

INSTALLATION PROCEDURES

FOR



Norelco® UNIVERSAL
70/35mm PROJECTOR

the original PHILIPS TODD-AO®

NORTH AMERICAN PHILIPS COMPANY, INC.

Norelco

MOTION PICTURE EQUIPMENT DIVISION

100 EAST 42nd STREET • NEW YORK 17, N. Y. • PHONE OXFORD 7-3600

FOREWORD

IMPORTANT

Refer to the Instruction and Operating Manual before unpacking or assembly.

Before an installation is started, it is essential that all required material and services be on hand or on order with a guarantee of availability when needed. This cannot be overstressed since in the past some openings have been jeopardized because the theatre failed to provide the required necessities.

The NORELCO equipment should not be unpacked before any required booth reconstruction work is completed and the booth cleaned. Expensive damage can be caused to the projector equipment if the above is not adhered to.

NORELCO cannot be responsible for damage due to mishandling, incorrect installation, or failure to follow instructions.

Be sure you have arranged for:

Installation Supervision of the Sound Equipment

Projectionists

Electricians

Plumbers

Carpenters (if required)

Masons (if required)
Tinsmiths (if required)
Stage-hands (if required)
Laborers (if required)

BE SYSTEMATIC AND THOROUGH. It will save money during the installation and prevent costly last minute emergencies.

The NORELCO equipment properly installed and properly used can be expected to fill your projection requirements for many years. Wise planning and purchasing can effect considerable savings but do not economize falsely by diverting from specifications.

In addition to the NORELCO equipment and accessories listed on the next 4 pages, there follows a check list of the major items that will be required for a 2 machine installation. This list may vary slightly dependent upon local conditions, but it is essentially correct. Be sure your material requirements are under control. Use the check list as a guide.

NORELCO UNIVERSAL 70/35 MM, MODEL DP 70
MOTION PICTURE PROJECTION EQUIPMENT

FOR A 2 MACHINE INSTALLATION

2 EACH

NORELCO Universal 70/35 MM, Model DP 70 Motion Picture Projector, complete with base, arc-lamp bracket, upper and lower magazines, 24 and 30-FPS drive motors, 4" eccentric lens adapter, magnetic sound head with 10 track magnetic pick-up head, optical sound head, and 35 MM conversion kit in oak storage case. One operating spare parts kit. One instruction manual and parts catalog.

The above consisting of and packed as follows:

2 EACH

CASE #1: Lower base with leveling screws and plumbing.

CASE #2: Upper base, lower magazine and takeup drive assembly complete with wiring, plumbing and optical preamplifier with exciter lamp and photocell and dowsor power supply with filter assembly.

CASE #3: Projector head with built-in magnetic sound head - less lens bracket, door, hinges and optical sound head.

CASE #4: Upper magazine.

CASE #5: Arc-lamp bracket.

CASE #6: Motor drive details, 24 and 30-FPS.

CASE #7: Door for projector head.

CASE #8: Set accessories for projector head, including 35 MM conversion parts in oak storage case, #3141 eccentric lens adapter (4" I.D.), lens bracket, hinges, magnetic flywheels, magnetic cluster and optical sound head.

1 EACH

CASE #8a: One #3130 operating spare parts kit, per attached list.

CATALOG #3130 SPARE PARTS KIT FOR NOBELCO
UNIVERSAL 70/35 MM PROJECTOR TYPE DP 70

<u>QUANTITY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
2	3130-11	Studs for assembling top motor
1	3030-123	Rectifier (Dowser)
1	3063-2M	Capacitor, start
1	3130	Allen Wrench Set (5/64, 3/32, 5/32, 7/32 1/4, 5/16)
1	3130-7	Socket Wrench Screwdriver handle 9" (35 MM Conversion)
1	3051	Tube - 6J7
1	3052	Photocell RCA 918
1	3053	Exciter Lamp 9V4A - Pre-focused base
1	3065	Belt - Gilmer Timing 270L-050
10	3030-159	Lamp GE 55
1	3131	Shell Turbo #33 Projector Oil - 1 Gallon
1	3063-3	Run, Capacitor
1	3030-22	Micro Switch
2	P5-635-21	70 MM Pad Roller (Nylon)
2	P5-635-22	35 MM Pad Roller (Nylon)
1	3030-16	Felt Disc
1	Cl-605-48	Leaf Spring
1	3130-10	Wrench Socket for lower motor cap screws

NORELCO 70/35 MM MOTION PICTURE PROJECTOR DP 70

WEIGHTS & DIMENSIONS OF CASES

		INCHES			
		H	W	D	LBS.
CASE #1	Lower Base	48	x 26	x 23	276
CASE #2	Upper Base	33	x 31	x 21	346
CASE #3	Projector Head	36	x 27	x 25	374
CASE #4	Upper Magazine	31	x 31	x 17	130
CASE #5	Arc Lamp Bracket	41	x 18	x 18	150
CASE #6	Motor Drive Assembly	24	x 22	x 16	127
CASE #7	Door	31	x 29	x 12	60
CASE #8	Misc. Assemblies	29	x 27	x 26	228
CASE #8A	Spare Parts	14	x 14	x 10	17

TOTAL WEIGHT CASES #1 THROUGH #8 - 1,691 lbs.

TOTAL WEIGHT OF TWO PROJECTORS, OR,
A COMPLETE NORELCO PACKAGE - 3,382 lbs.

ACCESSORIES SUPPLIED BY THE
NORELCO THEATRE SUPPLY DEALER

The 70 MM film handling accessories required are:

1. Four Goldberg 70 MM reels, 22 inches diameter.
2. Neumade rewind table, complete with built-in motorized rewinds, enclosed motor, foot control, etc.; two utility drawers; finished in olive gray enamel baked-on; approximate size of table 65" x 30" x 36" high.
3. One pair Neumade Dynamic 70 MM hand rewinds, ball-bearing, both ends geared, one with arm brake.
4. One Neuscope 70 MM splicer.
5. Three 3-section approved storage cabinets with hollow wall construction for each section, self-closing doors with individual handles and index facilities. Finished in olive gray enamel baked-on. Each cabinet 19"W x 27"D x 32"H. (2 cabinets can be stored underneath rewind table.)

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Order
Date

From

On
Hand

SOUND SYSTEM, with compatibility for 6-track or 4-track magnetic and one-track optical recordings.

Major items required include:

6 Pre-amplifiers, minimum.

Filament and plate voltage power supplies for above

Switching panels for selecting 6-track magnetic, 4-track magnetic or single track optical reproduction.

Level balancing and equalizing facilities for 6-track and 4-track magnetic reproduction from each projector.

Volume control panels, consisting of ganged control for stage and separate control for surround speakers.

Sound changeover panel at each projector.

