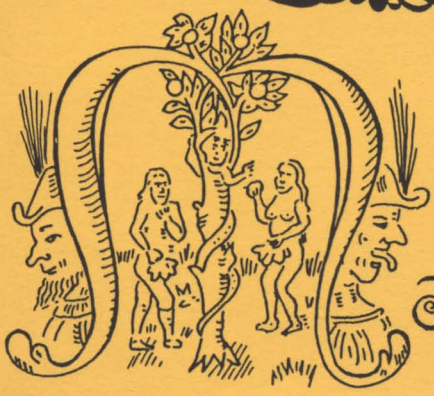

spring 1989

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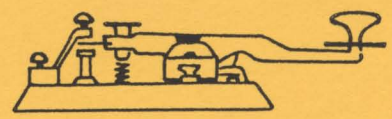
magazine for morse-telegraphy

nr 11

Morsum Magnificat



01-368 4588
1, Tash Place - London, N11 1PA

MORSUM MAGNIFICAT was first published in Holland, in 1983, by Rinus Hellemons, PAØBFN. Now published from London, it provides international coverage of all aspects of Morse telegraphy, past present and future.

MORSUM MAGNIFICAT is for all Morse enthusiasts, amateur or professional, active or retired. It brings together material which would otherwise be lost to posterity, providing an invaluable source of interest, reference and record relating to the traditions and practice of Morse.

EDITOR AND PUBLISHER:
G4FAI, Tony Smith, 1 Tash Place,
London N11 1PA, England. Tel: 01-368 4588

SUBSCRIPTIONS for issues Nrs 9-12 (pro rata when starting with Nrs 10, 11 or 12).

United Kingdom - £6.50 per annum, postpaid. Cheques, etc, payable to MORSUM MAGNIFICAT, or Girobank transfer to 57 249 3908.

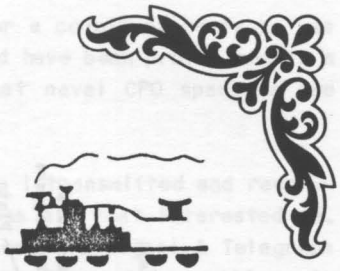
Europe, including Eire - £7.00 sterling by international cheque or postal order.

Other countries - Surface mail, £7.00 (or U.S. $13.00); Airmail £8.50 (or U.S. $16.00). Payment in U.S. dollars by banknotes only. PLEASE DO NOT SEND DOLLAR CHECKS OR MONEY ORDERS.

ISSN 0953-6426

Cover: Home of Samuel F.B. Morse, Poughkeepsie, N.Y., 1847-1872. A National Historic Landmark.

RAILWAY MORSE IS DIFFERENT



by DAVE KEEN

I worked as a telegraphist with British Railways for 21 years. Early in 1952, with a friend (who was ex-Royal Signals), I applied for a position as a Railway Telegraphist which was advertised in the local newspaper. After taking a Civil Service type entrance examination we were accepted and sent to the Railway Signal Training School at Hadley Wood for three months, learning to read the Bright's Bell instrument, and to understand procedures, etc.

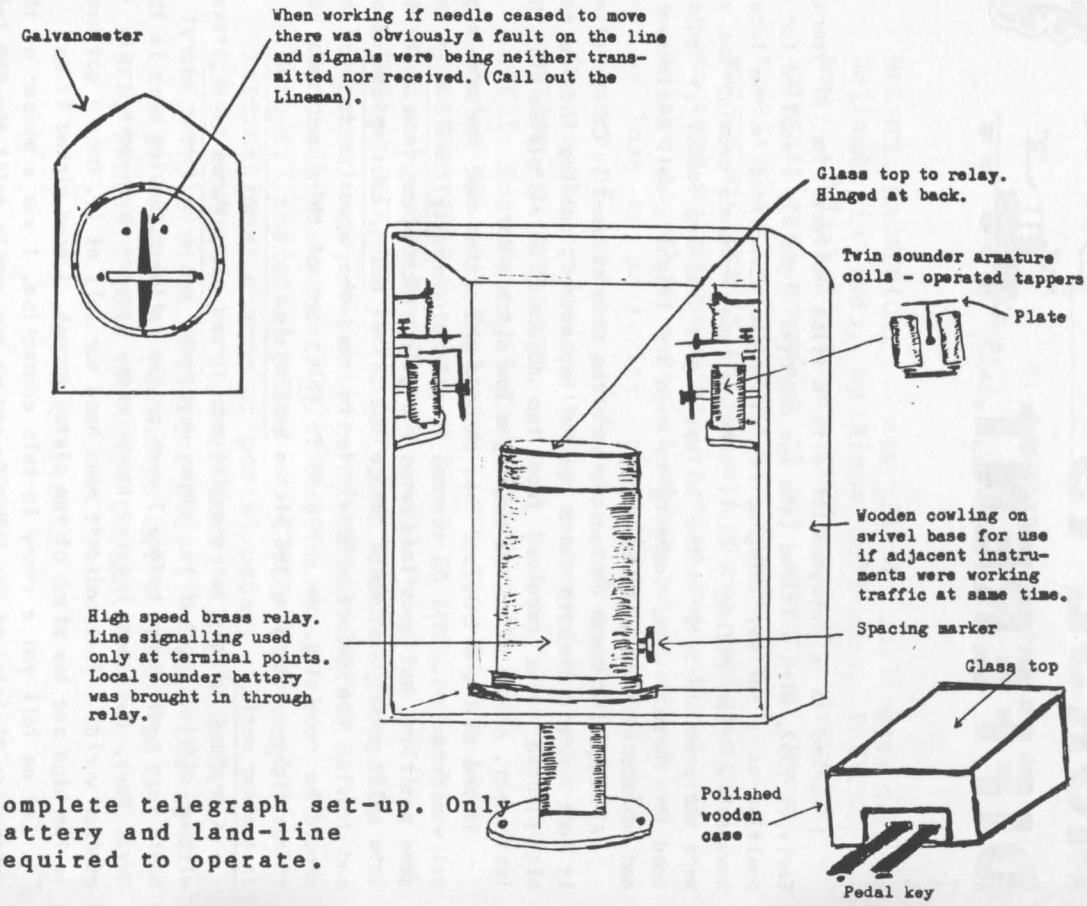
Although the Morse characters were the same as used in CW operating it took quite a time to learn the Railway method, reading the low and high-pitched tones received from two adjacent metal plates in the instrument. A high pitch was a dash, a low pitch a dot.

If one sent . — (A), and then changed the plates over the same signal would be — . (N). Of course, the plates normally remained in the same position, but sometimes when relieving each other from early to late shift some joker would change the plates round, causing confusion and leaving the unfortunate victim to read the opposite to what he should be receiving. We got used to this sort of thing and soon put things right by changing the plates back again.

In another world

A trained railway telegraphist could read radio Morse straightaway without difficulty, but the other way round was a different story! I could read radio Morse before I went on the railways, having been in the Royal Navy, but when I first heard those tappers I thought I was in another world. I just couldn't make head nor tail of it. Once I got used to the high and low pitch of the plates though, I soon picked it up.

Let me tell you a story in this connection. I was a member of the Merseyside Division of the RNV(W)R, and at our weekly drill the CPO Tel. got talking about the work I was doing. He didn't know that railway telegraphy as such existed, so I invited him to the office one evening when I was on duty. At the same time I made a bet with him that he would not be able to read railway Morse.



Complete telegraph set-up. Only battery and land-line required to operate.

I won the bet but I must admit that after a couple of hours he was beginning to pick it up and I believe he would have been proficient in a week. I have always been of the opinion that naval CPO sparkers are among the best in the world.

Soon working again

I must admit I am not a technical person. I transmitted and received on the instruments and at the time that was all that interested me. If anything went wrong I just sent for a Lineman (a Signal & Telegraph Lineman, to give him his proper title), who would soon have things in working order again. To be honest, this didn't happen very often. Occasionally one of the springs operating the tappers might break, or in winter the lines might come down if we had a very heavy fall of snow. Apart from things like that we found the equipment very reliable.

Like myself, I think most railway telegraphists in latter years were not concerned to know how the system worked. They were just content to do their job, sending and receiving, and to pick up their salary at the end of the week. I don't doubt there were one or two who may have delved into the history and workings of railway telegraphy but I can't say I ever met one, more's the pity. The Linemen were the chaps with all the knowledge, because it was their job to understand the system, and I very seldom found a poor one.

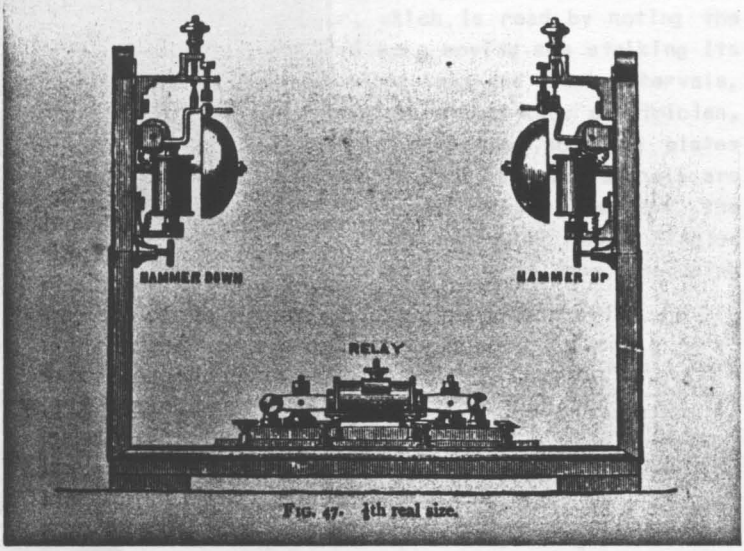


Fig. 1. Bright's Bell, the first acoustic instrument used in Britain for Morse signalling, and fore-runner of the double plate sounder. Illustration from "Telegraphy", by Preece and Sivewright, new edition, 1905.

Drop-handles and pedals

All in all the system was very good and we had few problems. It was a shame that in the early 1970's B.R. decided to close most telegraph offices, leaving a teleprinter system at just a few main line stations such as Liverpool Lime Street, Manchester, Crewe, London Euston, etc.

Before the railways were nationalised the different companies, LMS, LNER, GWR, etc, all used different types of instruments on their land-lines. When I started at Birkenhead Woodside station, for instance, we used a drop-handle (as on a single-needle instrument) to signal with, but instead of the needle we had the double plates already described which gave a louder tone and were much easier to read.

When I was promoted to a higher grade at Liverpool Central station the instruments were the same as those at Birkenhead except that the Morse was sent on two parallel wooden pedals. Hitting the left pedal gave the signal for a dot and the right pedal the signal for a dash. This station, by the way, was also a Post Office Agency station where we accepted Post Office telegrams from the general public.

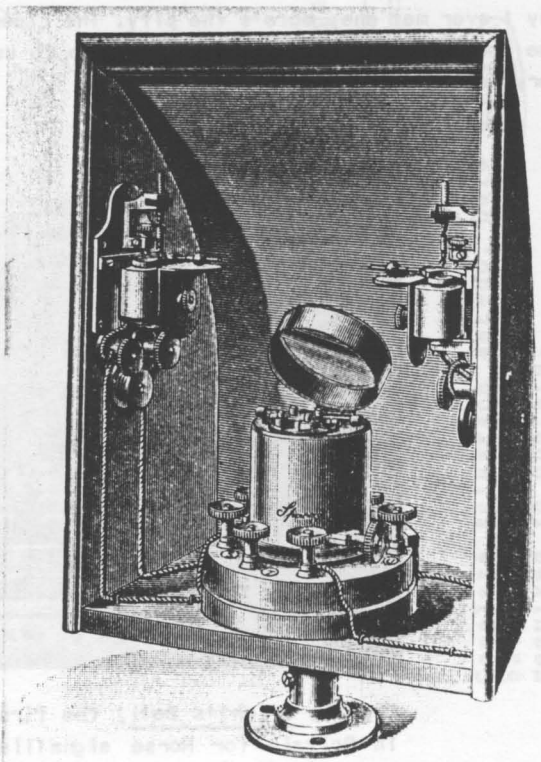


Fig. 2.
Double plate sounder, a modification of Bright's Bell. From "Telegraphy", by Preece & Sivewright, new edition, 1905. The instrument described by Dave Keen is very similar to this.

