

AccessionIndex: TCD-SCSS-T.20161127.001

Accession Date: 27-Nov-2016

Accession By: John Moriarty

Object name: Acoustic delay line unit from IBM 2848

Vintage: c.1964

Synopsis: Acoustic delay line unit from the IBM 2848 Display Control for the IBM 2260 Display Stations used with TCD's IBM 360/44.

Description:

The first computer in Trinity College Dublin, an IBM 1620 installed in 1962, see elsewhere in this catalog, was entirely standalone, with no networking at all. Similarly for the next machine, an IBM 1130, also see elsewhere in this catalog. The third machine, an IBM 360/44 installed in 1969, was the first time-sharing system in Ireland, with eight *local* IBM 2260 Display Stations user terminals directly connected via multicore or coax cables to an IBM 2848 Display Control. Fig.1 shows some of these terminals in the Terrapin huts in Fellows Garden; later when moved into 200 Pearse Street they were in a single row of eight against a wall.

The IBM 2260 Display Stations provided simultaneous multi-user access. They were not "networked"; each required an individual multi-core cable or a coaxial cable connecting to the computer and had a very limited range, some hundreds of feet at maximum. Up to twenty-four 2260 terminals could be linked to an IBM 2848 Display Control, which could function as a local channel-attached device or as a remote device at up to 2400 bps. An optional adapter allowed the attachment of one IBM 1053 printer which was shared by all displays attached to the 2848.

The 2260 was an interactive text-oriented terminal using a monochrome cathode ray tube (CRT) display and a keyboard. It was introduced by IBM in 1964 with three models: Model 1 with 240 characters in 6 rows of 40 characters, Model 2 with 480 characters in 12 rows of 40 characters, and Model 3 with 960 characters in 12 rows of 80 characters (this latter to match the number of characters on an IBM punched card). It is thought that 2260 Model 3 terminals were installed in Trinity College Dublin.

The characters for up to two 2260 terminals (denoted *even* and *odd*) were stored in an acoustic delay line within the 2848, see Fig.2. Quite unusually, the characters were scanned from this onto the CRT from top-to-bottom, i.e. the scan was vertical rather than horizontal. A character generator and code translator converted the six-bit character code set into five 7-bit bytes with even parity that were inserted serially into the delay lines to represent 5 x 7 characters. The delay line was a spiral wire with an electromagnet on one end and a torsion rotation detector on the other. The data bits were injected onto one end of the spiral by the electromagnet as mechanical vibration, propagated down the wire, and were detected at the other end after a delay proportional to the length of wire. Characters were continuously recirculated into the delay line until erased or replaced by other data. The electronics used discrete transistors as the 2848 predated the widespread introduction of integrated circuits.

Trivia: Any vibration close by an IBM 2848 could corrupt the data in the delay line

Within the Terrapin Hut in the Fellows Garden (now Fellows Square) that housed the IBM 360/44 system, a large room was reserved for the IBM engineers, who kept all

sorts of spares there. Spare 2848 delay lines were kept in a temperature-controlled oven so that they were ready to be installed in the controller when one of the delay lines drifted off specification.

See the IBM reference documents in the associated folder in this catalog, and also the details of TCD's IBM 360/44 elsewhere in the Hardware category of this catalog.

Many thanks to John Moriarty, first Director of the Computer Laboratory at Trinity College Dublin, who donated this item.

The homepage for this catalog is at: <https://www.scss.tcd.ie/SCSSTreasuresCatalog/>
Click 'Accession Index' (1st column listed) for related folder, or 'About' for further guidance. Some of the items below may be more properly part of other categories of this catalog, but are listed here for convenience.

Accession Index	Object with Identification
TCD-SCSS-T.20161127.001	Acoustic delay line unit from IBM 2848 Display Control for the IBM 2260 Display Stations used with TCD's IBM 360/44. S/N:

References:

1. Wikipedia, *IBM 2260*, see:
https://en.wikipedia.org/wiki/IBM_2260
Last browsed to on 27-Nov-2016.
2. Bitsavers IBM 2260 documents and brochures,, see:
<http://www.bitsavers.org/pdf/ibm/2260/>
Downloaded on 27-Nov-2016.



