



DOW CHEMICAL U.S.A.

REV
4/85

LOUISIANA DIVISION
P. O. BOX 150
PLAQUEMINE, LOUISIANA 70765-0150
504 389-8000

February 18, 1985

Carey Brannan
Plant Superintendent
Poly "B"

cc: Dr. M. Currier A. Seidule
 J. Granier B. Shamburger
 B. Ledford

POLY B INDUSTRIAL HYGIENE SURVEY, 1984

Summary:

The employees that had a likelihood for exposure in their jobs to noise and hexane were monitored using approved sampling and analytical methods. An Area Noise Survey of the plant revealed a significant reduction in noise levels around C-2001 and C-204 compressors. Other areas of the plant have basically the same noise levels that were detected in 1983. The Audio Dosimeter data indicates that the job classifications with the highest potential for overexposure to noise were the Extrusion O.T., Extrusion O.S., and Reaction Area S.O.T. Hexane exposure data that was obtained on the Reaction S.O.T., Lab S.O.T., and Purification O.S. jobs were well below the threshold limit value (TLV) of 50 parts per million. The highest exposure to hexane was detected on a Reaction Area S.O.T. and equalled 8.2 ppm for 423 minutes.

Conclusions and Recommendations:

1. The following job classifications had potential noise doses that averaged higher than the Louisiana Division's Guideline (85 dbA for 8 hours = 100%): the Extrusion O.S. - 174%; the Reaction Area S.O.T. - 128%; and the Extrusion O.T. - 116%. Employee's potential exposures to noise should continue to be documented and the results communicated to them, along with the hazards of noise and the benefits of wearing ear protection in high noise areas. These steps and the audiometric testing of employees by the Medical Department are the most feasible controls for noise exposure we have at the present time.

Conclusions and Recommendations: (Continued)

2. Personnel samples that were obtained on the Reaction S.O.T, Lab S.O.T., and Purification O.S. did not reveal any overexposures to hexane and the data was approximately equal to that we have for 1983. For example, the Reaction Area S.O.T.'s average exposure on a typical work day was 5.4 ppm for 1984 and 5.0 ppm for 1983 as compared to the 50 ppm Threshold Limit Value (TLV). Since this data does not indicate an exposure problem on an 8 hour basis, more emphasis in our exposure measurements should be placed on specific short-term jobs that may be performed during the workday. Such jobs would include filter cleaning, tank car unloading, breaking into process lines and the like. Currently, there is no short-term exposure limit (STEL) for n-hexane, however; there are general excursion limits that are recommended by the American Conference of Governmental Industrial Hygienist for substances with a TLV. These limits state that "Short-term exposures should exceed three times the TLV-TWA for no more than a total of thirty (30) minutes during a work day and under no circumstances should they exceed five (5) times the TLV, provided that the TLV-TWA is not exceeded."

NOISE EXPOSURE EVALUATION**Method and Explanation of Guidelines**

The new Dupont MK-2 Audio Dosimeter was used to measure employee's exposure to noise and was also used as a sound level meter to measure area noise levels. The dosimeter meets or exceeds all current requirements established by government agencies in the United States for personal audio dosimeters. All noise measurements were made using an 80 and 90 db(A) threshold level and a 90 db(A) criterion level. The threshold is the level that noise must exceed to be included in the dose calculation and the criterion is the decibel level that will yield a 100 percent dose in eight hours. The 90 db(A) criterion level is an OSHA regulation, to obtain the dose percent using the Louisiana Division criterion level of 85 db(A) the results were multiplied by two (2). This is true due to the 5 db(A) doubling rate that is included in both the OSHA regulations and the Louisiana Division Standard. All of the audio dosimeters were calibrated before and after each measurement using an approved acoustical calibrator (Dupont Audio Dosimeter Calibrator) at sound levels of 94 and 114 decibels.

NOISE EXPOSURE EVALUATION (Continued)**1. Personnel Monitoring**

Because ear protection is required to be worn in the high noise areas of the plant, the noise doses that were detected are potential doses.

As shown in Table 1 (Attachment 1), five (5) of the fourteen (14) employees that were tested had potential noise doses above the Division's Guideline. The average potential exposure for the jobs that were monitored are as follows:

Job	Number of Samples	Average Potential Dose
✓ Extrusion O.T.	2	116%
Extrusion S.O.T.	2	91%
Extrusion O.S.	3	174%
Reaction S.O.T.	2	128%
Lab S.O.T. (Uniloy)	3	57%
Technical	2	19%

2. Area Surveys

There were two areas of the plant (C-204 and C-2001) where significant reductions in the noise levels have been achieved. The C-2001 steam drive compressor has been replaced with an electric drive compressor that reduced the noise around the compressor from 98 decibels (A) to 90 decibels (A). On C-204 compressor, the discharge line was insulated with a lead shield that reduced the noise around the compressor from 99 decibels (A) to 93 decibels (A).

As shown in Attachments 3-16, the high noise areas of the plant are the extrusion area, the material handling area, and the reaction areas. The noise levels are basically the same as those that were detected in 1983, therefore; no changes in the ear protection will be necessary.

HEXANE EXPOSURE EVALUATION**1. Sampling and Analytical Method**

The 3M organic vapor monitor badge (#3500) was used to obtain breathing zone samples of personnel who may have a likelihood for exposure to hexane. The badges, which use an activated charcoal wafer as a collection medium, were desorbed with carbon disulfide and analyzed by gas chromatography.

HEXANE EXPOSURE EVALUATION - Continued2. Discussion of Results

As shown in Table 2 (Attachment 2), all of the samples were well below the 50 ppm Threshold Limit Value for n-hexane. The highest concentration was detected on a Reaction S.O.T. operator and equalled 8.2 ppm for 423 minutes. One excursion sample was taken on a Day Maintenance operator while unloading a hexane tank car. The operator's exposure during this job was 5.4 ppm for 200 minutes. The other excursion sample, also shown in Table 2 (Attachment 2), was taken on a Purification O.S. operator while cleaning FL 202 E & F hexane filters and equalled 4.5 ppm for 60 minutes. The average hexane exposure for the jobs that were sampled on a typical workday are as follows:

Job	Number of Samples	Average Sample Duration	Average Hexane Exposure
Reaction S.O.T.	3	404 Minutes	5.4 ppm
Lab S.O.T.	3	416 Minutes	1.9 ppm
Purification S.O.T.	3	403 Minutes	3.1 ppm

