

Flying
the flag
for
Morse

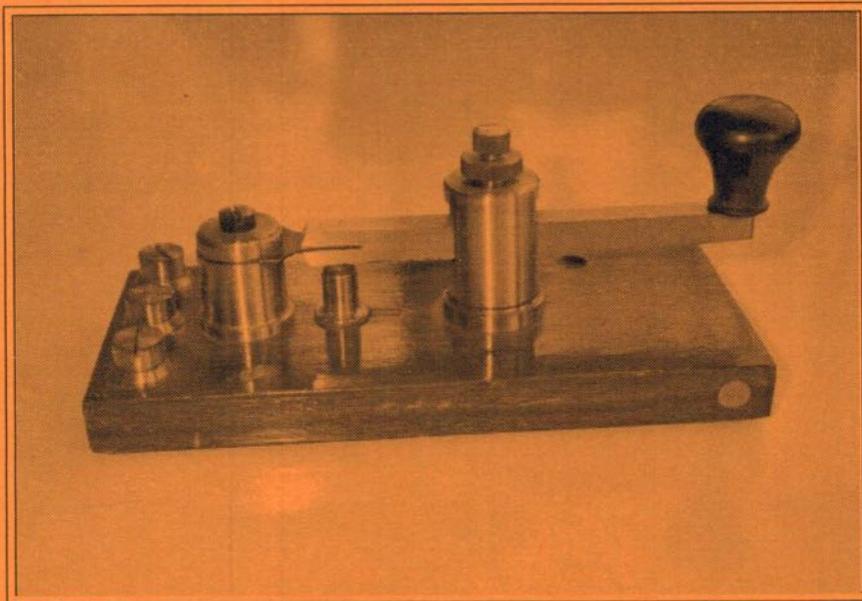
Number 71 – September/October 2000

Morsum Magnificat

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The Morse Magazine



Walters Variable Fulcrum Landline Key



The International Journal of Morse Telegraphy

Flying
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for
Morse

Morsum Magnificat

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FRONT COVER

Variable fulcrum single current landline key made by
Walters Electrical Co., London. 19th century.

Photo/Collection: Wyn Davies

Comment

Firstly, sincere apologies for the late production of this issue. I hope readers find this issue worth the wait.

Historic QSL Cards

Over the next few issues a page will be devoted to pictures of historic QSL cards. If any readers have old rare QSL cards of CW contacts from the early days of amateur radio, please send copies or originals (which will be returned) to MM.

First CW QSOs

From an idea of Cathy Stanfill's, KF6TIW, MM is compiling memories and recollections of reader's first CW contacts. Newcomers to Morse will come to realise that whatever pain, nervousness or embarrassment they are suffering, it has all happened before. Please send your experiences, whether recent or from the distant past, to the MM editorial office. Accompanying photos etc. would be especially welcome.

How the Victorians wired the World

A number of readers have enquired about obtaining copies of the channel 4 TV documentary on the 19 century telegraphs. A video is available from MM but it was not originally made for retail distribution and therefore includes 3 breaks for a TV station to insert advertising. More information is given on page 26. Overseas readers interested in a copy of this video should check that their national TV is a 625 line, PAL colour system.

Zyg Nilski G3OKD

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News

EUROCOM Supports 5 Wpm

The EUROCOM Working Group of radio societies across Europe is supporting 5 wpm Morse code amateur license exams as the qualification for full HF band access. It is understood that following the EUROCOM vote the European Conference of Postal and Telecommunications Administrations (CEPT) will adopt 5-wpm as the top speed.

The Deutscher Amateur Radio Club (DARC), at the EUROCOM WG held in Germany, successfully proposed a modification to regulation CEPT TR 61-02, to lower the Morse code examination speed from 12-wpm to 5-wpm. EUROCOM WG delegates supported 5-wpm as an interim measure in recognition that the Morse code requirement is likely to be removed at the ITU World Radiocommunication Conference in 2003.

Only the Hungarian Society (MRASZ) remained in support of 12-wpm for CEPT licensing. A modification to the CEPT regulations to implement 5 wpm will result in a virtual worldwide adoption of the lower speed.

(From the *W5YI Report*, July 15, 2000, credited to Jim Linton VK3PC, President, Wireless Institute of Australia, Victoria.)

Dow-Key Survey - Help Wanted

Lynn Burlingame, N7CFO, is writing the history of the Dow-Key Company for the N7CFO Keyletter. The Keyletter is a publication dedicated to the preservation of telegraph history and the collecting of telegraph instruments. The Dow-Key company was started in Winnipeg in the early 1940's and later moved to Warren, Minnesota. Dow-Key originally manufactured a line of speed keys, and later made high quality relays.

Lynn requests that any readers that knew Paul or Gordon Dow contact him. He is also doing a census of Dow-Key bugs and needs the following information: Type, finish, label information, serial number, damper type, color and shape of paddles. You can submit this information via an automated questionnaire at his web site at <http://www.qsl.net/n7cfo/index.htm> or contact him at the address below.

He especially needs to locate original owners of Dow-Key bugs to help date Dow-Keys by serial number range. You can write to Lynn at:

15621 SE 26th Street, Bellevue, WA 98008 USA. His telephone number is (425)641-5488,

E-mail: n7cfo@ix.netcom.com

(Lynn Burlingame)

Heliograph Trial a Success

On 15th July, John Alcorn, VK2JWA and a group of enthusiasts experimented with the use of heliographs. They had been waiting for a fine Saturday to 'helio' from Parrot's Nest, 8 miles (13 km) south-west of Lismore, New South Wales, to Rob Gallagher, VK2KGGK 's QTH on the Hogarth Range almost on the horizon (see photo). The line of sight (LOS) distance is about 45 kms (34 miles) west from Parrot's Nest. Heliographs were set up about 1330 hrs so that the sun was most favourable for signalling westwards. Unfortunately smoke haze meant that Rob, VK2KGGK 's location could not actually be seen. Using bearings previously worked out and some test flashing Rob was soon able to see the signals. Rob did not have a heliograph so coordination was achieved using 2m radios.

The quickest contact was made by Leith Martin VK2EA using the hand mirror like those supplied with survival kits. This provided a quick confirmation of the

aiming direction but was difficult to use for sending actual traffic. Two 'Helios' were used, one a standard Army 5 inch Mk. V heliograph and the other a 22 inch (55cm) heliograph made by John Alcorn called 'Heliomax'. There is a 'scope on the back to aid initial sighting and alignment. Both worked very well. The flash from the large mirror was brighter than the 5 inch Mk V but both were easily seen and readable. It took some time to check bearings align the instruments and adjust for the movement of the sun. Signals were kept short to prove adjustments and keep Rob occupied.

The trials finished at about 1500 hrs. It is planned to set up at Rob's end and communicate in both directions. Some other fine Saturday!
(John Alcorn, VK2JWA)



Top - Looking westwards to the Hogarth Range on the horizon.

Below - The Mk.V, survival mirror and Heliomax.

'In the Beginning'

This year's Key and Telegraph Seminar at the Antique Wireless Association conference was the most important ever. It took place from 4-6pm on Wednesday, September 5th at the Thruway Marriott Hotel in Rochester, NY. Gil Schlehman who now has 125 'different' bugs in his collection, gave another of his great presentations, showing photographs of 80 seldom seen examples. Tom French gave a fascinating presentation on McElroy straight keys and code practice oscillators. . . . And the Holy Grail of key collecting was opened for the first time in public.

In a talk entitled "In The Beginning", Pete Malvasi gave a presentation of the Historic Speedwell Museum in Morristown NJ, the birthplace of the telegraph key and the "Morse" code. He presented a complete photo review of the museum in it's current state in addition to the exciting plans which will soon be implemented to make this a modern, meaningful and interesting museum for both the general public and collectors.

The presentation also included a résumé of the background and work of Alfred Vail, illustrating his major role in the development of the electric telegraph and the "Morse code". The museum owns important original documents on the electric telegraph, including the notebook of Alfred Vail on the 1844 telegraph demonstration to Congress between Washington DC and Baltimore.

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Some of the best of these will be professionally reproduced and made available to collectors and the public in printed form. They will include the complete original patent papers for the original Lever Correspondent showing illustrations rarely seen before, in addition to early telegraph catalog excerpts - and the original contract between Morse and Vail.

Pete has also located Vail's last living direct descendant, Mr. Steven Vail and will lead a brief interview with him.

Pete was fortunate to have his Company, 'Nortel Networks', help sponsor his efforts to bring this important museum into a greater and more meaningful public view.

As part of the museum plans they will also produce a book similar in quality to Fons Vanden Berghen's "Classics of Communication", for sale in mid to late 2001. Finally they will actively consult the collector community on improvements and changes to the museum.

This was perhaps the most important presentation ever seen by the key collecting/telegraph-historian community.

(Tom Perera, WITP)

5 wpm Morse Now Law in Australia

On Wed. 12 July the Regulation changing the Morse requirement for all HF access to 5 wpm became law.

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100 Years of Maritime Radio at Cuxhaven

On 24th September 1900 Prof. F. Braun and his team achieved a distance of 62 Kilometres between the Isle of Heligoland in the German Bight and Cuxhaven with their "spark transmitters". A group of former radio officers have prepared a special radio event on short-wave to commemorate the centenary of this historic event. The national weather service of Germany, Deutscher Wetterdienst have supplied a call sign DDK8 on 11638 KHz to transmit from the the lighthouse "Alte Liebe" at Cuxhaven, the original site of Prof. Braun's transmissions.

A special historic telegram has been printed for the public. To receive a



Professor Ferdinand Braun

copy send a donation of 20 DM/10 EU or \$10 US Dollar or more for the lightship 'Elbe 1' foundation. Send money orders on behalf of: Foerdereverein Feuerschiff

Elbe 1 Cuxhaven e.V. at the Stadtparkasse Cuxhaven Bankzip 241 500 01 account nr. 196 014. On the money order state your name address and the letters "SLT" which stands for Ship's Letter Telegram. and send to the address below.

A competition will take place between 23rd September, 2000 at 07:00 UTC and 24th September 2000 at 19:00 UTC. The preliminary schedule for the transmissions

MM71 – Septem- 5

Datum: 24. 9. 1900 Uhrzeit: 11 Telegramm Nr.: Zahl der Zeichen: 11 von: 24. 9. 1900 nach: 24. 9. 1900	Hier steht dann Ihr Name  Telegraphen des Deutschen Reichs. Cuxhaven KCX	
Fragezeichen aus: Heligoland 27 26 des. 24. 9. um. 9. Uhr 11. Min.		
<i>Zum heutigen Feste der Wuensche beste. Trinkt nicht zuviel bei Doelle sonst werdet ihr voelle.</i>		
<i>Prof. F. Braun, am 24. 9. 1900</i>		
Dieses telegraphische Telegramm ist verbunden mit einer Spende zum Erhalt der Feuerschiffes 'Elbe 1', von dem es an die Postanstalten in Heligoland übergeben wird.		

The "historic telegram", styled in the fashion of the turn of the century 1900 of the "Reichspost und Telegraphenverwaltung" displays the text, Prof. F. Braun instantly sent during the transmission tests made from the station.

are: weather forecasts at 18 minutes past the hour, press at 25 minutes and traffic lists at 50 minutes past the hour. Also listen to the announcements made during the transmissions.

In the competition listeners have to recognize the call signs of the different historic traffic lists broadcasted by DDK8 and identify the names of the ships behind the calls according to the lists of the mentioned year. At 50 minutes past each hour traffic lists are sent from different years.

Each call from the different lists counts once as one point. The correct ship's name counts an additional 5 points. Competitors are expected to listen to the broadcasts – on trust!

Send log files for verification with the copied calls and ships names together with your name and address and the self-calculated points on the first page to: Foederverein Schifffahrtsgeschichte Feuerschiff Elbe 1 Cuxhaven e.V. POB 212, 27452 Cuxhaven, Germany.

The participant with maximum points wins a 3 day cruise on board the DFDS Scandinavian Seaways ferry from Hamburg to Harwich for 2 persons in cabin. The prize cannot be paid in cash. There are no legal remedies ('Der Rechtsweg ist ausgeschlossen'). Deadline for receipt of entries is the 30th of October 2000. If there are participants with equal amount of points, the winner will be selected by chance. Remember, each callsign represents a ship including some of the most famous.

Please remember that these are **one-way** transmissions so do not try to contact DDK8 on any frequency even if

you get the impression that there is some kind of traffic. It only seems so!

Former radio officers and friends of maritime radio meet on 23rd of September 2000, 11 am at Seepavillon Donner at Cuxhaven close to the lighthouse "Alte Liebe".

Also visit: <http://www.seefunker.de/sfk/gerpott/sf100y.htm> for more information.

(Jürgen Gerpott, DL8HCI & Sylvester Foecking, DH4PB)

RAC Asks Industry Canada To Discontinue The 12 Wpm Test

During the past year, RAC has consulted with the Canadian Amateur community in various ways including web site surveys, message boards, analysis of e-mail and postal correspondence, letters to the editor of The Canadian Amateur magazine as well as on-the-air discussions and other forums.

The RAC Board of Directors has concluded that a majority of Canadian Amateurs are supportive of dropping the 12 W.P.M. Morse test although many are against such a change.

In a recent letter to Industry Canada, RAC President Kenneth Oelke, VE6AFO recommended that full HF operating privileges be granted to amateurs who have passed a 5 W.P.M. Morse test. At the same time, Mr Oelke requested that the department consider the augmentation of written tests to strengthen and expand the requirements

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for operator knowledge and skills in the areas of station set up and operation, on-air procedures and operating practices, and to include more questions on modern modes of communication employed by Radio Amateurs.

This proposal would give Canadian radio amateurs operating privileges similar to those currently accorded to United States amateurs who successfully pass a 5 W.P.M Morse test.

