station
G3BGJ

Morsum magnificat

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Morsum Magnificat

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MORSUM MAGNIFICAT is published quarterly to provide international in-depth coverage of all aspects of Morse telegraphy, from its earliest concept to the present time.
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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PAØBFN, Rinus Hellemons, Holleweg 187, 4623 XD Bergen op Zoom, Holland. Tel: 01640-58707.

PA3ALM, Dick Kraayveld, Merellaan 8, 3145 XE Maassluis, Holland. Tel: 01899-18766.

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

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"All the News That's Fit to Print."

The New York Times.

THE WEATHER.
Unsettled Tuesday. Wednesday fair, cooler; moderate southerly winds, becoming variable.

VOL. LXI...NO. 19,[illegible] NEW YORK, TUESDAY, APRIL 16, 1912.—TWENTY-FOUR PAGES. ONE CENT [illegible]

TITANIC SINKS FOUR HOURS AFTER HITTING ICEBERG; 866 RESCUED BY CARPATHIA, PROBABLY 1250 PERISH; ISMAY SAFE, MRS. ASTOR MAYBE, NOTED NAMES MISSING

Col. Astor and Bride, Isidor Straus and Wife, and Maj. Butt Aboard.

"RULE OF SEA" FOLLOWED

Women and Children Put Over in Lifeboats and Are Supposed to be Safe on Carpathia.

PICKED UP AFTER 8 HOURS

Vincent Astor Calls at White Star Office for News of His Father and Leaves Weeping.

FRANKLIN HOPEFUL ALL DAY

Manager of the Line Insisted Titanic Was Unsinkable Even After She Had Gone Down.

HEAD OF THE LINE ABOARD

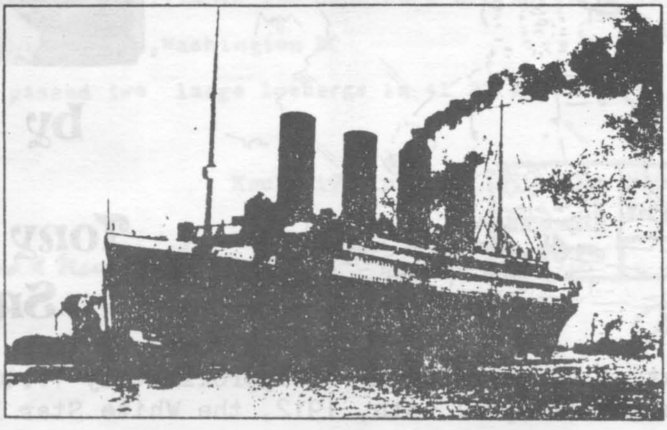
J. Bruce Ismay Making First Trip on Gigantic Ship That Was to Surpass All Others.

The admission that the Titanic, the biggest steamship in the world, had been sunk by an iceberg and had gone to the bottom of the Atlantic, probably carrying more than [illegible] of her passengers and crew with her, was made at the White Star Line offices, [illegible] Broadway, at [illegible] o'clock last night. Then P. A. S. Franklin, Vice President and General Manager of the International Mercantile Marine, conceded that probably only those passengers who were picked up by the Cunarder Carpathia had been saved. Advices received early this morning tended to increase the number of survivors by 200.

The admission followed a day in which the White Star Line officials had been optimistic in the extreme. At no time was the admission made that every one aboard the huge steamer was not safe. The ship itself, it was confidently asserted, was unsinkable, and [illegible] were informed that she would reach port, under her own steam probably, but surely with the help of the Allan liner Virginian, which was reported to be towing her.

As the day passed, however, with no new authentic reports from the Titanic or any of the ships which were known to have responded to her wireless call for help, it became apparent that [illegible]

[illegible]



The Lost Titanic Being Towed Out of Belfast Harbor.

CAPT. E. J. SMITH,
Commander of the Titanic.

THE PROBABLE LOSS.

[illegible]

[illegible]

PARTIAL LIST OF THE SAVED.

Includes Bruce Ismay, Mrs. Widener, Mrs. H. B. Harris, and an Incomplete name, suggesting Mrs. Astor's.

Special to The New York Times.

CAPE RACE, N. F., Tuesday, April 16.—Following is a partial list of survivors among the first-class passengers of the Titanic, received by the Marconi wireless station this morning from the Carpathia, via the steamship Olympic:

Mrs. JACOB P. ——— and maid.
Mr. HARRY ANDERSON.
Mrs. ED. W. APPLETON.
Mrs. ROSE ABBOTT.
Miss G. M. BURNS.
Miss D. D. CASSEBERE.
Mrs. WM. M. CLARKE.
Mrs. B. CHIBINACE.
Miss H. G. CROSSBIE.
Miss H. ROSEBIE.
Miss JEAN HIPACK.
Mrs. HY. B. HARRIS.
Mrs. ALEX. HALVERSON.
Miss MARGARET HAYS.
Mr. BRUCE ISMAY.
Mr. and Mrs. ED. KIMBERLEY.
Mr. F. A. KENNTMAN.
Miss EMILE KENCHEN.
Miss G. F. LONGLEY.
Mrs. A. F. LEADER.
Miss BERTHA LAVORY.
Mrs. ERNEST LIVES.
Miss MARY CLINES.
Mrs. SINGRID LINDSTROM.
Mr. GUSTAVE J. LESNEUR.
Miss GEORGETTA A. MADILL.
Mme. MELICARD.
Mrs. TUCKER and maid.
Mrs. J. B. THAYER.
Mr. J. B. THAYER, Jr.
Mr. HENRY WOOLMER.
Miss ANNA WARD.
Mr. RICHARD M. WILLIAMS.
Mrs. F. M. WARNER.
Miss HELEN A. WILSON.
Miss WILLARD.
Miss MARY WICKS.
Mrs. GEO. D. WIDENER and maid.
Mrs. J. STEWART WHITE.
Miss MARIE YOUNG.
Mrs. THOMAS POTTER, Jr.
Mrs. EDNA S. ROBERTS.
Countess of ROTHES.
Mr. C. ROLMANE.
Mrs. SUSAN P. ROGERSON (Probably Ryerson).
Miss EMILY B. ROGERSON.
Mrs. ARTHUR ROGERSON.
Master ALLISON and nurse.
Miss K. T. ANDREWS.
Miss NINETTE PANHART.
Miss E. W. ALLEN.
Mr. and Mrs. D. BISHOP.
Mr. H. BLANK.
Miss A. BASSINA.
Mrs. JAMES BAXTER.
Mr. GEORGE A. BAYT[illegible]
Miss C. BONNELL.
Mrs. J. M. BROWN.
Miss G. C. BOWEN.
Mr. and Mrs. R. L. BECK[illegible]
Miss RUTH TAUSSIG.
Miss ELLA THOR.
Mr. and Mrs. E. Z. TAYLOR.
GILBERT M. TUCKER.
Mr. J. B. THAYER.
Mr. JOHN B. ROGERSON.
Mrs. M. ROTHSCHILD.
Miss MADELEINE NEWELL.
Mrs. MARJORIE NEWELL.
HELEN W. NEWSOM.
Mr. PIERNAD OMOND.
Mr. E. C. OSTBY.
Miss HELEN R. OSTBY.
Mrs. MAHAM J. RENAGO.
Miss OLIVIA.
Mrs. D. W. MERVIN.
Mr. PHILIP MNOCK.
Mr. JAMES GOOGHT.
Miss RUBERTA MAINY.
Mr. PIERRE MARECHAL.
Mrs. W. E. MINEHAN.
Miss APPIE RANELT.
Major ARTUR PEUCHEN.
Mrs. KARL H. BEHR.
Miss DESSETTE.
Mrs. WILLIAM BUCKNELL.
Mrs. O. H. BARKWORTH.
Mrs. H. B. STEFFANSON.
Mrs. ELSIE BOWERMAN.

The Marconi station reports that it missed the word after "Mrs. Jacob P." In a list received by the Associated Press this morning this name appeared well down, but in The Times list it is first, suggesting that the name of Mrs. John Jacob Astor is intended. This supposition is strengthened by the fact that, except for Mrs. H. J. Allison, Mrs. Astor is the only lady in the "A" column of the ship's passenger list attended by a maid.

NAMES PICKED UP AT BOSTON.

BOSTON, April 15.—Among the names of survivors of the Titanic picked up by wireless from the steamer Carpathia here to-night were the following:

Mr. and Mrs. L. HENRY.
Mrs. W. A. HOOPER.
Mr. HILK.
Mr. J. FLYNN.
Miss ALICE FORTUNE.
Mrs. ROBERT DOUGLAS.
Miss HILDA SLATTER.
Mrs. F. SMITH.
Mrs. BRAHAM.
Miss LUCILLE CARTER.
Mr. WILLIAM CARTER.
Miss CUMMINGS.
Mrs. FLORENCE HARE.
Miss ALICE PHILLIPS.
Mrs. PAULA MUNGE.
Mrs. JANE ———
Miss PHYLLIS O ———
HOWARD B. CASE.
Miss MINEHAN.
Miss BERTHA ———

[illegible]

Biggest Liner Plunges to the Bottom at 2:20 A. M.

RESCUERS THERE TOO LATE

Except to Pick Up the Few Hundreds Who Took to the Lifeboats.

WOMEN AND CHILDREN FIRST

Cunarder Carpathia Rushing to New York with the Survivors.

SEA SEARCH FOR OTHERS

The California Stands By on Chance of Picking Up Other Boats or Rafts.

OLYMPIC SENDS THE NEWS

Only Ship to Flash Wireless Messages to Shore After the Disaster.

LATER REPORT SAVES 866.

BOSTON, April 15.—A wireless message picked up late to-night, relayed from the Olympic, says that the Carpathia is on her way to New York with 866 passengers from the steamer Titanic aboard. They are mostly women and children, the message said, and it concluded: "Grave fears are felt for the safety of the balance of the passengers and crew."

Special to The New York Times.

CAPE RACE, N. F., April 15.—The White Star liner Olympic reports by wireless this evening that the Cunarder Carpathia reached, at daybreak this morning, the position from which wireless calls for help were sent out last night by the Titanic after her collision with an iceberg. The Carpathia found only the lifeboats and the wreckage of what had been the biggest steamship afloat.

The Titanic had foundered at about 2:20 A. M., in latitude 41:16 north and longitude 50:14 west. This is about 30 minutes of latitude, or about 34 miles, due south of the position at which she struck the iceberg. All her boats are accounted for and about 655 souls have been saved of the crew and passengers, most of the latter presumably women and children.

There were about 2,100 persons aboard the Titanic.

The Leyland liner California is remaining and searching the position of the disaster, while the Carpathia is returning to New York with the survivors.

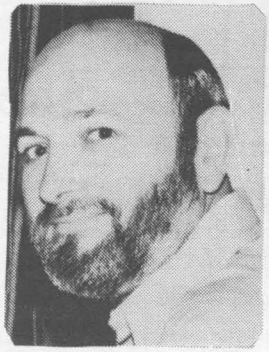
It can be positively stated that up to 11 o'clock to-night nothing whatever had been received at or heard by the Marconi station here to the effect that the Parisian, Virginian or any other ships had picked up any survivors, other than those picked up by the Carpathia.

