Flying the flag for Morse

Morsum Magnificat

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The Morse Magazine
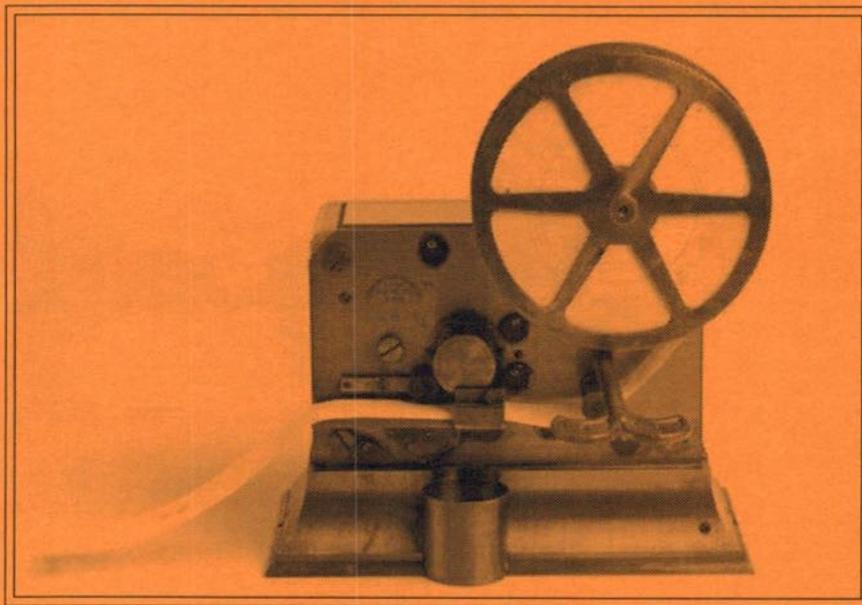
Alarm Receiving Station by Harrington-Seaberg

The International Journal of Morse Telegraphy

"When does my subscription expire ...?"

This is printed on the top line of the address label.
Also, we shall jog your memory with a renewal reminder included with that final issue.

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FRONT COVER

Alarm Receiving Station by
Harrington-Seaberg, Moline Illinois.

Photo/Collection: Fons Vanden Berghen

Comment

Please note that all the concessionary copies of the video 'How the Victorians Wired the World' have been sold and no more will be available from Morsum Magnificat. The TV production company, Blakeway Associates can still supply copies direct but at a higher price of £25 plus 17½% VAT. They can be contacted at 2D Studios, 36 Woodstock Grove, London W12 8LE. Telephone +44 (0)20 8743 2040.

In this issue there is an article by John Packer, Hon. Curator of the Porthcurno Museum of Submarine Telegraphy, who appeared in the programme. In his article he explains some of what went on behind the scenes.

This is the last issue of the year 2000 and so may I take this opportunity to wish all readers *Best Wishes for Christmas and a Happy New Year.*

Zyg Nilski G3OKD

Contents

Adverts

News

Consultation on UK Future of Amateur Radio Licensing

The UK Radiocommunications Agency issued a consultation document in September on the future of amateur radio licencing in the UK. It argues that "If amateur radio is to survive, we need to encourage more people, particularly youngsters, into the hobby. The Agency believes that there should be a relatively simple entry point into amateur radio to get people started (a Foundation Licence). This entry point would require minimal qualifications and allow newcomers a first taste of amateur radio. Our initial thoughts are that applicants will need to have completed a short competence based practical course which would cover the basics of amateur radio; safety, operating techniques (including on-air training under direct supervision), basic licence conditions and basic technical knowledge. At the end of the course, a simple multiple choice examination would be conducted by the course tutor. Ideally these courses would be run through approved amateur radio clubs.

As qualifications are minimal, operation would be limited to the VHF amateur bands and only commercially produced equipment would be permitted.

Power would be limited [25W erp] with antennas restricted to omnidirectional dipoles. The use of all current permitted facilities and operational modes would be allowed. Consideration was given to making this a short term licence, meaning that after three years the individual would be required to move on to the next level. However, this idea was rejected because it was felt that it was better to keep people in the hobby rather than forcing them to give up if they did not wish to progress to a more advanced level. It should also be recognised that amateur radio should provide an element of choice and some people may be quite happy to stay at this basic level."

The Morse Issue

The RA wants a more incentive based licensing system to encourage radio amateurs to develop their skills by linking licence privileges with qualifications held. They are empowered to introduce a Foundation Licence at any time but further restructuring of the amateur service must wait until a decision has been reached on the Morse issue due to be discussed at the 2002 World Radio Conference. The Conference is likely to drop the international requirement for users of frequencies below 30 MHz to be proficient in Morse and will allow the UK to decide whether or not a Morse test is relevant as a qualification for HF

operation.

The Agency's initial thoughts are that, if the mandatory knowledge of Morse was to be dropped in the UK, three levels of licence could be introduced; the Foundation, Intermediate and Advanced. All would require the basic competence course while the Intermediate and Advanced would require additional qualifications. If there are sufficient call signs available they would prefer to retain different call signs for each licence class. It would be necessary to transfer existing licensees into the new classes and there would be a natural progression path from the current Novice to the new Intermediate and from the current Full to the new Advanced Licences. The table below summarises this progression:

CURRENT LICENCE CLASS	NEW LICENCE CLASS
Full Class A	Advanced
Full Class A/B	Advanced
Full Class B	Advanced
Novice Class A	Intermediate
Novice Class B	Intermediate - Foundation

They say that "These are very much initial thoughts and we are currently working with the RSGB to develop these ideas."

They would be interested to hear from licensees on whether they agree with these initial thoughts or whether you have ideas of your own. Send comments by e-mail to amcb@ra.gsi.gov.uk or by writing to the Amateur Radio Section, Radiocommunications Agency, Wyndham House, Marsh Wall, London E14 9SX.

The RSGB's initial proposals can be found at: http://www.rsgb.org/

Telegraph Collector's CD Works on Apple Macintosh

Tom Perera, the producer of Telegraph Collector's Reference CD - 2000 gave copies of his CD to two Macintosh users and both reported that it works fine.

To use the CD on a Macintosh users should follow the following instructions:

1. Load the CD ROM into the drive and double click to open it. A window with all the root level files will show up, including the one called "go.htm"

2. Double click on "go.htm" and the OS display a message that it doesn't know which application wrote it. It will ask "which application do you want to use on it??? " Your Browsers (among all your other applications) will show up in the list. Select a Browser and open it.

3. The CD-2000 Table of Contents is now displayed.
(Tom Perera - W1TP - Telegraph Museums: http://w1tp.com)

Marconi Hut at Bass Point, Lizard Peninsula, Cornwall

MM64, inside back cover, showed a copy of a photo of the interior of the Marconi Hut at Bass Point, Cornwall, the worlds oldest purpose built experimental & ship-shore wireless station. Things have now moved on and readers of MM may be interested in an update.

The site was purchased by the National Trust who have restored the two huts to their 1901 condition as shown in contemporary photographs. One hut provides rented accommodation so there is permanent site occupancy which addresses security issues. The second hut has two rooms, one of them has been identified as the original wireless room. A survey by the Cornwall Archaeological Unit and staff from the Porthcurno Telegraph Museum revealed screw holes in the wooden wall which matched all the fittings in an early photo of the interior (see M64) and a replica station is being built by Porthcumo staff to be mounted in the exact position of the original. This will be open to visitors during the tourist season. The base of Marconi's original 150ft wooden mast and ring-bolts for the stays have all survived, and the National Trust will erect a 'token' 30ft wooden mast. An inverted-V multi-band trap dipole will be erected and an amateur station, possibly using modified Marconi equipment, will be installed in the second room.
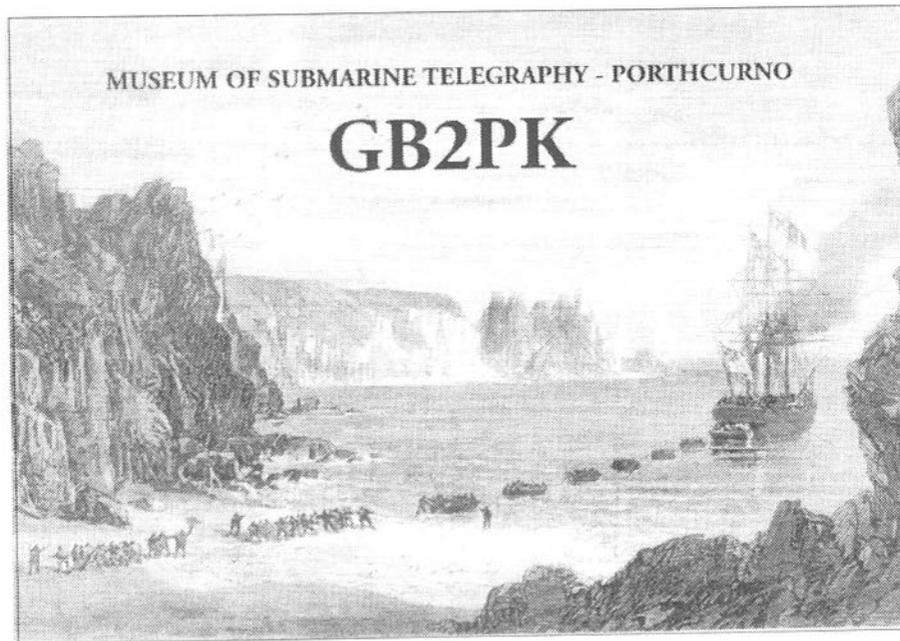
QSL card of the Porthcurno Museum of Submarine Telegraphy

A special call GB1ØØLD (LD was the call of the 1901 ship-shore station here, later transferred to St. Just near Lands End as GLD) will be sought, and the station will be activated by local 'hams' and will be also available by advance booking to suitably licenced visitors who would enjoy operating from this historic cliff-top site. A package deal with a local hotel will offer accommodation within walking distance of the site, plus permission to use the installed or visitors own equipment at the hut.

In January 1901 the station received signals from a Marconi station on the Isle of Wight, well over the horizon - added proof that a transatlantic success was possible, as proved on December 12th 1901 from nearby Poldhu where sadly no original buildings remain. GB1ØØGNI (Wight) and GB1ØØLD (Lizard) will re-enact this on CW at 04.30 GMT Jan 23rd 2001 and will welcome contacts with other amateurs on 80 and 40 metres thereafter. Meanwhile station GB2PK will be established at Porthcurno Telegraph Museum, for here the Eastern Telegraph Company 'spied' on Marconi's early experiments, establishing their own spark station, and there is conflicting documentary evidence that on occasion they even tried "jamming" some of Marconi's demonstrations at Poldhu to discredit the reliability of this new-fangled rival to the established submarine cable network.

Eventually Eastern Telegraph and other cable companies merged with the operating arm of Marconi's Wireless Telegraph Co. to form 'Cable & Wireless' and this company continued to operate Porthcurno as both a cable and, during WWII, a wireless station until 1970. GB2PK will not however try to "jam" the Lizard or Poldhu (GB2GM) stations during the year 2001 events. It but will participate in a more gentlemanly fashion, at times using 60 year old 'vintage' CW equipment, which in these days of the ubiquitous mobile phone will probably be of more interest to museum visitors.

More information is available from the museum website at: http:// www.porthcurno.org.uk

(John. E. Packer. Hon Curator. Porthcurno Museum Of Submarine Telegraph. E-mail: tunnels @tunnels. demon. co.uk)

Morse in the Navy Still Valued

An article in the October, 2000 edition of Ships Monthly describes exercises carried out by the Irish Navy. The article describes the use of signalling lamps, "…The next exercise involved several ships in formation which allowed sailors to practice their Morse code from the main decks. This old technique still remains useful and can be used to avoid radio communications that could alert and give information to the 'enemy' about a ships position. It is also useful in emergency situations if the ship telecommunication systems are damaged or disrupted after system failure"

(supplied by John Worthington, GW3COI)

EUCW Fraternising CW QSO Party 2000

All licensed radio amateurs who enjoy CW operating are invited to take part in this year's EUCW Fraternising CW Party on 18-19th November. Although there is a contest element in the sense that certificates are awarded to top performers, its real purpose is to give members of EUCW clubs the opportunity to meet each other, and other CW enthusiasts, and to demonstrate that amateur Morse is still alive and well. In an event like this it's more important to take part (and send in an entry) than to win!