*Figure 1: IBM 2260 Display Stations in the Terminal Room at Trinity College Dublin
Foreground: Rosemary Murphy of the Dept. Computer Science helping student*

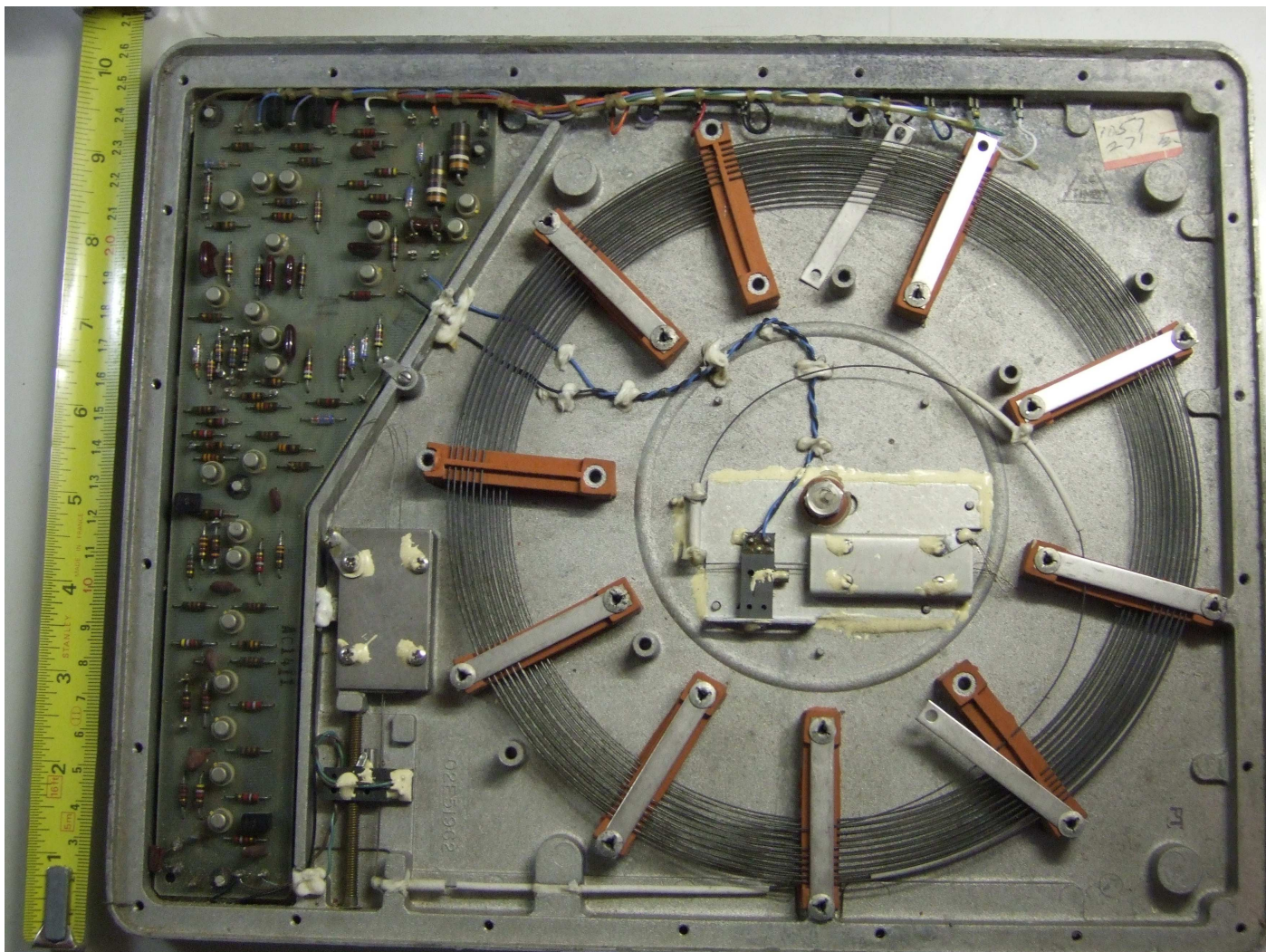


Figure 2: Acoustic delay line unit from IBM 2848, top view



