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# MONITORING THE SHIPPING ENVIRONMENT OF THE GCA/MRAPCON SYSTEM

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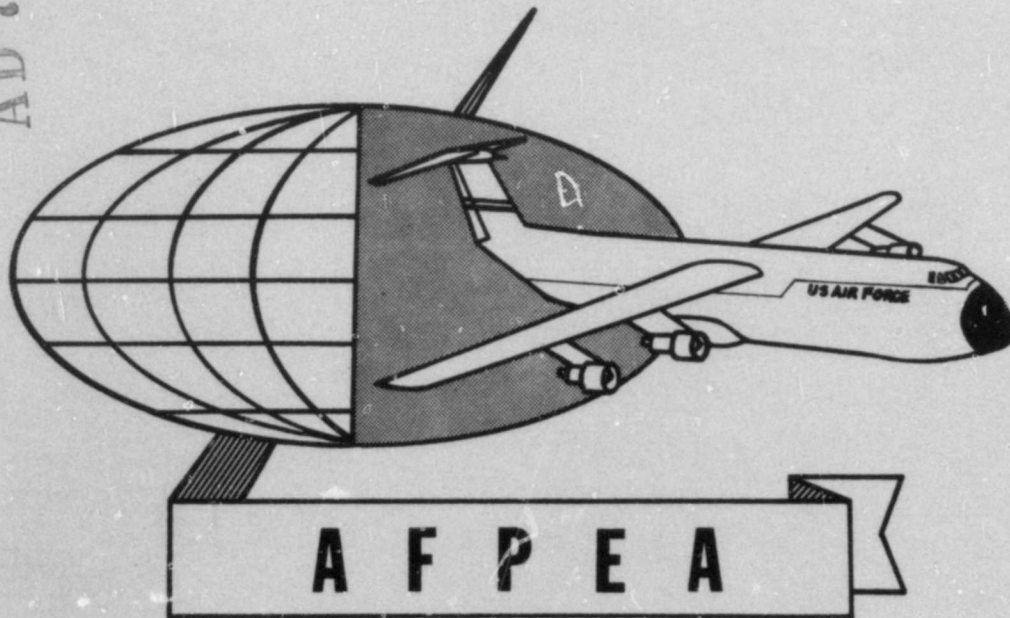
October 1972

# AIR FORCE PACKAGING EVALUATION AGENCY

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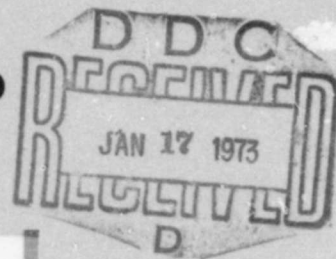
## DOCUMENT CONTROL DATA - R & D

*(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)*

| 1. ORIGINATING ACTIVITY (Corporate author) | 2a. REPORT SECURITY CLASSIFICATION |
|---|---|
| AFLC/DSPT<br>Air Force Packaging Evaluation Agency | UNCLASSIFIED |
| | 2b. GROUP |

3. REPORT TITLE

Monitoring the Shipping Environment of the GCA/MRAPCON System

4. DESCRIPTIVE NOTES (Type of report and inclusive dates)

Technical Report

5. AUTHOR(S) (First name, middle initial, last name)

Randle E. Dukes

| 6. REPORT DATE | 7a. TOTAL NO. OF PAGES | 7b. NO OF REFS |
|---|---|---|
| September, 1972 | | |

| 8a. CONTRACT OR GRANT NO. | 9a. ORIGINATOR'S REPORT NUMBER(S) |
|---|---|
| b. PROJECT NO. 68-28-C-19 | DSPT Report No. 48 |
| c. | 9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report) |
| d. | |

| 10. DISTRIBUTION STATEMENT | |
|---|---|
| Distribution Unlimited | Details of illustrations in this document may be better studied on microfiche. |

| 11. SUPPLEMENTARY NOTES | 12. SPONSORING MILITARY ACTIVITY |
|---|---|
| | |

13. ABSTRACT

Air Force Electronic Systems (GCA/MRAPCON), installed in transportable vans requiring major modification and/or repair, are transported to the Special Repair Activity (SRA) at SMAMA. After repair, the equipment is shipped to user activities throughout the world. The purpose of this project, initiated at the request of OCAMA/DSPC, was to obtain data on shipping and handling conditions and determine the most suitable mode of transporting the electronic systems. A Transportation Environment Measurement and Recording System (TEMARS) was used to obtain shock and vibration data for movement of the systems by air lift as well as surface movement by vehicle tow and air ride low boy trailers. These instrumented shipments indicated that the major damage potential in terms of shock, occurs during loading and unloading operations with only insignificant shock inputs occurring during transit. It was observed that the primary reason for the high "G" shock inputs that occurred during loading and unloading was the failure to use the proper material handling equipment, as required by TO 00-85-38 and Transportation Packaging Order (TPO) No. 5895-538-2178ZK. Based on the test data generated during the three modes of shipment used, it was concluded that each mode evaluated was suitable, from the standpoint of shock and vibration, for the transportation of vanized electronic systems.

| 14 KEY WORDS | LINK A | | LINK B | | LINK C | |
|---|---|---|---|---|---|---|
| | ROLE | WT | ROLE | WT | ROLE | WT |
| GCA/MRAPCON<br>airlift<br>air ride trailer<br>tow<br>van<br>blocking<br>bracing<br>data<br>shock<br>stress<br>intensity<br>technical order<br>transportation packaging order<br>modes | | | | | | |

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AIR FORCE PACKAGING EVALUATION AGENCY

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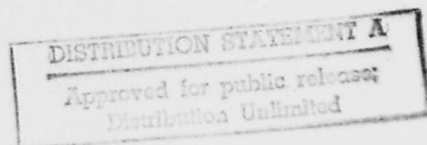
MONITORING THE SHIPPING ENVIRONMENT

OF THE GCA/MRAPCON SYSTEM

This report was prepared by:

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NOTICE

INTRODUCTION: The Air Force uses special purpose radio/radar systems (GCA/MRAPCON) installed in transportable vans. These systems, which cost approximately $1,000,000 dollars each, are periodically programmed through the SRA at SMAMA for modification and/or major repair. After repair, they are transported to user activities throughout the world by one or any combination of the following three modes of transportation:

a. Towing

b. Air ride low boy trailer

c. Air lift

There are approximately 24 systems scheduled through the SRA each year. Transportation damage received by some systems in shipment from the SRA to the user activity has been in excess of $100,000 dollars. This cost figure does not include other added costs resulting from increased down-time, disruption of programmed repair schedule, and additional demands on servicing personnel.

OBJECTIVE: The purpose of this project was to monitor GCA/MRAPCON vanized electronic equipment shipments to obtain data on the shipping and handling conditions experienced in movement by various modes of transportation from the Special Repair Activity (SRA) to the user. The information obtained will be used to determine the most appropriate and economical method of moving these systems. The data collected will also be used to identify conditions encountered in the logistics system which are potential damage hazards.

PREPARATION FOR SHIPMENT: Specific packaging, handling, and transportation instructions for GCA/MRAPCON systems and associated components are covered in Technical Order 00-85-38, "Preparation for Shipment of Ground Communications, Electronic, Meteorologicaly and Navigational Aids in Vans or Shelters", and Transportation Packaging Order (TPO) 5895-538-2178ZK.