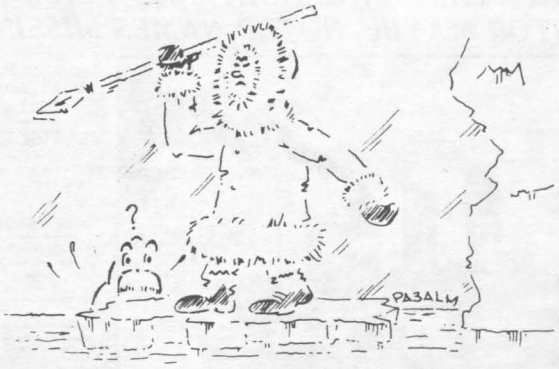
First News of the Disaster.

The first news of the disaster to the Titanic was received by the Marconi wireless station here at 10:25 o'clock last night [as told in yesterday's New York Times.] The Titanic was first heard giving the distress signal "C. Q. D.," which was answered by a number of ships, including the Carpathia,

Continued on Page 5.

Ice ahead!





by

Tony Smith

Seventy five years ago - at approximately 11.40 p.m. on the night of April 14th, 1912, the White Star liner 'Titanic' was on her maiden voyage from Southampton to New York, having received wireless warnings during the day that ice lay ahead. Steaming at 22½ knots, she struck an iceberg south of the Grand Banks of Newfoundland, and 2 hours 40 minutes later she sank.

When the collision took place, the ship's chief radio officer, Jack Phillips, sent out the general call of distress - CQD - followed by "Have struck iceberg. We are badly damaged. Lat 41.46 N. 50.24 W."

There was no response. Less than 20 miles away, the liner 'Californian' was on the edge of the icefield with her engines stopped. Her radio officer was off-duty and asleep, and signal rockets fired from the Titanic were apparently ignored by those on the Californian's bridge.

On the 'Carpathia', 58 miles away, radio officer Harold Cottam would normally also have been off-duty and in bed. He had been exchanging signals with the Titanic earlier in the evening, and decided to call Phillips one more time before turning in. He did not hear the first CQD. He called the Titanic and Phillips immediately came back with

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TELEGRAM

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280 Wy.Rn. 22

S S Amerika via S S Titanic and Cape Race N.F. April,14,1912

Hydrographic Office,Washington DC

Amerika passed two large icebergs in 41 27 N 50 8 W on the 14th of April

Knutp,10;51p

62496 filed with 2995 — HYDRO. OFFICE Rec'd APR 15 1912 — Enclosure

Telegram rec'd. at New York April 15, 1912.

P.C.

= Telegram from the SS Amerika via SS Titanic to shore stations concerning dangerous icebergs. =

"CQD CQD CQD SOS SOS CQD SOS. Come at once. We have struck a berg. Its a CQD OM. Position 41.46 N. 50.14 W. CQD SOS", the new position being a correction of the one previously transmitted.

Survivors

In response to the first SOS signal ever sent by a liner at sea, the Carpathia headed for the Titanic, arriving 1 hour and 20 minutes after it went down with a loss of over 1500 lives. The Carpathia picked up over 700 survivors, passengers and crew, huddled in lifeboats while the great ship was already in its icy grave far below.

Among the many ships eventually responding to the distress call was the Russian vessel 'Birma'. Its English radio officer sent a message later to his parents, "...we were 100 miles away.... at 6.00 a.m. we arrived at the position given us, but not a sign of any wreckage, only dam great icebergs and it was awfully cold".

On the Titanic, Jack Phillips and his colleague, Harold Bride, stayed with their transmitter to the last, sending signal after signal to ships replying to their call, with these in turn relaying the CQD to other ships farther afield.

Messages

At 12.26 a.m., Titanic to 'Ypiranga', "...can hear nothing for noise of steam..." 12.36, to 'Prinz Friedrich Wilhelm', "...are you coming...?" To the 'Frankfurt', "...please tell Captain to come..." And so it went on, to ship after ship too far away to render urgent assistance, "I require immediate assistance"; "We have struck an iceberg"; "Sinking head down, come as soon as possible"; "We are putting the women off in the boats"; Engine room getting flooded".

In reply to these calls came replies, 'Baltic' to 'Caronia', "Please tell Titanic we are making towards her". From the 'Virginia', 170 miles away, "We are going to his assistance". The 'Olympic', "Am lighting up all possible boilers as fast as can", and many more.

At 1.45, the Carpathia heard the Titanic for the last time. "Engine room full up to the boilers". By this time the Titanic's signals had become weak. At 2.17 the 'Virginian' heard them again, ceasing abruptly. There was no response to further calls - it was all over. Signal traffic continued between the other ships for the rest of the night as the Carpathia raced to the scene of the disaster to render what assistance she could.

Return to course

Around 8.00 a.m. she radioed to other ships, advising that she had picked up the survivors, and suggesting they return to their original courses. She sent news of the disaster and details of survivors to New York, her signals initially relayed by the Olympic.

On the four day voyage to New York Cottam, helped for part of the time by Bride, rescued from the Titanic,who, although unable to walk or stand, could at least use a key worked continuously to send hundreds of messages from the surviving passengers to their next of kin. This was a privilege not extended to surviving crew members - such were the times that there was a general feeling that while passengers had perished no crew member had any right to survive....

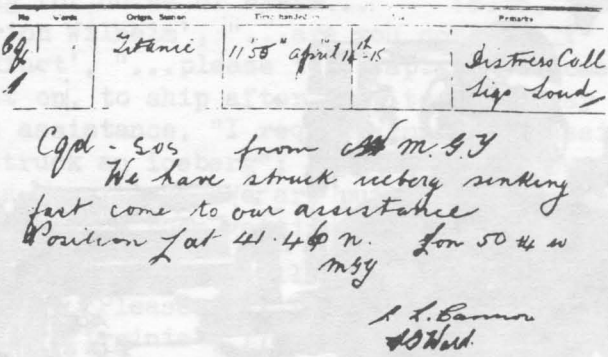
Smith Harold Bride in his radioroom o/b Titanic

How did it happen?

Following the disaster, Inquiries were set up in both Britain and the United States to dtermine how the reputably "unsinkable" Titanic could have gone down. The 852ft liner, the largest and most luxurious of its time, had a double-bottomed hull divided into 16 watertight compartments, of which four could be flooded without endangering buoyancy.

It was concluded that the iceberg ripped the side of the ship, rupturing five of the compartments. While this caused the ship to sink, two other factors contributed to the major loss of life. One was that for over 2,200 persons on board there were only 1,178 lifeboat places, and the other that it was common practice for single-manned ships' radio stations to close down at night - it was purely fortuitous that Cottam heard the Titanic's call for help.

Shortly after the Titanic sank, the Radiotelegraph Convention of London, 1912, brought in new International Service Regulations for wireless operating, which had been under discussion in many countries since they had been



message heard by SS Birma

drafted in Berlin some years previously. Article 21 of the new regulations specified that ships in distress should make use of the signal ..... (SOS). Phillips on the Titanic must have been aware of the forthcoming change of practice when he added SOS to his CQD call. But he did not survive that terrible night to see the new SOS signal brought into worldwide use.

New Safety Rules

As a result of the Titanic disaster, the first International Convention for Safety of Life at Sea was held in London in 1913, resulting in several new rules for ships at sea. As a consequence of this conference, and others held over the years which followed, all ships were required to have lifeboat spaces for every person on board. Lifeboat drills were to be held during every voyage, and enough AB's and stewards were to be available holding a Lifeboat Certificate to provide a qualified coxswain for every boat.

Large passenger liners were required to have three radio officers, and to maintain a continuous listening watch. Smaller ships, with one or two operators, were to use Wireless Watchers (persons trained to recognise distress and safety signals), and these were later replaced by the automatic alarm.

A compulsory order of priority for wireless signals was introduced with Distress, Urgency, and Safety signals taking the first three places on the list. A silence period was introduced, to be observed for three minutes twice an hour on the international distress frequency of 500 kHz, when only distress, urgency, or safety signals could be transmitted on this frequency.

The International Ice Patrol was set up, operated by the US Coast Guard, to monitor all ice in the North Atlantic and, as far as possible, the position of all ships in the area. Ships were required to report regularly by radio, and the Patrol broadcast regular ice reports. If a large berg drifted into the shipping lanes, a Coast Guard cutter would lie alongside and put a searchlight on it at night.

These safety arrangements, implemented over the years since 1913, have undoubtedly saved the lives of thousands who might otherwise have perished. Terrible though the disaster was, this is the true legacy of the night the Titanic went down.

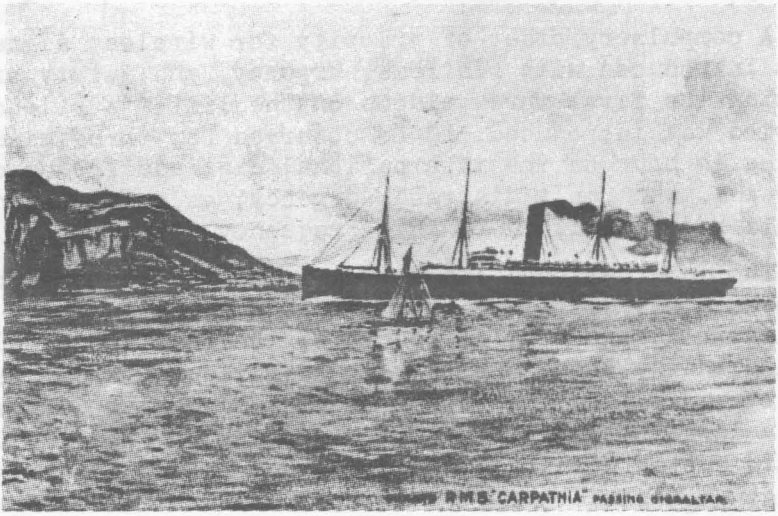
G4FAI.

Premonition?

Morgan Robertson, a little-known English author, wrote a book, "The wreck of the Titan", about an immense ship which collided with an iceberg.

Because it was thought unsinkable, the ship had too few lifeboats and nearly 2,500 passengers lost their lives in the icy water.

What is so remarkable is that the book was written in 1898.... 14 years before the loss of the Titanic.



CARPATHIA - MPA. 13555T 558x64 P2 F1 14K Pgrs: C/204, 3/1500 MV May 5 1903. NOTE: R/O. Harold Cottom (SK 5-30-84)Largely responsible for rescue 712 Titanic survivors 1912. The Carpathia was torpedoed 7-7-18 and sank with loss 5 men.

Butchering the code

Wm G. Pierpont, NØHFF.

When code is sent so fast that I can't distinguish a dah from a dit it doesn't bother me very much. (Maybe some day I will be able to read it.) But when it comes to speeds well within my present abilities and yet I can't read it, it does distress me. Why can't I follow it?

Obviously some hams can read the stuff I hear too often on the amateur bands, for they reply to it and manage to converse. Is there some extra skill to be learned? Is that skill needed for the listener or the sender?

How many of us send our calls like we write our signatures - illegibly? How many times do we have to listen to a repeated call sign before we can unravel it enough to call the station? How often do we hear the interestingly long code "characters" such as "dahdahdahdididahdit"?

