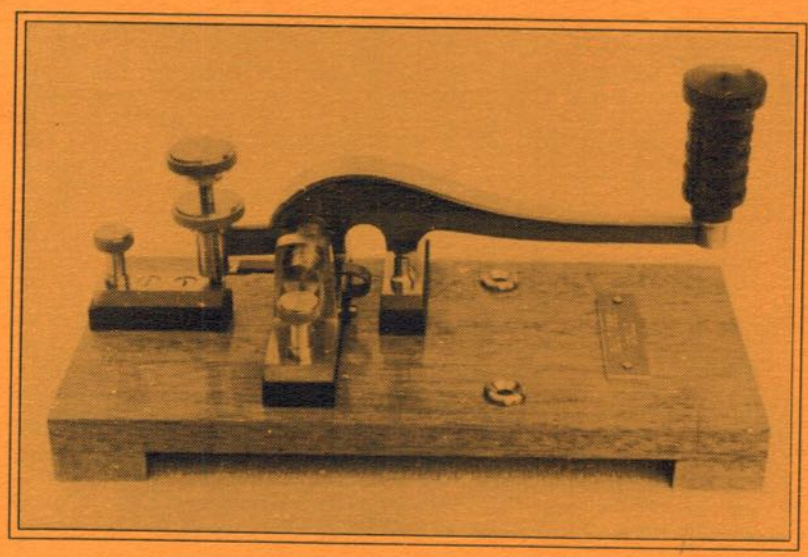
Flying the flag for Morse

Number 30 – October 1993

Morsum Magnificat

The Morse Magazine



Reproduction of a Camel-back key from the period circa 1860

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Morsum Magnificat

the Morse Magazine

MORSUM MAGNIFICAT was first published as a quarterly magazine in Holland, in 1983, by the late Rinus Hellemons PA0BFN. Now published six times a year in Britain, it aims to provide international coverage of all aspects of Morse telegraphy, past present and future. MORSUM MAGNIFICAT is for all Morse enthusiasts, amateur or professional, active or retired. It brings together material which would otherwise be lost to posterity, providing an invaluable source of interest, reference and record relating to the traditions and practice of Morse.

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ON OUR FRONT COVER

Reproduction key, period c.1860, a type used by the Post Office when it took over the UK telegraphs in 1870. Made by Dennis Goacher, G3LLZ, mainly from brass and assembled on a mahogany base using ebonite mountings. The arm is painted similar to originals in the Science Museum and Telecom Technology Showcase, although others have been observed with a plain lacquered brass finish. The knob fitted is made of wood, unlike the originals which were made of ebonite or porcelain, and has fewer grooves than some versions. The porcelain knobs could have been ordinary cupboard door knobs as some examples have a flower design and are very similar to the door knobs of the period. The reproduction arm was made from six separate parts, silver soldered together. The originals would have been castings. The tension spring has no adjustment, making the key heavy in use. The ebonite mountings are unpolished and the brass parts are lacquered apart from the arm as already mentioned. The base has a modern polyurethane varnish. The originals would have been french polished. Photo: G3LLZ.

Comment

DESPITE what some enthusiast magazines do, I've never believed they are an appropriate place to indulge in what might be termed as 'politics'. However, we are faced once again in the UK with the threat that newspapers, magazines and books, instead of being zero-rated for VAT as at present, might be taxed at anything up to the current 17½% Standard Rate in the autumn Budget. So, I'm going to break my own rule by appealing to readers to lobby against the move. There are hundreds of small, specialist magazines like *Morsum Magnificat* which could well disappear if this 'tax on learning' were to be imposed, even at a rate lower than 17½%.

Apart from the higher costs facing readers, which could well make them think twice about renewing their subscription or buying a book, the extra paperwork and accounting which the publishers would have to do would be crippling. We've already had to cope with the extra records and calculations resulting from the imposition of the so-called 'Single European Market' – don't let anyone kid you that it means universally less paperwork! Neither let the government convince you that VAT on magazines and books would be just a temporary measure – EC law prevents any commodity being returned to zero-rating once it has had VAT levied upon it.

Such an imposition of VAT is something which would affect not only our readers in the UK, but those in other European Community countries as well. Please write and protest to the Prime Minister at 10 Downing Street, London SW1, and send a copy of the letter to your local MP as well. Do it now, before it's too late!

Geoff Arnold

G3GSR

Contents

Advertisement Index

News

EUCW Fraternising CW QSO Party 1993

The EUROPEAN CW ASSOCIATION'S 12th CW Fraternising Party will be held on 20–21 November 1993 as follows (all times UTC):

20 November

1500–1700	7.010–7.030MHz
	14.020–14.050MHz
1800–2000	7.010–7.030MHz
	3.520–3.550MHz

21 November

0700–0900	7.010–7.030MHz
	3.520–3.550MHz
1000–1200	7.010–7.030MHz
	14.020–14.050MHz

All amateur and SWL stations in Europe are invited to enter in one of the following four 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 – Short-wave listeners.

Exchanges: Class A & B, RST/QTH/Name/Club/Membership number. Class C, RST/QTH/Name/NM (i.e., 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 EU 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.

EUCW clubs are AGCW-DL (Germany); Benelux-QRP; BTC (Belgium); CTCW (Portugal); EHSC (Extremely High Speed Club); FISTS; FOC (First Class Operators); G-QRP; HACWG (Hungary); HCC (Spain); HSC (High Speed Club); INORC (Italy); OK-QRP (Czech Republic); SCAG (Scandinavia); SHSC (Super High Speed Club); UCWC (Russia); UFT (France); U-QRQ-C (Russia); VHSC (Very High Speed Club), and members of these clubs are especially asked to support this event.

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. To be received by the EUCW Contest Manager, Guenther Nierbauer DJ2XP, Illingerstr. 74, D-6682 Ottweiler/Saar, Germany, not later than 20 December, 1993.

Certificates will be awarded to the three highest scorers in each class. Additionally, by courtesy of Jero Orellana Ramirez EA3DOS, 'Lilliput' miniature keys (as described in MM29, p.5) will be awarded to the three highest scorers. The highest scorer from each country will also receive a 'Lilliput' key, provided they are members of an EUCW Club.

This event offers a good opportunity to make contacts qualifying for the 'Worked EUCW' Award (see below).

Worked EUCW Award

The EUROPEAN CW ASSOCIATION'S 'Worked EUCW' Award offers an award certificate 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 RF output transmission power; and 'SWL', for short-wave listeners.

Open to both members and non-members of EUCW Clubs, the requirements of the award 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, 27 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 may be obtained by sending two IRCs to the EUCW Award Manager, Guenther Nierbauer DJ2XP, Illingerstr. 74, D-6682 Ottweiler/Saar, Germany.

The EUCW Fraternising CW QSO Party (see above) offers an excellent opportunity to gain qualifying points for this prestigious award.

TOPS Activity CW Contest 1993

THIS YEAR'S TOPS CONTEST will be held from 1800 UTC, December 4, to 1800 UTC, December 5, on frequencies 3.500–3.560MHz, with 3.500–3.515MHz reserved for DX contacts.

It is open to all amateurs, whether TOPS members or not, in three classes: A, single operator; B, multi-operator; and QRP, single operator, up to 5 watts output. Certificates of merit will be awarded to the highest scorers.

This contest continues to be popular both in Europe and further afield. There have, however, been few entries from the UK in recent years, and more will be welcomed.

Further information about the contest is available from Chris Hammett G3AWR, 48 Hadrian Road, Newcastle upon Tyne, NE4 9HQ, England.

Pay Up Or Else!

THE RADIOCOMMUNICATIONS AGENCY, Britain's licensing authority, has announced new procedures for the renewal of amateur radio licences as from 1 October 1993.

Renewal notices will now be sent to licensees six weeks before the renewal date instead of four weeks as at present. If payment is not received within those six weeks, and a final notice is ignored, the licence will be cancelled.

Those wishing to continue operating after a licence has been cancelled through non-payment will be treated as new applicants. They will then have to produce the relevant documents required to support the application, e.g., a Radio Amateurs Examination pass certificate for class A or B and a Morse test pass

slip for class A. Further information can be obtained from the Radiocommunications Agency, tel: 071-215 2263, or Subscription Services Ltd on 0272 258333.

IARU Region 1 Conference Motions

AUSTRIA

The national radio society of Austria, OVSV, submitted the following motion to the IARU Region 1 Conference held in Belgium in September.

(C4.18) **1.** The Conference should maintain its present position concerning the necessity of a Morse code test without technical aids as part of the licence requirements for amateur radio operators under 30MHz as long as the present Radio Regulations have not been changed in this respect.

The testing procedures should be left to the discretion of the national communications authorities, with a minimum requirement of 12 wpm to be maintained.

2. Should the Radio Regulations be amended to the effect that no Morse code is required any longer, OVSV maintains the position that the respective highest national licensing class should at least include the requirement to receive Morse code without technical aids at a minimum speed of 12 wpm. In such a case, OVSV supports a change of the delineation between 'code' and 'no-code' licences from 30MHz to 28MHz.

3. In any case, the use of Morse code should be bound to a respective licence class that includes a code test. Limited use of Morse code for training purposes, however, should be encouraged on frequencies above 144MHz in preparation for the 12 wpm requirement.

ISRAEL

The national radio society of Israel, IARC, originally submitted two recommendations to the conference affecting CW operation. One recommended that CW and SSB users should cede some portion of their allocation to the users of digital communications to ensure a minimum of 20 per cent of each band being allocated to NBDP and data transmission modes. The other recommended replacing the amateur Morse test with an AMTOR (NBDP) test.

Before the conference, however, the IARC Committee voted unanimously to withdraw the recommendations (including a third recommendation concerning spread spectrum experimentation) as it wished to reconsider its position on these matters. An official notice of withdrawal was sent to the Secretary of IARU Region 1 by the President of IARC on 21 August 1993.

*(*MM *hopes to report in the next issue on any decisions of the conference affecting Morse telegraphy. Would any readers who attended the conference, or have information about its proceedings, please send details to* MM. *– Ed.).*

US Medical Exemptions Challenged

MANY MEDICAL DOCTORS who sign telegraphy exemption statements (i.e. Amateur Morse test exemption) on their patients' FCC Form 610 applications are being written to by the FCC in Gettysburg concerning the alleged disability and potential exam accommodations.

The telegraphy exemption request is routinely denied if the doctor fails to respond within 30 days to three questions from the FCC. Many do not!

Although the FCC notifies the applicant, the form 610 application is not returned or acted upon by the FCC.

W5YI Report, *15 September 1993*

For Your Diary

READERS WHO HAVE ONLY recently become interested in the history of telegraphy frequently ask: 'Where can I find keys and other items to build my collection?'

With the growth of interest in radio and telegraph equipment of bygone days, there are often items of vintage equipment, components and books to be found at rallies and other shows staged primarily for radio amateurs. Keep an eye on your local papers, which often carry announcements about such events.

Morsum Magnificat/Radio Bygones is scheduled to attend the following events during the rest of 1993, with the full range of publications from our Bookshelf, so come along and say hello!

The 1993 **Leicester Amateur Radio Show** is scheduled for **Friday and Saturday, 29/30 October**, at its usual venue of the Granby Halls in Leicester.

The 7th **North Wales Radio and Electronics Show** takes place at the Aberconwy Conference and Exhibition Centre, on the seafront at Llandudno, on **Saturday and Sunday, November 6/7**.

STOP PRESS!

IARU Region 1 Conference Morse Vote

After discussion of the proposals put forward by OVSV (Austria), the following motion was carried with 38 votes in favour, none against, and abstentions from REF, AGRA (by proxy held by REF), URE, RSGB and ROARS.

'The Conference maintains its present position concerning the necessity of a Morse code test without technical aids as part of the licence requirements for radio operators under 30MHz.'

During the discussion, the RSGB reported that the recent survey carried out among their members revealed an overwhelming majority in favour of maintaining a Morse code requirement. However, as the matter had not yet been discussed by their Council they felt unable to vote on it.

There will be a fuller report in the next issue of *MM*, including the reasons for the abstention of REF.

PLEASE NOTE

Tony Smith G4FAI, will be moving house shortly. Until his new address is announced, please send your News to the Editorial Office in Broadstone.

Telegraph Manipulating Key Design

by H.J.H. Wassell

THE NEED FOR a somewhat smaller key than current models for marine applications, coupled with the very obvious fact that operators have many different ideas as to the 'ideal' key, led to the consideration of some fundamental conceptions in the process of hand keying; to the detailed observations of many operators and their keying methods, and finally to the design of a new key. The present article outlines some of these fundamental considerations and describes the new key.

FUNDAMENTAL CONSIDERATIONS

The Sequence of Events in Keying

The following sequence of events takes place in any form of keying: (i) The pressure of the spring has to be overcome. (ii) The mass of the key has to be accelerated (the movement is essentially in the arc of a circle in conventional type keys). (iii) The energy of the moving mass has to be dissipated as the forward contact is reached. (iv) The hand pressure is released. (v) The mass has to be accelerated in a reverse direction by a force dependent mostly on the return spring but partially on the hand pressure. (vi) The energy of the moving mass has to be dissipated as the top contact is reached.