DESCRIPTION OF THE GCA/MRAPCON SYSTEMS: There are two vans in a GCA system and three in a MRAPCON system. The vans which house a unique package of electronic instrumentation and components are of metal construction. Approximate specifications for the systems and components are presented below:

| NOMENCLATURE | DIMENSIONS (INCHES) (length X width X height) | WEIGHT (POUNDS) | VOLUME (FT³) |
|---|---|---|---|
| Expando Van (MRAPCON only) | 433-96-132 | 30,460 | 3,165 |
| Operation Van | 278-98-140 | 20,000 | 2,147 |
| Power Van | 278-98-130 | 19,000 | 1,966 |
| Box, Search Antenna | 132-78-72 | 1,000 | 346 |

| NOMENCLATURE | DIMENSIONS (INCHES) (length X width X height) | WEIGHT (POUNDS) | VOLUME (FT$^3$) |
|---|---|---|---|
| Box, Elevation Antenna | 78-18-72 | 400 | 35 |
| Box, Chick Sail | 112-46-59 | 600 | 175 |
| Box, Misc. Components | 51-30-48 | 500 | 37 |
| Box, Misc. Components | 48-48-72 | 600 | 96 |
| GCA System Total (7 pieces) | | 42,100 | 4,802 |
| MRAPCON System Total (8 pieces) | | 72,560 | 7,967 |

DESCRIPTION OF TEST EQUIPMENT: An Endevco Transportation Environment Measurement and Recording System (TEMARS), Model 28501, was used in monitoring the shipments (See Figure 1). The TEMARS provided the means for recording on compatible magnetic tape, in digital form, shock and vibration information, in terms of intensity and time duration, encountered in the transportation and handling environment. Three channels of the TEMARS were selected to record the acceleration inputs. The recording channels are identified as the X, Y, and Z channels to correspond with the directional location of the accelerometers on the GCA/MRAPCON vans as described in Figure 2.

The TEMARS used for this study has a shock recording range of 0-25 Gs and records duration of pulses from 0 through 126 milliseconds. Clock time can be recorded in increments of 1, 2, 5, 10, 20 and 60 minutes. The accelerometers used to sense the shock and vibration inputs were rigidly attached to the floor framework of the van. Dynamic information (shock and vibration) converted by the accelerometers into electrical signals is transmitted to the digital recorder. The recorder stores the information on computer compatible tape.

TEST PROCEDURE AND RESULTS, GENERAL: Through the cooperation of the personnel at SMAMA/DSPC, the TEMARS was installed during the packaging operations on the GCA/MRAPCON vans. Installation consisted of rigidly attaching three accelerometers to preselected points on the frame of the test van, directly above the axles, securing the recorder and installing the required interconnecting wire between the recorder and accelerometers.

Prior to the beginning of the transportation cycle, the TEMARS was turned on, and all transportation and handling shock and vibration data above a preselected "G" level was recorded. After the van was unloaded and parked at the receiving activity, the TEMARS was turned off to terminate the recording cycle.
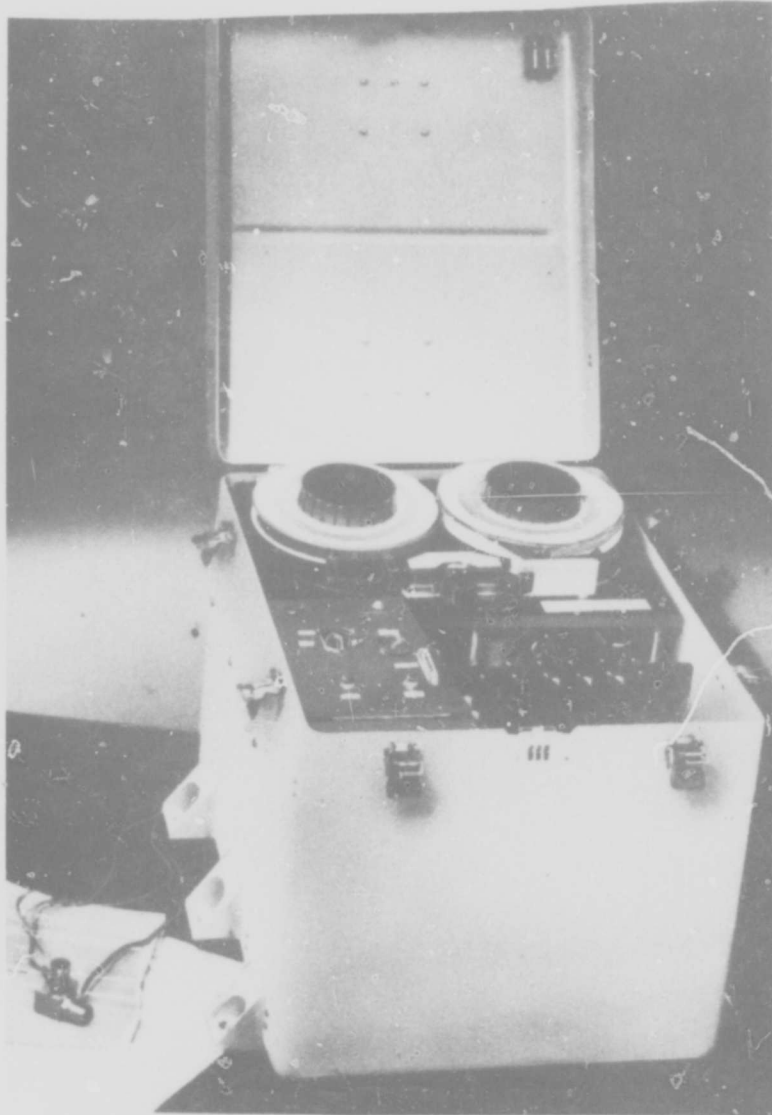
FIGURE 1

