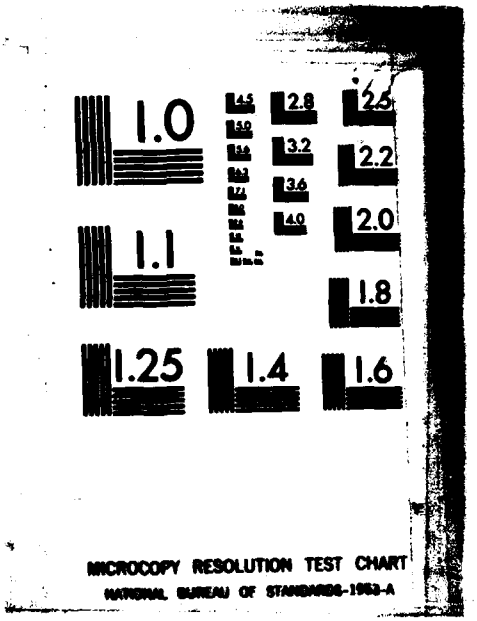
AD-A133 143 TELEMETERED SEISMIC NETWORK--'SYSTEM 768'(U) FOREIGN 1/1
TECHNOLOGY DIV WRIGHT-PATTERSON AFB OH 13 SEP 83
FTD-ID(RS)T-1277-83

UNCLASSIFIED F/G 8/11 NL

END


1.0
1.1
1.25
1.4
1.6
2.8
3.2
3.6
4.0
2.5
2.2
2.0
1.8
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

FTD-ID(RS)T-1277-83

FOREIGN TECHNOLOGY DIVISION

TELEMETERED SEISMIC NETWORK--"SYSTEM 768"

Approved for public release;
distribution unlimited.

EDITED TRANSLATION

FTD-ID(RS)T-1277-83 13 September 1983

MICROFICHE NR: FTD-83-C-001128

TELEMETERED SEISMIC NETWORK--"SYSTEM 768"

English pages: 9

Source: Dizhen Xuebao, Vol. 4, Nr. 4, November 1982, pp. 434-438

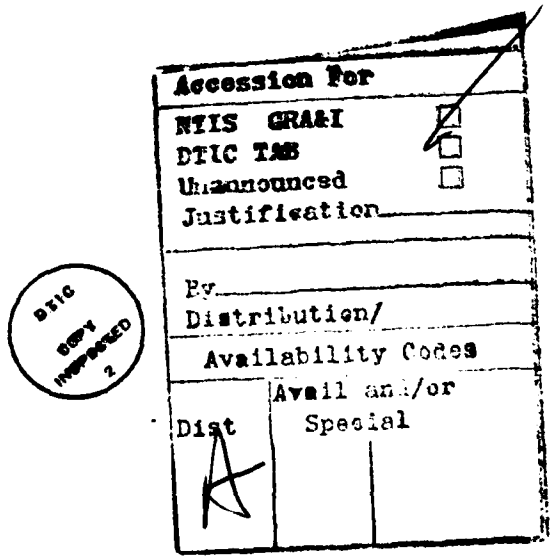
Country of origin: China
Translated by: SCITRAN
F33657-81-D-0263
Requester: FTD/WE

PREPARED BY:

TRANSLATION DIVISION
FOREIGN TECHNOLOGY DIVISION
WP-AFB, OHIO.

GRAPHICS DISCLAIMER

All figures, graphics, tables, equations, etc. merged into this translation were extracted from the best quality copy available.



TELEMETERED SEISMIC NETWORK--"SYSTEM 768"

After the occurrence of the earthquake in Haicheng in 1975, the National Bureau of Seismology established in 1976 a "telemetered seismic network observation, analysis and processing system general design group" so as to further enhance research in quake prediction. It was decided that the telemetered seismic network of Peiching would be expanded and the technology used would be improved. At the same time, telemetered seismic networks were to be set up in Shanghai, K'unming, Ch'engtu, Lanchou and Shengyang. The technological aspects of these six networks would be uniformly planned, designed and organized by the general design group. The design, research and construction of this entire technological system will be referred to as "system 768".

"System 768" is a modernized observation network for localized earthquakes and earthquake warnings. Its main features are: capability for both observation of quake warnings and earthquake measurements; combination of transmission via cables and wireless transmission; simultaneous recording using strip chart recorders, analog magnetic tape and digital magnetic tape recordings; unified time service; automatic remote control of instrument calibration; and real-time time-sharing of observation data effected directly by the computer system.