Transit Time and Factors Affecting It

At a hand speed of say 35 wpm the time for keying cycle is 1/28th of a second, and if the keying form is going to be good it is essential that the transit time should be a small proportion of this, say 1/10th of the dot time, which equals 1/280th of a second.

At the minimum hand keying speed, say 6 wpm, the time for cycle is 0.2 of a second and allowing for 1/5th of the dot time for transit time (in the case of a poor or learning operator) we get a transit time of 0.04 of a second.

To obtain a small transit time it is necessary to have: (i) A large force. (ii) A small mass. (iii) A small gap.

Now a large force is most undesirable since an operator would become rapidly fatigued if he had to exert high pressure on the key.

A small gap is practicable providing the electrical energy of the circuit to be keyed is relatively small. (It should be noted however that many older operators who have been used to a large gap would require re-education in this matter.)

It becomes important therefore that the mass to be accelerated should be small. It should be noted, however, that not only has the mass of the knob and moving bar to be accelerated but also that of the hand itself. Here of course we have considerable variations in mass but

it is likely that an added mass of greater than one ounce will be appreciated by the hand.

Effect of Impact

The mass of the moving key arm has to be decelerated when impact occurs at the contact. This will cause several effects since the energy has to be dissipated, partially as heat and partially in the form of sound.

Transverse Vibrations

The existence of vibrations in the bar of the key will cause confusion to the operator, particularly if their natural period is within or near the period of key movement.

The natural period of transverse vibrations will depend upon the inverse square of the length, the inverse root of the weight per unit length and directly as the root of the moment of inertia of the cross section of the bar. Now in the case of typical existing keys it will be found possible for the natural period of transverse vibrations to be comparable to the required transit time of the highest hand-keyed speeds (i.e., of the order of 1/280th of a second, see above).

It is clearly desirable therefore that the key should be so designed that the natural period of such vibrations is much smaller than that of the transit time. This implies again that the mass should be as small as possible. It also implies that the length of the bar should be small, but there are distinct limitations to this for other reasons. The amplitude of the vibrational deflection will be proportional to the weight per unit length of the bar and the 4th power of the length so that here again we require to keep the mass as small as possible.

In view of these requirements for small mass it would seem logical to use a lightweight material such as aluminium. There is another factor, namely that of 'deadness' which is desirable in a metal for use in the bar of the key. The expression 'deadness' implies that any vibration which is set up will be quickly damped out.

This factor is numerically indicated by the inverse of the specific acoustic resistance (numerically equal to the density of the material multiplied by the velocity of sound in the material) and typical values are:

Aluminium 138×10^4 grams/sec cm^2
Copper ..... 316×10^4 grams/sec cm^2
Steel ..... 390×10^4 grams/sec cm^2

It will be seen that aluminium is advantageous from this point of view as well.

The Natural Period of Oscillation as a Pendulum

It is clear that the natural period of the oscillation of the bar of the pendulum should not be comparable to any value of transit time required during keying. As was illustrated above, the longest time for a half-cycle is about 0.2 of a second and it is obviously desirable that the natural period of the key should be appreciably greater than this. While many of the older keys have natural periods which are fairly long, care had to be taken not to reduce it too seriously in attempts to reduce the mass and size of the key for other reasons.

When the blow at impact is applied to the compound pendulum of the bar a resultant force will be applied to the pivots unless the blow is struck at the centre of percussion of the bar. Not only

will this force be present at the pivot but further complex vibrations will be set up in the bar as a result. It is therefore desirable to position the contacts at or about the centre of percussion. This centre has not, fortunately, a very sharply defined position, but in the case of a typical key bar will cover a length of about inch. The effect of minimising force at the pivot of course will result in a minimum pivot wear.

Locus of Knob

Since the movement of the hand in keying is pivotal, based upon either the wrist, the elbow, or somewhere between the two, dependent upon the individual operator, the ideal locus for the knob would probably be therefore one based upon a pivot say 5 or 6 inches in the direction of the hand from the knob.

Such an arrangement would of course be very cumbersome mechanically and in general the hand does not object to a motion which is linear. The normal practicable key of course tends to have a circular motion in which the pivot is away from the hand, and here, if the gap is large and the radius small, the hand is forced into a movement which is definitely unnatural with resulting fatigue.

It has been found experimentally that the hand does not appreciate the divergence of the movement from a vertical locus if the radius is greater than about 2 or 2½in and providing the gap is kept reasonably small.

It has been suggested that, while the force supplied to the knob by the hand when the operator is fresh is very largely in a vertical direction, when the operator becomes tired the hand drags and there is an appreciable force on the knob towards the operator. It is desirable therefore that the location of the knob should be above the pivot point so that this forward force does not oppose the depression of the key.

Summary of Desired Conditions

From the above considerations we may summarise the conditions which are to be aimed at in any key design:
(i) Small mass of moving arm.
(ii) The use of 'dead' metal for the arm.
(iii) The use of arm length not less than 2½in but not greater than is necessary so that the transverse vibration amplitude is low.
(iv) A small gap having regard to the electrical loading.
(v) Contacts at or about the centre of percussion.

EXISTING KEYS

Forms of Keys

The basic way in which keys differ among themselves may be outlined in the following sections:
Contact groupings

The following contact groupings exist:
(a) Back and front contacts on either side of the pivot point. (b) Back and front contacts on opposing sides of the bar at the opposite end of the bar to the knob. (c) Back and front contacts on opposing sides of the bar at the same end of the bar as the knob.
Spring positioning

This is normally by a tension spring at the back of the key or a compression spring at the front.

Table 1

A	B	C	D	E	F	G	H	
5	1	-	1	1	-	1	2	1st Choice.
1	-	-	-	3	-	1	4	2nd Choice.
-	6	-	-	2	-	1	1	3rd Choice.

Table 2

A	B	C	D	E	F	G	H
17	9	-	3	11	-	6	15

Bearings

These normally are: (i) Plain journal. (ii) Adjustable cone pivots. (iii) Ball bearings.

Material of Bar

This is usually brass or aluminium.

Method of Contact Adjustment

The contacts are usually at the end of screwed studs which may be locked either by a split thread and a subsidiary locking screw or by a locking nut, usually a knurled type.

Knobs

A wide variety of knobs have been produced and these may in general be fitted with or without a skirt.

With the exception of the use of aluminium for the bar material there does not seem to be any adoption of the fundamental principles mentioned above in the design of existing keys. A careful mechanical analysis has been made of a number of keys without finding that their proportions have been dictated by anything other than general constructional requirements.

Operator Tests on Existing Keys

Conditions of Test

A considerable number of keys were set up and were adjusted by individual operators to give what they thought was the best operating pressure and operating gap. These operators were chosen from as many different operating types as possible and having various degrees of experience. In addition they were asked to state their order of preference (1st, 2nd or 3rd). After each operator had set up each key, measurements were taken to find out the knob movement and the knob pressure to which the keys had been adjusted.

Results of Test

The analytical side of these tests formed an initial basis out of which grew some of the fundamental conditions outlined above. It is perhaps interesting here to record the operators' preference. Eight keys were tried and these have been titled A-H. The preferences of the operators are listed in **Table 1**, above.

If we allow three points for the first choice, two for the second choice and one for the third, we get the placing of the respective keys shown in **Table 2**.

Of course this method is entirely arbitrary since there is not necessarily a definite or constant relationship between the merits of a key placed in the 1st, 2nd or 3rd categories.

Of the keys chosen it is interesting to

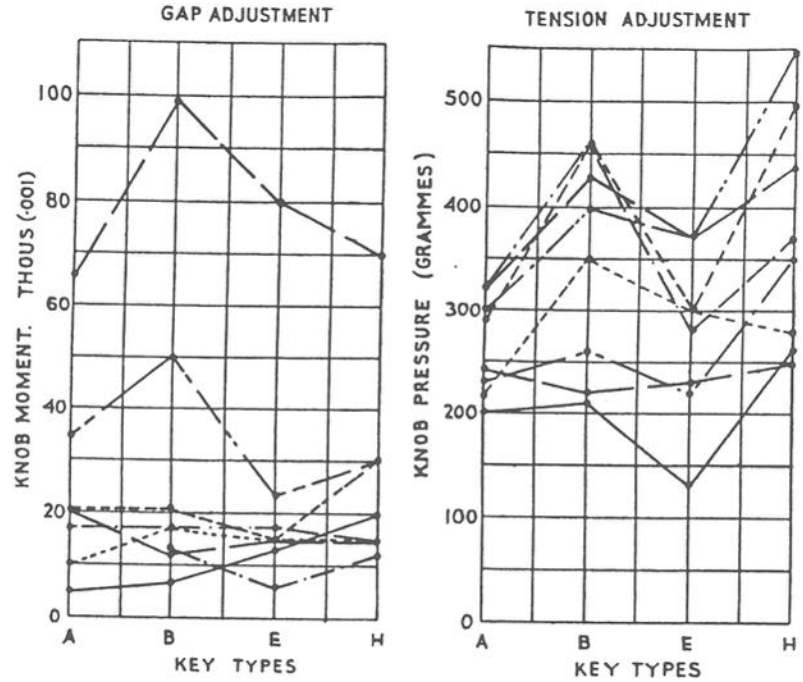


Fig. 1. Gap and tension adjustment

note that A was a key that had been used extensively by sea-going operators, while H was a key that had been used a great deal by land-station operators.

Some of the operators' adjustments of the four preferred keys are shown on **Fig. 1**. It will be noted that while there is a remarkable unanimity between different observers as to the relative way in which one key can be set up compared with another, there is a vast range of adjustments to which an individual key may be set up to suit differing operators.

Comments of Operators

Apart from making manual adjustments, observers were encouraged to comment on each key and state reasons for their preferences. Most of these reasons were expressed in vague and unscientific terms. It is obvious that the way in which the operator had been trained in the use of the key was having a considerable effect upon his comments. It is clear that the introduction of any new key would require an appreciable amount of education to be universally approved even if it were demonstrably superior.

One expression which was used by a number of operators was that they preferred a key which had a 'definite' feel and disliked a key which had a 'woolly' feel. This 'definiteness' would seem to be a mixture of a desire for little or no follow through of the key once the contact has been reached, combined with an absence of spurious vibrations. Thus from this point of view a really bad key

would have a very large mass with spring-supported contacts.

Another property which operators appreciate is that of 'liveliness'. This would seem to be a property given to a key by minimum mass and minimum frictional resistance. Another expression used by several operators was that at high speeds 'the key should send for you'.

By this it is thought that the operators mean that there should be no disturbing resonances which would introduce forces in opposition to those necessary to manipulate the key, and that if the force applied to the key is not necessarily truly vertical the movement of the key should still substantially be in the desired direction.

GENERAL FEATURES TO BE AIMED AT IN ANY KEY DESIGN

Quite apart from the considerations listed above under 'Fundamental considerations', there are a number of features concerned with the functional design of a key which should be borne in mind in any new design.

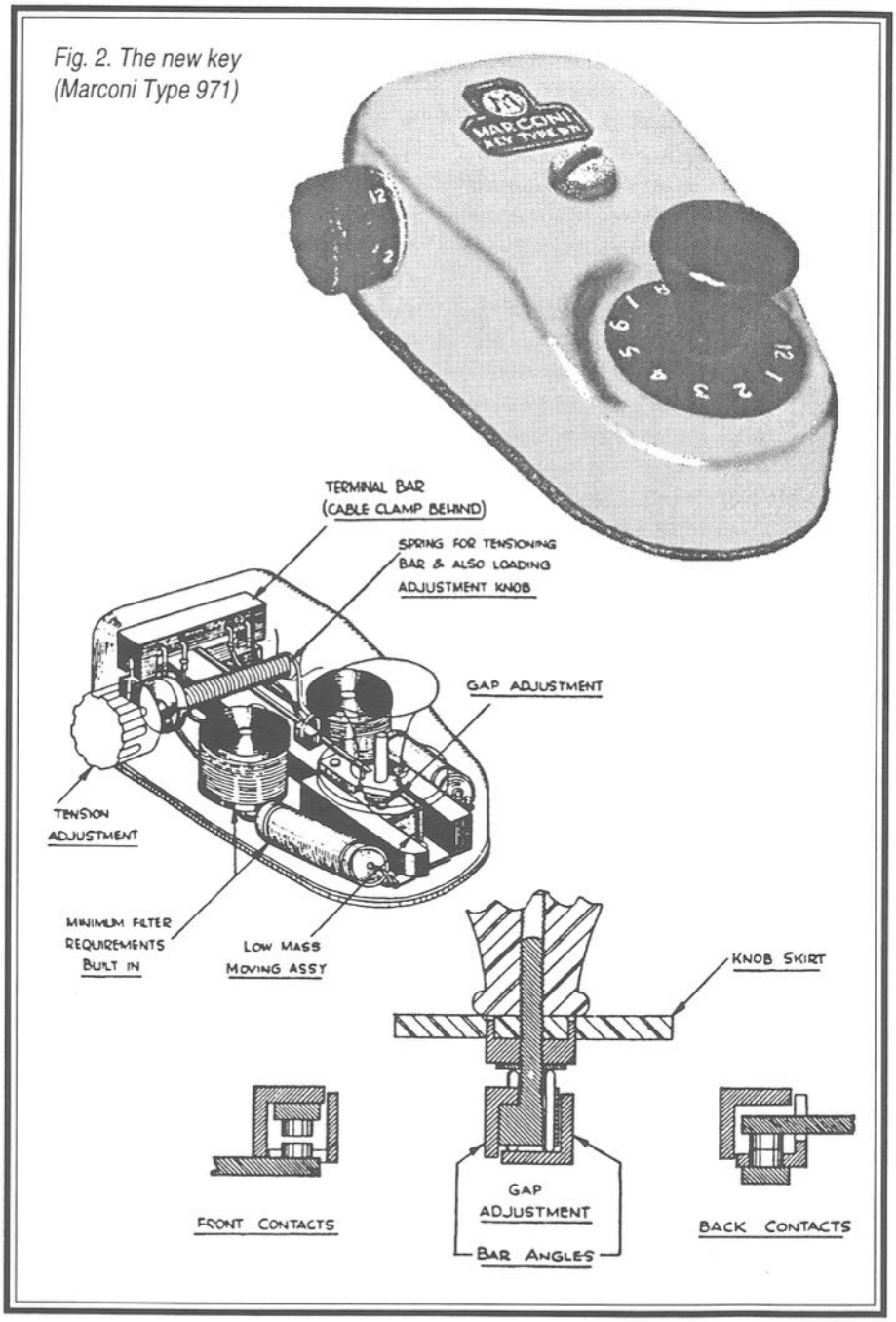
These may be listed as follows:

1. The key should have small dimensions consistent with performance considerations.
2. The key knob should have a minimum height above the table level. There are two general schools of operators:
(i) Those preferring the key at the front of the bench so that the whole of the hand and arm are unsupported. This is generally regarded as the British method.
(ii) Those preferring the key at the back of the bench, in which case the arm is usually rested at the elbow. This is normally regarded as an American system.

While the height of the knob above the bench is not of any great importance for the first school, it is desirable that it should be as low as possible when operated at the back of the bench in order to minimise wrist fatigue.

3. The adjustments of the gap and tension should be simple and positive. Since there are at the moment a very wide range of personal preferences for the adjustments of these variables, it is clear that ideally they should be capable of adjustment between shifts of operators.
4. The bearings for the key should either be easily adjusted or of a type which will not develop backlash. The latter type is to be preferred since the desired properties of free running yet having operation without backlash must of necessity call for comparatively skilled adjustment.
5. Since any key is the source of radio interference due to the generation of small sparks with the consequent shock excitation of associated circuits, it is desirable that some measure of filtering should be incorporated in the key itself and that the key should be adequately screened.
6. No access should be possible to any of the contacts which may have electric potentials on them with respect to earth.
7. Provision should be made for front and back contacts, with the bar of the key earthy, but not earthed. Some keys in the past have had additional auxiliary contacts but it is felt that the necessity for these is largely past as more modern apparatus is being used and since it is practically impossible to provide really satisfactory high speed operation when

Fig. 2. The new key (Marconi Type 971)



multiple contacts have to be adjusted and maintained.

8. Ready access should be provided for contact cleaning.

9. The parts of the key should lend themselves to production in large quantities.

DETAILS OF NEW KEY

Specifications

Having regard to the above considerations a new key was designed. A photograph and a schematic view of the key are shown in **Fig. 2**.

A comparison between the data for the 'A' key of the previous tests and for the new key (Marconi Type 971) are given in **Table 3**.

Bearings

Since it was considered desirable to use bearings which would not need adjustments, the alternative seemed to lie between ball bearings on the one hand and knife bearings on the other. Ball bearings have been used successfully in the 'A' key but on the one hand they are fairly expensive and on the other are not basically designed for extremely minute reciprocating movements. On taking down the races of an 'A' key (of unknown life history) it was found that the balls had worn an appreciable dent in the race.

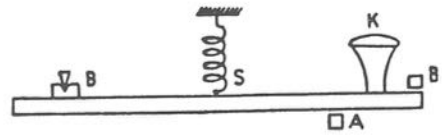


Fig. 3. Bar, contact, spring and bearing arrangements of the new key

The use of spring loaded knife edge bearings seemed to have attractions from the point of view of automatic adjustment for wear and low friction, but it was essential to take into consideration the way in which the force produced by the hand on the knob of the key affected the load on the bearings.

In **Fig. 3** are shown schematically the bar, contact, spring and bearing arrangements of the key. It will be noticed that the front contact of the key is fitted between the knob and the bearing while the back contact of the key is fitted to the side of the knob remote from the bearing, thus ensuring that when the knob is pressed down or pulled up the pressure is still maintained towards the bear

Table 3

	'A' Key	New Key
Weight	3lb 2oz	1lb 3oz
Volume (Overall cuboid)	158 cu.in	23.5 cu.in
Plan (Overall)	49 sq.in	19 sq.in
(Body)	40 sq.ins	14 sq.in
Mass of Moving Arm (less pivot bar)	4 oz	2 oz
Length between Knob and Pivot	3 13/16 in	3¼ in
Height of knob skirt above bench	2 in	1 1/16 in
Nat. period of transverse vibrations	470 c/s	4200 c/s
Amplitude of transverse vibration for given impact	1 unit	⅛ units
Nat. period of bar as pendulum	0.72 sec	0.57 sec

ing. (It is not thought to be good practice to pull the key upwards, but there are nevertheless some operators who do so).

The contacts A and B in the new design are placed symmetrically about the knob and close to it, so that the relatively large leverage involved will produce only a small force at the bearing. Furthermore the whole combination of knob and contacts is arranged to be at and about the centre of percussion of the bar.

While the spring S acting on the bar tends to maintain the pressure on the bearings, additional spring loading is provided at each bearing to minimise any side rock on the arm.

Tension and Gap Adjustments

An attempt has been made on this key to get the necessary adjustments for tension and gap within a single turn of the adjusting devices so that ready resetting of the adjustments to any predetermined value desired by the individual operator can be achieved.

In the case of the gap adjustment two separate contacts are used on the bar for front and back contacts and these are mounted on two separate aluminium angles whose relative position is controlled via a nut on the actual knob mounting. This nut is turned by moving the skirt of the knob which carries a scale on its periphery. The skirt is locked into position by the knob itself.

The pressure adjustment is made by torsional adjustment of the pressure spring into one of twelve pre-set positions by means of a knob on the left hand side of the key. This knob has to be pushed towards the key before it can be turned. The same spring which provides tension for the key also acts as spring loading for the adjusting knob.

Knob Height and Shape

The height of the knob has to be kept to a minimum above the deck, and in this case the skirt is about 1 1/16 in above the deck. The knob shape was chosen as a result of the preferences expressed by the operators using previous keys. There was an overwhelming preference for a skirt to be fitted to the knob. The top of the knob is patterned to avoid slipping in damp climates.

Click Suppression Filters

It is not possible to supply filters which will satisfactorily suppress any spark interference at the key without reference to the circuit with which the key is to be used. There is however a general minimum of filtering which is always necessary and this has been incorporated into the key itself.

With most modern circuits no extra filtering will be needed, and in general where it has to be augmented this can be done satisfactorily at the transmitter end of the key lead.

Contacts

Four contacts are used, all identical in mechanical arrangements. Since the modern key does not have to cope with such serious arcing conditions as past keys, it was felt that the contact material could be biased towards that which will give good life combined with low contact resistance rather than having a good arc resistance as well.

Bench Mounting

A bottom plate is provided for the key which can be screwed down to the bench and to which the key can be

fastened by a single securing screw.

Observer Tests

Observer tests were carried out between the new key and the two keys A and H which received preference in the previous observer test. All three keys were set up under an obscuring shroud and fitted with identical knobs and skirts so that the observer could not tell the difference by visual inspection. Again general tests were carried out and preferences given. The following table gives results of these preferences:

A	B	C	
1	4	5	1st Choice
4	3	3	2nd Choice
5	3	2	3rd Choice

Again allowing three points for a first choice, two for a second choice and one point for a third choice, we get the following results:

A	B	C
16	21	23

In this test, key 'A' was key 'H' of the previous test, key 'B' was key 'A' of the previous tests and key 'C' was the new design.

It is interesting to note that the same order of preferences of 'B' over 'A' was maintained although different observers were used and visual inspection was not permitted. It is also interesting that the new key had a majority preference.

Conclusion

It seems that there are definite scientific reasons for the apparently vague preferences of operators and that the incorporation of these principles in the new key has been justified in as much as the necessary reduction in size has been achieved and at the same time the operators' preference over other keys obtained.

Reprinted from The Marconi Review, *No. 82, July–September 1946, with permission of The Marconi Company.*

The Type 971

A Personal Recollection

by Geoff Arnold

WHEN I WENT TO SEA at the end of 1950, the key Type 971 was standard equipment on all new or recently refitted ships carrying Marconi Marine equipment.

On passenger ships, they proved popular at first because of the simple and calibrated adjustments provided for tension and gap. One of the basic principles instilled into a junior radio officer joining his first passenger ship was that the key was adjusted according to the Chief's preferences, and if you would rather have a different tension or gap then 'Tough!' – for you altered the settings at your peril! The Type 971 brought with it the possibility of each operator setting the key quickly and repeatably to his own preferences.

Mind you, it was possible to upset things if you turned either control too

hard against its end stops, as it could upset their calibration.

Unfortunately, though, it soon proved that the construction of the Type 971 was simply not up to the sort of battering they received, either in the normal course of use or, more especially, when being subjected to all sorts of sideways stresses when being operated on a heavily rolling and pitching ship. They did not take kindly to being crunched by a typewriter sliding along the desk either!

My own recollection of using the Type 971 was that it felt as if the bar was mounted on sorbo-rubber, for the knob would rock quite wildly from side to side. It also felt 'dead' and was, I thought, a most unpleasant key to use. I would be very interested to hear from other past users of the Type 971, and their impressions of the key.

During the early 1950s, collapsing Type 971s were gradually replaced by refurbished Type 365As, presumably resurrected from scrap-bins at various Marconi Marine depots. These had the back-end of the bar (which had operated the auxiliary contacts – see inside back cover of MM17) sawn off, so that they now provided just one 'make' contact to key the transmitter and one 'break' contact to provide receiver muting and protection. A few of these refurbished and modified keys had sleeve bearings, but most which I encountered had ball-race bearings. The old stock was obviously quite quickly exhausted and newly-manufactured keys began to appear. Interestingly, in view of the comments in this article, these had ball-race bearings.

As time passed, a 'cut-down' version of the 365 appeared, in which the insulating base-plate was reduced in size. The new key was housed in an inverted die-cast alloy box rather than the painted sheet brass plinth and cover previously used. I think this new one was identified as the Type 365E.

And so the Type 971 disappeared into the mists of obscurity, other than as a collectors' item. The calibrated gap control was adopted for the NATO Navy Key NSN-5805-99-580-8558 (see MM23, p.42, and 'Letters' in this issue).

The Key Type 971 was a great idea, especially for passenger ships, but sadly one of those examples of theory and practice not agreeing.

MM

Aircraft Identification Switchbox

by Tony Smith

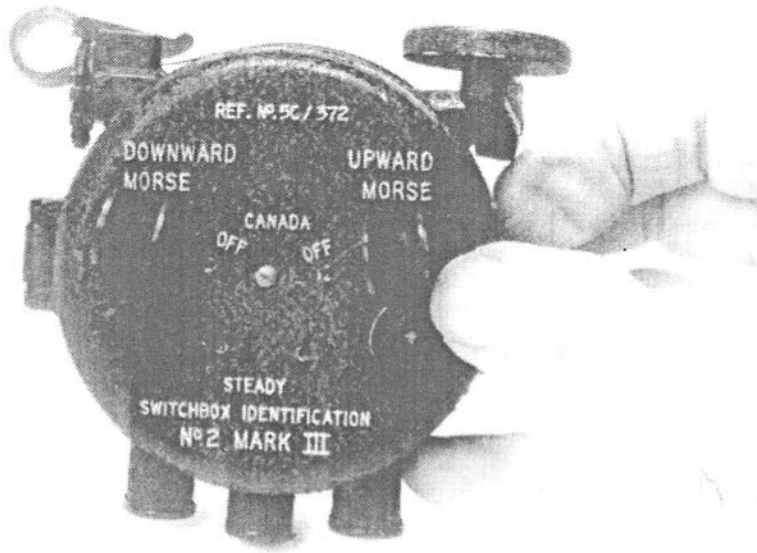
SINCE THE 'SWITCHBOX, IDENTIFICATION' was featured in MM14 (cover and p.39), further information about it has become available. Apart from other aircraft, this unit was fitted to control the upwards and downwards identification lamps of the Spitfire. The downward lamp was on the underside of the fuselage immediately underneath the cockpit, and the upward lamp was on top, just behind the cockpit.