TRANSPORTATION ENVIRONMENT MEASUREMENT
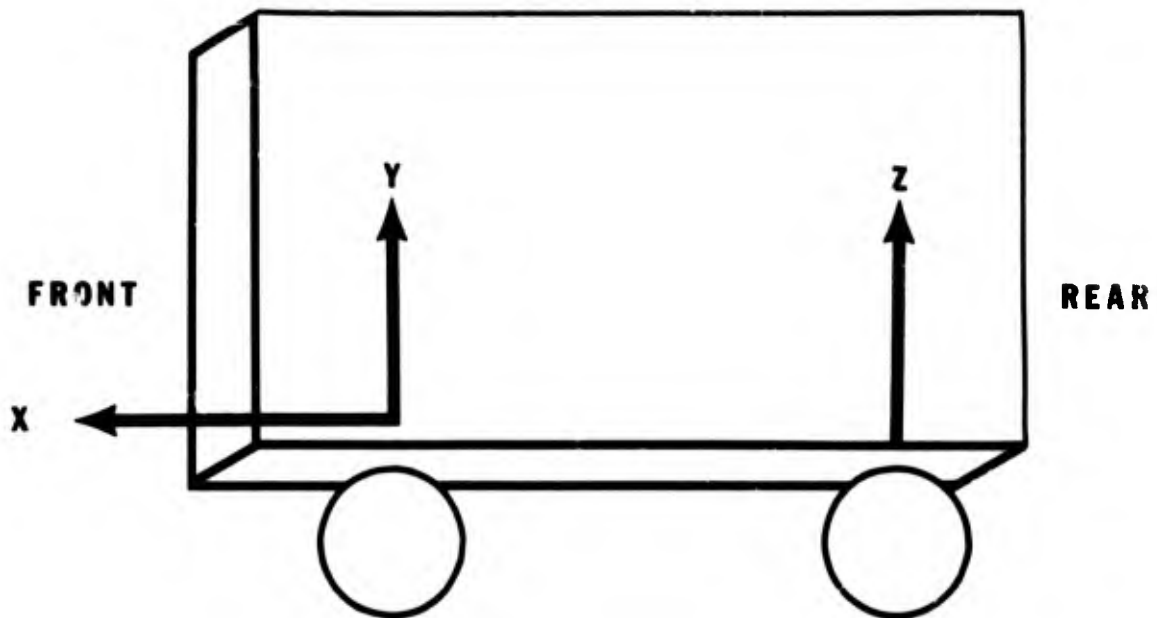AND RECORDING SYSTEM

FIGURE 2

ACCELEROMETER LOCATION AND RECORDING DIRECTION

The TEMARS tapes were processed on a computer at the AFLC Computer Center, and the data was displayed in two formats, standard and statistical. In the standard format, acceleration values and pulse durations, in terms of Gs and milliseconds, respectively, are consecutively printed out in the order in which they occur. This information is presented in columns for the X, Y, and Z channels. The first column on the chart indicates the day, hour, and minute of recording in 1, 5, 10, 15, 20 or 60 minute increments. In the statistical display format, the individual acceleration readings were consolidated in terms of shock or vibration inputs recorded within specific ranges of "G" levels and pulse duration.

AIR-RIDE TRAILER SHIPPING TEST: When opportune airlift is not available for CONUS movements of the vanized equipment, a special air ride low boy trailer is authorized for surface shipment. This commercial trailer is commonly referred to as "Single Drop" (roll-on/roll-off) and "Double Drop" (center drop - deep well) type. The "Single Drop" trailer is 36 to 40 inches high, while the "Double Drop" trailer is 18 to 24 inches high.

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A total of six shipments by air ride low boy trailer were monitored. Due to equipment malfunctions, the recorded shock and vibration data obtained was limited to three shipments. However, informative observations were made on all six shipments regarding packaging, packing, and handling procedures. For the three successfully instrumented trips by low boy trailer, no shock inputs above 5 Gs were recorded during transit while inputs up to 20 Gs were recorded during the loading and unloading of the vans. Excerpts of the standard print-out are presented in charts 1 through 3. During unloading of the vans, it was observed that fork lifts were used to lift the vans, which is in violation of the applicable TO 00-85-38, (See Figure 3), for proper loading/unloading of the equipment.

TOWING SHIPPING TEST: Personnel and tow vehicles of the 4th MOBCOMGP at OCAMA, contributed to this portion of the study. Of the four instrumented trips over primary roads, no shock inputs above 3 Gs were experienced during the tow exercises. Excerpts of the trip records are presented in the standard and statistical format (See charts 4 through 7).

AIRLIFT SHIPPING TEST: A total of three shipments by airlift were monitored. Two shipments were by type C-124 aircraft and one shipment was by type C-133 aircraft. Due to equipment malfunctions, the recorded data obtained was limited to one shipment. However, meanful observations were made on two of the three shipments regarding packaging, packing, and handling procedures.

Data was recorded on the shipping and handling conditions experienced in the movement of serviceable MRAPCON vans from SMAMA to Tempelhof Air Field, Germany, and the return of like reparable items from Germany to Dover AFB. A type C-133 aircraft was used to airlift the vans to the using activity. Loading of the cargo involved towing the vans into the aircraft with a short wheelbase truck, with reverse procedures used to unload at Tempelhof. (See Figure 4). No shock inputs above 2 Gs were recorded during transit, while inputs up to 4.13 Gs were recorded during loading and unloading operations. Excerpts of the trip are presented in both the standard and statistical format (See chart numbers 8 through 11). During the airlift, it was observed that the following violations to the applicable T.O. were occurring subjecting this sensitive equipment to transportation damage.

a. Tie down chains were connected to the low stress cat-walk brackets reducing shock mitigation of the vehicle springs and shock absorbers.

b. Wheels of the vans were not blocked and braced to prevent lateral and longitudinal movement during airlifts (See Figure 5).

c. Overseas activities were discarding reuseable containers, creating unnecessary field shipment problems.

d. The aircraft loadmasters had not been briefed or read the TO on tie-down requirements of GCA/MRAPCON vans.
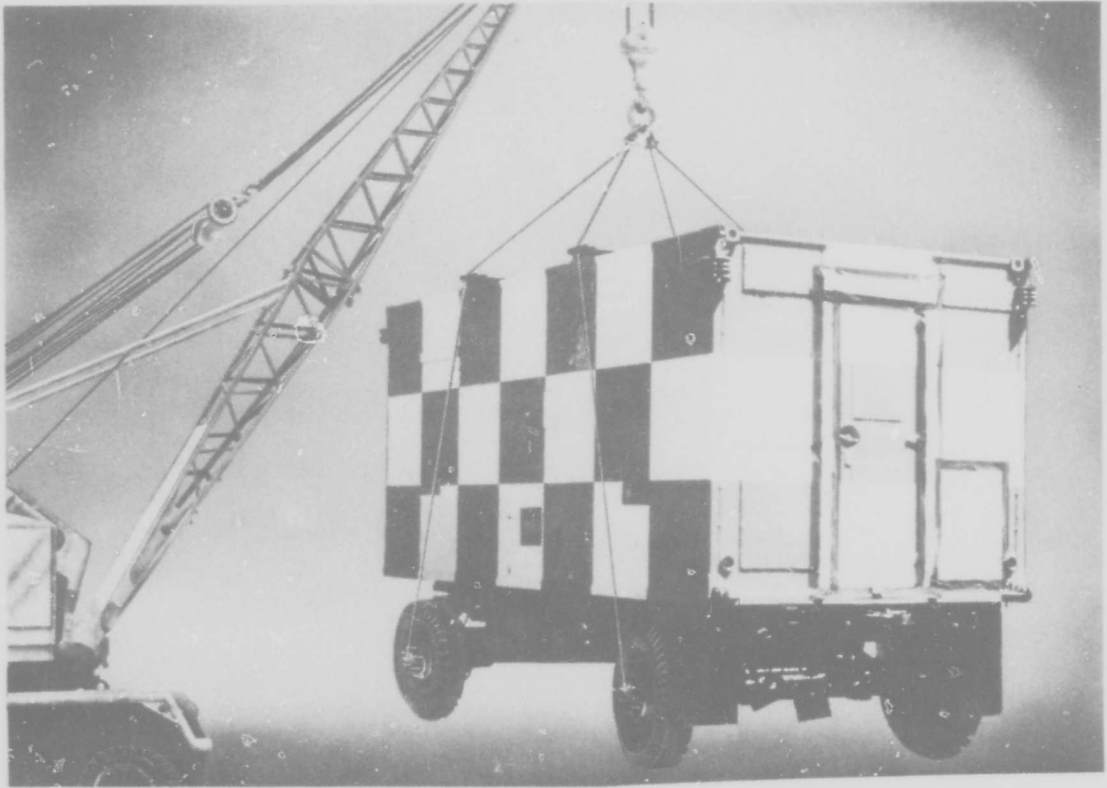
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FIGURE 3