Mark D. Ryland
Environmental Specialist
Plastics Department
Building 807

Attachments (16)

ltb

EMPLOYEE'S TIME-WEIGHTED AVERAGE POTENTIAL EXPOSURES TO NOISE AT THE POLY B PLANT, 1984

SAMPLING DURATION (MINUTES)	JOB	EMPLOYEE NUMBER	POTENTIAL EXPOSURE > 115 db(A)	TIME WEIGHTED AVERAGE EXPOSURE, PERCENT OF ALLOWABLE DOSE		
				DOSE % OSHA REGULATION ¹	DOSE % 90 db(A) THRESHOLD ²	DOSE % LOUISIANA DIVISION STANDARD ³
369	EXTRUSION S.O.T.	433909	YES	40.0	29.8	80.0
436	EXTRUSION S.O.T.	433642	NO	51.2	45.2	102.4
432	EXTRUSION O.T.	433900	YES	82.6	70.7	165.2
249	EXTRUSION O.T.	433672	YES	33.8	24.5	67.6
432	EXTRUSION O.S.	433220	YES	116.7	105.0	233.4
388	EXTRUSION O.S.	433244	NO	64.1	51.1	128.2
405	EXTRUSION O.S.	432266	NO	80.6	71.9	161.2
432	REACTION S.O.T.	433558	NO	35.9	18.9	71.8
420	REACTION S.O.T.	433341	-	-	92.0	184.0
360	LAB S.O.T. UNILOY	433613	-	27.0	-	54.0
420	LAB S.O.T. UNILOY	433477	-	-	20.0	40.0 ⁴
420	LAB S.O.T. UNILOY	433477	-	-	38.0	76.0 ⁴
425	TECHNICAL	434093	-	-	5.0	10.0 ⁴
425	TECHNICAL	434497	-	-	14.0	28.0 ⁴

¹ 90 db(A) for 8 hours using an 80 db Threshold.

² 90 db(A) for 8 hours using a 90 db Threshold.

³ 85 db(A) for 8 hours using an 80 db Threshold unless indicated differently.

⁴ 85 db(A) for 8 hours using a 90 db Threshold.

DO 104594
CONFIDENTIAL

MDR/ltb
2-14-85

ATTACHMENT 2

TABLE 2

EMPLOYEE'S TIME-WEIGHTED-AVERAGE (TWA) EXPOSURES TO HEXANE
AT THE POLY B PLANT, 1984

SAMPLE DURATION (MINUTES)	SAMPLE VOLUME (LITERS)	JOB	EMPLOYEE NUMBER	TWA EXPOSURE TO HEXANE ¹ PPM (VOL/VOL)
ACGIH THRESHOLD LIMIT VALUE FOR N-HEXANE				50.0
200	6.4	EXCURSION ²	434386	5.4
415	13.4	REACTION S.O.T.	433558	6.7
423	13.5	REACTION S.O.T.	433970	8.2
375	12.0	REACTION S.O.T.	433350	1.4
414	13.2	LAB S.O.T.	433477	2.8
417	13.3	LAB S.O.T.	434367	1.2
416	13.3	LAB S.O.T.	433477	1.7
405	13.0	PURIFICATION O.S.	432560	1.4
375	12.0	PURIFICATION O.S.	433087	2.0
430	13.8	PURIFICATION O.S.	432560	6.0
60	1.9	EXCURSION ³	433359	4.5

¹ Total hexane isomers.

² Sample was taken while employee was unloading hexane tank car.

³ Sample was taken while employee was cleaning FL 202 E & F hexane filters. Respiratory protection is required when performing this job.

