5000 cps
Output Current: Full output current available, 5 to 10,000 cps
Output Voltage: Full output voltage available, 30 to 10,000 cps
Voltage below 30 cps proportional to frequency
Noise Level: 60 db below full output
Power Input: 10 KVA, 440, 460, or 480 volts, 60 cycles, 3 phase
Power Output: 5000 watts
Plate Dissipation: 6000 watts

SYSTEM SPECIFICATIONS

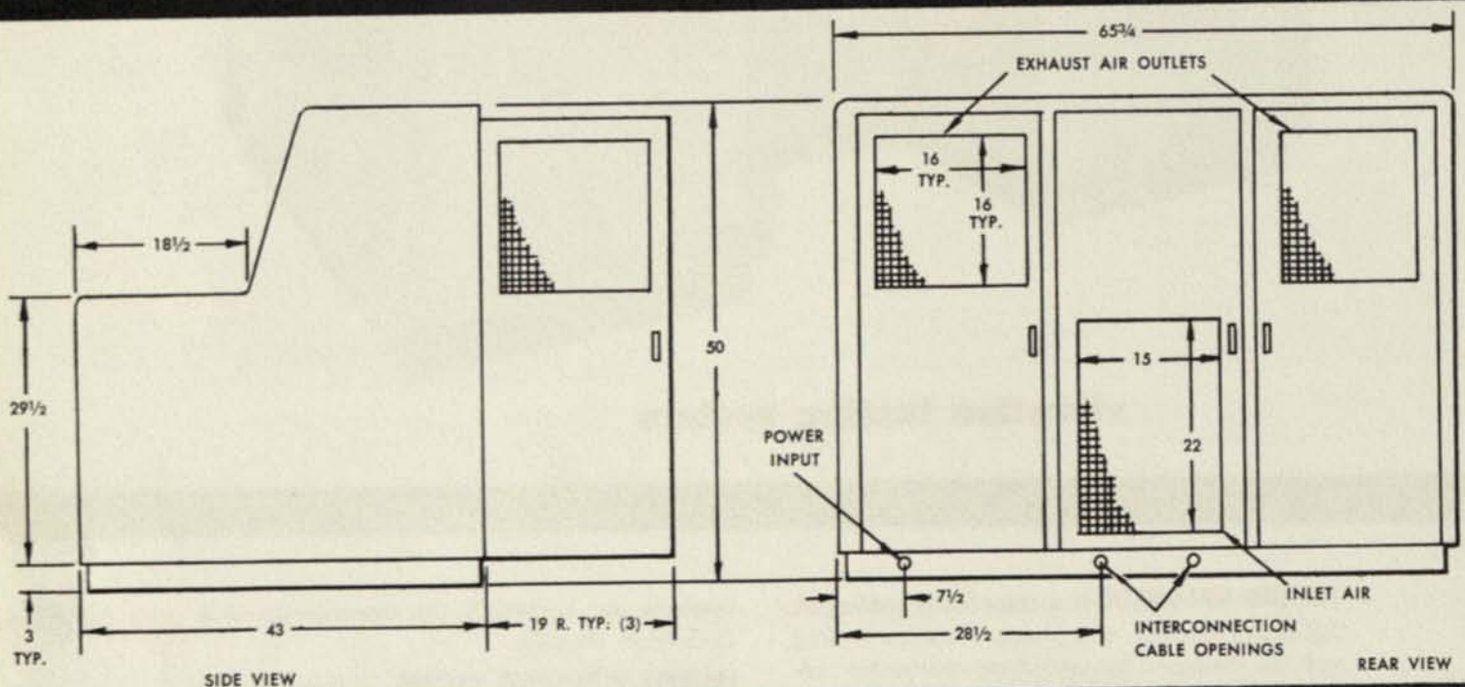
Frequency Range: 5 to 5000 cps
Hum and Noise: Less than 0.1 "G"
Sine Wave (Autocycling) operation:
Automatic Cycling: 5 to 5000 cps
Servo Control:

Acceleration and/or displacement maintained to ±3% over frequency range.

Simultaneous metering of displacement and acceleration provided.

Automatic transfer from constant displacement to constant acceleration (or vice versa) without stopping system.

Weight: Sine-O-Matic Console, 2300 pounds net.



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LING

Model CP-5/6R RAND-O-MATIC

HUGH MARSLAND & CO.
REPRESENTATIVES
6699 LINCOLN CHICAGO 45, ILL.
TELEPHONE ORchard 6-1100

RANDOM NOISE AND SINE WAVE VIBRATION TESTING SYSTEM

THE LING RAND-O-MATIC is a completely packaged, automatic cycling, random and complex wave vibration testing system. Designed for use where continuous output and fully automatic programming and operation are desired, it is ideal for production-type vibration testing and reliability programs.