LOADING THE EQUIPMENT ONTO AIR RIDE TRAILER

FIGURE 4

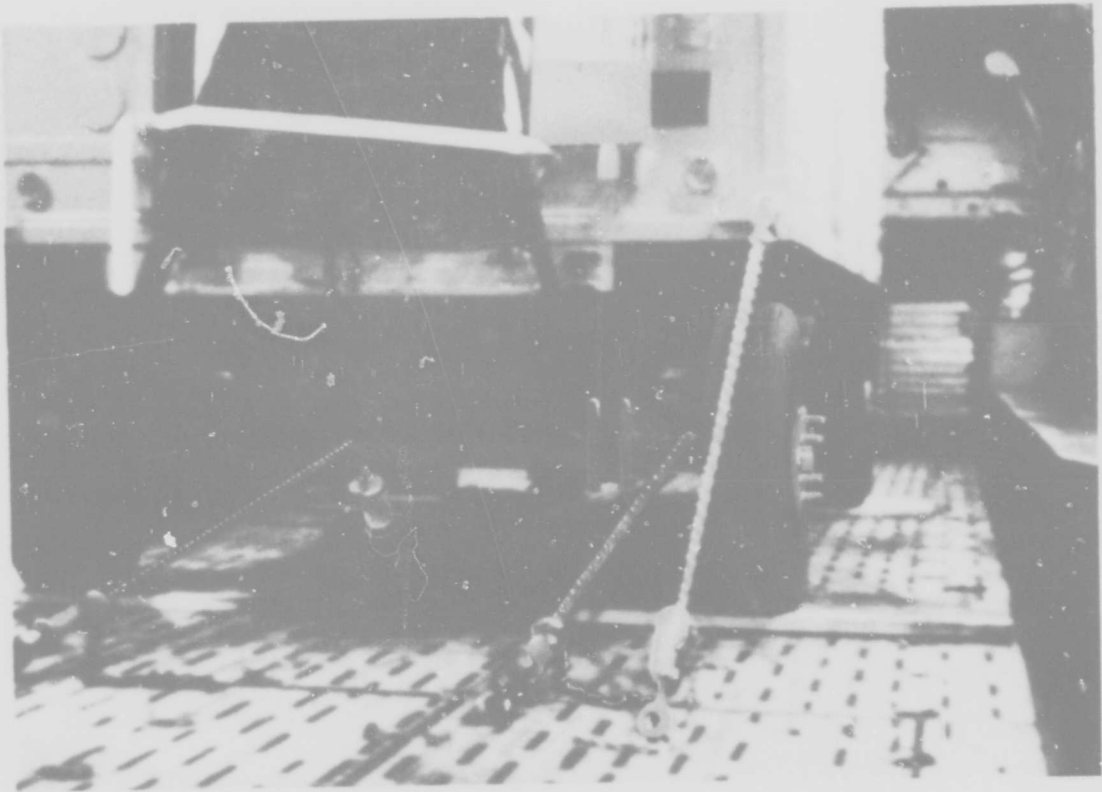LOADING THE EQUIPMENT INTO THE AIRCRAFT

FIGURE 5

TIE-DOWN AND BLOCKING METHOD USED DURING AIRLIFT

e. Some field activities were not aware that technical packaging assistance was available from the Air Material Area (AMA) assigned the geographical area of responsibility.

CONCLUSIONS: Evaluation of the data obtained from monitoring the GCA/MRAPCON van shipments indicated that air lift or surface movement by tow or air ride low boy trailer were all satisfactory modes of transport for this type of equipment. The levels of shock and vibration recorded during transport were well below the 20 G shock level specified in MIL-STD 810B for equipment mounted in trucks or semitrailers.

Shock inputs recorded during loading and unloading in some instances approached levels of intensity which could result in damage to electronic equipment mounted within the van. Excessive shock inputs could generally be attributed to improper material handling equipment and procedures.

Failure to apply the instructions of the appropriate Technical Order and Transportation Packaging Order, as witnessed in several instances during this study, could result in damage to the GCA/MRAPCON systems.

RECOMMENDATIONS:

a. Transportation specialist should be assigned to visually observe and assist each shipment of GCA/MRAPCON vans during loading/unloading at the SRA.

b. Traffic management and host base transportation officers should bring to the attention of their personnel the special handling requirements for the GCA/MRAPCON equipment in accordance with TO 00-85-38.

# APPENDIX

## RECORDED DATA ANALYSIS

Extracts of the shock magnitude in Gs and the duration in milliseconds are printed in charts 1, 2, 3, 4, 5 and 8 while charts 6, 7, 9, 10 and 11 contain a statical compilation of all shock events above threshold level.

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CHART 1 TRIP INFORMATION AND CALIBRATION DATA:

SHIPMENT FROM McClellan AFB to Charleston AFB

TRIP INFORMATION

| MODE OF TRANSPORTATION | TRIP ORGIN | TRIP DESTINATION | SYSTEM | TAPE NO |
|---|---|---|---|---|
| Surface-Low Boy Trailer | McClellan AFB | Charleston AFB | 04 | XX |

| DATE OF TRIP | DAYS | TRIP STARTING TIME (HRS) | MINUTES | NUMBER OF TAPES USED | CLOCK INCREMENT MINUTES |
|---|---|---|---|---|---|
| 5/7/9 | 7 | 14 | 0.0 | 1 | 15.00 |

TRANSDUCER CALIBRATIONS

| LEVEL | X-ACCEL (G's) | Y-ACCEL (G's) | Z-ACCEL (G's) | MAX PULSE DURATION MILLISECONDS |
|---|---|---|---|---|
| Threshold | 1.50 | 1.50 | 1.50 | 63.00 |
| Full Scale | 15.00 | 15.00 | 15.00 | |
| Program Reject | 0.0 | 0.0 | 0.0 | |