Figure 3: Acoustic delay line unit from IBM 2848, electronics



Figure 4: Acoustic delay line unit from IBM 2848, electronics

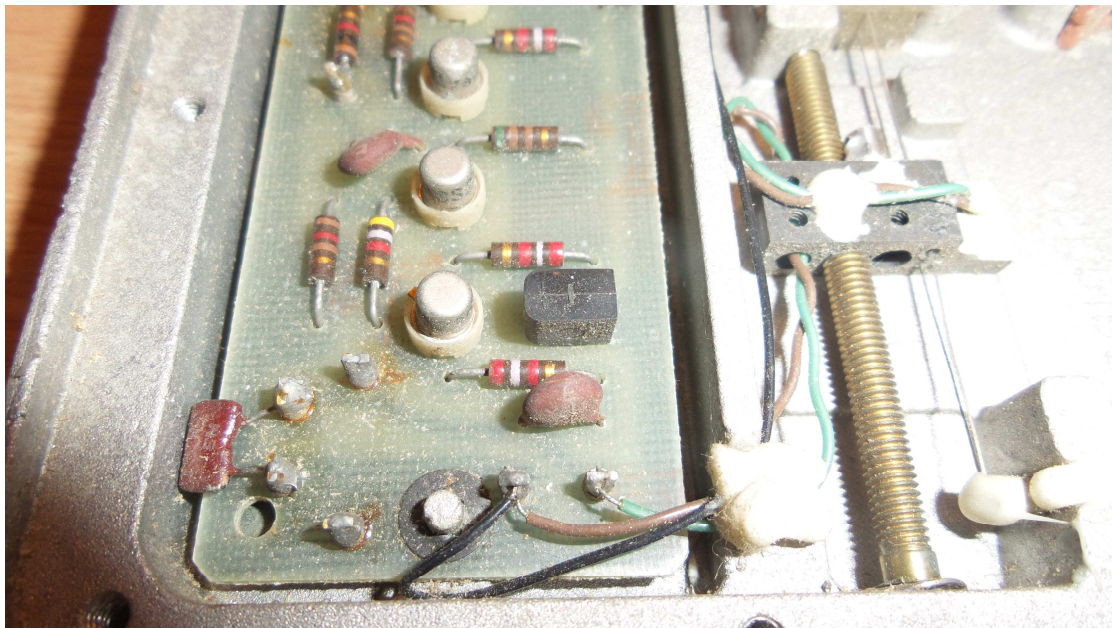


Figure 5: Acoustic delay line unit from IBM 2848, electronics