Power supply for exciter lamps, capacity 8 amperes - 9 volts D.C.

6 power amplifiers (minimum)

5 stage speakers (identical)

Surround speakers and enclosures, as required.

70 V. matching transformers; 1 for each surround speaker.

1 70 V. distribution transformer.

Picture Changeover Switching, consisting of:

2 D.P.D.T. wall switches, or

1 Potter-Brumfield Latching Relay type

KB-17-A/115V. A.C. Coils and

2 S.P. Momentary contact foot switches.

2 Arc lamps capable of properly "covering" the 70 MM aperture. (Note 1) This requirement infers the use of a 13.6 MM positive carbon, "cold" mirrors when the lamps employ reflectors, and water-cooled jaws in certain models of suitable lamps.

Positive Carbons) Per lamphouse manufacturers
Negative Carbons) specifications.

2 Rectifiers with capacity to handle power requirements of lamps that are to be used.

OR

1 (or 2) Generator(s) of required capacity..

2 Ballasts with resistive capacity capable of reducing generator voltage to required arc voltage at rated arc current, and equipped with low current burn-in tap.

2 Knife switches - 3 blade burn-in type with capacity for lamp current that is to be used.

Order
Date

From

On
Hand

Cooling (Note 2) If city water is not used for cooling of projector apertures, Supply

1. Water recirculator for projector apertures connected in series and
2. Water recirculators for lamps if latter have water-cooled jaws.

Port Hole Shutter Frames.
Port Hole Glass (See Note 4).
Port Hole Glass Brackets.
Lamp exhaust stacks.
Lamp exhaust fan.
Tinsmith's services.
Mason's services (port hole or booth changes)
Carpenter's services (port hole or booth changes)
Booth floor covering)
Booth acoustic treatment) as required
Booth painting)
Automatic pressure regulating valve) 30-40 lb.
Water Pressure gauge) range (Note 3
Master shut-off valve, machine shut-off valve and drain check valves.
Plumber's services.
Electrical conduit, troughs, wires, switches, panels.
Electrician's services.
Screen frame - adjustable curve type.
Screen - non-metallic surface - medium gain x 1.2 or x 1.3.
Masking materials
Curtain track)
Curtain) as required
Curtain control)
Stage hands and erection supervision/labor for screen frame, masking, etc., as required.

NOTE 1: Operating current range 120 to 150 amperes.

NOTE 2: City water cooling recommended for projector film gates.

NOTE 3: When city water is used for cooling required.

NOTE 4: Glass obtainable from:

(a) National Theatre Supply as "Maltese Parallel Lens (Waterwhite)" Manufactured by Semon Bache & Co. N.Y.C. Maximum size available 20" x 40"

OR

(b) Pittsburgh Plate Glass Company
1 Gateway Center, Pittsburgh 22, Pa., as
"Ophthalmic Glass Plates" - 3/8" thick

OR

(c) Huff Manufacturing Company
3774 Selby Avenue
Los Angeles, California - as "Porthole Glass"

OR

(d) Fish-Schurman Corporation
70 Portman Road
New Rochelle, N. Y. - as "Porthold Polished Crown"
(Waterwhite)

WARNING: Procure glass immediately - do not substitute
common plate glass in projection ports -
distortion, color degradation and light loss
can result.

SOUND EQUIPMENT

The sound installation will be the responsibility of a duly hired organization other than NORELCO. Experience to date has shown that much of the sound installation can often be performed without interfering with regular performances.

A copy of the recommended sound specifications for 6-track reproduction is included herewith. It will be the responsibility of the supplier of the sound equipment to provide all necessary drawings and technical data.

If booth space is limited, and the present sound system location must be utilized for the NORELCO 70/35 Equipment, it is suggested that the existing equipment be jury-rigged in another location to clear the required area. This should allow for:

- Location of Racks
- Installing Troughs and Conduits
- Mounting Front Wall Controls
- Mounting 70 V Distribution Transformer Box
- Pulling required wires in Booth
- Partial Connections
- Mounting and wiring to Surround Speakers
- Running back stage conduit and wires.

Consult with your sound installation engineer.

The NORELCO magnetic cluster sockets are factory-wired with 7' long cables suitably labeled and covered with a 6' long

flexible conduit. Termination can be made in a box on front wall to the left of each projection port at a convenient height. This box must be connected to the pre-amplifier rack or cabinet with suitable conduit. Some sound equipments, such as Ampex, are shipped with the necessary cables to connect between the rack and the box. Where this is not the case a tightly twisted pair, shielded and jacketed, must be available.

The following types of cable have been used in past installations:

ALPHA Type #2256

BELDEN Type #8737 #22 stranded twisted pair, spiral shield, plastic jacket (.160" O.D.)

SUPRENANT 2-S-BUB 7340 JS2 #26
2 wire shielded cable (.138" O.D.)
Manufactured by Suprenant Mfg. Co.
Boston, Mass.

PORT HOLES

Existing projection and observation ports might require enlargement and relocation. (See Port Hole Chart). Particular attention must be paid to the specified splay angles. Port shutters and frames should be installed and one of the recommended types of projection port glass installed with the top of the projection glasses tilted back toward the projector approximately 20°. REMEMBER TO ALLOW FOR CLEANING CONVENIENCE ON ALL GLASSES. Glass must be set in sponge rubber, etc., so that there are no air leaks...spaces between frames and walls should be caulked or plastered. The machines run at a higher speed and move much more film than a 35 MM projector with a resultant higher noise level in instances where booth walls and ceiling are not acoustically treated.

All port work should be done before the new projectors are unpacked and moved into the booth in order to avoid costly damage to the equipment.

Generally speaking, the size and location of the 70 MM ports will allow their use with existing 35 MM equipment.

The recommended distance between the optical center line of projectors is 5'. This provides good working and servicing conditions. Observation ports 18" square and with the bottom edge 48" from the booth floor are desirable. This allows the projectionist to observe a major portion of the large screen when standing at the rear of the lamp.

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ELECTRICAL REQUIREMENTS

PROJECTORS - LAMPS

Drawing 100-B (included herewith) provides the essential electrical requirements for the NORELCO projectors. By referring to Figure 1 and Port Hole Chart the required location for each projector, of the 12" x 12" floor opening can be determined.

It is highly desirable that this opening be made before the NORELCO equipment is unpacked and placed in order that a maximum of electrical work be performed prior to theatre shut-down. All boxes or conduits should be installed flush with, or below, the booth floor level.

Where old fashioned 3 point pedestals are in use, or where center to center spacing of present pedestals is other than the 60" specified for the NORELCO equipment, cutting these holes and starting the electrical work can be accomplished quite readily. In other cases, existing openings might be enlarged or modified to accommodate the specified conduits; or the existing bases might be temporarily shifted while the required work is performed.