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## DATA RECORDED DURING PACKAGING

| Day of Month Hour, Min | X-ACCEL PEAK (G's) | X-ACCEL DURATION Milliseconds | Y-ACCEL PEAK (G's) | Y-ACCEL DURATION Milliseconds | Z-ACCEL PEAK (G's) | Z-ACCEL DURATION Milliseconds |
|---|---|---|---|---|---|---|
| 7.14.45 | 6.67 | | 0.0 | | 0.0 | |
| | 2.62 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | -1.67 | 0.0 | 0.71 | 0.0 | 0.0 | 0.0 |
| | 4.05 | | 0.0 | | | |
| | 2.62 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 0.0 | 0.0 | -2.62 | 0.0 | 0.0 | 0.0 |
| | 0.0 | 0.0 | 2.38 | 0.0 | 0.0 | 0.0 |
| | 0.0 | 0.0 | 0.0 | | 11.43 | 0.0 |
| | 0.0 | | 0.48 | | -4.76 | 0.0 |
| | | | 0.0 | | 10.48 | |
| 7.15.0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.10 | 2.00 |
| | 0.0 | 0.0 | 0.0 | 0.0 | 3.33 | 0.0 |
| | 0.0 | | | | 8.10 | 0.0 |
| | -4.29 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 2.14 | 0.0 | 1.43 | 0.0 | 0.0 | 0.0 |
| | 3.57 | | 0.0 | | | |
| | -3.10 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 2.62 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 15.00 | 0.0 | 0.0 | 0.0 | | |
| | 0.0 | 0.0 | -5.95 | 0.0 | 0.0 | 0.0 |
| | 0.0 | 0.0 | 2.62 | 0.0 | 0.0 | 0.0 |
| | 0.0 | | 4.05 | | 4.76 | 0.0 |
| | 0.0 | | 0.0 | | 11.67 | 3.00 |
| | 0.0 | | 0.0 | | -7.62 | 2.00 |
| | 0.0 | | 0.0 | | 4.05 | |

Chart 1 - Page 2

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## DATA RECORDED DURING LOADING

| Day of Month Hour, Min. | X-ACCEL PEAK (G's) | X-ACCEL DURATION Milliseconds | Y-ACCEL PEAK (G's) | Y-ACCEL DURATION Milliseconds | Z-ACCEL PEAK (G's) | Z-ACCEL DURATION Milliseconds |
|---|---|---|---|---|---|---|
| 9.13.15 | -2.62 | 0.0 | -2.86 | 0.0 | 0.0 | 0.0 |
| | -2.62 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | -2.62 | 0.0 | *15.00 | 0.0 | 0.0 | 0.0 |
| | 5.24 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

* The 15 "G" reading was attributed to the van being dropped by the crane operator on the bed of the lowboy trailer during loading operations.

Chart 1, Page 4

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## DATA RECORDED OVER THE ROAD

| Day of Month Hour, Min. | X-ACCEL PEAK (G's) | X-ACCEL DURATION Milliseconds | Y-ACCEL PEAK (G's) | Y-ACCEL DURATION Milliseconds | Z-ACCEL PEAK (G's) | Z-ACCEL DURATION Milliseconds |
|---|---|---|---|---|---|---|
| 11.3.15 | 1.67 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Chart 1, Page 5

CHART 2 TRIP INFORMATION AND CALIBRATION DATA:

SHIPMENT FROM McClellan AFB to Dover AFB

TRIP INFORMATION

| MODE OF TRANSPORTATION | TRIP ORGIN | TRIP DESTINATION | SYSTEM | TAPE NO |
|---|---|---|---|---|
| Surface-Low Boy Trailer | McClellan AFB | Dover AFB | 3-69 | 1 |

| DATE OF TRIP | DAYS | TRIP STARTING TIME (HRS) | MINUTES | NUMBER OF TAPES USED | CLOCK INCREMENT MINUTES |
|---|---|---|---|---|---|
| 10/09/69 | 9 | 9 | 35 | 1 | 10.00 |

TRANSDUCER CALIBRATIONS

| LEVEL | X-ACCEL (G's) | Y-ACCEL (G's) | Z-ACCEL (G's) | MAX PULSE DURATION MILLISECONDS |
|---|---|---|---|---|
| Threshold | 1.25 | 1.00 | 1.25 | 63.00 |
| Full Scale | 25.00 | 10.00 | 25.00 | |
| Program Reject | 0.0 | 0.0 | 0.0 | |

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DATA RECORDED DURING UNLOADING

| Day of Month Hour, Min. | X-ACCEL PEAK (G's) | X-ACCEL DURATION Milliseconds | Y-ACCEL PEAK (G's) | Y-ACCEL DURATION Milliseconds | Z-ACCEL PEAK (G's) | Z-ACCEL DURATION Milliseconds |
|---|---|---|---|---|---|---|
| 15.5.0 | 0.0 | 2.00 | 0.0 | 0.0 | 3.6 | 0.0 |
|  | *18.7 | 4.00 | 0.0 | 0.0 | 3.2 | 0.0 |
|  | 1.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
|  | 2.0 | 2.0 | 0.0 | 0.0 | 0.0 |  |
| 15.5.10 | 4.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
|  | 1.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

*The 18.7G recording was due to the van striking a cement curb while being towed to the parking site.

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## DATA RECORDED DURING LOADING

| Day of Month Hour, Min. | X-ACCEL PEAK (G's) | X-ACCEL DURATION Milliseconds | Y-ACCEL PEAK (G's) | Y-ACCEL DURATION Milliseconds | Z-ACCEL PEAK (G's) | Z-ACCEL DURATION Milliseconds |
|---|---|---|---|---|---|---|
| 10.1.10. | 9.1 | 4.00 | 1.1 | 0.0 | 0.0 | 0.0 |
| | 2.8 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 |

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CHART 3 TRIP INFORMATION AND CALIBRATION DATA:

SHIPMENT FROM McClellan AFB to Lockbourne AFB

### TRIP INFORMATION

| MODE OF TRANSPORTATION | | TRIP ORGIN | TRIP DESTINATION | SYSTEM | TAPE NO |
|---|---|---|---|---|---|
| Surface-Low Boy Trailer | | McClellan AFB | Lockbourne AFB | 1 | 1 |

| DATE OF TRIP | DAYS | TRIP STARTING TIME (HRS) | MINUTES | NUMBER OF TAPES USED | CLOCK INCREMENT MINUTES |
|---|---|---|---|---|---|
| 02/06/70 | 6 | 1.0 | 25.0 | 1 | 60.00 |

### TRANSDUCER CALIBRATIONS

| LEVEL | X-ACCEL (G's) | Y-ACCEL (G's) | Z-ACCEL (G's) | MAX PULSE DURATION MILLISECONDS |
|---|---|---|---|---|
| Threshold | 1.00 | 2.50 | 2.50 | 63.00 |
| Full Scale | 10.00 | 25.00 | 25.00 | |
| Program Reject | 0.0 | 0.0 | 0.0 | |

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DATA RECORDED DURING LOADING

| Day of Month Hour, Min. | X-ACCEL PEAK (G's) | X-ACCEL DURATION Milliseconds | Y-ACCEL PEAK (G's) | Y-ACCEL DURATION Milliseconds | Z-ACCEL PEAK (G's) | Z-ACCEL DURATION Milliseconds |
|---|---|---|---|---|---|---|
| 11.0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.40 | 3.00 |

Chart 3, Page 2

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DATA RECORDED DURING UNLOADING

| Day of Month Hour, Min. | X-ACCEL PEAK (G's) | X-ACCEL DURATION Milliseconds | Y-ACCEL PEAK (G's) | Y-ACCEL DURATION Milliseconds | Z-ACCEL PEAK (G's) | Z-ACCEL DURATION Milliseconds |
|---|---|---|---|---|---|---|
| 17.4.40 | 0.0 | 0.0 | 0.0 | 0.0 | 9.1 | 0.0 |

Chart 3, Page 3

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CHART 4 TRIP INFORMATION AND CALIBRATION DATA:

SHIPMENT FROM Route 40   TO   Tinker AFB

### TRIP INFORMATION

| MODE OF TRANSPORTATION | | | | | |
| --- | --- | --- | --- | --- | --- |
| Towing | | | | | |

| DATE OF TRIP | DAYS | TRIP ORGIN | TRIP DESTINATION | SYSTEM | TAPE NO |
| --- | --- | --- | --- | --- | --- |
| 4/19/20 | 19 | Route 40 | Tinker AFB | 1 | 1 |

| TRIP STARTING TIME (HRS) | MINUTES | NUMBER OF TAPES USED | CLOCK INCREMENT MINUTES |
| --- | --- | --- | --- |
| 1400 | 32.0 | 1 | 1.00 |

### TRANSDUCER CALIBRATIONS

| LEVEL | X-ACCEL (G's) | Y-ACCEL (G's) | Z-ACCEL (G's) | MAX PULSE DURATION MILLISECONDS |
| --- | --- | --- | --- | --- |
| Threshold | 0.20 | 0.0 | 0.20 | 126.00 |
| Full Scale | 2.00 | 0.0 | 2.00 | |
| Program Reject | 0.0 | 0.0 | 0.0 | |

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## DATA RECORDED DURING OVER-THE-ROAD TOW

| Day of Month Hour, Min | X-ACCEL PEAK (G's) | X-ACCEL DURATION Milliseconds | Y-ACCEL PEAK (G's) | Y-ACCEL DURATION Milliseconds | Z-ACCEL PEAK (G's) | Z-ACCEL DURATION Milliseconds |
|---|---|---|---|---|---|---|
| 19.14.33 | 0.63 | 0.00 | 0.00 | 0.00 | 1.49 | 4.00 |
|  | 0.54 | 4.00 | 0.00 | 0.00 | 0.98 | 4.00 |
|  | 0.57 | 0.00 | 0.00 | 0.00 | 1.08 | 0.00 |
|  | 0.76 | 0.00 | 0.00 | 0.00 | 1.11 | 0.00 |
|  | 0.86 | 6.00 | 0.00 | 0.00 | 0.86 | 6.00 |
|  | 0.44 | 0.00 | 0.00 | 0.00 | 1.11 | 0.00 |
|  | 0.73 | 0.00 | 0.00 | 0.00 | 1.49 | 0.00 |
|  | 0.92 | 0.00 | 0.00 | 0.00 | 1.49 | 4.00 |
|  | 0.89 |  |  |  | 1.49 | 0.00 |
| 19.14.53 | 0.00 | 0.00 | 0.00 | 0.00 | 0.41 | 6.00 |
|  | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 | 24.00 |
|  | 0.00 | 0.00 | 0.00 | 0.00 | 0.79 | 28.00 |
|  | 0.00 | 0.00 | 0.00 | 0.-0 | 1.49 | 0.00 |

Chart 4 - Page 2

CHART 5 TRIP INFORMATION AND CALIBRATION DATA:

SHIPMENT FROM Tinker AFB Over Route 40 and Return to Tinker AFB

## TRIP INFORMATION

| MODE OF TRANSPORTATION | TRIP ORGIN | TRIP DESTINATION | SYSTEM | TAPE NO |
|---|---|---|---|---|
| Towing | Tinker AFB | Route 40 and return to Tinker AF3 | 1 | 1 |

| DATE OF TRIP | DAYS | TRIP STARTING TIME (HRS) | MINUTES | NUMBER OF TAPES USED | CLOCK INCREMENT MINUTES |
|---|---|---|---|---|---|
| 4/20/72 | 20 | 9 | 40.0 | 3 | 1 |

## TRANSDUCER CALIBRATIONS

| LEVEL | X-ACCEL (G's) | Y-ACCEL (G's) | Z-ACCEL (G's) | MAX PULSE DURATION MILLISECONDS |
|---|---|---|---|---|
| Threshold | 0.40 | 0.0 | 0.30 | 126 |
| Full Scale | 4.00 | 0.0 | 3.00 | |
| Program Reject | 0.0 | 0.0 | 0.0 | |

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DATA RECORDED DURING OVER-THE-ROAD TOW

| Day of Month Hour, Min | X-ACCEL PEAK (G's) | X-ACCEL DURATION Milliseconds | Y-ACCEL PEAK (G's) | Y-ACCEL DURATION Milliseconds | Z-ACCEL PEAK (G's) | Z-ACCEL DURATION Milliseconds |
|---|---|---|---|---|---|---|
| 20.9.43 | 0.51 | 10.00 | 0.00 | 0.00 | 0.67 | 10.00 |
|  | 0.70 | 0.00 | 0.00 | 0.00 | 0.57 | 0.00 |
|  | 0.83 | 6.00 | 0.00 | 0.00 | 1.33 | 24.00 |
|  | 1.08 | 0.00 | 0.00 | 0.00 | 2.67 | 0.00 |
| 20.9.46 | 0.44 | 8.00 | 0.00 | 0.00 | 0.62 | 6.00 |
|  | 0.44 | 0.00 | 0.00 | 0.00 | 1.29 | 16.00 |
|  | 0.44 | 0.00 | 0.00 | 0.00 | 2.71 | 0.00 |
|  | 0.00 | 0.00 | 0.00 | 0.00 | 1.24 | 0.00 |
|  | 0.00 | 0.00 | 0.00 | 0.00 | 0.48 | 68.00 |
| 20.12.33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | 32.00 |
|  | 0.00 | 0.00 | 0.00 | 0.00 | 1.67 | 16.00 |
|  | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | 16.00 |
|  | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | 8.00 |
|  | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 16.00 |
|  | 0.00 | 0.00 | 0.00 | 0.00 | 2.43 | 0.00 |

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CHART 6 - STATISTICAL COMPILATION OF DATA RECORDED ON
X-CHANNEL FROM TINKER AFB - OVER ROUTE 40 AND RETURN TO TINKER AFB

| PULSE WIDTH(MS) | *C* | 0. | 8. | 16. | 24. | 32. | 39. | 47. | 55. | 63. | 71. | 79. | 87. | 95. | 102. | 110. | 118. | 126. | LINE TOTALS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 91- 4 00 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 82- 3 91 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 73- 3 82 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 64- 3 73 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 55- 3 64 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 46- 3 55 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 37- 3 46 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.28- 3 37 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 19- 3 28 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 10- 3 19 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 01- 3 10 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 92- 3 01 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.83- 2 92 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.74- 2 83 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.65- 2 74 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.56- 2 65 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.47- 2 56 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.38- 2 47 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.29- 2 38 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.20- 2 29 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.11- 2 20 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.02- 2 11 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.93- 2 02 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.84- 1 93 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.75- 1 84 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 66- 1 75 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.57- 1 66 G | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1.48- 1 57 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.39- 1 48 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.30- 1 39 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.21- 1 30 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.12- 1 21 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 03- 1 12 G | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 0.94- 1 03 G | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 0.85- 0 94 G | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| 0 76- 0 85 G | 4 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| 0 67- 0 76 G | 8 | 6 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| 0 58- 0 67 G | 14 | 10 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 |
| 0 49- 0 58 G | 93 | 140 | 16 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 253 |
| 0 40- 0 49 G | 53 | 150 | 13 | 8 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 225 |
| **COLUMN TOTALS** | 183 | 309 | 35 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Line "C" is an auxiliary memory, and records only maximum amplitude without regard to pulse width.