MDR/ltb
2-14-85

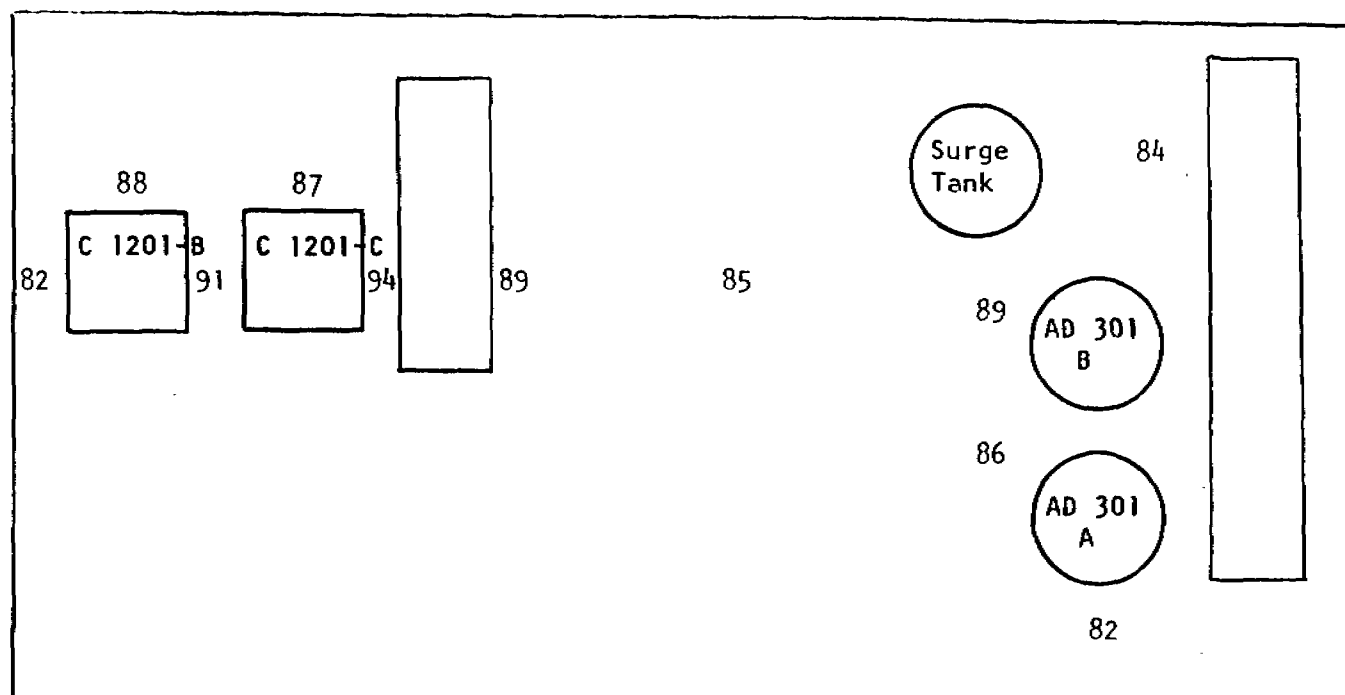
DO 104595
CONFIDENTIAL

SHOP

82

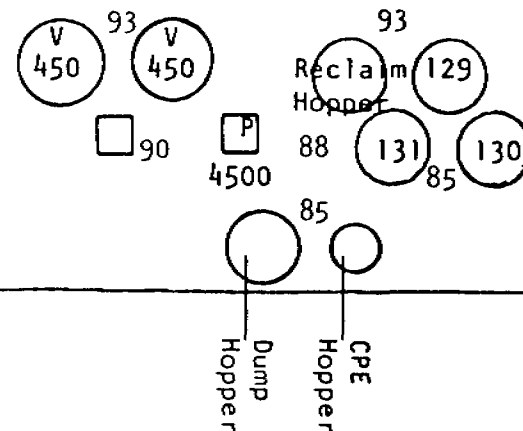
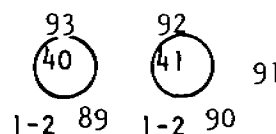
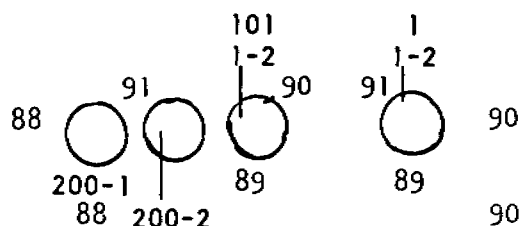
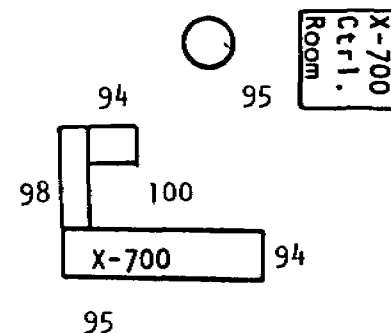
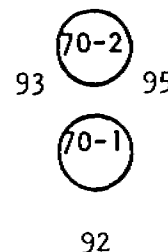
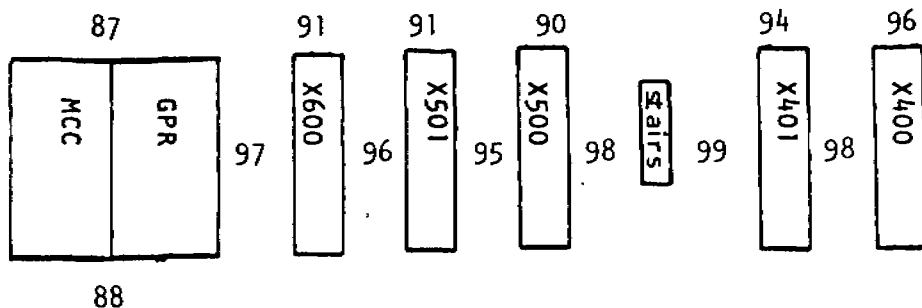
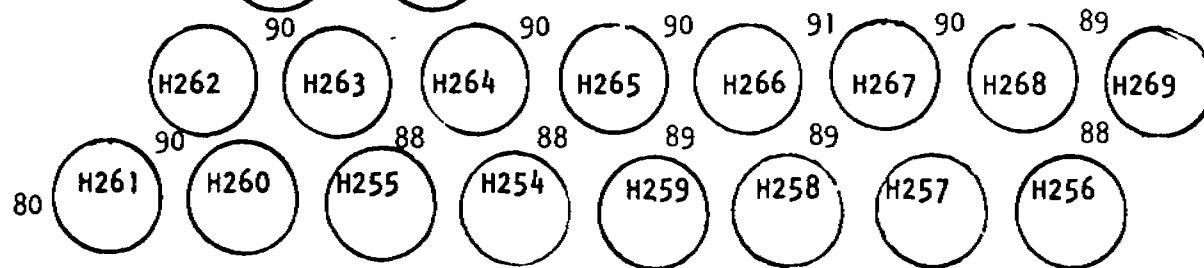
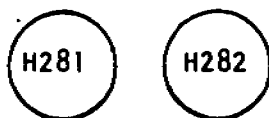
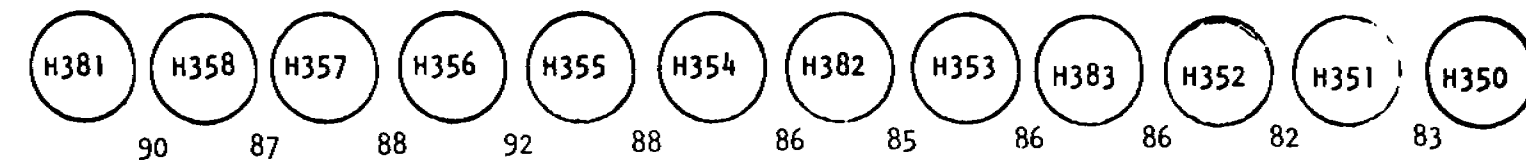
80

79

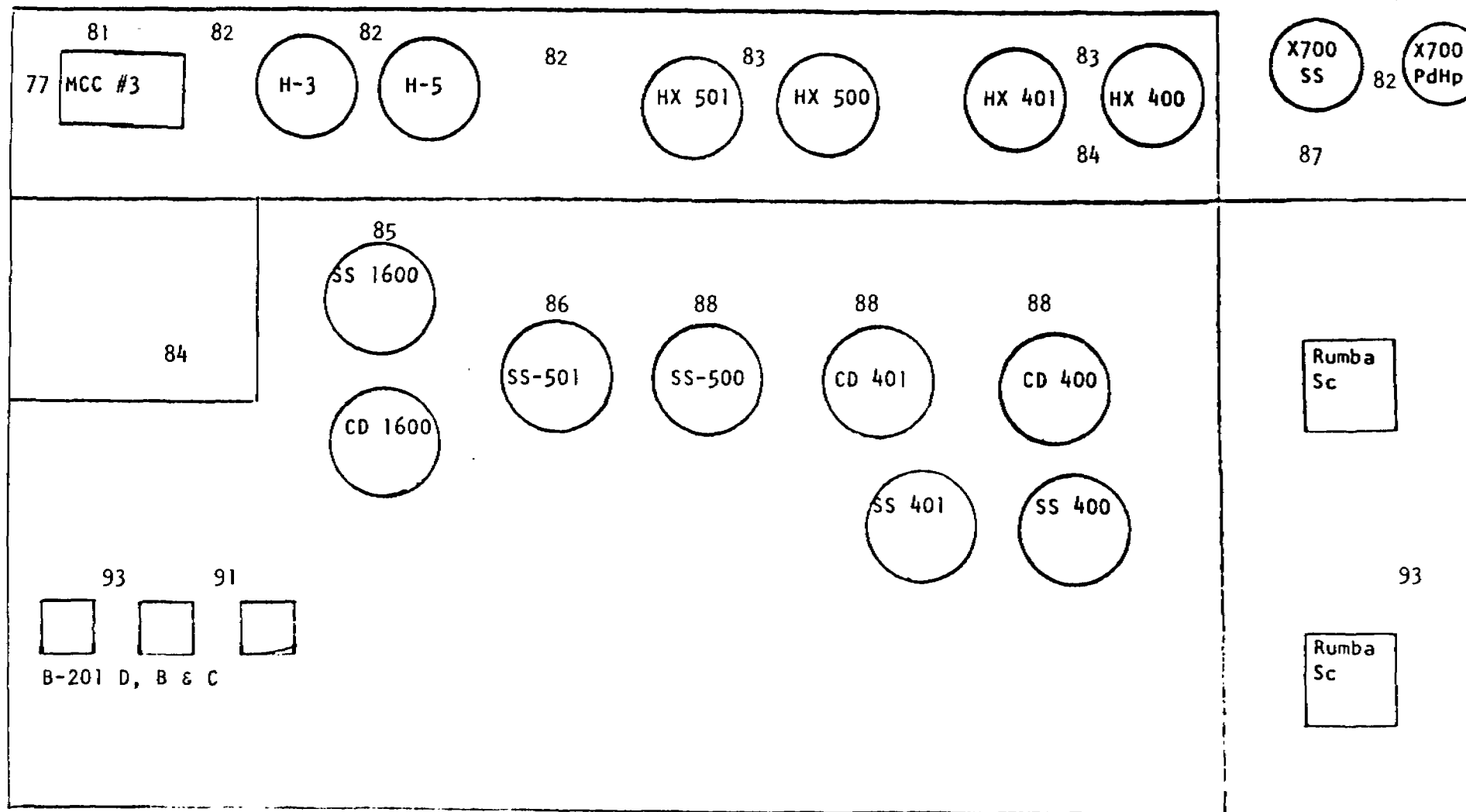


AREA NOISE SURVEY
(DECIBELS A-WEIGHTED SCALE)