I. Principal functions of "System 768"

1. The entire system can continually and reliably provide quake warning observation data and earthquake data to be used in the research on medium long term, short term and especially pre-quake predictions. Furthermore, it can speedily analyze these data.

2. After a destructive earthquake has taken place at home or abroad, the system can relatively accurately determine the basic quake parameters within 10 minutes after the seismic waves pass through the entire seismic network, and provide a complete record of the quake.

3. The system provides basic data and information for research in seismology.

II. The chief constituent parts of "System 768"

"System 768" is chiefly made up of the following seven systems: quake warning observation system, quake observation system, quake observation system using wireless transmission, digitized quake observation system, computer data processing system, remote control and calibration system and power supply system.

1. Quake warning observation system. At present, this consists of digital nuclear spin magnetoscope, digital electroscope, digital radon detector, digital bubble inclinometer, digital instrument for measuring temperature, pressure and humidity, digital terrestrial stress gauge, instrument for measuring drop in water level and quake warning remote measurement equipment. The warning instrument automatically samples observation once every minute or once every hour. The digital signals of observation are transmitted from the quake warning observation system to the data recording, analysis and processing center by means of cables or wireless passage via the corresponding rransmission equipment.

2. Quake observation system. This includes 3-component short period seismometer and under-well seismometer with 10 to 100 times amplification, 3-component medium-long period seismometer with 100 to 1000 times amplification, 3-component long period seismometer with 1000 times amplification, 3-component medium-strength quake seismometer with 1 to 10 times amplification and pulsed amplitude-modulated and freqneyc-modulated remote measurement equipment as well as PTY-8 quake remote measurement equipment. The bandwidth of the entire system is in the range 0.005 to 20 Hz.

After the analog seismic signal is picked up by the short period seismometer, it passes through the PTY-8 quake remote measurement equipment, and is transmitted to the recording, analysis