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CHART 7 - STATISTICAL COMPILATION OF DATA RECORDED ON
Z CHANNEL FROM TINKER AFB - OVER ROUTE 40 AND RETURN TO TINKER AFB

| PULSE WIDTH(MS) | *C* | 0. | 8. | 16. | 24. | 32. | 39. | 47. | 55. | 63. | 71. | 79. | 87. | 95. | 102. | 110. | 118. | 126. | LINE TOTALS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.93- 3.00 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.86- 2.93 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.80- 2.86 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.73- 2.80 G | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.66- 2.73 G | 70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 70 |
| 2.59- 2.66 G | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 |
| 2.53- 2.59 G | 38 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 38 |
| 2.46- 2.53 G | 132 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 132 |
| 2.39- 2.46 G | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 43 |
| 2.32- 2.39 G | 69 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 69 |
| 2.26- 2.32 G | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 |
| 2.19- 2.26 G | 38 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 38 |
| 2.12- 2.19 G | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| 2.05- 2.12 G | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 1.99- 2.05 G | 36 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 |
| 1.92- 1.99 G | 17 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 |
| 1.85- 1.92 G | 27 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 |
| 1.78- 1.85 G | 12 | 4 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 34 |
| 1.72- 1.78 G | 11 | 6 | 5 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| 1.65- 1.72 G | 17 | 10 | 15 | 5 | 4 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| 1.58- 1.65 G | 17 | 8 | 1 | 7 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 |
| 1.51- 1.58 G | 29 | 9 | 16 | 6 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 64 |
| 1.45- 1.51 G | 9 | 10 | 6 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32 |
| 1.38- 1.45 G | 17 | 24 | 27 | 18 | 2 | 1 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 91 |
| 1.31- 1.38 G | 9 | 15 | 12 | 19 | 5 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 63 |
| 1.24- 1.31 G | 9 | 11 | 9 | 11 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 42 |
| 1.18- 1.24 G | 21 | 26 | 29 | 23 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 108 |
| 1.11- 1.18 G | 9 | 9 | 7 | 7 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 34 |
| 1.04- 1.11 G | 22 | 25 | 18 | 18 | 2 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 89 |
| 0.97- 1.04 G | 12 | 14 | 8 | 5 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 44 |
| 0.91- 0.97 G | 20 | 12 | 9 | 8 | 2 | 3 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 54 |
| 0.84- 0.91 G | 37 | 24 | 13 | 12 | 8 | 3 | 3 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 101 |
| 0.77- 0.84 G | 23 | 10 | 7 | 6 | 5 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56 |
| 0.70- 0.77 G | 67 | 23 | 16 | 16 | 5 | 1 | 4 | 4 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 141 |
| 0.64- 0.70 G | 36 | 11 | 11 | 14 | 3 | 3 | 4 | 1 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 87 |
| 0.57- 0.64 G | 99 | 38 | 39 | 46 | 14 | 9 | 9 | 6 | 7 | 5 | 4 | 3 | 3 | 1 | 2 | 0 | 0 | 0 | 274 |
| 0.50- 0.57 G | 67 | 30 | 29 | 77 | 31 | 9 | 8 | 4 | 7 | 1 | 2 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 271 |
| 0.43- 0.50 G | 70 | 41 | 58 | 133 | 49 | 31 | 16 | 11 | 5 | 7 | 1 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 425 |
| 0.37- 0.43 G | 100 | 554 | 1126 | 1070 | 180 | 55 | 21 | 5 | 5 | 5 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 3120 |
| 0.30- 0.37 G | 1 | 1974 | 778 | 148 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2907 |
| COLUMN TOTALS | 1265 | 2891 | 2246 | 1668 | 334 | 125 | 74 | 31 | 27 | 10 | 12 | 7 | 10 | 3 | 3 | 3 | 2 | 3 | |

* Line "C" is an auxiliary memory, and records only maximum amplitude without regard to pulse width.

# CHART 8 — TRIP INFORMATION AND CALIBRATION DATA: SHIPMENT FROM McCLELLAN AFB TO TEMPELHOF AIRFIELD

## TRIP INFORMATION

| MODE OF TRANSPORTATION | TRIP ORIGIN | TRIP DESTINATION | SYSTEM | TAPE NO |
|---|---|---|---|---|
| Airlift | McClellan AFB | Tempelhof Airfield | 1 | 1 |

| DATE OF TRIP | DAYS | TRIP STARTING TIME (HOURS) | MINUTES | NUMBER OF TAPES USED | CLOCK INCREMENT (MINUTES) |
|---|---|---|---|---|---|
| 5/1?/71 | 17 | 15 | 35.0 | 3 | 1.000 |

## TRANSDUCER CALIBRATION

| LEVEL | X-ACCEL (g's) | Y-ACCEL (g's) | Z-ACCEL (g's) | MAX PULSE DURATION MILLISECONDS |
|---|---|---|---|---|
| Threshold | 1.50 | 0.50 | 2.50 | 1.26 |
| Full Scale | 15.00 | 5.00 | 25.00 | |
| Program Reject | 0.0 | 0.0 | 0.0 | |

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# —DATA RECORDED DURING LOADING AT McClellan AFB

| Day of Month, Hour, Min | X-ACCEL PEAK (Gs) | X-ACCEL DURATION (Millisecond) | Y-ACCEL PEAK (Gs) | Y-ACCEL DURATION (Millisecond) | Z-ACCEL PEAK (Gs) | Z-ACCEL DURATION (Millisecond) |
|---|---|---|---|---|---|---|
| 17.16.13 | 0.0 | 0.0 | -0.63 | 0.0 | 0.0 | 0.0 |
|  | 0.0 | 0.0 | -0.56 | 0.0 | 0.0 | 0.0 |
|  | 0.0 |  | 0.71 |  | 0.0 |  |
| 17.16.14 | 0.0 | 0.0 | -0.71 | 0.0 | 0.0 | 0.0 |
|  | 0.0 | 0.0 | 0.63 | 0.0 | 0.0 | 0.0 |
|  | 0.0 |  | 0.71 |  | 0.0 |  |
| 17.16.16 | 0.0 | 0.0 | -1.43 | 4.0 | 0.0 | 0.0 |
|  | 0.0 | 0.0 | 1.43 | 0.0 | 0.0 | 0.0 |
|  | 0.0 |  | 1.75 |  | 0.0 |  |
| 17.16.26 | 0.0 | 0.0 | -2.63 | 4.0 | 0.0 | 0.0 |
|  | 0.0 | 0.0 | -1.27 | 0.0 | 0.0 | 0.0 |
|  | 0.0 | 0.0 | -4.13 | 0.0 | 0.0 | 0.0 |
|  | 0.0 |  | 0.87 | 0.0 | 0.0 |  |
|  | 0.0 |  | 0.71 |  | 0.0 |  |