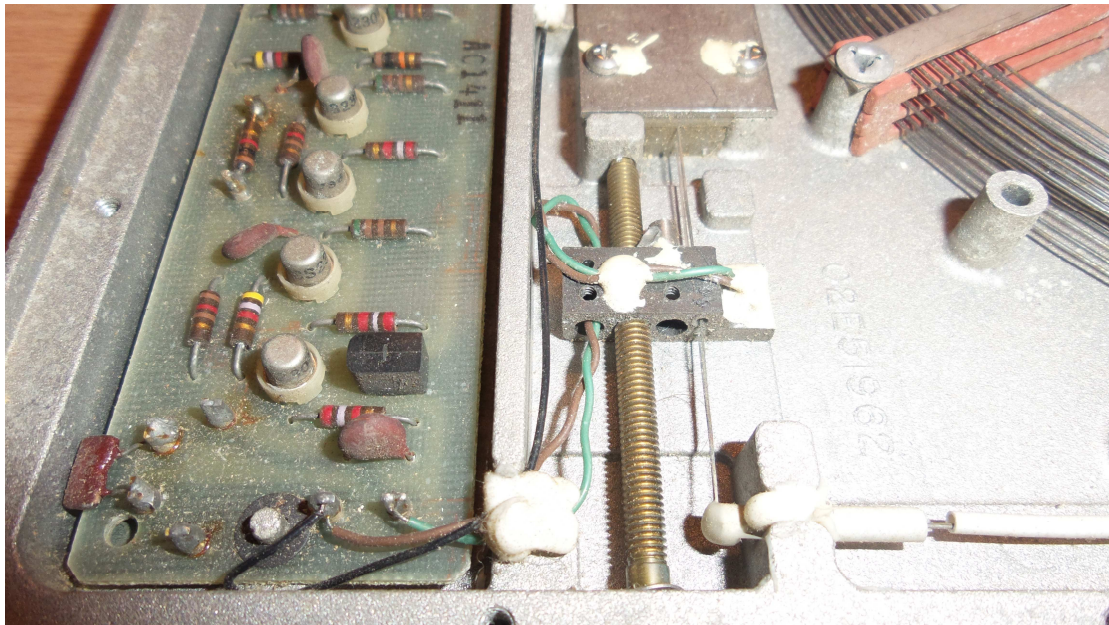


Figure 6: Acoustic delay line unit from IBM 2848, transmitting electromagnet

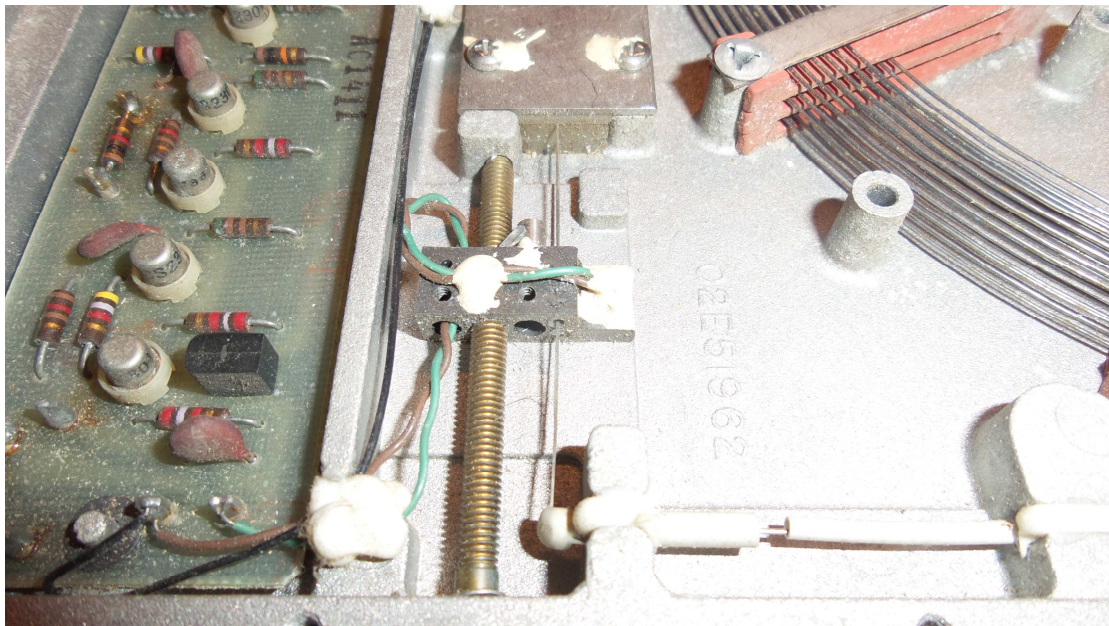


Figure 7: Acoustic delay line unit from IBM 2848, transmitting electromagnet

