DOCUMENT 405-96

RANGE INSTRUMENTATION TAPE RECORDER SURVEY

19961029 093

WHITE SANDS MISSILE RANGE
KWAJALEIN MISSILE RANGE
YUMA PROVING GROUND
DUGWAY PROVING GROUND
ABERDEEN TEST CENTER

ATLANTIC FLEET WEAPONS TRAINING FACILITY
NAVAL AIR WARFARE CENTER WEAPONS DIVISION
NAVAL AIR WARFARE CENTER AIRCRAFT DIVISION
NAVAL UNDERSEA WARFARE CENTER DIVISION, NEWPORT
PACIFIC MISSILE RANGE FACILITY

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45TH SPACE WING
AIR FORCE FLIGHT TEST CENTER
AIR FORCE DEVELOPMENT TEST CENTER
AIR WARFARE CENTER
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REPORT DOCUMENTATION PAGE

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A copy of the tape recorder survey disseminated to the T&E community represented by the Underwater Systems, Telemetry, and Data Reduction and Computer groups of the Range Commanders Council. Lack of participation suggested this initiative might not yield significant savings and there is not sufficient need or desire to common recorder standards at this time.

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RANGE INSTRUMENTATION TAPE RECORDER SURVEY

OCTOBER 1996

Prepared by

UNDERWATER SYSTEMS GROUP
RANGE COMMANDERS COUNCIL

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RANGE INSTRUMENTATION TAPE RECORDER SURVEY

INTRODUCTION

The Range Instrumentation Tape Recorder Survey task was initiated with the expectation that one or several common tape recorder standards could be adopted by Navy ranges, resulting in cost savings based on improved compatibility. Ranges would be able to leverage the commonality through more effective sharing of data and equipment as well as maintenance resources. A survey questionnaire was developed and disseminated to the range community represented by the Underwater Systems, Telemetry, and Data Reduction and Computer groups of the Range Commanders Council. Only minimal response was received and follow-up phone surveys yielded little improvement to the data sampling. The lack of response suggested that this initiative might not yield significant savings and that there is not sufficient need or desire for common recorder standards at this time. Consequently, it seems to be in the best interest of the Underwater Systems Group to close out this task without recommending specific tape recorder standards. However, it is still instructive for this report to address some of the important issues identified during the tape recorder evaluation process.

RANGE TAPE RECORDER SURVEY

The survey (see appendix A) asked each respondent to identify current and planned recorder assets in terms of capability and application. It also requested salient characteristics of the ideal range recorder and the make and model if it currently exists. The viability of a central maintenance repair depot was addressed, and finally whether an appropriate standard is already (or soon to be) available elsewhere. A consensus on one or more recorders was not achieved. Some responses suggested that tape recorders would not be replaced but that current computer storage technologies would be used as appropriate for the data volume and speed required.

RANGE DATA ARCHIVING SOLUTIONS

Virtually all Navy ranges have requirements to record both analog and digital data. The data comes from a variety of sources requiring one to several hundred channels at a variety of bandwidths and dynamic range. Most analog recorders today are really digital recorders with built-in A/D converters of specific dynamic range and frequency to accommodate the signal of interest. They may also be supported by multiplexors to accommodate the number of channels required.

In strictly digital environments, a large variety of more cost effective commercial-off-the-shelf (COTS) solutions have become available from the computer sector, and range sites can readily support most of them on a variety of computer platforms.

These recording solutions include DAT, 8mm, CD-ROM, optical disk, and conventional disk to name a few. These technologies continue to improve at a rapid pace, providing economical solutions to the most demanding data archiving requirements. Furthermore, the use of local and wide area networking can all but eliminate the need for special purpose recorders to accommodate shared data files. Each site has the flexibility to use its own data storage resources via the network.

At the time of the survey, the two most popular recorders were the Metrum RSR-512 and the Racal Storeplex. These recorders use conventional VHS format tape and provide bandwidth that can be easily subdivided to support the channel requirements. For direct recording of analog signals above 20 kHz, the Metrum continues to be one of the only viable COTS recorders available.

