

CALIBRATION OF STANDARD NETWORK

by

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MEMORANDUM

NOTE DE SERVICE

TO
À

M.J. Berry.

FROM
DE

A.J. Wickens

SECURITY - CLASSIFICATION - DE SÉCURITÉ
OUR FILE - N/RÉFÉRENCE
YOUR FILE - V/RÉFÉRENCE
DATE February 5, 1975

SUBJECT
OBJET

Calibration of the Standard Network.

Re:- File 6082-1-10, Aug.8/74

Two meetings were held; the first on Sept.11/74 was attended by M. Berry, M.Bone, R.Hayman, F.Kollar, F.Lombardo, W.Milne, D.Weichert, J.Wickens; the second on Jan.7/75 attended by M.Bone, R.Hayman, F.Kollar, G.Leblanc, F.Lombardo, A.Stevens, D.Weichert, J.Wickens.

At the first meeting a description of present procedures was given by F.Lombardo. Essentially each instrument (3 LP'S, 3SP's) was checked with the Willmore bridge for "as found" response after which it was cleaned readjusted and checked again with the bridge to obtain the final response. Also, and of considerable importance, discussions were conducted with the station operator. The time required to carry out the calibrations, discussions and general housekeeping was usually ten man days.

It was decided to investigate present equipment and procedures and to withhold further meetings until a definite policy, agreeable to all concerned, could be laid down which would accomplish the following:-

- 1) Provide up to date easily portable calibration equipment which could be mailed to and operated by station operators if necessary.
- 2) Lay down a procedure which would result in more frequent contact with the station operators without an increase in field time or expenditure.
- 3) Place a "signature" pulse on the S.P. instruments.

Informal discussions before the second meeting established that a change in procedure would save considerable time in the field with further savings resulting from the proposed new equipment.

The second meeting revolved around the following three points.

- 1) Procedure
Under the new procedure a station will be visited by a member of

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the group from Ottawa only when adjustments that cannot be performed by the operator are necessary or when it has been some time since the station was visited. When a station is visited adjustments will be made only when it appears that the instruments are outside nominal limits. Nominal response will be achieved by adjustments to the seismometer period and the "T" network resistances. An overlay of the comprehensive calibration sequence described below will be used to ensure that the instruments are in fact operating within nominal limits. The precise response of the instruments will be obtained in Ottawa by a detailed treatment of the response sequences obtained in the field. The proposed calibration equipment requires only one operator and is semi-automatic in that it will activate three components at a time with a pre-programmed sequence of signals. The man days per visit will be reduced from the previous 10 to an estimated 2.

2) Equipment

It is proposed that a mini digital computer with a precise crystal controlled time base be used to provide digital signals which will be sinusoidal (D to A conversion) and square wave sequences which vary in amplitude vs. frequency in such a way that essentially the output response of the seismometer would be constant in amplitude. Overlays would show deviations from nominal performance in the field. A comprehensive treatment of the output sequence in the office at Ottawa would produce the response characteristics for each instrument.

3) Implimentation

The micro systems mini computer originally considered for the

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"back pack" system is available for testing as the nucleus of the new equipment. A.J. Wickens has agreed to work on the software for the system in co-operation with the instrument section who will provide the hardware.

An operational prototype should be thoroughly tested before the end of 1975.

Handwritten signature of A.J. Wickens and typed name: A.J. Wickens, Seismology Div.