The switchbox was fitted to the starboard (right-hand) side of the cockpit, close to the instrument panel, with the two switches, as shown in the photograph, providing steady illumination or Morse signalling from each lamp, or from both. The power for the circuit, and for all other electrical equipment on the Spitfire Mk V, came from a 12V 40Ah accumulator charged by a 750-watt engine driven generator, which was presumably much the same on other models.

The key is designated a 'morsing key' in the original Air Ministry Manual for the Spitfire Mk V. Its tension can be adjusted by turning the small ring at the top left of the switchbox after depressing a small latch lever which engages in a series of slots, each one of which provides a different tension. The gap can be adjusted by opening the cover and adjusting a screw and locknut at the centre of the cover. This adjusting screw can be seen protruding to the front through the cover in the photograph.

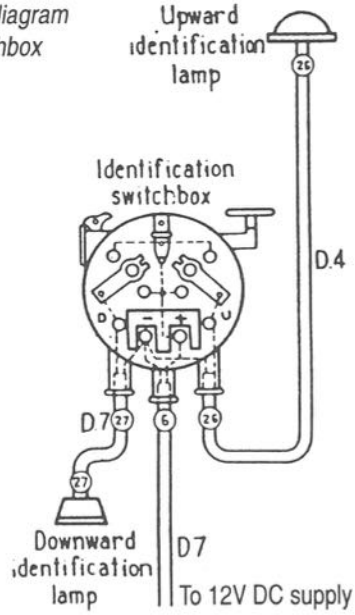
Although not intended for conventional telegraphy, the key is of simple and rugged construction, with a bearing arm and sleeve 30mm long! There is a small lubrication hole on the top of the casing and a few drops of light oil applied via this hole loosens up the key considerably if it is stiff in operation. The minimum gap it can be adjusted to is about 4mm. Presumably the process of keying Morse from the awkwardly placed switchbox while flying an aircraft like the Spitfire was not the easiest of tasks, due to vibration, etc., and the over-large gap, with strong spring tension, even at minimum setting, was intended to help in sending the accurate slow Morse required for visual signals.

The switchbox is finished in black crackle paint, and has a diameter of 85mm. The front cover, which is easily opened, is hinged at the left and secured on the right by a hinged thumbscrew. I found a note on the inside of the cover of the switchbox I acquired recently, stating that it was essential that the external switch levers be placed in the 'steady' position before opening the cover. This probably referred to a circuit condition when in use, rather than some mechanical aspect of the switch. I hope so. I had to open the cover before



Switchbox, Identification, Ref. No. 5C/372
Photo, Murray Willer VE3FRX

Wiring diagram of switchbox



finding the warning, and then it was too late!

Apart from the Spitfire, it is known that the switchbox was also used in Lancasters (two – one each for pilot and co-pilot), the Bolinbroke (again two – one for pilot and one for navigator), and the Anson (info from Murray Willer VE3FRX). It would be interesting to know what other aircraft the switchbox was used on, and over what period. Perhaps it was standard equipment on most aircraft?

The one I have is stamped R.C.A.F. 72. The 72 could represent the year of manufacture, but this seems doubtful. If anyone can add to the information in this article in any way, please let me know. Also, does anyone know what colour the upwards and downwards identification lights were, and in what specific circumstances they would have been used? ***MM***

When Morse Reigned Supreme

by Richard Angove

PRACTICALLY EVERYONE employed in the broad field of line and radio telegraphy will have had, at some time in their career, direct contact with Post Office Telegraphs. Even today there are many who started their working life as 'Marconi trained' operators occupying posts, some in executive positions, at coast and other signal stations. Some of those people can still recall their early Morse days at a 'back-to-back' or other locally-wired key and buzzer circuit, probably at the local Post Office where, until about a decade ago, they still existed until teleprinters replaced them everywhere.

How far away it all seems and what a dramatic contrast were those days of dots and dashes, to the sophisticated multi-channel equipment we take for granted today. The demise of the traditional Post Office telegraph in September last *(1982 – Ed.)* seems an appropriate time to glance back briefly over that momentous century of telegraph history.

Amid the rest of the stirring headlines of the 19th century and into the already flamboyant pattern of steam engines and smoking chimneys came the Electric Telegraph to take, not only Britain, but most of the world by storm.

Britain was then riding on the crest of a wave of industrial prosperity; this new invention patented by Charles Wheatstone and William Fothergill Cooke in 1837 gave it further impetus.

Railway networks were expanding and it became a matter of the greatest urgency to find a medium of communication more rapid than the steam locomotive. Telegraphy was the answer. The subsequent rush to adopt the new idea however led to chaos. In the case of the railways it was not too bad. They had their own self-contained routes and were able to contain the circuits within their own privately-owned property.

But, having tasted the new and intriguing flavour of a seemingly magic recipe for instant contact world-wide, it was inevitable that people everyone should clamour for it. Following the railways, the Electric Telegraph Company was formed. Towns and villages within reasonable distance from railway stations were soon brought within its network by this countrywide company. But for some years there was little legal control and private companies were established in more remote areas. Some attached their transmission lines to trees, rooftops and any other convenient elevated points.

It quickly became obvious that some standardised control was needed. This responsibility was vested in the Post Office by Act of Parliament and the system expanded under that control, much


Counter No.
Office Stamp
POST OFFICE
INLAND TELEGRAM
FOR POSTAGE STAMPS
Serial No.
Charge
Chargeable Words
Sent at/by
Tariff £ excl. RP
VAT £
RP £
TOTAL £
Circulation
Prefix
Handed in
Service Instructions
Actual Words
If you wish to pay for a reply insert RP here
To
BLOCK LETTERS THROUGHOUT PLEASE
THE INLAND TELEGRAM SERVICE
IN EXISTENCE SINCE 1870 HAS
NOW BEEN DISCONTINUED
The particulars on the back of this form should be completed.

as we can remember it, from 1870 until the end of September last year.

Early inland telegraph charges were, by today's standards, extremely low. At 6d. (2½p) for twelve words with 1s. 2d. extra for each additional word, the public's overwhelming response soon caused a major staff crisis. Papers and magazines were full of advertisements for technical and manipulative staff to cope with this new development.

It must be remembered that electricity itself was still something of a mystery to most people. Educational establishments, although teaching some scientific subjects, were not geared to physics and chemistry as they are today, particularly the complexities of magnetism, insulation and the countless other technical factors involved in line communication.

Some of the advertisements, obviously drafted by the local Postmaster, were somewhat naive in their contents stressing such requirements as a 'good head for heights' and a 'knowledge of wire-handling' being advantages! Ladies journals advertised for '... well-bred and educated young ladies to train in the operation of the new electric telegraph...' Preference was given to people between the ages of 20 and 40 who, for the most part, were the children of established civil servants and people prominent in commerce. Regarding the ladies, one advert stressed that '...the daughters of gentlemen of the cloth were particularly welcomed ...'

Remember that, a hundred years ago, apart from domestic service, the textile mills and a few other less-desirable occupations, women in general were not employed on anything like the broad scale they are now. Therefore it was quite revolutionary for the Post Office to break into a labour market hitherto unknown. Within a few years 'working for the Post Office' took its place among the nursing and teaching professions as an acceptable occupation for ladies.

Men, it would seem, were more readily forthcoming and rapidly adapted to the then fairly simple technical duties required. They were also recruited as operators, both sexes later becoming the familiar grade known as C. C. & T. (counter clerk and telegraphist).

Weekly pay varied according to age and ability. Women earned 10s. (50p) rising to 30s. (£1.50) with about half these amounts while undergoing training. At starting ages (14–16) men's scales were the same as for women but on completion of training and from the age of 21 men enjoyed modest advantages over their female counterparts.

Although these people worked long hours by today's standards – between 50 and 60 per six-day week, which was readily accepted at the time – security of employment and working conditions were good. Punctuality was strictly enforced and all regulations concerning secrecy, accuracy of operation and other vital factors contributing to a high standard of efficiency, were rigidly adhered to.

In those largely pre-union days, amenities, compared with offices and shops of the era, were good. Operators in the smaller offices took refreshments to work with them and were provided with a gas-ring or other means of making a hot drink. The larger offices had better facilities and, by the turn of the century, some canteens run by properly trained staff had appeared.

Operators were trained at the nearest local centre or district headquarters for six to eight weeks, after which they were expected to achieve a sending speed of eight to ten words per minute in the Morse code. Received signals were 'read by ear' and written down in pencil at the same speed. Most of them soon advanced to 15 or 20 words a minute with accurately-spaced, well-formed signals.

Frequently, as many readers will know, operators engaged in conversational exchanges exceed these speeds, especially when fully proficient, then adopting the well-known abbreviations and 'telegraphese' so familiar internationally.

In this connection the writer (an ex-operator) has often found that people who are unfamiliar with telegraphy find it surprising that many operators incorporate into their style of manipulation a degree of their own personality in such a way that individuals could often be readily recognised when reading signals 'by ear'.

In a big office as many as perhaps 50 or more circuits could be open at the same time, each would receive a different callsign relating to the distant calling station. Every station had its officially-listed callsign of two to three letters, each sign being memorised and immediately recognised by the staff.

Operators could recognise, even over the tremendous clatter and noise of other circuits, the calls for which they were responsible. A high degree of perception was achieved after years of practice and experience.

Despite regulations to the contrary, names would often be exchanged. While most big Post Office telegraph departments were staffed mainly by females the connecting offices, coast stations, railway and Lloyd's signal stations were manned by male staffs and meetings

...BRIEF PREVIEW...

were sometimes arranged, usually in an adjoining town or village.

These must have been the original blind dates as neither party had seen the other or even heard each other's voice. Tales have been told of the parties concerned creeping down side streets or dodging into doorways to get a brief preview of the waiting date, sometimes to disappear quickly and quietly if the prospect was not up to the anticipated standard. The next day to tender a shakily-transmitted excuse over the wire pleading some sudden illness or an urgent call to work overtime!

By the late 1930s teleprinters had started to replace Morse in all but the smaller and remote offices and the staff were called upon to acquire new manipulative and technical skills. Viewed against today's background with the Post Office employing thousands of counter clerks and telephone operating staff of both sexes some idea of the dramatic changes since the days of secret trysting against a background of stuttering Morse signals may be realised.

(This article appeared in Mariner, *March-April 1983, and is reproduced by kind permission of the Marconi International Marine Company Ltd.)*

Info Please!

Readers require further information on the following keys, etc.
Please write to Tony Smith, via the Editorial Office (see inside front cover), if you can help.
All useful information received will be published in MM *in a later issue*

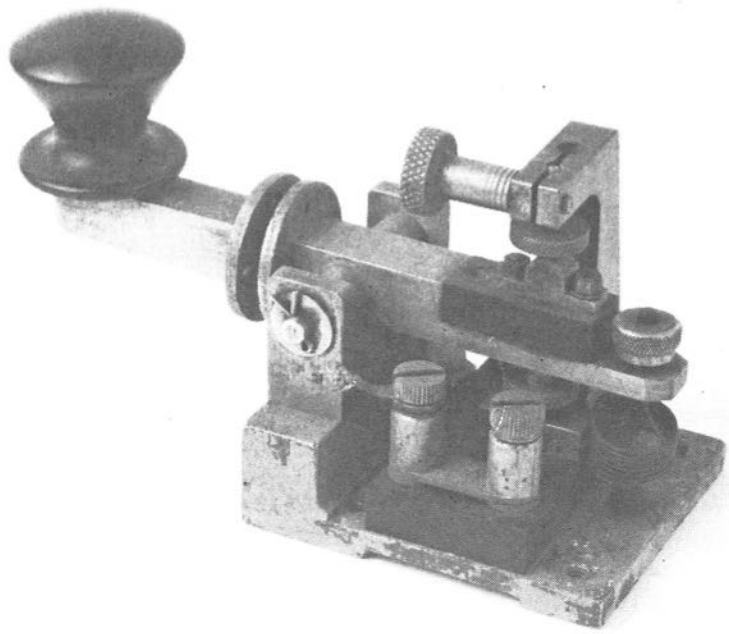
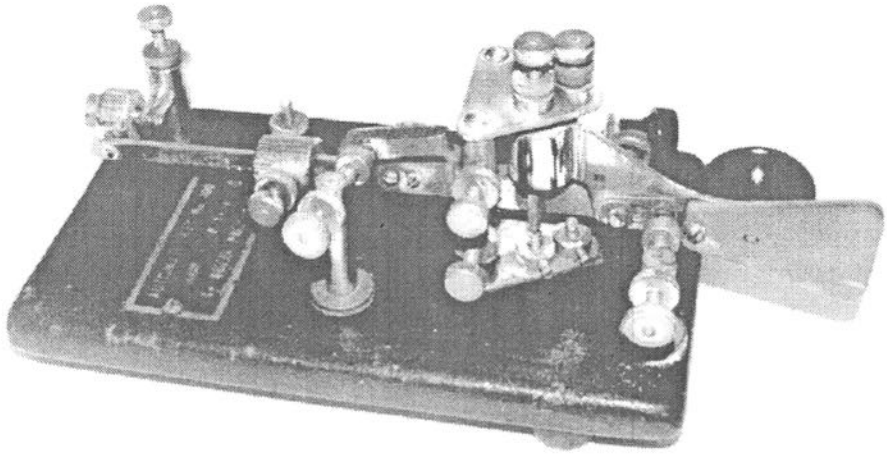


Photo: Geoff Arnold

An unknown key from the Journeaux Historic Wireless Collection

This key is apparently designed to be built into a piece of equipment, as the arm carries fixed and loose flanges with tapped holes, which could be used to secure a weatherproof gasket. The only identification mark is a logo (see right) which appears underneath the cast metal base.
Despite its unusual proportions, the key handles beautifully.
Any information to Geoff Arnold please



Collection/Photo: Colin MacKinnon VK2DYM, Glenhaven, Australia

Buzza Automatic Key No.100, made by Buzza Products, Australia. In wooden case with black leatherette covering and red felt lining. Further information required, e.g., where made in Australia, approximate date, other Morse products made by same company, etc., etc?