Look out for members of the following EUCW clubs: AGCW-DL (Germany); ARI (Italy); Benelux-QRPC; BTC (Belgium); CFT (Belgium) CT-CWC (Portugal); EA-QRPC (Spain); EHSC (Extremely High Speed Club); FISTS; FOC (First Class Operators); G-QRP; HACWG (Hungary); HCC (Spain); HSC (High Speed Club); HTC (Switzerland); INORC (Italy); I-QRPC (Italy); MCWG (Macedonia); OE-CWG (Austria); OHTC (Finland); OK-QRPC (Czech Republic); RTC (former GDR); SCAG (Scandinavia); SHSC (Super High Speed Club); SP-CWC (Poland); UCWC (Russia); UFT (France); U-QRQC (Ukraine); VHSC (Very High Speed Club); YL-CW-GP (Germany); 3A-CW-G (Monaco); 9ACWG (Croatia), and work them as follows:

Dates, Times, and Frequencies
18 Nov 1500-1700 UTC 7010-7030 & 14020-14050 kHz
1800-2000 UTC 7010-7030 & 3520-3550 kHz
19 Nov 0700-0900 UTC 7010-7030 & 3520-3550 kHz
1000-1200 UTC 7010-7030 & 14020-14050 kHz

Classes
A - Members of EUCW clubs using more than 10w input or 5w output.
B - Members of EUCW clubs using QRP (less than 10w input or 5w output).
C - Non-members of EUCW clubs using any power.
D - Shortwave listeners.

Exchanges
Class A & B, RST/QTH/Name/Club/Membership number.
Class C, RST/QTH/Name/NM (ie, not a member).
Class D, Log information from both stations.

Call: CQ EUCW TEST. Stations may be worked or logged only once a day, per band, during the contest.

Scoring: Class A/B/C - 1 point per QSO with own country, 3 points per QSO with other European country. Class D - 3 points for every complete logged QSO.

Multiplier, all classes: 1 multiplier point for each EUCW-club worked/logged per day and band.

Logs: to include date, UTC, band, call, info sent, info received, and points claimed per QSO.

Summary: to include full name, call, address, total points claimed, station details, power used, and signature. Entries to be received by the EUCW Contest Manager, Guenther Nierbauer DJ2XP, Illinger Strasse 74, D-66564 Ottweiler, Germany, not later than 31st December, 2000. Certificates will be awarded to the

three highest scorers in each class.

Worked EUCW Award

Additionally, this event offers a good opportunity to make contacts qualifying for the prestigious *Worked EUCW* Award, printed on heavy parchment type paper depicting the map of Europe "at the time of Samuel F.B. Morse". There are three classes of award, *Standard,* for contacts made using any authorised transmission power; *QRP,* for contacts made using not more than 5 watts r.f. output transmission power; and *SWL,* for shortwave listeners.

The requirements of the award, which is open to all licensed amateurs and SWLs, are confirmed CW only contacts (SWLs - CW stations heard) with 100 different stations who are members of EUCW clubs, over 3 different amateur bands with a minimum of 20 stations worked or heard in each band. The total of 100 stations worked or heard over 3 bands must include at least 3 members of six different EUCW clubs. Only contacts made on or after Morse bicentennial day, 27th April 1991, count for the award, with up to 40 stations worked or heard on that day counting for double points. Full details of the award can be obtained by sending 2 IRCs to the EUCW Award Manager, Gunther Nierbauer DJ2XP, address as above.

(Details are also available from Tony Smith G4FAI, QTHR, by sending an s.a.e. or by e-mail from *g4fai@connectfree.co.uk*).

World's First Regular Wireless Service

On May 15th, 1900, the German PTT started the world's first wireless telegraphy service meant for regular use. Its callsign was KBM and it was located at a lighthouse on Borkum Island, off the German North Sea coast. Communication was with a lightship. The equipment was made up of spark transmitters and coherer receivers manufactured by the Marconi Wireless Telegraph Company. Up until 1904, more than 5,000 chargeable telegrams were sent. A special event amateur radio station operated as DQØKBM to commemorate the centenary of this service.

(Information Ted Jones, G3EUE)

13th QRPCC HOT Party

The 'QRP Contest Community' (QRPCC) is holding the 13th Homebrew and Old Time Equipment (HOT) party on Sunday 19th November, 2000. 'Guests' are invited who are operators of homebrew or equipment more than 25 years old. There are three classes:

Class A - Transmitters **and** receivers are homebrew or older than 25 years.

Class B - Transmitters **or** RX are homebrew or older than 25 years - the homebrew or old time transmitter or receiver may be complemented by a modern commercial receiver or transmitter.

Class C - QRP-Transmitter (below 10 watts input or 5 watts output) which is homebrew or older than 25 years.

It will take place between 13.00 - 15.00 UTC on 7010-7040 kHz and 15.00 – 17.00 UTC on 3510-3560 kHz. It is for single operators, CW only and, except for *Class C*, a PA input below 100 watts.

Call "CQ HOT" and exchange: RST, serial No. (starting from 001 on BOTH bands) /Class, e.g. 579001/A.

QSO Points (There are no multiplier points)

Class A : with A or C = 3 points, with B = 2 points

Class B : with A or C = 2 points, with B = 1 point

Class C : with A or C = 3 points, with B = 2 points

Logs must include a description of the homebrew or old time equipment used (type, vintage). Please also give a short description of about 40 letters for publication in the result lists. The deadline is December 15th to Dr. Hartmut Weber, DJ7ST, Schlesierweg 13, D-38228 SALZGITTER, Germany, or via PR to DJ7ST@DB0ABZ.

Please test your homebrew or old time equipment before the event to avoid a 'bombshell' during the party (which has happened not only once..., hi).

The QRP-Contest-Community (QRPCC) is a supra-national network of QRP enthusiasts (at present 170 promoters from 12 nations) pursuing the organization and promotion of QRP Contests since 1992.

The QRPCC may be viewed as a support group of the QRPers and homebrewers interests in a self-help manner.

Their Original QRP Contest, designed for genuine QRP gear, has been held by the QRPCC since 1996 and the Homebrew & Old Time Equipment Party since 1997 very successfully. The latest event is the QRP Minimal Art Session, the youngest QRPCC event, which first took place into life on 1st of June, 2000.

(Information: Michael Haugrund, e-mail: mike.mhe@t-online.de)

IARU Region 3 Conference Supports "No-code" Position

The International Amateur Radio Union Region 3 conference, held in Darwin, Australia, August 28 - September 1, 2000, decided that whilst it strongly supports Morse code as an effective and efficient mode of communication, "it believes that the position of Morse as a qualifying criterion for an HF amateur license is not relevant to the healthy future of amateur radio."

The conference therefore urged IARU Region 3 member societies to seek, as an interim measure, the reduction of all Morse code testing speeds to five words per minute, and expressed its support for the removal of Morse code testing as an ITU requirement for an amateur license to operate on frequencies below 30 MHz. It recommended that the IARU Administrative Council adopt this position as IARU policy.

In voting on these matters, ARRL voted "against" and Hong Kong ARTS abstained. The Radio Society of Great Britain, normally considered to be a member of IARU Region 1 (broadly, Europe/Africa), sent its president, Don Beattie G3OZF, to Australia ostensibly to represent Pitcairn Island, the last remaining British dependency in Region 3. His real purpose in attending appears to have been to pursue the RSGB's current policy (reported in MM58, p.4) of seeking to persuade other IARU member-societies to also support the RSGB's "no-code" viewpoint.

IARU Administrative Council Meeting

The Administrative Council of the International Amateur Radio Union met on 3-4 September 2000 in Darwin, following the IARU Region 3 conference. The principal business of the meeting was to begin preparations for WRC-2003, which has several items of importance to the amateur services on its agenda.

The WRC-2003 agenda items of relevance to the amateur and amateur-satellite services were identified and reviewed. They include harmonization of amateur and broadcasting allocations near 7 MHz, possible revision of Article S25 of the international Radio Regulations, consequential changes to terms and definitions in Article S1, review of provisions concerning the formation of amateur call signs, additional allocations for Little LEO satellites, study of a possible allocation to the Earth-exploration satellite service near 430 MHz, and possible identification of globally harmonized frequency bands for use by agencies and organizations dealing with public protection and disaster relief.

The Council noted the update on the progress towards its policy of transferring into an ITU-R Recommendation the operational and technical qualifications for an amateur license and acknowledged the input of Region 1 member-societies and the Region 3 Conference on the subject. This input will be taken into account in the formulation of further IARU input on the subject to ITU Working Party 8A.

(Information from IARU News Release 5th September, 2000.)

(*MM footnote: As reported in MM70, p.9, the World Radio Conference (WRC-*

2000) held in Istanbul, Turkey, May 8 - June 2, 2000, agreed to place a review of S.25 of the Radio Regulations, which governs amateur radio internationally, on the agenda for WRC-2003. The IARU's recommended revision of the regulations relating to operating qualifications, which omits any reference to the amateur Morse test, is to be discussed by ITU-R Working Party 8A in advance of WRC-2003. If approved by a WRC, the impact of the recommended new regulations would be to give national administrations discretion to include or not include knowledge of Morse as one of the "operating skills" required for an amateur HF licence. (See MM66, pp 4-5 for the background to, and full wording of, the IARU recommendation). In reality, the action of the Region 3 Darwin Conference will have little effect, because a review of ITU Article S.25 is already in the hands of Working Party 8A. WRC-2003 will be held in June 2003 in Geneva, Switzerland. Ed.)

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.

How Did He Know!?

Gary Spence, VE2GK/VE3KG

I went on the air "legally" in June of 1974 at age 15 as VE3HJS in Thunder Bay, Ontario. However, few months before that date I used my father's callsign of VE3EUL to make many CW QSO's.

The first evening we had our "new" Heathkit SB-101 set up in our cold basement, I exchanged reports with a station, but the copy was very bad, and the QSO was never completed.

The next day I called CQ and was answered by a very strong signal. It was a local amateur whose call was unknown to me, as he did not attend the local radio club.

I told him my name was "Charlie" and that I was 50 years old. His reply was "you sound more like a teenager" To say the least, I was quite shocked and a bit unnerved, as I was VERY new to ham radio, and my nerves didn't need any more "rattling!" It was not legal for me to be transmitting code over the amateur bands, and these regulations were fresh in my mind as I was very close to writing my amateur exam.

To this day I still don't know how that fellow knew he was not talking to a 50 year old...maybe it was my "youthful spring in my sending"...only the radio gods know for sure! He's an SK now so he must have taken this secret to his grave....

Morse in the Australian Antarctic Part 2 - The Pioneer Island Expeditions

by Allan Moore, VK1AL

THE pioneer island expeditions were a unique and hugely successful joint civilian-military exercise. They involved the ANARE expeditioners, their Head Office in Melbourne (and many other government departments and educational institutions); the RAAF who apart from providing radio and other equipment also provided a flight contingent; and the Royal Australian Navy, who provided a vessel and crew to convey all concerned to Heard Island, and later Macquarie Island. At Macquarie the Australian Army also found its niche for years to come, and substantially participated in the delivery of all the station's stores and equipment from ship to shore using wartime amphibious DUKWs.

After much detailed preparation by the Australian National Antarctic Research Expeditions, as described in Part 1, ANARE expeditioners set out to establish their first bases, on Heard and Macquarie Islands. At these remote locations their only contact with the outside world was by means of radio - and the Morse code.

The navy re-commissioned a Landing Ship Tank (MkIII) LST 3501 (later HMAS Labuan) equipped with opening bow doors and ramps. The ship had seen service with the Royal Navy in the English Channel in 1945 and possibly in the Mediterranean as well, transferring to the RAN in 1946. The LST sailed from Melbourne on 17th November 1947 and arrived at Heard Island on 11th December. During the voyage, the ship's naval telegraphists not only handled naval radio traffic in Morse between the ship and the Naval Board in Canberra, but also handled ANARE traffic via Sydney Radio, a not inconsiderable task.

The RAAF provided a small contingent to fly and maintain a Navy Walrus amphibian aircraft while at Heard Island. The Walrus, the last aircraft of this type in RAN service was unfortunately wrecked at its moorings during a savage storm at the end of 1947. The Walrus and its crew did some valuable aerial and photographic work during the aircraft's short life in an hostile environment. Its wreckage was recently returned to Australia and now resides at the RAAF Museum at Point Cook where it will undergo refurbishment.

Heard Island Radio - VJH

Heard Island - 'Hard Island' might be a more fitting name - lies in a region of fierce and recurring wind activity and is known as the birthplace of storms. Huge glaciers fall down to the sea from the central mountain, culminating in many ice cliffs ranging in heights of 50 to 100 feet and more. It is possible to experience the four seasons more than once on the same day, and this is the place where our fourteen men would spend the next twelve months or so.

Despite several bad storms, accompanied by extremely high winds, the LST eventually unloaded, leaving all the expedition stores in a somewhat haphazard fashion high up on the black volcanic sandy beach at Atlas Cove. She departed the island on 4th January 1948, while the radio group remaining on the island began to set up and establish Heard Island Radio.