The heart of the telegraph code is timing. Each element - dit, dah, and space - must be proportioned reasonably well in order to be intelligible. And unless the letters are separated by a proper space how can we tell for sure what letters they are? Words run together put a heavy burden on the writerinordertodecipherthemdontthey? All too many signals heard on the CW bands have every one of these disturbing characteristics. By contrast, the well-sent, properly proportioned signals stand out like landmarks of clarity.

Where have we fallen down in teaching the newcomers? Have we so stressed the receiving end - and it is vital (if we can't receive, we can't communicate at all) - that no

attention has been paid to teaching proper sending? Just because the present regulations as enforced (USA. Ed.) do not specifically require proof of sending ability, is it unimportant?

Let's look at the problem of distorted code a bit more fully, and from the intelligibility aspect. Most of us can read sending where the dits are too fast for the dahs - that is, the dahs are disproportionately long. (Is that a consequence of our bugs and keyers?). They are a bit distracting, but not incomprehensible. On the other side are those who make their dahs so short that at times they sound like dits - and that is troublesome. We can misunderstand.

While it can be annoying, the occasional misspelled word or abbreviation can usually be understood - and all of us slip this way at times. It is no major stumbling-block. And we sometimes send too many or too few dits for characters like S, H and 5, B and 6, etc. These are forgivable slips, and in most cases can be understood rightly.

But it is lack of proper spacing of letters within words (and calls!) and between words that causes most of our problems. Leave out the space between TT and it becomes M, similarly spacing errors can make ST sound like V (and vice-versa), G like ME, C like NN - this list is long. Does this happen because of wrong initial learning of each character as a distinct unit in itself? or is it misplaced haste that leads to running letters together? Haste that leads to this leads only to unintelligibility.

Perhaps the commonest fault with spacing concerns the need to keep words separate. I sense at times this is due to undue hurry to get the thought across. But in so doing the receiver is deprived of a key element in his reading and understanding - where each word begins. English is not an easy language to decipher when word-beginnings are not marked.

Maybe we can all profit from some drills (including new learners) in sending. Many years ago Walter Candler recommended the following to help us develop a good timing sense:-

Drill 1 - Send the letter S, counting the dits as you send

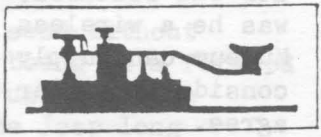
it, then keep on counting up to say 12 and without hesitating send a second S, and so on until you have sent 20 or 25 of them. Gradually speed this up by dropping out one count, until normal letter spacing is reached (the length of one dah). Try it with the letter O, etc. Both drills may be speeded up as you send faster, keeping the same spacing proportions.

Drill 2 - Take a simple sentence, sending it first with wider than normal spacing between letters and between words, and then gradually shorten these spaces to normal length, being very careful to keep letters and words distinct. E.g., if a single dash represents longer spacing between letters and a double dash a longer spacing between words, it would go like this: g-o-o-d--s-p-a-c-i-n-g--i-s--e-a-s-y--t-o--r-e-a-d, etc. Then gradually bring it to normal spacing.

A keyboard and an iambic keyer will always make perfect characters with proper proportions between and among the internal parts. What is sent may be wrong, but it will be "properly made" wrongness! But with an ordinary handkey or a semi-automatic key there will always be some evidence of one's individuality. Let's not let it get out of hand. After all, the purpose of the code is to convey intelligence, not to present the listener with a puzzle.

Let's not burden the listener with more than the QRM and QRN he is probably struggling with by making our message garbled! As someone has noted, well-sent code comes through interference much better than poorly sent code.

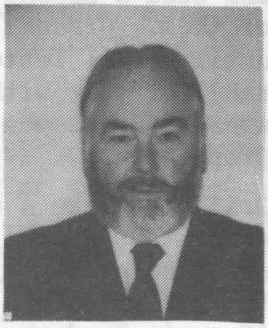
Spark-gap 6



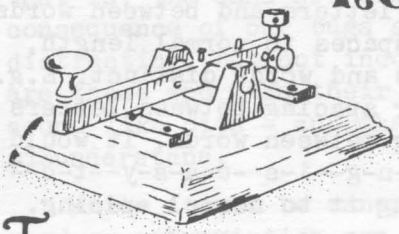
Share your 'memories of Morse' with other readers of Morsum Magnificat - and save them for posterity! Amateur or professional, the story of Morse, worldwide, is made up of such memories.

And when you send us your story, please send us your passport type, or other photograph, which we can use. Not only do our readers want to know your story, they want to know what you look like as well!

Home made handkey



by Maurice Sandys, G3BGJ.



TYPE "D" REPLACEMENT (CIVIL)

During my RAF service, I developed a great affection for the old RAF Type D Morse key, which was the standard ground station key at the outbreak of war. Such was my liking for W/T operating, that even before I left the RAF I had acquired my amateur licence and had set up station - using an old Type D that no-one seemed to own! On being demobbed, I couldn't bear to be parted from it, and smuggled it out, walking boldly past the guardroom with my precious booty stuffed into my kitbag.

Thereafter, for many years, I used it on the amateur bands. But, sometimes I would look at it and puzzle over its odd features. Who, I wondered, was the designer and was he a wireless operator himself? Perhaps the RAF Museum can supply the answer. Some of the features I consider peculiar are listed below, though not all may agree.

a) Where one would expect to see friction reducing ball bearings, one finds instead a tapered shaft which is wedged into the holes in the brackets and brass arm.

b) The brass arm is not pivoted midway between the front and back contacts, the shaft being much closer to the back contacts. Thus, if one adjusts the front contacts for a tiny gap, the back gap is bound to be even smaller, reducing the likelihood of a clean "break" when using the back contacts for receiver muting.

c) The front bottom contact has some resilience, but the back bottom contact is solid, so that the key clicks (of the mechanical variety) made by the back contacts are louder than those made by the front contacts - very disconcerting if one is sending without sidetone.

d) After adjusting the key to one's liking, screwing the brown bakelite cover back on invariably upsets the adjustment.

Despite these criticisms, many old RAF wireless operators used to send a lovely drop of X50 on the Type D. X50 was one of the old pre-war X-signals and meant "your Morse is good". One's chest used to swell with pride when given this rare accolade and it would be underlined in the log - hoping that the NCO i/c would spot it! There was also the dreaded X602 - "your Morse is bad" - but no one would ever admit to getting that.

The old X-signals were extremely comprehensive, more so than the Q-signals which replaced them when the Combined Operating Procedure came into force in about 1944. One could be complimentary or cutting at will, or use ingenious adaptations such as X138 (array) for hooray! Another relic of those days, of which there appears to be no modern equivalent, either professional or amateur, was a wonderful procedure manual called the CD28 which dealt with every conceivable situation that might arise in an operator's working life, from exchanging signal strengths to originating an O-A (Emergency, enemy air attack). I wonder if the RAF museum has a copy, although I did not see one the last time I passed through.

As regards point c), being able to send without sidetone was essential. I can remember being on a forward W/T station in North Africa about 1944, using of all things an ancient R1082/T1083 (called the Jeep long before the famous American vehicle), still powered by the battery driven Type E motor-generator with the old-fashioned (even for those days) 120 volt high tension batteries for the receiver HT. One had to send without hearing one's note on this equipment. Some overcame this problem by turning the receiver gain down and the reaction up, but this made break-in impossible and the operator could well be asked to repeat the lot because the receiving station had tried in vain to stop him. It was

best to attune one's ears to the generator hum, the pitch of which changed slightly when the key was pressed. But what we lacked in sophistication we made up for in skill, or so we liked to think. What is certain is that at the outbreak of war, the RAF had a highly effective world wide network of W/T stations using hand-keyed Morse.

In the Middle East in 1942, I would often tune in the Inter-Command network on the spare receiver and listen with rapt attention to the Air Ministry (CFJ) working duplex with Ambala (GFW). In duplex working, the transmitters were about 15 kHz apart and each end had a receiving and a transmitting operator. Both stations would be sending messages simultaneously, the sending operator occasionally interrupting his message to acknowledge receipt or request on behalf of his receiving colleague.

A non-stop stream of Type-X messages (5 letter groups) would pass each way over the duplex circuit. It was fascinating to listen to quite the most superb operating I have ever heard. Those Type D tapered shafts must have been red hot! (I wonder how today's el-bug operators would fare if called upon to send unusual combinations of letters hour after hour).

As a matter of interest, the 5-letter groups of Type-X code were generated by a teleprinter-like machine developed before the war by Air Commodore Oswyn Lywood. It was of greater complexity than the German Enigma and, as far as is known, the enemy never succeeded in breaking down the code. Unlike its German counterpart, however, this British achievement is seldom mentioned.

Regrettably, scant attention is given to the work of the Signals Section in the RAF Histories and many feats of operating skill have gone largely unrecorded. The multitude of wireless operators who passed through Flowerdon, Cranwell, Yatesbury and Compton Bassett would seem to be a legion of the forgotten. The same is true of magazines which print historical articles. When wireless operators are mentioned at all, it is usually to say something uncomplimentary. For example, see "Wellesleys over the Sudan" (Aeroplane Monthly, March 1984).

The Type D lingered on after the war, but its days were numbered. It was the official key at the Civil Air Traffic Control Centre at Uxbridge during the early

fifties and no doubt survived in the RAF in odd corners of Empire. The advance of technology, however, eventually brought about the demise of CW. Today, gaping youths passing through the RAF Museum, or rummaging in jumble sales, look at it in wonder. Perhaps the Falklands campaign brought it a new lease of life. I don't know - but hand-keyed Morse is still the quickest way of getting a message through under atrocious conditions. Many foreign military machines realise this and still use hand keyed Morse communications. The French do. One occasionally hears them on the 3.5 MHz amateur band. However, I digress from the main topic.

Pondering one day on the Type D's idiosyncracies, the thought occured to me that I could knock together a home-made straight key which did not possess the characteristics I considered undesirable. That is precisely what I did, using only odd items from the junk box. The only outside help needed was to get someone in the workshop to do the drilling and tapping (all holes in the brass arm must be drilled accurately at right angles to the surface).