Industry Canada is aware that a review of the international regulations governing the Amateur Services will take place at the next World Radio Conference currently scheduled for 2003. One aspect of such a review would be the testing requirements for access to frequencies below 30 MHz. The proposed review is supported by the International Amateur Radio Union, which has consulted with its member organizations in over 180 countries during the past four years.

Independent of the review of the International Regulations, many countries including The United Kingdom, Australia, South Africa, and many European countries are either considering or have already decided to decrease their Morse testing requirements. A decision by Canada to drop the 12 W.P.M. test would be in harmony with what is happening in other parts of the world and would simplify the

negotiation and implementation of reciprocal operating agreements.

(RAC Bulletin)

Free Morse Tutor Program

There is a free morse tutor program called "DMORSE" at web site:

<http://come.to/g0mdo>.

(Don Ward GØMDO)

Fly-in Hamfest

The annual Tompkins County Amateur Radio Club hamfest was held at the local airport in Ithaca, New York State. The weather was good so Tom Perera, WITP put some of his travelling museum into his trusty ol' Piper and took off for the 1.5 hour flight (6-hour drive).

On landing, the club let him taxi right up into the flea market and set up working sounder and key displays right on the wings of the aircraft. They even provided a spot to sleep in the hangar... There were no great telegraph keys but everyone had a good time.

(Tom Perera, WITP)



THE LETTER WHICH OCCURS most frequently in English is 'e', and it is represented in Morse by the shortest and simplest signal, just one dot. At an early age Samuel Morse was avidly interested in the techniques of printing. A book edited by his son is informative (Morse, 1914). A letter dated January 17th 1849 and reproduced there includes "... in my boyhood it was my delight, during my vacations, to seek my pastime in the operations of the printing-office. I solicited of (sic) my father to take the corrected proofs of his *Geography to the printing-office*, and there, through the day for weeks, I made myself practically acquainted with all the operations of the printer. At 9 years of age I compiled a small volume of stories, called it the 'Youth's Friend,' and then set it up, locked the matter in its form, prepared the paper and worked it off; going through the entire process till it was ready for the binder."

In a work on the history of printing Gaskell (1972) is this passage, "*Founts were usually supplied in quantities approximately proportional to the frequency of use of the various sorts, the fount schemes or 'bills of letter' being worked out by the founders. In the eighteenth century a 'full bill' was based on a quantity of 3,000 lower-case letters m, and included 7,000 a, 12,000 e, 400 x, 800 A, and so on.*"

In a standard English work on printing there are data related to

Mathematical Analyses of Telegraphic Signalling

by E. Geoffrey Walsh
GM4FH

(E-mail: Geoffrey.Walsh@ed.ac.uk)

the numbers of different letters in a printer's case. An American abridgement of the work contains the same figures (Stower 1817). In a notebook of Samuel Morse is a page showing the values he took for the different letters of the alphabet (Morse 1914). The data are shown in Table 1. The values are identical for 25 of the 26 letters of the alphabet. For

	Grammar Morse		Grammar Morse	
a	8500	8000	n	8000 8000
b	1600	1600	o	8000 8000
c	3000	3000	p	1700 1700
d	4400	4400	q	500 500
e	12000	12000	r	6200 6200
f	2500	2500	s	8000 8000
g	1700	1700	t	9000 9000
h	6400	6400	u	3400 3400
i	8000	8000	v	1200 1200
j	400	400	w	2000 2000
k	800	800	x	400 400
l	4000	4000	y	2000 2000
m	3000	3000	z	200 200

Table 1 The figures for Roman lower case pica in a printers' lay are reproduced in the 'grammar' column. (Pica is the 12 point type, 6 lines to the inch the largest normally used in the text of books). Samuel Morse's figures are in the 'Morse' column.

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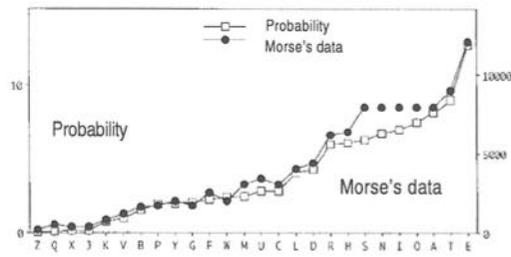


Figure 1 - Comparison of a modern estimate of letter frequency with the values used by S. Morse.

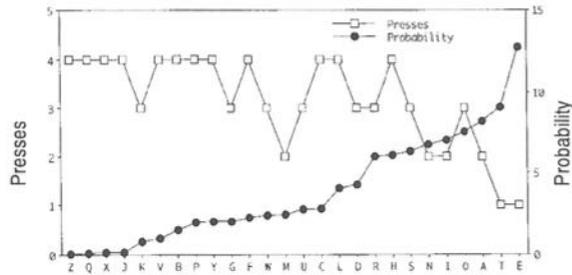


Figure 2 - Number of presses used in Morse, for the alphabet this merely ranges from one to four, as compared with the wide variation of letter probability.

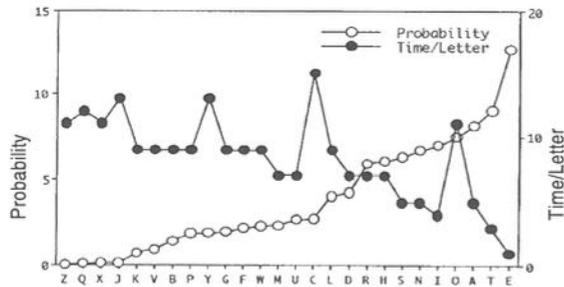


Figure 3 - Time per letter needed for Morse compared with letter probability.

'a' there is a difference of one numeral, perhaps a mistake.

Letter frequency is one of the most basic principles of breaking secret codes, it has been used for hundreds of years; the history is well summarised by Singh (1999). The frequencies of letters in newspapers and novels has been estimated by Beker and Piper (1982); their sample was of 100,362 alphabetic characters. In Figure 1 Morse's values have been plotted against the frequencies given by Beker & Piper. Bearing in mind that the two investigations were undertaken well over 100 years apart the correspondence is remarkable.

I have used the figures of Beker & Piper to prepare two further graphs. In Figure 2 is plotted the probability of a letter occurring and the number of presses needed in sending the corresponding Morse signal. The commonest letters need the fewest presses but whilst the probability ranges from 0.1 for 'z' to 12.7 for 'e', a difference of 127 fold, the number of presses varies by only four fold. In Figure 3,

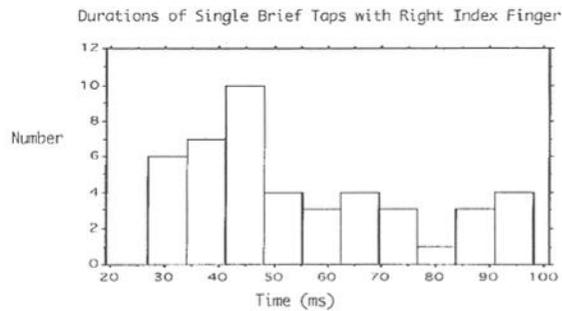


Figure 4 - Mean time for single taps, data from medical students. There is wide variation. Because muscles take time to contract and relax a single tap inevitably must last a certain significant length of time. Muscle properties limit the speeds with which Morse characters can be sent.

the probability is plotted against the time needed to send a letter. Again, whilst the probability varies 127 times, the time varies only from 1 unit for 'e' to 13 units for 'j' & 'q'.

The Morse code is ergonomically sensible although the comparatively common letter 'h' requires four presses whilst 'm' which is less common requires only two presses. The letter 'o' is also frequently found but with 3 dashes and two spaces takes the time of 11 dot units, whilst the less common letter 'g', with two dashes and a dot, takes only 9 dot units.

Variability of human muscular actions

In the course of physiological studies I have made many measurements of the ability of people to make movements with some precision. There is always considerable variation in performance from person to person and usually also much variation when the same person attempts the same trial successively.

In one investigation 45 students were asked to tap a metal plate as briefly as possible with the right forefinger. The results are shown in figure 4. It will be seen that the values range over about a four fold range, the commonest duration for a single tap being about 45 ms. Bearing these facts in mind it was anticipated that a study of Morse operators would also show considerable variability, and this might be interesting to document.

Analysis of Morse Signalling

Text book accounts of the Morse code show the dot and the spaces within characters of the same length, one unit of time, the dashes three times as long and this is also the spacing between letters. As to the time between words, five, six or seven units are stated to be appropriate according to which authority is consulted. It seemed likely however that human operators do not stick rigidly to these recommendations and an estimate has now been made of some performances.

The basis of this report is a study of signals sent by 22 radio amateurs, some of whom have used more than one type of key. I have asked them to send the famous passage from Hamlet (Act 3, Scene 1) starting 'To be or not to be: that is the question...'. For the analysis they have been asked to omit sending punctuation marks, and should a mistake be made not to stop to correct it. They

have been asked to send at speeds at which they have been comfortable.

1. Recording technique

A laptop computer has been used as a digital oscilloscope to record the Morse signals, a pod being inserted into the parallel port. The pod was powered by the computer and provided 8 optically isolated digital channels; only one being needed for this analysis. The pod was a 'VIPs30' manufactured by the firm 'TTi', (Thurlby Thandar Instruments Ltd). The software

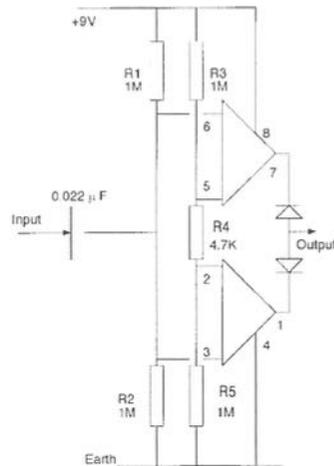


Figure 5 - Circuit of decoder used for analysing tapes of Morse signals. The operational amplifiers are the two halves of a single 8 pin CMOS chip, the CA3240. The resistance divider, R1 & R2, holds the inverting input of one and the non-inverting input of the other amplifier at a nominal voltage of 4.5 V; the resistance chain R3, R4 & R5 holds other inputs slightly higher or lower. With no signal the output of both amplifiers is positive. When a signal of either polarity reaches the input the output of one or the other amplifier goes negative and can act as a sink for the biasing voltage at the input of the pod; no smoothing was necessary.

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used was from Kyle Data Services Ltd (VLS.EXEv1.00) and not that supplied with the pod. Local radio amateurs who were CW operators were encouraged to bring their own keys which were connected to the system; the input voltage dropped from about 5 to 0 volts when the key was operated.

2. Decoder

A number of analyses were also made of side tones of Morse signals on tapes sent me by operators not living locally. For this study a decoder was necessary; the circuit is shown in Figure 5. The system was monitored by an oscilloscope-like waveform display on the computer screen to confirm that it was working correctly. The input level was adjusted appropriately by the volume control of the tape recorder.

3. Analysis

The software for running the pod

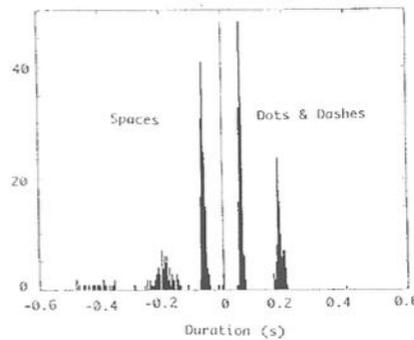


Figure 6 - Histogram of results of a skilled operator using a straight key. The horizontal scale represents the duration, the numbers relate to the fraction of a second. The vertical scale indicates the number of instances that the corresponding interval has been found by the computer. The dots and dashes, are to the right of the zero, the spaces to the left

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provided data files of the recordings, the duration was one minute, the sampling rate was 4 ms. These files were analysed with a 'Matlab' programme. There resulted histograms showing the durations that the key was down or up. The plotting was such that marks (key down) gave positive values, spaces (key up) were plotted as negative values.

The analysis took about 45 seconds, a Fourier transform of the input was also displayed graphically, the values were plotted as a power spectrum.

4. Straight keys

A. High Skills, Well Practiced. The results obtained from a tape sent by a practised highly skilled operator, G4SSH, Mr Roy Clayton, (until recently Chief Morse Examiner) are shown in Figure 6. The shorter positive values will be the dots, the longer the dashes. The two populations are clearly distinct and within each group the scatter of values is comparatively small. The shorter negative values represent the spaces within letters, they too show little

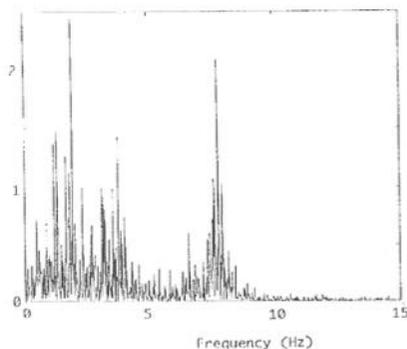


Figure 7. Power spectrum of the signals shown in Figure 6.

scatter. With the next cluster of values, around 200 ms, the spaces between letters, there is more variability. The higher values at about 400 ms are the spaces between words, there is here fairly wide variation.

The spectral analysis shows that there is very little energy above about 10 Hz. Morse is very economical as regards band-width (Fig. 7). Another tape was analysed, that of a Morse enthusiast. The general features are similar to those described above and the spectral analysis shows most of the energy at quite low frequencies (Figs 8 & 9).

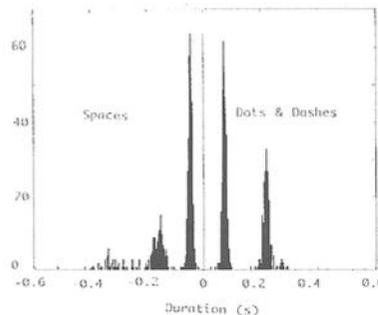


Figure 8 - Histogram of results from another skilled operator using a straight key. The main features are similar to those of Figure 6.