In addition, the new arc lamp power supplies might be located, control switches installed, conduit provided and wires pulled. Resorting to temporary relocation of existing power supplies may be required.

In some cases foot switch operated picture changeovers will be preferred by projectionists. Drawing 100-B and the accompanying sketch "2 Machine Foot Operated Changeover Circuit" provides all the necessary data. Where hand-operated changeover switches are preferred, omit the 6" x 6" box on front wall (100-B) and the foot switches and P-B relay shown in the check list. Figure 18A, page 20 of the Catalog P-1955 Instruction Manual shows the necessary circuitry for hand switch changeovers. NOTE THAT IN THIS CIRCUIT THE 90 VOLT SELENIUM RECTIFIER IN THE #2 BASE IS NOT CONNECTED, leads #51-52 are taped to be used in an emergency only.

PLUMBING REQUIREMENTS

Reference to Figure 1 will allow the plumber to run the cold water supply and drain lines if city water is used for cooling.

The fittings on the NORELCO base have a 1/4" NPT thread. A 3/8" copper tube cold water feed line terminating in a shutoff valve at the "A" locations (Dwg. 100-B) and 1/2" copper tubes with a check valve for drains at each "B" location will allow coupling to the bases after installation. Supply line for both machines can be common, but in the supply line there must be placed a master shut-off valve, an automatic pressure regulating valve and a pressure gauge, all located in the booth.

A safety water flow switch is built into the base of the NORELCO projector to aid in guarding against striking an arc without water flowing. A mean pressure of 30 lbs. is required if this facility is to be used.

After the projectors are in place, the plumber will be required to supply copper tubing and fittings to connect the bases to the lines and to the lamphouses. Fig. 20, Page 22, in the P-1955 Manual depicts the internal water cooling schematic when "city" water is used for cooling. When re-circulators are used it is strongly recommended

Sequence IV
(Booth) Cont.

that one re-circulator be supplied for each lamphouse, and one for cooling the projector apertures connected in series.

SCREEN - FRAME - SPEAKERS

If there are structural changes required, such as plaster column or organ grille removals, attempt to perform this work during off-show hours. It is cheaper than doing it at night on a rush basis with over-time. In most recent installations little or no structural changes have been necessary.

If the new 70 MM screen location indicates that the existing stage must be modified to hold the speakers, arrange for material and labor. Remember that the center of the high frequency speaker must be located $1/2$ to $2/3$ up on the height of the picture. This means that if your picture is 20' high, and the lacing and frame consume 1 foot, then the center of the high frequency horn must be between 11' and 15' above stage floor. Measure from the bottom of the low frequency baffle to the center of the high frequency horn and determine the height of the 5 platforms that you will require to raise the horns to the proper height. Have them built considering any variances for speakers that might not set over the existing stage floor.

REMEMBER, the ideal speaker location is for one in the center of the picture, one at each extreme left and right end and the other two equally centered between the aforementioned three, with all speakers placed close to the screen.

A typical drawing covering these details is included in this Manual. (See Fig. 2)

OVERTIME is expensive. Save money by preparing in advance.

The screen frame is usually erected under the supervision of the supplier, but actually by the stage hands. Items generally required are ladders, mobile scaffolds and hoisting equipment. The need for minor tools, ropes, fasteners, etc., is generally anticipated. Other than the possible removal of any required existing obstructions, little can be done preparatory to closing, in the actual erection of the frame.

However, local situations might make it possible to install the curtain track, the curtain and (possibly) the control equipment, before the actual erection of the screen frame. Of course, where the latter includes facilities for holding the track early erection is precluded.

A final stage item that can be provided for, and possibly installed prior to shutdown, is back-stage draping. The entire area behind the screen-speaker location must be draped with a soft absorbent material, such as discarded curtains, ozite, or other acoustic material. Again, by referring to Fig. 2 a "line" that this material should follow can be determined. If an area 5 feet deep behind the screen curve is located, the absorbent material can be hung from that location.

LENS CALCULATIONS FOR 70 MM FILM

for non-anamorphic processes

Aperture = 1.913" Wide X .868" High

Ratio = 2.2 : 1

For 0° Projection Angle

* * *

Lens E.F." = $\frac{1.913" \times \text{Throw}'}{\text{Width}'}$

* * *

ON A CURVED SCREEN:

Width is length of chord measured from one side edge to opposite side edge of PICTURE.

Throw is measured from film plane to center of picture chord.