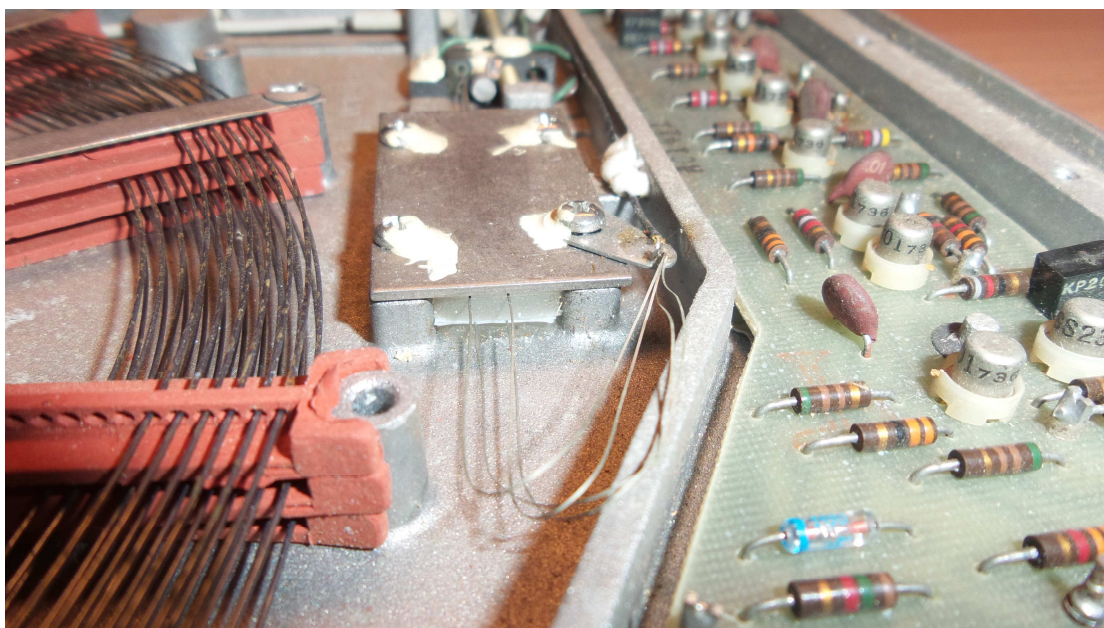


Figure 8: Acoustic delay line unit from IBM 2848, transmitting electromagnet

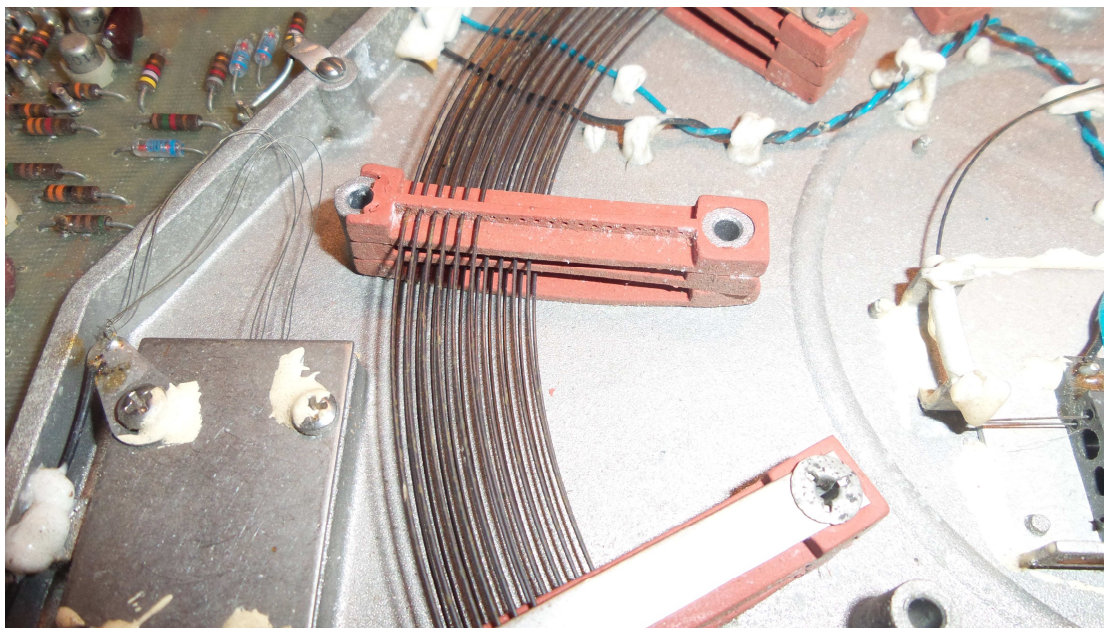


Figure 9: Acoustic delay line unit from IBM 2848, transmitting electromagnet