Last minute messages

When the Liverpool office closed down I managed to purchase two of our four complete instruments for ten shillings each before they were taken away for scrap. These instruments were actually transmitting messages up to 11 a.m. on the morning that the office was dismantled. One of the units I bought was made at the Telegraph Works, Silvertown, and the other by Elliott Bros (London) Ltd, although I don't know the date of manufacture.

When I was at Liverpool Central there were three telegraphists (or Telegraph Clerks as they were usually known). One, who was close to retiring age and had been at Central since a boy, could read the single-needle instrument. It was too much for me, however. I'm sure I would have become boggle-eyed!

Incidentally, one thing we did on the railway was to always spell out figures, ONE, TWO, THREE etc, and to this day I am inclined to do the same thing with radio Morse.

Different instruments

I mentioned that different companies used different instruments and the following extract from "Railway Signalling and Communications", c.1946, describes some of these:

"Except for the teleprinter instruments the single-needle is the only visual form of telegraph instrument used by the railways now. In the audible class are found the sounder, which is read by noting the time interval between the sounds produced by a moving arm striking its bottom and top stops, using the Morse code of long and short intervals, and the Bright's Bell instrument, invented by a well-know electrician, C.T. Bright* (1832-1888), with two differently toned sounding plates struck by separate hammers. The Morse code is used, but the signals are of equal duration, one tone representing a dot, the other a dash, the signals being read by listening to the difference of tone. Single-needle** instruments often have sound plates attached to them, producing a similar effect....."

MM footnotes

*Sir Charles Tilston Bright was knighted at the age of 26 for his part in the work of laying the first Atlantic cable in 1858. He was responsible for many important improvements to Britain's telegraphs.

**There will be an article on operating the single-needle instrument in a future issue of MM.

oooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooo

GOOD QUESTION!

Heard on 20 metres G4... to W9... "OK on ur QTH Illinois = which state is that in?"

(From Groundwave, newsletter of Wimbledon & District ARS, July 1987.)

R. I. P.

RECORD IT PLEASE

BRUCE MORRIS, GW4XXF.

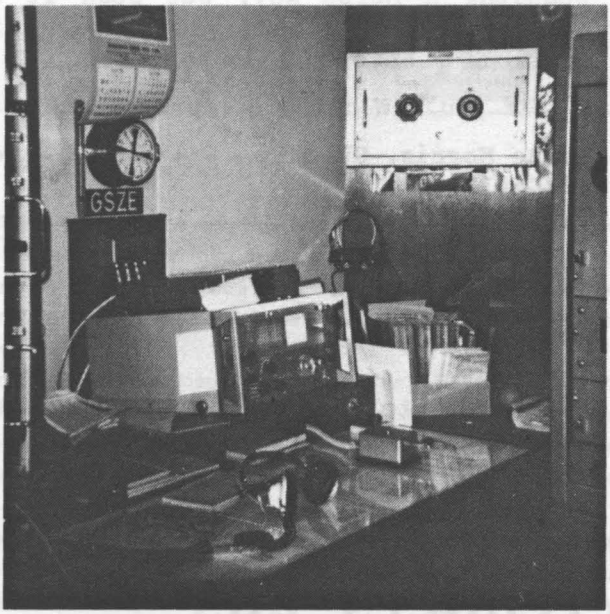
To all who served as Wireless Operators or Radio Officers, at sea, in the air or in a coast radio station, 500kHz, 500kc/s, holds a revered place in memory as the W/T distress and calling frequency. A constant cacophony of Morse calling - CQ, TTT, XXX, Wx, TFC list", etc, yet for three minutes twice each hour (at a quarter past and a quarter to the hour) a silence period to give that faint SOS a better chance of being heard (remember CQD?).

500kHz has been guarded round the clock, around the world, by countless ships and coast stations for over 80 years but soon it will be no more. As we read in MM7, the spectre of the Global Maritime Distress and Safety system, with its Satcoms, Selcall, DSC, Sitor, Epirbs, Cospas-Sarsat, Navtex, Fax and all, looms large conspiring with "economics" to render the dedicated Radio Officer at his Morse key obsolete for evermore.

Already silent key

Many famous W/T callsigns have already gone silent key and will never be heard again. GIL, GLV, GNI, GKZ, GND, around the UK coast. OSA, EAR, ZDK, EAP, EAO, in Europe. WSL, WSF, KOK, WPA, WAX, WOE, Stateside. VIH, VIW, "down under" and many others world-wide. These have gone. PCH and EJM are going soon and the pace of closure is quickening.

In today's cost-conscious world there is just not enough commercial W/T TFC to subsidise the distress watch on 500. GMDSS may not be scheduled for full implementation until 1st February 1999 but I doubt if there will be much of a distress watch on 500 within a couple of years from now.



W/T office,
Shell tanker
DORCASIA, GSZE,
September 1971.

Photo:
Bruce Morris.

Historic recordings

If we are not careful, an important part of communication history will slip by, lost for ever in the ether. To remedy this Norman Varnes and I have started a collection of tape recordings which includes some of those famous callsigns signing off 500 for the very last time. We have missed many and are obviously unable to record all those at are left.

Do you have any famous coast stations or ship callsigns on tape? Do you have anything that gives the feel of that constant babble of Morse code on 500 from anywhere in the world? If you can help in any way, please contact one of us. We are both ex-Marconi Marine "Sparks", at sea in the 50's, 60's and 70's.

History is now

We are also collecting old deep-sea ships' W/T gear for preservation, and especially all the bits'n pieces that went into making up a radio room - message pads, Notices to Ship Wireless Stations, Admiralty Lists of Radio Signals, manuals, Handbooks for Wireless/Radio Operators, bulkhead notices, advertisements, etc, etc. History is now, not in the past. So much is discarded without thought for its value as part of our heritage.

Many readers of MM have been down to the sea in ships,

pounding a Morse key, but soon it will be a forgotten memory. Let us record and preserve in sound as much as possible - before it is too late.

If you can help, please contact:

Bruce Morris, GW4XXF,
62 Gerllan,
Tywyn,
Gwynedd, LL36 9DE,
U.K.
Tel: 0654-710741.

OR

Norman Varnes, G4YXX,
Cherry Tree Farm,
Charlton Musgrove,
Wincanton, BA9 8HW,
U.K.
Tel: 0963-32389.

[SAE/IRC appreciated]

Heading photo: Junior Radio Officer Bruce Morris in 1965, on board Ellermans cargo passenger liner t.s.m.v. CITY OF PORT ELIZABETH, GPLC.

****

readers' ads

WANTED

HF QRP transceiver for CW operation. Valve or transistor - old homebrew project OK - all or any bands. Appearance immaterial but must operate 101% perfect. Also required, decent straight key, anything considered. Doug Chinn GØKKX, 28a Cavendish Road, Henleaze, Bristol BS9 4EA.

To buy/borrow, "History of the Marconi Company", by W.J. Baker; "Wireless at Sea - the First 50 Years", by H.E. Hancock; any other books about wireless at sea or coast radio stations. Bruce Morris GW4XXF, 62 Gerllan, TYWYN, Gwynedd, N. Wales, LL36 9DE. Tel: 0654-710741.

For aircraft tx/rx 1154/1155. Plugs and sockets, preferably with shrouds and harness - flat pin, 4 and 8 pin types with round locating centre pin. Also any accessories used with this equipment, particularly the ground power supply - power unit type 114 (ref. 10k/350), Visual Indicator type 1, D/F Antenna and tx/rx mounting hardware. Larry Robinson GØHTR, 82 Grassholme, Stoneydelph, Wilnecote, TAMWORTH, Staffs B77 4BZ, England.

(Deadline for readers' free ads in next issue, 1st May 1989, subject to space being available.)

JUST RAMBLING....

THE LAST INSTALMENT of "The story of the Key" is in this issue. Lou Moreau's authoritative 6-part series has been praised by many readers and we are all grateful to her for allowing MM to print her work. We hope that she will share more of her expertise and knowledge with us in the future.

MANY OF YOU no doubt read newspaper reports last November about the International Maritime Organisation's decision to go ahead with the Global Maritime Distress and Safety System in 1993. From that time Morse will no longer be obligatory for ships at sea, and the new system (described in MM7) is to become compulsory in 1999.

I was surprised to see a comment in an amateur radio magazine recently that this decision has no implications for amateur radio. Amateur Morse tests are compulsory under international regulations only because of the need to recognise, and not interfere with, distress, safety, and other important traffic. As professional CW is phased out there will no longer be the original need for an amateur Morse test.

Most newcomers today take up CW because having taken the compulsory test they find to their surprise that they actually like Morse! If the test should ever be abolished (and it will be increasingly hard to argue for its retention after 1999), few are likely to try to learn the code voluntarily without some other form of positive encouragement.

National societies will be delighted to have code-free licenses and the consequent expansion of membership. Just refer back to "The Spanish Morse Test", also in MM7, to see what I mean! So when the time comes, who will represent the interests of amateur Morse telegraphists in their time of crisis? Think about it - and write to MM with your views!

THERE IS STILL a lot of material waiting to appear in MM. If your article hasn't appeared yet please be patient; everything will appear in due course. The need to get a good balance; and the need to include material of current interest, decides what can be used in a particular issue. This means that some articles appear quicker than others.

A reader wrote to me recently, "When I first started to subscribe I didn't think that a magazine about Morse could continue to publish interesting articles after more than a few issues, but I was wrong!"

With a fine collection of material still awaiting publication I hope that MM can continue to attract such comments. Meantime, I still welcome new contributions to ensure that "the well never runs dry"!

73, Tony.

BRASS HAND KEY

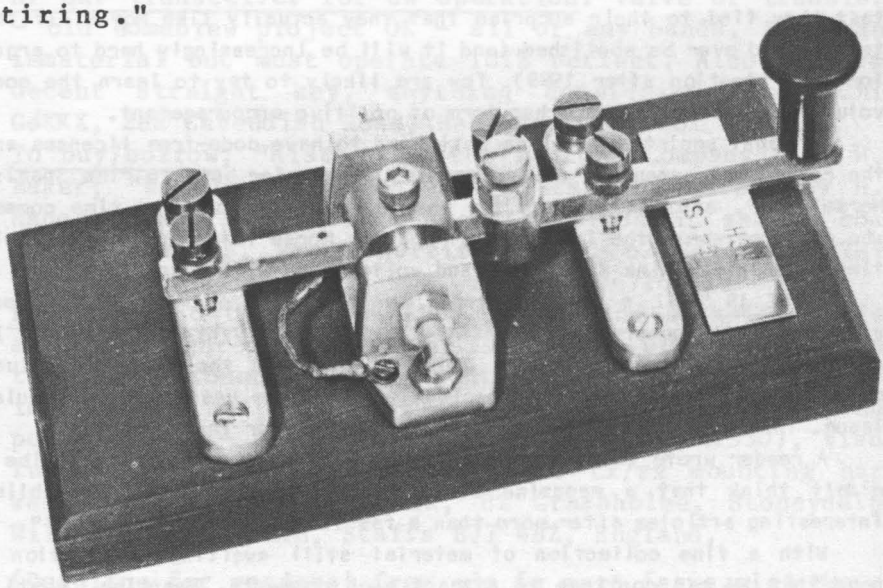
Don Harris, G4LSB, has sent MM details of his home-made, solid brass, hand key which looks very nice indeed.

He comments "a lathe is needed to turn up the pivot housing from ¾" round brass. The arm is 5/16" hexagon. The pivot mounting bracket was hacksawed and filed from a one inch square brass bar.

Contacts, terminals, and the braided continuity lead are from an old war-time key. Threads used are 1BA, 2BA, and 8BA.

The knob is from a switch in an old car; the spring from an old ball-pen. Base is Tufnal - 6" x 3" x 5/8".