The first weeks after arrival were difficult, with all members living rough in tents while the prefabricated living and working huts were built, engines mounted, and scientific apparatus assembled. The Met./radio hut was the first building to be completed. Four steel radio masts, 70 feet high, were erected to carry a rhombic antenna directed at OTC (Overseas Telecommunications Commission), Sydney, but during the first year of operation, at least, an inverted Vee antenna was used.

Guying the masts was difficult owing to the instability of the sand, and holes were almost impossible to dig. Fuel drums filled with stones and partly sunk in the earth helped to secure the masts. During the year, aerial wires were dashed to the ground on several occasions by winds exceeding 100 mph, but the masts themselves held firm.

Early Problems

The AT20 transmitters, although new, had seemingly been in the tropics and when unpacked were found to be infected with some form of fungus. This produced intermittent and often almost untraceable faults. To add to these difficulties, one transmitter fell into a barge during unloading and was damaged. The other fell into the sea and got wet. As a result, considerable work was necessary before Heard Island made official contact with Sydney Radio.

Work continued on the sets throughout the year, and they were eventually rendered satisfactory. The AT20 transmitters then gave good service until the station was closed on 8th March 1955. The AR7 Kingsley receivers were thought to have been second-hand when procured, and had been sent to a firm in Australia for overhaul prior to their arrival at Heard Island. Some spares, including fuses, did not arrive with the other necessary components, and operating without fuses caused the loss of two power supply transformers. Nevertheless, the AR7s remained in service for some years, and in 1950 were complemented by a UK manufactured Eddystone receiver, Model 680.

The emergency AT5/AR8 sets arrived in good order, but were described as having too low a power for contact with Australia except under extremely favourable conditions. The battery operated SCR-300 walkie-talkie sets were considered very good for their purpose,

but with some disadvantages, particularly their weight.

First Radio Contact with the Outside World

Very early in the expedition's life, before Radio VJH was operational, the honour of contacting Australia - albeit by amateur radio - fell to one of the expedition's operators, Alan Campbell-Drury, who contacted an amateur in Perth using CW and his own equipment, a WW2 5 watt "spy-type" suitcase unit, the Type A Mark III made by the UK Marconi Company. This contact is believed to have been made on Boxing Day, 26th December, 1947.

Once mains power was available, official radio schedules commenced using the AT20 transmitters, and by mid-February 1948 regular weather reports and other messages were being transmitted to Sydney.

During the year, thousands of meteorological, scientific, administrative and personal traffic radiograms were sent by the team through Sydney Radio VIS. Traffic from ANARE headquarters was sent to Heard Island by the same route. Radio conditions were very poor throughout the year. This was not due to the condition of the equipment but to the ionospheric conditions which resulted in frequent and, at times, extensive radio blackouts.

Melbourne Radio VIM, was the designated backup station if difficulties were experienced in contacting Sydney. Schedules with Sydney were arranged at six, and sometimes three-hourly intervals depending on the time of day at the station. Despite the poor conditions, early Heard Island expeditioners believe that the Melbourne backup circuit was never utilised.

Recurring Obstacles

Operators are averse to static interference, but more particularly drift static caused during severe blizzards, which can interfere with signals for days on end. Drift static noise is caused by charged particles of snow colliding with aerial wires, causing high voltages to be discharged which are heard in the operator's earphones. The high noise level is annoying and is similar to that caused in a car radio when the ignition system is unsuppressed. Extremely high voltages have been measured across aerial wires during experiments. Drift static haunted our island operators and those at the continental stations for some decades.

Another constant but legitimate source of interference which occurred at all ANARE stations was that caused by the ionosonde. This scientific device generates radio frequency signals rapidly through the spectrum from about 30 kHz to 30 MHz for one minute each quarter of an hour, and for three minutes on the hour. A loud grinding noise combined with drift static, weak signals and interference from other stations tested the most patient operators to their limit.

Following the cyclical transmission of its radio signals, the ionosonde's companion scientific radio receiver/recorder was able to detect and measure the absorption/reflection characteristics of the ionosphere.

First Foreign Stations Worked

Heard Island was isolated but not

completely alone in this part of the world. The South African Government sent a party to Marion Island, in the Prince Edward Group, in December 1947, and set up a meteorological and radio station. Heard Island Radio communicated with Marion Island ZRS before the end of April 1948 and exchanged weather information on a daily basis.

Contact was made with Capetown ZTF in South Africa direct, with meteorological exchanges. Meteorological analyses broadcast from Pretoria were also received. Until directional inverted Vee antennas were beamed towards Marion Island and South Africa, some difficulties in reception and transmission were experienced.

It is significant in one of the first reports of station activities that the interchange of information with the Marion Island party, and the chess games played over the radio, were welcome aids to morale, and the men expressed their keen appreciation of the cooperation afforded by the Marion Island personnel. The report went on to say that the year's activities proved the value of inter-Dominion co-operation in the maintenance of remote weather stations, and future collaboration was keenly anticipated. (Not always involved in radio chess games themselves, operators passed moves as requested. In subsequent years, radio chess continued to be popular, and was often played between Australian and

Arthur Scholes at the operating console, Heard Island radio hut, 1948. (ANARE photograph, taken by Alan Campbell-Drury)

foreign Antarctic stations, the Russians at Mirny in particular).

On February 11, 1949, the LST, now renamed HMAS *Labuan*, arrived with the new party and relief operations commenced. The end had arrived of a busy but successful inaugural year for radio and the Heard Island team as a whole.

Macquarie Island

Background: Following the arrival at Macquarie Island of Sir Douglas Mawson in December 1911, a radio and meteorological station operated there for about four years. It was dismantled in 1915 following the tragic loss, on its return voyage to Australia, of the Commonwealth Fisheries Investigation ship 'Endeavour' in which 21 men perished, including all members of the 1914 Macquarie wintering party. Apart from a brief visit by Mawson in December 1930, the island remained unoccupied until 1948 when the first ANARE expedition arrived.

After returning to Australia from the initial voyage to Heard Island, LST 3501, loaded with more stores and equipment sailed for Macquarie Island on 28th February 1948, arriving at the island on 7th March. The seas between Australia and Macquarie Island, some 1400 miles south of Melbourne and slightly further south in latitude than Heard Island, are as boisterous as those near Heard and the winds blow just as hard. Although snow falls frequently, the island receives rain on about 300 days each year. The party arrived relatively late in the season, during the Antarctic autumn, so the period of daylight was restricted.

There was no sheltered landing place, so the LST had to stand off the northern part of the island in Buckles Bay, close to the site chosen for the new station. When the wind blew offshore, she moved away and returned when the weather improved. WW2 Australian Army DUKWs were used for the first time, also pontoons, towed ashore by various means. The DUKWs were able to be loaded on board the LST and then leave and return to the ship through the large bow-opening doors.

As at Heard, the stores were carried hurriedly as high as possible up the beach and left in no particular order. While expedition members roughed it by living in tents, building of permanent living and working structures began in earnest.

Macquarie Island Radio VJM

Identical radio equipment to that supplied for Heard Island was provided, including two AT20 transmitters, two Kingsley AR7 receivers, the emergency AT5/AR8 unit, and SCR-300 field radios. The tall Kelly and Lewis radio mast was built to accomodate an inverted Vee aerial directed at Sydney Radio VIS/VKS. Other vertical antennas cut to pre-determined frequencies were installed as well as various long-wire aerials. A power winch, needed to pull together various sections of the tubular masts, arrived without certain necessary parts. The difficulty was eventually overcome with innovation, but slowed down the process of mast erection in shortening daylight.

Some spare sections of the mast were utilised as poles to carry power lines from the power house to the Radio/Met

office. Schedules were arranged at six, and sometimes three hourly intervals, depending on the time of day, and the radio station operated seven days a week throughout the year.

During the first year, no arrangements were in place to exchange traffic with New Zealand or other stations. Direct radio contact with Heard Island was finally abandoned, with only a few social contacts being made owing to auroral activity causing persistent radio blackouts, and power supply difficulties at Macqarie Island.

Power Problems

The power problems arose in the main 15 kVA diesel generating machinery early in the expedition's life and persisted throughout the year. The tragic loss by accident of the engineer, Charles Scoble, in July added to the party's woes. The radio group, and others, worked hard and managed to get two generating sets working. Again, a fresh problem arose - vital engine lubricant had not been landed in sufficient quantities, causing power to be rationed all year. In spite of economies in usage, the larger generators eventually had to be shut down and the station then had to function on a much smaller emergency generator producing only about 5 kVA of power.

The RAAF flew in a replacement engineer by Catalina flying boat in August. Prior to the flight, the radio group erected a subsidiary transmitting antenna to provide homing signals using the AT5 transmitter. Bad weather delayed the aircraft's departure from Hobart for several weeks and all through the long flight, against strong head winds, the group maintained constant radio watch.

The new engineer was safely landed using the station dinghy, and immediately commenced work on the diesel generating equipment. The small petrol generator was given a much needed overhaul so that, with limited running of the larger diesel engine, it was possible to maintain normal communications until January 1949, when the lubricating oil ran out.

A French expedition vessel, the *Commandant*

Peter King, Macquarie Island, 1948. (Photo, courtesy Peter King)

Charcot, called briefly at Macquarie Island during the first quarter of 1949. (It had been unable to penetrate early ice in Adelie Land where the French had planned to establish their first continental station.) The French kindly provided three drums of diesel lubricating oil, and some drums of petrol, and the power crisis was over a month before it was time for the party to leave Macquarie. Among other supplies received were two cases of Martel Cordon Bleu cognac and some canned Algerian wine, in exchange for a couple of cases of Fosters beer.

In spite of many difficulties, the radio group performed exceptionally well. They handled a wide range of traffic throughout the year and expanded their network of radio contacts. Macquarie Island quickly became an important outpost, allowing meteorologists to provide an increasingly improved standard of weather forecasting, as well as the exchange of a range of other valuable scientific information.

(Extracted/summarised from *Fifty Years of Australian Radio Communications in the Antarctic, 1947-1997,* a series of articles written by Allan Moore to celebrate the Jubilee Year of ANARE (the Australian National Antarctic Research Expeditions) for *Aurora*, Club Journal of ANARE.)

To be continued...   **MM**
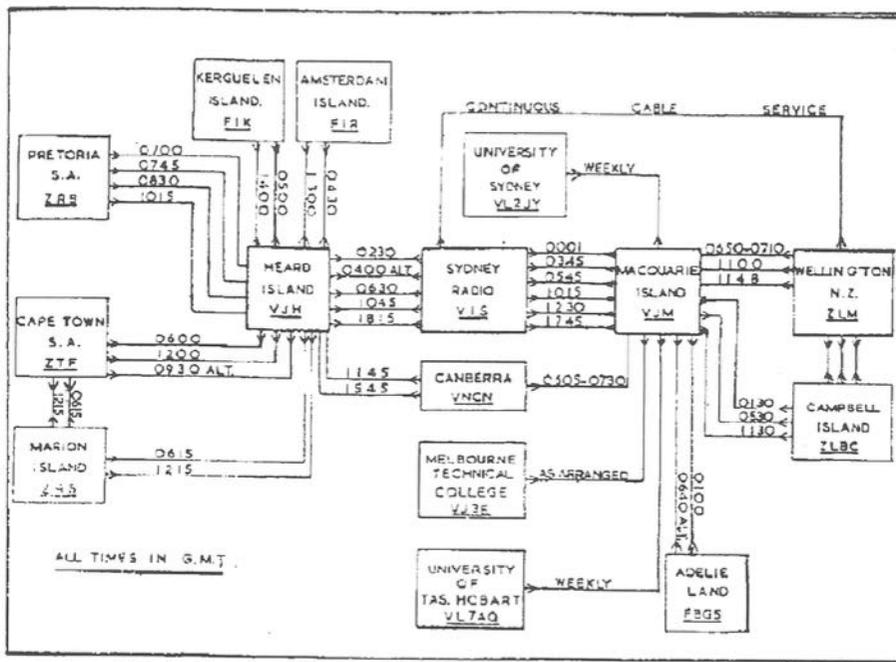
By June 1951, the Heard and Macquarie Islands radio network of CW circuits had expanded as shown above. Chart originally prepared by Lem Macey, the first radio supervisor on Heard Island, who also served in a number of ANARE expeditions in later years.

Reviews of the K1EL K-Keyers

by Dr Gary Bold, ZL1AN

The predecessor of the K9 Keyer was the K8+ keyer chip produced by Steve, K1EL. The price and the circuit are the same, but the K9 has several enhanced features. The K8+ was great, but the K9 is even better!

You get a chip and PCB, and supply a few parts and assemble it yourself. You also need a separate paddle, but in my opinion the K9 gives by far the most bang for the buck. If you're starting with a keyer, can put together a simple PCB, and can obtain a paddle from somewhere, don't hesitate, get the K9! Likewise, this is the one to get if you need a second keyer.

