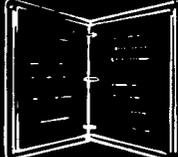


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**ENGINEERING
TECHNICAL
INFORMATION
SYSTEM**

FIELD NOTES • TECHNICAL REPORTS
DATA RETRIEVAL • MANAGEMENT
PROFESSIONAL DEVELOPMENT

VOLUME 12 NUMBER 6

Field  **Notes**

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FOREST SERVICE

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U.S. DEPARTMENT OF AGRICULTURE



ENGINEERING FIELD NOTES

Volume 12 Number 6

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**FOREST SERVICE
U.S. DEPARTMENT OF AGRICULTURE
Washington, D.C. 20013**

TRANSPORTATION OF CONCRETE CYLINDERS

*Robert D. Wildman
Engineering Technician
Sawtooth National Forest
Region 4*

As all Construction Inspectors and Contracting Officer's Representatives know, full concrete cylinders are difficult to transport to the testing facility. They usually end up in the rear of a pickup, clanging together and rolling around. Until recently, there has not been a way to tie the cylinders together well enough to have them remain upright while driving on rough, winding, mountain roads.

Now there is a way; the cylinder carrier shown in figures 1, 2, and 3 has alleviated the problem of transporting full cylinders. The carrier shown was designed to hold eight cylinders, but it could be made larger or smaller. The 8-cylinder carrier can be constructed from the following materials:

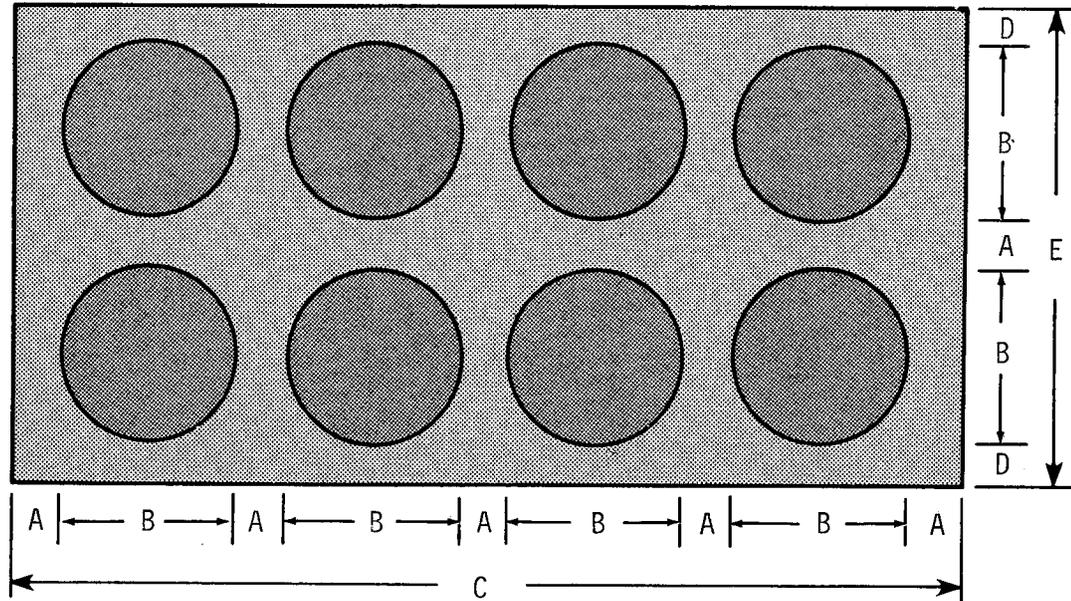
Plywood

- 2 - 3/4 in. x 18 in. x 36 in. = top and bottom
(19.1 mm x 457.2 mm x 914.4 mm)
- 2 - 3/4 in. x 8 1/2 in. x 16 1/2 in. = short side
(19.1 mm x 215.9 mm x 419.1 mm)
- 2 - 3/4 in. x 8 1/2 in. x 36 in. = long side
(19.1 mm x 215.9 mm x 914.1 mm)
- 2 - 3/4 in. x 16 1/2 in. x 34 1/2 in. = bottom insert
(19.1 mm x 419.1 mm x 876.3 mm)

Finishing nails

Padding (foam or rubber)

Empty cylinders may be transported upside down to keep lids from blowing off.