* * *

Width' = $\frac{1.913" \times \text{Throw}'}{\text{E.F."}}$

Throw' = $\frac{\text{E.F."} \times \text{Width}'}{1.913"}$

Height' = $\frac{\text{Width}'}{2.2}$

NORELCO 70/35 PROJECTOR DATA

FJP 11-26-60

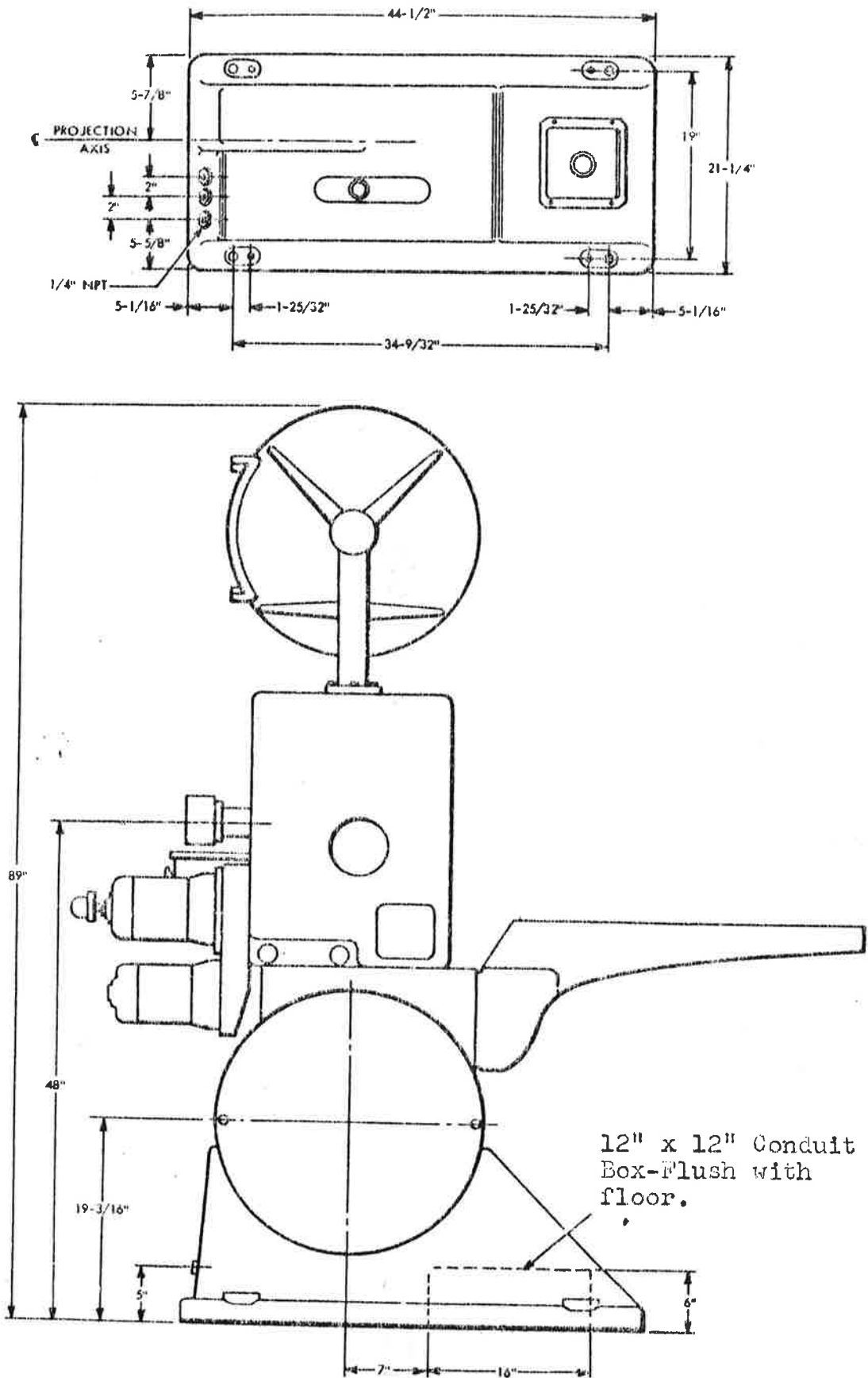
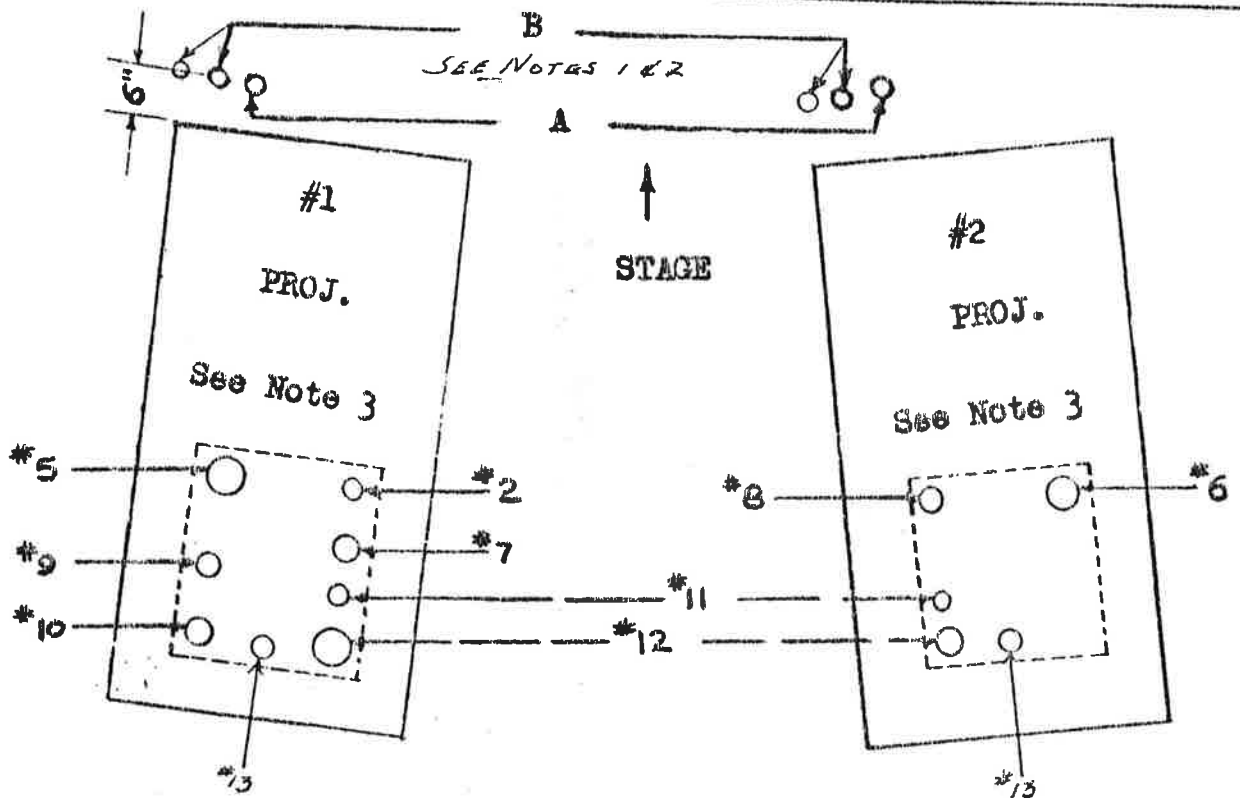
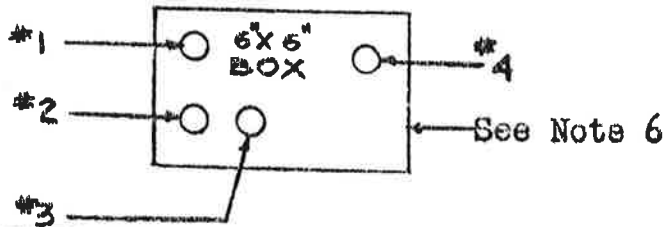


FIG. 1-Dimensions of NORELCO Projector.