DO 104597
CONFIDENTIAL



88

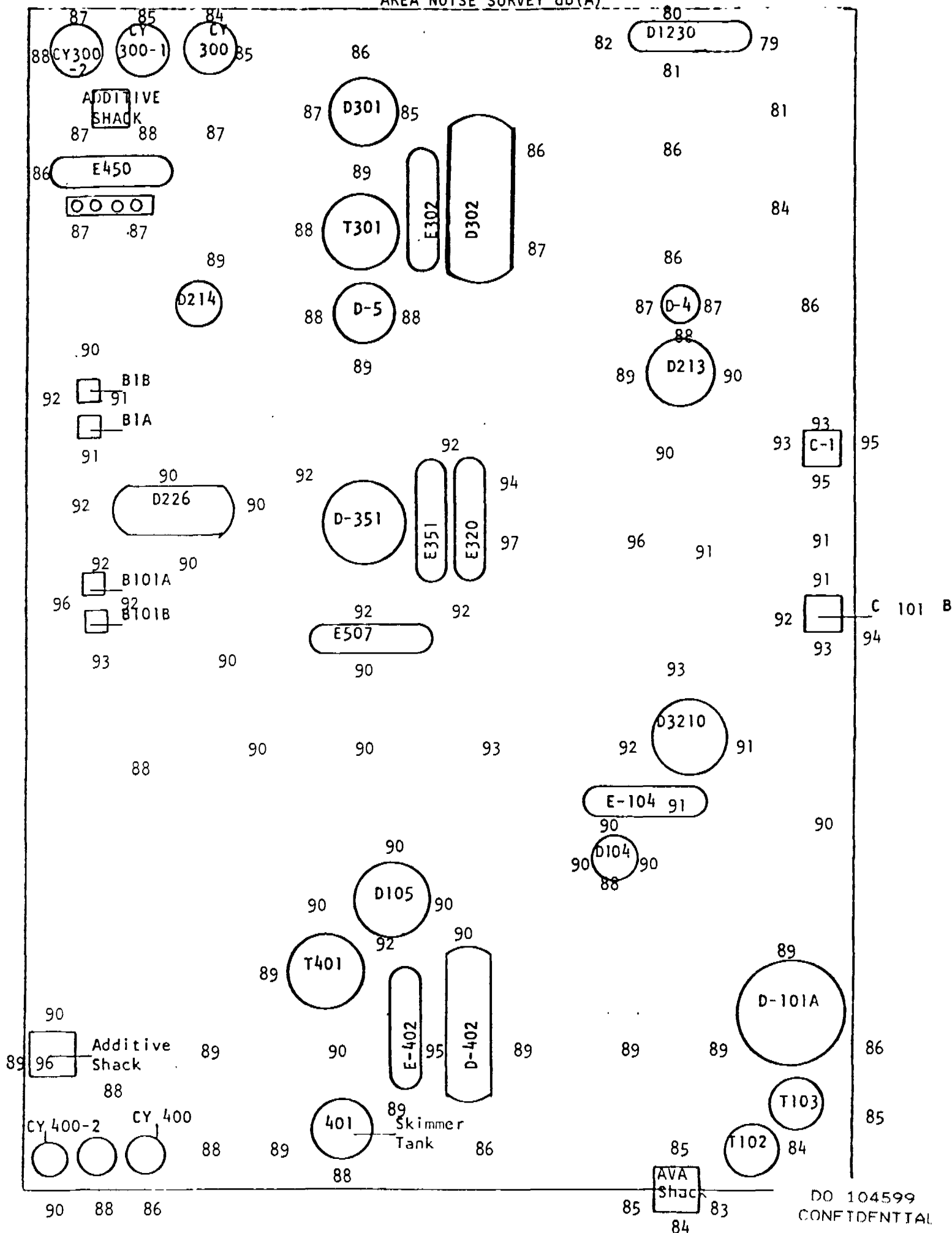


EXTRUSION MIDDLE DECK
(POWDER HOPPER & SHAKER DECK)