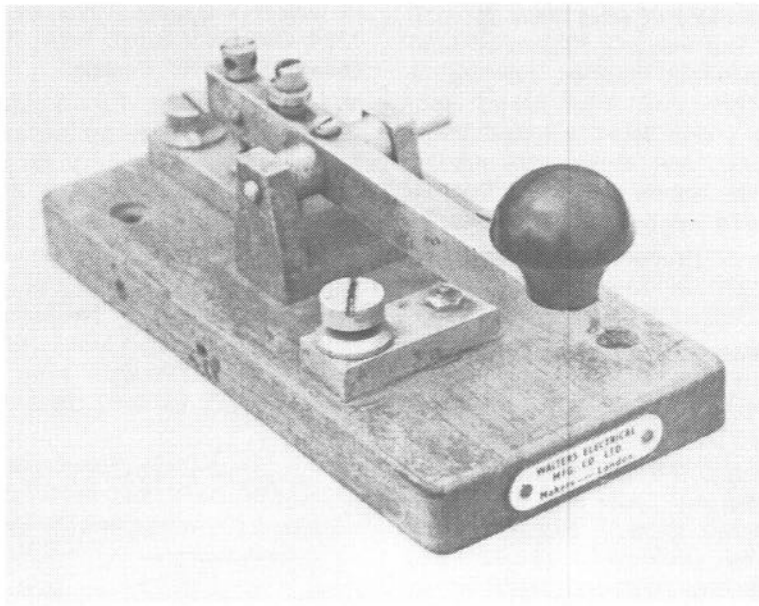


Photo: Malcolm Henchley G0CHZ

Walters Key, possibly a railway key. Does anyone have an old Walters catalogue which would enable this particular model to be identified please?

Readers' ADS

WANTED

Post Office Sounder, any condition. Denis Whitbread G4VGS, 287 Perry Street, Billericay, Essex CM12 0RB. Tel: 0277 624177.

***MM* Back Issues** Nos. 1–20, plus 22, 23, 25. Bob Finch, 7530 Ridgeview Lane, Lafayette, IN 47905-9795, USA, 'phone 317-564-4226.

Very Old Telegraph apparatus (Wheatstone, Breguet, Hughes...). Marconi Multiple Tuner. F. Vanden Berghen, Lenniksesteenweg 462/22, B-1500 Halle, Belgium. Phone +32.2.356.05.06.

FOR SALE

The 'Lilliput Key', as described in MM29, p.5. Miniature key constructed around a piece of solid brass, 50 x 10 x10mm, and weighing 50 grams. Useful for miniaturised stations, camping or holiday operation, or of interest as a collector's item. Jero Orellana Ramirez EA3DOS, Av. Roma 10, 08015 Barcelona, Spain, price £10 Sterling (cash). Key sent by registered post.

Stereocode Processor in die-cast box. (See *RadCom*, Sep '75, p.674, for details). Price £25.00 + postage.

A Handbook of Practical Telegraphy by R.S. Culley. Pub. Longmans 1874, 6th ed. 443pp + 48pp pub. catalogue and including 144 text figs/ccts, 9" x 6". Ex-library copy with taped spine, otherwise fair. Very rare, price £25.00. *Edison* (biography) by G.S. Bryan, c.1934. 304pp, fair, price £6.00. *The Thin Red Lines* by Charles Graves. (WWII history of Cable & Wireless Co) c.1950. 183pp + 29 plates, fair. Price £6.00. *Mastering Morse* by F.J. Camm. Pub. Newnes c.1940, 3rd ed. 32pp, wraps, good. Price £3.00. *Learning Morse* published by Wireless World c.1940, 6th ed. 16pp, wraps, good. Price £3.00. *The Heliograph* by Alan Harfield. 1986, 2nd ed. 75pp inc many illustrations. Wraps, mint. Price £3.00. ***All prices plus postage.*** Alan Williams G3KSU, 11 Grange Avenue, Ryde, Isle of Wight PO33 3LS, 'phone 0983 565551.

EXCHANGE

Key & Plug Assembly No.9, ZA/CAN/BR 0937 (three bridge with angular case) wanted, or Key & Plug Assembly No.9 with American J37 key (as in Group 16 of key survey, MM28). Offered in exchange: J.H. Bunnell Key & Plug Assembly No.9 in mint condition, still in factory wrapping. Chris Bisaillion, 1324 Old Carp Road, RR#1 Kanata, Ontario K2K 1X7, Canada.

Telegraph Keys: Buy-Trade-Sell. Specify needs. Write for list of about 300 keys for trade. Send $1.00 postage (US cash only). Tom Perera K2DCY, 11 Squire Hill Road, North Caldwell, NJ 07006, USA.

Vibroplex J36 bug, Serial No. 1726. US Army Signal Corps. 26/3/42, offered in exchange for Hi Mound 'Mk 702' single paddle. No other swap. Phone Walt, G0TUJ, on 0482 589849 (Hull area).

Readers' ADS are free! Why not use *MM* to advertise your Morse items for sale or exchange or to seek your specific requirements. Send your ADS to Tony Smith, c/o *MM* Editorial Office.

Amateur Radio in the Year 2005

Page from a History Book

by Jim Griffin W9NJP

IN 1996, W9NJP was successful in convincing the FCC to change the maximum power limit from 1000 watts down to 25 watts. The new limit was a compromise, for W9NJP attempted to limit power output to 5 watts.

For historical purposes, please note that Mr NJP donated millions of dollars to both presidential and congressional campaigns. Mr NJP was offered the chairmanship of the FCC, but declined; he is now ambassador to the Northern Territories of Canada, and lives in a six-room igloo at the northern tip of Hudson Bay.

It is now the year 2005; the new power limit has been in existence for nine years. Commercial gear reflects such limits, with the average transceiver running 10 watts. Many articles now appear on how to modify old gear down to 25 watts. Beta Amplifier Company recently ran an ad for a 25 watt amplifier that can be keyed continuously for 14 years.

New S-meter levels

The majority of the rigs are made by Goobooto of Kenya, Africa. This firm was the first to jump on the bandwagon when the new power limits went into effect. To appease those who were used to ear-blasting signals, they reset S-meter levels so that a former 'S2' signal is now 'S9'; and audio amplifiers were juiced up so that signals sounded louder. This approach met the approval of hams, particularly in the United States. A typical 10 watt signal will now run 20 over 9.

Coincidentally, towers and beams were also eliminated. Neighbours around the world were tired of the eyesores that hams erected in their backyards. They also were tired of their TVs jumping every time their neighbour got on the air. They no longer believed it was some local CB operator who was interfering.

Pressure from the United Nations and other Human Rights groups was strong enough to get most signatory nations to abide by the resolution. Hams were now forced to use wire antennas that couldn't be seen very well. Spouses of hams, particularly those that joined SAT (Spouses Against Towers), were resolute in ensuring the UN mandate was enforced.

The QRP fraternity debated what true QRP levels should be with the new power limits in effect. In keeping with the former 200 to 1 ratio, QRP levels were defined as 125 milliwatts or less. Microwatting became popular amongst a certain segment of the low power community.

Antenna Pruning

Interestingly enough, complaints of QRM and bad operating were not

eradicated. Hams continued to tune up on top of QSOs; some hams sent CQ and finished with a $\overline{KN}$; and others maintained the practice of sending QRL and an immediate CQ before listening to see if the frequency was in fact vacant.

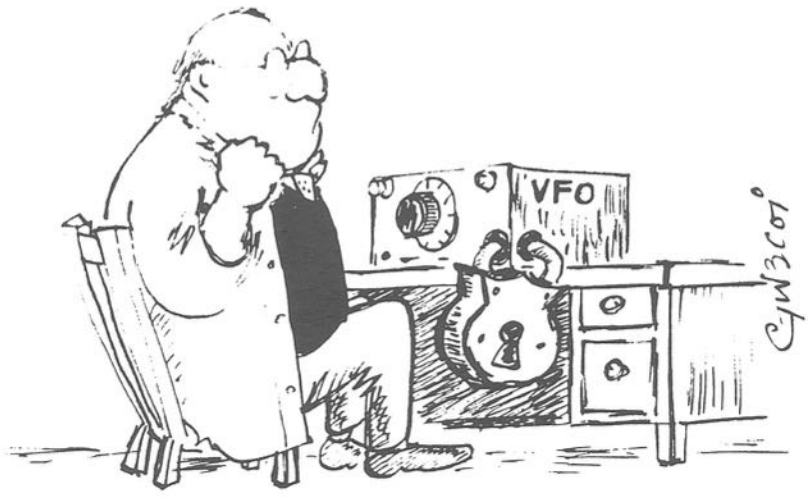
Antenna pruning became the byword of the day. Hams discovered their signals sounded like the old kilowatts if they pruned their antennas to a specific frequency. As a result many hams were always found on specific frequencies; this phenomenon in turn led to the 'my frequency' syndrome, somewhat of a reminder of 75m SSB in the 1990s.

Many ham operators left the HF bands, feeling that it was too difficult to operate without a linear and a beam antenna. The VHF bands became very popular and extremely overcrowded. Further deregulation by the FCC, which allowed citizens to get a no-code/no-exam license, aggravated the overcrowding on the higher frequencies even more. Satellites, at first, were helpful, but extreme ERPs burnt out the receivers of the space birds.

Advertising Down

The shift in power limits also spelled the demise of certain amateur radio organisations. The advertising of one organisation in its monthly magazine fell from 230 pages (out of 250 pages) down to 20. Reduced advertising was the result of equipment being more simplistic in design and fewer associated problems such as TVI and tower fatigue.

The Goobooto Company also found it was cheaper to advertise in such magazines as the *QRP Quarterly* since its advertising rates were dirt cheap. The *Quarterly* was still published by a volunteer group of QRPers who were spread



THE 'MY FREQUENCY' SYNDROME

across the country and were typically confused about who gets what.

The Microwatt faction decided 25 watts was too much power and started its own forum, the QRPPPPP, also known as KWERP. The *KWERP KWORTERLY* contained many technical articles about building transceivers using discrete components such as resistors and capacitors. Most construction projects were variations on a theme, transposing one resistor here, one capacitor there. The authors claimed their design was more advanced than the next guy's design.

Computerised Operation

Despite this die-hard approach to building one's own, most ham operators purchased commercial equipment since a complete transceiver, with power supply and antenna tuner was contained in one small integrated circuit chip. The biggest problem commercial manufacturers faced was how many buttons and LEDs they could put onto such a small package.

The integration of communications equipment with the computer was the turning point in the evolution of amateur radio. By the year 2000, computers totally ran a ham radio station. Sophistication of small computers allowed contesters to compete without human intervention. Even signal reports became genuine as the computer could measure the level of microvolts and assess an accurate signal level. Contesters simply sent their results to the reporting authority via packet.

The big guns were those who spent more money on faster and more elaborate computer systems. Another by-product of this evolution was that contesters could spend more time on other facets of life such as family duties.

Spectrum Need Diminishing

The evolution of amateur radio was further enhanced through the nodal repeater system. The computerised nodes would receive a coded signal and send it through other repeaters in the chain until the message reached its final destination. Through this process a ham operator could contact any specific station throughout the world without concern for atmospheric conditions. The message always got through.

At first, VHF frequencies were used to initiate contact with the repeater; however, over time it was found that radio stations connected via modem to local telephone lines could access the repeater more readily. The need for frequency spectrum diminished rapidly.

Statistics show that most communication activities are now through the nodal system, the users holding the no-code/no-exam class license. Those amateurs who hold the archaic licenses granted through testing of Morse code and technical knowledge, and who continue to use the air waves for communications, are in the minority, with their numbers rapidly diminishing.

It is predicted that by the year 2015 the FCC will discontinue the amateur radio license as its usefulness has been abated by technological advances.

(Reprinted, by kind permission of the author, from QRP Quarterly, *journal of the QRP Amateur Radio Club International, October 1992.)*

Christmas is a'coming...

If you're looking for a present for another collector or enthusiast, or perhaps wanting to drop a hint to a loved one about something you'd like to receive yourself, the answer to your problem could be here

Books on telegraphy...