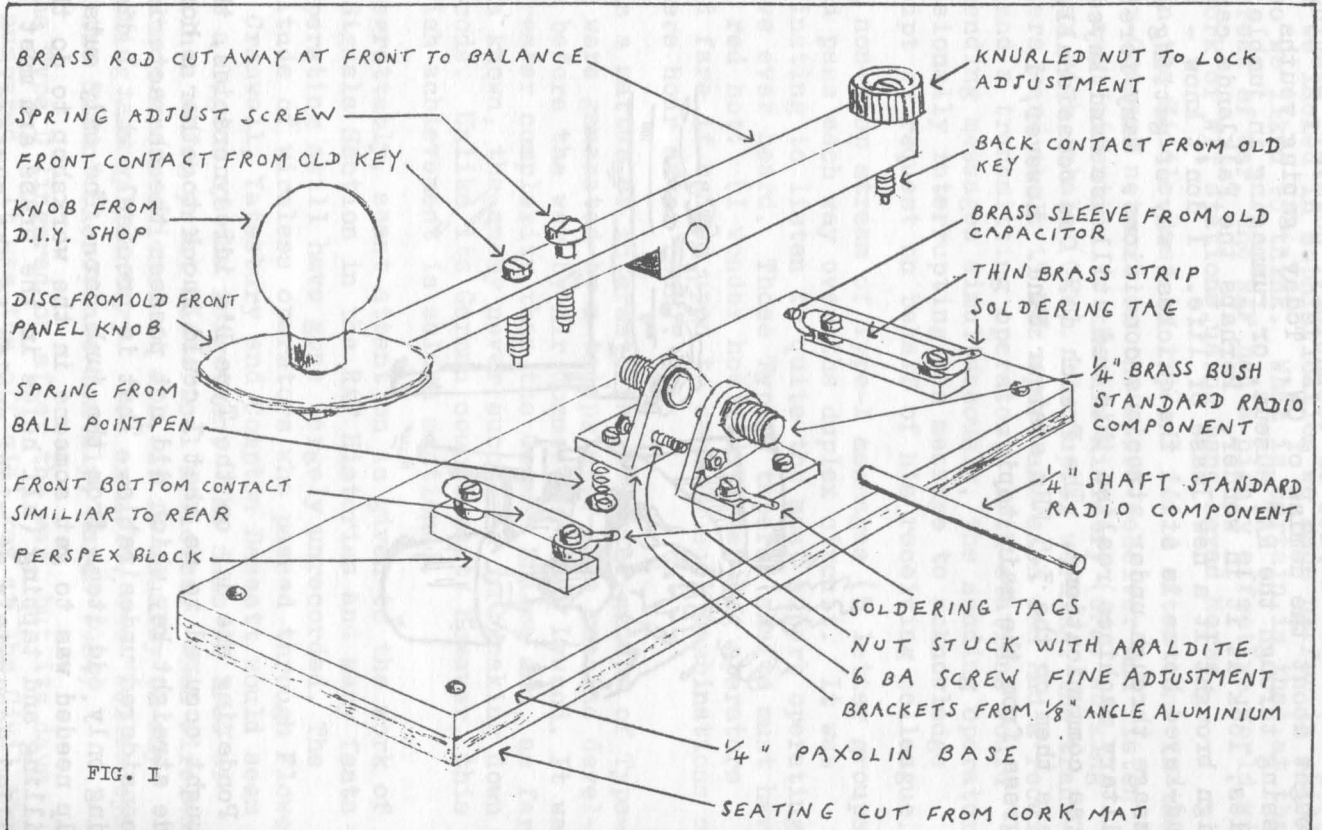

BRASS ROD CUT AWAY AT FRONT TO BALANCE
SPRING ADJUST SCREW
FRONT CONTACT FROM OLD KEY
KNOB FROM D.I.Y. SHOP
DISC FROM OLD FRONT PANEL KNOB
SPRING FROM BALL POINT PEN
FRONT BOTTOM CONTACT SIMILIAR TO REAR
PERSPEX BLOCK
KNURLED NUT TO LOCK ADJUSTMENT
BACK CONTACT FROM OLD KEY
BRASS SLEEVE FROM OLD CAPACITOR
THIN BRASS STRIP SOLDERING TAG
1/4" BRASS BUSH STANDARD RADIO COMPONENT
1/4" SHAFT STANDARD RADIO COMPONENT
SOLDERING TAGS
NUT STUCK WITH ARALDITE
6 BA SCREW FINE ADJUSTMENT
BRACKETS FROM 1/8" ANGLE ALUMINIUM
1/4" PAXOLIN BASE
SEATING CUT FROM CORK MAT

FIG. I

Construction was simplified by the fact that keys today are required to pass only a few milliamps. Those massive brass keys of yesterday were designed to handle amps. How the bits and pieces fit together is shown in the exploded drawing. The legends reveal that it is an amalgam of discarded household objects, and so must surely be the cheapest key in the Western Hemisphere, though certainly not the worst! The dimensions of the base are $2\frac{3}{4}$ ins. by $5\frac{1}{2}$ ins. - considerably smaller than the Type D.

Features to note are:

a) The arm is pivoted midway between the front and back contacts. My break-in system uses the back contacts to mute the receiver and it is essential to make a clean "break", otherwise one's eardrums may be jolted.

b) Both front and back contacts have some resilience. I like a little bit of "give" in the contacts, though other operators may prefer them to be solid.

c) The brass arm is balanced by cutting away brass at the front end. My preference is for a lightly balanced key, with very little tension in the spring. Some operators, I know, prefer lots of tension so that considerable force is required to depress the key.

d) It has a knob one can grasp. I much prefer this to the flat-topped knob of the Type D.

The key was built in 1970 and is still in everyday use. I do not claim that it is better than the Type D (except perhaps for receiver muting), but using one's own creation is always a great morale booster and my old Type D, sad to say, is now gathering dust. A final touch was to make a cover from balsa wood, not unlike the brown bakelite cover of the Type D. Sanded down and doped several times, then sprayed RAF blue, it makes quite a smart adornment to my operating desk and never fails to impress visitors.

By the way, this is not an April the First story - this key does exist.

(This article originally appeared in QRV, Journal of the Royal Air Force Amateur Radio Society. We would be delighted to receive details of other home-made hand keys for future publication in Morsum Magnificat.)

QSK de DJøXJ

One often hears "BK" at the end of an over. Then, when you try to QSK it becomes clear the other station can't work "break-in", but operates on "VOX".

Transceiver makers want the buyers of their rigs to believe they can work "BK". They call it "semi-BK", but it is not the real thing! With real "BK", one can hear the other station between the dots and dashes of one's own signals.

When the other station works true BK and you cannot, you can still interrupt him if there is QRM, or you have a question, remark, etc. But please don't give BK yourself when you can't copy him between your signals. Better give KN, its more correct, and shorter too!

Despite their limitations, almost every transceiver can be changed to full BK with a so-called "shift-register IC". When you press the key, the TX is "on", but the signal goes on the air 10 milliseconds later, and lasts for 10 milliseconds after you release the key. In fact, a kind of shift.

Immediately after the milliseconds, the transceiver is on "receive", and you can listen with true BK. Older transceivers need to have their mechanical relays replaced with reed relays, otherwise you go crazy with all the clicking.

An Icom 720 or 730 does not need this modification. Their relays are very silent. With three IC's, a few diodes and transistors, and a pair of R's and C's, true break-in becomes possible with most rigs.

I will publish details in this magazine later. In the meantime, I will gladly send a diagram with full details, on receipt of an S.A.E. (from UK or overseas, send addressed envelope and IRC. Ed.) My address is:

E. Kaleveld, DJØXJ,
Jesteburgerstrasse 36,
D-2116 Asendorf,
West Germany.

Spark-gap 7

GETTING STARTED.

An important aspect of encouraging CW operation is to persuade new operators to use CW immediately after they have passed their Morse test. One successful means of doing so has been the CW NOVICE AWARD issued by the G-QRP Club.

To obtain this award a newly licensed operator has to make CW contacts with 50 different stations during the first 12 months that he holds the licence. There are two classes, Class A - 3 watts r.f. out or less, Class B - any licensed power.

To apply all that is required is a log extract certified by one other licensed amateur, and a fee of 50 pence (UK) or 3 IRC's (outside UK). Applications should be sent to G8PG, 37 Pickerill Road, Greasby, Merseyside L49 3ND, England.

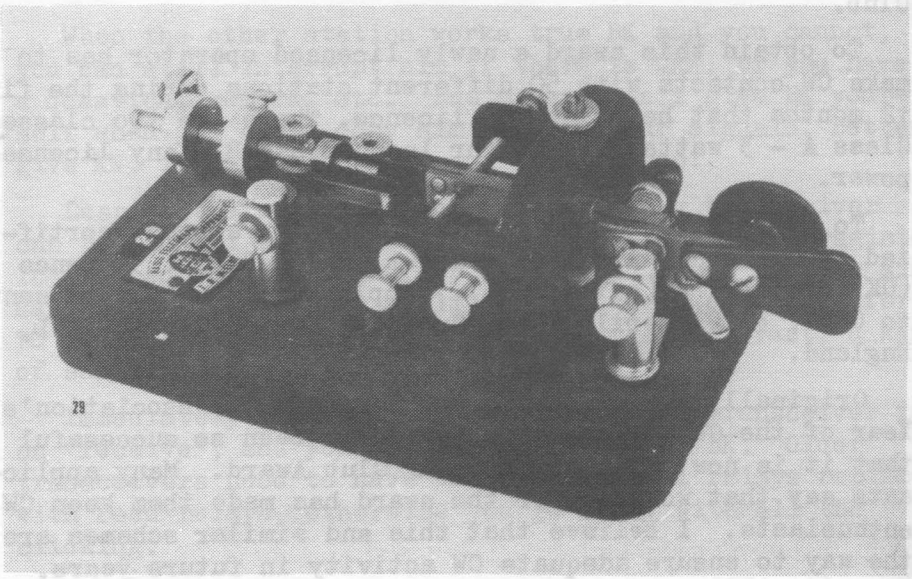
Originally issued during the European CW Association's Year of the CW Novice, this award has been so successful that it is now a permanent G-QRP Club Award. Many applicants say that working for the award has made them keen CW enthusiasts. I believe that this and similar schemes are the way to ensure adequate CW activity in future years.

Gus Taylor, G8PG,
Communications Manager, G-QRP Club.

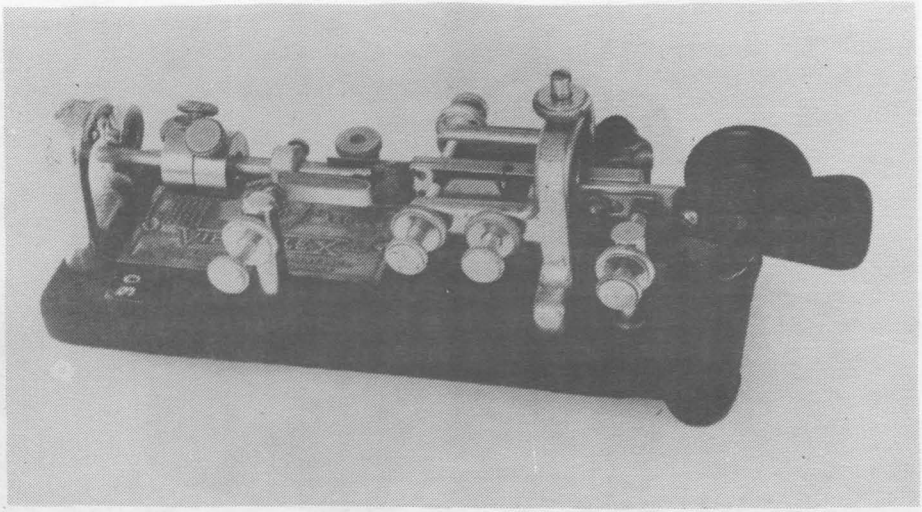
Showcase

THE KEYS ILLUSTRATED in this "Showcase", and in coming issues of Morsum Magnificat, are part of the collection of John N. Elwood, W7GAQ, who very kindly sent the photographs from the USA.