For US$8, Steve airmails you an 8 pin DIP pre-programmed microprocessor chip, and a detailed schematic. For US$10 he includes a professionally produced printed circuit board. You supply a few additional resistors and capacitors, push switch, power source, case, and about 30 minutes soldering. The basic circuit is shown in Fig.1.

You can download the complete instruction manual in pdf format, and an order form, from Steve's web site, http://members.aol.com/k1el/index.html - you have to order personally because Steve customizes each chip with your own callsign and some other options you select on the order form.

No On/Off Switch

The chip runs from nominally 5V, but I run mine satisfactorily from a couple of penlight cells. It draws 5 mA active, 5 muA in standby mode. It enters standby mode between paddle presses, so you don't need an on/off switch. Mine has been running continuously on the same alkaline cells for 9 months, and there's been no perceptible drop in voltage. It produces an optional 800 Hz sidetone, and stores 3 types of CQ calls and two 15 character user-loadable messages. The traditional knob for varying the speed is absent. This results in an even smaller keyer!

Steve programs in your choice of A or B timing, startup speed, and message set. The only control is a single pushbutton switch. All commands are sent with the paddles. To initiate command input, press and hold the pushbutton for about a second. The keyer sends "r" on the internal monitor, and waits for you to send one of 14 different letters, which set particular parameters. Examples: You can toggle the sidetone on and off, change the callsign memory or load a message

memory, toggle between iambic modes A and B, swap the paddles, set one paddle as a "straight key", initiate "practice" mode - when the keyer sends randomly selected characters - or set or interrogate the speed.

The K9 includes a feature of which I'm a fervent advocate, character autospace. When this is enabled, after a little practice, it's impossible to send characters closer together than the standard 3 dot-time interval. This banishes the most common sending fault on HF, running characters together. Newcomers find this particularly perplexing. I wish everybody would use it!

Fast Speed Change Mode

The K9 has two excellent additional enhancements over the K8+ design. Firstly, To change the speed with the K8+, you had to enter an "S"

command, then send the speed in wpm from the paddles. This works fine, but requires several seconds. The K9 has an additional fast speed change mode. To use this, you press the button, and operate a paddle while it's depressed. A press of the dit paddle increases the speed by 2 wpm, a press of the dah paddle decreases it. Thus, for a fast speed change from 12 to 20 wpm, just press the button and blip the dit paddle 4 times! This rapidly becomes as automatic as turning a speed knob. I have always wanted this feature, and know of no other keyer which has it. I programmed it into a Commodore 64 keyer emulator program I wrote once, and often wondered why nobody else had done it.

The second enhancement is constant speed command entry. The K8+ forced you to send commands at whatever sending speed was currently set. Thus, if
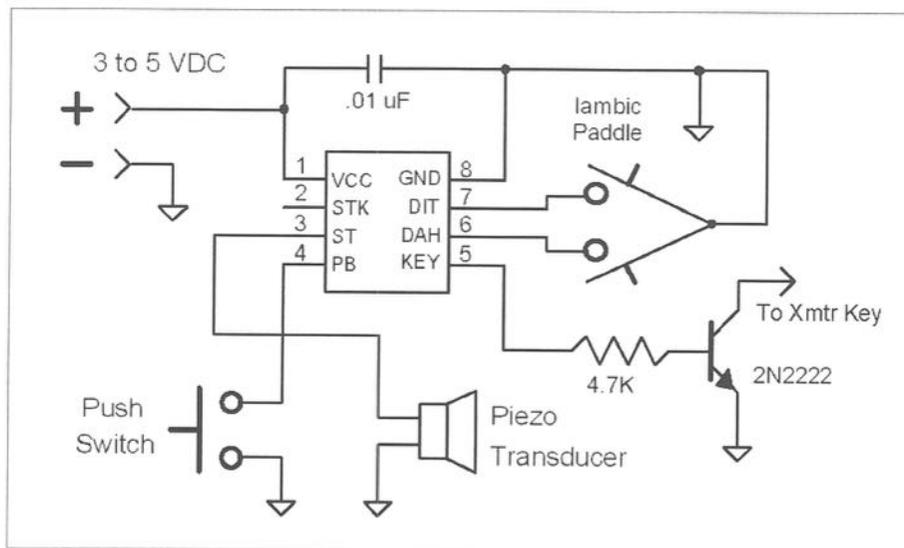
Fig.1 *K9 keyer - circuit diagram*

you inadvertently shot the speed up to 40 wpm, it took a bit of frenetic sending of high speed numbers to get it back down again. The function speed now always stays at the default startup speed you selected, in my case 25 wpm.

I checked the speed with my mains-clocked calibrator. Like the K8+, the speed is about 1 wpm slow up to about 15 wpm, 2 wpm slow from 16 to 25, then 3 wpm slow up to 49 wpm. However, this is academic. In practice, you just blip with the paddles to the speed you want.

Built into Dead Mouse!

The PCB is only 30 mm square, so you can mount it in a very small case. Steve says that some people even build his chips into dead computer mouse housings, and use the mouse buttons as paddles! This is an interesting idea, and requires sending by "tapping" with two fingers instead of the standard horizontal finger and thumb paddle motion. I mean to try this when I have time, as dead mice are zero-cost items from your local computer store. I don't think I'd be able to send as accurately or as fast by finger-tapping though. Can somebody try this and send a report?

The "fast-speed change" and "constant command-speed" features alone enhance the K9 from a great keyer chip into a really superb one. I'd be proud to have developed this keyer myself. Even if you have a K8+ already, get a K9 as well! For US$10, how can you go wrong?

The K10 Keyer

The K10 is a pre-programmed PIC12C672 8 pin microprocessor, the K9's big brother. It includes all the features of the K9 and some new ones, in particular a High Speed CW (HSCW) mode which I haven't seen on any other keyer. See fig.2. Once again, you can find full details on Steve's website, http://members.aol.com/k1el/index.html and you can download the complete instruction manual, a 65k file in pdf format, from the site.

The connections are different from earlier versions, so you can't just plug it into a K9 socket. The transmitter driving circuit using an npn 2N2222 (any other reasonable transistor will do) is standard. There are 4 memories, with a total allocation of 96 characters, which can be distributed unequally between messages. The left-hand CMD PB is the "command push-button", which initiates command input, and accesses memory 1.

Commands are entered at a user-changeable "command speed" which remains constant, irrespective of the current sending speed. There are 21 commands. You can select iambic mode A or B, invoke autospace, swap the paddles, change the (optional) sidetone frequency, set hand-key mode, load and play messages.

You can initiate an interactive practice session of 5 character random groups, at one of four difficulty levels. The K10 sends a single character, which you echo back on the paddle. If you were correct, the K10 re-sends this character, plus another character to be echoed as before, until 5 characters are sent. The cycle then restarts. Thus, both receiving and sending skills are exercised! Unlike the K9, there are no pre-recorded messages. However, it's simple to record your own, straight from the paddle.
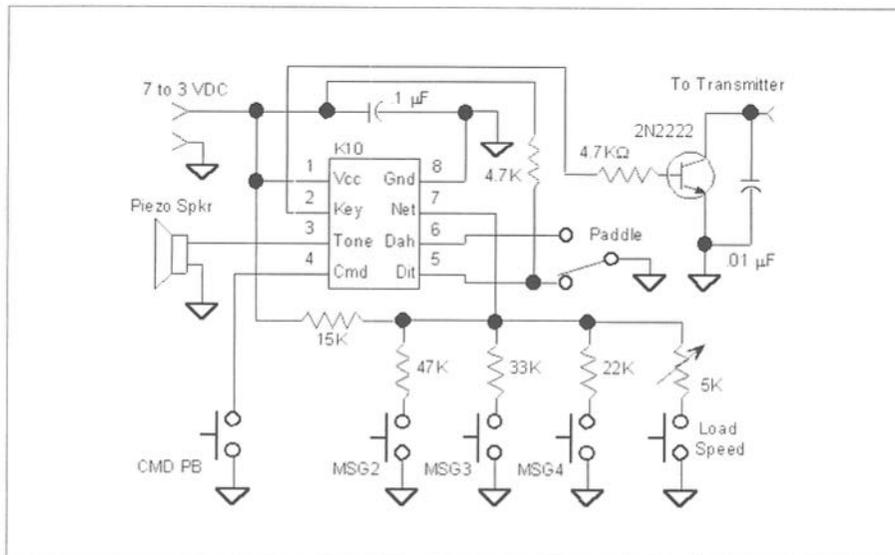
Fig.2 *K10 keyer - cicuit diagram*

HSCW

The High Speed CW feature is used for meteor scatter propagation. In this mode, a pre-recorded message is sent repetitively, in bursts, at 1000 lpm (200 wpm) or more. Some of these bursts get reflected from meteor ionization. What comes through is recorded and played back at lower speeds so that the Morse is readable. Steve offers a "Standard" version: 1000, 2000, 4000 or 6000 lpm with 1 minute loop, and a "Euro" version: 1000, 1500, 2000 or 3000 lpm with 2.5 minute loop.

The HSCW mode repetitively sends a pre-recorded message at the selected speed. The Morse comes out either as an on/off 2 kHz audio tone or as a logic signal to key an external audio oscillator. This audio goes to the microphone input of your VHF/UHF transmitter. Hopefully, meteor trails will

scatter a portion of it to DX locations, where it's meant to be recorded and played back at a lower speed which humans can read.

Fascinating. I know nothing about this mode, but it should interest the VHF types. Is anyone experimenting with HSCW? Write in and tell us about it.

K8 PIC Keyer Source Code

Steve has also decided to place the full assembler code for the earlier K8 chip in the public domain, and you can download that too! This expands into a 52 kB text file. If you want to see how a coding expert programs a PIC Morse keyer, this is the place to look! Be prepared, though, for a long look.

Steve says; "For those of you who want to 'roll your own' keyer, it will provide a good starting point for your own design and also show how much of

a challenge it is to cram lots of functionality into the smaller PIC chips. Information is provided in this MPASM file that tells you how to customise it with your callsign and settings."

Assembler code is much less compressed than high-level code (like BASIC, FORTRAN, JAVA) and you'll need some familiarity with the chip's instruction set to comprehend it. Fortunately, Steve's website has pointers to other sites where you can get this information. PIC chips have become important components of communications and control systems. Steve is one of the pioneers, but we'll undoubtedly see more implementing Ham-based applications in future. In fact, Steve has a RTTY chip coming up which will be the basis for a low cost portable RTTY station.

Prices and Ordering

The K9 and K10 keyers are $8.00 each, or $10.00 with pcb, within the USA. For delivery outside the US add $2.00 **per order** to cover international shipping and handling. A K10 kit is available with all board mounted components for $15, again plus $2.00 per order for overseas. A new K20 CW/HSCW keyboard kit including all board components (not reviewed here) is also available at $25.00 ($27.00 overseas).

An order form is downloadable from Steve's website and orders can be sent by e-mail to K1EL@aol.com, or by post to: Steven T. Elliott K1EL, 43 Meadowcrest Drive, Bedford NH 03110, USA. If you don't have internet facilities, ask a friend to download the appropriate documentation and an order form for you. Payment can be made by credit card within the USA. From overseas, payment must currently be made in US dollars by cheque or money order drawn on a U.S. bank, but Steve hopes to have international credit card facilities before the end of the year.