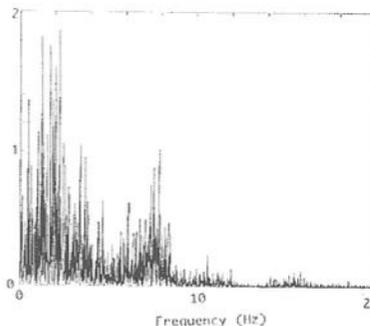


Figure 9 Power spectrum corresponding to the signals used for plotting Figure 8.

B. High Skills but Rusty. Another ham had served as a signaller behind enemy lines in the North African campaign but had not sent Morse for 10 years. The results are shown in Figure 10. The dots and short spaces have good consistency, these spaces being slightly shorter than the dots. The dashes are also rather well grouped but the separation of the longer spaces, those between letters and those between words is unclear. The spectral analysis again shows most of the energy below 10 Hz (Figure 11)

5. Electronic Keyer

The results with an ETM3 keyer are shown in Figure 12. As expected the variation of the dots and dashes and the short spaces is minimal. It is likely that the real spread of values will be even less than portrayed as some will fall in one bin and some the next. The spaces between letters and between words are less clearly demarcated. The spectral analysis is much the same as with the straight keys (Fig 13).

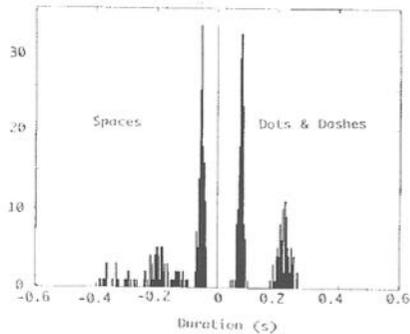


Figure 10 - Histogram from a skilled operator using a straight Morse key for the first time after a long interval.

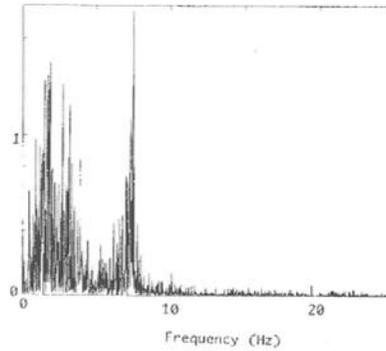


Figure 11 - Power spectrum corresponding to the signals used for plotting Figure 10.

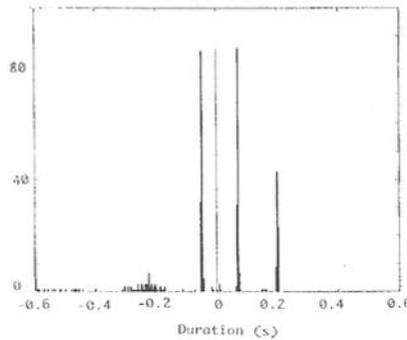


Figure 12 - Histogram of the results with an electronic key.

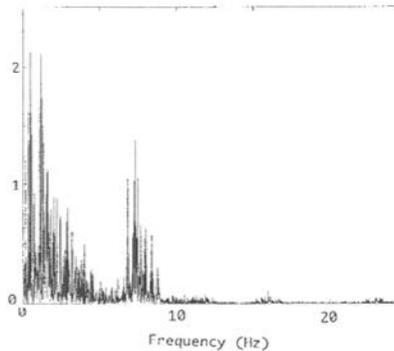


Figure 13 - Power spectrum corresponding to the signals used for plotting Figure 12.

Another graph represents the passage sent using a 'Ten-Tec' electronic key. The histogram is similar to the previous one (Fig 14).

6. 'Bug' keys

Results with an unidentified bug key showed as expected dots which are fairly consistent. However the dashes are variable and the spaces do not fall into three separate categories. Furthermore there is a significant showing of very short values, evidently contact bounce (Fig 15). The findings with a Vibroplex key were similar (Figure 16) as were those with another bug key. To obtain more information about this type of keying, oscilloscope traces were obtained. An example of a very dirty signal is shown in Figure 17.

Discussion

Morse can be easily readable even though it departs strikingly from the nominally correct values. This robustness stems from Morse's choice of wide separation in the lengths of dots and dashes and of the spaces. Had the ratios been closer a degree of confusion would have been expected because of the inevitable variation in the timing of movements. If Morse has once been learnt the memory is likely to last a lifetime although if it is not used the speed of both sending and receiving may be expected to fall. From the examples examined it was easy to decide from the histograms whether a straight, an electronic, or a bug key had been used.

The greatest departures from the nominally correct values were shown with bug keys. However it is

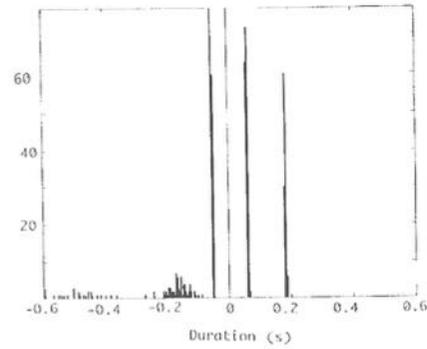


Figure 14 - Histogram of another recording from an electronic key.

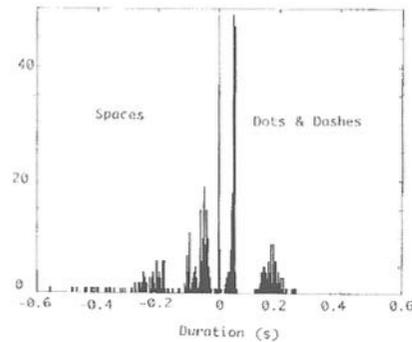


Figure 15 - Histogram of signals from a bug key.

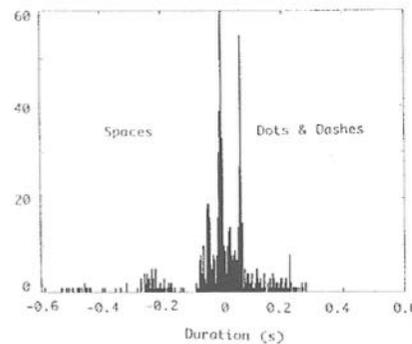


Figure 16 - Histogram of signals from a Vibroplex key

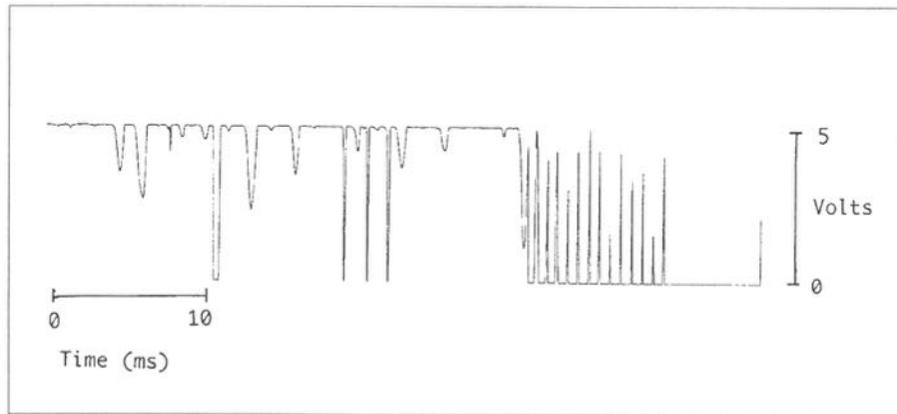


Figure 17 Oscilloscope recording of contact bounces of a bug key.

possible that the ones used were not properly set; there are a number of adjustment screws. Some enthusiasts are especially keen on using these keys, the distinctive musical note that characterises the sound doubtless arises from the contacts bouncing.

The sending and receiving of Morse can be quite pleasurable, there is rhythm, and meaning over and beyond the text of the message. In MM number 70 Thomas Smith wrote:- *"There is nothing like hand keying to give 'style' and 'fist' character to Morse signals."* An extra long dash or space may convey emphasis or even emotion. Many, perhaps most, amateur operators do not normally send punctuation marks; a long space at the end of a sentence may be as significant as sending the characters for a full stop. In speaking we pause at the end of a phrase or sentence, operators may be using a similar way of signalling. Telegraphists have their own 'signatures', peculiarities by which they can be recognised. Some aspects of Morse are akin to music and

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poetry; straight keys, basically simple levers, allow for the most expressive use of Morse's famous code.

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Acknowledgements

The Matlab programme was kindly written for me by Dr. W. I. Sellers. Many radio amateurs some local, some far away, have been most helpful. I particularly am indebted to members of MEGS (Morse Enthusiasts Group Scotland), to the Dundee Amateur Radio Club and to members of the Cheltenham ARA.
 Dr Dorothy Collin, University of Western Australia, and G. Forbes of Napier University, Edinburgh, have helped me with questions related to the history of printing.

MM

Morse in the Australian Antarctic

Part 1 - ANARE Preparations

by Allan Moore, VK1AL

Allan Moore, who wrote about his own experiences in the Antarctic in MM36, has written a series of articles titled, and describing in detail, *Fifty Years of Australian Radio Communications in the Antarctic, 1947-1997*, to celebrate the Jubilee Year of the Australian National Antarctic Research Expeditions (ANARE). This task was undertaken with the ongoing and generous support of former expeditioners, including (to name but a few) Doug Twigg, Alex Brown, Eamonn Gavaghan, Frank Johnson, and particularly some of the pioneer operators and technicians of the first stations. MM is grateful to Allan, and the editor of the ANARE Club journal, *Aurora*, for their permission to print summaries and/or selected extracts from the series describing the work of the expedition radio teams, and their use of Morse in the Australian Antarctic.

Recruiting Radio Staff

Background: There had been earlier (private or semi-private) Australian expeditions to the Antarctic, the most famous, perhaps, being Sir Douglas Mawson's Australasian Antarctic Expedition of 1911-1914 which established the first Antarctic radio stations in history (see Polar Radio - 1912 Style, MM33, p.26). In 1947, the Australian administration finally decided to establish an official foothold in the Antarctic, with government radio stations on Heard Island and Macquarie Island, and to seek out a permanent location on the Antarctic continent as well.

ANARE recruited competent and qualified technicians and operators highly experienced in the repair, tuning and use of communications equipment for Morse code operation, who would work for a

year or more at the new island stations. Technical staff had to be properly certificated or have equivalent experience. Operating staff needed a minimum Morse sending and receiving speed of 22 wpm and an ability to touch-type at reasonable speeds. These qualifications remained in force for many years but changed in certain respects due to the advent of satellite communications. In 1947, the needs of the recently ended WW2 had, in part, created large ranks of trained radio personnel as potential expeditioners

The use of Morse was vital to ANARE for nearly 40 years. It was used by ships conveying expeditioners to and from the Antarctic, including Royal Australian Navy and ANARE chartered vessels. The Royal Australian Air Force (RAAF) used it for contact between its

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aircraft and ground stations when on Antarctic duty, and in ground navigational transmitting beacons. ANARE stations used Morse in a major way to contact Australian coastal radio stations or radio establishments, and foreign Antarctic stations many times every day. Even mainland New Zealand and South Africa formed part of the Morse communications network from ANARE's earliest days.

Procurement of Radio Equipment for the Expeditions

Coincidental with recruitment of the teams, officers of ANARE were negotiating with the RAAF, which had been chosen to assist the expeditions with the procurement of a huge range of supplies, including radio equipment. The RAAF continued to play this role for several years to come. As WW2 was not long over, it was able to provide a range of war surplus radio equipment, and other equipment on a long-term loan basis.

ANARE made other purchases from their own funds as necessary. The RAAF also provided aircraft and Air Force personnel as part of this pioneer project and participated for some years in helping to map and explore important areas of the Antarctic.

It was decided to provide identical equipment at both island stations. The two main transmitters for each station were manufactured by STC Australia and Tasma (Thom and Smith). Designed and manufactured (by other companies as well) for the RAAF from the 1940s to meet an urgent need for medium powered transmitters, these units were known under a variety of names and prefixes. The one adopted by ANARE was a model

called AT20, which was equipped for CW transmission only.

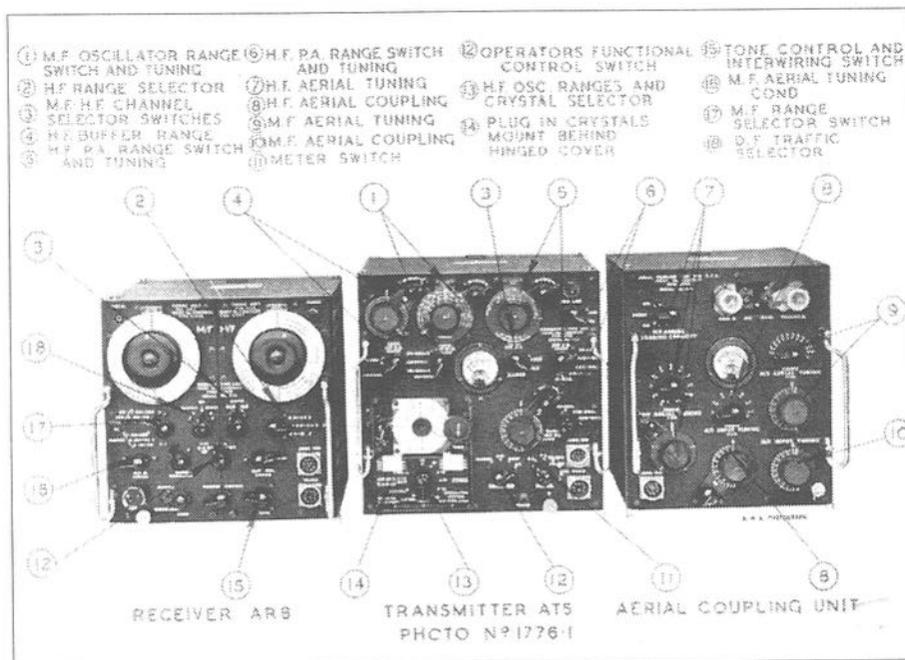
Later, these great workhorses were upgraded to allow voice transmission (AM) and were known as model AT20M. They operated up to 500 watts output power, between 2 and 20 MHz, and this frequency range proved generally suitable for ANARE operations.