DIMENSIONS				
A	B	C	D	E
2 IN. (50.8 MM)	6 1/2 IN. (165.1 MM)	36 IN. (914.4 MM)	1 1/2 IN. (38.1 MM)	18 IN. (457.2 MM)

Figure 1. Cylinder carrier (top view)

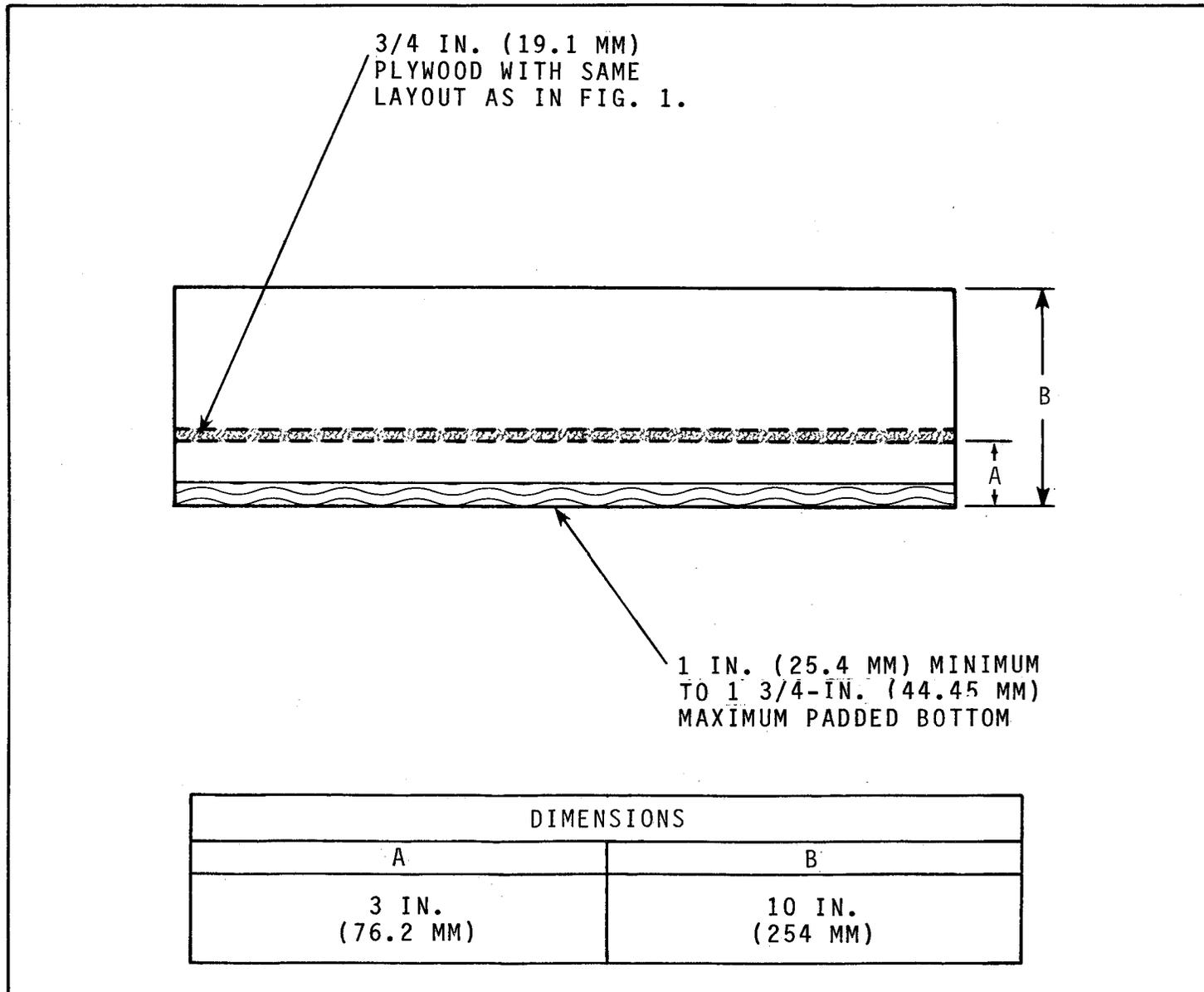
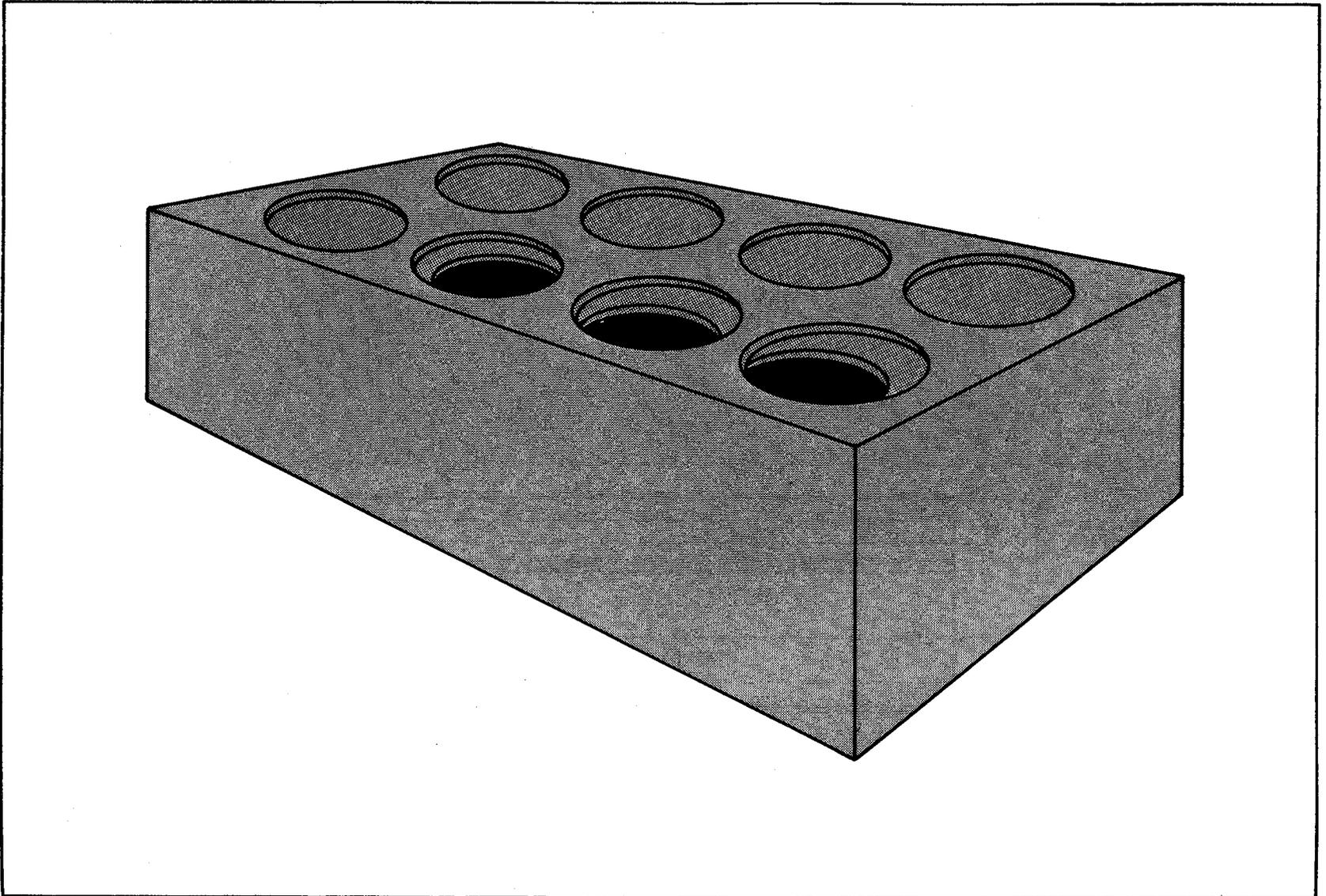