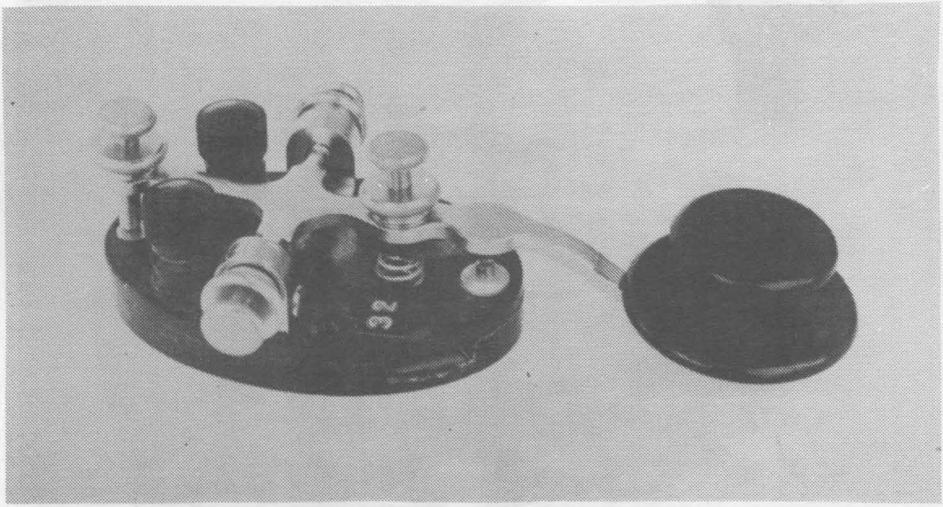
These were taken by Ray Nelligan, USA.
If anyone can provide additional information about any of the keys, for example details of manufacturer, or the type of key, where this is not shown, we would be pleased to hear from you.



15 TR McElroy

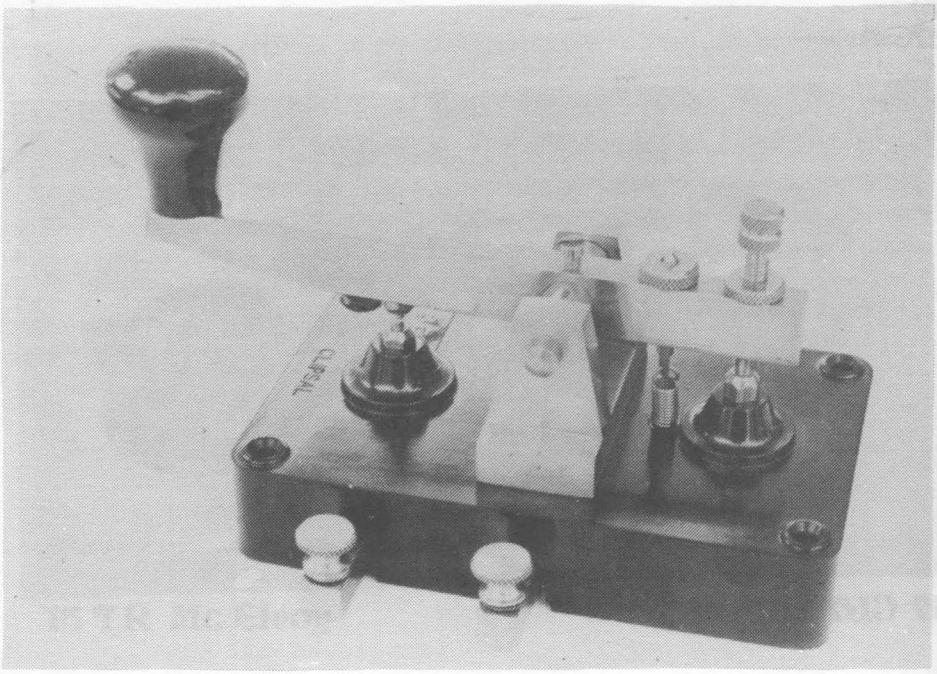


16 Vibroplex "Standard Original"

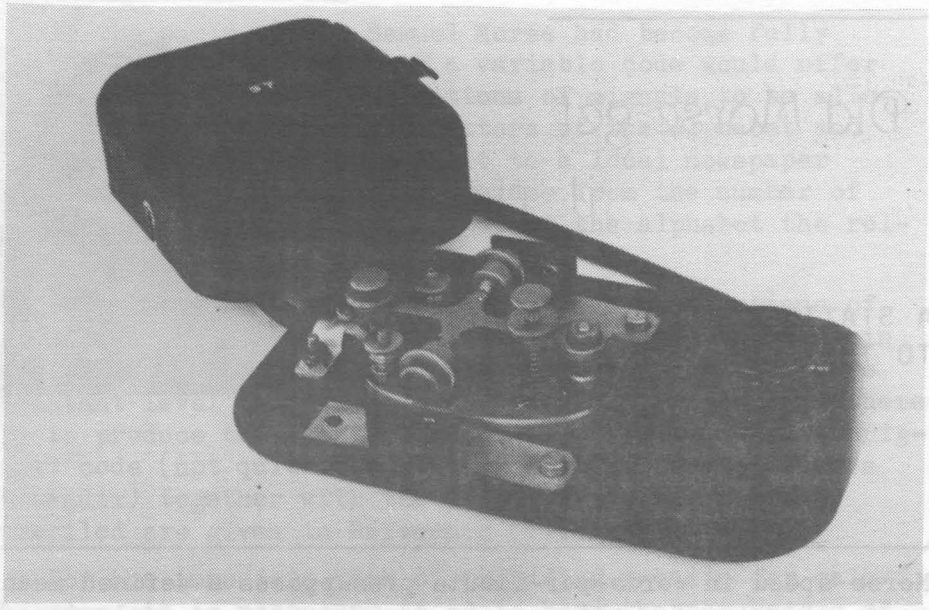


17 CLT 26012B

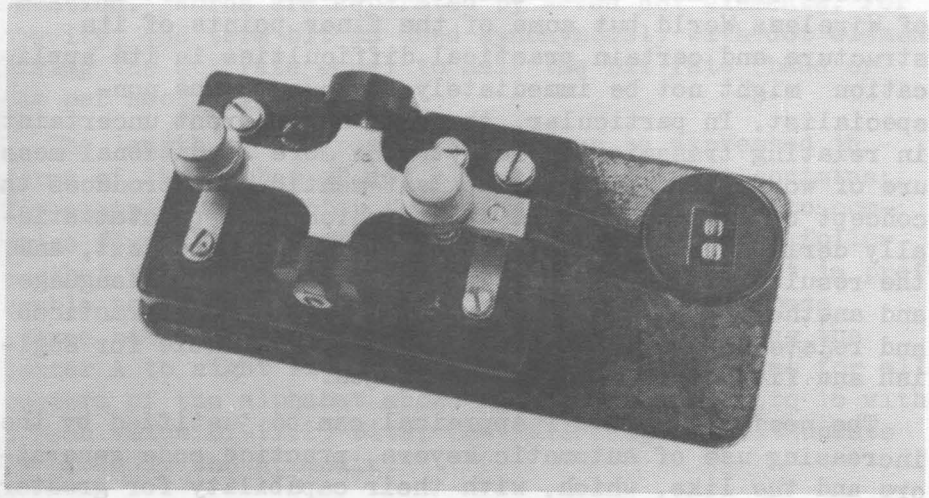
18 TCS Emergency key



19 Clipsal



20 Unknown



21 J H Bunnell & Co, New York

A.S. Chester M.I.E.E.

Did Morse get it right?

A STATISTICAL BACKGROUND TO THE CODE.

Morse speed in words-per-minute presupposes a defined mean word. A value for this can be derived from an analysis of Samuel Morse's own data. Recent trials support the original work for English but not for French or German. Certain aspects might even have surprised the great man himself...

Morse code must be reasonably familiar to most readers of Wireless World but some of the finer points of its structure and certain practical difficulties in its application might not be immediately obvious to the non-specialist. In particular, there is an inherent uncertainty in relating transmission rate to the more traditional measure of words per minute. The last-mentioned introduces the concept of a standard word length which must be statistically derived from an analysis of plain language text, and the results may differ significantly between one language and another. This article looks at present-day practices and relates these to statistical data available for English and five other European languages.

The need for such a reappraisal can be justified by the increasing use of automatic keyers, practice code generators and the like, which, with their capability for greater precision in code formation, has led to a general desire to define transmission speed more closely and more uniformly than has been the custom in the past.

Statistical beginnings

By the early 1830's Samuel Morse had become fully aware of the potential that a variable code would offer in arranging shorter combinations of signals to be allocated to the more frequent letters of the alphabet and it is recorded (1) that a visit to a local newspaper printing room enabled him to deduce from the number of type pieces held for each letter of the alphabet the relative frequency of use.

From this information, Morse devised combinations of short and long signals specifically designed to maintain the product of character length and frequency at a more constant level than would otherwise be the case, and thereby to produce the shortest messages overall. Morse's original code (not quite the same as that in use today, see Appendix) together with the letter frequency table he compiled are given in Reference (1).

For the immediate task of providing a basis for calculation, it is necessary to state here the parameters of the mark-space structure as follows. The dot length (period) can be regarded as the basic element and the dash is given a length equal to three dots. The spaces between the elements within one character are equivalent to one dot and the spaces between characters are given three dots duration. Words are separated by seven dot elements. For brevity, the term bit is used synonymously with dot element making the dot rate equal to half the bit rate (baud or bit per second).

The length of a Morse character can be expressed in terms of the number of dot elements or bits it contains: for example, the letter A (dot dash) can be said to comprise five bits. However, as one character cannot follow another without inserting a space of some kind, it is preferable to include the standard inter-character space (three bits) as part of the letter itself bringing the letter A to eight bits. On this basis a bit count for all letters of the alphabet shows a range from four to 16 with a mean value of 11.23 bits. The full range of bit counts is given in the Appendix.

Random code

When letters are selected at random they appear, by definition, at uniform relative frequency and a mean

five-letter word in code is equal to five times the mean letter plus four bits to make up the remainder of the word space. Taking a rounded value for the mean letter as 11.2 bits, the mean word comes to 5 x 11.2 + 4 = 60 bits. Code speed in words per minute is then numerically equal to the bit rate or twice the dot rate.

Figure characters also can usually be regarded as random in their occurrence and a similar analysis to that for letters gives the mean character length as 17 bits from which the mean five-figure group (including word space) comes to 5 x 17 + 4 = 89 bits. Speed in word/min can then be shown to be equal to 1.35 x dot rate.

English language

The fact that plain text does not make use of all letters of the alphabet with uniform frequency presents the major difficulty in setting a value for the mean (plain language) word. It is safe to say, however, that the figure is bound to be significantly less than the value for the random case, otherwise there would be no benefit to be gained from the use of a variable length code and, in fact, the ratio of the two figures can be regarded as a measure of achievement in optimizing the design.

Before going on to report the results of trials it must be conceded straight away that a standard word for plain language does seem to have established itself already: a scrutiny of published material shows a concensus for a nominal standard of 50 bits (including word space) and the word "Paris" is sometimes quoted as representing this value.

Frequently the information is given directly in terms of word/min and dot rate as, for example, word/min = 2.4 x dot rate (1 word/min = 50 ÷ 60 baud). Seldom is the reader provided with any basis for the figures quoted and variations do appear from time to time not only in the literature but in the observed calibration of automatic keyers and practice tapes.