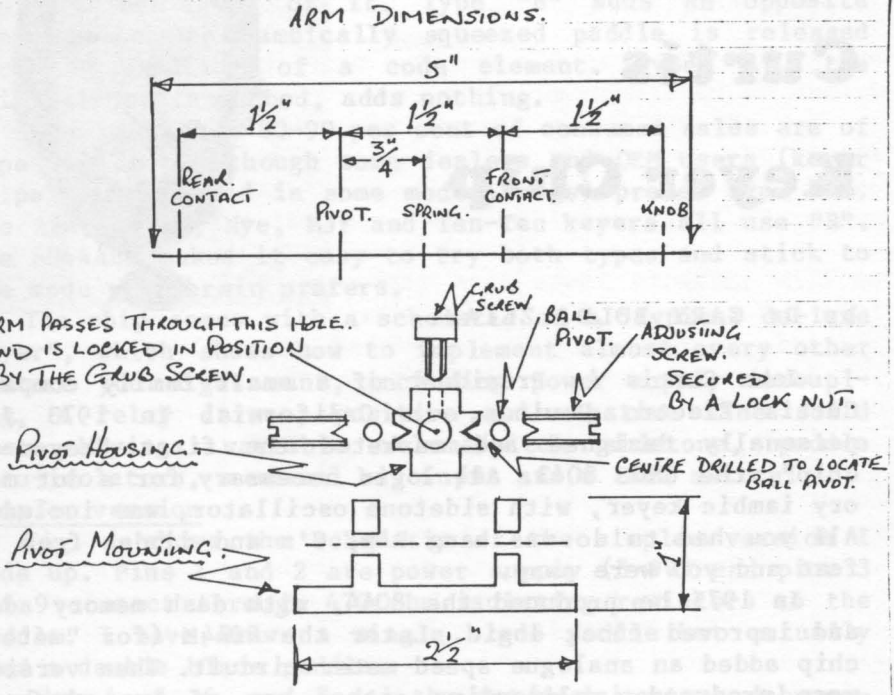
Weight of key - one pound six ounces (624g). Action is light but positive and not at all tiring."



HOME-MADE SOLID BRASS KEY (Don Harris)

G4LSB.—BRASS MORSE KEY.—

DONALD HARRIS
"DAYSPRING COTTAGE"
LOWER COMMON
AYLBURTON, LYDNEY
GLOS. GL15 6DU
ENGLAND



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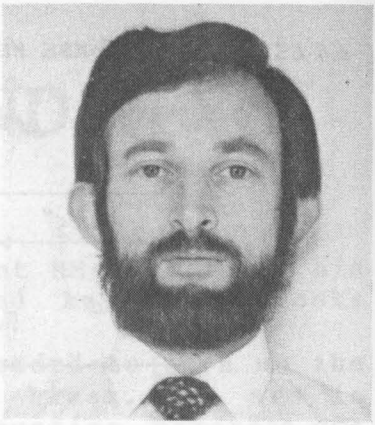
NO NEED TO WRITE AN ARTICLE!

Is there something you want to say about Morse? A comment about a previous article; a point of view; a strongly held opinion; useful information; an interesting or amusing experience?

If you don't think it justifies writing an article yourself, send MM a letter instead, or even a few notes, and we can adapt it to make up a "filler" or a "one-pager".

All correspondence, please, to Tony Smith, 1 Tash Place, London N11 1PA, England.

The Curtis Keyer Chip



by Dr GARY BOLD, ZL1AN.

John Curtis is President of a small family company, Curtis Electro Devices, in California. In 1973 John personally designed and marketed the first "keyer-on-chip", the CMOS 8043. All logic necessary for a dot memory iambic keyer, with sidetone oscillator, was included. All you had to do was hang R's, C's and diodes from its feet and you were away.

In 1975 he produced the 8044, with dash memory added and improved clock logic. Later the 8044M (for "meter") chip added an analogue speed meter circuit. Then versions were produced implementing either one of two alternate iambic keying modes, which John defined as types "A" and "B". Finally, in 1986, he announced a product I couldn't resist, the 8044ABM, including all features as standard. I built a keyer around one and will now tell you about it.

Novel features

The Curtis 8044ABM is a CMOS 20 pin DIP. It provides for paddle debouncing and speed meter circuitry, generates a (squarewave) variable pitch sidetone and implements two novel features. Firstly, you can switch between type "A" and "B" iambic modes by either grounding pin 8 or connecting it to the positive supply. Secondly, you can generate either correctly ratioed (3:1) Morse elements, or implement any desired amount of positive (heavier) or negative (lighter) element weighting. I know of no other keyers with this feature, which is a boon for coping with transmitters with bad keying characteristics or crudely compensating for RF feedback.

The difference between types "A" and "B" iambic modes is subtle and many operators at low speeds anyway wouldn't be aware of it. Type "B" adds an opposite element when an iambically squeezed paddle is released during generation of a code element. Type "A", the original Curtis method, adds nothing.

John says that 80-90 per cent of consumer sales are of type "A" chips, though some dealers and OEM users (keyer chips are included in some modern rigs) prefer type "B". The AEA, Heath, Nye, MJF and Ten-Tec keyers all use "B". The 8044ABM makes it easy to try both types and stick to the mode your brain prefers.

The chip comes with a schematic of a "typical de-luxe keyer", which shows how to implement almost every other feature you might want, including power supply decoupling, a relay driver, positive and negative line solid state keying, variable volume/pitch sidetone, paddle opto-isolators, a manual key input and a tune switch.

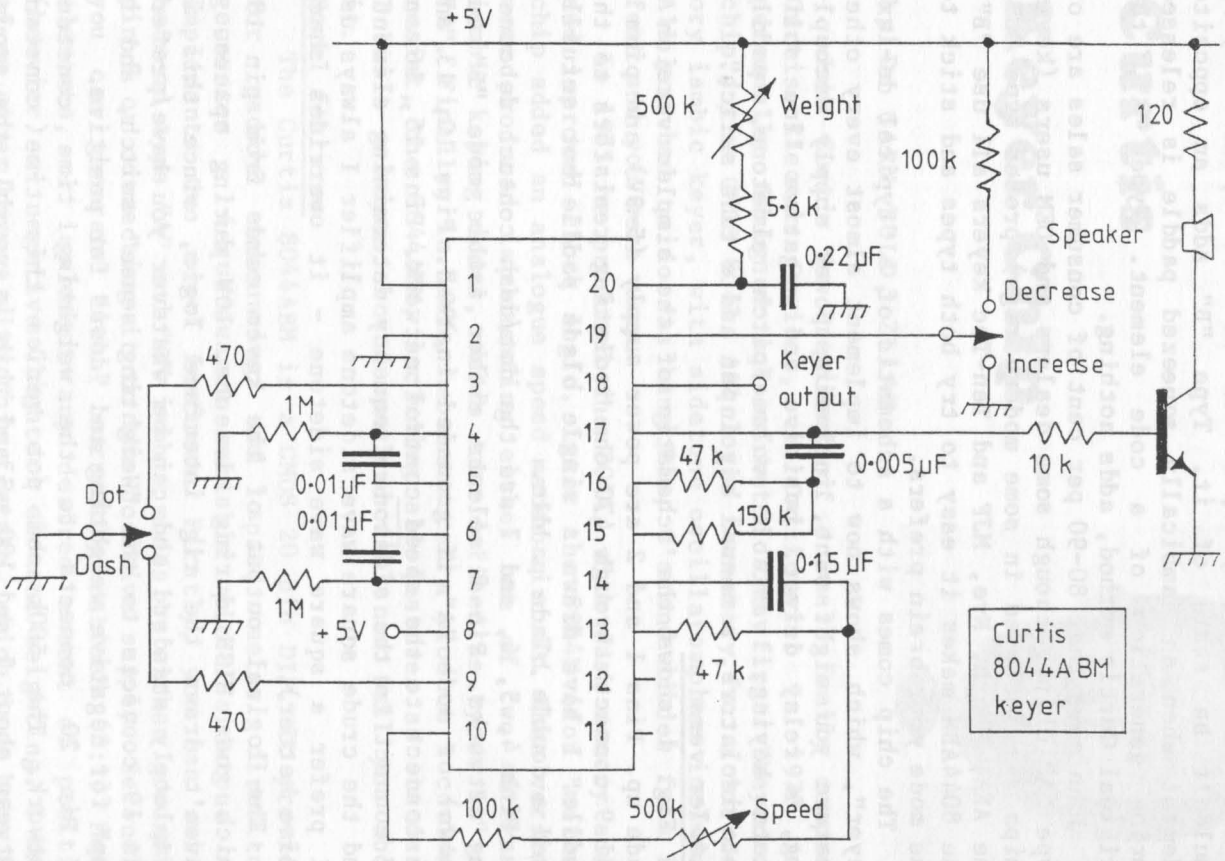
Simpler version

Fig. 1 shows the schematic of the simpler version I made up. Pins 1 and 2 are power supply (5-9V) and pins 3 and 9 connect through 470 ohm isolating resistors to the paddle. I have drawn a single blade paddle but actually used a double blade paddle.

Pins 4, 5, 6, and 7 are the dot/dash contact debouncing networks. Pin 8 selects either iambic mode "B" (as shown) or mode "A" if grounded instead. Pins 10, 13 and 14 connect to the speed control network. Pins 15, 16 and 17 connect to the sidetone frequency determining elements and the crude square wave sidetone amplifier I always use (I prefer a square wave sidetone - it overrides shack noise better).

The logical output of the keyer comes from pin 18, which goes HIGH during elements, LOW during spaces. I haven't drawn the rig interface logic, since this is completely standard and can be whatever you have/prefer. Pin 19 connects to the "Weighting sense" switch, and is "up" for negative weighting and "down" for positive.

Pin 20 connects to the weighting time constant network. The 500k ohm pot varies this time constant between about 1 and 100 mS and this is roughly the amount of weighting that you can add or subtract to or from elements. Minimum weighting occurs at the low resistance end. In this position flipping the sense switch between


+5V
500 k
Weight
5·6 k
0·22 µF
100 k
120
Speaker
Decrease
Increase
Keyer
output
470
1M
0·01 µF
0·01 µF
1M
Dot
Dash
+5V
470
47 k
0·005 µF
10 k
150 k
0·15 µF
47 k
100 k
500k
Speed
1
2
3
4
5
6
7
8
9
10
20
19
18
17
16
15
14
13
12
11
Curtis
8044A BM
keyer

positive and negative makes no perceptible difference to character weighting and you get virtually perfectly ratioed code.

Vanishing dots!

However, at the other extreme all elements sent above 12 wpm can be lengthened to merge, or shortened to vanish altogether! Positive weighting is added to the end of elements and negative weighting is taken from the start. Note that all elements, at all speeds, will be lengthened and shortened by the same unit of time, for any given setting of the weight time constant.

Proportionately, however, high speed elements will be affected more than low speed ones. This is exactly what you want to cope with bad keying characteristics, but not what you require if you believe, as some operators do, that the weighting time duration should change with speed.

Speed meter

Pins 11 and 12 connect to the optional analogue speed meter readout circuitry. (They're shown unconnected in my illustration as I don't need it, but I checked it out). For a speed meter you'll need to operate from a regulated power supply (the reading varies with voltage).

Connect 0.22 uF from pin 11 to ground. This causes pin 12 to go from HIGH to LOW for about 3 m every time the keyer clock changes state. A 50 uA moving coil meter, in series with a variable (calibration) resistor, is connected between pin 12 and the DC power supply. When the keyer operates the average meter reading will be proportional to the clock speed. It is adjusted with the series calibration resistor to show speeds from 0 to 50 wpm directly on the meter scale.

To perform the calibration accurately, connect a frequency meter to pin 12. Adjust the keyer speed control until the indicated frequency is 42 Hz (the correct clock speed for 50 wpm) and adjust the meter calibration resistor to read "50". The calibration will now be correct for all speeds.

Alternatively, you can do a rough calibration by sending a continuous dash stream and counting the number of dashes occurring in five seconds. This is near enough to the speed in words per minute.

A much simpler keyer, without the speed meter, weighting and sidetone feature can be built. This can be

run from a 9V battery and will draw only a few tens of microamps.

Summary

I couldn't fault the way this keyer performed. The clock oscillator started instantly, there were no false characters and I couldn't make it malfunction in any way. I experimented with the iambic mode switch and re-affirmed that my fingers, after years of ACCUKEYER sending, are firmly locked into mode "B". In mode "A", they often left off the last element of a character and "CQ" turned into "KG".

This is a good chip and on the basis of these tests I can recommend it thoroughly. It is obtainable from:

Curtis Electro Devices Inc.,
Box 4090, Mountain View,
CA 94040, U.S.A.

(The above article originally appeared as part of Gary Bold's "The MORSEMAN" column in Break-In, journal of NZART, March 1988. The cost of the 8044ABM in early 1988 was U.S. $19.95, plus postage. Write or telephone - (415) 964-3864 - for current price etc. Payment from overseas is acceptable by VISA card or by cheque on a US bank.)

++

Q4T

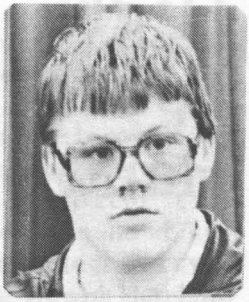
Regarding "What Happened to the Sounder?" (MM4), sounders were used for communication with and between peripheral units at Heliopolis, at least until 1942. They were probably used after that (G3ABU may remember), but at that point I left in a hurry.