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

MM71 Searchword

by Tony Smith

(Find the answers to this puzzle in MM71. Solution p.48)

Across

1 Airport site of Tompkins County hamfest (6)

3 Working Group supporting 5 wpm exams across Europe (7)

7 Author of "The Story of the Key" (6)

13 Lighthouse at Cuxhaven (4,5)

15 Home town of Lynn Burlingame N7CFO (8)

16 Key commonly used by ANARE operators (7)

17 President of WIA, Victoria (6)

18 Hungarian national radio society (5)

19 Source of recruitment for early ANARE radio supervisors and technicians (3)

20 Successor to the Postmaster General's Department (7)

23 Use of Morse was vital to it for nearly 40 years (5)

24 Swedish pump key DK1000 (8)

Down

1 Lists contents of MM Nos 65 - 70 (5)

2 Great Western Railway telegraph licensee (4)

4 FISTS autonomous overseas chapter (3)

5 Its properties limit speeds of Morse sending (6)

6 Manufacturer of AT20 transmitter (5)
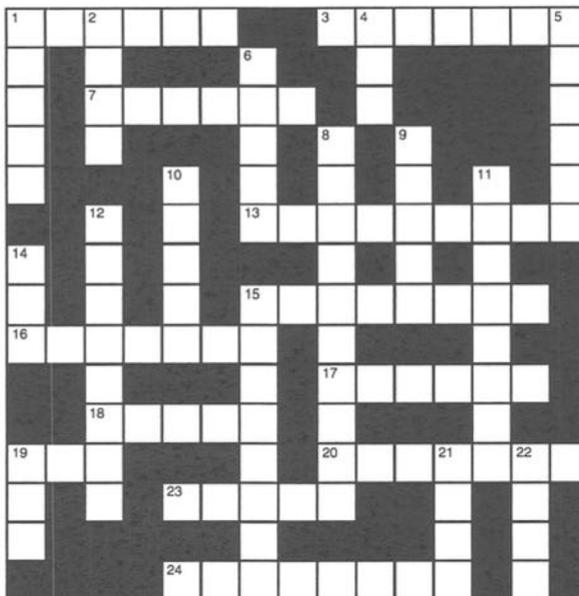
8 Tapped briefly by 45 students (5,5)

9 President of RAC (5)

10 CW club founded 1987 (5)

11 Bomber equipped with AT5/AR8 units (8)

12 Flash signalling instrument made by John Alcorn (8)

14 Volunteer organisation before the U.S. entered WW2 (3)

15 Conditions causing fallen aerial wires (8)

19 Peaking filter on FT-100 (3)

21 Cold drink after the schedule? (4)

22 Played early procurement role for 23 (4)

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 instuments. Information will be lost unless it is compiled in one place and shared with other readers.
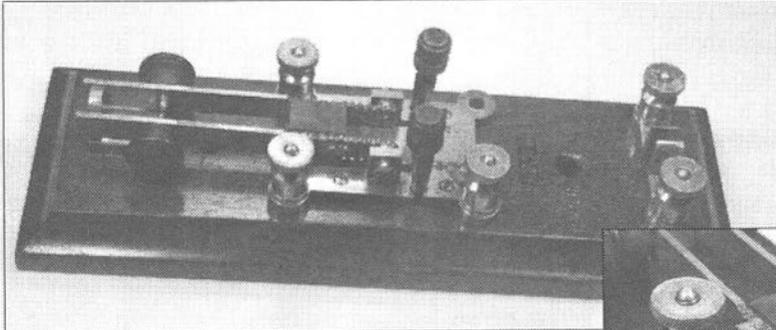
An early Telegraph Switching device with lightning damage made by Western Electric ("W.E. MANUF'G CO CHICAGO") and marked NPRR (Northern Pacific Railroad. It bears a January 17, 1871 patent date. One screw is melted and adjacent metal pitted. Definitely got zapped by lightning over the years!
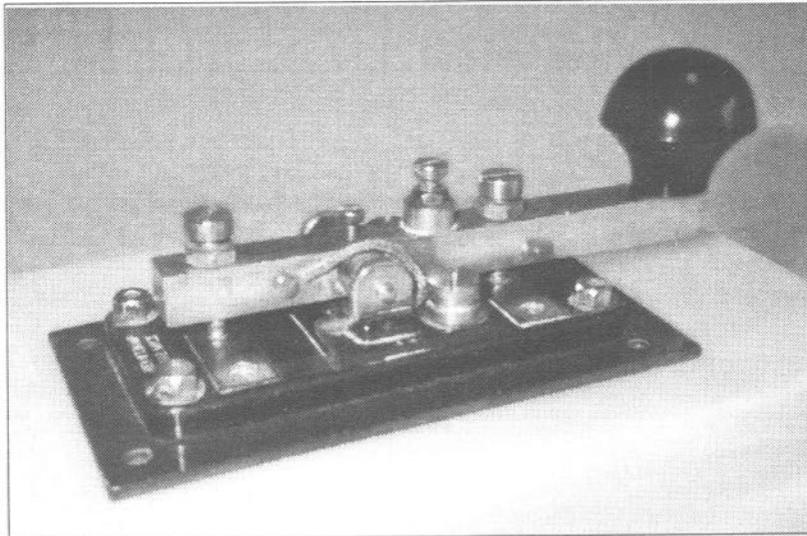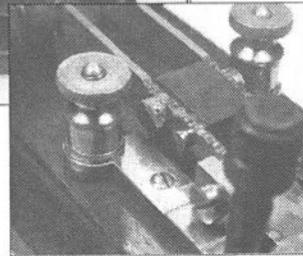
The prettiest of all the W/T 8 AMP British & Commonwealth Army keys - the all-brass bridgeless No.2 Mk. II.
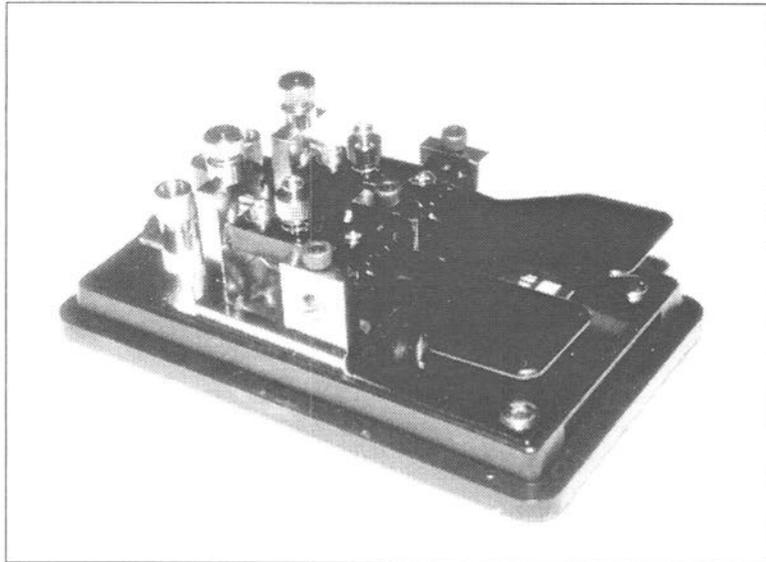
A very interesting new key from Hi-mound which Motoaki Uotome calls a 'PC mouse-type double speed key' based on the original style of two lever keys used for the under-sea cable telegraphs of the 19th century. The model number is Hi-mound MK-708. It looks like two straight keys in paralell and can be used as a direct ' double speed' key or as a manipulator for an electronic key.

The Self-winding Stockticker by T. A. Edison Inc. The patent was registered around 1902

The Best Way To Learn Morse

by John Worthington, GW3COI

BEFORE I start on this contentious issue, I should say that I learned Morse by the "Carried Along by A Thousand Others System" – in my case in Her Majesty's Royal Air Force whose trainees in 1940, and for many years after, were packed into the Winter Gardens, Bournemouth. Three months spent there was adequate to take a new recruit from zero to 12 wpm.

The first week was allotted to learning the code alphabet and for every working hour after that you ingested code sent by the instructor starting at 5 wpm. The speed was increased each week by one extra word per minute until exam time, when if you didn't pass you were posted elsewhere to acquire a different skill. I have never met anyone who was so treated but it was rumoured that failures wound up with a bucket and brush etc.

That first week of learning the code I certainly didn't manage very well, as I found the following week when the first 5 wpm was fired at us - but the continual bombardment of code slowly did the trick and by the third week we were delighted to find we were actually improving. When the exam came, there were a few failures but we never learned what percentage - probably for security reasons.

There was no advice at any time about how to teach yourself the code in that first week. I remembered that the Boy

Scouts used images like "*Elephants In High Heels*" to show the dots and dashes in each letter - but my memory ill serves me and it might have been "*Elephants In Straw Hats*" or something just as daft.

There were such objects for all alphabet letters but imagine having to think of such phrases when the Morse was coming to you at 5 wpm. The instructors, a hardy race, nearly all retired key-bashers, never mentioned any methods to remember the code except to stare at a copy of the alphabet until letter perfect.

I have to say that there have been many methods advocated by folk, trying increase their income. Such things as gramophone records, pocket automatic senders and even hypnotism have their adherents but I have come to the conclusion that the RAF experience of being carried along in the company of hundreds of others in the same boat was very effective.

Present day learners of course are never likely to be in such a position. I may be wrong in this belief but learning Morse on your own must be a really tough job and straw-hatted elephants have probably been pressed into service once more. There is no doubt that whatever methods are used, when you listen to the large number of today's self-taught learners, success is rife.

They deserve a medal at least for their hard won skill. *MM*

Some Wartime Uses of W/T

by James Farrior
W4FOK

RADIO TELEGRAPHY (W/T) played a role in the very important "Chain Home" radio-location system utilized primarily to track enemy airplanes approaching the coast of Britain during WWII. W/T was also used with a direction finding system (D/F), which provided friendly aircraft with position plots.

In 1941, before the US entered WWII, I joined the Civilian Technical Corps, sponsored by the British Air Ministry. I soon found myself in England, wearing the RAF uniform and attending the RAF RDF (now called RADAR) school at Cranwell, Lincolnshire. My background had been four years as a professional point-to-point radio telegrapher, with some technician experience, and a radio amateur (W4FOK) since 1938. Upon completion of the training, I was assigned as a RDF mechanic to the "Chain Home" station at RAF Scarlet Point, near Castletown, Isle of Man. I served there for 1½ years, until I was released by the British Air Ministry to become a Radio Officer in the American Merchant Marine, where I served until the end of the war.

The 'Chain Home' System

The 'Chain Home' RDF system consisted of a large number of powerful RDF stations located at strategic points around the coast of Britain for the primary purpose of providing advance warning of approaching enemy aircraft. There were sufficient stations to provide redundancy, which improved the accuracy and reliability of the system. Also, each RDF station had a considerable

amount of redundancy of hardware, and the sites were hardened and camouflaged.

Scarlet Point and a number of other RDF stations sent their tracks to a 'Filter Room' at Preston, about 30 miles NE of Liverpool. At the Filter Room, the tracks were continuously sorted out and displayed on a large map. The information was used primarily by the Fighter Command, but also by Civil Defense. Scarlet Point typically used operators primarily WAAFs (Women's Auxiliary Air Force) to send the plots (position and altitude) by telephone. A cable under the Irish Sea connected the Isle of Man to England.

Communication

As a backup to the telephone, Scarlet Point had a HF W/T radio link to Preston. This was frequently utilized as a drill, and could quickly be put into service whenever the telephone was not working. The Transmitter used was a T1087 R/T W/T. Only W/T (CW) was utilized. For security purposes, the plots could be encrypted.

An airman named Dick Haslam was the W/T operator at Scarlet Point, and he, and also the Preston operators, sent at a speed that never exceeded about 15 wpm. That struck me as odd, because my experience in the U.S. had been in traffic nets where sending was with a bug at a typical sustained speed of 30 to 35 wpm. I was the only other telegrapher at Scarlet Point, so I was pressed into service whenever the operator was unavailable. Message traffic could also have been handled over the W/T link in an emergency. However, I don't recall anything other than tracking plots being sent.

Traffic procedures were very simple, and used a number of 3-figure signals, each signal beginning with the figure "5". These signals were very similar to the 3-character American military signals, which began with the character "Z".

Located adjacent to the Scarlett RDF station was a Direction Finding (D/F) station that worked in conjunction with similar stations located elsewhere to determine an airplane's position. A lost aircraft could get his position by sending an appropriate HF W/T signal followed by a short key-down signal.

Each D/F station, using an Adcock system of aerials and a goniometer, would measure the bearing from their station to the aircraft. The bearings were quickly sent to a central location where they were plotted by triangulation, and the resulting position plot was sent to the aircraft by W/T.   *MM*

Cullercoats Radio GCC

by William P. Jones

T HE SITE ON WHICH the station stands is a rocky promontory facing east straight into the North Sea. On the left lies the small protected bay of the village of Cullercoats which was founded 400 years ago and was a flourishing fishing centre in the nineteenth century. On the north side of the station is another natural bay which bears the name of Table Bay.

Early History

In 1905 the Marconi Company established a small radio station in this exposed position exactly where the generator building is now standing. Since that time the site has been known as Marconi point. In 1908 when wireless telegraphy was relatively well developed the GPO took over the station to provide

Modern picture of Cullercoats main building, built in 1925

a service to the growing fleet of merchant ships that traded with the countries of Europe and the Far East.

The River Tyne was host to a great ship building industry and was also the coal exporting centre for the vast Durham and Northumberland coalfields. The workload of the radio station must have been very great.

Ship owners must have called upon those services with gratitude since the river was extremely busy and berths for the ships to occupy were in short supply. Colliers often lay in the river for weeks awaiting their turn to enter the docks.

1926 view of Cullercoats showing the antenna system, emergency generator room (right) and main building.

Heydays

During its heyday years the station provided a direction finding service which, before the days of radar, was a vital service to ships trying to find the Tyne entrance when visibility was down to a mile or less in the fogs which plague the North Sea. On one occasion a ship was actually driven ashore, having dragged its anchors onto the rocks alongside Marconi point. The captain of the ship walked ashore and came into the station to meet the radio officers. Apparently the crew followed some time later having gone to their cabins to pack up their belongings.