A SINGLE, COMPACT UNIT contains all components of the system except the shaker itself. The power generator, field and degaussing supply, instrumentation and stop-start controls are housed in the convenience of a desk-type console.

THE RAND-O-MATIC now makes it possible and economically practical for even the smaller manufacturers and sub-contractors to obtain the benefits of a vibration testing program, and for all users it provides an efficient system for conducting all tests called for under MIL-E-5272.

SEE OTHER SIDE FOR SPECIFICATIONS

model CP-5/6R

RAND-O-MATIC

LING

SPECIFICATIONS

COMPONENTS:

1 Electronic Power Supply housed in special console cabinet, Model CP-5/6
1 Field and Degaussing supply
1 Automatic Cycling Oscillator, Model CO-10-A
1 Automatic Servo System, Model S-11-D1

Space Provided for the Following Optional Equipment:

2 Graphic Equalizers, EG-10-B
1 Mixer Amplifier, MA-2-A
1 Clipper Amplifier, CA-2-B
5 Peak and Notch Filters, EPN-10
1 Peak and Notch Power Supply, PL-10-A5
1 Cathode follower, CF-3-B
1 Cathode follower power supply, PL-3-A
1 Low Pass Filter, LP-10-B
1 Power Supply for selector switch, PL-P1
1 Noise Generator General Radio 1390-A
1 Band Pass Filter Krohn-Hite 330MR
1 Oscilloscope, Hewlett-Packard, HP 122AR
1 RMS Meter, Ballantine 320
1 X-Y Plotter, Moseley 2A
1 Frequency Counter, Westport WE-110-L

ELECTRONIC POWER SUPPLY SPECIFICATIONS:

Frequency Range: 5 to 5000 cps
Frequency Response: ± 1 db, 5 to 5000 cps
Distortion: Less than 3%, 5 to 5000 cps
Output Current: Full output available, 5 to 5000 cps
Output Voltage: Full output voltage available, 30 to 5000 cps
Voltage below 30 cps proportional to frequency
Noise Level: 60 db below full output
Power Input: 10 KVA, ~~440~~, 460, or 480 volts, 60 cycles, 3 phase
Power Output: 5000 watts
Plate Dissipation: 6000 watts

SYSTEM SPECIFICATIONS:

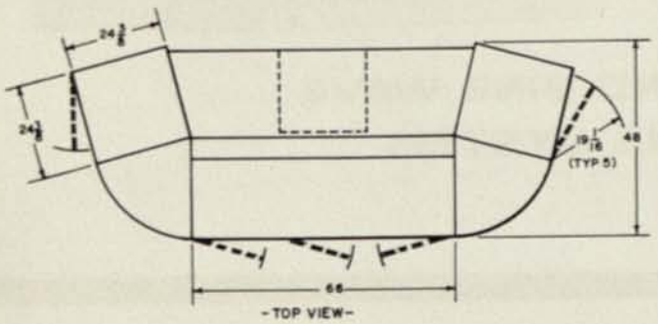
Frequency Range: 5 to 5000 cps
Hum and Noise: Less than 0.1 "G"

SINE WAVE (AUTOCYCLING) OPERATION:

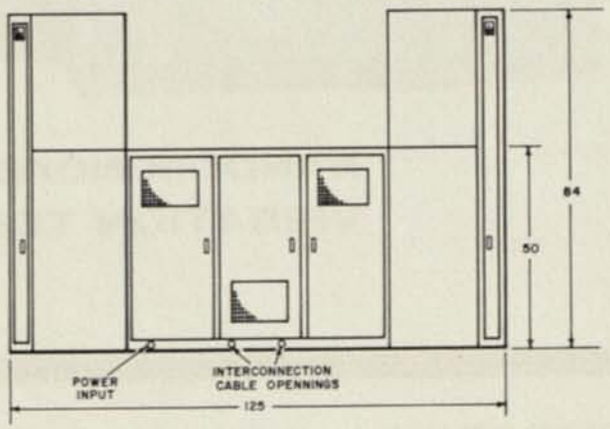
Automatic Cycling: 5 to 5000 cps
Servo Control:
Acceleration and/or displacement maintained to ± 3% over frequency range.
Simultaneous metering of displacement and acceleration provided.
Automatic transfer from constant displacement to constant acceleration (or vice versa) without stopping system.
Weight: Rand-O-Matic console, 2300 pounds net.

RANDOM AND COMPLEX WAVE OPERATION:

Overall system frequency response (transfer function) with compensation (equalization)
± 1 db 20-2000 cps
± 3 db 5-2000 cps



-TOP VIEW-



-REAR VIEW-

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