I think they were used because they did not interfere with the more important traffic. Certainly they could be - and frequently were - ignored. Some of the older operating signals were used too, such as Q4T (QRX for tea) and Q4P. I can also remember demonstrating QLF, standing on a bench.

My outfit (F) was remotely situated, right inside the dome of the Museum, and anybody passing the Naafi on the way up would collect orders for cakes with QSC?

John Roscoe, G4QK.

A word with TF



by REYNIR H. STEFANSSON, TF6-005.

I can hardly believe that I am the first Icelander to subscribe to MM, but since it's so here's a crash course in my language. I hope it earns someone "TKS FER QSO ES THE ICELANDIC"!

Yes... ja; No... nei; Thanks... takk; Thanks for... takk fyrir; And... og; But... en; Or... eda; Weather... vedur (or WX); Rain... rigning (or regn); Sleet... slydda; Snow... snjokoma (or snjor); Hail... hagl; Rain showers... skurir; Snow showers... el; Fog... thoka; Sunny... solskin; Windy... hvasst; Cloudy...skyjad; Hot... heitt; Cold... Kalt; Warm... hlytt; Frost... frost; A little... adeins; I... eg; You... thu; It is... thad er.

Some Icelandic letters are unfamiliar to English speakers so some of the above translations are approximations only with English letters replacing Icelandic ones. Nevertheless, TF CW operators will understand these Anglicised words. Try a few phrases as well!

Thanks for a nice QSO... Takk fyrir anaegjulegt QSO.

I hope to meet you soon... Vonandi hittumst vid bradum.

Best wishes to you and the family...Bid ad heilsa ther og Fjolskyldunni.

It has been very nice to work an Icelander... Thad var gaman ad tala vid Islending.

Your signal is good (bad) here... Merki thitt er gott (slaemt) her.

I will call you tomorrow at the same time... Eg kalla i thig a morgun a sama tima.

See you later (CUL)... Se thig seinna.

Can you arrange an MS sked via Geminids?... Geturdu sett upp MS sked um Geminids?

Icelandic amateur stations have the new WARC bands, 10, 18, and 24 MHz, and these are open for our A, B and C class ops. TF Novices have 35 cpm speed or more, with 5W input and home-built crystal controlled gear. Their calls have N as the third letter. 3.525 MHz is their mainstay for TF work but they use the QRP frequencies, 3560, 7030 and 21060 as well. They can also use other frequencies in their assigned bands provided they are crystal controlled.

73 ES GL WID MMAG. Reynir, TF6-005.

High Speed Hand Sending

by BILL DUNBAR, AD9E, President, Morse Telegraph Club and Editor of "Dots & Dashes", the journal of MTC.
[This article is appearing concurrently in MM and in D&D]
****

The British Broadcasting Corporation's programme "Record Breakers", which features achievements from the Guinness Book of Records, has issued a challenge to anyone wishing to try to break the 35 w.p.m. hand key sending record set up by MTC's own Harry Turner in 1942.

Grand Chapter member and London resident Tony Smith, G4FAI and editor of Morsum Magnificat who sent this notice, reports:

"I have now established that the BBC are prepared to consider attempts on the record from virtually anywhere in the world, provided it is practicable to arrange local filming facilities if necessary. I don't think there's an expenses paid trip to London in this one! Initially, if anyone is interested and feel they have the necessary ability they should write to Steve Hocking, Assistant Producer, 'Record Breakers', BBC Television Centre, Wood Lane, London W12 7RJ, England.

"The conditions laid down by the Guinness Book of Records for any challenge are:

- The attempt should be sustained for at least 60 seconds, but preferably longer.
- The penalty for an error would be 5 words per error.
- There are no restraints on the mechanical nature of the key except that any spring loading or servo-mechanism would not be permitted.
- The nature of the text would be a) unfamiliar; b) in the first language of the operator; c) cursive material of an unfamiliar fictional type which would be selected by the invigilator, paying regard to the presence or absence of letter groups and/or number groups.

"Just what the latter means I'm not sure (!) but no doubt it would be clarified if anyone responds to the challenge."

The announcement recalled a 1985 conversation during "Railroad Days" in Galesburg, Ill. I was taking part in a Blackhawk Chapter Morse demonstration, and a visitor told me his father, A.L. Carver, had set up a world's hand key sending record of 43.80 w.p.m. in 1912. I cited Harry's Guinness Book record, and Mr Carver said he would send me proof of his Dad's accomplishment. He did, it being an article photocopied from the December, 1912, Railroad Telegrapher, the journal of the Order of Railroad Telegraphers.

The achievement came in a contest sponsored by the Kansas City Railroad Telegrapher's Club, in that city. It was a closely supervised affair with operators from Missouri, Kansas, Iowa and Nebraska, in which Carver sent 219 words in 5 minutes (43.80 w.p.m.) This broke the record of 43.75 w.p.m. (350 words in 8 minutes), set by New Yorker D.J. Ellington at Boston in 1906. This did not sound good for our buddy Harry or for the Guinness people, and further investigation seemed in order until I remembered I was "comparing apples and oranges".

American Morse is about 20 percent faster than International Morse code. The late "Father Joe" Terstegge, of Terre Haute Chapter, explored this several years ago in a most interesting Dots and Dashes article. Recalling it, I divided 35 by 4 = 8.75, then multiplied that by 5. Bingo! Harry's American Morse equivalent is 43.75, the exact speed achieved by Ellington in 1906!

Conversely, Ellington's 43.75 and Carver's 43.80 American Morse speeds, multiplied by 80%, come out at 35 and 35.04 w.p.m. respectively if adjusted to International. This would seem to indicate the limit for hand key sending, and Bro. Turner is right up there at the top. (Note that Carver's record was set over five minutes - an eight minute run might have produced a bit slower rate.)

Applying this formula to another notable record results in an astonishing figure. As many of you know, at the 1939 Asheville, North Carolina, code tournament Ted McElroy set a world's record by copying International code at 75.2 w.p.m. If an equivalent American Morse speed is calculated for this, it comes out at 94 w.p.m.!

I think I'll go check the yard. 73.

(For the benefit of non-American readers, Bill Dunbar tells us that to "check the yard" is the American railway practice of making a written record of the initial, number, status and whereabouts of each goods wagon at your station or yard. This was compiled by going out and walking the premises, not from memory or another employee's information.

We hope to carry an article about Harry Turner, W9YZE, including details of how he obtained his hand key world sending record, in a future issue of MM. There must be few, if any, high-speed hand senders around today but if any readers consider taking up the BBC challenge to attempt to break Harry's record, or know of anyone else making the attempt, be sure to let MM know about it!

The 1886 Tillotson advertisement reproduced inside the back cover refers to yet another record - achieved at the Telegraphers' Tournament in New York on April 5, 1885. Assuming five characters to a word to facilitate comparison, the figures quoted equate to speeds of 44.96 w.p.m. American, and 35.97 w.p.m. International using Bill's conversion formula.

Does any reader, particularly in the States, have any further information about the 1885 Tournament which would help to clarify or confirm this particular record claim?)

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PICKING UP THE THREADS

Harry Calleia has lived and sailed for ten years in his 100 year old boat the "Ark", and many readers of MM must have worked him on the key at sea as G4IUD/MM. Sadly, Harry lost his boat in the South Biscay last September, losing everything, including his treasured copies of Morsum Magnificat.

Now he is picking up the threads again. He writes, "Some long time ago I was given an old original Cornish lugger which I'm now in the process of rebuilding and getting ready for sea again. She's very small, only 24 ft, which after my old 44ft "Ark" seems tiny. So eventually I'll be /MM again - but God knows where I'll stow the tx!

"Please accept my thanks for the goodwill you have demonstrated by your thoughtfulness in replacing my MMs. I am delighted with the back issues (all of which I have re-read) and with the gesture. Thank you.

Sincere 73, Harry Calleia."

AUSTRALIAN JIGGERS

by JOHN HOULDER.

On the Australian land-lines bug-keys were known as jiggers. In the eastern states, Vic., N.S.W., and Queensland, the most common jigger used in the Post Office was the Simplex Auto (fig. 1), and an indication of its popularity is the serial number on my machine, No. 7,081.

The Simplex Auto produced the "crisp" signal which is favoured in sounder working. It was designed by Leo G. Cohen and manufactured in Melbourne. It was extremely robust and held its adjustments well, although it didn't have the reputation for carrying signals on long physical lines that some other machines had. Notice that it has the hard contact fitted to the pendulum and that the spring contact is the adjusting contact - the reverse principle to that of all other machines I have seen.

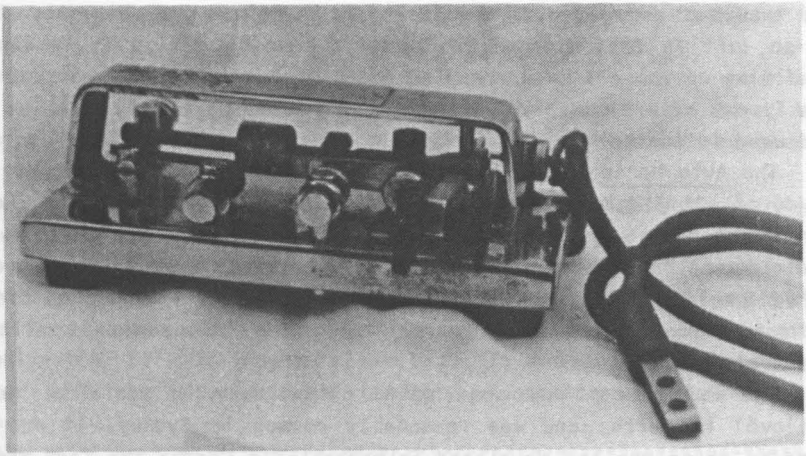


Fig. 1. SIMPLEX AUTO.

Its popularity was due to (a) its robustness and (b) its ease of use, being single-paddle as opposed to the other machines around, which were all double-paddle. Simplex (or Cohen) also made another machine which had automatic dashes as well. This was considered to be an excellent machine, but I think it was only made in limited numbers.

The Pendograph (fig. 2) is the pride of my collection, and was manufactured by a man called McDonald, in Adelaide, at the turn of the century or a little later. There were probably no more than about six in use in Sydney in my day, although they were probably more common in their home state, South Australia, and in Western Australia.

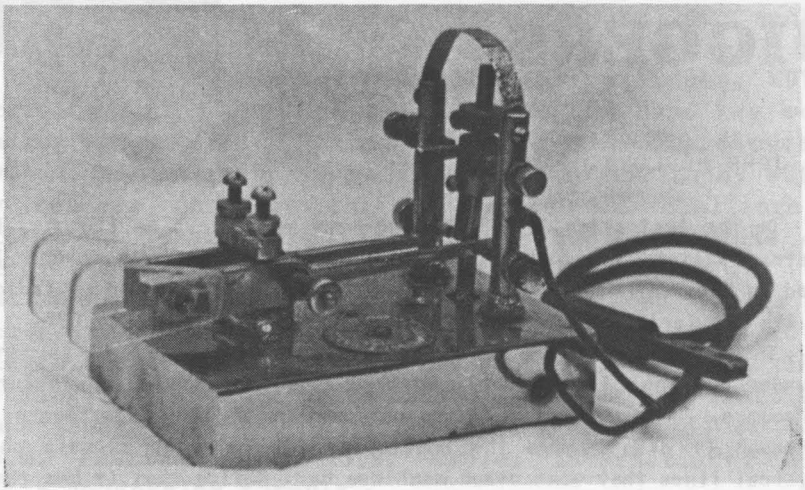


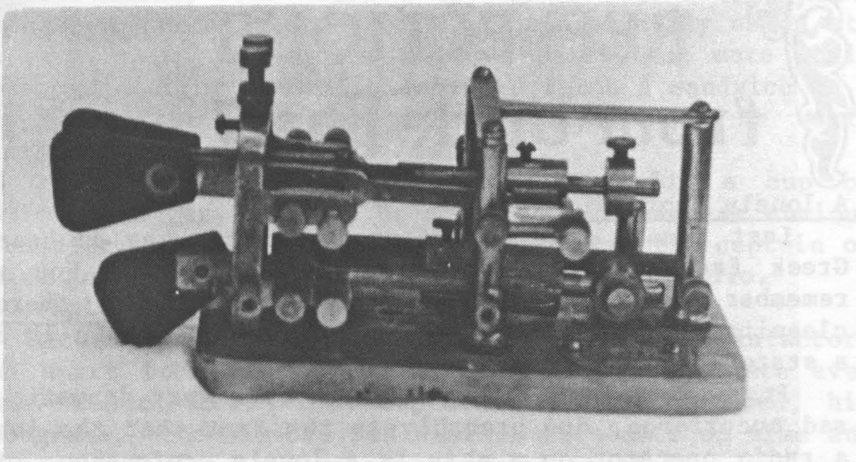
Fig. 2. THE PENDOGRAPH.