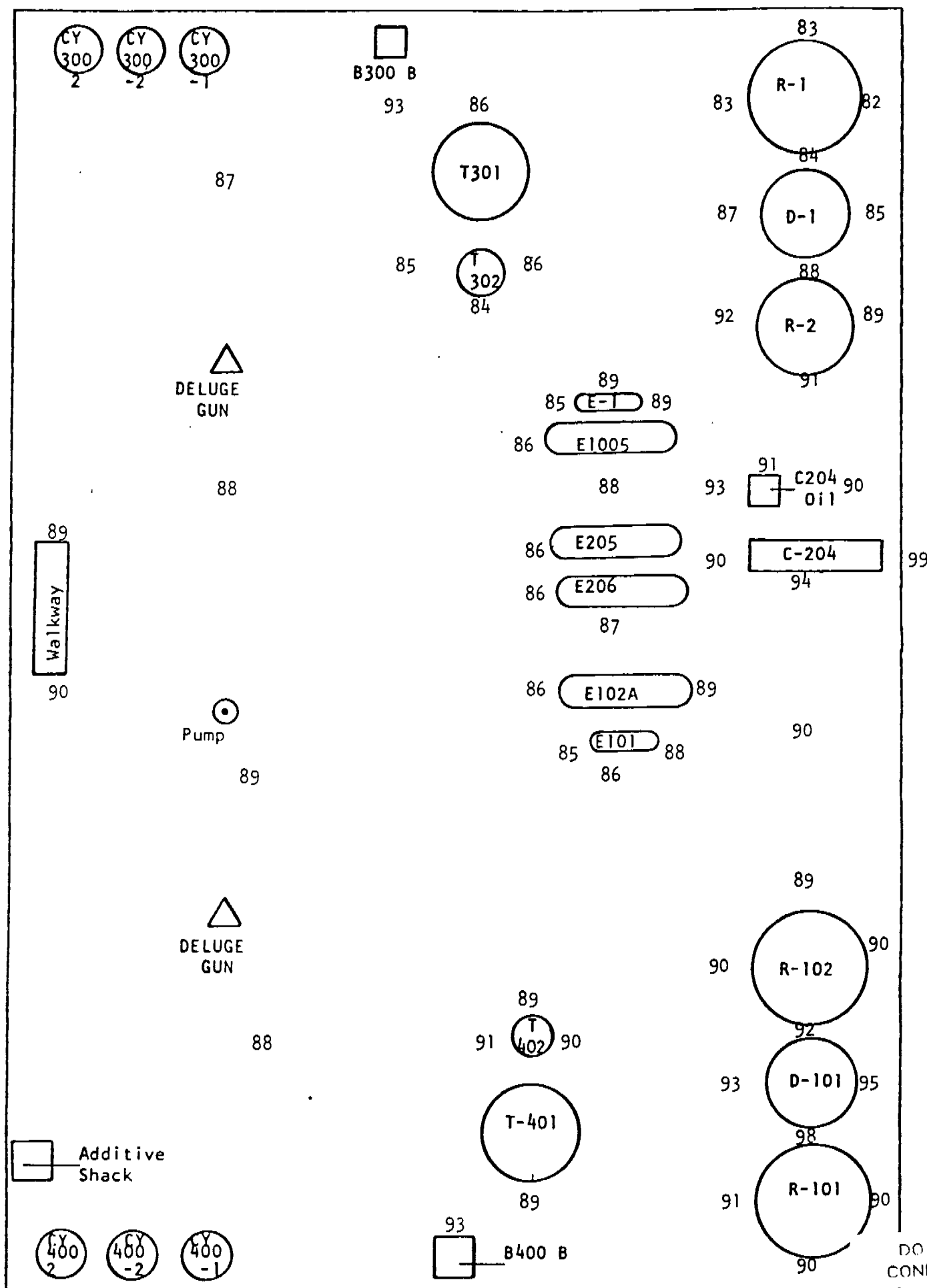
ATTACHMENT 6

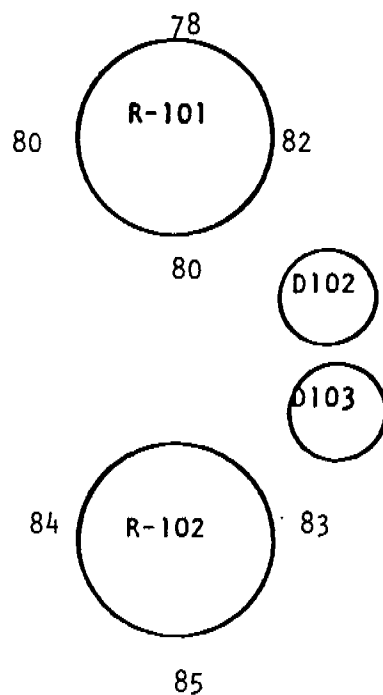
TRAINS 1 and 11 DOWNSTAIRS

AREA NOISE SURVEY db(A)



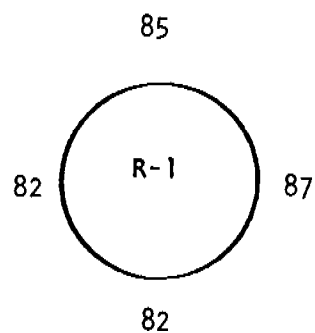
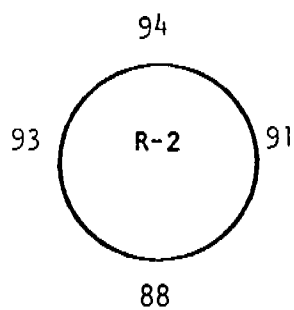
ATTACHMENT 7

TRAINS I AND II - 2ND DECK
AREA NOISE SURVEY db(A)

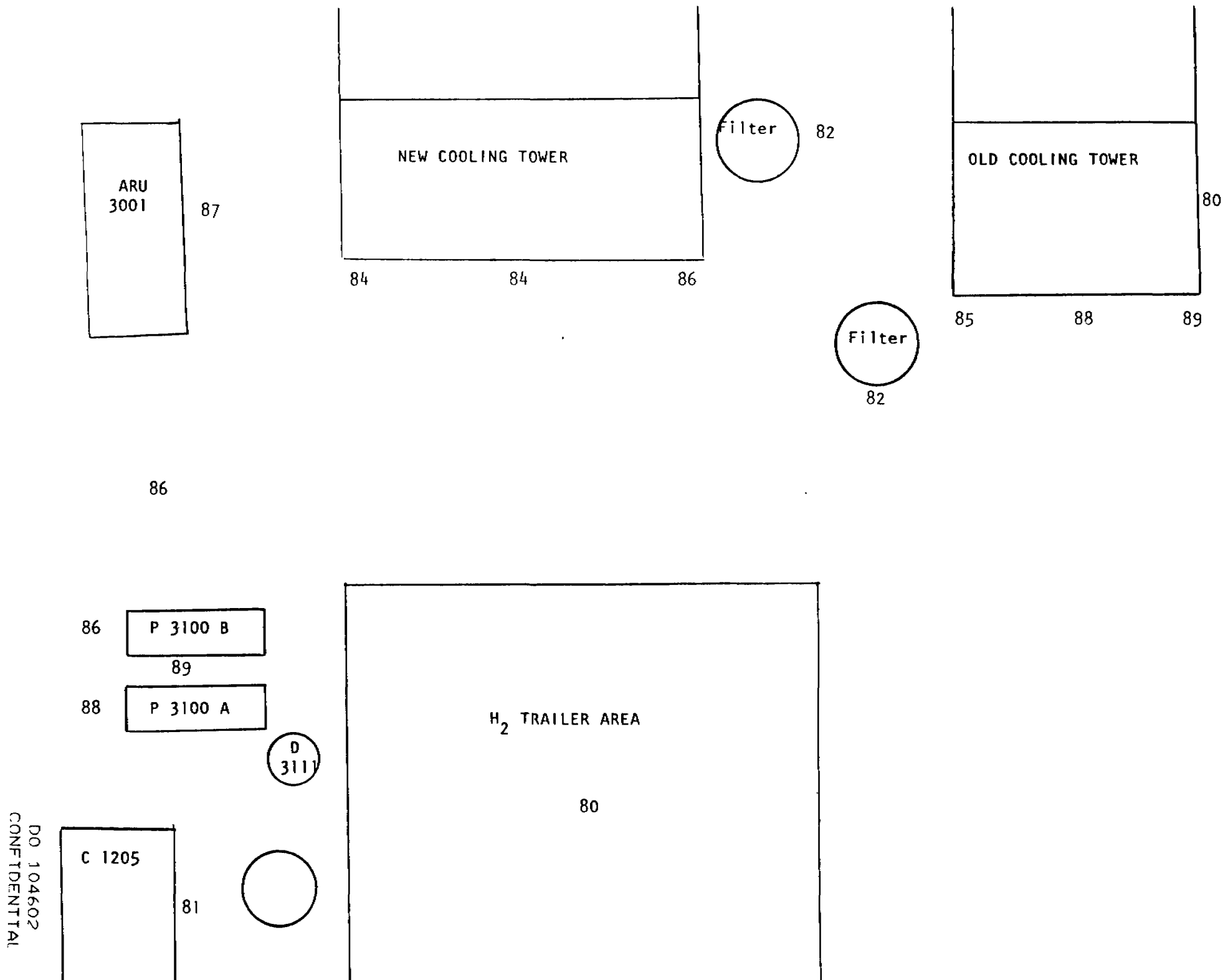
TRAINS I AND II - 3RD DECK
AREA NOISE SURVEY db(A)B-300
-B