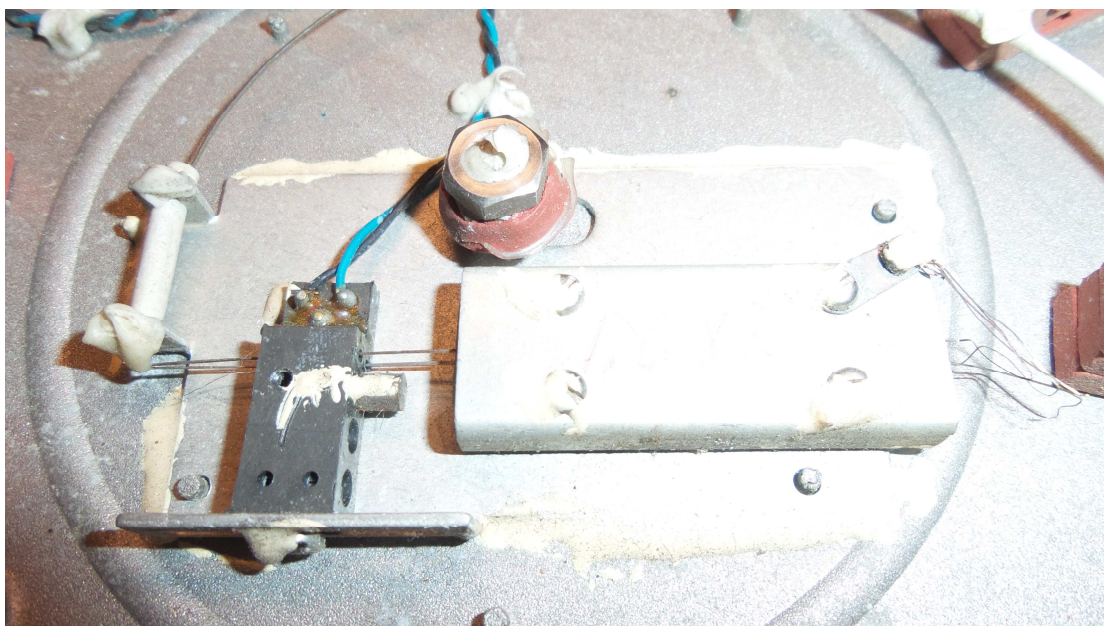


Figure 10: Acoustic delay line unit from IBM 2848, receiving torsion rotation detector

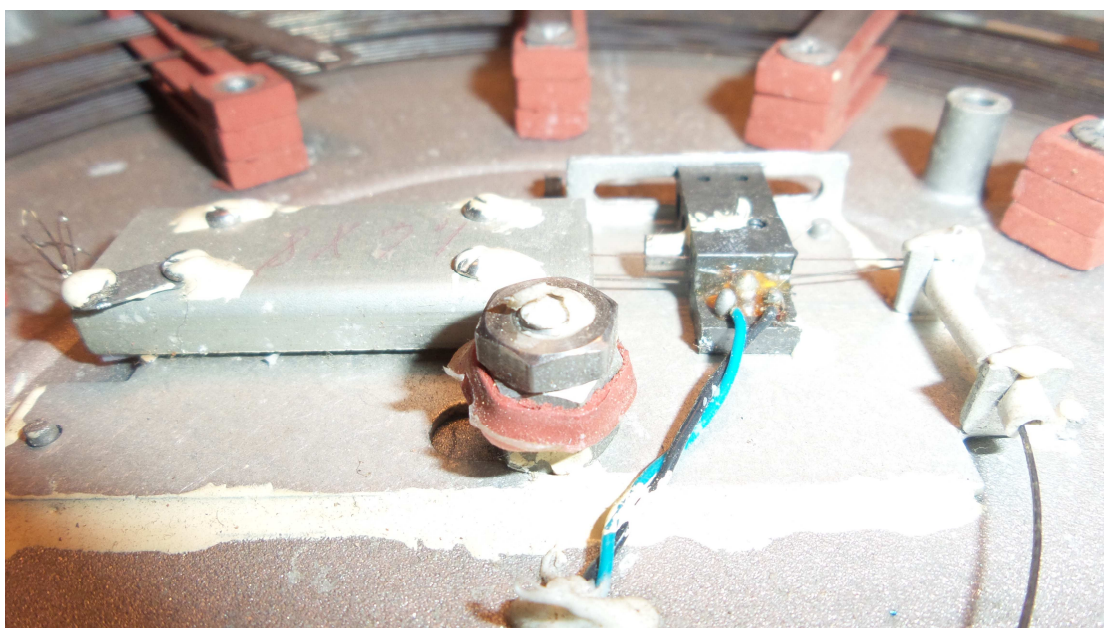


Figure 11: Acoustic delay line unit from IBM 2848, receiving torsion rotation detector