FRONT WALL (See Note 4)



ELECTRICAL REQUIREMENTS

1. To power Distribution panel - 2 #14 Cond. (A.C.-110V)
2. C.O. Circuit #1 Projector - 4 #14 Cond. (D.C.)
3. To #1 Projector C.O. Switch - 2 #14 Cond. (A.C.)
4. To #2 Projector C.O. Switch - 2 #14 Cond. (A.C.)
5. To ballast resistors - if Generator 2-4/0 -- 1-2/0 Conds.,
or to rectifiers 2-4/0 (D.C. 180 Amps./65-75 volts)
6. Same as #5.
7. To front wall - for auxiliary motor switch (IF USED)
4 #14 Cond. (See Fig. 18 - Page 19 P-1955 Manual)
8. Same as #7.
9. To magnetic circuit breaker, for generator, or to
rectifier relays-4 #14 Cond. (2 A.C. - 110V Circuits)
10. To Power distribution panel - 3 #10 Cond. (2 A.C. - 110V-Motors)
11. Crossover conduit - 2 #14 Cond. (D.C. - Changeovers)
12. Crossover Conduit - 2 #10 Cond. (A.C. - Motor) 2 #14 Cond. (Arc Control)
13. To power distribution panel - 2 #14 Cond. each machine
for duplex receptacle to be mounted on each base
for arc lamp work light, arc lamp fan and recirculator

SEE NOTE 5

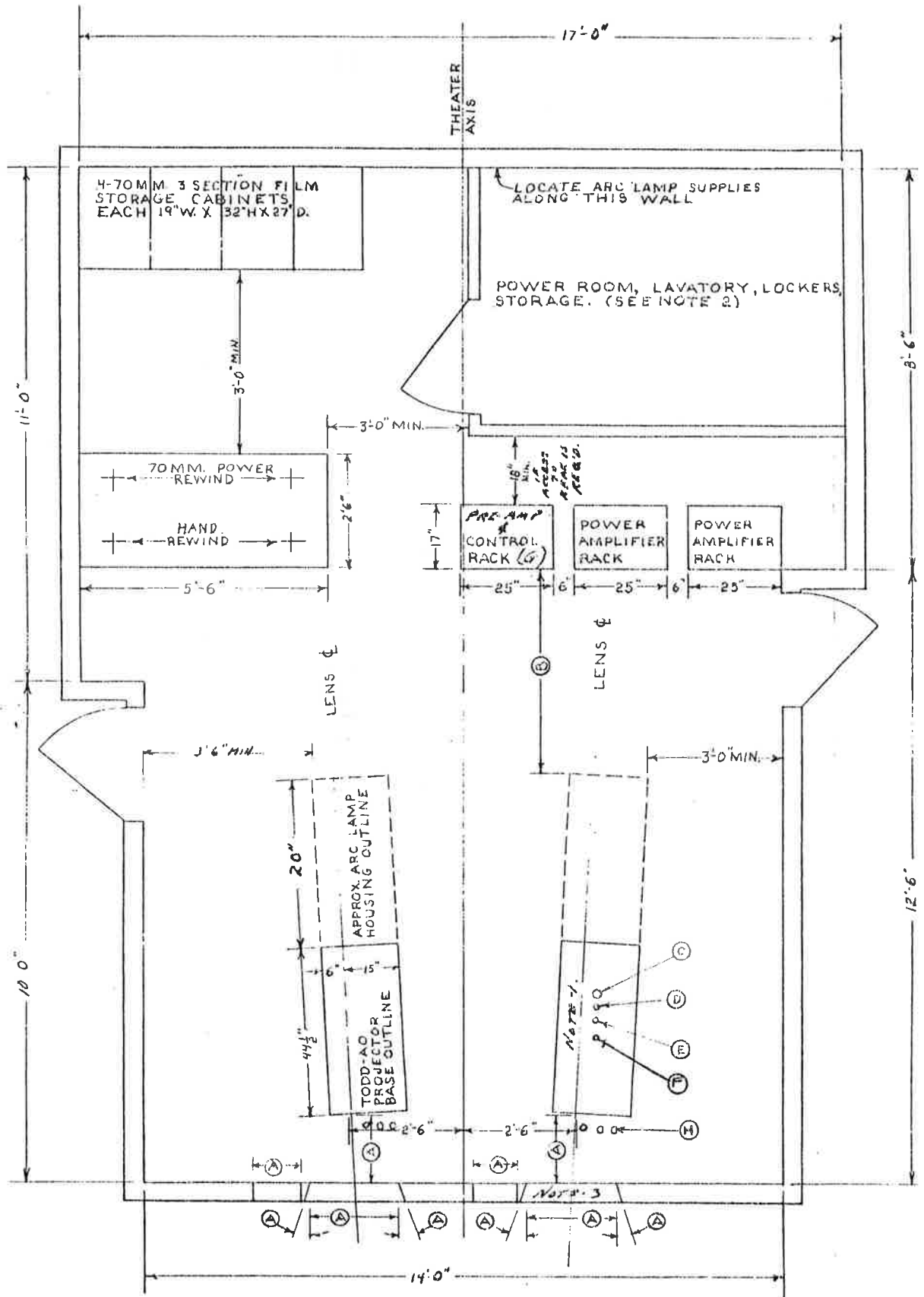
PLUMBING REQUIREMENTS (See Note 1 and 2)

- A. Cold Water Feed - See Fig. 1 Att. - Shutoff Valve Required at EACH Projector.
- B. Drain Line to Waste Pipe or Equivalent - 2 Outlets at EACH Machine. Insert a Check Valve at EACH Projector.

NOTES:

- 1. If water recirculators are used omit A & B.
- 2. Place automatic pressure regulating valve, gauge and master shut-off valve in common water feed line when city water is used. Locate all in booth.
- 3. See Port Hole Chart to locate bases relative to front wall.
- 4. See Port Hole Chart for Port Hole Requirements.
- 5. Sound Wiring Requirements not shown.
- 6. Box and #1, #2, #3, #4, not required if wall type picture changeover switches are used, but a conduit is run from EACH projector base to EACH wall switch box. (See Fig. 18A-Page 20 - P1955 Manual)

Date: 12-1-60 FJP	NORTH AMERICAN PHILIPS COMPANY, INC. NEW YORK, NEW YORK
# 100-B	ELECTRICAL REQUIREMENTS 2 NORELCO PROJECTOR INSTALLATION



TYPICAL BOOTH LAYOUT FOR 2 MACHINE
 NORELCO 70/35 PROJECTION EQUIPMENT
 DO NOT SCALE

LEGEND:

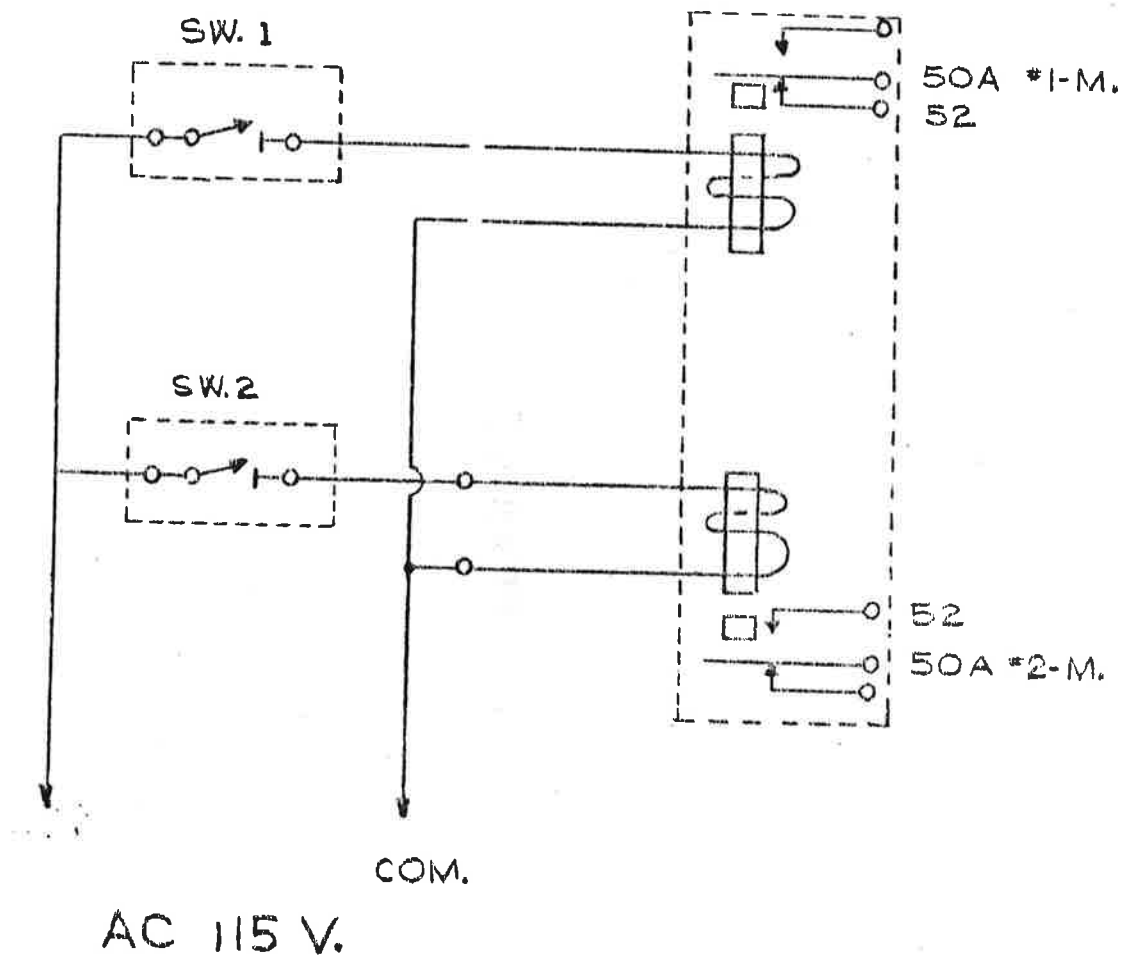
- (A) These dimensions can vary for each installation. Refer to Port Hole Chart.
- (B) This spacing should be 4'6" minimum.
- (C) Conduit for D.C. supply from rectifiers or generator (ballast resistor) to each projector.
- (D) Conduit to A.C. Relays at rectifiers, or A.C. magnetic circuit breaker for generator, with crossover conduit between projectors.
- (E) Conduit from A.C. distribution panel for 115V power supply to projectors, 3 #10 Conductors, with crossover conduit between projectors.
- (F) Changeover and auxiliary motor switch conduit requirements shown on Dwg. 100 B.
- (G) Consult sound service company for sound wiring requirements for each particular system.
- (H) Cooling water requirements: 1 feedline with shutoff valve and drainlines with check valves required at each base, with common feed line equipped with automatic pressure regulating valve, gauge, and master shutoff valve located in booth, if city water is used for cooling lamps and projectors. For recirculators see Seq. 4 Plumbing Reqt.

NOTES:

- (1) For greater detail see Dwg. 100 B titled, "Installation Requirements - 2 Projector Installation" and Figure 1.
- (2) This space arrangement may be dictated by local ordinances and area requirements of various equipment.
- (3) For projection ports use glass listed in Note 4 following check list.

11-29-60 FJP
#100 A

NORTH AMERICAN PHILIPS COMPANY, INC.
NEW YORK, NEW YORK



MATERIAL...

- SW. 1)
- SW. 2) S. P. Momentary-Contact Foot Switches.
(Normally open)
- REL. 1 Latching Relay LK Series - Type LK 17A
115 V. A.C. Coils
Potter-Brumfield, Princeton, Ind.
(or equivalent)

Note: Terminals 50A & 52 will be found on lower (8) terminal strip in Upper bases of each projector. 50A is lower left, 52 is lower right.