I believe there was an earlier model with the pendulum pivoted from the top, but I have never seen one. I think very few can have been built and I suspect there are none left today. There are probably only a dozen or so left in Australia of the model I have, and mine is in the best condition of those I have seen in recent years. I believe that the Pendo (as it was affectionately known), was probably the first bug to be built and used in Australia.

The Auto Morse (fig. 3) was regarded by most operators as the Rolls Royce of all jiggers and had automatic dashes as well as dots. Like the Pendograph, it was designed in Adelaide and both keys were used by Adelaide operators on long distance circuits such as the overland telegraph line to Darwin. If you look at a map you will appreciate that both Adelaide and Perth had some very long (thousands of miles) of physical circuits.

The Auto Morse was used quite extensively in Adelaide and (I believe) in Perth, and was reasonably common in Sydney. It was often used by those who had developed Telegraphist's Cramp; the fact that the machine had automatic dashes made life a lot easier for these chaps. In the days before the advent of carrier systems both the Pendograph and the Auto Morse had an enviable reputation for the quality of signal they produced and were reputed to have a signal carrying capacity as good as the hand key.

Fig. 3. THE AUTO MORSE



Although the Australian telegraphs were under government control, there was no objection to the use of bugs/jiggers. They could either be purchased by the individual or, in later years, they were on issue by the Department. They were used by about 95% of operators. This was my observation in Sydney and Melbourne at least. It was something of a Catch-22 situation. Most of the hand-keys installed were in a worn condition, with pitted and worn contacts, etc, so no-one used them and nobody bothered very much about replacing them - because everyone used jiggers.

Having worked a bit of CW as well as sounder it was my experience that careless Morse, sounded worse on sounder than on CW tone. Most operators preferred not only to transmit on a machine but to receive from one as well. I was no exception to this.

(John Houlder was a Telegraphist in the Sydney Chief Telegraph Office, 1952 - 1968. Telegraph Supervisor, Dubbo Provincial Telegraph Office, 1968 - 1973. Traffic Officer, and later Senior Traffic Officer, Dubbo District Telecommunication Headquarters, 1973 - 1980. (This District being responsible for Telecommunication Services in an area of approximately 107,000 square miles.) He is presently Administration Manager with the Department of Industry, Technology and Commerce, in Canberra, A.C.T.).

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LONGER WORD?

Re the "Longest Word?" (MM8, p.27), Bath's spa water was described by Dr Edward Strather as

AEQUEOSALINOCALCALINOCERACEOALUMINOSOCUPREOVITREOLIC

and that's 52 letters! Larry Robinson, GØHTR.

REFLECTIONS from Uncle Bas-7

A lonely profession

Last time I told you about my experiences on board a Greek freighter more than thirty years ago. You will remember how I gave the radio cabin a very thorough cleaning, but I didn't mention how it came to be in such a state in the first place

It was, in fact, brought about by a very dramatic and sad occurrence, due probably to the fact that the job of a radio operator on a ship is a lonely profession, often taken up by introverts. They have to perform their duties, usually in a small cabin, isolated from the rest of the ship in every sense of the word.

I have been told that in the early days a ship's radio officer had to sit in a sort of wooden crate fixed in the bridge tucked away out of sight. He sat there bent over a small collapsible table, squashed between huge lead batteries and the spark transmitter. Surrounded by an ozone cloud, he had the task of trying to write out received cables with a pencil while the vessel lurched from side to side.

These men used crystal receivers of course, and apart from everything else they had to find a sensitive spot on the crystal in order to get some kind of reception. What a life, what a miserable existence!

No-one knows for sure

But some were heroes too! I have only to remind you of the role of the Sparks on board the "Titanic". It was a long time ago but everyone knows the story. There is a rumour that he was singing "Abide with me..." while pumping the Morse key. After so many years of course, no-one can tell if this is true or not. Compare that situation however with a phone call today via satellite from the Pacific to London.

But to return to the "Georgios Sidderatos" from Piraeus. After being on the ship for some time I found out what had happened to my predecessor. During all the

years he had been the ship's operator he had stayed more or less twenty-four hours a day inside his radio cabin. He never went to the messroom and consequently never ate anything warm. During the night a patrolling mate would spot him leaving the radio cabin to fetch a sandwich or a cup of coffee from the galley, after which he would disappear again behind his equipment.

Occasionally he called the messboy for a cup of coffee, but very rarely. He never bathed, as was obvious from afar. His only communication was with the captain on board and with the coast stations ashore, by radio.

No complaints

According to the captain, his work was satisfactory and apart from his way of life no complaints were ever made about him. The captain always received his telegrams, time-signals and weather forecasts on time and transmitted signals were equally well handled.

Obviously the only one who can check the performance of a radio operator on board ship is another operator, but where can one get such a person on a rusty old Greek freighter? Quite often, when the captain took a telegram to the radio shack he tried to persuade the man to spend some time in the mess with the other officers, but without success.

Unsatisfactory way of life

At our ports of call, usually entertaining places, he stayed on board. So the well-known story (not true of course!) of booze and women did not apply to our lone ranger. When it came to money he did not have any; his entire wages were transferred every month to some obscure village in the northern mountains of Greece. Reflecting on his way of life afterwards, one could say that it was not a good or healthy way to pass his time.

A week before arriving in Hamburg, all signs of life from the radio cabin stopped altogether. Cables which the captain usually put on his writing desk were still untouched a few days later, and no weather forecasts or time-signals were received any more.

Investigation of the malodorous radio cabin revealed that Sparks was in some kind of coma. Hospitalisation in Hamburg was to no avail. He died a few days later, among strangers and far from his loved ones.

Bastian van Es, PAØRTW.

The story of

The Key-6

THE FIST OF KING SPARK

by LOUISE RAMSEY MOREAU, W3WRE.

When wireless entered the communications picture everything except the operator and the transmission code changed; King Spark spoke with a mighty voice and the antennas blazed with the power of his fist (fig. 1).

The tremendous power generated by the transmitter made it possible for the operator to monitor his signal three ways simultaneously. He could see the blue spark jump across the electrodes of the gap; hear the crashing roar of his fist as he closed the key; and smell the ozone that built up in the shack.

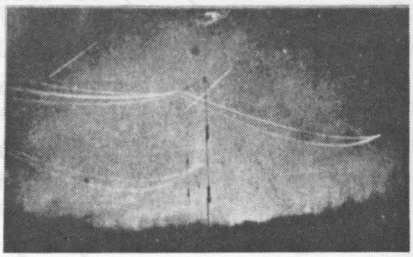
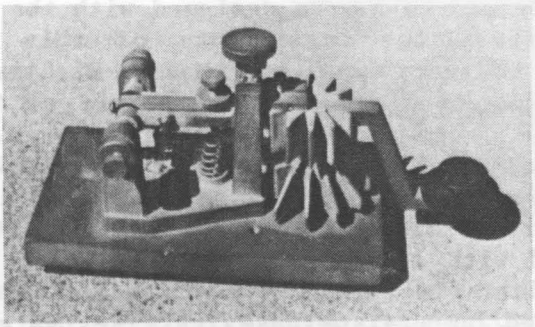


Fig. 1.
Clifden
Antennas.

Enlarged contacts

The conventional telegraph key could not be used because it was placed in the primary circuit of the transmitter and the high current was too much for the small contacts to handle. Thus the contacts were enlarged to give a broader surface. Some keys, such as those of the American Marconi Company (fig. 2), used silver contacts half an inch or more in diameter, and because of the large amount of heat generated on contact, cooling fins or flanges were provided to assist dissipation of the heat.

Fig. 2. American Marconi Key.



The lever, in turn, became larger to support the contacts and the entire key design reverted to the original telegraph styles of the 1840's. All metal working parts were mounted separately on a heavy slate, wood, marble or dielectric base, providing insulation to protect the operator.

Skirted knob

One other safety feature, not mandatory but generally adopted by most operators, was the "skirted knob", over the years popularly but erroneously nicknamed the "Navy Knob". Actually this is of European origin, adopted by ship's operators who found the "skirt" afforded additional protection against their fingers accidentally touching the lever.

Jack Binns at the key of a reconstructed transmitter similar to the one with which he sent the first radio distress call (CQD) in history, from the sinking S.S. Republic in 1909.

New York Times, January 22, 1919

Fig. 3. Jack Binns with Masse Key.

Most American keys were designed with the curved lever that identifies the instruments of this country. An exception, however, was the Masse Wireless Telegraph Company, reflecting the English origin of Walter Masse who designed their straight lever instruments. They also manufactured the largest of the hand keys, one of which was used by Jack Binns, radio operator of the Republic, (fig. 3) for his historic "CQD" in January 1909.

Designed with a fourteen inch long cast brass lever; contacts with flat, square cooling surfaces; and all parts mounted on a slate base, this key weighed eighteen pounds. These large capacity keys were, of course, used to interrupt very high current, particularly those in the mighty "rock crushers" of the coastal stations.

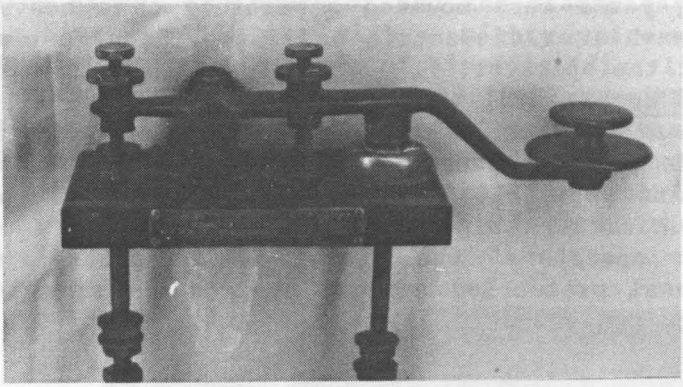


Fig. 4. U.S. Navy Key.

Leg style

The smaller capacity keys used on ships and lower power wireless stations were constructed in much the same style as the larger ones. Those made for the United States Navy for shipboard operation were leg style (fig. 4) to insure steady operation aboard ship.

With the wiring under the surface of the operating desk there was further protection for the operator. Many of these keys were rated to handle up to thirty five amperes of current without arcing while others, particularly those of the Marconi company were rated at fifty to sixty amperes.

Relay keys

Often, smaller keys, or keys with small size contacts, were operated through a Relay Key (fig. 5) placed between the key and the transformer primary to prevent arcing.

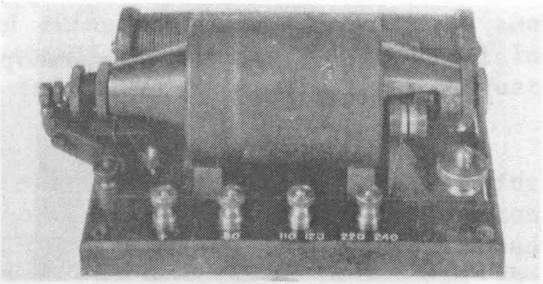


Fig. 5.
Relay Key.

These keys, actually solenoids, operated in parallel with the key for very large power transmitters. The relay key was used to break the primary circuit in air but another style, the "Oilbreak" key (fig. 6), operated with the solenoids immersed in oil to prevent arcing.

Break-in

There was provision for break-in operation during the spark era by means of a rather primitive "T-R" switch that was part of the instrument, as in the Marconi Company's "Grasshopper" key (fig. 7). Here the key was not only wired for transmission but an additional contact broke the receiving circuit, thus providing protection against damage to the fragile coherers during transmission. As a point of historic interest this type of key was in use in the radio room of the Titanic.