90

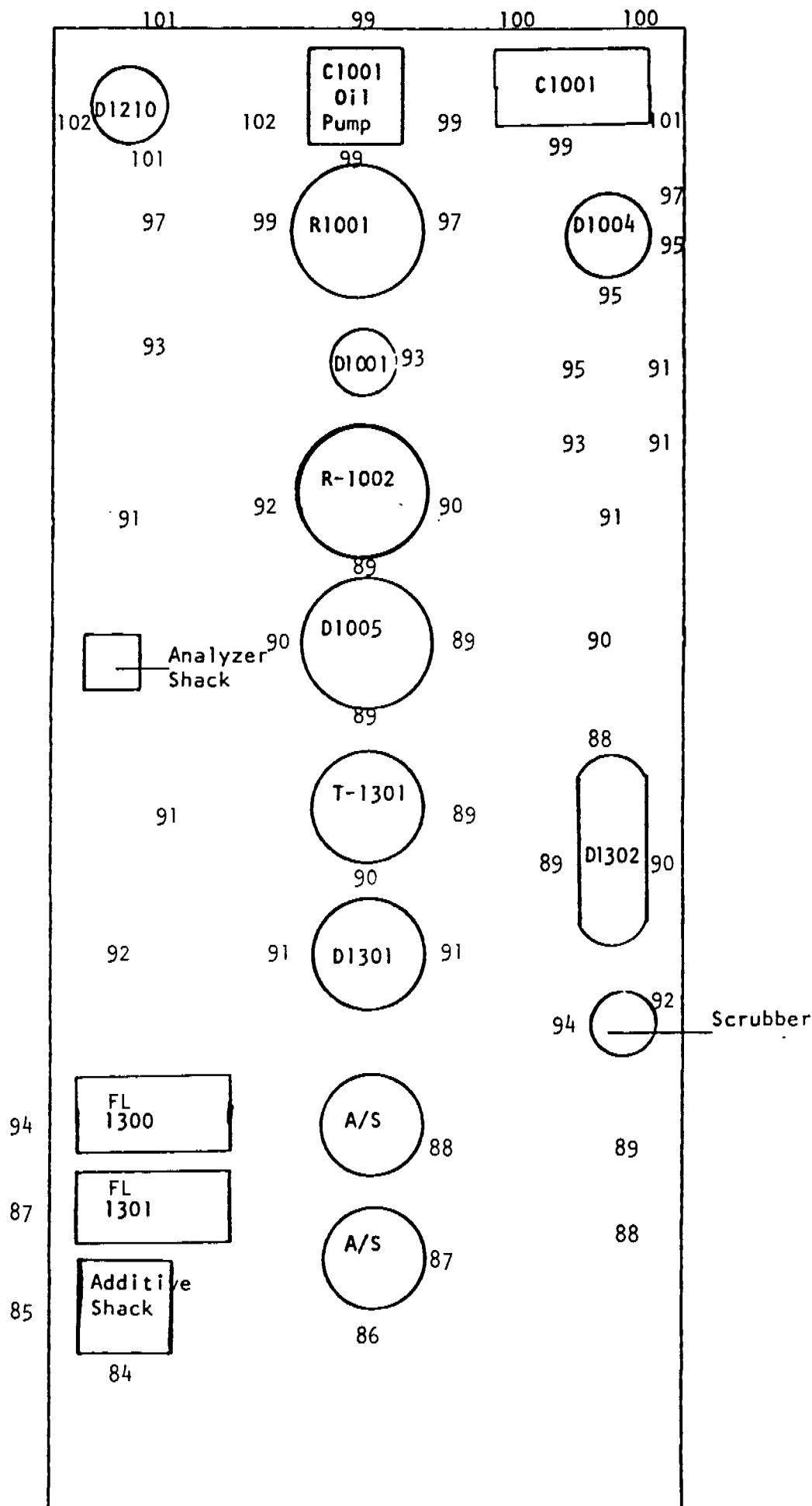
92

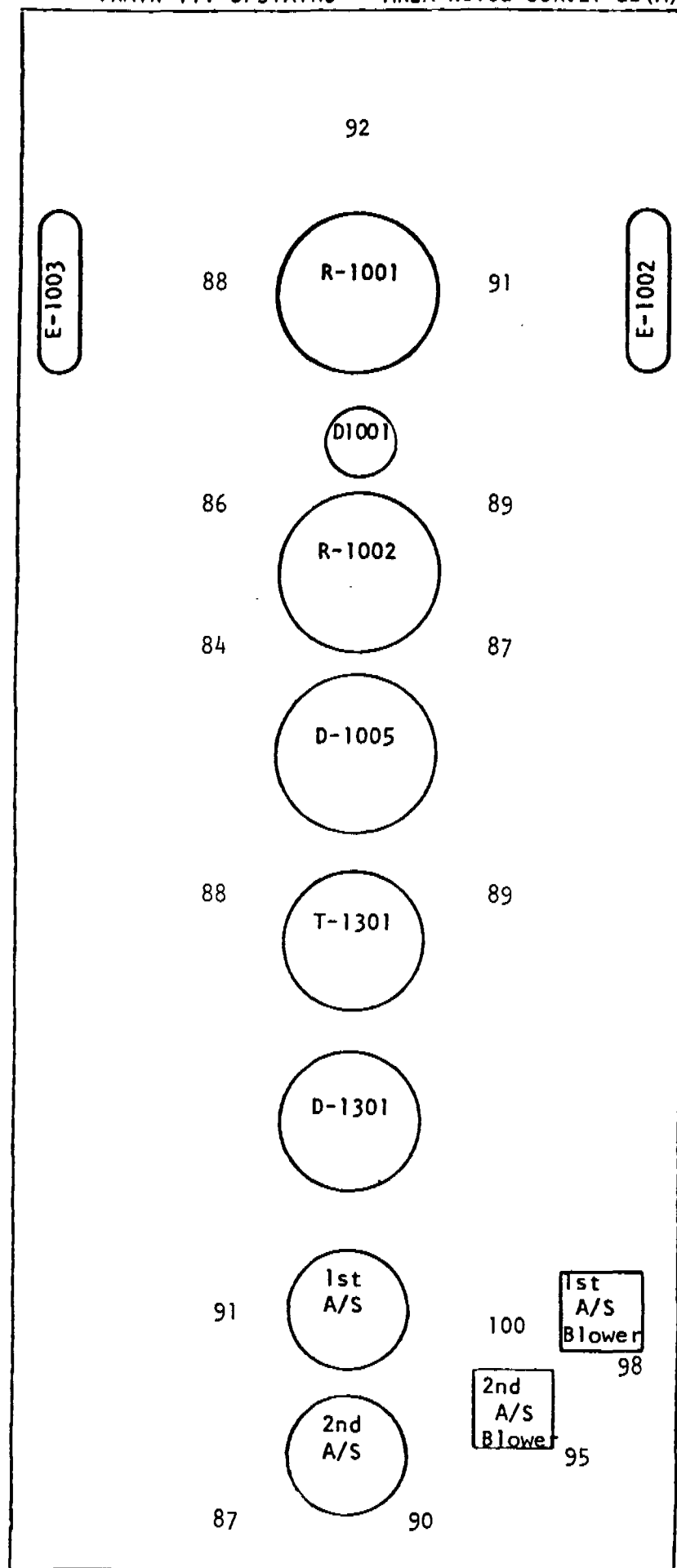
DO 104601
CONFIDENTIALB-400
-A

90