To complement the main transmitters, Australian designed and produced AR7 receivers from Kingsley Radio were also provided in pairs to the stations. (the AR7, too, had other prefixes, such as KCR11). These receivers were designed principally for the RAAF in the 1940s, and in many respects resembled the US made National HRO model. They were built in large numbers during the war and covered 140 kHz to 25 MHz, receiving voice as well as CW. Later, in the early 1960s, these old receivers were still considered useful and were pressed into a different type of service.

Emergency Equipment

The emergency transmitters and receivers chosen were AT5/AR8 units, originally manufactured for use in Australian-made Beaufort bombers, and also installed in some Hudson bombers. Designed and made by A.W.A. (Amalgamated Wireless (Australasia)) in the 1940s, they could be separated and used independently of each other if required.

They served as CW emergency units at the ANARE stations in the event of failure of the main radio equipment. Their frequency range was similar to that of the main equipment, and power was in the order of 50 watts - which could be



AT5/AR8 emergency radio equipment chosen for the ANARE island stations.

effective under reasonable conditions. They could also operate on voice (AM) if required.

After the war, the AT5/AR8 units were popular with amateur radio enthusiasts. They could sit on an 'average' office desk, were ruggedly built and fairly heavy. Their power source was a genemotor, type G, driven from a 28 volt battery bank, or an AC power pack, type S.

For field or ship-to-shore use, US Army Signal Corps Radio (SCR) WW2 walkie-talkies, designated SCR-300, were initially provided for the island stations. They operated on FM at about 45 MHz with a range up to about 7 miles. They were generally satisfactory for 'line-of-sight' use only.

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Pre-embarkation Training and Refresher Courses

Most of the pioneer radio members were sent to the RAAF School of Radio at Ballarat, Victoria, as part of their indoctrination and training, and the RAAF continued to provide this useful assistance until about 1953. This was to familiarise operators with AT20, AR7 and AT5/AR8 equipment, and to refresh them on Morse code operation.

To some of the group, the equipment was identical to that used and repaired by them during the war, and they instantly felt at home with it. Others had the opportunity to see new types of equipment for the first time, and to learn to tune and operate them. It was also a great opportunity to learn of and discuss

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technical developments in radio since the war's end. For those who had not touched a Morse key for some time, plenty of sending and receiving practice was provided. Other time was spent in learning or brushing up on frequency prediction techniques.

Profile of a Radio Supervisor - Technician

Radio supervisors and technicians came from a variety of professional communications backgrounds. Some were trained by the Air Force, Army or Navy, others were from the merchant navy or were civilian aircraft operators. Many came from the DCA (the former Department of Civil Aviation), and some from the Postmaster General's Department (PMG) now Telstra.

A good radio supervisor or technician needed to have a great deal of experience, patience, aptitude, innovation, and be prepared to work under difficult conditions. At the stations they were required to keep vital equipment operational at all times, find and fix elusive faults - sometimes between important or urgent radio schedules - and to manufacture unavailable components out of almost nothing. Apart from a high technical ability, early supervisors were equally competent radio operators as well.

A supervisor gathered his crew and ventured into blizzard or high wind conditions, if necessary, to repair and raise fallen aerial wires. There is little more difficult than trying to fix antenna problems at 70 feet above the ground in sub-zero temperatures, with high winds gusting.

Another difficult project to

undertake is the relocation of radio equipment from one radio hut to another without dislocating normal radio schedules. This has been successfully done at stations on many occasions, often in the dead of winter. The completion of a successful transfer is a source of much pride for all our radio technical staff.

As the years passed and new types of equipment and technology were introduced, supervisors had to keep abreast of these changes. Reordering components, and making responsible recommendations for the next expedition's communications needs, required much careful thought and planning - for without this communications could suffer badly, long after an "old" group had departed the station.

Multi-skilled, our radio supervisors had an aptitude to work outside their main area of responsibility. They often helped to maintain or repair diesel-electric generators, or the electrical workings of a multitude of specialised station vehicles. In early expeditions they were *de facto* electricians and wired up buildings and equipment to diesel-electric power supplies. They assisted ships' radio officers on chartered vessels who encountered the occasional difficult-to-trace technical fault, and were particularly good at repairing radar installations, foreign or Australian manufactured.

Like other station members, they also mixed concrete, built huts, counted penguins, developed films, cooked meals, washed dishes and were involved in numerous chores around the station. Often the super-tech or supervisor was the most popular man in the station, especially

when scientific colleagues needed a "loan" of components for their pet projects, or perhaps some help with a difficult circuit - and this assistance was always forthcoming.

Profile of a Morse Code Operator

Radio Officers came from similar backgrounds to those of the technical staff. PMG telegraphists, however, were principally trained on land-line sounder systems, but once their ears became accustomed to the high-pitched note of CW transmissions they could favourably compete with radio-trained operators.

What makes a good Morse operator? Correct training and practical experience are obviously important attributes. Patience, consideration, concentration and a good attitude closely follow.

How do operators approach their work and what do they think about while they are operating? Basic Morse communications terminals can be reduced to a transmitter, receiver, a power source, and antennas, at each end of a designated circuit. But the equipment still requires human hands and minds to make it function.

Perhaps the following light-hearted attempt to explain may provide an insight: Armed with Morse keys and headphones, and their minds filled with symbols representing the 26 letters of the English alphabet, the 10 unitary figures, a variety of symbols for punctuation, and numerous other symbols necessary to complete the protocol, the operators face each other with a distance of sometimes three or four thousand miles between them.

They do not always know each other, nor their counterpart's strengths and weaknesses as operators. They will actually be engaged in a form of competitive mind-game using the first primitive computers - their brains - as their primary weapons. They both wish to perform at their best but, unlike in other contests, neither participant wishes to win, simply to achieve a draw.

During the schedule there will be a total communion of minds, for a draw is the optimum result. It means that a message has been successfully disposed of at one end, and correctly received at the other. Many distractions will impede progress - What is the state of the ionosphere? Will it reflect? Have they chosen the right frequencies? Is there a lot of traffic on hand? Are signals fading away, at times to nothing? Is there static, or interference from other stations? Is one operator sending too fast (or too "rough") for the prevailing conditions?

Did one (or both) have a "hard" night the previous evening, combined perhaps with a poor sleep? Is one operator more experienced than the other? Did the receiving operator interrupt or "break" the transmitting operator too often when he could not understand a symbol or a word, thus causing the receiver a temporary loss of face? These are some of the mind-game elements involved in working a long-distance Morse circuit, day in, day out.

However, with skill and experience, these distractions or frustrations fade into the background. Each operator, while sending and receiving, conjures up his own private thoughts as the jumble of Morse symbols

leaves the first mind in an orderly and constant fashion, activates the key with a wrist, and transmits the signal.

At the distant terminal the operator hears and mentally visualises the letters, but does not type them down until they have formed a word, and the gradual intelligence of the message begins to take shape. While this staccato of dits and dahs is in progress thoughts of home, of loved ones, of dinner and, if lucky, perhaps a cold Foster's or Swan lager after the schedule, come to mind. And with these private thoughts intruding the operators subconsciously transmit and copy their messages - frequently surprising themselves afterwards that they did not remember everything they had sent or received.

Having successfully transmitted messages each way, with no further traffic on hand, finding out who won the football,

and bidding each other a friendly farewell with a promise to meet at the next schedule, these operators have indeed shown what makes a good operator - and both look quietly forward to their next mental tussle. The most important part of radio operations, however, is the essential requirement that all traffic be handled quickly, dispassionately, and with the utmost confidentiality.

Operators' Requirements

The operators needed single-case typewriters (capital letters only) to record received messages, earphone sets, microphones - and the all important Morse keys for transmission of messages. The basic key was a conventional hand key, many of which were manufactured by the Clipsal Company of Adelaide or the PMG workshops.

Mechanical semi (or fully)

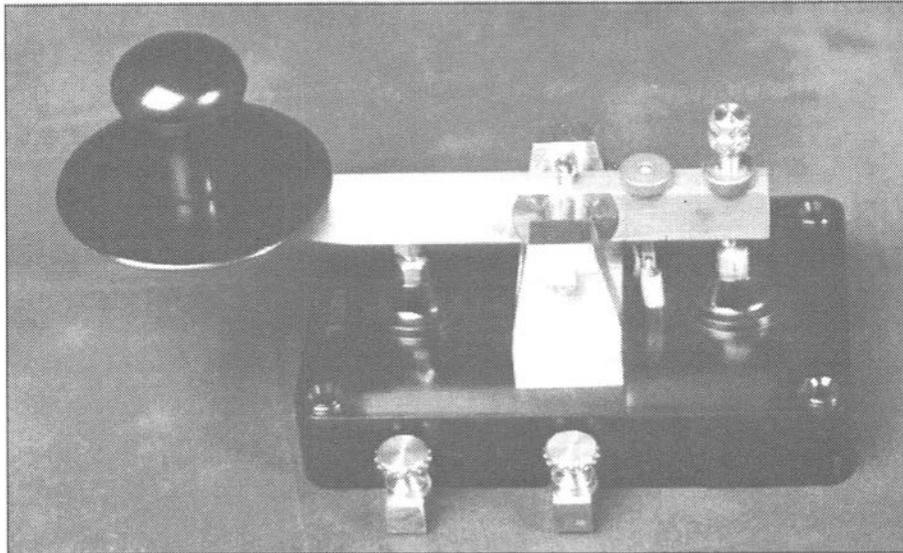


Photo: Allan Moore

Clipsal key, commonly used by ANARE operators.

automatic keys, known as “bugs” or “jiggers”, were procured from the former Post Master General’s Department (PMG) and other sources, but most operators took their own. One type of semi-automatic key (the Simplex Auto) preferred by many operators was invented by a Melbourne PMG telegraphist, Leo G. Cohen, in the early 1920’s, and many are still in use in the amateur radio service today in much their original form.

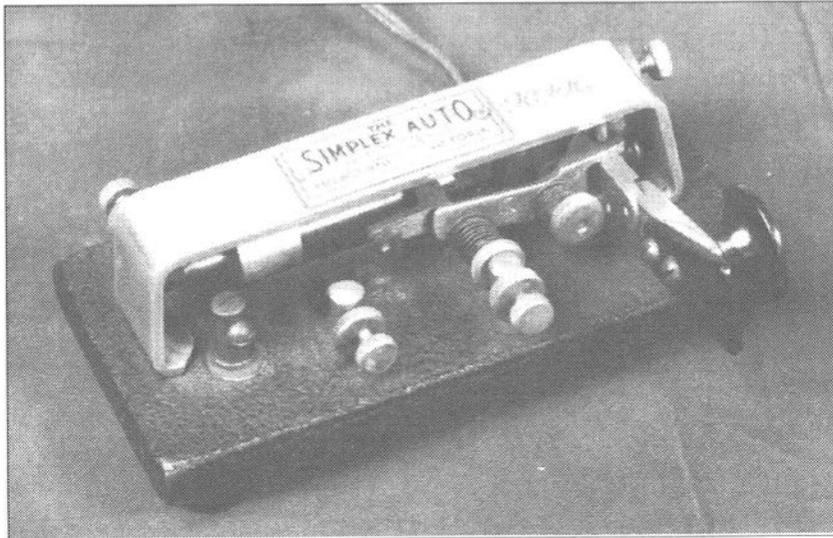
A competent operator can transmit approximately 25 words per minute on a conventional key for relatively short

periods of time. The same operator using a semi- or fully automatic key can transmit under good conditions at speeds of between 30 and 40 words per minute. At 30 words per minute this speed can be sustained for several hours on end. In simple terms two good operators, sending and receiving at speeds of 25 wpm each, mentally manufacture or decipher a combination of over 21,000 dots and dashes in one hour. Higher speeds produce more symbols.

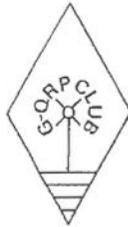
To be continued...

MM

Photo: Allan Moore



Simplex Auto semi-automatic key, or “jigger”, also used by ANARE operators.



G-QRP Club

The G-QRP Club promotes and encourages low-power operating on the amateur bands with activity periods, awards and trophies. Facilities include a quarterly magazine, Morse training tapes, kits, traders' discounts and a QSL bureau. Novices and SWLs welcome.

Enquiries to **Rev. George Dobbs G3RJV, St Aidan's Vicarage, 498 Manchester Road, Rochdale, Lancs OL11 3HE.** Send a large s.a.e. or two IRCs

Morsum Magnificat

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VIDEO

Morsum Magnificat has acquired a small quantity of this 50 minute made-for-TV documentary film on the history of the electric telegraph. See MM70 P.4 for a review. It was first broadcast on Channel 4 in the UK and digital satellite on 7th July 2000. It is only available in TV station layout i.e., on the tape in three separate parts with a 3 minute gap between each part. This was originally to allow for advertising breaks.

Please note that it is to the TV standard used in the UK and many, **but not all**, countries, i.e. 625 line PAL. The format of the tape is VHS.