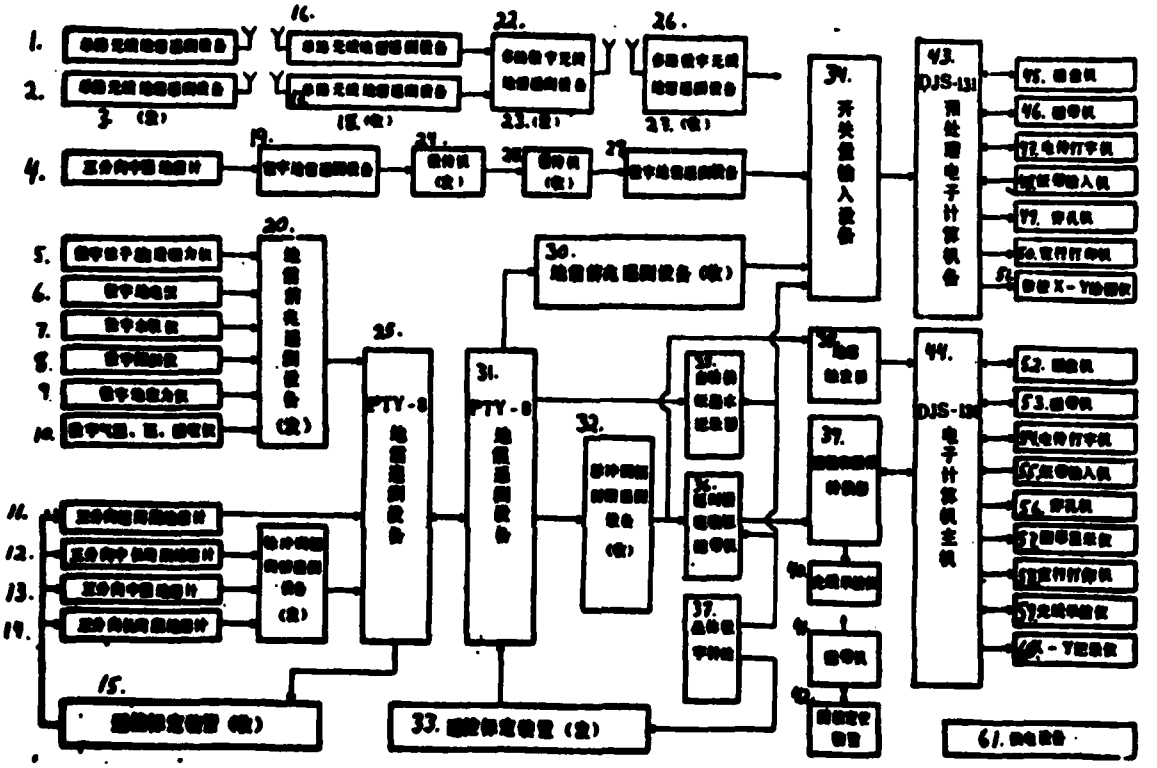


Figure 1. Schematic diagram of "System 768"

KEY to Figure 1 (preceding page):

1,2--single-line wireless quake remote measurement equipment; 3--(transmission); 4--3-component medium strength quake seismometer; 5--digital nuclear spin magnetoscope; 6--digital electroscope; 7--digital radon detector; 8--digital inclinometer; 9--digital terrestrial stress gauge; 10--digital instrument for measuring temperature, pressure and humidity; 11--3-component short period seismometer; 12--3-component medium-long period seismometer; 13--3-component medium-strength quake seismometer; 14--3-component long period seismometer; 15--remote control calibration setup (reception); 16,17--single-line wireless quake remote measurement equipment; 18--reception); 19--digital quake remote measurement equipment; 20--quake warning remote measurement equipment (transmission); 21--pulsed amplitude-modulated and frequency-modulated remote measurement equipment (transmission); 22--multi-line digital wireless quake remote measurement equipment; 23--(transmission); 24--data transmission machine (transmission); 25--PTY-8 quake remote measurement equipment; 26--multi-line dididgtal wireless quake remote meausrement equipment; 27--(reception); 28--data transmission machine (reception); 29--digital quake remote measurement equipment; 30--quake warning remote measurement equipment (reception); 31--PTY-8 quake remote measurement equipment; 32--pulsed amplitude-modulated and frequency-modulated remote measurement equipment (reception); 33--remote control calibration setup (transmission); 34--on-off signal input; 35--automatic paper-change strip chart recorder; 36--time-delayed low-speed analog magnetic tape machine; 37--crystal digital clock station; 38--earthquake activator; 39--analog to digital converter; 40--oscilloscope; 41--magnetic tape machine; 42--positioning device; 43--DJS-131 computer peripheral equipment; 44--DJS-131 computer main-frame; 45--magnetic disk drive; 46--magnetic tape machine; 47--teletype; 48--paper tape drive; 49--puncy; 50--wide-spaced printer; 51--X-Y plotter; 52--magnetic disk drive; 53--magnetic tape machine; 54--teletype; 55--paper tape drive; 56--punch; 57--monitor; 58--wide-spaced printer; 59--oscilloscope; 60--X-Y recorder; 61--power supply equipment

Distant seismic signals measured by single-line wireless remote measurement equipment can be transmitted to wired remote measurement stations, to be relayed thence to the PTY-8 quake remote measurement equipment and then to the recording, analysis and processing center via telephone lines. These can also be transmitted via several wireless relay stations. It is also possible to collect many single-line wireless signals at the central station and then transmit them to the recording, analysis and processing center.

4. Digitalized quake observation system. This is a wide bandwidth and wide activity range digitalized quake observation system. It is still in an experimental stage.

After the analog quake signals are picked up by the seismometers, they are converted into digital signals by the multi-line digital quake remote measurement equipment and then transmitted to the quake data preliminary processing equipment of the recording, analysis and processing center via data transmission machines and telephone lines or wireless transmission equipment.

5. Computer data processing system. The recording, analysis and processing center is made up of the computer data processing system and related equipment. It includes equipment for the automatic reception and processing of digitized quake warning signals, the computer main-frame equipment for the automatic reception, scanning and processing of analog quake signals and for the various operations by the analysis and research personnel, the crystal digital clock station, magnetic tape recorder and strip chart recorder.

The entire set of computer programs used in this system is developed by our seismology research and technical personnel. Real time collection, ordering, organization, preliminary analysis and storage of quake warning signals and digital quake signals are accomplished in the computer peripheral equipment. The computer

main-frame takes care of such tasks as regular processing of quake warning data, high speed automatic preliminary determination of quake parameters, regular processing of earthquake data (preparation of charts, mapping of quake centers, compilation of earthquake catalogs, etc.), calibration and examination of the frequency characteristics and operation of the quake observation system and the seismic wave data, and detailed analysis of quake warning data.