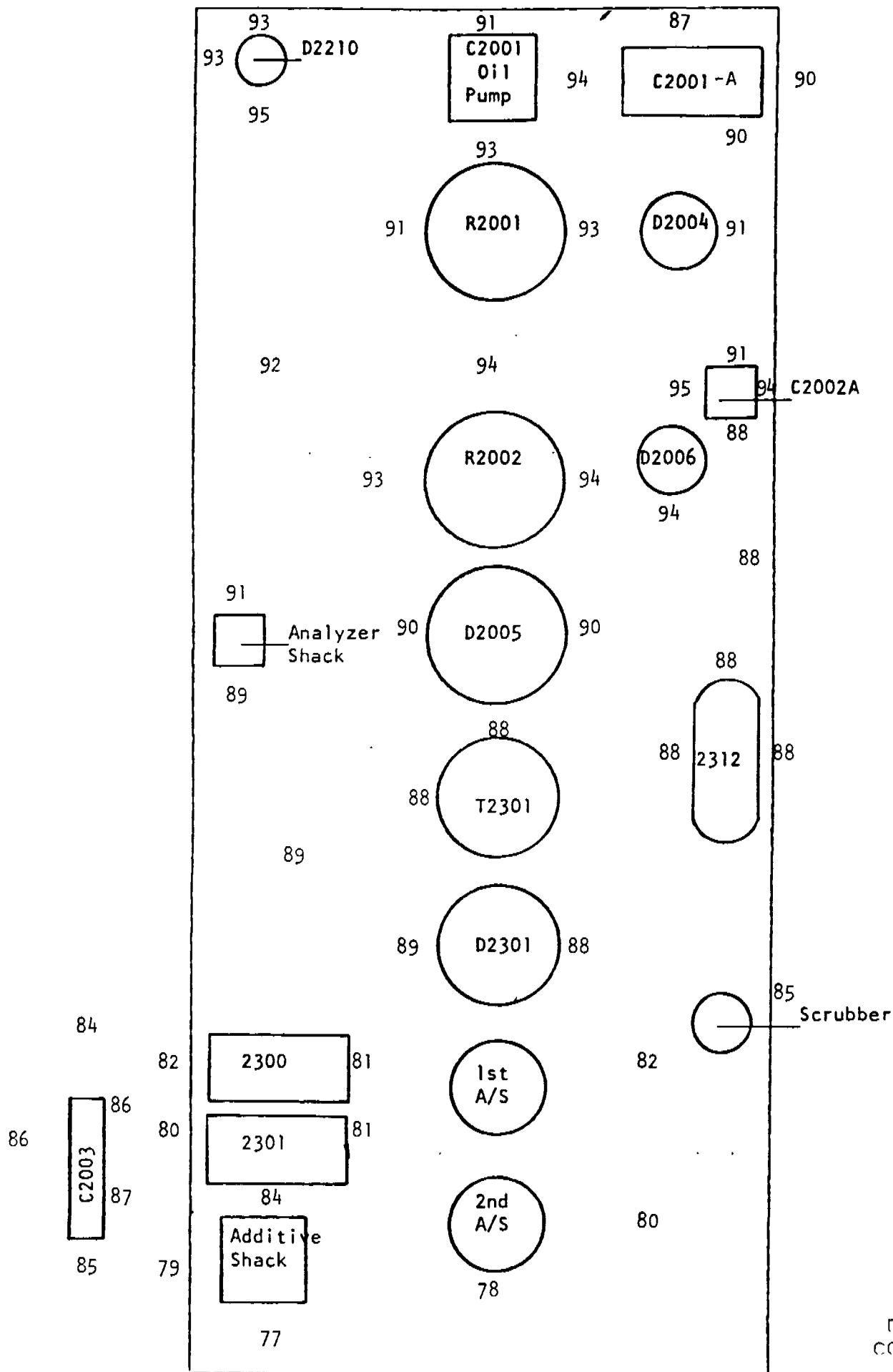
ATTACHMENT 10

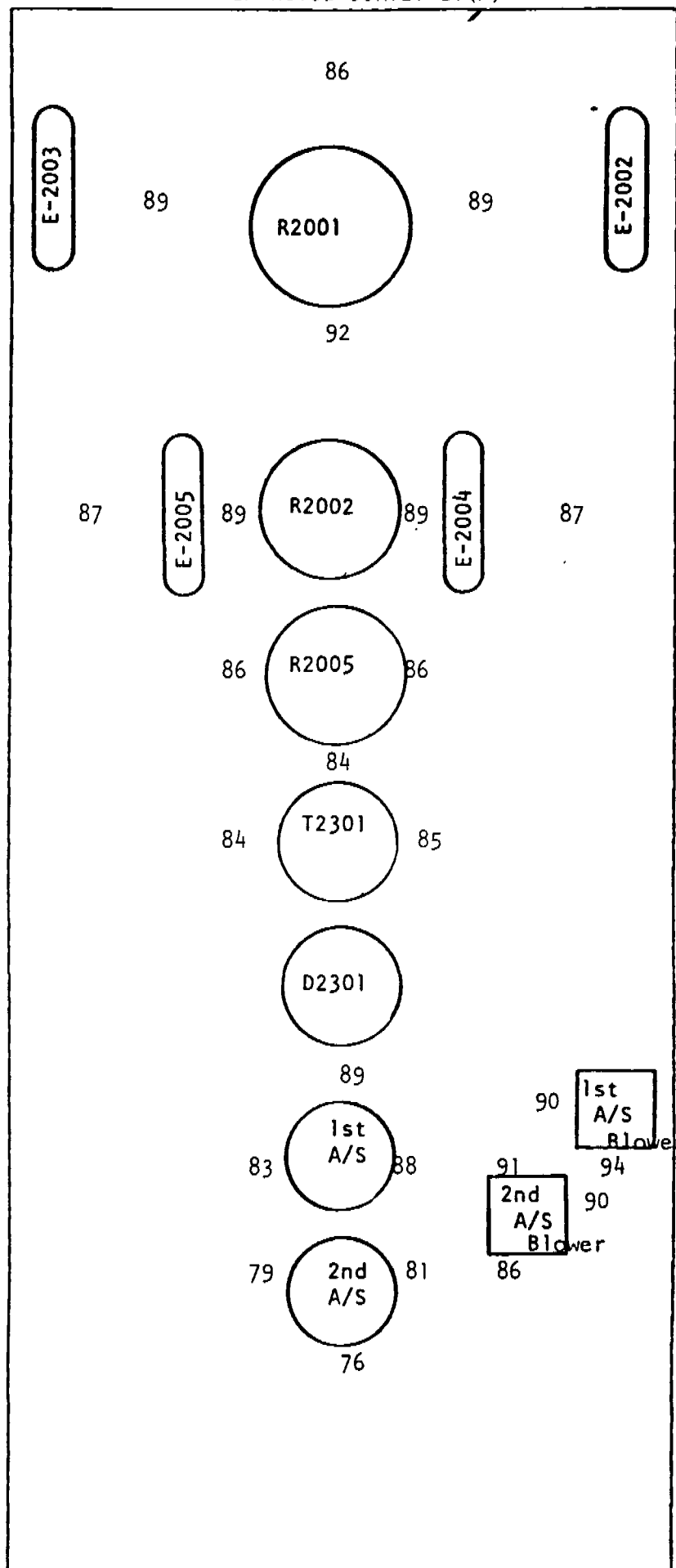
TRAIN 111 DOWNSTAIRS
AREA NOISE SURVEY DB(A)