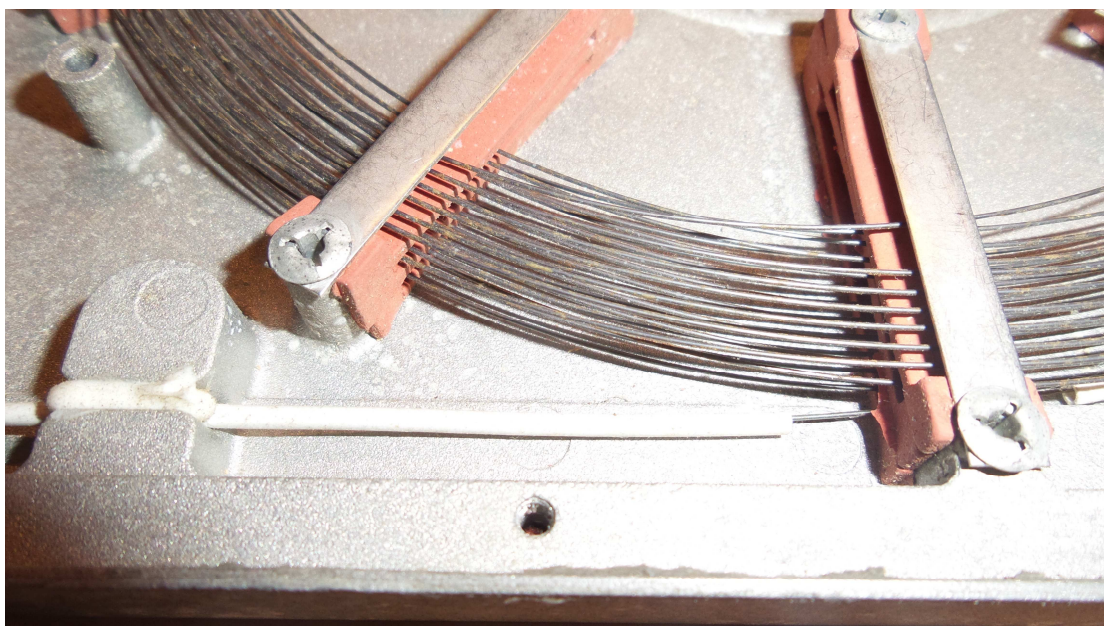


Figure 12: Acoustic delay line unit from IBM 2848, clamping

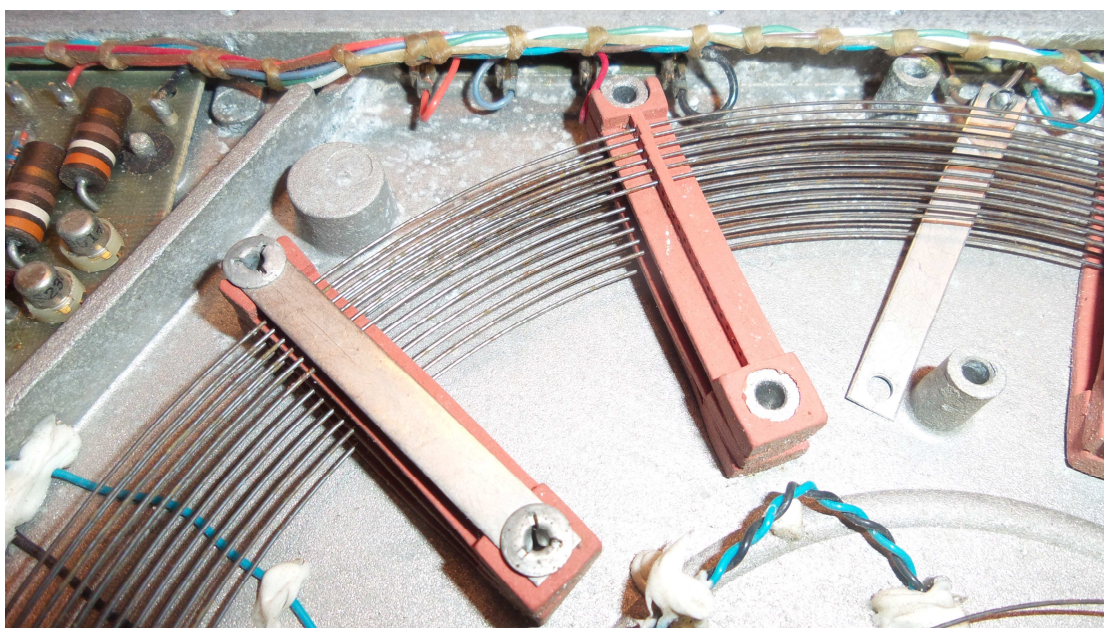


Figure 13: Acoustic delay line unit from IBM 2848, clamping

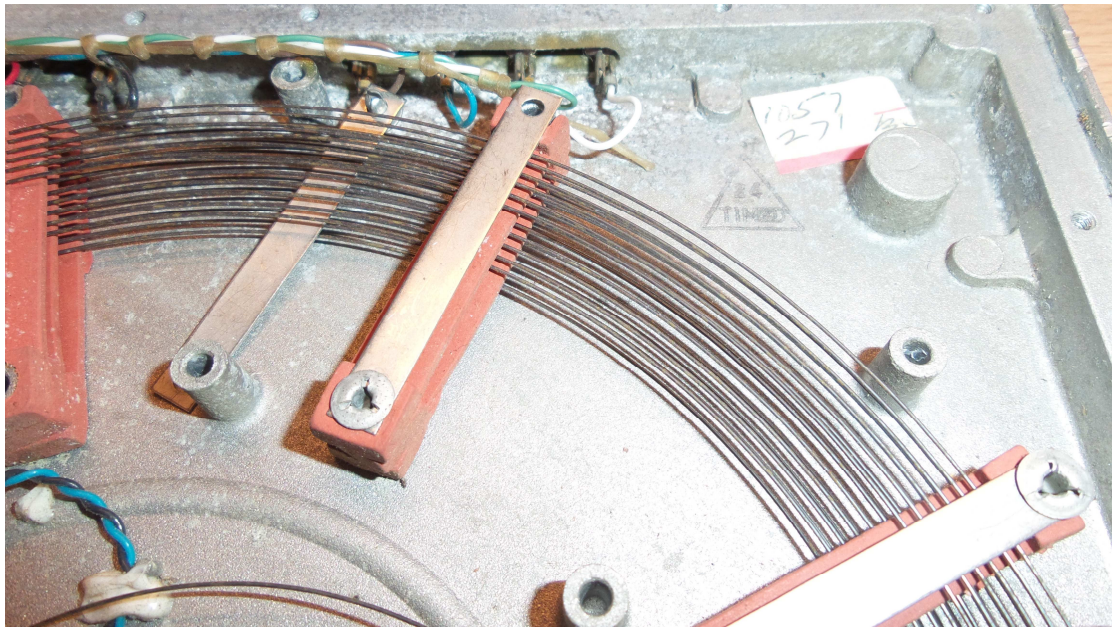


Figure 14: Acoustic delay line unit from IBM 2848, clamping



Figure 15: Acoustic delay line unit from IBM 2848, manufacturing stamp



Figure 16: Acoustic delay line unit from IBM 2848, manufacturing stamp