The crystal digital clock station is the over-all time service system with an accuracy of ± 1 msec per day.

6. Remote control and calibration system. The chief equipment includes the coded remote control and the calibrator which automatically control and examine the conditions of the instruments and equipment of the observation stations. These automatically calibrate the seismometers through remote control once every day, and can send out calibration signals to one or more stations as a function of time.

7. Power supply system. To ensure normal operation of the network system, stations lacking alternating current power supplies are powered by solar cells or large capacity air cells. The recording, analysis and processing center is equipped with diesel generators.

Almost all of the parts and components used in "System 768" are products of our country. All the specialized software of the computer has been developed by ourselves. The correctness of the logic design of the entire system has been borne out by more than one year's testing on the Shanghai seismic network. Twenty-seven different types of equipment amounting to over 300 machines all meet design requirements. Installation and testing of equipment for the other networks are under way. This huge and complex advanced system is the result of the combined research and fabrication efforts of all of the near 100 persons of the units related to the seismic system. Its construction has been enthusiastically supported and

assisted by the commissioners of related departments of the central government, and the colleges, tens of factories and research units of Shanghai.

The completion of "System 768" marks a new starting point for the modernization of the quake and quake warning observation, analysis and processing system of our country. Extended application of this technology will certainly increase the pace of earthquake prediction research in our country.

Acta Seismologica Sinica Reporter

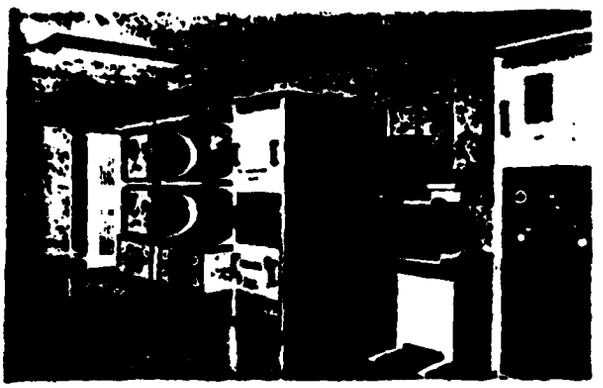


Photo 1. Computer peripheral equipment

Photo 2. Computer main-frame

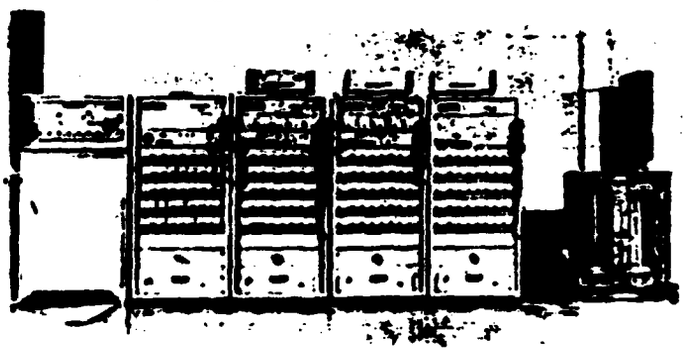


Photo 3. PTY-8 quake remote measurement equipment (reception)