Figure 2. Cylinder carrier (side view)



4

Figure 3. Cylinder carrier (corner view)

CONSULTATION & STANDARDS

*Walter E. Furen
Assistant Director*

CONSTRUCTION MATERIALS SAMPLING & TESTING HANDBOOK

*E. J. Mandigo
Materials Engineer
Washington Office*

In 1977, Region 1 published a materials handbook for construction and materials field personnel. The publication proved to be quite convenient as a field reference in Region 1, as well as in several adjacent Regions. Within the next 2 years, other Regions provided similar information to their construction and materials personnel.

Recognizing an internal need for a similar publication, Region 9 brought the matter to the attention of the Washington Office in 1979 and suggested that a Service-wide handbook should be considered; a brief inquiry to several of the Regions by the Washington Office confirmed that need. Based on the recognized need and the potential efficiency of preparing and updating one Service-wide handbook versus several individual efforts, development of the handbook proceeded during the winter of 1979-1980 and into the spring of 1980. A task force consisting of Bob Hinshaw, Region 1; Duane Logan, Region 3; Ted Stuart, Region 5; Bob Harmon, Region 9; and Jim Mandigo, WO, collaborated on the handbook.

The handbook combines new material with information taken from several sources, including the Region-1 and Region-3 handbooks, Region-2 training material, FHWA handbook, and several State publications. The result is a publication that is applicable Service-wide and is consistent with Forest Service Standard Specifications for the Construction of Roads and Bridges, (EM-7720-100), 1979 edition.

The handbook incorporates a glossary of sampling and testing terms, and chapters on safety, sampling techniques, and testing procedures. Standard test methods published by the American Association of State Highway and Transportation Officials (AASHTO), which are frequently needed in the field, are also included. Revised schedules for sampling and testing frequencies are presented, as are new standard forms with comprehensive examples.

Because the handbook contains new material, the decision was made to distribute a limited number of draft copies for a review by prospective users. The review will take place during the 1980 construction season; revisions will be made during the winter with publication planned for the spring of 1981.

The quality of the final publication depends largely on cooperation during the field review process. Reviewers are asked to give it a fair trial and provide comments and suggestions. Your help is greatly appreciated.

BINDERS FOR FOREST SERVICE STANDARD SPECIFICATIONS FOR
CONSTRUCTION OF ROADS & BRIDGES (EM-7720-100)

M. E. Unruh
Construction and Maintenance Engineer
Washington Office

In the fall of 1979, a new edition of Forest Service Standard Specifications for Construction of Roads and Bridges, (EM-7720-100) was printed; 1,500 copies were trimmed and drilled for looseleaf binders and distributed for in-Service use. At the same time, special looseleaf binders intended for heavy-duty use for a period of 4 to 6 years were ordered and distributed. Many of the covers separated from the spines during shipment, and many more were found to be defective since then.

We have purchased new heavy-duty binders that will meet our requirements, and they will be distributed as soon as production is completed to those who received the 1979 shipment.

THE AUTOSTRESS BRIDGE

*L. D. Bruesch
Chief Highway Structures Engineer
Washington Office*

The Forest Service has entered into a collection agreement with the American Iron and Steel Institute (AISI) to construct and field test a steel girder bridge, designed by a new method called "Autostress," which is to be installed on the Mt. Baker-Snoqualmie National Forest. The agreement, signed by Regional Forester R. E. Worthington in June, 1980, calls for a single-lane, two-span continuous bridge over the Whitechuck River about 90 miles (144.8 kilometers) northeast of Seattle, Washington. AISI enlisted the Forest Service's help because of the availability of the heavy logging equipment loads.

The "Autostress" design method is an extension of the presently used load-factor design method, and was developed to utilize the ability of a redundant steel structure to shakedown. After a few passages of a sufficiently heavy load, such a bridge will develop moments and stresses caused by plastic deformations; in the case of the proposed Whitechuck River Bridge, these will develop over the pier. During subsequent passages of similar loads, the moments will ensure elastic behavior and are analogous to the moments induced in a concrete beam by prestressing. The moments and stresses are produced automatically, hence the name "Autostress." Cost savings might run 5 to 10 percent, in comparison to the cost of a load-factor designed structure.

The collection agreement, signed by AISI and the Forest Service, involves others: The U.S. Steel Corporation Research Laboratory, Monroeville, Pennsylvania, will perform the initial design for the steel girders; the FHWA Western Bridge Office, under contract to the Forest Service, will prepare the design and drawings; and the Civil Engineering Department, University of Washington, under contract to AISI, will perform the field testing. The agreement requires AISI to bear all costs over and above that of the most cost effective structure that the Forest Service normally would install.

Under the present schedule, the bridge is to be constructed during the summers of 1981 and 1982; field testing will follow immediately. The test results will be used then to support inclusion of the concept in the AASHTO bridge design specifications.