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## — DATA RECORDED DURING TAKE-OFF FROM McClellan AFB

| Day of Month, Hour, Min | X-ACCEL PEAK (Gs) | X-ACCEL DURATION (Millisecond) | Y-ACCEL PEAK (Gs) | Y-ACCEL DURATION (Millisecond) | Z-ACCEL PEAK (Gs) | Z-ACCEL DURATION (Millisecond) |
|---|---|---|---|---|---|---|
| 17.19.07 | 0.0<br>0.0 | 0.0<br>0.0 | −0.56<br>−0.56<br>0.63 | 4.00<br>0.0 | 0.0<br>0.0 | 0.0<br>0.0 |
| | 0.0<br>0.0<br>0.0 | 0.0<br>0.0 | −0.56<br>0.63<br>0.63 | 0.0<br>6.00 | 0.0<br>0.0<br>0.0 | 0.0<br>0.0 |
| | 0.0<br>0.0 | 0.0<br>0.0 | 0.63<br>0.63<br>0.63 | 4.00<br>8.00 | 0.0<br>0.0 | 0.0<br>0.0 |
| | 0.0<br>0.0 | 0.0<br>0.0 | −0.71<br>−0.71<br>0.63 | 102.00<br>10.00 | 0.0<br>0.0<br>0.0 | 0.0<br>0.0 |
| | 0.0<br>0.0 | 0.0<br>0.0 | 0.63<br>0.63<br>0.63 | 10.00<br>14.00 | 0.0<br>0.0<br>0.0 | 0.0<br>0.0 |

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# —DATA RECORDED DURING UNLOADING AT TEMPELHOF AIR FIELD, BERLIN

| Day of Month Hour, Min | X-ACCEL PEAK (Gs) | X-ACCEL DURATION (Millisecond) | Y-ACCEL PEAK (Gs) | Y-ACCEL DURATION (Millisecond) | Z-ACCEL PEAK (Gs) | Z-ACCEL DURATION (Millisecond) |
|---|---|---|---|---|---|---|
| 20.2.5 | -1.21<br>0.51<br>0.51 | 5.00<br>0.0 | -1.11<br>0.63<br>0.63 | 3.0<br>0.0 | 1.03<br>0.0<br>0.71 | 0.0<br>0.0 |
| 20.2.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 20.2.7 | 0.0<br>0.0 | 0.0<br>0.0 | 0.63<br>-0.71 | 0.0<br>0.0 | 0.0<br>0.0 | 0.0<br>0.0 |

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## CHART 9 – STATISTICAL COMPILATION OF DATA RECORDED ON X CHANNEL FROM McCLELLAN AFB TO TEMPELHOF AIRFIELD

| PULSE WIDTH (MS) | C* | 0. | 8. | 16. | 24. | 32. | 39. | 47. | 55. | 63. | 71. | 79. | 87. | 95. | 102. | 110. | 118. | 126. | LINE TOTALS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.91 – 4.00 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.82 – 3.91 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.73 – 3.82 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.64 – 3.73 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.55 – 3.64 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.46 – 3.55 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.37 – 3.46 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.28 – 3.37 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.19 – 3.28 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.10 – 3.19 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.01 – 3.10 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.92 – 3.01 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.83 – 2.92 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.74 – 2.83 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.65 – 2.74 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.56 – 2.65 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.47 – 2.56 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.38 – 2.47 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.29 – 2.38 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.20 – 2.29 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.11 – 2.20 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.02 – 2.11 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.93 – 2.02 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.84 – 1.93 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.75 – 1.84 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.66 – 1.75 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.57 – 1.66 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.48 – 1.57 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.39 – 1.48 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.30 – 1.39 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.21 – 1.30 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.12 – 1.21 G | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1.03 – 1.12 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.94 – 1.03 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.85 – 0.94 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.76 – 0.85 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.67 – 0.76 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.58 – 0.67 G | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.49 – 0.58 G | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 0.40 – 0.49 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **COLUMN TOTALS** | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

*Line "C" is an auxiliary memory, and records only maximum amplitude without regard to pulse width.

## CHART IV. STATISTICAL COMPILATION OF DATA RECORDED ON Y CHANNEL FROM McCLELLAN AFB TO TEMPELHOF AIRFIELD

| PULSE WIDTH (MS) | C* | 0. | 8. | 16. | 24. | 32. | 39. | 47. | 55. | 63. | 71. | 79. | 87. | 95. | 102. | 110. | 118. | 126. | LINE TOTALS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.89 – 5.00 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.77 – 4.89 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.66 – 4.77 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.55 – 4.66 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.44 – 4.55 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.32 – 4.44 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 4.21 – 4.32 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.10 – 4.21 G | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.99 – 4.10 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3.87 – 3.99 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.76 – 3.87 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.65 – 3.76 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.54 – 3.65 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.42 – 3.54 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.31 – 3.42 G | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.20 – 3.31 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.09 – 3.20 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.97 – 3.09 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.86 – 2.97 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.75 – 2.86 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.64 – 2.75 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.52 – 2.64 G | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2.41 – 2.52 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.30 – 2.41 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.19 – 2.30 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.07 – 2.19 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.96 – 2.07 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.85 – 1.96 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.74 – 1.85 G | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1.62 – 1.74 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.51 – 1.62 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.40 – 1.51 G | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 1.29 – 1.40 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.17 – 1.29 G | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1.06 – 1.17 G | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.95 – 1.06 G | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0.84 – 0.95 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.72 – 0.84 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 0.61 – 0.72 G | 11 | 9 | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 |
| 0.50 – 0.61 G | 5 | 15 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 |
| **COLUMN TOTALS** | 18 | 27 | 10 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | |

*Line "C" is an auxiliary memory, and records only maximum amplitude without regard to pulse width.

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## CHART 17 — STATISTICAL COMPILATION OF DATA RECORDED ON Z CHANNEL FROM McCLELLAN AFB TO TEMPELHOF AIRFIELD

| PULSE WIDTH(MS) | C* | 0. | 8. | 16. | 24. | 32. | 39. | 47. | 55. | 63. | 71. | 79. | 87. | 95. | 102. | 110. | 118. | 126. | LINE TOTALS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.89 – 5.00 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.77 – 4.89 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.66 – 4.77 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.55 – 4.66 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.44 – 4.55 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.32 – 4.44 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.21 – 4.32 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.10 – 4.21 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.99 – 4.10 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.87 – 3.99 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.76 – 3.87 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.65 – 3.76 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.54 – 3.65 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.42 – 3.54 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.31 – 3.42 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.20 – 3.31 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.09 – 3.20 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.97 – 3.09 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.86 – 2.97 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.75 – 2.86 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.64 – 2.75 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.52 – 2.64 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.41 – 2.52 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.30 – 2.41 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.19 – 2.30 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.07 – 2.19 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.96 – 2.07 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.85 – 1.96 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.74 – 1.85 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.62 – 1.74 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.51 – 1.62 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.40 – 1.51 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.29 – 1.40 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.17 – 1.29 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.06 – 1.17 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.95 – 1.06 G | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 0.84 – 0.95 G | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 0.72 – 0.84 G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.61 – 0.72 G | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0.50 – 0.61 G | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| **COLUMN TOTALS** | **3** | **6** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | |

*Line "C" is an auxiliary memory, and records only maximum amplitude without regard to pulse width.