I have heard that during the Second World War the operators monitored Norddeich Radio which sent orders to the U-boat wolf packs operating in the Atlantic ocean. No doubt the messages would have been sent on to the code-breakers at Bletchley Park.

During the 1960's and up to the 1980's the station was called upon to provide communications for the oil industry, and in the 1970's for thousands of workers who were engaged in the construction of the great platforms in the English as well as the Norwegian sectors of the North Sea oilfields. Cullercoats, Stonehaven and Humber radio stations were the only means of keeping in touch with their homes and loved ones. Telex and facsimile services kept the industry running.

The modern building was built in 1925 about 30 yards further to the west in a less exposed position. There are 6 or 7 rooms contained within and I was allowed the privilege of having a look round during the visit of British Telecommunications engineers. The building has been completely cleared but I was unable to glean any information regarding its future.

From the photograph you can see that the building is very sturdy and has had to withstand the ferocious gales that strike during the winter months and occasionally summer months too. The antenna has been firmly anchored. The transmitting antenna's array is sited approx 2 miles to the north occupying a few fenced-off acres. ***MM***

THE MORSE SYSTEM that was used so extensively and is well known did not spring immediately nothing; Samuel Morse experimented in other ways first in the search for a practical realisation of his dream of the rapid long distance transmission of information.

An early idea of his was to transmit signals for numerals, words would be accorded a number, 56 being for instance 'Holland' and 15 'Belgium'. He was a

Samuel Morse's First Electric Telegraph

E. Geoffrey Walsh
GM4FH

Email: Geoffrey.Walsh@ed.ac.uk
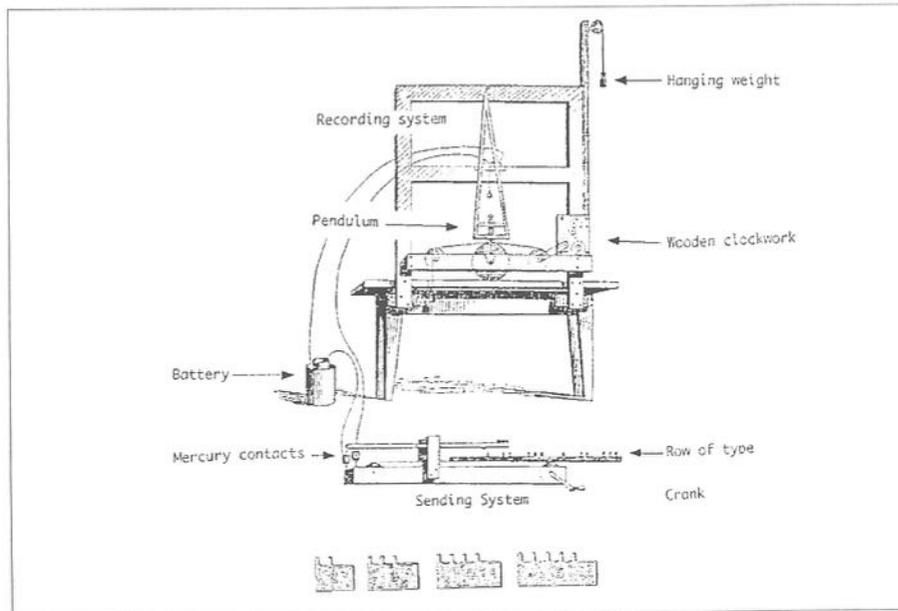
Figure 1 - For the sending system (below) an endless belt of carpet binding moved type with projections that caused a circuit to be completed through mercury contacts. At the lowest part of the figure are illustrations of the type used for sending the numerals 2, 3, 4 & 5. For the reception of signals a pendulum moved under the influence of an electromagnet perpendicularly to the illustration. The frame for the receiving system was devised from a 'canvas stretcher' as used by painters. In 1883 the original apparatus was preserved at the 'Cabinet' of the Western Union Telegraph Company, New York.
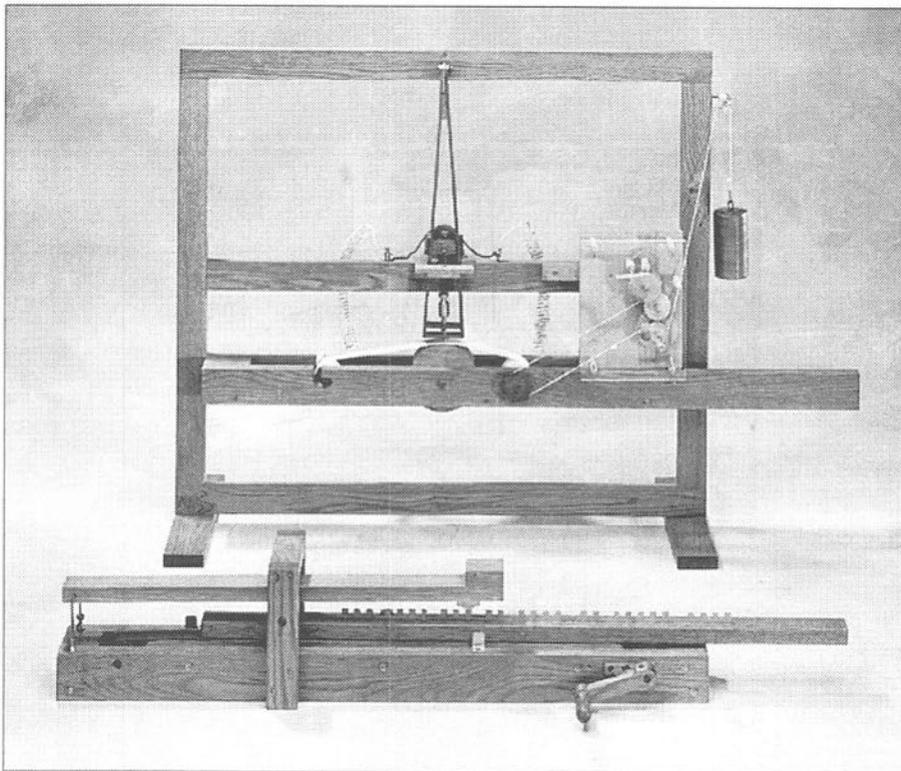
Figure 2 - Full size replica of Samuel F. B. Morse's 'correspondent' (sender) used in the first demonstrations of his original numbered code in 1837. This full size copy was made for Fons Vanden Berghen by the Provincial Technical School of the Province of Brabant, Belgium from a replica held in the Science Museum, London.

skilled painter but knew little about electricity and was impoverished at the time his thoughts were maturing. He knew a great deal about printing. His idea was to have lead type with projections moving along a belt to make a series of contacts and complete an electrical circuit. The movement was hand cranked.

A general view of his equipment is shown in figures 1 & 2. At the receiving end a hanging weight drove a clockwork mechanism which pulled a paper tape along under a pencil (see figure 3 & 4). The pencil rode in a pendulum which carried a piece of soft iron near to a coil. Thus when current was passed from the transmitter the pencil moved and marked the paper with a deflection.

The original system would only transmit over a few yards; performance was improved when more than one battery was used and more turns were put on the coil.

Morse cast the type for the system himself, that for 1,2,3,4 & 5 having the corresponding number of projections whilst 6,7,8 9 & 0 also had 1,2,3,4,& 5 projections respectively. This
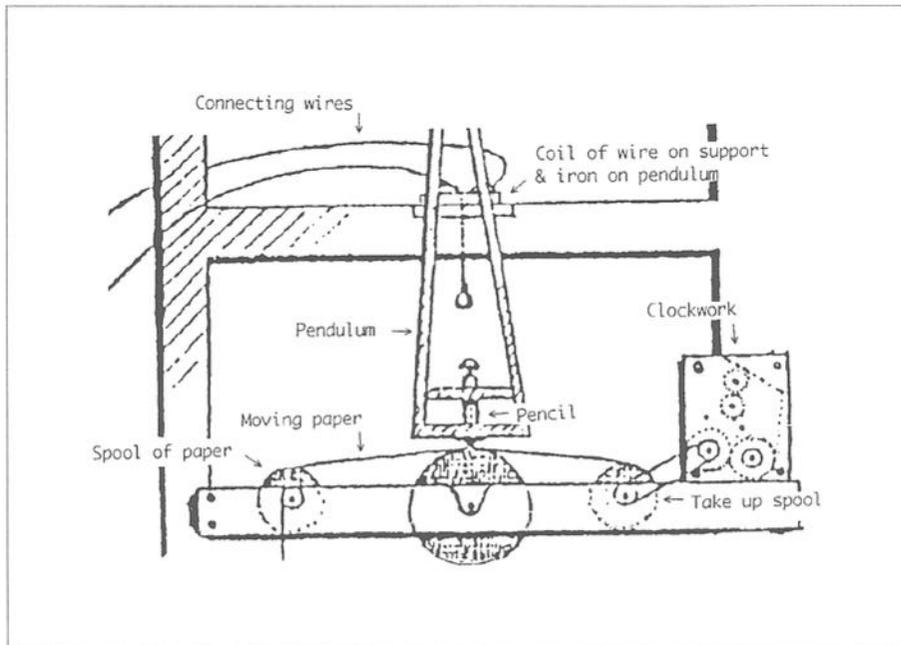
Figure 3 - The lower part of the receiving apparatus. The paper was moved from left to right by clockwork and allowed the pencil to mark the paper.

arrangement was not ambiguous for longer spaces followed the second series than the first series.

So Morse's first working system did not use hand-sent signals, nor were the messages taken down by ear. There were no dots & dashes, just dots. The system would have required a large and ever expanding dictionary whilst the movements of the rather massive pendulum will have been sluggish and signals could not be expected to be transmitted except extremely slowly.

Reference: Pope F. L. (1883) The American Inventors of the Telegraph. *Century Magazine 35.924-944.* **MM**
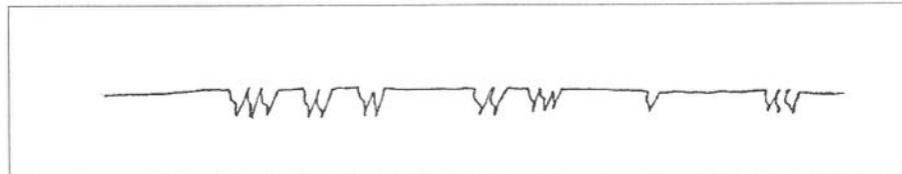
Figure 4 - An example of the 'Telegraphic Writing' that resulted. In 1883 this is said to have been preserved in the Archives of the New Jersey Historical Society. It would be interesting to know whether the original still exists and if so its whereabouts.

The Making of 'How the Victorians Wired the World'

by John E. Packer

Hon. Curator of the Porthcurno Museum of Submarine Telegraphy*

A S has been mention of this Channel 4 TV programme in MM recently (Issue 71) readers may be interested in a few details about how it was made. All the working equipment seen in the film, apart from a brief view inside a railway signal box, was filmed at the Porthcurno Telegraph Museum.

It began with a phone-call out of the blue from a London office asking if the museum had such a thing as a Morse key. After replying "how many would you like?", I learned it was from Blakeway Associates planning to film a documentary on the telegraph (the Victorian internet) for TV Channel 4, and I assured them we did indeed have Morse keys, cable keys, sounders, inkers, needle telegraphs - the lot!

As a result a few weeks later we blacked out our museum education room, removed anything that looked remotely "twentieth century" and found a suitably antique looking mahogany table on which to wire up working equipment. Fortunately we have a stock of old red and green cotton covered copper wire (no shiny PVC) and were soon winding lengths into the pig-tail coils seen in early prints of electrical hook-ups.

As a licensed radio amateur I was pressed into service, pretending to be a dozen different operators, and spent two days tapping away on different keys, at differing speeds, and with different hand styles, including the sideways motion of the railway single needle telegraph. I was also asked to send by knife blade, to illustrate a historic incident in a railway carriage when two telegraphers passed disparaging remarks about a third passenger who unfortunately for them could read sounder signals.

In a film made by non-telegraphers, in several different locations, to meet a deadline, some technical ambiguities were bound to creep in. Cooke & Wheatstone's early 5-needle telegraph was really a remote-pointing device. This instrument could only signal twenty letters out of the alphabet, but it was only used for a short time on one railway circuit. It was soon followed by a two-needle telegraph. This was the one which had a rather difficult code to remember, and eventually the British railway network settled on the single-needle system which features in the film.

An adaptation of Morse's original code was adopted, left deflections corresponding to dot, right to dash. Sharp eyed viewers will notice the needle is mounted on a green dial which can be rotated to counter any 'bias' to left or right which might be produced by stray earth currents, a common problem on the single wire and earth-return circuits of the day. American railroads tended to prefer listening to the clicks of the sounder rather than watching a needle, and later needle instruments were fitted with two small brass gongs which the needle hit, making ting-tang noises, higher note for left or dot, lower for dash. In theory "ting-tang" Morse was quicker than sounder, as equal length bi-polar signals were used, there were no long dashes.