<p>2 MACHINE FOOT OPERATED CHANGEOVER CIRCUIT FOR NORELCO PROJECTORS</p>
<p>FJP--11-26-60</p>

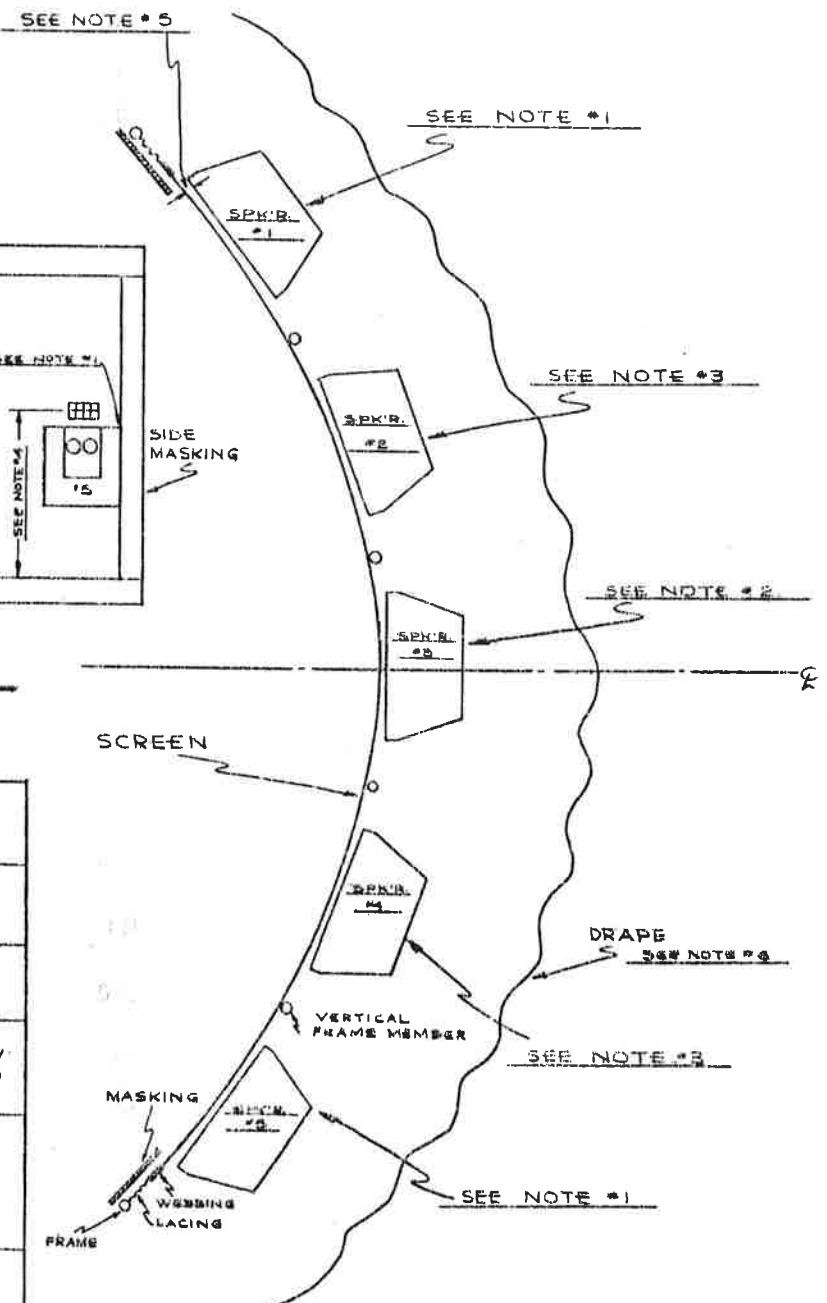
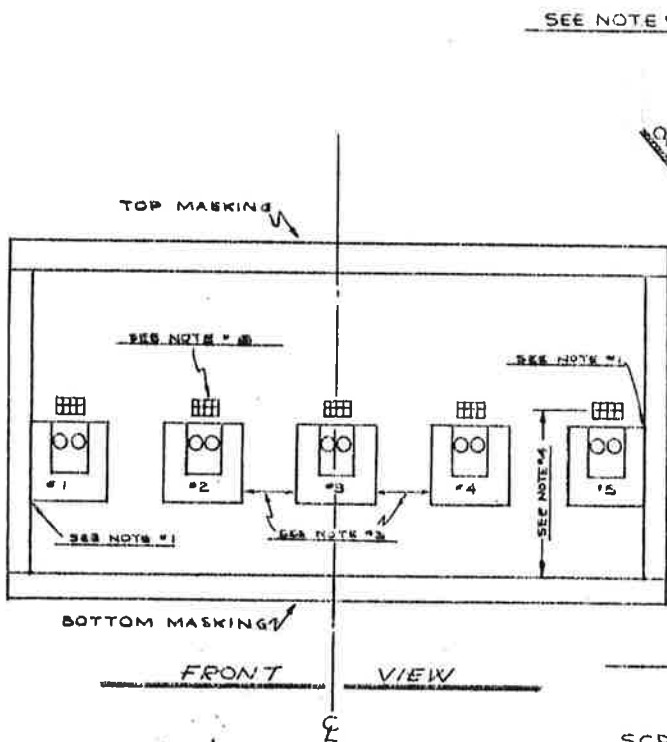
70mm Composite Film Sound
Specifications

1. The frequency response as measured on theatre equipment...
50 - 8,000 cycles flat within plus or minus 1 1/2 db.
40 - 12,000 cycles flat within plus or minus 3 db.
2. Cross talk between channel... minus 40 db. at 1,000 cycles.
3. Signal to noise... minus 55 db.
4. Wow and/or flutter not to exceed 0.2 of one per cent in a band width between 2- 200 cycles.
5. Preamplifier distortion not to exceed one per cent when operated at a level of 12 db. above the level from magnetic film recorded at three per cent distortion.
6. Power amplifier distortion not to exceed two per cent at rated output of the amplifier between 50 and 12,000 cycles.
7. Speakers and power amplifiers should be of such power rating that any single track can properly fill the auditoriums' acoustical needs. The speakers shall not be of the acoustical lens type.

TRACK AND SPEAKER LOCATION

On the six-track portion of the magnetic cluster Track-1 is the outside core closest to the operating side. Continuing in numerical order 2-3-4-5-6. Track 6 is the innermost core.

Track 1 feeds left hand speaker looking at screen, Track 2 left center, 3 center, 4 right center and Track 5 the right speaker. Track 6 is the effects track for surround speakers.



- NOTES:**
- NOTE #1**
#1 & #5 SPEAKER PLACEMENT MUST BE AT EXTREME EDGES OF PICTURE.
 - NOTE #2**
#3 SPEAKER ON CENTER LINE OF PICTURE.
 - NOTE #3**
#2 SPEAKER MUST BE CENTERED BETWEEN #1 & #5 SPEAKERS -- #4 SPEAKER CENTERED BETWEEN #3 & #5.
 - NOTE #4**
SPEAKER ASSEMBLIES MUST BE RAISED SO THAT THE CENTERS OF THE HIGH FREQUENCY HORNS ARE AT THE SAME LEVEL AND LOCATED $\frac{1}{8}$ TO $\frac{1}{4}$ THE HEIGHT OF THE PICTURE.
 - NOTE #5**
SPEAKERS MUST BE PLACED CLOSE AS POSSIBLE TO SCREEN.
 - NOTE #6**
BACK STAGE MUST BE TREATED TO ELIMINATE BACK STAGE REVERBERATION. OLD SOFT VELOUR CURTAINS, OZITE OR SIMILAR MATERIAL CAN BE HUNG FROM AT LEAST THE HEIGHT OF SCREEN TO FLOOR.
 - NOTE #7**
SPEAKER OPENINGS MUST NOT BE OBSTRUCTED.

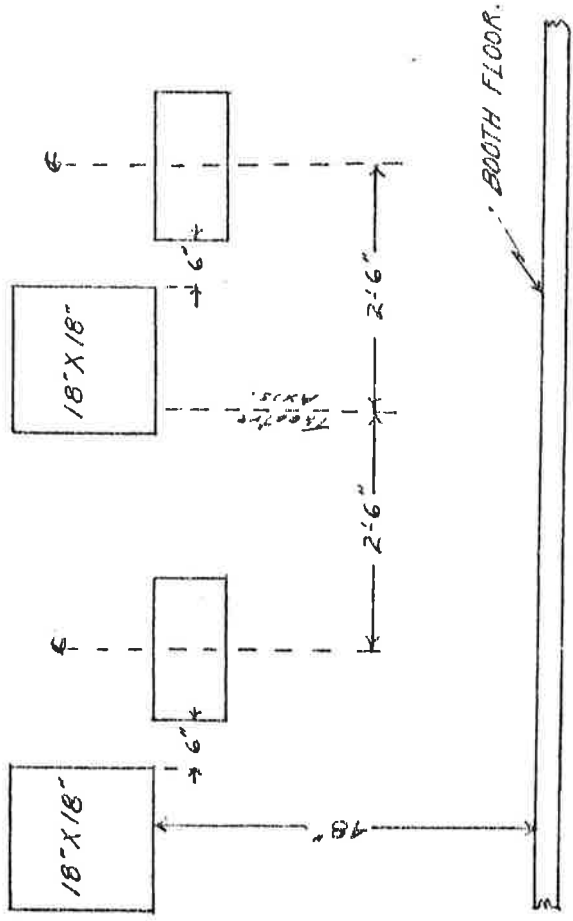
- NOTE #8**
DO NOT USE ACOUSTICAL LENS HIGH FREQUENCY HORNS.
- NOTE #9**
PHASING, H.F. SHELVING, H.F. DISTRIBUTION TO BE DONE BY SOUND INSTALLATION ENGINEER.