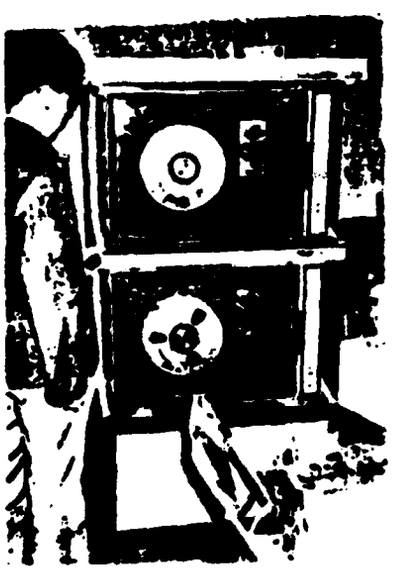


Photo 4. Time-delayed low-speed analog magnetic tape machine

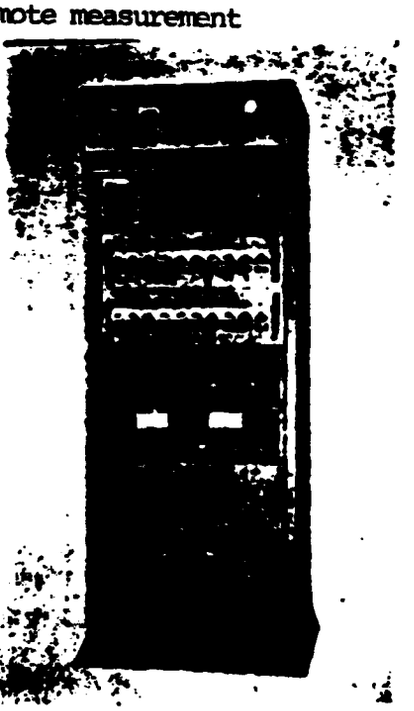


Photo 5. Remote control calibration equipment

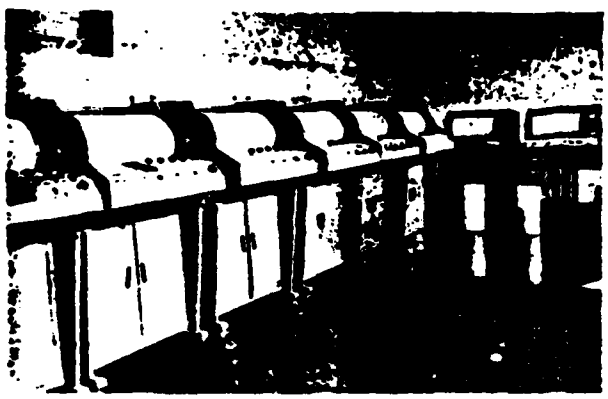


Photo 6. Automatic paper-change strip chart recorder

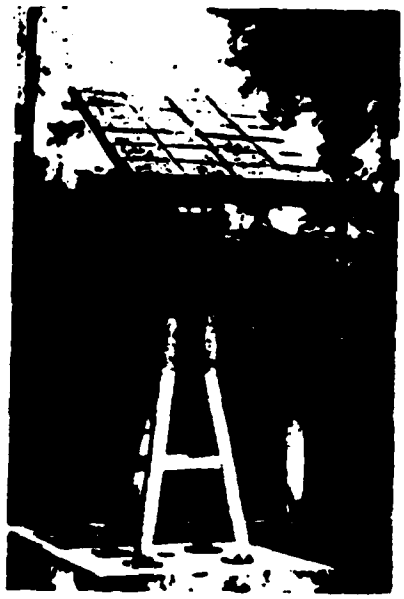


Photo 7. Solar cells

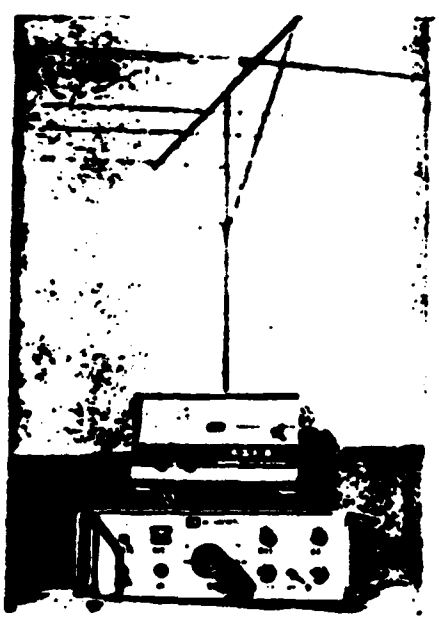


Photo 8. Single-line wireless remote measurement equipment (transmission)