Figure 17: Acoustic delay line unit from IBM 2848, edge view

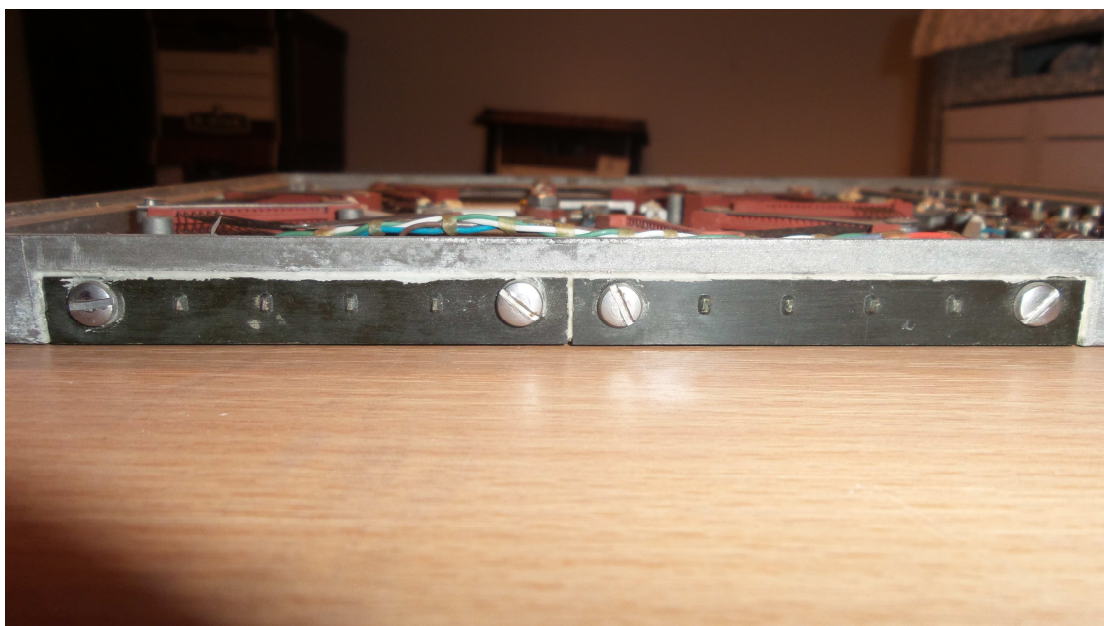


Figure 18: Acoustic delay line unit from IBM 2848, edge view



Figure 19: Acoustic delay line unit from IBM 2848, bottom view



*Figure 20: Acoustic delay line unit from IBM 2848, serial number
"M4 SER.NO. 5968 6904"*



*Figure 21: Acoustic delay line unit from IBM 2848, serial number
"M4 SER.NO. 5968"*



*Figure 22: Acoustic delay line unit from IBM 2848, part number
"0U841020"*