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 F.J.P. NEW YORK, NY.

FIG. 2. TYPICAL SPEAKER PLACEMENT.

70 MM PROJECTION PORT CHART

Proj. Angle	Lens Center Line Intersection from Floor at Front Wall	Distance Front Edge at Projector Base from Wall	Port Width for Lens E.F.			Port Height - for Lens E.F.											
			2.6"	3.0"	3.5"	4.1"	4.8"	5.6"	6.6"								
0°	18"	18"	26"	20"	18"	17"	15"	14"	5.6"	6.6"	3.0"	3.5"	4.1"	4.8"	5.6"	6.6"	
5°	14 1/2"	20 1/2"	26"	20"	18"	17"	15"	14"	6.6"	8"	13"	13"	11"	9"	9"	8"	
10°	11 1/2"	22-3/4"	26"	20"	18"	17"	15"	14"	13"	8"	13"	13"	11"	9"	9"	8"	
15°	8"	24 1/2"	26"	20"	18"	17"	15"	14"	13"	8"	13 1/2"	13"	12"	9 1/2"	9"	8"	
20°	3 1/2"	27-3/4"	27"	22"	20"	18"	16"	15"	14"	9"	15"	15"	13"	12"	10"	10"	9"
25°	28 1/2"	30 1/2"	29"	23"	21"	19"	17"	16"	15"	9"	17"	17"	15"	13"	11"	10"	9"



- Notes:
- (1) Data is for based on typical lens types
 - (2) For short barrel construction an increase in height and width might be required
 - (3) Deviation in distance between front wall and base will affect required port size
 - (4) Port height must be divided above and below lens centerline intersection at front wall
 - (5) If front wall construction is very thick (over 6 - 7 inches) port openings should be splayed out as required to prevent interference with light beam

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Recommended Port Hole Spacing

OUTSIDE VIEW

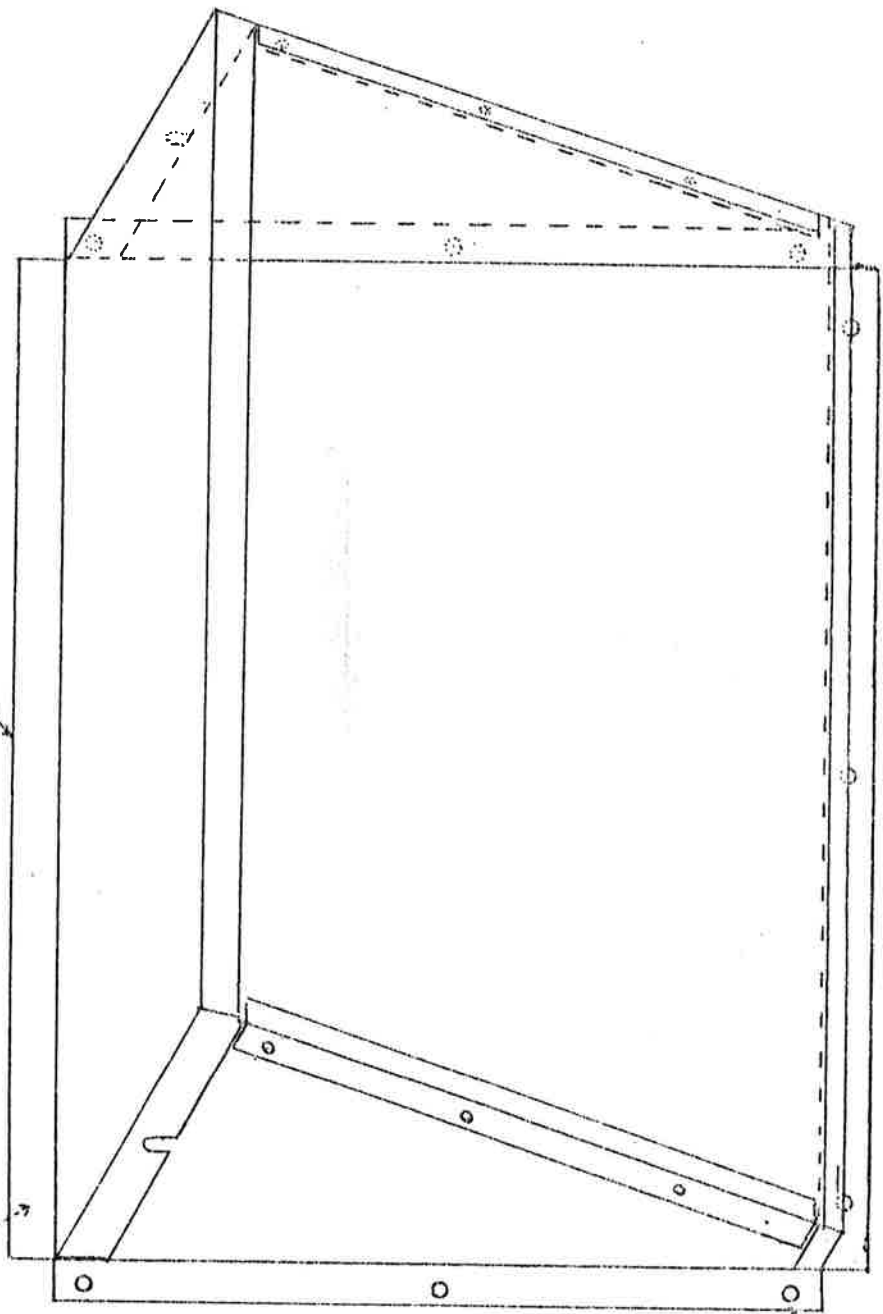
North American Philips Co., Inc.
New York, N. Y.

PROJECTION PORT GLASS FRAME.
MATERIAL - SHEET METAL

SPECIAL GLASS-(SEE
NOTE 9 -CHECK LIST)
SET IN SPONGE RUB-
BER.

REMOVABLE TOP.

APPLY A STRIP OF SPONGE
RUBBER TO BACK OF THIS
LIP SO AS TO CONTACT
SLIDING SHUTTER



FASTEN TO PORT FRAME - CAULK AIR SPACES.

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