Mac-Key Blue Book *by Tom French*
If you're interested in the bugs made by Ted McElroy, bring this booklet along to all the hamfests and flea markets.
16pp, 5½ x 8½in, paperback, saddlewire bound
£3.15 (UK): £3.40 (Eur/Sur)

Introduction to Key Collecting *by Tom French*
What to look for, where to find them... illustrated with photos and original ads, from ordinary keys to rare models. The *Introduction* will help you build a superior collection while avoiding common mistakes. *(MM17)*
64pp, 7 x 8½in, softcover, saddlewire bound
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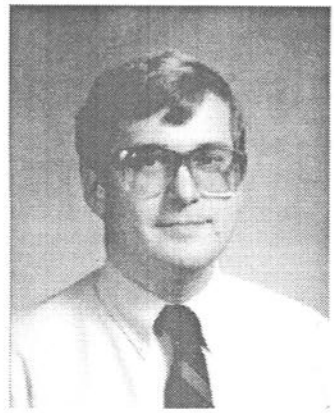


by Doug Alderdice KA2WFT

IN MY EARLY DAYS as a member of the Morse Telegraph Club here in the States (see Club Profile, MM28, p.35), I read with interest in that organisation's newsletter, *Dots & Dashes*, about the public telegraph demonstrations put on by members of the various MTC chapters at rail-fan shows, shopping malls and other venues.

In an area like Buffalo, once one of the busiest rail centres in the eastern US, with its attendant telegraph operators, I thought that there must already be MTC members demonstrating the electric telegraph to the public.

As both a model and prototype rail-fan (as well as a communications enthusiast), I had been attending the various railroad shows in the Buffalo vicinity for some years. In that time, however, I had never seen a live telegraph on display, and not even a telegraph instrument for sale amongst the various railroad memorabilia and ephemera.

I came to the conclusion, therefore, that if there was to be a telegraph demonstration in Buffalo, I was going to have to be the one to do it!

Starting from Zero

Unlike many members of MTC, I have no professional telegraph background. Heck, I wasn't even born until well after the 'golden years' of landline Morse and steam railroading. I didn't even (and still don't) know the 'Mother Tongue' of American Morse. I didn't have any sounders, resonators, or anything else beyond information gleaned from *Dots & Dashes*. But, *D&D* does have a swap section and I eventually purchased both the sounders and some reproduction resonators from fellow members.

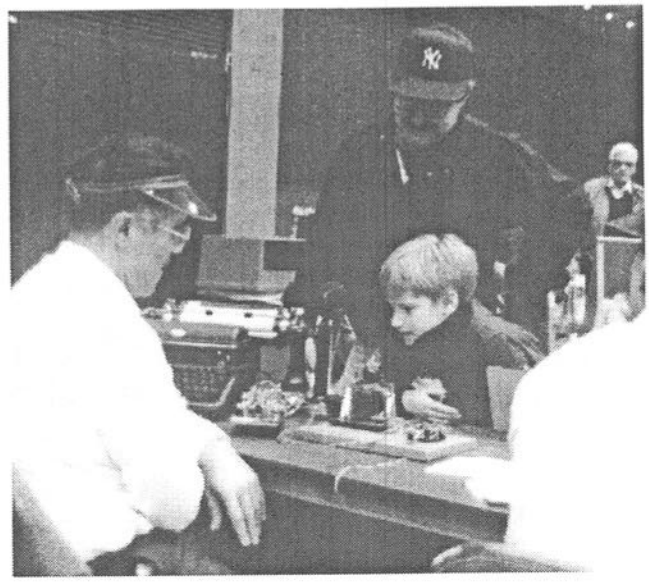
Now to learn to read the sounder! I figured that would be a big enough hurdle without trying to learn American Morse at the same time, so I worked with, and continue to use, the International Code. The learning

process turned out to be a pleasantly easy experience of exchanging the beeps of the radio for the click-clack of the sounder. Starting at a slower speed than I was used to on the radio and gradually building up speed on the sounder yielded proficiency equal to my abilities on the air.

Then there were the other details of a telegraph 'station' – telegram forms and blanks, signage, station calls, etc. With the assistance of Bill Dunbar, president of MTC, I designed my own MTC telegram blanks reminiscent of the telegraph company blanks of old. Being a fan of the Erie Railroad, (my grandfather worked on the Erie from Susquehanna, Pennsylvania), I chose the Erie office calls of 'BU' from Buffalo and 'NS' from Susquehanna for our display 'stations'.

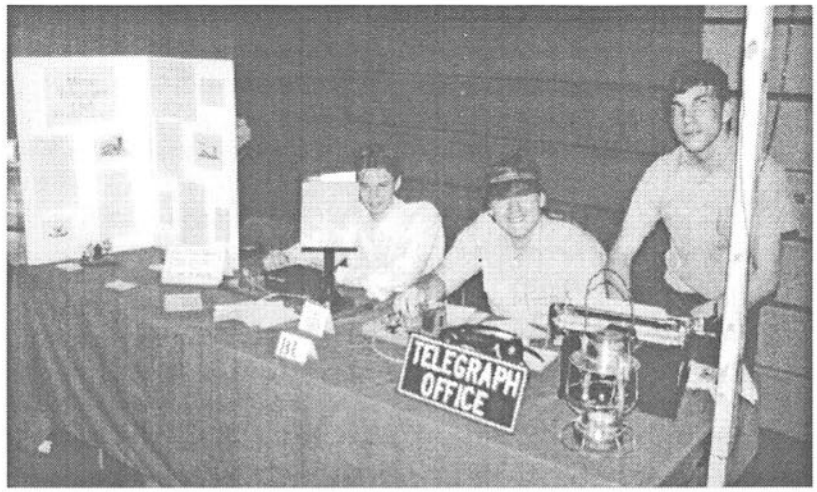
Now for a Partner

All was in place, except an operator for the second station. After all, it's not much fun sending telegrams to yourself! As a high-school teacher, I had been advising a student amateur radio club with a ham colleague, Brian Neri WA2CWF. Also, outside of work I had been assisting Brian in some second world war military communications demonstrations in his hobby endeavours and thus he was the logical choice for a demo show partner.



WA2CWF tells an interested lad and his father about the telegraph at the autumn 1992 show

I worked with Brian on the sounder, which he picked up very quickly. We made final preparations in the form of display placards with historical notes about the telegraph, train orders and station agents (all learned from *D&D*, *MM*, and other sources), secured some green eyeshades for the operators, and



The student crew at 'BU' spring 1993.
From left to right, Ian KB2QHT, David KB2OXX and Mike

were set to go. An interesting side note is that the timing for the first show corresponded appropriately with a graduate school course I was taking in which I used the demonstration as my major project for the class. Needless to say, I earned an 'A' in that course!

Show Time

In November 1991, the annual model train and toy show held each autumn in downtown Buffalo, and sponsored by a local rail history group, was to be our first venue. Brian and I set up BU and NS on two tables at opposite ends of an aisle at the show, not knowing what to expect. From conversations with Bill Dunbar, I knew that it could be a fun event with a lot of interest – but you never know!

The demonstration's debut was a success. Brian and I passed 23 telegrams for the public from one table to the other over the course of the weekend event. People asked a lot of questions about the telegraph and were intrigued to see one actually operating, while the experienced telegraph ops picked up right away that we weren't using American Morse!

The separation of the tables really helped to show that Morse code and sounders could actually be used to send messages. It was particularly fun to see the fascination in the eyes of the little ones. One would think that in this age of video games and computers the telegraph would not get much interest.

Enter the Students

While we enjoyed a nice success at that first show, Brian and I found that it wasn't terribly convenient to staff each table for the entire duration of the show – seven hours at a crack!

It made arrangements for Q4P breaks interesting, as it isn't prudent to leave

antique equipment unattended at a public show. What to do?

Working with amateur radio with our students at Lafayette High School in Buffalo, it suddenly dawned on us, why not include the kids in the demonstrations? It would give us extra skilled staff at the stations for working in shifts, and would give the students a great opportunity to publicly display their Morse skills.

Another show was coming up for the spring. Similar in format to the autumn show, but more directly focused on model and prototype railroads, it is sponsored by another rail history group in nearby Lockport. (It is interesting to note that the second telegraph line installed in the US was between Buffalo and Lockport – the sites of our appearances!)

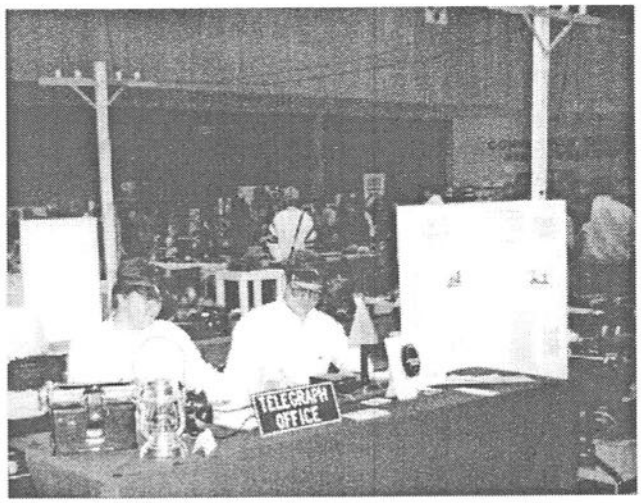
In the weeks before, we instructed the school students at the club meetings about the telegraph, trained them in operating and reading the sounder, handling the paperwork, and wiring a telegraph circuit. They were eager and ready by show-time. The initial plan was to have Brian and myself as the main ops with the students who were 'sounder confident' filling in on a secondary basis – the 'extra board' in railroadspeak.

Murphy Lurks Everywhere

When it came down to the week of the show, for one reason or another, only two students were able to attend. One had just passed his Novice license exam and the sounder was no problem for him, but the other was having a devil of a time learning Morse in any form.

To further complicate things, Brian phoned me the morning of the first day of the show explaining that he had an emergency and wouldn't be able to come along until later – much later. Oh, brother! Fortunately we had set up everything the night before.

When I picked up the students on the way to the show, I told them about the turn of events and informed 15-year-old David, who later received the callsign



The author and KB2OXX staff BU at the autumn 1992 show, with the telegraph poles from station to station visible in the background

KB2OXX, that he was on duty right away. He gulped and said OK, and was placed at station 'BU,' the sending point for the telegrams and the first telegraph table the public came to.

He performed beautifully, handling the questions from the show guests like a pro, and sending solid Morse on the line. Mike, our other student, served wonderfully in the capacity of runner for the tables, getting refreshments for the ops and minding a station when either David or myself needed a break. After his emergency, Brian was able to come later in the day and in the end, the weekend was a huge success with the group handling almost forty messages.

Since Then

At the time of writing (August 1993), we have now appeared twice at each of the railshows, earning a standing invitation for the spring show, and generating a lot of inquiries about the telegraph from local rail and historical groups.

At each appearance we have added a little more to the display. Train orders are sent over the wire and copied on reproduction forms during traffic lulls. Brian constructed some very real looking 'telegraph poles', complete with some artificial birds, to hold up our wires and draw attention to our stations (our first wires were taped along the walls behind us). Newly acquired equipment or ephemera is displayed, and new students are always coming along with us for the history lesson of a lifetime.

While the main focus of the demonstrations is to give the public a live-action view of the electric telegraph, it is also a means of recruiting members for MTC, and at each show, at least one former brass pounder has signed up to receive more information about the Club. What has turned out to be the truly unexpected bonus of the shows, however is the opportunity for the high school students to participate in and experience a living history display.

In this age of encouraging and developing our young people's self-esteem during a complex time of life, what better way to accomplish this than for a teenager to publicly display a special skill of which few others have knowledge?

ABOUT THE AUTHOR

I was first licensed at age 20 in 1984 and hold an Amateur Extra class licence, have been president of a local amateur radio repeater club for the past three years, and have been a member of MTC since 1985. I have had a lifelong interest in communications equipment and, in addition to telegraph equipment, have a small collection of 1930s, 40s and 50s Western Electric telephone sets and related equipment.

I am the microcomputer specialist at Lafayette HS where I have taught since 1986. Lafayette is a public academic inner-city high school. WA2CWF and I formed the student ham club in the second semester of 1987. We have had approximately five students participate in the club each year, resulting in about one pupil becoming licensed each spring.

Morse Code

New Places for an Old Art?

by Anne Prather KA9EHV

MORSE CODE IS A DYING ART – or so some people would have us believe. We passed a codeless license because we felt that code was a barrier to the younger people trying to get into the hobby. The FCC now allows certain disabled people to waive their code requirement on an individual case-by-case basis. Code is difficult, it's slow, it's boring, and there are much better communications methods out there today.

Statements like this may cause those of us who love the code to rally to its defence – declaring that we will never use sideband, that CW is the only way to enjoy ham radio. Under the onslaught, some of us may even be tempted to treat the new Communicators rudely because their codeless licences fly in the face of our long-held preferences.

Such behaviour is not helpful. The communications art is changing. As it changes, so will the use of the International Morse Code. Its usefulness in radio may well be fading, though you wouldn't know it listening to the CW bands. But there are other places in which Morse code may prove a useful and effective communications alternative. Those of us who want to preserve the code would do well to encourage its implementation in appropriate applications.