It was against this background that I felt the need to satisfy myself that any standard being quoted, and in particular the 50 bit word, had a reasonably sound statistical basis for its application and had not established itself merely by common usage. At the same time, it had to be admitted that, even if a 'better' result were to be found, there might still be a case for retaining a round figure

such as 50 bits in the interests of easy standardization, providing the figure did not depart too far from reality.

To derive a standard word for plain language it is necessary to combine the bit count for each letter with its relative frequency of occurrence to obtain a measure of the overall effectiveness of the letter in a long run of text. Relative letter frequencies must, of course, be estimated by statistical trial and in the first instance I selected three quite different sources of available data.

The first was the original frequency table compiled by Samuel Morse and reproduced in ref. (1). The second was taken from a work (2) on cryptography by H.F. Gains first published in the late 1930s, which not only provided two sets of data by different analysts (Meaker and Ohaver) on English but data on five other European languages as well.

The third was obtained during correspondence following publication of an article (3) by a beginner operator describing his attempts to relate the dot rate on his automatic keyer to the amateur radio Morse test at 12 word/min. It was not in the least way possible to foretell what the outcome of the exercise might be, but in the event the results proved to be so gratifying that I undertook a count of letter frequencies myself to provide extra data for analysis. The method used for this exercise and the results obtained are given at the appendix.

Given suitable data on letter frequencies, the procedure to determine the length of the standard word was the same for all sources of material. For all letters designated r_1 to r_n the product of bit count x_r and frequency f_r gave a table of values from which an overall mean letter size could be calculated. In the usual notation, the the mean value x is

$$\bar{x} = \frac{1}{N} \sum_{r=1}^{n} x_r f_r .$$

where N is the size of the sample. Defining the mean word as comprising five mean letters plus four extra bits to make up the word space, a value for the standard word was calculated. The results of the exercise using letter frequency data from the five sources listed are given in Table 1. The total dispersion of the mean over the five

results is gratifyingly small considering the wide differences in source and sample size. A global mean value for the mean word comes to 49.4 bits and is unchanged (to three significant figures) when the data points are restricted to the middle three values.

Other languages

In addition to two sets of data on English, reference (2) provides letter frequency tables for five other European languages. The exercise to find a value for the standard word was extended to include these languages and the results obtained are given in Table 2. Data for French, Italian and Spanish were compiled from a count made by the author, but the origins of data for German and Portugese are said to be uncertain.

TABLE 1. Results of five independent trials to determine the mean word for English.

Origin	Sample size	Mean word (bits)
Morse	106,400	49.8
Gains (Meaker)	10,000	49.5
Gains (Ohaver)	10,000	49.3
Chester	10,000	49.3
Wood	1,798	49.1

TABLE 2. Results of trials to determine the mean word for the five European languages given.

Language	Origin	Sample size	Mean word (bits)
German	Uncertain	Not given	46.3
French	Gains	10,000	47.6
Italian	Gains	10,000	49.7
Spanish	Gains	10,000	50.4
Portugese	Uncertain	Not given	50.4

The results show significantly low values of the mean word for French and German relative to the other language

trials, including English. This seems likely to be due to the fact that the frequency table for German shows zero count for letters J, Y, Q, and Z (all long symbols in Morse) while the count for the letter E (the shortest symbol) was the highest encountered over all languages. The relatively low value for French cannot be so easily explained with zero count for K and W (letters of around average size in Morse) but a fairly high count for E. Spanish and Portugese, producing equal results, are the only two languages in the six tested to show a mean word exceeding 50 bits.

The standard word

Results for English show a value for the mean word estimated over five trials as 49.4 bits with an overall dispersion of +0.4 to -0.3 bit. There can be little doubt therefore that a standard word of 50 bits will meet all normal requirements for the measurement of Morse speed in English. Of the five other languages, Italian, Spanish and Portugese all show values for the mean word within ± 1% of 50 bits which value can be accepted as the standard for these languages also, albeit on the basis of smaller samples.

French and German deviate much more from the 50 bit standard at -4.8% and -7.4%, respectively, and it may be worth considering whether any additional trials should be undertaken on these languages to verify the low values obtained from the published data used

Given a standard word length of 50 bits, the word Paris is often used to represent this value. Whether it is really necessary to quote an actual example of a 50 bit word is debatable but there must be other internationally recognisable words of this length from which to choose. It was during a search through a list of suitable candidates for an alternative to Paris that I stumbled on the fact that the word Morse is one of precisely 50 bits (including word space) and, being more than relevant to the subject in hand, could hardly be bettered as an international standard.

Morse practice and test criteria

Traditionally, Morse speed for plain language transmission is estimated by marking off groups of five letters in a passage of text (ignoring word spaces) and then

sending the passage normally in a given time. Random letters are normally arranged in groups of five and the counting of 'words' is then straightforward. It is common practice to send code at a rate some 20% lower than that for plain language with the intention of presenting the same overall degree of difficulty to the operators. Whether this practice is entirely justified is arguable but a quantitative measure of one aspect of the problem is given in the following paragraphs.

TABLE 3. Standard words for three categories of Morse against corresponding wpm/dot rate (dot rate in dots per second = half a bit rate).

	Plain	Code	Figures
Standard word (bits)	50	60	89
Ratio wpm/dot rate	2.40	2.00	1.35

Given a standard word length for each of the three categories of Morse, it is simple to find the corresponding ratio of transmission speed in word/min to dot/s. Table 3 gives standard word lengths derived from the data produced in this article with the required ratio.

The dot rate for plain language can be adjusted down if necessary by 1% since the mean word length for English estimated by trial has been found to be about this much short of 50 bits. For certain other languages, the dot rate could be much greater in error; see the results for these in Table 2.

When using automatic keyers, the dot rate can readily be set to a level corresponding to the required word speed. In such cases, it may be useful to remember a few equivalents such as 24 word/min in plain language corresponds to 10 dot/s. It is also interesting that this same dot rate will produce a speed in code of 20 word/min and on this basis a combined Morse test in plain and code would have to be sent at word speeds in the ratio 24/20 to represent the same 'pace' to the operator.

The method, however, would not take into account the

difference in letter predictability between the two categories of text and it could be argued that if plain text in the operator's own language is easier to copy than random code at the same dot rate, then the word-speed ratio between the two should be increased to redress the balance. Unfortunately, this aspect is difficult to quantify and seems to depend on the individual operator's training and experience.

An exercise which started out to test the validity of the 50 bit standard word has shown the figure to agree with the result of statistical trials to within about ±1% for English and three other European languages. But unfortunately, the standard doesn't seem to fit the German or French languages as well as the others and users in these countries may wish to consider whether conformance to a round-figure standard is more important than precise alignment with the result of one statistical trial. More generally, and especially for non-European languages, the problem of the standard word can be avoided altogether by the universal adoption of dot rate as the only reliable measure of the 'pace' of transmitted Morse.

References

(1) C. Cherry, On Human Communication, p.35. Wiley, New York; Chapman & Hall, London.
(2) H.F. Gains, Cryptanalysis, appendix. Dover Publications, 1956 New York.
(3) I.T. Wood, The true measurement of Morse speed, Short Wave Magazine, vol. 39, February 1982.

APPENDIX

Morse symbols and bit content including inter-character space together with frequency count. Taken from the Sunday Times of 18 July 1982 using a wide range of material by different writers. But specialist subjects were avoided, as were passages containing undue repetition of proper names and frequent use of foreign words. The combined result is from a total sample of 10,000 letters. Following the style of Gains, relative frequencies are given as the percentages of the sample while dropping the decimal point gives the actual count.

Appendix continued.....

Letter	Morse symbol	Bit content	Relative frequency
A	·—	8	8.25
B	—···	12	1.78
C	—·—·	14	3.14
D	—··	10	3.38
E	·	4	12.77
F	··—·	12	2.38
G	——·	12	2.04
H	····	10	5.06
I	··	6	7.03
J	·———	16	0.19
K	—·—	12	0.58
L	·—··	12	4.30
M	——	10	2.29
N	—·	8	7.02
O	———	14	7.13
P	·——·	14	2.03
Q	——·—	16	0.14
R	·—·	10	6.30
S	···	8	7.06
T	—	6	9.17
U	··—	10	2.83
V	···—	12	1.20
W	·——	12	1.80
X	—··—	14	0.28
Y	—·——	16	1.76
Z	——··	14	0.09

(First published in Wireless World, August, 1983)

Memories of Morse

Three telegraphists - the last of the Morse-trained men at London's Main Telemessage Office in Electra House - have taken early retirement.

Before they left, Ernie Glynn, Jim Harron and John Gooding recalled the "good old days" of fitful telegraphy, when the Morse dots and dashes were used to send telegrams around the world.

Morse was still very much in use when they joined the business in the mid-1950's and it carried on for another ten years before it gradually gave way to faster and more reliable communications, leading to today's computer systems.

Caption for photograph:

Telegraphists Jim Harron, John Gooding and Ernie Glynn recall the days of dots and dashes at Electra House. Photo: Telecom Today.

All three men missed the "personal touch" they had to give each Morse message.

Said Ernie: "You had to monitor each transmission to ensure it went through smoothly. And if the distant operator interrupted and asked for a message to be repeated you had to do so. Afterwards you waited for him to acknowledge."

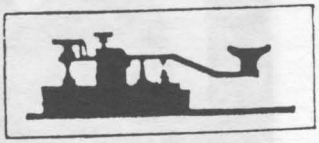
Messages took time to set up, with call-signs exchanged before the transmitter started sending.

"Today," said Jim, "initiative doesn't come into it. Each message is handled in the same way whether it's going to Reading or Rangoon. You just press a few buttons and it is there."

Added John: "We'll have a lot of memories. However the present system is far quicker and more reliable."

(From "Colin Coleman's Diary", Telecom Today, July 1986)

Spark-gap 8



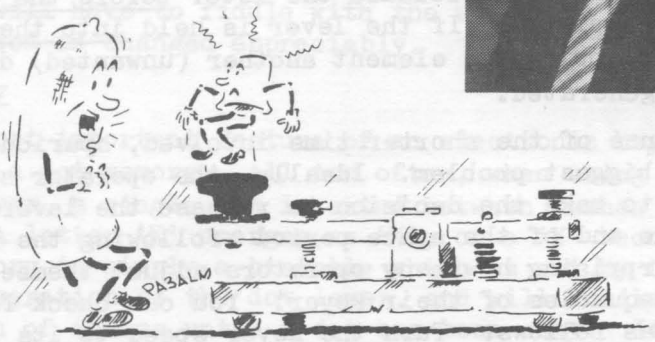
I have an old Vibroplex modified with extra "legs" so that it can be operated upside down. It belonged to an old Morse operator of the New York Times who was left-handed and insisted he couldn't use a Vibroplex in the conventional manner. The finger knobs look as though it has probably transmitted millions of press words.

Don deNeuf, WA1SPM.

ROY WALMSLEY G3IBB

Key-tronics

1



Along with every other aspect of amateur radio, the simple function of switching a transmitter on and off to produce Morse code has become highly technical. Very few CW operators have retained the "pump-handle" key. Even the simplest keyer in the hands of a competent operator enables him to enjoy long rag-chews with no discomfort, at speeds which were once the prerogative of the elite. Those operators with less ability can achieve the same degree of success by using keyers with built-in memories, or even a keyboard.