TECHNOLOGICAL IMPROVEMENTS

*Harold L. Strickland
Assistant Director*

CHANGES AT EQUIPMENT DEVELOPMENT CENTERS

*Farnum M. Burbank
Chief Equipment Development Engineer
Washington Office*

At the recent Regional Foresters' and Directors' meeting in Missoula, Montana, we had an opportunity to brief the group about new events within Equipment Development. Dr. Tom Nelson introduced the presentation with the brief statement, "It is no longer business as usual for Equipment Development."

Over the past few years, we have gone through a critical self-examination of our organization and procedures. We asked the Administrative Management Staff for help in analyzing our operations, and we have evaluated the results of everyone's efforts. From these we developed a new look. One of the first considerations was the restructuring of the organization to provide stronger leadership from the Washington Office. Consequently, the Centers have been reassigned as detached units of the Washington Office, with the Center Managers reporting to the Assistant Director for Technological Improvements, Division of Engineering. This will provide unified and consistent technical and administrative direction, as well as optimum responsiveness to management needs.

The development of a new Project Evaluation Selection and Implementation Process (PESIP) is a significant change, and I want to emphasize certain important features. There will be systematic procedures for benefits analysis, estimates of probability of success, and engineering assessments of economic, environmental, safety, and other impacts. All proposed projects will be measured against their contributions to the Resource Planning Act program targets. The selection process will highlight a national system of priority setting, based on the Chief's goals, skills available, functional requirements, and funding available. The final program will be the responsibility of the Deputy Chief for National Forest System, whose decisions will be based on this systematic analysis of all the elements mentioned. We will use a linear program already in operation, thereby making optimal use of the program's criteria of funding available, priorities, skills, or other identifiable or quantifiable

factors. The system provides excellent opportunities for closer coordination with Research during the analysis and selection phase and with State and Private Forestry during the implementation phase. The linear program also aids in the identification of Center potential workloads and required skill mixes well in advance of the start of work.

This is only part of the total engineering development cycle. Procedures are being prepared for the development and test phase and for the implementation and use phase. We will keep you informed of the progress.

Starting with FY 1982, the Center budgets will be prepared according to standard Forest Service formats. We believe the standard formats will eliminate the misunderstanding and confusion that have occurred in the past due to our "different" procedures and will provide the opportunity for better budgetary administration and control.

CHANGES IN ENGINEERING FIELD NOTES

ENGINEERING FIELD NOTES, JANUARY-FEBRUARY 1980

The GPO contractor incorrectly placed the figure captions on page 2. Please mark your copy so that the caption for Figure 1 identifies the photograph on the left side of the page; the caption for Figure 2 describes the photograph on the right side.

ENGINEERING FIELD NOTES, MARCH 1980

In production of the March issue, Figure 4 on page 11 was rotated inadvertently 90° clockwise, thereby showing the underside of the bridge in a vertical position. Please correct this error by marking the right side of the photograph to indicate the top of the figure.

Under "The Hobo Engineer" (page 17, paragraph 1, line 4), please correct "Huskley" to read "Huckeby."

INVITATION TO READERS OF *FIELD NOTES*

Every reader is a potential author of an article for *Field Notes*. If you have a news item or short article you would like to share with Service engineers, we invite you to send it for publication in *Field Notes*.

Material submitted to the Washington Office for publication should be reviewed by the respective Regional Office to see that the information is current, timely, technically accurate, informative, and of interest to Forest Service Engineers (FSM 7113). The length of material submitted may vary from several short sentences to several typewritten pages; however, short articles or news items are preferred. All material submitted to the Washington Office should be typed double-spaced, and, ideally, all illustrations should be original drawings, glossy prints, or negatives.

Field Notes is distributed from the Washington Office directly to all Regional, Station, and Area Headquarters, Forests, and Forest Service retirees. If you are not currently on the mailing list, ask your Office Manager or the Regional Engineering Technical Data Systems Coordinator to increase the number of copies sent to your office. Copies of back issues are also available from the Washington Office.

Field personnel should submit material for publication or questions concerning *Field Notes* to their Regional Coordinators:

R-1	Melvin Dittmer	R-4	Ted Wood	R-9	Rich Wilson
R-2	Royal M. Ryser	R-5	Paul Stutes	R-10	Jack Van Lear
R-3	Juan Gomez	R-6	Kjell Bakke	WO	Al Colley
		R-8	Michael Martin		

Coordinators should direct questions concerning format, editing, publishing dates, and other problems to:

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