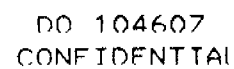
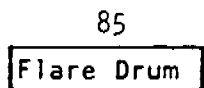


ATTACHMENT 12

TRAIN IV DOWNSTAIRS
AREA NOISE SURVEY db(A)

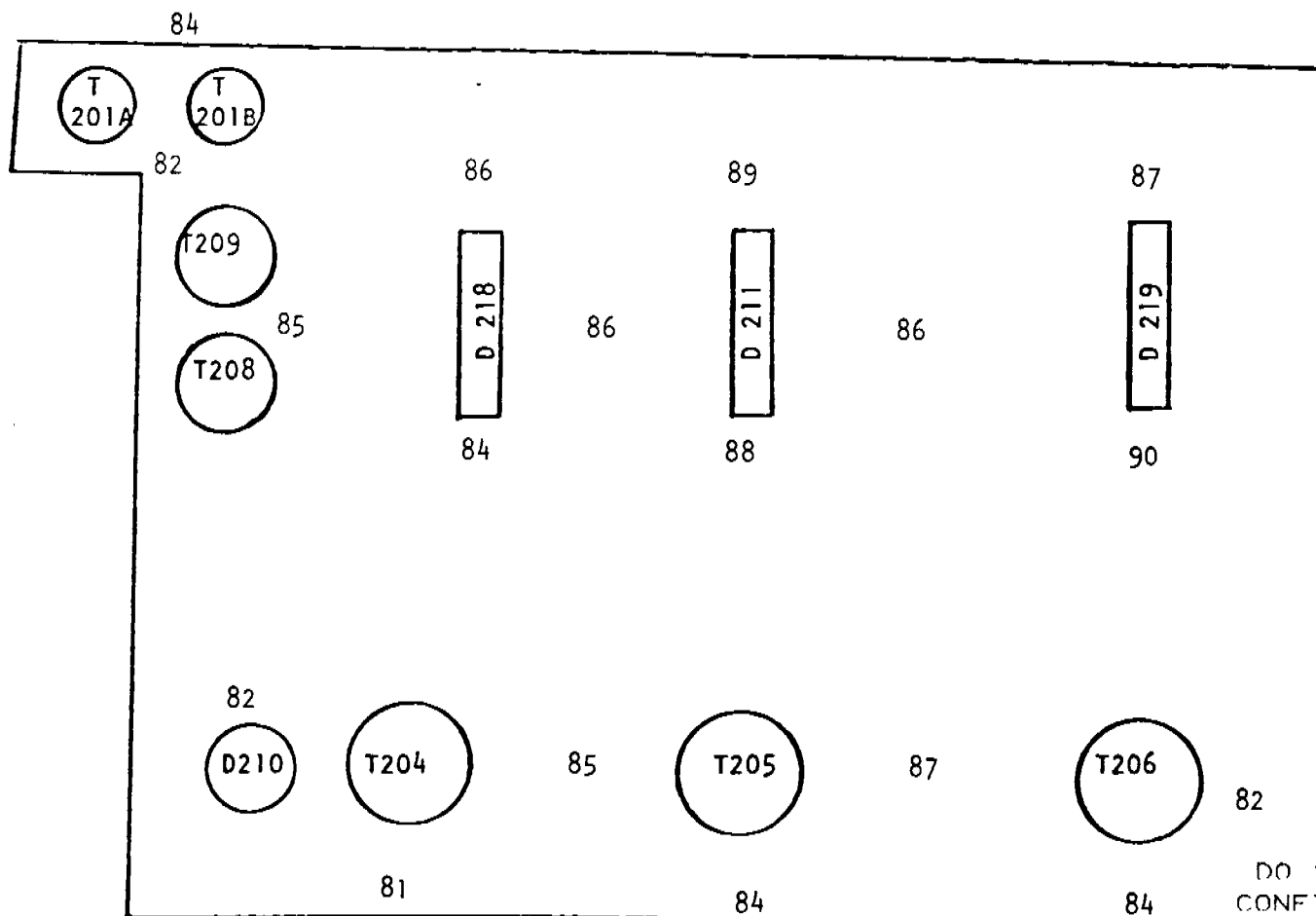
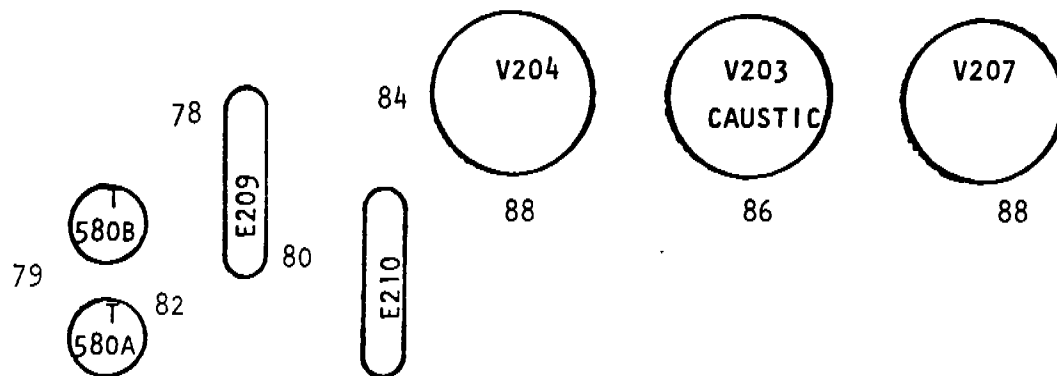
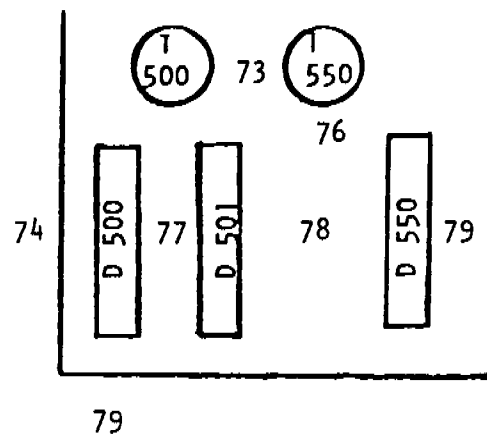


TRAIN IV UPSTAIRS
AREA NOISE SURVEY db(A)



ATTACHMENT 15

AREA NOISE SURVEY db(A)



AREA NOISE SURVEY db(A)