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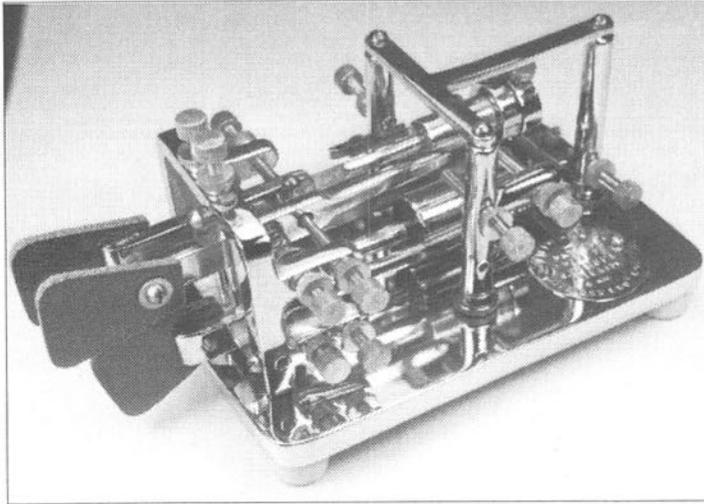
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Showcase

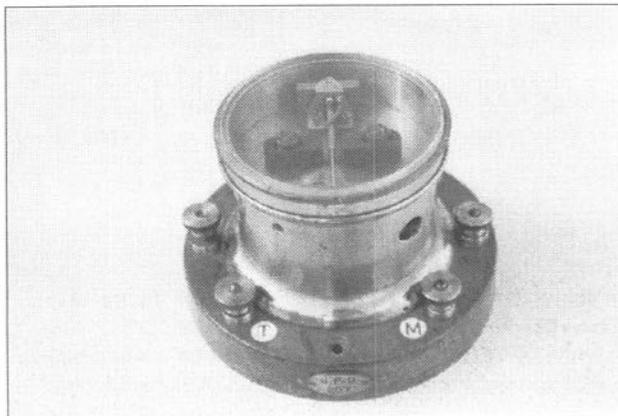
Readers are invited to contribute any additional information and stories, no matter how minor, to the Editor, *Morsum Magnificat*. There have been thousands of designs of keys & telegraphy instruments. Information will be lost unless it is compiled in one place and shared with other readers.

Photo/Collection: Dave Pennes



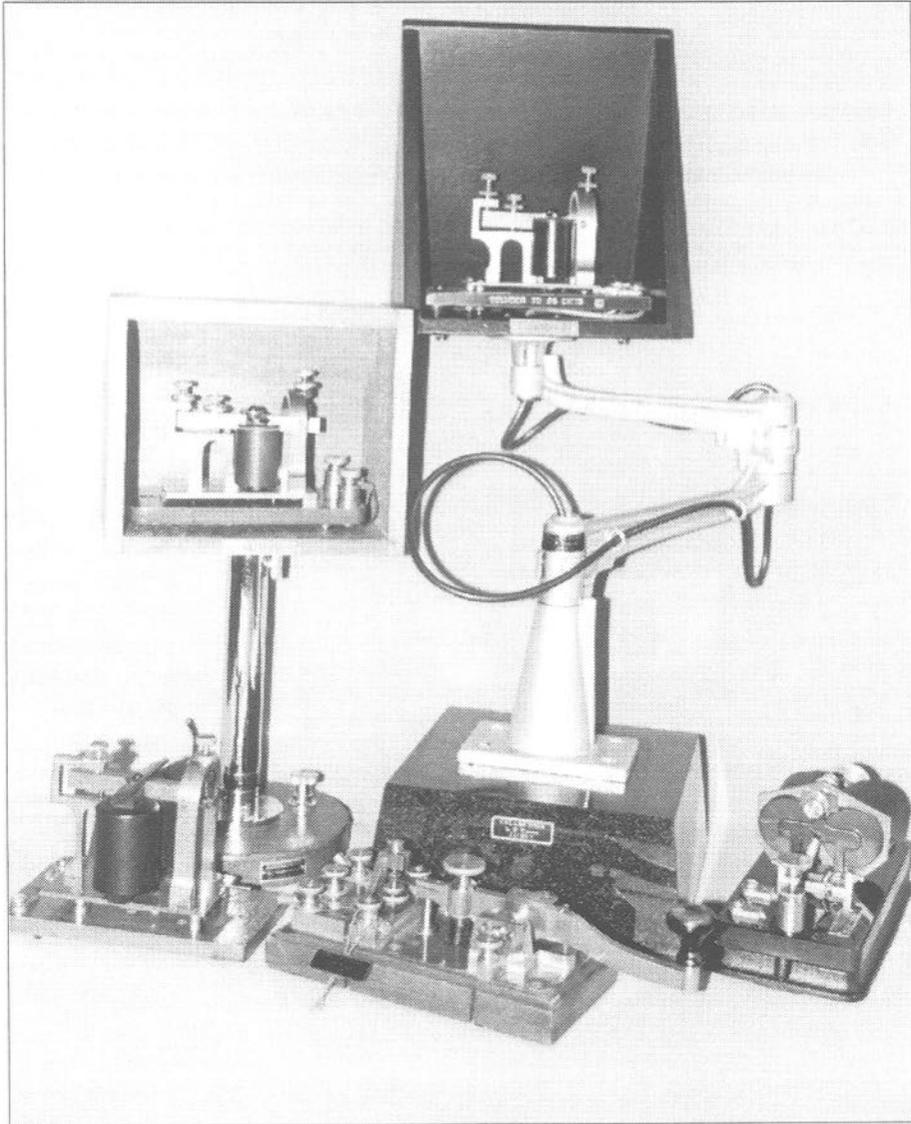
An 'Automorse' - the most complicated mechanical bug ever made, even more than Model-X. Automorse is a three lever fully/semi automatic mechanical bug that made automatic dashes in fully automatic mode. It could not be used in fully automatic mode on US wire circuits since American Morse used long and

short dashes. The lack of a circuit closing switch marks this as a European (or dedicated wireless) device since US wire circuits were closed circuit systems. 'Automorse' was made by in Adelaide by the Hitchcock Brothers in the 1920's (Dave Pennes)



British Post Office Relay
Type 'A' - 19th century

Showcase - continued



Photo/Collection: Heisuke Kimura, JA1DVV

Part of the collection of Heisuke Kimura, JA1DVV. Upper left – Hi-mound sounder, the Japanese name is "Teishim-sho-gata". Upper right – Western Electric swinging arm resonator and sounder with black stone base. Lower left – Western Electric 15B sounder, AT&T 30 ohm. Lower middle – Ericsson original Öller Key, c1860. Lower right - J. H. Bunnell Type 2-2 C.Q.A. Relay, 150 ohm.

I was recently offered a Yaesu FT-100 for review which I accepted with alacrity, even though several reviews have already been written about it. Henry, G3GIQ, wrote a comprehensive one which you can download from <http://www.hamradio.co.uk/misc/FT100Review.html>

He tried to cover everything, and his review was very positive. But he didn't cover CW operation in any detail, so I grabbed the chance to check it out myself. (Since writing this, the review has been deleted, but Ralph, ZL4AG, found Henry at www.qsl.net/g3giq/ and Henry promptly sent the review as an attachment. If you still want to read it, Henry will undoubtedly send it to you also. There's also a review in *QST*, June 1999.)

The FT-100 is an astonishing radio. It covers HF, VHF and UHF, with AM, FM, SSB, CW, and digital modes. It's also small - about as big as a modern car radio, with a detachable front panel for mobile installation. It requires 13.6 volts and 22 Amps to output 100 Watts on HF. It is, of course, microprocessor controlled, and there are around 100 parameters you can adjust and change. Which brings me to ponder the interesting state of evolution we have reached in modern transceiver design.

Menu Access

In the 1970's, rigs began to shrink. Until then, the sheer bulk of the

The FT-100 on CW ...and more

by Dr Gary Bold ZL1AN

technology you had to cram inside meant that front panels were large enough to have separate controls for everything you could do. Any experienced Ham could sit before a "standard" HF rig and figure out how to drive it in a few minutes. But now the internals have *shrunk* by an order of magnitude in volume, while microprocessor control has *increased* the available adjustments by the same factor. There's no front-panel room for all of them, so manufacturers place the ones they think you'll need most there, and give you "menu access" to the rest.

I know nobody who can remember *all* of the menu options on whichever such radio they have, and the FT-100 will be no exception. Fortunately, once the radio is set up the way we like it, most of us can remember the half dozen or so that we'll want to use in general operation.

On the front panel, the FT-100 includes a concentric AF/RF gain control (RF gain alternately acts as a squelch), tuning knob, tuning step-size button, mode button, band up/down button, and

clarifier/menu selector/coarse tune knob - a sensible selection.

Keyer Speeds

I spent 30 minutes reading the manual to become familiar with the menu system and find out how to drive it on CW. I found, as expected, that there was a built-in iambic keyer, but was delighted to discover optional automatic character-spacing included, and enabled as default! I wish everybody would use this feature! The manual didn't indicate whether type A or B timing is implemented, so I plugged in my paddle (standard stereo miniature socket) to find out. Delight again! My fingers told me it was type B, the same as the Accukeyer they learned on, so I was immediately ready to go.

Keyer speed is set from menu number 52 (there are 66 menus) and is changed by rotating the tuning knob. The frequency display then indicates a number between 1 and 100. The numbers clearly didn't correspond to the speed coming out, so I produced a calibration curve by running a lead from the extension speaker jack into the computer soundcard, and firing up "CwGet", Sergei's Morse reading program (see MM67, p.15. Ed.) The latest version indicates received speed in wpm on the bottom panel, and I had already determined this to be

correct using my calibrated CMOS Superkeyer.

Fig.1 shows the result, with numbers displayed by the FT-100 (bottom axis) plotted against the resulting speed. The curve is non-linear, and runs between 5 and 58 wpm at the extreme settings. Strange. Why didn't Yaesu include extra code to display directly in wpm? However, a minor point unless you're sending for a code practice session. Most of us just dial up a speed that "sounds right" or matches that of the other operator without worrying exactly what it is. Having to call up a menu to change speed is somewhat cumbersome as I do this constantly to match speeds to whoever I'm talking to. But I could live with it.

DSP Peaking Filter

You can store one message to send automatically, but this is only 50

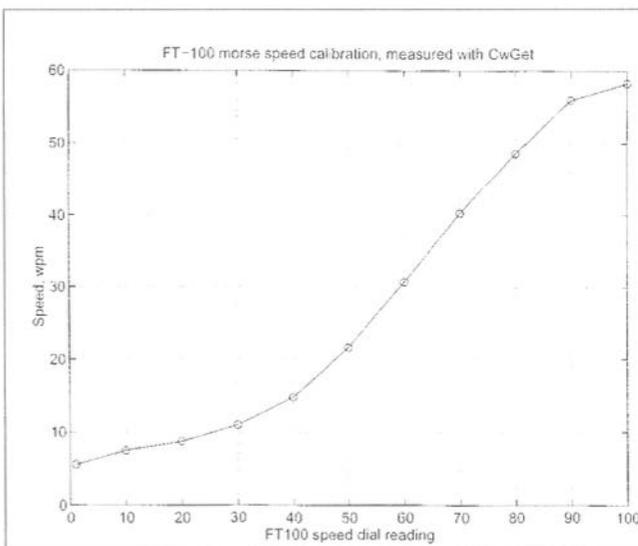


Fig.1 - Numbers displayed by the FT-100 (bottom axis) plotted against the resulting speed.

characters long - not enough for a 3 by 3 CQ. This is loaded, as usual, from the keyer. I loaded "CQ CQ CQ de ZL1AN ZL1AN ZL1AN" and found that by pushing the appropriate button 3 times, a 3 by 3 CQ came out - as in the CMOS Superkeyer - but if you do this, it's necessary to send "K" manually at the end. You can, of course, use an external keyer if you want more.

There are two optional IF CW filters available (450 Hz and 250 Hz bandpass), not installed on the reviewed radio. But it does implement a DSP "peaking filter" which acts on the audio signal. Optional 60Hz, 120Hz, or 240Hz passbands are available, and I set up 120Hz. This is fast to switch in and out - convenient for tuning the band using the wide SSB response, then switching in the DSP filter to pick out a weak signal.

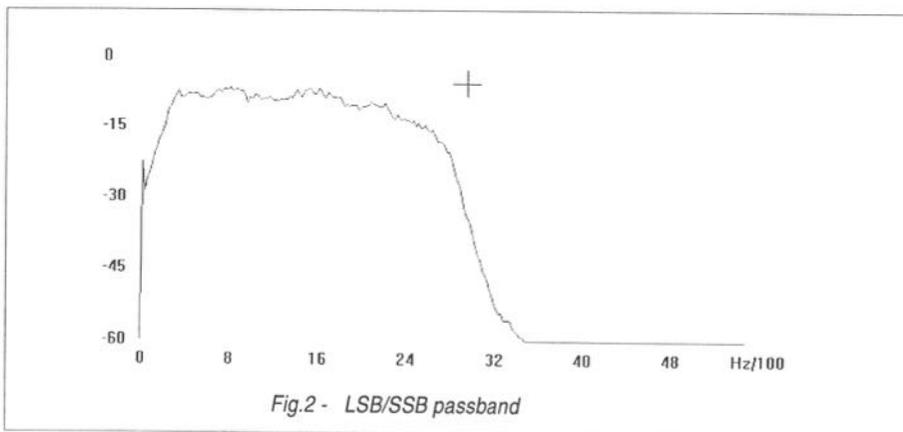
Discovering all this took another 30 minutes, and I was not yet on the air. Menu number 21 sets the power as a percentage of the total available in whatever mode you're using, and the specs say that this can be varied between 1 and 100 Watts on HF CW. I dialed up

25 watts, and called CQ on the bottom end of 80 metres.

Keying and Receiving

A long rag-chew with John, ZL1BYZ followed. John said the QSK keying sounded fine, and my fingers found the keyer acted just like the CMOS Superkeyer and K9 units they are used to. The FT-100 receiver sounded great, even with the built-in top-panel mounted speaker. The DSP peaking filter made John's signal armchair copy, which was sometimes useful because he was using his Ten-Tec 1280 (kitset) rig, which radiates just 3 Watts. Then I had a chat with Ron, ZL1AJP in Whangarei, who made similar comments.

I measured the receiver passband responses using Horne's excellent "Gram" sound-card spectral analysis software, using white RF noise, on the audio signal taken from the extension speaker output. Fig. 2 shows the LSB/SSB passband, which begins to roll off at about 2.7 kHz. Fig 3 shows the CW "peaking filter" response, set nominally to a centre frequency of 800 Hz. This had



a measured response maximum at 820 Hz, and was 60 dB down at 520 Hz and 1330 Hz. You can see why it's called a "peaking" filter (easier to implement in DSP units) since it doesn't have the flat-topped passband characteristic of IF filters.