With the laying of the first Atlantic cable, viewers see something like two Morse keys in parallel being used, with a quite different hand action to Morse. This is a cable-key, which sends one polarity to line when the left key is depressed and the other with the right. At the far end of perhaps 2,300 miles of cable the tiny received currents would not work any of the ordinary landline equipment and Lord Kelvin's mirror galvanometer was employed. This reflected a candle flame onto a screen, the spot of light moving to left or right giving a visual code similar to the single needle. Unfortunately when we tried this the spot of light was too dim for the camera, and thus mirror working had to be 'fudged' using one of the lighting crew's spots as the source. The slow sending speed is authentic, for the huge capacitance of long submarine cables made high speed hand sending impracticable.

A museum colleague John Nash displayed his timing accuracy by sending into the Morse inker where it was recorded for visual inspection! One problem at Porthcurno with demonstrating working equipment is the need to conserve paper tape or 'slip' as it is no longer available in the correct widths. We do have stocks of 5-unit tape which is wider, and one of our helpers recently invented a motor driven tape-splitter which has eased the situation.

When the film crew wanted several operators keying at once, and also when a female hand was needed, we pressed other museum staff into service, which may account for some unorthodox sending, and again when Professor Wolff demonstrates SOS in Morse he sends it as no ships operator ever did, i.e. S - pause for breath, O - pause for breath, S rather than the unique combined proword signal - dididitdahdahdahdididit. Apart from that, I hope Morse enthusiasts found the film relatively 'authentic'

The crackling blue spark which appears from time to time was from a 10 inch (25 cm) induction coil made by one of our helpers as part of a replica early ship-shore station. The film ends with a view of the 1870 cable to India being landed. This was at Porthcurno beach, and the view of the distant Logan Rock headland has not changed today. Things filmed but not included in the programme were a working Wheatstone ABC telegraph and various automatic transmitters keying from pre-punched tape.

* Porthcumo. Penzance. Cornwall. TR19 6A. Tel & Fax (01736) 810966.
E-mail: tunnels@tunnels.demon.co.uk
Website:http;//~.porthcurno.org.uk

Info Please!

Photo/Collection: Jack Barker

FEDERAL

DC 3V
AC 5V   15A

Small brass 'Gamage' type of key on a base with three unusual terminals and buzzer marked as shown in the inset.


Photo/Collection: Jean Le Galudec

Unknown key but possibly from the USA

Small steel key with 'high-rise' knob on a 3½ inch (8.75 cm) lever. The whole is assembled on a thick ebonite base 2 x 2½ inch (5 x 6.25 cm), through-bolted to a heavy steel plate, 2½ x 4 inch (6.25 x 10cm)
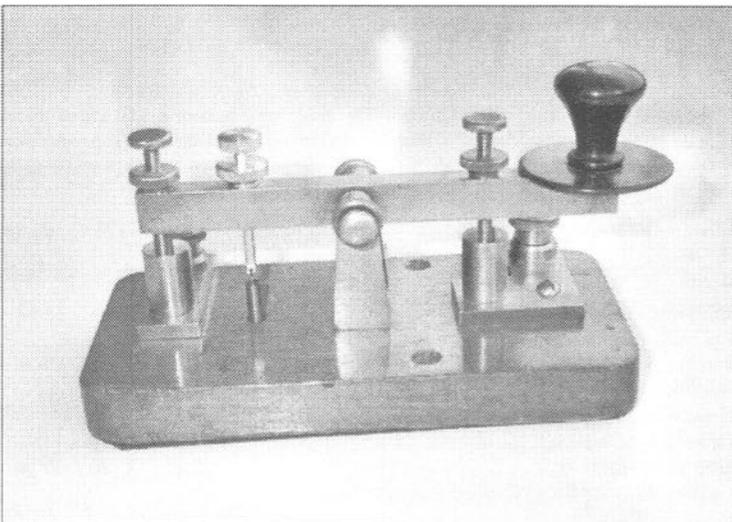
Unknown key with shrouded contacts

MM Bookshelf

Specialist Books on Telegraphy by Mail Order

ALL WORLD ORDERS ARE SHIPPED BY AIR MAIL UNLESS OTHERWISE STATED
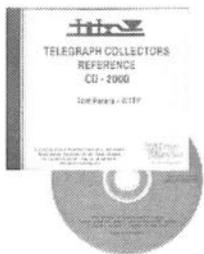
Telegraph Collectors Reference CD-2000 *by Tom Perera*
(Also works on the Apple Mac)
An absolute mine of information for collectors compiled from variety of sources including important web pages (See MM70, p11 for details). Users need a PC running Explorer or Netscape web browsers to access the CD. The 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**
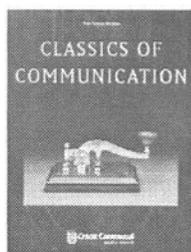
Classics of Communication (English Edition) *by Fons Vanden Berghen*

A book of exceptional quality produced originally to accompany a Brussels Exhibition sponsored by a Brussels bank. Illustrated with 240 high quality photographs, 140 in colour, including many rare telegraph instruments. The text includes the history and technology of electricity through to wireless and early television, but a large section of the book is devoted to telegraphy. Without sponsorship, a book of this size and quality could not have been economically possible for such a limited readership - 107 pages, 24.5cms x 29.5cms (9.7in x 11.6in). **£16.95 UK - £18.25 EU - £21.00 World (US $36)***
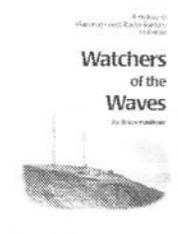
Watchers of the Waves *by Brian Faulkner*

A history of maritime coast stations in Britain, from Marconi's early experiments and through the days of spark, valve, and automatic W/T and R/T to the computer-controlled systems of the 1990s. Profusely illustrated with 24 drawings and over 80 photographs -128 pages, 21 cms x 29.5 cms (8.25 in x 11.6 in).

£15.00 UK - £15.50 EU - £17.10 World

	UK	EU	WORLD
Perera's Telegraph Collector's Guide by Tom Perera	£7.60	£8.10	£8.90
An essential pocket-size reference guide for collector and historian			
The Story of the Key by Louise Ramsey Moreau	£4.25	£4.50	£5.00
The Best of MM Vol. 1. 77 photos/Illustrations, 60 pages.			
Wake of the Wirelessman by B. J. Clemons	£14.20	£14.70	£17.00
A true story of an early maritime wireless operator			
"Q41" and Beyond by Shirley Lawson	£6.20	£7.20	£7.90
The story of a Wren (Womens Royal Naval Service) telegraphist			

	UK	EU	WORLD
Railroad Telegrapher's Handbook by Tom French	£8.00	£8.30	£9.00
Old-time telegraphy on the American railroads			
Bunnell's Last Catalogue with notes by Tom French	£5.50	£5.70	£6.00
Illustrates and describes the company's many telegraph instruments			
History, Theory & Practice of the Electric Telegraph	£13.95	£14.95	17.50
(facsimile reprint of 1866 edition) by George B. Prescott			
The Victorian Internet by Tom Standage *(MM63)*	£8.30	£8.40	£9.30
The story of the early telegraph pioneers			
Keys, Keys, Keys by Dave Ingram	£8.50	£8.90	£9.80
A visual celebration of the Morse key			
Marconi's Battle for Radio (children's book) by Birch & Corfield	£5.85	£6.00	£6.80
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Radiotelegraph & Radiotelephone codes -			
Prowords & Abbreviations by John Alcorn	£12.85	£13.70	£15.50
A History of the GPO Mark 1, 2 and 3			
Morse Telegraph Keys by Dennis Goacher*(MM65)*	£6.00	£6.50	£7.20
The Phillips Code - a facsimile reprint by Ken Miller*(MM61)*	£10.00	£10.20	£10.50
Telegraph codes for press reports			

Clubs & Societies

The Scandinavian CW Activity Group (SCAG)

SCAG was founded in 1974 by Swedish amateurs interested in CW communication. The purpose of SCAG is to support and encourage amateur radio telegraphy and to work for good operating behaviour on the amateur bands. It aims for good co-operation between the Scandinavian countries, and for good international relations. While most members come from Scandinavia, there are also members in other parts of the world. Any radio amateur having an interest in telegraphy can become a member.

SCAG is a founder member of the European CW Association (EUCW), an organisation of independent CW clubs across Europe which seeks to promote, encourage and protect amateur CW activities by mutual co-operation between its members.

Skeds

SCAG activities are open to non-Scandinavian amateurs, who are also welcome to check in on the different SCAG nets:

General sked frequencies: 3555, 7030, 14055, 21055, and 28055 kHz.
Sked times: 1730 and 2130 MEZ.

Nets and Bulletins

High Speed Net	Fridays	1730 MEZ
		3578 kHz
Rag Chew Net	Saturdays	1600 MEZ
		3555 kHz
SCAG Net	Sundays	1030 MEZ
		7030 kHz
SCAG Nord Net	Sundays	1800 MEZ
		3557 kHz
SCAG DX Net	Sundays	1430 UTC
		14055 kHz

Awards

Rag Chew Award:

Issued by SCAG members to anyone who has shown excellent CW skill in QSO with a SCAG member for more than 45 minutes (EU) or 30 minutes (DX). This award can be given only once to the same station. There is no charge.

Worked Scandinavia on CW

This award is open to all amateurs. Contacts after 1st October 1986 count. For further information on this award write to SCAG Award Manager: R.M. Meilstrup OZ5RM, Geelskovparken 12.1, DK-2830 Virum, Denmark.

Straight Key Day - New Rules for 2001

SKD is held from 0800-2200 UTC

every New Year's Day and Midsummer's Day, on 3540-3580; 7020-7040; 10105-10125; and 14050-14070 kHz, and the Midsummer event is designated as EUCW Straight Key Day. Neither is a contest, but an opportunity to use a straight key for relaxed and friendly contacts with fellow-enthusiasts.

Only straight keys are allowed, and participants may vote for the best 'fist' or hand-style worked with a number of votes according to the number of QSOs worked, ie, 1-2 QSOs - no vote; 3-5 QSOs - 1 vote; 6-8 QSOs - 2 votes; 9-11 QSOs - 3 votes; and more than 12 QSOs - 4 votes.

A "Straight Key Award" is issued to all participants who receive at least three votes, and the winner on New Year's Day SKD is awarded the SCAG HONOUR KEY for one year. As in all SCAG activities, both SKD's are open to non-Scandinavian amateurs.

For further information contact the SCAG SKD Manager, Eric Wennström SM1TDE, Vasagatan 9-324, SE-172 67 Sundbyberg, Sweden. E-mail: sm1tde@grk.se

(A copy of the full SKD rules can also be obtained from MM, by e-mail or on receipt of an s.a.e. Ed)

SCAG News

The SCAG Newsletter is published four times a year. The language is Scandinavian, but some articles in English are also included.

Further Information

Non-Scandinavian amateurs are welcome to join SCAG, and the annual membership fee is 70 SKr. or USD 10. For further information, write to SCAG Secretary, SM6DPF Stig Hansson, Box 51, S-450 54 Hedekas, Sweden.

(MM is grateful to Jens Nohns OZ1CAR, Editor, SCAG Newsletter, and Eric Wennström SM1TDE, SCAG SKD Manager, for assistance in compiling the above profile. Ed)   *MM*

Your Letters

Heliographs

I refer to Murray Willer's letter in MM71 concerning signalling lights.

An article was published in MM56 about the early days of telegraphy in Western Australia. A brief reference was made to a heliograph service to Rottnest Island which is off the coast near Fremantle. That service opened in December 1879; it was operated by the Western Australia Colonial Postmaster General and continued in that form until March 1900 when a submarine cable provided a telephone service to the island.

It is presumed that a telegraph service also continued to operate following the general transfer of telegraph stations to the Federation of Post Offices in 1901. Overall some 186 telegraph stations were established in Western Australia over a period of 31 years: Rottnest was the only service using a heliograph.

Ted Jones, G3EUE
Bramber, England.

Your Letters

AM Buzzer Practice Boards MM69, P.35

In 'Info Please' in MM69, Jack Barker is seeking further information on the makers of these Buzzer Practice Boards. I cannot help with the makers of these boards but have data on other nomenclature.