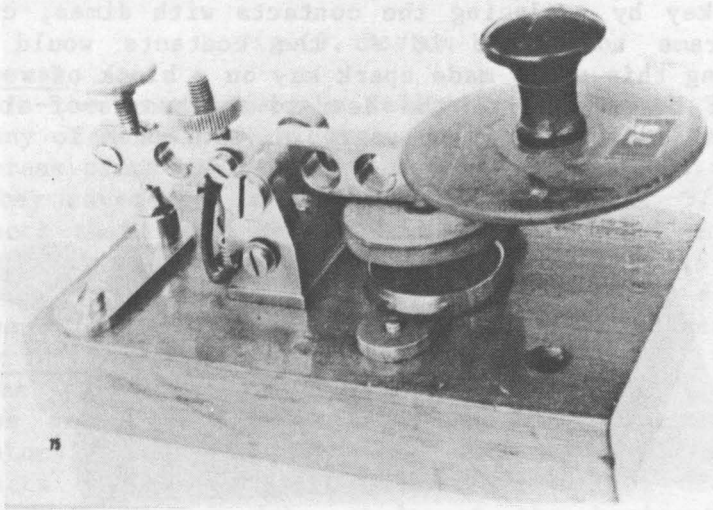
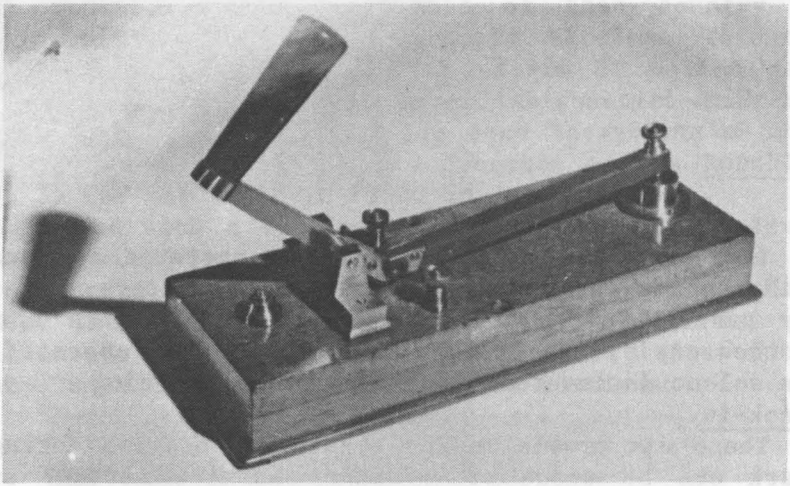


Fig. 6. Oil Break Key

Fig. 7. "Grasshopper Key.



Ham keys

The huge keys that handled the power of the spark were of course designed for commercial use, but there was a new demand as the amateur radio operators increased in numbers.

"Joe Ham" couldn't afford these expensive instruments so, as with most of his equipment in the earliest days of radio, he built his own spark key. He modified a telegraph key by replacing the contacts with dimes, cutting the frame to adjust it so the contacts would meet. Mounting this newly made spark key on a block of wood, he was in business with the dear-to-the-hearts-of-all-old-timers "dime key" (fig. 8).

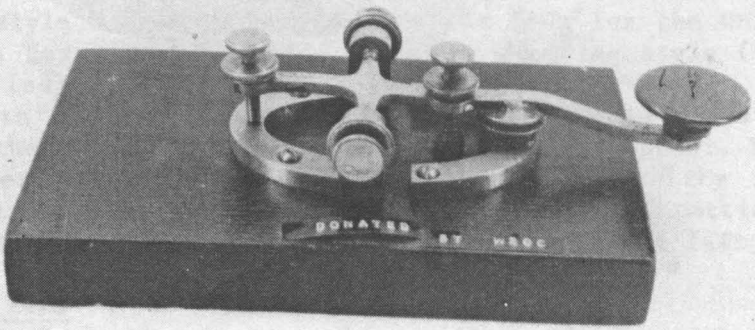


Fig. 8. "Dime" key.

The fact that he had ruined or defaced a coin of the realm didn't worry him at all. He was only interested in getting on the air, and for twenty cents he could do just that.

Dream key

Of course there were commercially produced keys for the Amateur. In 1915, the Clapp-Eastham Company of Boston offered a smaller capacity key that, although produced for the luxury liner and the yachting trade, was the dream key of every Amateur.

The so-called "Boston key" (fig. 9) with a marble base and German silver plated working parts was advertised at $15.00. Other manufacturers also offered marble base keys, but to the Amateur the smoothly operating Boston key rated as "Number one."

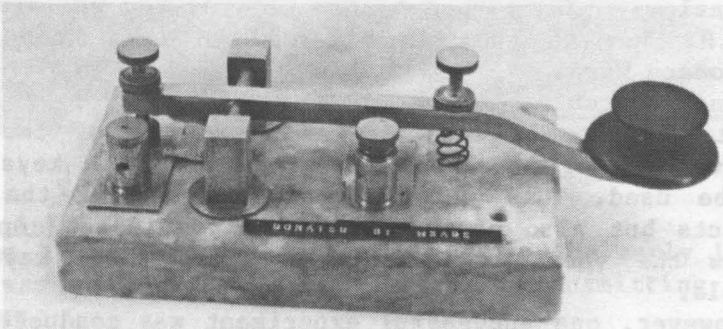


Fig. 9. Boston Key

All brass

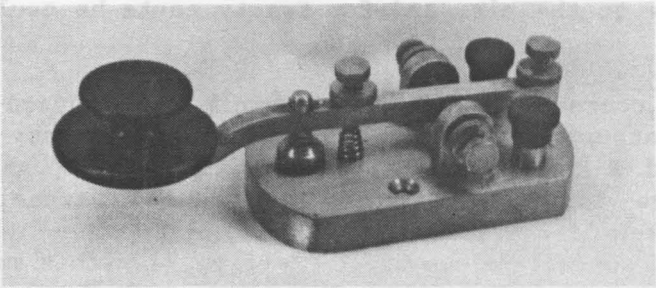
For the brasspounder's delight, the Signal Electric Company of Menominee, Michigan, made a key that assembled all brass parts on a solid brass frame (fig. 10).

They advertised a choice of 1/4, 3/8, or 3/16 inch contacts that could be unscrewed and replaced when they became worn, and J.H. Bunnell offered a similar style brass key. This style became more widely used as spark refined, and the larger keys were no longer necessary.

Heavy duty side-swiper

The problem of "telegrapher's paralysis", called "glass arm" by the wireless fraternity, still plagued operators. As with other wire instruments, the small contacts of the "side-swipers" could not be used with spark so a heavy duty style of the horizontal key appeared (fig. 11).

Fig. 10. Signal Electric Key.



These keys, with extra large contacts, usually mounted on a slate base were quite popular, particularly with Amateurs. Perhaps the best known is the "Cootie Key" of Bob Karlowa, 9XR, although this kind of key was also sold by J.H. Bunnell and was offered by Sears Roebuck and Montgomery Ward.

Bugs not suitable

It is generally accepted that because of the power involved during the spark era semi-automatic keys could not be used. This was not only because of the small contacts but also because the spark equipment could not follow the very high speeds of which these keys were capable.

However, one successful experiment was conducted with a Vibroplex, in 1909, by E.N. Pickerill at the Waldorf-Astoria station "WA" (fig. 12).

Mr Pickerill wrote, "I hooked it up with a big Relay key in parallel with the transformer and the other operator was startled as those strings of fast dots came through and asked what the heck was going on."

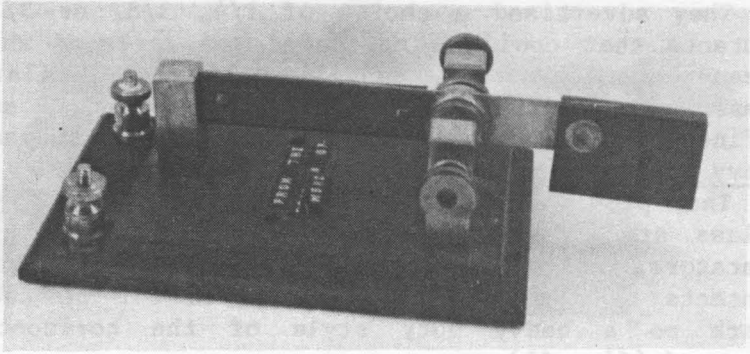


Fig. 11. Cootie-style Key.

"Oddly enough, my transmitter handled it well but the receiving equipment could not follow the fast dots of my Vibroplex." So far as is known, this is the only documented record of the use of a semi-automatic key with spark operation.

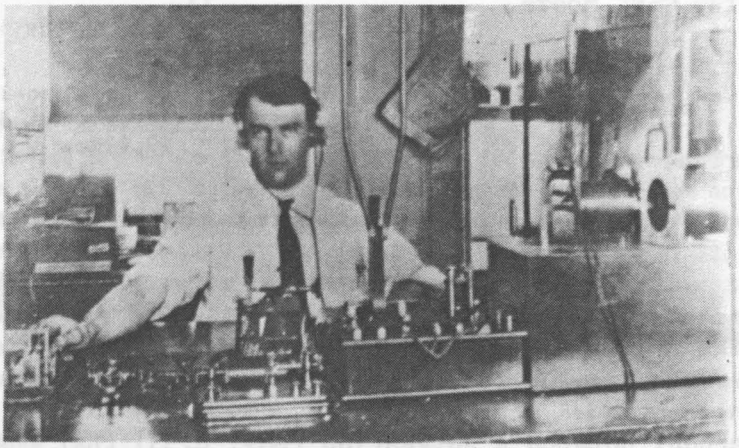


Fig. 12. Pickerill and "Bug" at "WA".

End of a reign

When King Spark was deposed by CW in the early 1920's there was no longer any problem with transmitting power and keys.

From that time to the present the small telegraph instruments have been used for radio operation. After World War Two military keys were adopted for radio use and, in the speed key field, electronic keys began to appear.

For the record

Three men are responsible for the key. Alfred Vail, who gave us the first lever action. Jesse H. Bunnell, the curved steel lever, and Horace G. Martin for his contribution to operating speed - the bug.

Down the years, however, it has been the telegrapher himself who has developed and given the the industry the improvements that have contributed most to the efficiency and comfort of his fellow operators.

Suggested references

1. U.S. Patent Indices for the years 1901-1920.

Photographs

Figs. 1, 4, 5, 8, 9, 10, 11, W3WRE library.

Fig. 2, W6GVY.
Fig. 3, Radio Club of America Yearbook 1959.
Fig. 6, R. Nelligan photo, W7GAQ collection.
Fig. 7, Science Museum, London.
Fig. 12, C.S. Moore.

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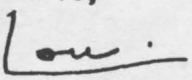

Louise Ramsey Moreau, W3WRE
99.99%cw

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That first OK

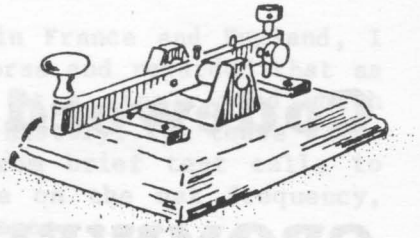
Anthony Hopwood's suggestion (MM9, p.33) that the term "OK" originated in test signals used to set up the instruments on the first Morse line between Washington and New York in 1846 created a minor furore in the correspondence columns of the London Daily Telegraph last November.

While this was an ingenious and entertaining interpretation of a piece of contemporary dramatic reporting, it was only a suggestion and not a formal conclusion. Mr Hopwood's article was accepted for publication in MM on that basis.

In MM10, p.25, in fact, another Morse text is quoted, pre-dating the Hopwood reference by some weeks, in which "OK" is used as part of the text of the message, suggesting that at that time the term was already part of the language. It appears from the correspondence in the Daily Telegraph (and from correspondence received by MM!) that "OK" was in use as early as 1839, which was well before the first Morse line was installed and American Morse came into existence.

MM can't take sides in the absence of thorough research but we certainly liked the idea expressed in the last sentence of Anthony Hopwood's letter in the Daily Telegraph of 30th November, 1988. "The expression probably caught on because it was disseminated by the explosive growth of the American Telegraph System and that was down to Morse not Old Kinderhook."

Those were the days



by H.RUSSELL JONES, O.B.E.

Eagerly awaited at the end of the first World War was the re-introduction of amateur wireless - suspended during the war.

Having proved to the satisfaction of the Postmaster-General that I was a suitable candidate for a wireless licence ("radio" was not much in use at this time), I was granted a licence for the operation of two portable stations - codes 2DA and 2DB - at an annual fee of £2.

These stations were used by the local troop of Boy Scouts at Conway, North Wales. The transmitters were based on Ford motor spark coils, and crystal and coherer receivers were employed. Imagine the chaos that would be caused today were such equipment used. However, we had lots of fun and much Morse practice in using the sets across country.