After a few days and several DX CW QSOs, I became quite at home with this remarkable radio. Its performance on CW was impressive. It's not cheap, but if you need a single, compact radio to replace two separate HF rigs, and a VHF/UHF rig, in a caravan or for portable operation, consider it carefully. My thanks to Richard at Com-Centre for making the review unit available. If somebody wants to give me one, I'll accept it with alacrity.

Portable at the Beach

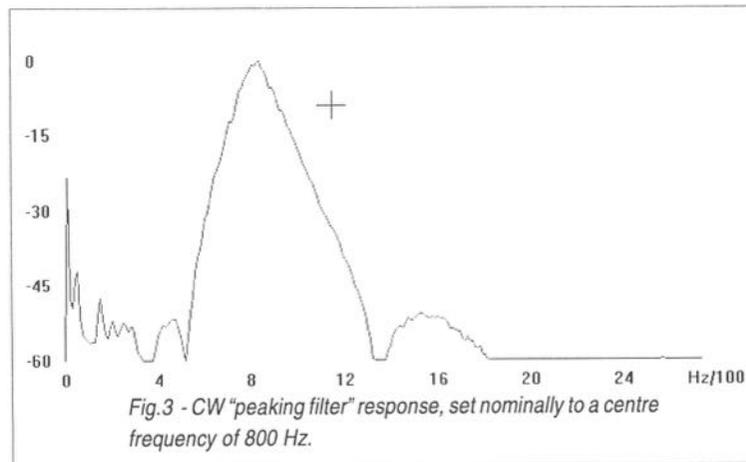
The FT-100 had to go back before I embarked on my yearly holiday, operating portable, and my little TS-50s seemed large in comparison when I packed it in the Holden and took off for the Coromandel peninsula. This year, we stayed in a beach cottage with mains

power, and I decided to use a wire antenna instead of the Trident mobile whip I've used in the past.

Such antennas don't need to be complicated. I just strung 20 metres of insulated wire from a window to a convenient tree, and end-fed it with the MFJ 945D portable transmatch. It tuned up OK, but RF got into the keyer with powers above 10 watts, so I attached a counterpoise wire to the chassis on the transmatch, and ran this down to, and along the ground for about the same length. The effect was marked. Now the tuner gave me a 1:1 SWR on all HF bands from 80 metres to 10 metres - including the WARC bands - and the RF feedback vanished. Maybe the old-timers knew something when they strung out their counterpoises.

As always, I was struck by the dramatic difference in noise level, away from the electrical hash of the city. On 20 metres, beautiful CW from around the world gently sifted through my head in a gentle white-noise background and effortlessly decoded itself. Even the

regular click of the electric fence was vanquished by the TS-50's excellent noise blanker. And though I keep the TS50 throttled back to 50 watts (I must get a power



supply that doesn't trip out above this), and though my humble wire was only 3 metres high, surrounded by trees, I made DX CW contacts every night, with the reliable K9 keyer. A highlight was meeting my old friend Chris, G4BUE, on 40 metres.

It helps, of course when you're transmitting from a country that everyone wants to talk to, and people on the other side of the earth are thoughtfully running kilowatts into 5 element beams. But a surprising number of 559 DX CW signals still come from dipoles, G5RVs or multi-band verticals.

Looking Forward

What can I say at the dawn of this new millennium? Firstly, I'd like to attack the apathy and gloom that some of us express. I still hear people muttering that "there's no challenge left in Ham Radio". Most of them have high-end computers. They're wrong. More new HF communication modes have been pioneered by Hams in the last 2 years than in the preceding 2 decades. All involve extending the powerful synergy between computers and transceivers, and most require only a PC with soundcard, using free software available on the web.

If you want to experience the cutting edge at the start of this millennium, this is where it's at. I have used most of these modes, and have been privileged to participate in the first QSOs ever made with some. It's exciting to see the signal processing algorithms that until recently have been used only by communications professionals appearing in free, user-friendly Ham software - and in CW software too.

MM71 - September/October 2000

Having said that, the Lorelei call of CW always seduces me back to the bottom of the bands, and it always will. This, the most ancient and primitive of all our modes, still gives me the greatest pleasure. No computer is needed. No other mode requires such a complex and skilful hand manipulation of a coding device, nor a *human* mind as a post-detection processor to interpret the coding of others. It's this human-machine collaboration, where a sentient being becomes *part* of the communication system, that makes CW unique and immensely satisfying.

Secondly, there's considerable evidence that interest in Morse is rising. Prices of vintage keys and telegraphy equipment are increasing, and new applications are being explored. For example, check out the web page of the "Morse 2000 Outreach", at the University of Wisconsin, at <http://www.uwec.edu/academic/hss-or/Morse2000/resource.html>

This group co-ordinates investigations into applying Morse communication for the deeply disabled. How do you use a computer if you can only move one finger? You can use Morse. A standards committee has even been formed to establish agreed Morse symbols for *all* computer keyboard keys and mouse buttons, to be adopted by manufacturers (and there are many) of interfaces and communication software for the disabled. Fascinating stuff.

(Adapted and edited for MM from Gary Bold's *The Morseman* column in *Break-In*, journal of NZART, January/February 2000.)

MM

MM70 Searchword

by Tony Smith

(Find the answers to this puzzle in MM70. Solution p.48)

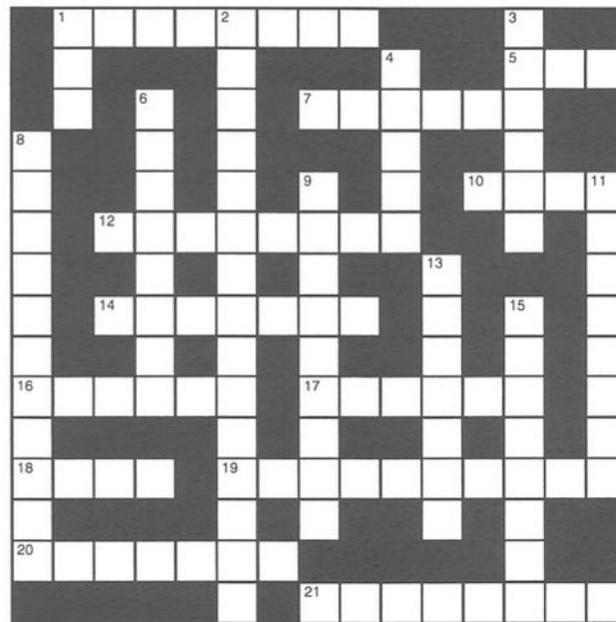
Across

- 1 Cathy, aboard the Queen Mary (8)
- 5 Typewriter looks as though it came from here (3)
- 7 Author of "Morse Code: Breaking the Barrier" (6)
- 10 Method recommended by 7 (4)
- 12 Loud visitors to W6RO (8)
- 14 Relatively expensive paddle at Friedrichshafen (7)
- 16 Director of Telegraph TV documentary (6)
- 17 A previous editor of MM (6)
- 18 Thoughtful lad at Fort Worth (4)
- 19 Type of contacts in Carpenter relay (4, 6)
- 20 1909 meaning of "92" (7)
- 21 Australian commemorative public holiday (5, 3)

Down

- 1 Open-wire lines are the only way to go to make this lower (3)
- 2 Europe's most international radio rally (15)

- 3 Tom Perera's Telegraph Collector's CD was launched here (6)
- 4 They did a superb publicity job for ROA (5)
- 6 Key handling method (8)
- 8 Savoury sounding unusual key base (11)
- 9 DARC's CW Manual even has special characters for this language! (9)
- 11 Week in the Northern Territory when Alice telegraphs Canberra (8)
- 13 Delaney semi-automatic key (4, 3)
- 15 1939 McElroy challenger (8)



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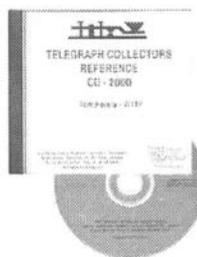
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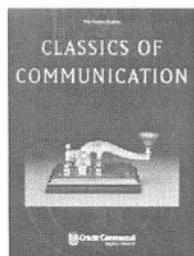
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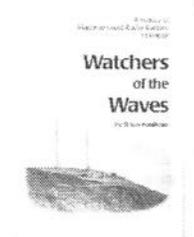
NEW - Telegraph Collectors Reference CD-2000 by Tom Perera

An absolute mine of information for collectors compiled from variety of sources including important web pages (See MM70, p11 for details). Users need a PC running Explorer or Netscape web browsers to access the CD. The great advantage of using the CD is that the browser software is used off-line, which means that no phone connection is needed. As a result access is much faster and the CD includes the whole of 'Perera's Telegraph Collectors Guide' and his cyber-museum but with high resolution pictures, many in colour. A draft of the cumulative index of MM is included. **£9.00 UK - £9.20 EU - £9.70 World**



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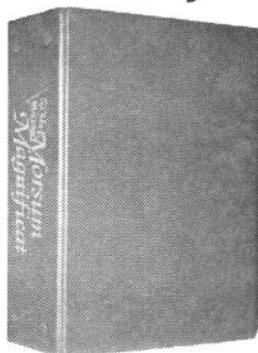
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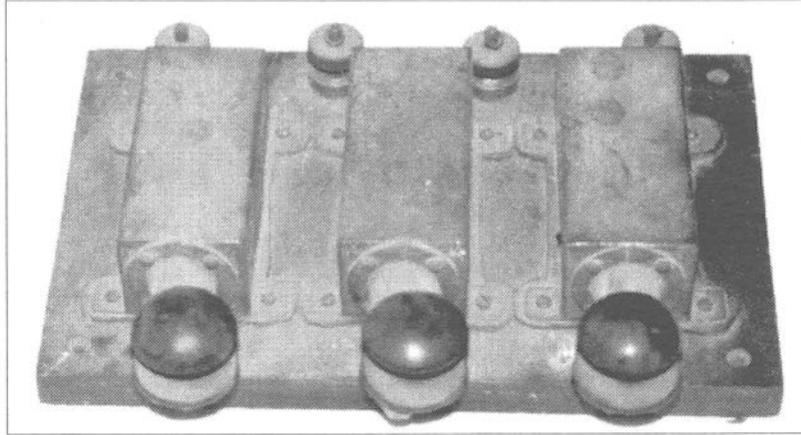
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Readers are invited to contribute any additional information and stories, no matter how minor, to the Editor, Morsum Magnificat. There have been thousands of designs of keys & telegraphy instruments. Information will be lost unless it is compiled in one place and shared with other readers.



Photo/Collection: Graham Winbolt

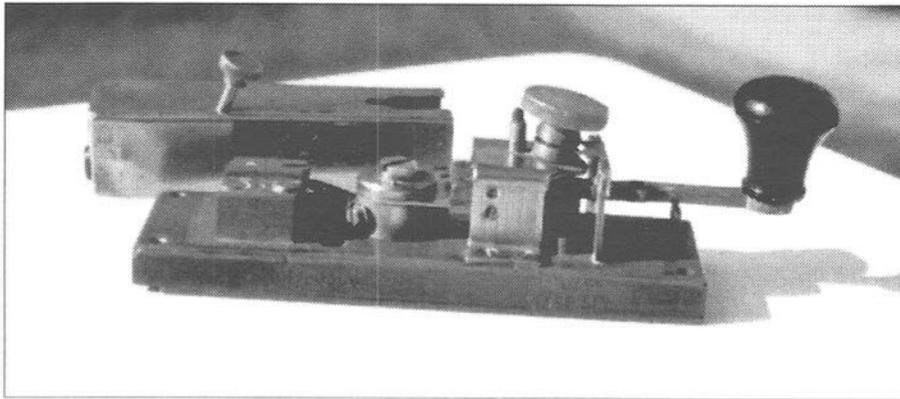
This triple key assembly was found by Dr Graham Winbolt, Chairman of the Communications and Electronics Museum Trust. It turned up amongst a miscellaneous collection of equipment but so far no one has been able to identify it. It might possibly have had some Naval connection, though that is by no means positive. Does any reader recognise it. (contributed by Colin Latham)

Collection: Ermanno Chiaravalli, I2BFF



Photo: Ted Jones, G3EUE

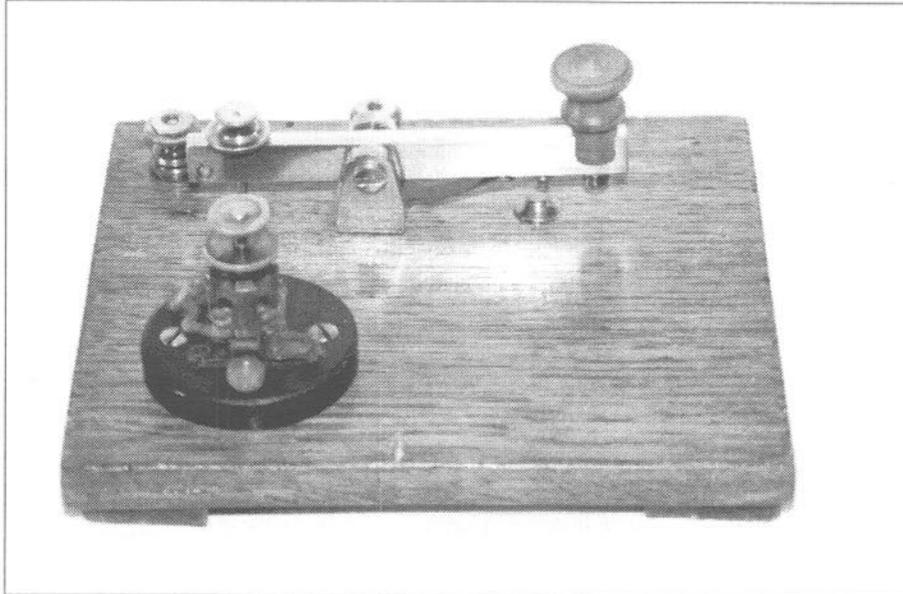
Is this key of Russian origin - info please



Photo/Collection: William P. Jones

This key belongs to William P. Jones. It is marked "12 oz TYPE 51" but is different to the one owned by Vic Reynolds (MM36 P.45) It carries the same pre-war RAF stores ref: 10F/20366. Vic recalled them in use from 1939-1945. Type 51s (differences again) were later used in the Comet 2 (MM34 P.13) and Vulcan bombers (MM37 P.44) . A NATO variant is also discussed in MM38 P45. Can any readers offer information on this early version of the Type 51 key?