The ham radio subculture contains many tales of situations in which the code played a vital role. My personal favourite came from a young friend in college. When asked why she was late for our dinner appointment, she explained: 'Well, the elevator got stuck, and the alarm sounds like the telephone. I couldn't get anybody to come until I tapped out SOS on the alarm'. Another friend tells us of a blind-deaf amateur who used CW by sending with a key and putting his hand on the speaker cone to copy incoming signals.

Yes, there are better, more sophisticated communications methods out there. Packet, spread-spectrum, digital signal processing – all of these contribute to the communications art we have pursued over the years. But it seems to me that if we allow ourselves to be deluded into letting the Morse code die, we are losing the ability hams have had since the inception of the hobby to provide ingenious and economical solutions to difficult problems. Further, we will lose a communications method that has three important qualities. First, it is simple. Second, because it is simple, its implementation is economical. And finally, it is universal.

International

SOS means 'distress' whether you're in Hong Kong or Canada. An amateur

from Uzbekistan knows that 'QTH' means 'location'. Turks, Arabs, Americans, the blind, the blind-deaf, the quadriplegic all use the same International Morse code. This is not as true of some of the other communication methods out there. Yes, digital standards are international, but the data communicated by these media are not, necessarily. Yes, the average DX station will know enough English to say 'Your signal is S5' – but look where the signal-reading convention came from!

The universality of the International Morse code may decline along with its use in commercial applications. But as long as there is need for a simple, barebones communications method that spans both cultural and physical parameters, it's well worth preserving the code.

I can send 15 words per minute with my lips, ten words a minute with my eyebrows, and at least that with most of my toes. Fortunately, except for the experimentation I did for this article, there's no real reason for me to improve these proficiencies. I have a friend with Lou Gehrig's disease, however, who needs to be able to send with something besides his hands. He is losing his voice, so the standard voice-recognition software typically used by high-level quadriplegics won't work. If he were to lose his eyesight as well, he would be unable to use the point-and-click software he currently uses. How nice the Morse code would be in this situation. It's not so fast – but neither are his current methods of computer interface.

Recently I found myself in need of something to help out with computer screens. Although I can see well enough to read most words, I have a problem if I have to look at individual letters. Further, I travel a lot, which makes portability a prime consideration in any adaptive method I use. I recently picked up a computer program that echoes ASCII characters in Morse code. It will go as high as 100 wpm and uses different pitches to indicate upper-case and lower-case characters. It took some getting used to, but the ability to distinguish case proved to be wonderful for checking capitalisation and punctuation errors.

Recognition and Synthesis

For those who need sophistication and convenience, IBM makes a whole series of voice-recognition and speech-synthesis products designed to work with PCs. They did not send me price information on any of these products, but I suspect they run into thousands of dollars. They also require large amounts of RAM and disk space – limiting the amount of space available for other applications. They are faster and easier to use than Morse interfaces. But for those who know the Morse code, it may be just as effective in 'spell-heavy' applications – like spell checkers, DOS hex editors, etc., – to use Morse code.

If I were completely blind, I would certainly investigate a speech synthesiser for use at home and for reading large volumes of material. Even at 80 wpm, a Morse code interface can't go as fast as a speech synthesiser. But it's nice to know that if I want to work on a writing project on a ski trip, I have an audible, self-contained method of reading the screen.

A blind friend recently spent $900

for her speech synthesiser. A portable version of the one she bought is available for $1295. The portable version is lightweight – 13 oz. – and plugs into the serial port of a laptop or notebook. By contrast, I paid nothing for the Morse reader – at most I would be out a $50 shareware fee for its use. Even though it's light, you still have to haul an extra piece of hardware around if you use a portable speech synthesiser. For my particular application and circumstance, the Morse reader turns out to be an economical and effective solution to an awkward problem.

When all is said and done, Morse code can be implemented with the simplest materials – a switch and an oscillator or beeper to turn on and off. Because it's so simple, it can be implemented inexpensively in many cases. And its use crosses both national and physical barriers. Blind-deaf hams can communicate with sighted hams by using the code. Quadriplegics can use the code to activate voice synthesisers if there is no other activation method that will work.

People severely handicapped enough to require the use of Morse code are probably relatively few in number. But for those who really need it, the code can open up the world. And it is the world-opening ability of Morse code for those who need it that we will lose if we lose the code. When you operate CW, you can't tell if the person on the end is 'normal' or severely handicapped with multiple sclerosis, for example. And it's a great relief to someone who is handicapped in any way to be able to interact in a societal circumstance in which the handicap is not central. As a matter of fact, in most CW QSOs, the handicap is irrelevant.

The code isn't ideal. It has many drawbacks – especially for those whose minds don't deal with languages easily or who, for whatever reason, find the code difficult. But those of us who love the code, if we want to preserve it, ought to be out there looking for other places besides radio in which it can be effectively implemented and used. If we want to keep the code a viable, dynamic communications method, we need to look honestly at its advantages and disadvantages, and encourage its use in places where its advantages are integral to the final application.

A Living Language

There is another aspect of the code that my discussion of its utilitarian uses has ignored. The code is a living language, complete with the idiom and nuance that makes each language unique. I can infer a lot about a person by the way he or she sends code. Do they use IMI as a question mark or an indication of repetition? If weighting is selectable on their keyer or keyboard, what have they chosen? Do they send 'fer' to mean 'for'? How do they laugh? Each person seems to develop a set of code-sending habits that come through whether they use a keyboard or a bug.

Viewing the code as a language takes it beyond the dimension of something boring and utilitarian and brings it into the realm of codes and intrigue. It seems to me that CW fans could do a lot to further the art of Morse code by emphasising the intrigue. If you love the code

and want your kids to love it, help them build a wire telegraph between their house and a neighbour's. Play games with the code. Tell stories about it. See if there is someone in your life for whom the code can solve a perplexing communication problem.

It is perfectly possible to enjoy the code for what it is and what it can do. I enjoy the code. I also enjoy computers and SSB. I have used the code to deal with my difficulties using computers in a way suitable to me. I experience a deep sense of frustration at the attitude that CW is the be-all and end-all of ham radio. This flies in the face of reality as does the attitude that code is obsolete and ought to be discontinued. Neither attitude is completely true, and the best thing those of us who love CW can do is admit that the code has its limitations and work to find it a place in modern communications art.

(This article first appeared in 'The Final Transmission' column of Communications Quarterly, *Spring 1993. It is reprinted in* MM *with permission of the author and Communications Quarterly, CQ Communications Inc., 76 North Broadway, Hicksville, NY 11801, USA.)*

(Readers are invited to tell MM *how they feel the CW community could respond to the views expressed by Anne Prather about keeping the code viable. Tell us about new applications for Morse that you know about, or perhaps have developed yourself? Or tell us about your ideas, even if you haven't yet worked out how to bring them to fruition! – Ed.)*

Some Day I'll Know

by Stan Martin G2IZ

WHEN I WAS A SCHOOL LAD, the father of one of my classmates was an amateur with a three-letter callsign, working on 400 metres. He used to copy weather forecasts from 'FL', Eiffel Tower, on 2600 metres spark, and these were proudly displayed on the class notice-board. I was very intrigued, and became 'hooked'.

I made up a crystal set using Perikon, Zincite-Bornite, or a Carborundum crystal, using a gramophone needle for pick-up. Carborundum was not so sensitive, but was more stable, holding contact steadily. What a thrill it gave, listening to the various spark transmissions – shipping in the Channel, dear old FL, POZ (Nauen, Germany) and plenty more.

From the start I could read Morse, having taught myself and several friends with a buzzer made from an old door bell and a home-made key. The next step was to apply to the GPO for an experimental licence. One had to state the class of experiment one wished to do, and describe the apparatus, which it was fervently hoped would satisfy the Post Office Engineers.

Morse Test

Yes! I would be granted a licence if I went to the local General Post Office for a check upon my ability to read and send Morse. Arrangements were duly made, and I was ushered up to the topmost room in Gravesend's GPO.

There sat Mr Devereux, the Head Postmaster, a buzzer and a PO type key on the table in front of him. A very kindly and understanding gentleman – 'I am waiting for a telegraphist to come along. Would you like me to give you a little practice meanwhile?' And he proceeded to do just that, sending items from our not very celebrated local newspaper.

'Well, did you read that alright?'

'Yes', said I.

'Well, would you like me to give you the test instead of waiting for the telegraphist?'

'Yes, that would be fine', said I, breaking out in an awful sweat. Away we went – and it was my turn to change the local news paragraphs into Samuel Morse's code.

Mr Devereux said, 'I gave you the story about the West Indians' cricket match, so it was nice and easy.' It was not! I did not know a thing about cricket and the West Indian names were not easy to copy either.

He told me he had failed the chap taking the test before me. The chap had made detrimental remarks about the Postmaster's style of sending. There was a reason after all for the kindly offer of a practice run – I had agreed I could read him, so had I too failed I could not have laid any blame on his sending. I

staggered out into the street to cool down – a very relieved man!

World-wide Results

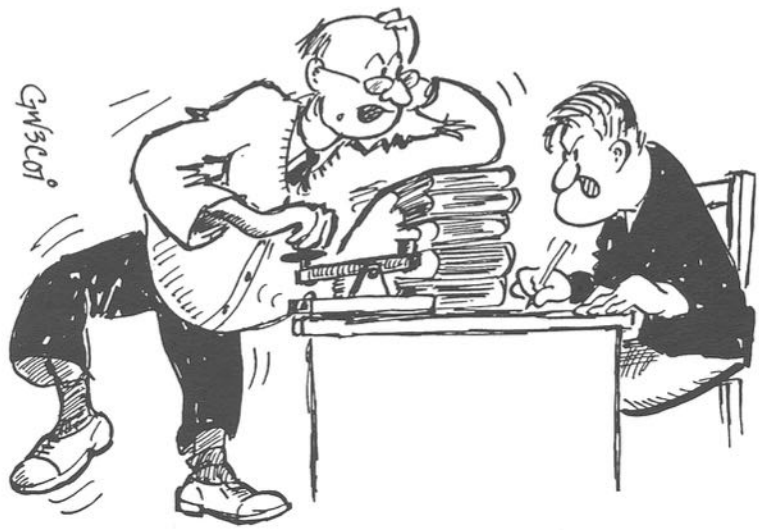
My first transmitter was a TPTG (tuned plate – tuned grid) with a crystal across the grid coil, crystal control then being mandatory. The single valve was an LS6A bright emitter.

With that simple 'bread board' transmitter and an 0-V-2 receiver I got world-wide results on 40 metres using a Windom antenna. Things were much easier in those days – plenty of room on the bands, little QRM and no heavy background noise – fantastic considering today's conditions where we have to cope with strange things like FSK, SSB, SWR and hertz.

Transmitters needed power supplies so I made my first transformer. I got a quantity of strip iron for the laminations. I knew it would be lacking in magnetic quality but thought that if I allowed plenty of turns, say 8, I would get away with it. Yes, 8 turns per volt should do the trick. It did not!

In a matter of minutes it would have roasted an ox. Trial and error is a sure way to learn and another attempt was made using proper Stalloy stampings – and everything in the garden was lovely.

Crystals became very much in demand and I started cutting and grinding raw quartz, selling a 3.5-meg crystal for 4s. 6d. (22½p). There was much satisfaction in making slices of quartz perform, but it wasn't so rewarding money-wise. No Rolls Royce was to be mine. My transport was only a fixed-wheel 'Speed Iron'.



.. STYLE OF SENDING ...

Intensive Listening

Then came World War Two and the

consequent upheaval of ham radio. Our rigs disappeared into the caverns of Chislehurst and we were distraught unhappy souls. Very quickly, however, the Radio Security Service was organised and we were enrolled as intercept operators involved in intensive listening throughout the whole radio spectrum, searching for enemy and subversive transmissions. I was group leader for Home South Group Ten.

The good old days. Memories come flooding back. National Field Days – a scout's trek cart careering down Shorne Hill loaded with our equipment, plus a few car batteries from a local garage; all scattered in a hedgerow at the foot of the hill.

Car batteries? Yes, in those days a 'Field Day' was just that. We did not bring along a petrol generator.

Boy Scouts bringing in cups of tea, cheese and pickled onions – to say nothing of an occasional cow's head poking into our tent. Looking back is a depressing process. I realise I have become a has-been and should not trespass any further.

But they were the 'Good Old Days', leisurely and uncomplicated – no SWR, no SSB, no computers. Very much like Heaven I should think. Some day I will know...

(Condensed from an article originally written by G2IZ for Monitor, *Journal of the International Short Wave League).*

We are sorry to report that Stan Martin G2IZ, who was a very supportive reader of *MM* from its earliest days, passed away on 20 July 1993, aged 91 years.