I wonder how many readers know of the coherer detector? It consisted of a tube filled with metal filings. On receipt of a signal the filings "straightened up" (cohered) and became conductive in a circuit which included a relay. Operated by the relay a "tapper" struck the coherer at the end of each signal, thus restoring it to a non-conductive state in preparation for the next signal.

During the war and, I am sure, quite illegally, a friend of mine and I operated a Morse circuit between our houses using the gas and water mains as the connecting circuit. For obvious reasons I do not propose to describe the circuit.

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-GOOD NEWS-

The Radio Society of Great Britain has announced that as from 5th February, 1989, its Sunday news bulletins, from GB2RS, are to include CW transmissions on 7047.5 kHz. Operator is G3LEQ.

Transmissions start at 1000 hrs local time at 30 wpm, reducing in stages to 26 and 22 wpm, with a repeat at 18 wpm at 10.30 hours.

[Will readers please send me details of any English language CW news bulletins from outside the UK that they know about. Ed.]

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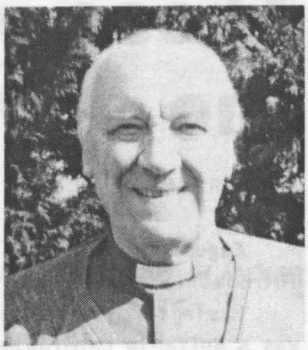
Codeword

CROMWELL



by RAY HUNTING, G3OC.

In August 1940, the German army in Northern France was preparing for Operation Sealion, massing troops and barges for the invasion of England. All this activity had not gone unnoticed. The Royal Air Force regularly bombed the assembled barges and military formations, whilst on this side of the Channel the British Army stood in a state of readiness. We had a problem. The heavy losses of tanks and artillery prior to the Dunkirk evacuation meant that our troops were under-equipped to meet a German attack.

At this time of national anxiety I was a Wireless NCO in the Royal Signals. Towards the end of August I was sent to a former stately home in Buckinghamshire to take control of a wireless Morse net of mobile stations attached to three Infantry divisions. I had two other operators to work reliefs.

On arrival, I was given the net call-signs/frequencies and a view of a map showing the deployment of the Army units defending our sector of the south coast. Once the net was established, a few coded messages were passed between the divisions and net control, then we settled into a listening watch.

An officer came into the wireless room and handed me a slip of paper. He said, "Put this in a prominent place where you can see it. That is the codeword you will send to the divisions only when you are given special instructions. It will mean that the Germans have begun crossing the Channel to launch the invasion."

I pinned the paper to the wall above my Army number 9 set. The codeword was CROMWELL, evidently chosen from the title Oliver Cromwell had adopted, "The Lord High Protector of the Commonwealth of England".

During the past months both in France and England, I had sent countless messages in Morse and regarded that as everyday work, but now I stared at a single word which could change the whole course of history. The tense waiting days passed slowly. Apart from brief test calls to the divisions to check they were on the net frequency, there was a complete wireless silence.

The enemy increased their air activity. On Saturday, 31st August, I saw a formation of 150 Heinkel bombers passing overhead and heard machine-gun fire as Spitfires dived among them, sending several crashing into fields. My diary shows there were air raid warnings most nights. On Wednesday, 11th September, I listened to Winston Churchill's broadcast at 1800 hours. His strong resolute voice warned us, "The invasion cannot be long delayed.... during the next week or so. It will be a very important week for us in our history."

As the listening watch continued, I spoke to some infantrymen who had been relieved from one of our coastal positions. They swore that there had been an attempt at invasion, because they had seen many blackened bodies carried to the beach by the tide. They assumed that fuel pipes laid under the Channel had released petrol which had ignited and engulfed the incoming barges. It was more likely that the bodies they saw were those of unfortunate merchant seamen who had drowned in oil covered waves after their ship had been sunk.

As the Army stood in readiness, the Royal Air Force was winning the Battle of Britain. The turning point came on Sunday, 15th September, with a decisive victory. Two days later, on 17th September, Hitler postponed the invasion indefinitely.

I closed down the net and removed the codeword from the wall. That single word, comprising twelve dots and twelve dashes had not been used.

There remains a question which can never be answered. If the order had been given to me to send that codeword, perhaps I would never have had the opportunity to write this, and maybe you would not have been here to read it!

(Footnote: It is now known that on September 7th, 1940, some Home Guard Units in error rang church bells to warn of the invasion. This never became public knowledge and in no way affected the Army's state of alert. R.J.H.)

RECOLLECTIONS OF THE "B2"

by Mike Pavely, G3GWD.

Much has been mentioned over the years in the amateur radio press about the above-mentioned piece of equipment. The Army Set No. 3, Mk II, popularly known as the B2, was developed like many other sets for use in irregular warfare during the second world war.

With no experience of the subject the writer will not dwell on the war-time use of the equipment but merely confine discussion to the "ham" use which many of these excellent rigs were put to in the immediate post-war era, and in particular his own experiences operating the rig as a VQ4/VQ5 in East Africa from 1951 to 1960.

For those not familiar with the B2, the following might be of interest. The equipment comprised a separate transmitter and receiver, both working off a common power supply, in the frequency range 3 - 16 MHz, CW only, at between 20 and 30 Watts D.C. input. The transmitter section consisted of an EL32 crystal controlled oscillator driving a 6L6 PA stage - the PA being designed around a pi-network circuit which was, it is believed, quite a unique circuit for the time.

(Most amateur transmitters in the pre-war and immediate post-war years utilised either a single-ended or push-pull arrangement for the PA, link-coupled to the antenna or ATU. The pi-network did not become generally popular until the advent of the dreaded TVI problem, and the necessity for much improved harmonic suppression, in the mid 1950s.)

The B2 receiver was a 4-valve superhet consisting of mixer/oscillator, I.F. amplifier, detector/BFO and audio stage using the loctal 7Q7/7R7 series of valves. The transmitter and receiver were fitted together in one metal container, approximately 12" x 10" x 5½", whilst another housed the power supply, PA coils, crystals, headphones, and key.

A further unique feature of the transmitter was the series of reversible PA coils which, when plugged in externally to the transmitter one way would cover, say, 5.3 to 7 MHz and when reversed, 7 - 9.3 MHz, the others completing the range from 3 - 16 MHz in the same way. Despite its relative simplicity, the receiver was a very sensitive and selective unit.

When these rigs first appeared on the military surplus market in 1947 their potential for use on the ham bands with little or no modification (unlike many other pieces of government surplus gear) was very quickly realised. The 3.5, 7, and of course 14 MHz bands were readily covered and VFO operation was easily obtained by driving into the crystal socket if required.

Articles appeared in the amateur press at the time, giving details of various types of modulation which could be applied to the transmitter, thus making the B2 a complete station. However in actual practice most owners discarded the receiver section for base station use in favour of a communication receiver for serious DX working.

In 1951 the writer, fairly newly licensed as G3GWD and having completed National Service in Royal Signals, applied for and obtained employment in East Africa. Much of the time would be spent in various parts of the three territories, living in hotels, etc., and the problem arose of what, if any, gear would be suitable to take to operate in "Darkest Africa"..... no prizes for guessing the answer..... a B2.

Although the transmitter and receiver sections were still readily available on the surplus market, from certain well-known emporia not a million miles from Leicester Square, for some reason the power supplies were like gold dust. Possibly this could be explained by the versatility of the units, i.e. suitable for operation on mains or 6V car battery, and able to supply 450V/200V for the TX/RX from a very small (for those days) physical package. But for whatever reason it was not possible to obtain a unit prior to departure by sea to Mombasa. There was just time to build a small unit at home which enabled operations to start in Nairobi, but with only about 6W input.

Not long after arrival in Nairobi, and the issue of the call VQ4CW, contact was made with the Radio Society of East Africa and luckily one of the members, Stan Crow, VQ4SGC, happened to have a spare B2 power pack. So a deal was done, enabling full power transmissions to commence from a Nairobi hotel.

Quite obviously the altitude of Nairobi, at 5,500 feet, and the DX call-sign, enabled contacts with many parts of the world to be made fairly easily. Nevertheless, this in no way detracts from the excellence of the B2 performance when one considers that it was only possible to erect a 14 MHz dipole at most locations, fed with twisted plastic-covered lighting flex. In those days co-ax was extremely expensive and very difficult to obtain, especially in East Africa.

The B2 receiver was used almost exclusively, at least in the early days, and gave quite astonishing results in DX pile-ups when one considers that there were no RF amplification stages or filtering circuits in the design. For the first 2 years of operation, CW was used exclusively for DX working although several forms of AM were tried

including cathode and clamp modulation for local contacts.

A short posting to Uganda in December 1951 enabled the writer to operate as VQ5CW from the Ibis Hotel, Jinja, for a few weeks. With assistance from VQ4HJP, possibly the first 7 MHz VQ5-W6 QSO was made with W6DFY in California, using the B2 of course with the 14 MHz dipole, the feeders being strapped and tuned against earth as a "T" antenna. Using the antenna in this way many good 7 MHz contacts were made world-wide from various locations in Kenya and Uganda.

During the late 1950s, the B2 was used on several occasions operating portable at check points during the Coronation Safari motor rally (later the East African Safari and now the Kenya Safari Motor Rally.) Modulation was provided by a pair of 6V6s operating in Class AB.

After returning to the UK in 1960, the B2 was pressed into service from time to time on the LF bands until more suitable equipment could be built or obtained for the home station. During a business trip to Eire in 1971 the rig was taken along, this time to be operated on 160 metres, with suitable modifications. There had never been very much activity from EI on top band so a number of very good contacts were made with UK stations using the call EI2VCF, operating CW only from Carlow and Skibereen.

Due to the age of the B2 it has now been finally retired but is happily still in the writer's possession where it will remain for the foreseeable future. For those who may have seen the series "S.O.E." on BBC TV in recent times the B2 is featured in the first and possibly other programmes in the series. It is described in some detail in the book "S.O.E. - The Special Operations Executive 1940-46", by M.R.D. Foot, upon which the BBC programmes were based.

(This article originally appeared in Mercury, journal of The Royal Signals ARS, March 1988, and is reprinted with kind permission.
In the next issue of MM there will be the first part of a two-part article, "In Yugoslavia with the B2" in which Len Key, M.B.E., GØFQX, describes his WW2 experiences with this fine set working with the Partisans in Nazi-occupied Yugoslavia.)

oooo00oooo

"GONE AWAY"

Following Larry Robinson's review of the G.W. key in MM10, Bill Young, G4KUU, reports that a letter he wrote to the maker's last-known address in Rhyl has been returned, marked "gone away". Several readers have expressed an interest in this key. Does anyone know if it is still being made, and if so, where? Please contact the editor if you can help.

With typewriters, Phillips code and bonuses, the pressure was on to increase Morse operating speeds. KAYE WEEDON continues the story.

Faster Manual Morse - 2

In 1900, the New Zealand born Sydney journalist, DONALD MURRAY, was able to sell to Postal Telegraph-Cable Co his new page printing telegraph. It was described and shown at an A.I.E.E. convention. During the discussion of the lecture, facts were presented as to the well established practice of typing sounder telegrams.

(During this discussion, (ref. 35), Mr Jones of the Postal Telegraph-Cable Company reported "The very best that Morse telegraphers can do in a day's work, is about thirty words a minute. The simplest of all telegraph systems, outside the telephone, if you wish to include it, is the Morse system, where a man sits with his hand on his key, his eyes steadily fixed upon the message, the words passing in through his eyes and out through his fingers over the wire into the ear of the receiving operator, and the latter printing it upon a portable printing press - a typewriter. There is no telegraph system that can transmit a message from the sender to his correspondent in so quick a time, except by telephone, as the Morse system operated in this way."

Commenting on the printing telegraph under discussion, Mr Jones said, "...Some very clever systems have been devised... but the trouble seems to be that while you can get a great deal over the wire , it takes a little time at the start, and a little time at the finish, which handicaps the business, and also that the expense of preparing the tapes and translating the tapes is so much more expensive than by the Morse system, and so much more complicated, and adds so much to the delay of the business, that neither the managers of the telegraph companies nor the public, whose business is to be transacted, will have anything to do with such systems."

Commenting further on the speed of the Morse system, Mr Jones continued, "Between New York and Boston and some other cities,

we have a system in the Postal Telegraph-Cable Company of paying an operator so much a day for his labor. He begins work at eight o'clock in the morning and quits at five-thirty in the evening, with a certain time for luncheon. We put four of those operators on a quadruplex in New York, and there are four in Boston. Those operators get a premium on each message beyond a certain number that they handle in a day... Consequently they have quite an incentive to do their very best.... Now, it has been found that an operator in New York sending to an operator in Boston.... will do at the rate of 60 to 65 messages per hour, and they average thirty words per message... The very highest rate of Morse transmission is about thirty words a minute. Those are the very best operators - the very flower of the flock. Now, if you take the general run of operators, where there isn't piece work, and where they are not inclined to exert themselves to such an extent, where there is no incentive for it, I should think if you got fifteen words per minute on average, you would be doing very well indeed.")