Photo/Collection: Jean Le Galudec



Key and buzzer of unknown origin - information wanted please

Clubs & Societies

Clubs and societies with interests in Morse and telegraphy are welcome to introduce themselves on these pages



FISTS CW Club

(The International Morse Preservation Society)



Founded in September 1987, the brainchild of Geo Longden, G3ZQS, FISTS has some 5000 members, including two separate and autonomous overseas Chapters, in Australia/New Zealand and the USA. The club has three simple aims:

- ˆ To further the use of CW on the amateur bands
 - ˆ To encourage newcomers to the CW mode
 - ˆ To engender friendship within the membership.
- Membership is open to all amateur CW operators and listeners, irrespective of speed and ability.

Awards

Century Award

The Century Award is available to licensed members only. The requirement is 100 points gained from contacts made with FISTS members worldwide. One point is gained for working members in one's own continent; two points for working members outside one's own continent; and three points for contacts with the club's own station, GXOIPX or any other FISTS station..

Silver Award

Requires 250 points (Century Award plus 150 points)

Gold Award

Requires 500 points (Silver plus 250 points)

Diamond Award

Requires 1000 points (Gold plus 500 points)

Platinum Award

Requires 100 Century-holder contacts

Platinum 250 Award

Requires 250 Century-holder contacts (Platinum plus 150 contacts)

Platinum 500 Award

Requires 500 Century-holder contacts (Platinum 250 plus 250 contacts)

Millennium Award

Requires ten contacts with Diamond Award Holders between 1st January and 31st December 2000

(All of the above are available to transmitting members only and a small fee is charged for each award issued)

Elmer Award

A member may nominate another operator to receive this award in recognition of help and encouragement given to the nominating member as a newcomer to CW operating. Non-members may be nominated.

Activities/Facilities

Straight Key Week

In September each year, FISTS Straight Key Week is open to members and non-members. By having a whole week for this event amateur operators are encouraged to recreate something of the atmosphere of earlier days with leisurely, enjoyable and meaningful contacts on the hand key. Nominations are invited from participants for the best operator heard and a plaque is awarded to the "Fist of the Year". A further SKW is held in the winter.

Last Sunday CW Contest

Held on the last Sunday of each month, this is a "ladder" type contest which runs for 12 months. For members only, but non-members may be worked for points.

Nets

Sundays, EU: QRS, at 0900 local, on 3.575 MHz. USA: 0100z on 14.058 MHz.

Tuesdays, EU: at 1930 local, GX0IPX/P on 3.558 MHz (+/-).

Activity Frequencies

UK and Europe: keep watch on 3.558 MHz.

DX: keep watch on: 14/21/28.058 MHz on the hour for 15 minutes.

QRS: keep watch on all Novice/restricted allocations.

The club mounts special event stations from time to time, using the call G0IPX or variations thereof.

Phone-a-Sked

For nervous beginners, FISTS operates a "phone-a-sked" service for the benefit of all amateurs, not just members of the club. Those about to go on the air for the first time can obtain sympathetic help from an experienced operator to help them through their first contact on the key. A list of these operators, with their telephone numbers, is obtainable from G3ZQS.

Other facilities, etc

The club has a monthly newsletter, *Key Note*, and a QSL bureau for member-to-member contacts. Club stickers, FISTS QSL cards, badges, etc, are available at a reasonable cost. Discounts for members are available from various traders. The club is represented at various rallies (hamfests) at home and abroad. *Key Note* is also available in .PDF format for direct insertion into electronic mailboxes.

EUCW

The club is a member of the European CW Association, and members of FISTS are eligible to participate in various activities arranged by the Association and by fellow member-clubs across Europe.

Special Emphasis On Newcomers

Geo Longden sums up FISTS as follows, "The club whilst open to all, is directed primarily at newcomers who will find we have a nucleus of very experienced operators aware of the problems they are facing. To ensure the survival of CW we must actively encourage new blood. FISTS is about Morse and not about FISTS. Encouraging non-members to use the mode is more important than recruiting them into the club, although their inclusion for the *right* reasons would be most welcome."

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To the less confident, he says, "Please do not feel overwhelmed by the 'rag-chewing' that you will undoubtedly hear between members. If you want to keep your QSO short, that is your privilege and no-one will think any the worse of you for doing so.

"I would counsel you to send no faster than you are able to copy and, if it enhances the readability of your code, even slower. A good operator is recognised in many ways but prime amongst these is the clarity of his code rather than the speed at which he sends. A love of CW is all you need to join FISTS. There is no requirement to send/receive at some specified minimum speed."

To experienced operators, he says, "Your membership is highly valued. Please have patience with those less experienced than yourself. An ounce of tactful and constructive criticism is worth a ton of caustic comment."

Membership/Enquiries

The annual fee for membership of FISTS is: UK - £5.00, EEC - £7.00, other countries - £10.00. Enquiries and applications for membership should be addressed to the Club Secretary, Geo Longden, G3ZQS, 119 Cemetery Road, Darwen, Lancs BB3 2LZ, England (E-mail: fist1@compuserve.com). Overseas chapters have their own local subscription arrangements.

USA Chapter: Enquiries to Mrs Nancy Kott WZ8C, 5450 Diehl Road, Metamora, MI 48455. (E-mail: nancy@tir.com)

Australia/New Zealand Chapter: Enquiries to Ralph Sutton ZL2AOH, 12c Herbert Gardens, 186 The Terrace, Wellington 6001, New Zealand.

(E-mail: sir_lancelot@compuserve.com)

Fists Web Sites

Further information about FISTS is also available from the following web sites:

(Europe) <http://www.asel.demon.co.uk/fists-hq/>

(USA) <http://www.fists.org>

(Our thanks to Geo Longden G3ZQS (FISTS Club Secretary) and Bob Lowe G0FRL (FISTS Awards Manager), for their assistance in preparing this updated profile of FISTS.) MM

Your Letters

Readers' letters on any Morse subject are always welcome, but may be edited when space is limited. When more than one subject is covered, letters may be divided into single subjects in order to bring comments on various matters together for easy reference. Please note that the views in readers letters are not necessarily those of MM

RAF Type F (Bathtub) Key 10A/7741

On a visit to the Com-Centre in Auckland, New Zealand, earlier this year, I was shown a "RAF Bathtub" key and asked what it was. As this is a pretty common key (#720 in Tom Perea's Telegraph Collector's Guide), I was able to tell them quite a bit about the key.

When I was at pre-sea college in the 1960's we used to buy bathtub keys for a shilling or two, take off the knob and chuck the rest of the key away. The knob fitted a WT 8 Amp No2 Mk 2 perfectly (and many other keys) and was very popular. You still see many keys today modified with knobs from, or similar to, the Bathtub key.

The Com-Centre published my summary of the key, including the usual story about the clip being used to hold the key down when the plane ditched. This article brought the following response from ZL2AKV, which I think you will find of interest.

"This particular key was wired up to the 1154 transmitter and the associated 1155 receiver in Harvards and Ansons. Admittedly the key had a terrible touch, but operationally they were thumped with a heavily gloved fist

during the Canadian winters and often as not the aircraft was in turbulence.

The transmitters could not be tuned until the aircraft engines were started. Then the case clip was moved onto the shoulder of the knob to clamp while tuning up. If tuning was started in the cold, then the aircraft batteries would revert to zero! Further the cunningly designed bakelite case was to enclose any spark gap in order not to blow up the aircraft in the event of a fuel leak!" (ComCentre Communicator Issue #6 July/Aug 2000)

*David Smith, ZL2BBB
Hastings, New Zealand*

U.S R/Os Used Two Codes - Confirmation Found

I finally have confirmation for what I've known for a long time, but was unable to reference. While poking among used books I found 'How to be a Wireless Operator', by Charles B. Hayward, 1919. In the section on 'Learning the Code' is found, "Operators holding commercial extra first grade licenses must be equally proficient in both codes, as when stationed on shore they must receive radio messages and transmit them over landlines." I also have a U.S. Navy advancement form for

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Radiomen, c.WWI, which requires proficiency in American Morse for First Class as well.

Neal McEwen, K5RW

http://www.metronet.com/~nmcewen/tel_off.html

Civilian Technical Corps Information Needed

In 1941, before the U.S. entered WWII, I served as a volunteer in the Civilian Technical Corps (CTC), an organization sponsored by the British Air Ministry. I served in Britain as a technician in the highly secret CH (Chain Home) early warning Radar system.

A WWII "Historical Radar Archive", located in Scotland, wishes to contact as many as possible of the people, military or civilian, who served in order to record their experiences and information about the stations at which they served. Finding such people has been very difficult. As an example, I am the only ex-CTC member that they have located.

If you had such service, or know of anyone who had, please contact Mr. Ian Brown at the Historical Radar Archive at:

ibrown@radararchive.freereserve.co.uk

Please also let me know at w4fok@net-magic.net

To read the brief resume of my CH experience submitted to the archive, visit:

<http://www.net-magic.net/users/w4fok/CTCHistory.htm>

*Jim Farrior, W4FOK
Fernandina Beach, Florida*

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Port Lockroy MM70 P.17 5G Transmitter

I was interested to note the description of the photograph on P.18 in the article on Port Lockroy refers to the 5G as a clandestine transmitter. I would be most interested to know where the 'clandestine' tag originated.

I first happened on the 5G in the RNV(W)R in the early 50s and also noted that they were in use on MFVS motor fishing boats. I seem to recall that the 'sparks' doubled as duty cook, while listening on the B28 speaker.

Brian Payne, G4CJY

High Wycombe, UK

(My fault – Operation 'Tabarin' was a Royal Navy covert operation to listen for enemy activity in the Antarctic. The 5G transmitter was issued for use at the Port Lockroy base and I loosely referred to it as 'clandestine' in the caption because its use in this instance. – Ed)

Key MM70 P43

Ref MM70 page 43, this is the same Marconi key PS 213A, see MM60 page 43 and especially MM62 page 41.

Wyn Davies

Wrecsam, Wales

Free Morse Tutor Program

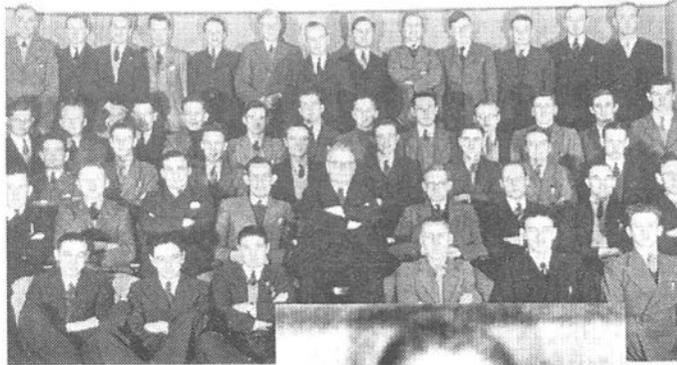
There is a free morse tutor program called "DMORSE" at web site:

<http://come.to/g0mdo>.

(Don Ward GØMDO)

Raymond Kenneth Leigh Marconi R/O

I am trying to locate the pre-war radio training school where my father would have trained to become a radio



officer in the Merchant Navy. I was always under the impression the school was in Lancashire, perhaps Preston. Since I cannot find any leads I was wondering if MM readers had any information on this school.

The only evidence I have is a photograph. My father is on the back row, 5th from the right with arms folded. Perhaps a reader might recognise themselves on the photo.

My father's name was Raymond Kenneth LEIGH, born 5th March, 1922 in Chorley, Lancashire. When he attended radio school he was living at 6, Miller Street, South Shore, Blackpool, Lancashire. His Marconi radio officer's service commenced on 1st December, 1939 until 27th August, 1945. His ships were 'Glen Head', 'City of Rangoon', 'Manchester Progress', 'Empire Shearwater', 'Marita', 'Port Caroline', 'Baron Jedburgh', 'Como', 'Danby' and 'Tortequero'.

Amongst his friends was one called 'Ken'. My father married, lived in Blackpool and became a telephonist for the GPO and died suddenly on 13th August 1966. His widow still lives in Blackpool.

I am also interested to make contact with anyone who knew my father. Please write to 62 Rectory Lane, Prestwich, Manchester M25 1BL, UK, or e-mail:

t.leighbaker@btinternet.com

*Christina Leigh-Baker
Prestwich, England*

Wanted - articles and tips on making and restoring keys - contact MM

Code Quick Method MM69 P.42

With reference to the 'Code Quick Method' in MM69, this method of using short phrases to remember Morse characters was familiar to me when serving in the army in Malaya in the 1960s.

Later, I recommended the method to three local radio amateurs who passed their Morse test after years of struggling.

The phrases can be constructed to suit, but examples of those most often used in my army experience were:

L - She thought she could

Q - God Save the Queen

F - Did it hurt you

U - Did it what

Z - My mate Billy

X - My belly hurts

I've not seen any written manual on this method - it was passed on by word of mouth.

*Ray Bullock, GØEML
Shrewsbury, England*

Signalling Lights MM68 P.40

I have a number of similar light blinker torches in my collection. One by Santon carries the Admiralty Pattern No. AP 16001, while another by Dorman & Smith, Ordsal. Elec. Works, Salford. shows AP 16001A, this one also carries the RAF Ref. 5A/2878. A torch by Shimwell Alexander Mfg. Co. Dock St. London carries the identity Admiralty

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Pattern AP 0583-160011, and another unit made in Canada is marked AP 16001. All of these have the Morse key mounted on top as indicated in your sketch. The Shimwell unit is a brown or bronze colour while two of the others are black and one has been repainted grey.