At Naval Undersea Warfare Center Division Keyport, the Metrum RSR-512 has been selected and purchased in volume to meet analog acoustic recording requirements. A savings was realized through reduced procurement expense, common maintenance and parts substitution, common tape media, and common operator training. Over the past few years, the steadily increasing capacities of computer disk drives and tape archiving systems have allowed migration of much of our digitized analog data storage to these less expensive and more readily accessible peripherals. The Metrum recorders may eventually be replaced by portable computers augmented with peripherals to perform A/D/A conversion, multiplexing, time code generation, and data storage functions.

Appendix A: RCC Range Instrumentation Tape Recorder Survey

Background. The Underwater Systems Group, at their winter 1992 meeting, proposed conducting a survey of range instrumentation recorders to (1) determine if an ad hoc standard could be identified which would allow sharing of tape recorder assests among ranges, and (2) document existing recording conventions so that range data could be transferred among activities more easily. The Range Commanders Council has asked that this survey be extended to include the Telemetry Group and the Data Reduction and Computer Group.

1. Respondent Information:

Name:_____   Code:_____

Activity:_____   Telephone:_____

Address:_____   Fax:_____

_____

_____

What percentage of your activities assets does this response address?   %

2. Current Assets: Please provide information for those recorders you currently own.

MAKE	MODEL	NUMBER OF CHANNELS	QUANTITY	AGE	APPLICATION

3. Replacement/Augmentation Plans:

a. Current Year (FY-93):

MAKE	MODEL	NUMBER OF CHANNELS	QUANTITY	AGE	APPLICATION

b. Out Years (Through FY-96):

MAKE	MODEL	NUMBER OF CHANNELS	QUANTITY	AGE	APPLICATION

4. Core Data Recorder Specification: If you had the opportunity to develop a specification for a single recorder to meet the bulk of your range recording needs, what attributes would it have?

    a. Total Record Time:_____

    b. Direct/FM:_____

    c. Maximum Bandwidth:_____

       Per Channel:_____

       Total Aggregate:_____

    d. Maximum Size:_____

    e. Maximum Weight:_____

    f. Power Specification (AC/DC/Battery):_____

    g. Environmental Considerations:_____

       _____

       _____

    h. Media (Tape {_ inch, VHS, etc.}/Disk/RAM/Optical Disk):_____

       _____

    i. Input Channels:

       Analog:_____

       Digital:_____

    j. Output Channels:

       Analog:_____

       Digital:_____

    k. Data Exchange Compatibility Requirements:

       Wide Band Group 1:   Yes:_____   No:_____

       Wide Band Group 2:   Yes:_____   No:_____

       Intermediate: Yes:_____   No:_____

       Other:_____

5. Does a Core Data Recorder Make Sense to You?   Yes:_____   No:_____

6. Your Choice for a Recorder:

MAKE	MODEL	NUMBER OF CHANNELS

7. Recording Conventions: How you lay out your data collection to ensure repeatability and ease of playback and annotation.

CHANNEL NUMBER	DATA TYPE
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	

CHANNEL NUMBER	DATA TYPE
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	

ABBREVIATION CONVENTIONS:

A = Analog	FM = FM	IRIG = IRIG (Time Code)
D = Digital	Io = Io	V = Voice

Other: _____

8. Recorder Maintenance Consideration:

Would you utilize a central maintenance repair depot, if made available? ☐ Yes ☐ No

9. Core Data Recorder Considerations:

☐ Standard already exists:

What? _____

☐ It's coming:

From Where?_____

☐ We Should Wait and See:

How Long?_____

☐ Who Cares?

Name?_____ Are you really sure that you want to put your name here??

10. CONGRATULATIONS, YOU ARE DONE!!

Please return this questionnaire (before 30 September 1993) to

Richard R. Peel
Head, Tracking Systems Division

Mail responses to

Commander
NAVUNSEAWARCENDIV
ATTN: Code 572
610 Dowell Street
Keyport, WA 98345-7610

Or fax to

(206) 396-7165