Your Letters

Readers' letters on any Morse subject are always welcome, but may be edited when space is limited. When more than one subject is covered, letters may be divided into single subjects in order to bring comments on various matters together for easy reference

American Morse by Radio

I learnt the code (American Morse) in Newfoundland, in 1941, from the local postmistress in the village where I grew up. (Newfoundland operated the British system of combined Posts and Telegraphs until after confederation with Canada in 1949).

We used American Morse on low-powered wireless sets, up to a distance of 10 or 15 miles. We were also the relay station for the customs control boats operating between Newfoundland and the French islands of St Pierre and Miquelon, and they used International code. Because of this, I learned both codes at the same time but I didn't know what a sounder was until two years later when I went to work in a somewhat larger relay station.

I went into the Post Office in March that year to learn the code in exchange for helping out with whatever I could do. I used to get practice for about half an hour or so, every now and then, when the postmistress was not too busy to send to me. This was on a 'dead' key, with the transmitter turned off and, of course, no sounder. Then, after a while, I was allowed to turn the receiver on to listen and copy what I could – in pure CW, still no sounder.

One day, that summer, the postmistress was suddenly taken ill, couldn't carry on, and had to be taken to hospital, about 20 miles distant. You can probably guess the rest. With about five months of sporadic listening and sending practice behind me, I was left to run the office for the rest of the day, and I knew not how much longer.

Faced with the prospect of keeping sked with the regional operating office, staffed by professional operators, I soon found out what was meant by the expression 'To separate the men from the boys'!

The operator assigned to the section we worked was a woman, and a good operator too. Interestingly, after about two years working in various offices around the circuit I found myself sitting beside her in that same repeating office on my first promotion.

In that first village post office job we were, of course, a repeating office in our own right. We served seven smaller offices with mail and telegraph by telephone. The phones were the old crank type, where the cranking generated a ring at the other end, something like the old field telephones, and every sub-post office had one.

At that time, the communications system in Newfoundland had the main office at St. John's, with the whole country divided into an interlocking grid through various regional repeating

offices like the one mentioned above.

The use of American Morse for wireless communication seems to have been unusual. I never gave it a thought at the time, but later came to the conclusion that it was more usual for International code to be read from radio tone signals and American Morse from landline circuit sounders.

Eventually finding myself in Gander, in the last year of the war, I worked at the airport for four years then went to Ontario to work for Canadian Pacific Railway (telegraphs). It was back to Gander again in 1952 for another seven years before finally returning to Ontario, this time to work for Canadian National Railways as a telegrapher in the main Toronto relay station. After eight years there, I went as agent-telegrapher to Guelph (where I now live), which was then a small town.

During both stints at Gander I had a ham licence, first as VO2JH then, on my second trip, as VO1DH (my sons' initials). A couple of friends in our local Morse club are trying to convince me to get my licence back. Maybe I'll try.

John Hann
Guelph, Ontario, Canada

(Does anyone know of other instances of American Morse being used for professional radio communication, i.e., with CW and not sounders? – Ed.)

Smallest Keys

I was interested in the item on the 'Lilliput' key in MM29 (p.5), and while I cannot offer information on one smaller than 50mm, you might like to record that the key fitted to the Anglo-Polish Clandestine Set is only 60mm long.

This, however, is designed on the traditional lines of a central pivot with adjustable contact spacing (and locking) and spring tension for weight. It is quite something when one realises that the set was used for serious communication purposes.

Ted Jones G3EUE
Bramber, West Sussex

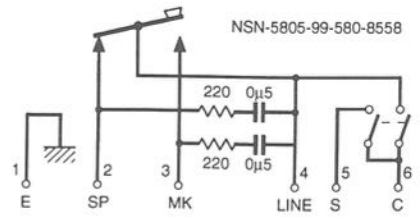
In *Electron* (magazine of VERON), July 1990, I read an article by PA3CIR with construction details of his 'smallest key in the world', with a base plate of 1 cm each side and a height also of about 1 cm.

I watched this key in use, with other keys/keyers, at the Morse Memorial Day at Maassluis on 27 April 1991 (reported in MM20, p.44). I regret not having tried this key but got the impression that a somewhat bigger key would have been easier to use.

Monika Pouw-Arnold PA3FBF
Mijdrecht, Holland

Constant Dashes

I recently bought a used NATO Naval Key with a built-in key-click filter in its base. This, however, caused problems when I attempted to use it with a Star Master Keyer at my evening classes.



Circuit of the NATO key, showing arrangement of filter

	K		A		T		A		K		A		N		A	Dot total
Western code	– · –		· –		–		· –		– · –		· –		– ·		· –	
Dot count	9	3	5	3	3	3	5	3	9	3	5	3	5	3	5	67
Kana code	· – · ·				– ·				· – · ·				· – ·			
Dot count	9		3		5		3		9		3		7			39

I needed sidetone for keying to the class, but when I depressed the key the filter proved to have a time constant, causing the electronic keyer to sent constant slow dashes. I have bypassed the filter and can now use the keyer as a practice oscillator as desired.

Rik Whittaker G4WAU
Marple, Cheshire

Ignition Coil Spark TX

I am almost certain that the 'unknown sounder or repeater relay' illustrated in MM27 (p.26) has nothing to do with telegraphy at all. If the owner will connect a car battery to the two smallest terminals and adjust the knob on the box front until the buzzer works, assuming the secondary is not open circuit (a common fault) a spark or a hefty shock should be got from the third terminal, for the device is the ignition coil from a 1920s vintage car.

There is however an interesting association with telegraphy. These coils were popular with radio amateurs for building spark transmitters. Model-T Ford coils were favourite, and many a Morse message has been tapped out on such a device.

If the owner will please connect his coil to a suitable spark gap and 'tank circuit' and a good 300ft 'T'-aerial, I will listen out for him on 200 metres – until the detector van catches up with him!

John Packer G3NRD
Penzance, Cornwall

Katakana Speed

Ted Jones, G3EUE, says in MM29, p.36, 'The mere thought of kana code at 50 wpm made me feel quite ill!'.

This speed is not so formidable. It is obtained because kana is a syllabary, each symbol normally representing two western symbols – one consonant followed by one vowel.

The table above shows an example of the relationship, based on the word 'katakana'.

Besides the difference in physical length of the encoded word, during the course of it the Western operator has to react to 8 symbols while his kana counterpart only has 4 to deal with, before the break of 5 (now 7) dot lengths.

Rev. Duncan Leak
Stoke-on Trent, Staffs.

Last Telegraph Messages

I was pleasantly surprised to see West Virginia linked via one of our higher mountains (Mt. Porte Crayon) to S.F.B. Morse in MM27, p.27. I'm enjoying *MM*

now even more than in its early days, and encourage you to keep up the good work and expand the publication.

Maybe in response to Richard Thomas' comment in the same issue (p.19) I will find time to write an article relating to the last telegraph messages in the US. We had a railroad Morse wire working in West Virginia until Spring 1975, and a B & O (Baltimore & Ohio) railroad Morse wire working until 1985!

Thanks again for much pleasure and enlightenment.

George Ward W8JWX
Huntington
West Virginia, USA

(We look forward to receiving your article! – Ed.)

Worst Ops?

It would be invidious but amusing for *MM* readers to provide examples of the very worst operators they've had the misfortune to communicate with. Mine was when I was control station at Southern Command, working W/T with garrison outstations at Aldershot, Bulford and Taunton. This was a Fred Karno net if ever there was one, and one particular operator NFQ (Not Fully Qualified, having failed the course at Catterick) used to have me tearing my hair and cussing horribly.

But bearing no grudge I opened up the net on the morning of a New Year's Day with: GM ALL = HAPPY NEW YEAR. After an enormous pause, back came old NFQ with: IMI WA HAPPY NEW... I swear this was so. Full marks to him though for not anticipating!

Reg Prosser GW4BUS
Caernarfon, Gwynedd, Wales

Early Break-In

Following on from the reference to early break-in working in MM29 (p.30), one of the cheapest methods was to have a separate receive aerial, and keep the receiver on all the time. The ARRL said it was viable up to 50 watts 'out', but as you can imagine the clicks it created in the sending station were huge.

However, on the few occasions when you QSO'd a chap with the same set-up it was quite effective.

John Worthington GW3COI
Abersoch, Wales

Morse Music

Further to my letter about 'Kraftwerk' (MM26, p.37), in their 1991 record *The Mix* this group re-released *Radioactivity*, changing both Morse (now around 20 wpm and high-pitched) and the text, relating to the locations of atomic disasters. The song fades out with numerous SOS's, which are also to be heard at the beginning and in the middle of the song.

Also, a very recent video-clip song *Emergency on Planet Earth* by the group 'Jamiroquai' has SOS sent three times at the beginning, at about 12 wpm, with the letters distinctly separated. It is interesting to find Morse going strong in young people's music of today!

Monika Pouw-Arnold PA3FBF
Mijdrecht, Holland

PLEASE NOTE

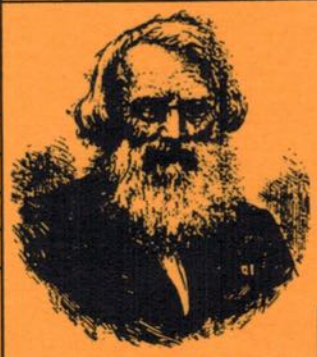
Tony Smith G4FAI, expects to be moving house shortly. Until his new address is announced, please send your Letters to the Editorial Office in Broadstone.

Morse QSLs

A series of reproductions of QSL cards with a Morse theme

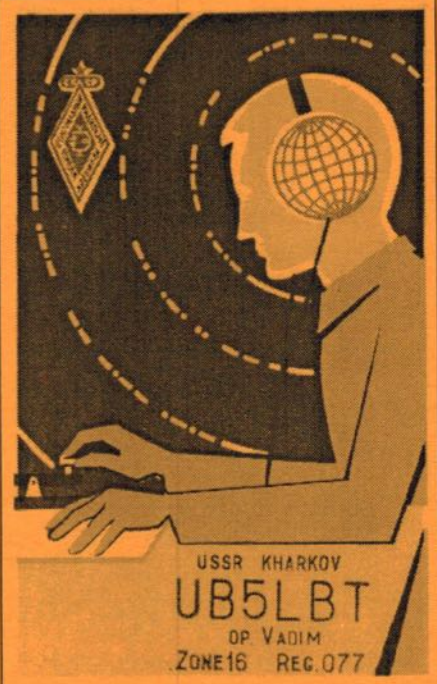
G4FAI Tony Smith, [redacted], England

Date	To
GMT	
Mode	
Freq	
RST	
Rig	
Pwr	
Ant	
FISTS - 029 G-QRP - 288 QRP ARCI - 5187 RAFARS - 1209	
Pse/Tks QSL	



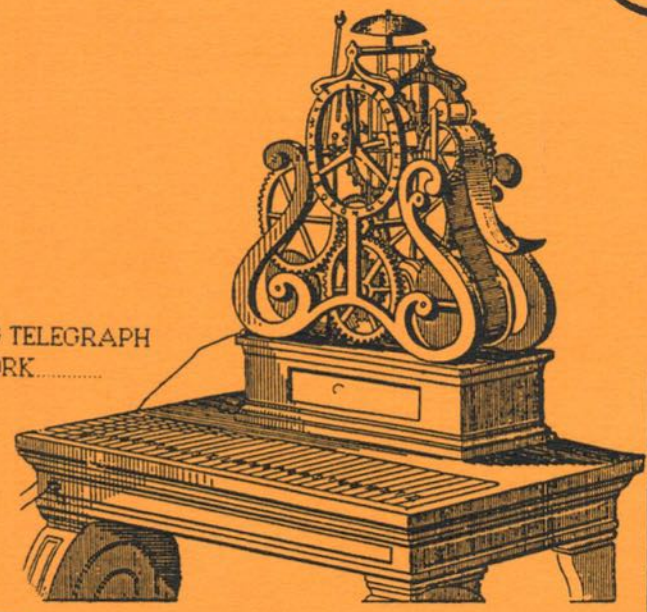
Samuel F. B. Morse
1791–1872

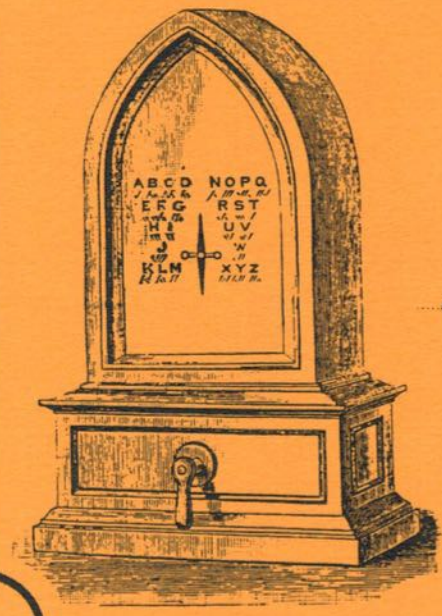
Morsum Magnificat



DOVER- CAP GRIZNEZ CABLE - 1850

BRETTS PRINTING TELEGRAPH
WHICH DIDN'T WORK.....





.....AND WHEATSTONES NEEDLE
INSTRUMENT,WHICH DID!

PORTHCURNO TELEGRAPH MUSEUM