While I have not been able to locate any bulletins or instruction sheets on these. I believe they were also used for landing or picking up spies and allied agents off enemy coasts, and also for signalling to British aircraft (usually Lysander aircraft) dropping off supplies to agents or members of the French Resistance in France.

When fitted with a blue or dark filter, they have a range of only a couple of hundred yards and the pinpoint of light would be very difficult to detect. The Dorman Smith unit has an aiming device on top which can be raised somewhat like a rifle sight and provides greater accuracy in aiming.

I do have a device called a Portable Blinker Tube supplied to the U.S. Navy Ref. 17B15 Model A-2071. This is a small torch with a Morse code key on top and connected with a short cable to a separate battery case containing 3 D cells. It comes with a red and blue filter and again with limited range and difficult to detect, and my information is that it was used by submarines landing or picking up agents off the enemy coast. The Portable Blinker Tube was designed to be mounted on a pair of binoculars for accurate spotting.

The British Navy had a similar device comprising a portable tube blinker (flashing light) containing the lamp assembly and connected by a short cable

to a battery case holding 3 D cells. The unit came in its own wooden carrying case and was marked Hether type Admiralty Pattern AP 378A. Like the U.S. Navy device, this was also designed to be mounted on a pair of binoculars.

I have examples of both the U.S. Navy and British Navy Portable Tube Blinkers in the collection.

While Lynn Burlingame refuses to accept responsibility for getting me involved in this light signalling business, I must tell you that some years ago, he sent me a Canadian Mk 5 Heliograph which consists of a mirror mounted in such a way as to reflect the sun's rays in any direction, and which sends the dots and dashes of the Morse code by a short deflection of the mirror. It was used by the armies of a number of countries for about 40 years from about 1870. I was completely intrigued by the device. Then a friend in England sent me an Aldis signalling lamp used by the British and Canadian Navies and Air Force, and I was hooked on the subject.

The collection now has about 50 artefacts including different types of light blinkers used in WW I and II, various types of signalling lanterns and several signal projectors including one off a U.S. Destroyer and one off a German U-Boat.

My interest is basically in the history of communications and the collection of telegraph and wireless keys and the light and visual signalling items is an extension of that interest. It's a great hobby and one of the most interesting aspects of the hobby is the people you meet.

*Murray D. Willer
Ontario, Canada*

First CW QSOs

Let us have recollections of your first CW QSO. Photos of station, keys and/or copies of QSL cards sent or received etc. also welcome - Ed.

Leroy V. Carruth, W6ZOO

In 1947 in Santa Barbara, California, I was waiting anxiously for the arrival of my ham license. In anticipation, I had borrowed a small receiver, and had built a simple (25 watt input) 6L6 transmitter on a board with a little power supply on another board. I had all this hooked up on a breakfast table and for an antenna I had a random wire strung out a window. I had a simple straight key which I had used in learning the code. So I was ready!

On May 22, my license arrived (W6ZOO) I sat down and nervously tapped out a CQ on about 3540 kHz. After several failed attempts, to my amazement, a ham in Glendale (about 90 miles away) answered by call. Excited and thrilled, I was focusing on a good QSO, not noticing that the key was moving closer and closer to the edge of the table.

Suddenly, it went off the edge, followed in quick succession by the power supply and the 6L6 transmitter. The whole rig now lay face down, smoldering on the floor. I helplessly listened as my "contact" called and called, while I sat there as a living "silent key." To say the least, it was memorable first contact!MM

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Readers Ads

Readers advertisements are free to MM subscribers. The number of insertions should be specified, otherwise it will be assumed that it is required in the next issue only. Non-subscribers are welcome to advertise in the Classified Ads section. Please contact MM for styles available and rates.

New - Ads can include one photo free of charge

FOR SALE

FREE TO GOOD HOME: my expired Indiana automobile license plates with my amateur radio call letters WA3LKN. Reimburse my postage cost. Dave Pennes WA3LKN; 4607-C Santa Cruz Drive; Indianapolis, IN 46268-5354, USA. e-mail: dpennes@hotmail.com

16+ PAGE ILLUSTRATED LIST all kinds of telegraph related items surplus to my needs including straight/semi-automatic keys, sounders, relays, KOBs, military items and many miscellaneous items (e.g. WU dolly gram - 1950s'-code learning machines. \$3.00 plus equivalent of 4US stamps (\$5.00 refund on \$25 purchase). Dr. Joseph Jacobs, 5 Yorktown Place, Fort Salonga, NY 11768, USA. Phone: 516-261-1576. Fax: 516-754-4616. E-mail: joekey@aol.com

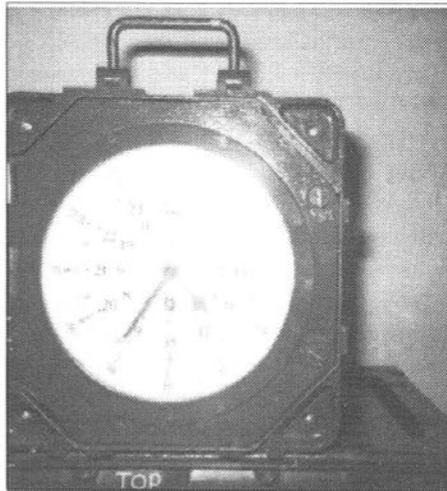
THE MM Q & Z CODEBOOK, a comprehensive 82-page list of the Q-codes and Z-codes, including a one-page list of the original Q-codes of 1912. Available from Dick Kraayveld PA3ALM, Merellaan 209, 3145 EH Maassluis, Holland. Price £5 UK, or US\$10.00 outside UK, including postage in both cases. Payment accepted in cash only.

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BOOK: "Radiotelegraph and Radiotelephone Codes, Prowords and Abbreviations." 2nd Edition. AUD\$16 posted within Australia. 90 Pages. Q,X,Z Codes, 97 Phonetic, 20 Morse Codes. Phillips, Myer, 10,11,12,13 Codes. Much other info. Probably world's best listings. Internet: <http://www.nor.com.au/community/sarc/phonetic.htm>. Also via MM. VK2JWA, John W. Alcorn. QTHR. +61 02-66215217. jalcorn@nor.com.au VISA, MASTERCARD, BANKCARD (Aus, NZ) accepted.

WANTED

WANTED: a complete griddle or mapco (battle field code) wallet/folder, Clock-Signal-Office (10" x10" metal, 7 day, windup) - see photo. Would also be interested in anything Cipher/Crypto/Code, (pre-microchip) even empty boxes/bags. Please contact Ken Mitchell, ken@kvasmitchell.freeserve.co.uk, or phone +44 (0)1337 870396 evenings.



WANTED - continued

WANTED BY MM EDITOR: Book "Samuel F. B. Morse – His Letters and Journals", edited by his son Edward Lind Morse. Please contact Zyg Nilski at the MM offices.

WANTED: "Snapper Key" and/or sounder as shown on the inside back cover of MM69. Contact Andrea Gaeta, via G. Mantellini 10, 00179 Roma, Italy. Phone: +39 (0)6-785-7083. E-mail: andregaela@tin.it

WANTED: Early paddles such as the Nikey, Autronic, Ham-key HK1 & HK2. Ray Bullock, 40 Little Harlescott Lane, Shrewsbury SY1 3PY, England. Tel: +44 (0) 1743 245896.

WANTED: REMOTE CONTROL Unit 'K' (ZA 46190), enclosed key with leg straps; also 'K' Mk 2 NATO 5820-99-949-1174 gap and tension screws. Mine have snapped off – perhaps you have a Junker key with screws to spare? Please write to Chris Bisailion, VE3CBK, 1324 Old Carp Road, Kanata, Ontario, Canada, K2K 1X7.

WANTED TO BUY: Telegraphic Code Books, as used to reduce the costs of telegrams by replacing common phrases with codewords. Would be interested in both originals of photocopies. I am a hobbyist in Cryptography and am fascinated in different ways data is and has been represented for different purposes (e.g. speed, economy, confidentiality etc.) Also interested in related items. Letters to Mark Darling,

48

132 Knowlands, Highworth, SN6 7NE, United Kingdom or e-mail: darling@patrol.i-way.co.uk

WANTED: TELEGRAPHY ITEMS

(esp. land-line). I am looking for somewhat special telegraphy apparatus: Single and Double Needle, Wheatstone etc. Buy or swap. I can swap for early electricity (e.g. tubes from Crookes, Röntgen and Geissler; Ruhmkorff; Wimshurst;...), very old radiovalves, some telephony and of course telegraphy. Who else collects telegraphy ?? All letters answered. Fons Vanden Berghen; Lenniksesteenweg 462/22; B-1500 Halle, Belgium.

Tel. +32.2.356 05 56 (home: after 8 pm my local time) or office: +32.16.38 27 21 or e-mail: fovabe@telindus.be

SOLUTION TO MM70 SEARCHWORD

Page numbers in MM70 shown in brackets
Across: I Stanfill (33), 5 Ark (7), 7 Finley (31), 10 Koch (31), 12 Tourists (34), 14 Bencher (12), 16 Barnes (4), 17 Arnold (inside F/cover), 18 Adam (10), 19 Anti-bounce (36), 20 Deliver (45), 21 Anzac Day (7).
Down: 1 SWR (31), 2 Friedrichshafen (12), 3 Dayton (11), 4 RNARS (15), 6 European (29), 8 Cheeseboard (38), 9 Esperanto (12), 11 Heritage (7), 13 Auto-Dot (44), 15 McDonald (26).

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Historic QSL Cards

Historic Cards from the collection of Tony Ricicki, W2VRK

ROBERT M. MORRIS, 827 CROSS AVENUE, ELIZABETH, N. J.
Official Relay Station A.R.R.L.

Radio 144 # 1
Your CW sigs. here 2 M. E.S.T. 7:30 PM
Audibility 100% Character 100% Wave 100% Mtrs.
Transmitter: 100 watts Modified Hartley Circuit 100 Mtrs.
Rectified AC with 5 mfd. condenser on plate. Rnd. 100 TCA. Aerial 4 wire flat top T 50' long 30' high, cage lead in. Counterpoise 10 wires 50' long, fanned out 60 degrees.
Receiver: 3 circuit variometer. Reg. Det. 100 step BF 1 step AF.
Single wire aerial 100' long 30' high.
Remarks: Best 73's

PSE QSL Best 73's.

Robert Morris

2CQZ - Bob Morris W2LV (SK) was a radio pioneer in New Jersey, USA. This was his call and card in 1923. Mr. Morris was the third US operator (after Schnell 1MO and Reinartz 1XAL) to make a historic transatlantic contact with station 8AB, L. Deloy of France in early 1924 around the 100 meter frequency.

NOM. LU-1CA
MARCELINO REY
SAN EDUARDO 674
QUYONO. 93 - 4372

BUENOS AIRES. Agosto 16 de 1931

ARGENTINA
Para la Estación RADIO W-3 L Z

Su transmisión Radiotelegráf. QSO con mi Estación en 100 metros
el hoy a las 19.05 hora argentina = GMT 23.05

RECEPCIÓN
QRX 20 metros. Band
QRK r4 QSB RAC DRM phone
QRN S1 QSS - QRB -
Tiempo Bad Viento NNO
Barómetro 757 Termómetro 19°C
Receptor Super-Heterod., Schnell
Antena

TRANSMISIÓN
Circuito Hartley inductivo T. P. T. G.
QRH 21 metros
Alimentación 1 UV211 1000 volts
DC Generator for plate and filament.
Antena Zeppelin
Sobre Torre de hierro de 20 mts. de alto

OBSERVACIONES: TMA OB BY FB QSO UR SIGS QSA 1 2/3 PB Sted
Pláceme salutar a Vd. muy atte. al cost DC

Pse. QSL Card

DY: WED ALL WORLD WITH ARMSTRONGA PUSH-PULL
CIRCUIT. 2 201A 220 VOLTS DC ELECTRIC PLANT.

Marcelino Rey

CA1 - A beautiful 1931 card from LU1CA in Argentina. Prior to 1929, ham calls in Argentina were listed as CA1 and were sent with the informal prefix of sa-CA1 to indicate South America / Argentina. A very complete card in terms of information, it lists temperature of 19C and Barometric pressure! It confirm a 20 meter QSO with W-3LZ of Pennsylvania, USA.

Under the Special Patronage of Her Majesty



And H. R. H. Prince Albert

**CALVANIC AND MAGNETO
ELECTRIC TELEGRAPH,
GT. WESTERN RAILWAY.**

The Public are respectfully informed that this interesting & most extraordinary Apparatus, by which upwards of 50 SIGNALS can be transmitted to a Distance of 280,000 MILES in ONE MINUTE,

May be seen in operation, daily, (Sundays excepted,) from 9 till 8, at the Telegraph Office, Paddington, AND TELEGRAPH COTTAGE, SLOUGH.

ADMISSION 1s.

"This Exhibition is well worthy a visit from all who love to see the wonders of science."—MORNING POST.

Despatches Instantaneously sent to and fro with the most confiding secrecy. Post Horses and Conveyances of every description may be ordered by the **ELECTRIC TELEGRAPH**, to be in readiness on the arrival of a Train, at either Paddington or Slough Station.

The Terms for sending a Despatch, ordering Post Horses, &c., only One Shilling.

N.B. Messengers in constant attendance, so that communications received by Telegraph would be forwarded, if required, to any part of London, Windsor, Eton, &c.

THOMAS HOME, Licensee.

O. NURTON, Printer, 45, Church Street, Portman Market.

From the days when the electric telegraph was a hi-tech novelty. This poster advertises the Cooke and Wheatstone two-needle telegraph service in the early 1840s. Cooke had licenced its use to a promoter, Thomas Home.