The other side of the coin is very different. Tuning across the HF bands and listening to the barrage of spurious dots and dashes, a mental picture emerges of wild-eyed, hysterical operators scrambling through innumerable QSO's, and rapidly disappearing under a mountain of QSL cards.....

But, let's face it - electronic keyers are here to stay. They are becoming more and more complex, with the result that an operator must learn a little more about the beast he is trying to control if it is to perform correctly.

Slop-time

What makes one keyer "feel" different to another? Perhaps the most important factor is "slop-time". This is the time in which the operator can release the lever once a dot or dash (element) has been initiated. All keyers are self-completing - once the lever is pressed the element will be correctly generated, even if the lever is released. Some poorly designed keyers make it necessary for the operator to release the lever before the dot or dash is completed. If the lever is held into the space period following the element another (unwanted) dot or dash is generated.

Because of the shorter time involved, spurious dots are the biggest problem. Ideally, the operator should be able to make the decision to release the lever right up to the end of the space period following the element. It is surprising how many operators adjust themselves to the inadequacies of their keyer! You can check for this problem as follows: Turn the keyer speed to its lowest setting and press the dot lever. Try to consciously hold the lever into the space period following the dot, and then release it. If two dots are generated - now you know why you have never been able to master it!

Spurious elements

Contact bounce is another factor causing problems. If you put a good quality switch on the input of a counter, when the switch is operated as many as 60 or 70 counts will be registered for a single operation. What is mind-boggling, is that when the switch is released a further count of several operations is registered.

The net result is spurious elements being formed, or a dot or dash incorrectly generated. The more frustrated the operator becomes, the harder he hits the paddle, and the more the bounce. Try putting a capacitor from each lever to common. Values will vary from keyer to keyer, but something in the order of 0.1uF to 1uF should help.

Another subtle problem arises from a keyer's dot/space ratio. Ideally this should be variable, and set up to

give unity ratio at the output of the transmitter. All too often it is fixed, with the result that the keying is slightly clipped. If the resultant side-tone is clipped, sending at slow speeds becomes extremely difficult.

It is unfortunate that if a keyer is made with a variable weight (dot/space ratio) control its setting will be a function of the speed of the keyer. Unless weighting is achieved in some form of digital manner, the operator will have to fiddle with the weighting control if the speed is changed appreciably.

Dot memory

The most important feature of an electronic keyer has got to be a dot memory. All too often, when using a simple keyer, a single dot inserted between dashes is missed. A letter 'K' emerges as 'M', or a 'Y' becomes '0'. A dot memory is simply a bistable which is set by the initial operation of the dot lever, and will inhibit the generation of dashes until a dot has been sent. It is generally arranged for the leading edge of the first dot to reset the memory so that subsequent dots in a series depend on the lever remaining pressed, thus giving maximum "slop-time.

"Missing dots" are responsible for a very large proportion of keying errors, and when an operator first uses a keyer with a dot memory the difference is truly amazing - yet all too often one is not aware of the reason. To test the operation of a dot memory, again set the keyer to its slowest speed. "Paddle" a 50 wpm 'N'. If a 'T' ensues, the memory isn't working.....

Wide choice

For the operator about to bury his pump-key and take up electronic keying, a wide choice of devices is available. Squeeze keying has become popular, and when one of the systems is mastered, lends itself to effortless high speed sending. All squeeze keyers can be used with a single lever paddle. Three quite different systems exist. "Iambic" keying is where the keyer produces alternate dots and dashes when both levers are pressed at the same time.

A second system is the "single dot insert" method,

which was popular when the MSK-5 keyers, manufactured by the late OZ7BO, were on the market. Pressing the dot key in a stream of dashes inserts one single dot. It is claimed that all letters with the exception of 'X' can be formed with a single squeeze of the paddle.

The third system was introduced in a keyer called the "Ultimatic", by W6SRY (QST, Feb 1953; Apr/May 1955; Sep/Oct 1960), and is often referred to as such. If a dot paddle is pressed during a string of dashes, the output reverts to dots. Similarly, the output changes to dashes if the dash lever is pressed during a string of dots.

Each system has advantages over the other two, and each has its own following. When any one system is mastered, it is very difficult to change to another. It would be foolish to advocate any as the "best" system. Iambic keying has tended to become the most popular, primarily because it was available commercially in the early days of electronic keyers.

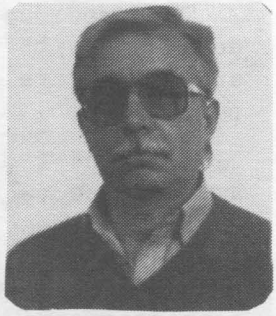
Word spacing

Automatic spacing between letters is taken for granted, but automatic spacing between words is also possible. After a letter has been formed, if the paddle is not pressed again for a period in excess of the normal inter-letter spacing, a counter locks out the paddle until a space corresponding to 7 dots has elapsed (inter-word spacing).

Paddle manipulation has to be a lot more precise if this system is to be exploited - all too often an 'A' comes out as 'E' and 'T'. A modern keyer with inter-word spacing is the "Accu-Keyer", details of which are in QST, August 1973, and contemporary editions of the ARRL Handbook. Whichever system is adopted, a great deal of practice, off the air is needed.

("Key-tronics" originally appeared in MERCURY, journal of the Royal Signals Amateur Radio Society, in 1978)

Home brewed C



by ON4WD

Ever heard of a beer bottle capacitor? No? Then read on, you may need one yourself one day!

It was the Spring of 1917. The three-masted barque "Standard" was on her way from San Francisco to the Northern fishing waters, and ran aground on the inhospitable coast of Alaska.

The ship was soon a total loss, the crew took to the lifeboats, and after a few days landed near one of the Libby McNeil salmon canning factories. As was usual in those days, the factory had a wireless station for communications, since there were no telephones or telegraph cables in that part of the world.

Among the few passengers aboard the "Standard" was a wireless operator, on his way to relieve a colleague at a coastal station. Out of curiosity, and of course to say "hello" to the local operator, he looked in the radio-room to see what equipment there was.

The gear was of the usual type for the period, a crystal-carborundum receiver for 500kHz, and a $1\frac{1}{2}$ KW transmitter with open spark-gap, the whole neatly under a cover of rust. Nothing special after all, if it wasn't for the home-brewed capacitor, a true example of the art of telegraphic ingenuity, at which he gazed with open mouth.

The previous summer, that particular C had broken down and, with the nearest source of parts some 2000 KM away, the wireless op had devised his own replacement part.

He found two galvanised washing tubs, the same kind grandma used when she washed grandpa's long underpants. He filled these with a strong salt-water solution, and filled two dozen empty beer bottles with the same solution. He placed a piece of copper wire in each bottle neck and connected them together. This was one side of the capacitor, and the two wash-tubs formed the other side.

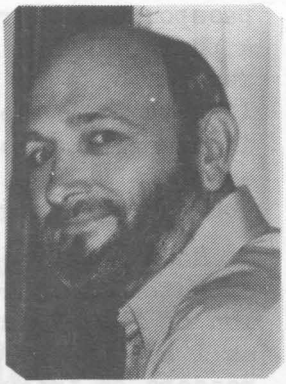
He worked the whole summer with his repaired tx. From time to time he heard a "plop" when HT sparked through one of the bottles. He simply removed this bottle and replaced it with another.

It all looked very primitive, but..... it worked.... However, we won't talk about the tone of the transmitter! Try something like this with your modern "rice-box" !

"Sic Transit Gloria Telegrafisti..."

Jules.

Just rambling



by G4FAI

Many thanks to those readers who have written to say how much they like MM. All comments are passed on to our "head office" in Holland, and Rinus and Dick are equally appreciative of the nice things you have been saying.

Although there's a lot of work in getting the mag out, what it actually contains depends a great deal on our contributors. We have had an encouraging response from a number of readers who have sent in some very interesting and entertaining articles.

There is one slight problem however - much as we would like to, we cannot necessarily get your contribution in the next issue of MM. With a quarterly magazine there is of course a long wait between issues to start with, and we do have to prepare material for printing some time in advance of publication date. We also aim to have plenty of good material in hand, not only for the next issue, but for issues beyond that. The last thing we want is to be scratching around to find something to fill the last few pages of an issue!

What I'm trying to say is, if your contribution doesn't appear in the next couple of issues after you send it to us, please don't think it is any less appreciated. We are trying to put variety into the mag and to provide a balanced content. Everything we accept will be published in due course, making its own contribution to the success of MM.

And of course we want you to continue sending ideas or material to us. Anything about Morse is of interest, and contributors' guidelines are available from me for the asking. If you do send us anything, please include a

passport photograph of yourself. It is a feature of MM. A photo makes a nice addition to your article, and the readers like to know what you look like! We would also like to have photographs of readers' stations, or other interesting Morse subjects to adorn our cover. This is another feature, helping to strengthen the link between you and your magazine.

Have you tried 3.553, the MM ragchew frequency? Lots of Dutch stations lurk there, readers of the Dutch edition of MM. Rinus and Dick are there from time to time, as I am, and we have already met a number of English readers on frequency. It's a pity our DX subscribers can't come up QRG. Several have written to say we ought to have a similar frequency on 15 or 20m for MM worldwide. Perhaps that's something we could consider as the sunspots get better? We already have subscribers in most continents so we certainly have the potential for such an arrangement.

Any suggestions for giving more publicity to MM would be most welcome. Apart from making sure that every issue is a good one, our top priority is getting the numbers up so that we can work from a secure base. A number of readers have helped already, and we are most grateful. If you write in a magazine, club newsletter, etc, please mention MM; I can supply a special "write-up" sheet on request. If you can suggest other publications or organisations likely to be interested, please send me details. If you can persuade your friends to take out a subscription, please do so! Any ideas or suggestions will be most welcome.

Have you got your copy of the Morsum Magnificat Q & Z codebook yet? This full list of the Q-code and the Z-code is an eye-opener, and includes the original Q-code of 1912, which takes up all of one page! Radio amateurs today certainly don't make enough of the Q-code, and the overlooked or forgotten Z-code offers even greater flexibility and precision in amateur communications. How about ZAE - "I am unable to receive you", or ZWH - "try again" ? This 82 page booklet is both practical and historical; a "must" for every radio shack.

73, ZKJ2 next time,

Tony

DON K. de NEUF, WA1SPM.

The incredible Indo-European telegraph

By 1860 the commercial and diplomatic pressure for telegraph service between the United States and Europe was increasing every year. But at that point in time the engineers had long felt that a telegraph line lying at the bottom of the Atlantic Ocean was technically impossible.

As a result of such thinking a vast undertaking by Western Union was planned - and construction actually started - for an open wire telegraph line running westward nearly 10,000 miles in length from the U.S. through what is now Alaska and across Siberia to European terminals. But by 1865 Cyrus Field had successfully laid a submarine telegraph cable across the Atlantic. The construction of the Alaska-Siberia proposed facility was promptly cancelled shortly after the Atlantic Cable began to provide service.

About the same time, Great Britain was desperate for telegraph service between London and India in particular in the building of her global empire. A submarine telegraph cable was actually laid through the Mediterranean and the Red Sea to India, but it suffered so many failures and interruptions for various reasons that it was virtually useless. (One can imagine the sleepless nights suffered by the telegraph engineers!).