Piecework, or bonus pay, was therefore the incentive for the operators to work fast. A paper by Murray in 1908 was devoted to this practice.

Clatter and click

(Murray commented (ref. 37), "If some magic carpet suddenly transported a British telegraph engineer into a large New York telegraph office he would at first be dazed by the extraordinary clatter of the sounders, which are tuned up to make about four times as much noise as the British variety. The next sound to catch his attention would be the click of typewriters. He would see typewriters by dozens and scores, every operator with a typewriter, and all telegrams being typewritten... Every operator has his 'mill', as the typewriter is familiarly called."

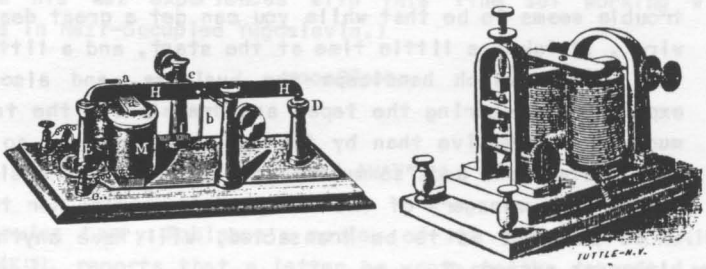


Fig. 5. Early American sounders. As early as 1853, we are told that this simple receiving set had replaced the embossing receiver in the main telegraph offices.

Fig. 6. The SHOLES-GLIDDEN-SOULE machine demonstrated c. 1870. Note pedal- operated line shift.

"The telegraph companies do not supply the typewriters. Each man has to furnish his own machine, and a telegraph operator without a 'mill' has now no chance of employment in any of the large cities of America. The typewriter manufacturing companies make special efforts to cater for the custom of operators, and dealers in secondhand machines do an immense business amongst the telegraph fraternity. When an American operator is out of work and hard up he sells his typewriter to one of these agencies, or if he gets a job he hires a 'mill' until such time as he is in a position to buy it.

...The typewriter... has resulted in considerable speeding up of telegraph work. The great gainers from the use of the typewriter, however, have been the operators themselves, and it is no doubt for that reason that the cost of providing typewriters has fallen on the operators.

....The nervous strain and muscular drudgery of rapid writing is enormous compared with the same work done on a typewriter. When using the pen or pencil one group of muscles and one set of nerves have to perform a very complicated series of motions for each letter. With the typewriter, on the other hand, one simple motion of one finger is sufficient, and even this great reduction of muscular and nervous strain is again reduced eightfold by spreading the work over all eight fingers of both hands. It is this complete release from pen servitude that has made the type-

writer such a boon to telegraph operators in America, and it is surprising that telegraph operators in this country have not long ago recognised the 'mill' as a friend and helper.

...Operators who ranked only as second class on account of slowness or defects in penmanship have become first class. Formerly the sending operator on the morse key could make the receiving operator 'sit up'. With the advent of the typewriter however, the position is now reversed, and the receiver can take with ease all that the finest star operator can send.

Bonus for speed

...from a letter written by Mr Minor M. Davis, Chief Engineer of the Postal Telegraph Cable Company in New York...'A minimum, intended to be a good day's work is determined on by observation... between 8 and 5.30 a good man will handle about 300 (messages) on a New York-Boston circuit, 325 on a New York-Philadelphia circuit, 280 on a New York-Chicago, and so on... each operator is allowed one cent per message for each message handled in excess of the minimum, or if he prefers to cease work when he reaches the minimum he is excused and paid his regular salary for the full day.

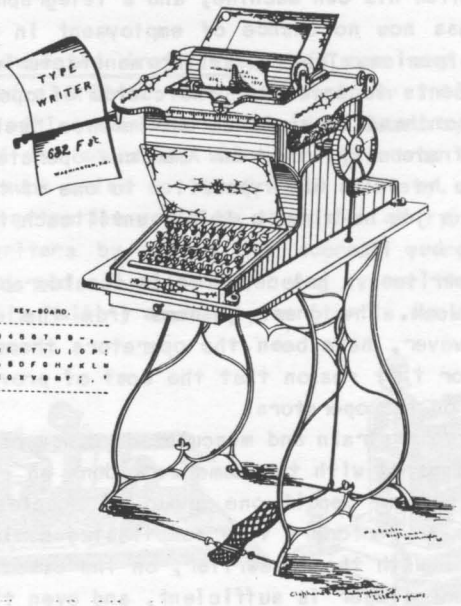


Fig. 7. Remington No. 1. The machine and table, etc, was evidently closely related to Victorian sewing machines. Remington's chief mechanic had previously done much work on sewing machines.

'There are comparatively few circuits that can be operated in this manner (we have only about twenty-five of them). The increase in speed is considerable. It is not uncommon for an operator to handle a hundred messages more than the minimum, and sometimes operators handle 500 messages in a day.
I have known one or two cases where 600 have been handled. Operators are not required to work at these very high speeds; but usually they are applicants for these circuits. It takes 'good men' to work them, and operators like to be known as capable of the work'...")

But not the GPO!

Kaye Weedon continues: It was obviously outside the economic horizon of the government employed English telegraphists to buy their own typewriters; thus they were cut off from any chance of discovering the advantages.

The British G.P.O. would not in their wildest dreams consider buying typewriters for their operators. Nor were things different in Germany. For 10 years the German GPO had investigated the use of typewriters without reaching a conclusive result. More than the Atlantic Ocean divided the U.S. operators from their colleagues in England, Germany, and the rest of Europe.

Phillips code

The introduction in 1879, by Walter Phillips, of the PHILLIPS CODE BOOK marked another advance in faster message handling. Essentially, this code substituted "words" of 2 to 4 letters for those of 5 or more. This gave savings of 30 to over 50 percent of actual signals transmitted.

The Phillips Code was used almost only for press matter intended for the large number of newspapers over the U.S. continent and was not permitted for ordinary telegrams. "Working Phillips" involved very remarkable brain work.

First, both operators had to know the Phillips Code by heart. The sender would automatically encode his abbreviated message in Morse - American Morse, i.e. Vail's code. The receiving operator performed the almost incredible task of hearing the sounder in a noisy room, immediately decoding the message from "Phillips" into the readable language of the original message, which his pen recorded on paper - later written by typewriter.

In press work, the use of the Phillips Code - exclusively American - materially lightened the burden of the telegraph operators, some of whom could now handle 50 to 55 w.p.m. for hours. Around 1907, such operators augmented their annual pay of 400-500 dollars by a bonus of 25-50 percent, using their privately owned typewriters.

At one time, c. 1907, before the general introduction of the

"Vibroplex" key, two U.S. operators on one, rare, occasion netted 50 w.p.m. over 8 hours, using reception by sounder, typewriter, and Phillips Code.

Feat of endurance

(Murray (ref 37) also reported, "It is now not a rare thing for two first-class Press operators in America, one sending "code" and one receiving on the typewriter, to handle 20,000 words of press in one night. The record is said to have been 24,000 words transmitted and received by two men in eight hours .... an astonishing feat of endurance to anyone practically acquainted with such work.

The code contractions for common phrases are works of art. Here are a few examples:-

Fapib - Filed a petition in bankruptcy.
Dbf - Destroyed by fire.
Cats - Created a tremendous sensation.
Utc - Under the circumstances."

A skilled telegraph operator, HORACE G. MARTIN, in his U.S. patents of 1903, 1904 and 1907, introduced the semi-automatic "BUG-KEY", named the "VIBROPLEX" in 1907. Utilizing a mechanical vibrator dot generator, this horizontal action key relieved operators of the feared "glass arm" and increased their speed of transmission. Such keys, while not mentioned by Murray in 1908, evidently were in widespread use two years later.

Summary

The State Telegraph of Prussia appears to have been using quill pen ledger entry of received telegrams as late as 1853, visually read off the embossed tapes of the Morse register.

The competing American private telegraph companies demanded speed. Innovations by the telegraphists themselves were encouraged and gradually adopted with the steady increase of traffic.

Reading sounder by ear took only a few years to spread after its introduction in Britain and its colonies. Well informed, Germany delayed sounders until 1893 and some years later described their considerable advantages.

Typing from sounders was tested in Germany for over a decade but remained a U.S. practice, apparently adopted in Canada and, possibly, Australia and New Zealand.

By 1927, Bell Telephone Co. had nearly three times as many thousands of miles of manual telegraphy lines as of wires devoted to printing telegraphs.

Several American speed records are noted in literature, the steady day by day speed was lower but high, or very high, compared to achievements in other countries.

In 1917, "crack" operators were shipped to France as soon as the U.S. entered World War 1. Using sounders, typewriters and "bug" keys, these men about doubled the military traffic over existing French landlines.

In peacetime, competing private companies paid for what they got; government monopolies got what they paid for.

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The original Norwegian paper has 32 illustrations and a bibliography of 52 items.

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(We are indebted to the Norsk Teknisk Museum of Oslo, Norway, for permission to publish the above extracts from VOLUND 1985.)

KAYE WEEDON* was born in Oslo, Norway, in 1907. He graduated in communication engineering at Trondheim in 1931. After a few years in two radio factories he spent 43 years with the Kodak agents, later the Kodak House, in Norway. Since he retired at 70, Mr Weedon has delved into the history of electronic tubes, early radio engineering and telegraphy.
The Antique Wireless Association presented him with the 1983 Houck Award for "Documentation of the History of early Wireless Communication".
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Sparks

Not very conspicuous
a seagoing officer he was
abiding his time like a fireman,
doctor, policeman, required only
in case of emergency.

Not very conspicuous
with the other crew members he rode
passing storms in his shaking radio cabin
but lonely he weathered more magnetic storms
and solar spots pestering communication.

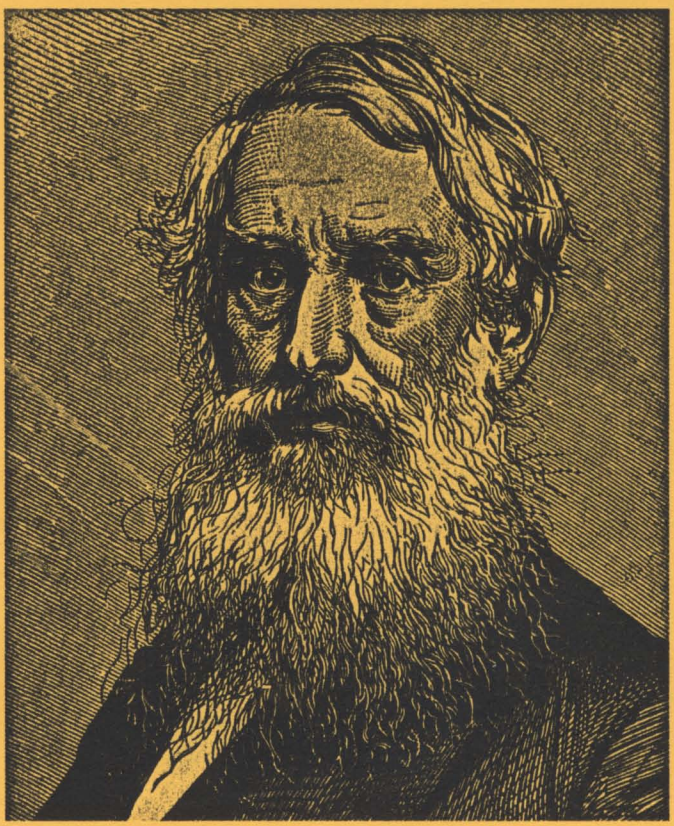
Not very conspicuous
he overcame the failing techniques
of fuming batteries and red hot tubes
only available to him, where he was
supposed to conquer the world
with dots and dashes.

Not very conspicuous
he managed complex electronic systems
culminating in sounder and radar,
the eyes and ears of the navigator
who in many cases thanked the Lord
for his presence on board.

Not very conspicuous
he will sail away in the mist of time
labouring over a hundred years
for owners and crew and those incommunicado
at home. He saved and helped many
except himself.

Sea-going life will be different, emptier
and more dangerous without Sparks.

Jan Noordegraaf.



Samuel Finley Breese Morse