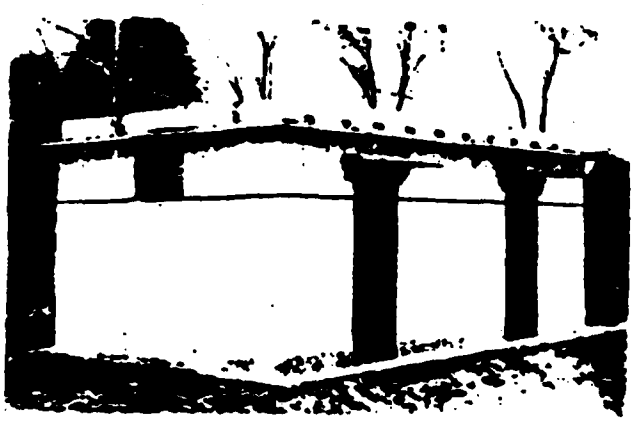
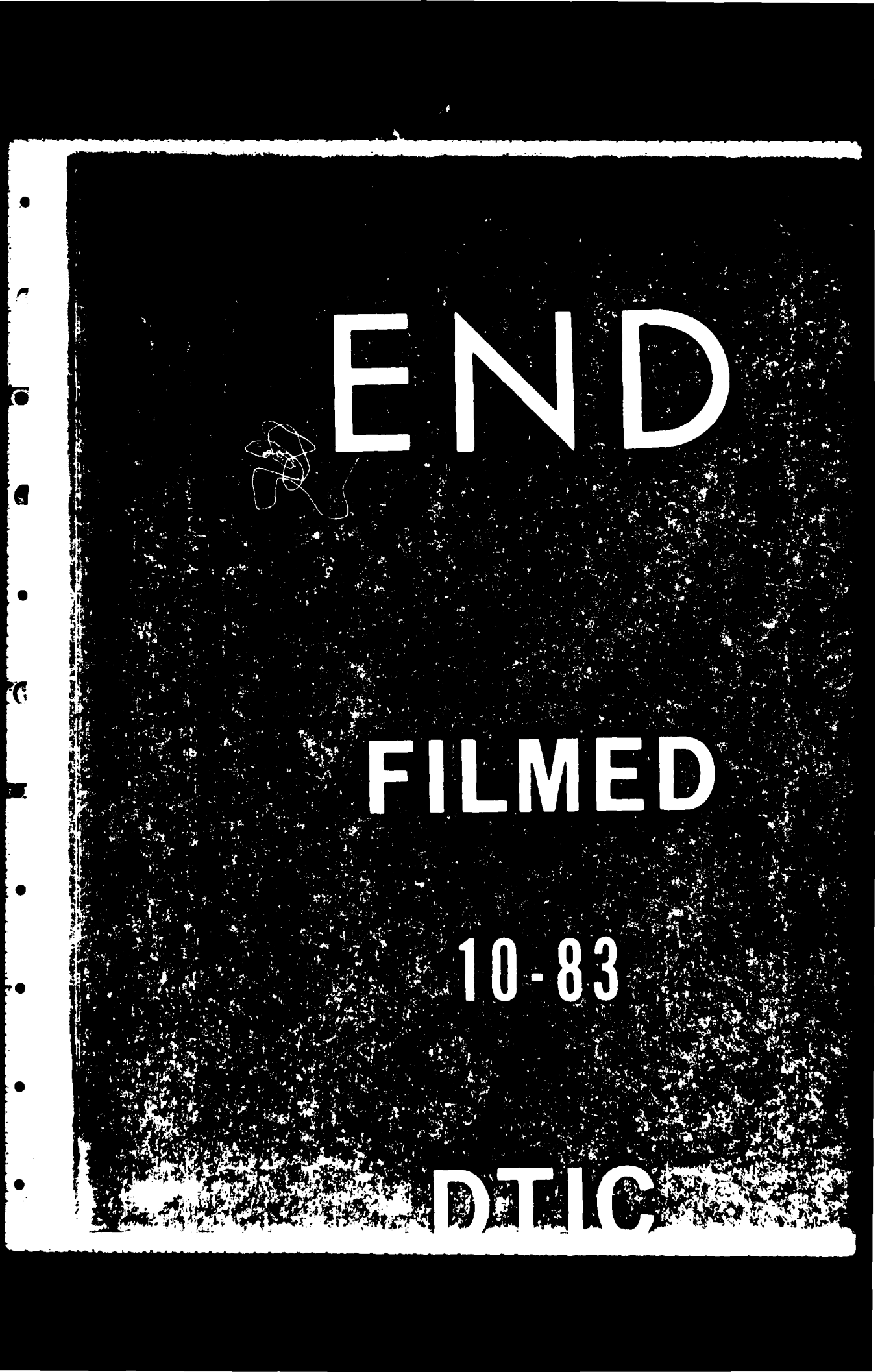


Photo 9. "System 768" earthquake station


END
FILMED
10-83
DTIC