The AM board in my collection is identical to the one in my collection. The plate reads:

> BUZZER PRACTICE
> REF. NO. 10A/4067
> AM

SERIAL NO.   (blank)

Louis Meulstee, PAØPCR, in his article "Unusual Military Morse Keys" in *The AWA Review,* Vol. 8, 1993, page 32, illustrates four buzzer sets:

Figure 79 – "Buzzer Signal Training." This is a self-contained Morse training unit comprising a key, buzzer and battery, mounted on a wooden base. 'Instruction in reading a buzzer should not be started until the beginners are proficient in all signals sent on a dummy key, at 4 words a minute' (Signal Training, -All Arms, 1932)

Figure 80 – RAF "BUZZER PRACTICE", Air Ministry Ref. No. 10F/4067. It bears a remarkable resemblence to the Army "Buzzer Signal Training" in the previous figure. The Morse key, however, is slightly different, having a thicker lever and no knob guard.

Figure 81 – "Buzzer Signal Training", 1940. This buzzer has an unusual metal base. The Morse key is a KEY W/T 8 AMP, No. 2 Mk III (black), moulded in black bakelite.

Figure 82 – "Buzzer Signal Training", 1956, YA 2588. The Morse key is a KEY W/T 8 AMP, No. 2 Mk II, metal lever.

John N. Elwood, WW7P
Phoenix, Arizona

Automorse MM71 P.27

In the last sentence of the caption to the Automorse picture on page 27 of MM71 a wrong impression may be gained. The vast majority of Australian landline circuits were 'closed', which meant that the normal straight keys were provided with circuit closers and a jack built into the wooden base to take the plug of a jigger. Therefore there was no real need for the jigger to be provided with a circuit

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closer - the most commonly used jiggers, Simplex Auto and Pendograph did not have them.

I therefore don't agree with the statement "the lack of a circuit closing switch marks this as a European (or dedicated wireless) device."

As I understand US keys and bugs, the bug attached to the key by two alternative methods. Firstly, via the circuit closer therefore making it necessary for the bug to be provided with its own circuit closer. Secondly, by connecting the bug to a straight key by opening up the contacts of the straight key sufficiently to clamp the plug of the bug between them. This would have the same effect but there would be no need for a circuit closer being provided on the bug itself. This method was never used in Australia to my knowledge.

The plug on all Australian jiggers is much thicker than that on a US bug. Many pictures and articles on Australian straight keys depict the PMG key without a circuit closer. This has come about by these keys being used for amateur radio purposes or in conjunction with a sounder or buzzer in a KOB setup for practice purposes. The circuit closer is then removed (and unfortunately becomes lost) so that the battery is not exhausted if the lever is left closed.

As a matter of interest the Automorse was also made in a left hand version. I have both a right and left hand model - I have never seen or heard of another left hand one.

Ron McMullen
N.S.W., Australia
(ronmac@interact.net.au)

No Code - No Theory!

I do realize this is controversial but I invite readers of MM to visit my web page at:

http://www.neteze.com/radions/amateur.htm

Primarily it's aimed at CW Operators. I have come to believe that we need to push the Phone boys a little; we are getting run off the air and have no band segments of our own. While there is still a 5 WPM requirement, we need to begin this movement for a reduced theory test. Phone operators need to understand their theory is no more or less relevant than the code. If you have the time, go to my web pages and see what I'm talking about or write to me for printed information: P.O. Box 4694, Santa Rosa CA 95402-4694, California, USA.

W.B. Reese, WB6TMY

Automatic SOS Sender

I have in my possession a small clockwork device in which a metal disc of about 2.5 inches (say 6 cm) diameter rotates slowly. It has projections which close contacts and these indicate that it was designed to send SOS in Morse 3 times and then a steady carrier before the cycle repeated and so on until the spring was unwound.

There is no escapement but some regulation of rate is provided by a pair of air vanes mounted on a rapidly rotating pinion. The frame bears the lettering 'K610' It possibly dates to WWII. Can any reader provide further information.

Geoffrey Walsh, GM4FH
Edinburgh

Russian Key MM71 P.38

With reference to information wanted on the Morse key at the bottom of page 38 of MM71, I purchased one of these keys some time ago. It was sealed in a brown card box which had a label affixed. (see sketch). This key appears to be a Russian "Universal" key variation 2, probably made in the late 1980s or early 90s. The key seems to be well made but the plastic case is rather flimsy. The markings on the lid are shown on the attached 'rubbing'.

Derek Judge

I can confirm that Emanno Chiaravalli's key shown on page 38 of Morsum Magnificat number 71 is Russian. I have one of these keys bought at a rally last year and still in the original packaging. Unfortunately I'm not able to translate the Cyrillic script on the label or the packing slip. I have also seen these keys offered for sale on the Morse Express website where they are described as being Russian.

John McGinty, GM4GZQ
Houston, Scotland
(John@mcgintyj.fsnet.co.uk)
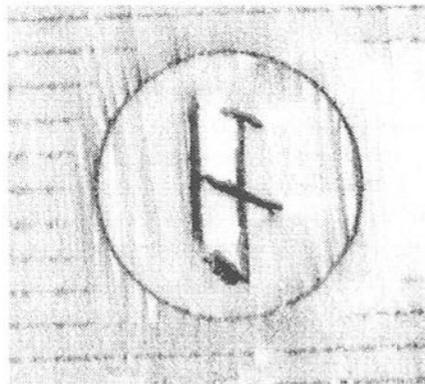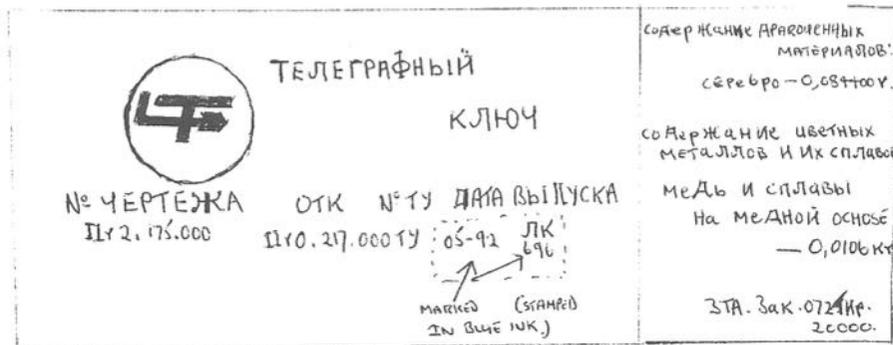
With reference to the photograph by Ted Jones, G3EUE on page 38 of MM71, this is a Russian key.

I bought one of these at the recent Telford Rally (held at Cosford) from a stand manned by UT7CT. It was in its original packing and Anton had several of these, and other keys, for sale.

He told me that these keys were made from the mid 1970's and he thought that the one I bought was made in about 1984.

John Goldberg, G3ETH
Chester, England

WANTED - continued

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.
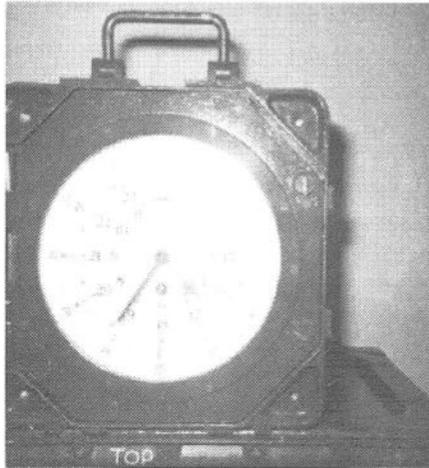
WANTED TO BUY: Telegraphic Code Books, as used to reduce the costs of telegrams by replacing common phrases with codewords. Would be interested in both originals of photocopies. I am a hobbyist in Cryptography and am facinated in different ways data is and has been represented for different purposes (e.g. speed, economy, confidentiality etc.) Also interested in related items. Letters to Mark Darling, 132 Knowlands, Highworth, SN6 7NE, United Kingdom or e-mail: darling@patrol.i-way.co.uk

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: andreagaeta@tin.it

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 Bisaillion, VE3CBK, 1324 Old Carp Road, Kanata, Ontario, Canada, K2K 1X7.

SOLUTION TO MM71 SEARCHWORD

Across: 1 Ithaca (7), **3** EUROCOM (2), **7** Moreau (36), **13** Alte Liebe (5), **15** Bellevue (2), **16** Clipsal (21), **17** Linton (2), **18** MRASZ (2), **19** DCA (19), **20** Telstra (19), **23** ANARE (16), **24** Pedersen (35).

Down: 1 Index (23), **2** Home (Back cover), **4** USA (40), **5** Muscle (10), **6** Tasma (17), **8** Metal plate (10), **9** Oelke (6), **10** FISTS (40), **11** Beaufort (17), **12** Heliomax (3), **14** CTC (43), **15** Blizzard (19), **19** DSP (31), **21** Swan (21), **22** RAAF (17).
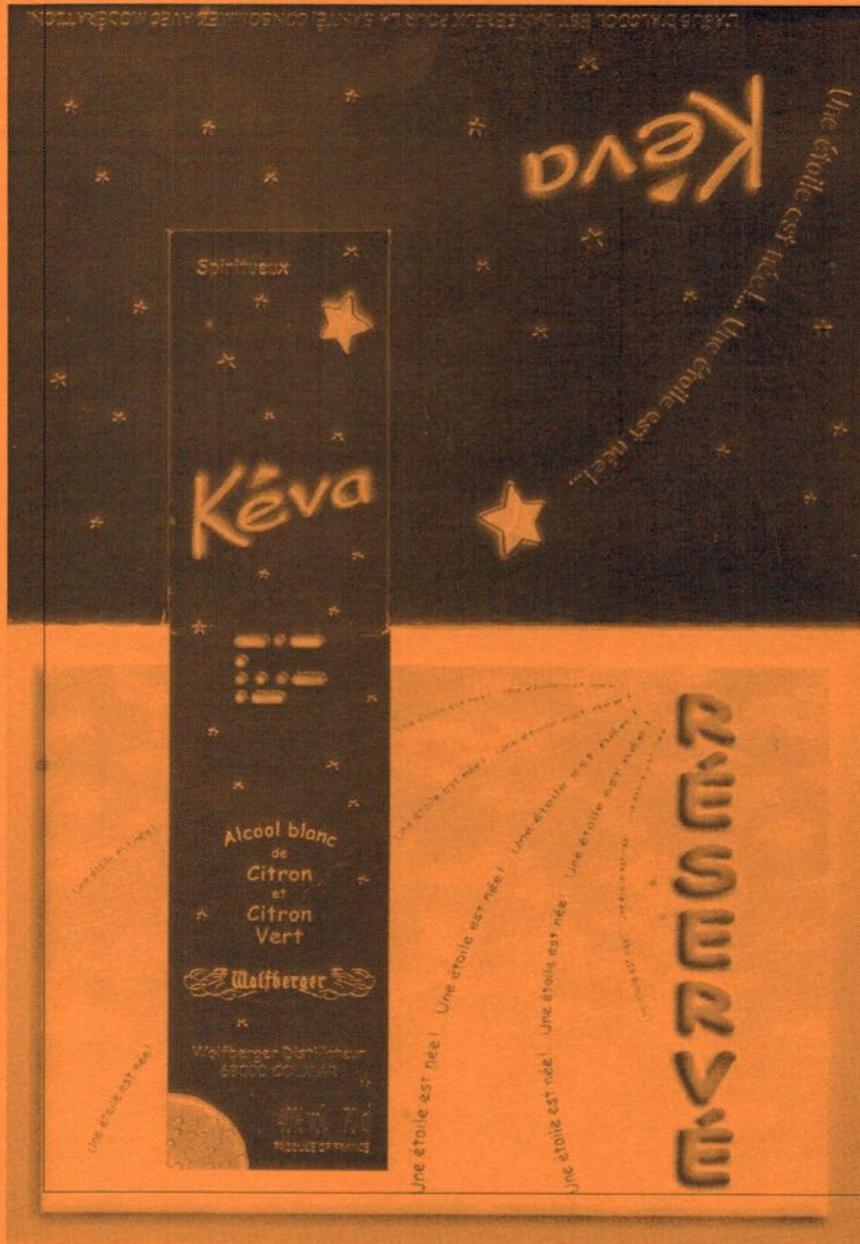
Found in a Strasbourg restaurant recently by Jacob Henri, F6GTC, to reserve a table. It promotes a new liqueur by the Alsation distillery, Wolfberger. The name 'Keva' has been translated into Morse. (It must have been a high-class restaurant - Ed.)

Historic QSL Cards

Historic Cards from the collection of Tony Ricicki, W2VRK

3QW- Dated 1921, this card is from Linwood G. Lessig, K4SV, when he was a 16 year old "Spark" transmitter operator in Pottstown, PA., USA. This is a very early example of homemade QSL cards used in the United States. Mr. Lessig was first licensed in 1920 at age 15 and built all his own equipment.

0BA - Early Dutch card. Op. E. J. Wiering of Rotterdam confirming a QSO with U-2BGI of New Jersey, USA in 1925.