Attempts were then made to bridge the gap instead by overland facilities via the Russian telegraph system to the Persian border, with a new line in Persia to connect into an existing Aden-Karachi circuit. But the maintenance of the line in Persia was so poor that satisfactory operation was seldom realised. And, the mish-mash of facilities when operating caused many delays, because messages had to be manually repeated at so many points by operators unfamiliar with the language used. As a result when messages finally reached their destination they were often so badly mutilated they were completely unintelligible. (The Automatic Repeater system for long lines was just being introduced in the U.S. in the 1860's).

In 1867, Siemens, a German organisation put forward a plan for a new system, under an undivided management, to pass through the Anglo-German cable, Prussian Germany and Persia, to connect at Tehran with a system administered by the British-India Authority.

The Indo-European Telegraph Co., Ltd, was subsequently formed to construct and operate the line. It was completed early in 1870, after solving many major construction and logistic problems. Intermediate stations between London and Calcutta included Lowestoft, Emden, Berlin, Thorn, Warsaw, Jitomir, Odessa, Kertch, Suchum, Tiflis, Julfa, Tehran, Bushire, Jask, Karachi, and Agra. The circuit consisted of two 6 mm-diameter wires carried on some 70,000 poles. Spruce poles were used in Poland, oak poles in Southern Russia, and iron poles in the Caucasus and Persia.

With the exception of a break between 1914 and 1921 because of the first World War the company line proved efficient, reliable and very profitable service for almost 60 years. The overhead line was more than 11,000 kilometers long - more than a quarter of the earth's circumference. It was truly a magnificent monument to the Siemens people and their associates who not only overcame tremendous technical construction and operating problems, but frequently almost unbelievable diplomatic and nationalistic stubborness and resistance.

Incidentally, while the Western Union facility via Russian America and Siberia died aborning, one fantastic plus developed from its efforts. WU president Hiram Sibley urged the purchase of Russian America by the U.S. from Russia. It did so for $7,200,000 - and thus became Alaska and eventually the 49th state of the Union. It was probably the greatest land bargain in history - about two cents an acre!

Don deNeuf's story looks back at the Indo-European Telegraph from modern times. The following is a contemporary account of the same line, describing what happened one quiet Sunday evening in 1884.

A GREAT TELEGRAPH FEAT. An Englishman after having been shown the operations of the pneumatic tube for carrying parcels in New York, said: "I have seen just one thing more wonderful than that"....."I have talked by cable from London to Calcutta, India, over 7,000 miles of wire.

Two years ago I called upon Managing Director W. Andrews, of the Indo-European Telegraph Company, at No. 18 Old Broad Street, London. It was Sunday evening, and the wires were not busy. Mr Andrews called up Emden, a German town. 'Give me Odessa', he wired, in a few seconds we got the signal from the Russian seaport city, and asked for Teheran, the capital of Persia. 'Call Kurrachee,' said Andrews. In less than half a minute we were signalling that Indian town. The signals came at the rate of fifteen words a minute.

After learning that the London office was testing the long wires, Kurrachee gave us Agra, and we chatted pleasantly for a few minutes with the operator on duty there. In a short time the operator switched us on the cable to the Indian capital Calcutta. At first the operator there could not believe he was talking to London, and he asked in the Morse language: 'Is this really London, England?' It was a wonderful achievement. Metallic communication between the capital of the English nation and the seat of her government in India, 7,000 miles away as the bird flies."

(From the 'New Orleans Times Democrat', and reprinted in the 'Journal of the Telegraph', August 20th 1886.)

Some thoughts on my 85th birthday

by John Lingards Sykes.

ANOTHER MILESTONE PASSED and one less to go. I had my eighty fifth birthday earlier this year and I still don't know what to do about it. What is there to do?
Make myself comfortable in the chimney corner and wait as patiently as may be for the man with the scythe ?
Count my sins and pray for forgiveness ?
Count my blessings and be thankful but without expecting more ?

What has it all been about, if anything ? What purpose have I served ? What difference would it have made if I had not been born ? Difference to whom ? To me ?
I wouldn't have known anything about it.
To my children ?
There wouldn't have been any.
To my mother ?
It would have saved her much anguish during the closing few months of her pitiably brief life.
Has my life been a success ? How can I tell ? By what criteria ? Would I like to live it all over again ? If the operative word is 'all', than the answer is a very firm "No" !
Does this mean that I find life so unsatisfactory that I want to die ?
No, of course not. It just means that I want it to continue more or less as at present, the one thing I know to be impossible.

Then what are my hopes, fears, plans ?
Hope: that one night, but not tonight, I may fall asleep and not wake up. Fear: that I may live too long, lose my mental stability, dignity and self-respect to become a burden to myself and those who have to care for me. Plans: not to plan but to live one day at a time and live it

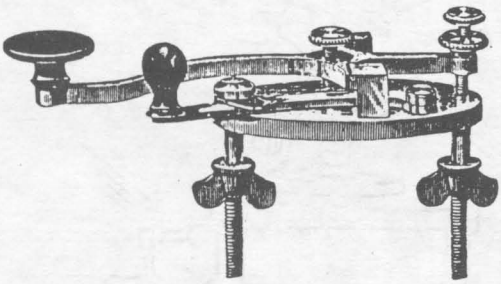
to the full.

Do I believe in life after death ?
Yes, on Sunday, Tuesday and Thursday; not on Monday, Wednesday and Friday; on Saturday I am a bit uncertain.
Do I WISH for life after death ?
Not unless it amounts to much more than we are promised in Revelations. I have never been enthusiastic over the prospect of standing up with a lot of six-winged dingbats (with twain do they cover their face, with twain do they cover their feet and with twain do they fly) and chanting "Holy, holy, holy" to all eternity nor can I amagine a God, who could or would put up with such nonsense for five minutes.

But if St. John hasn't got it right, then who has ? Probably no-one but more and more I find my thoughts straying towards the paradise of Omar Khayyam's Rubáiyat but with a pot of tea in place of the flask of wine. A book of verse ? The Rubáiyat itself will suffice. A loaf of bread ? No problem, I roll my own. Ant thou beside me singing in the wilderness ?
Now we are getting down to cases.

All I ask for is to be with those I love and who love me, whether in this world or any other.
And if there isn't any other ?
Then I won't be aware that there isn't and it won't matter.

Jack.



Second trick in the desert

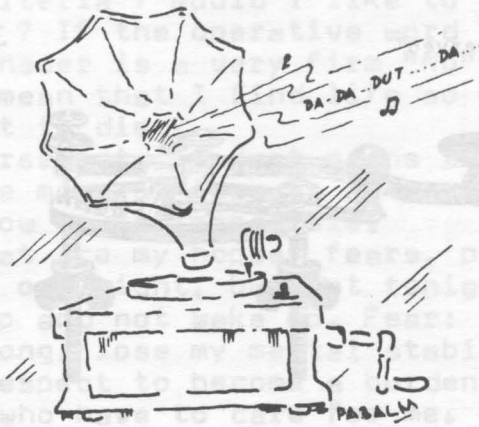
Down yonder in the sand cliffs,
I hear the Navajo drums,
Beating out their evenin' song
A twilight softly comes.

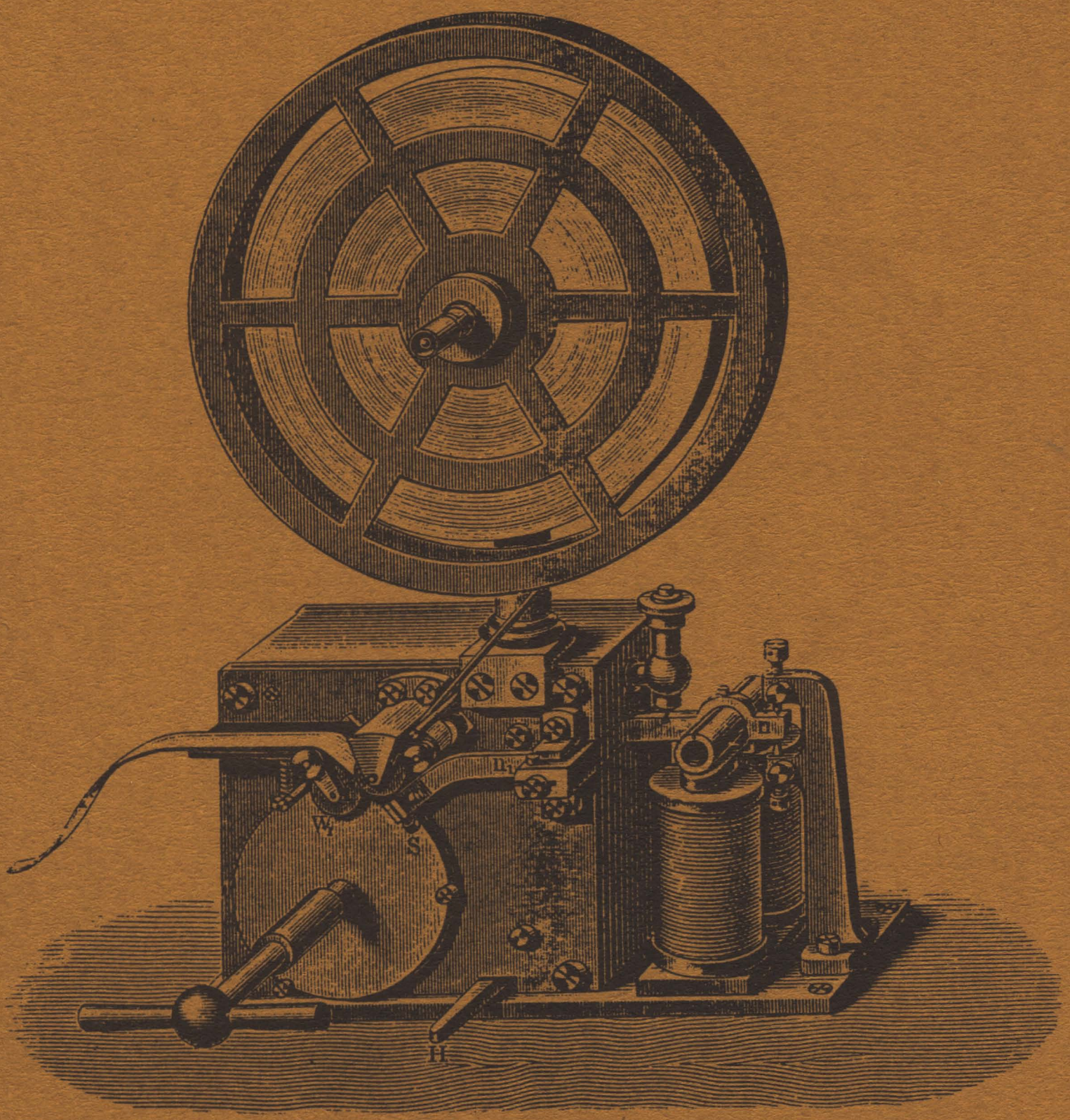
The stars shine so clear and bright,
And hang so low it seems
I could reach up and pick a few,
To wrap around my dreams.

The Morse wires hum a lonely tune
The Dispatcher's phone is still.
The tinkle of soft laughter floats
From the shacks below the hills.

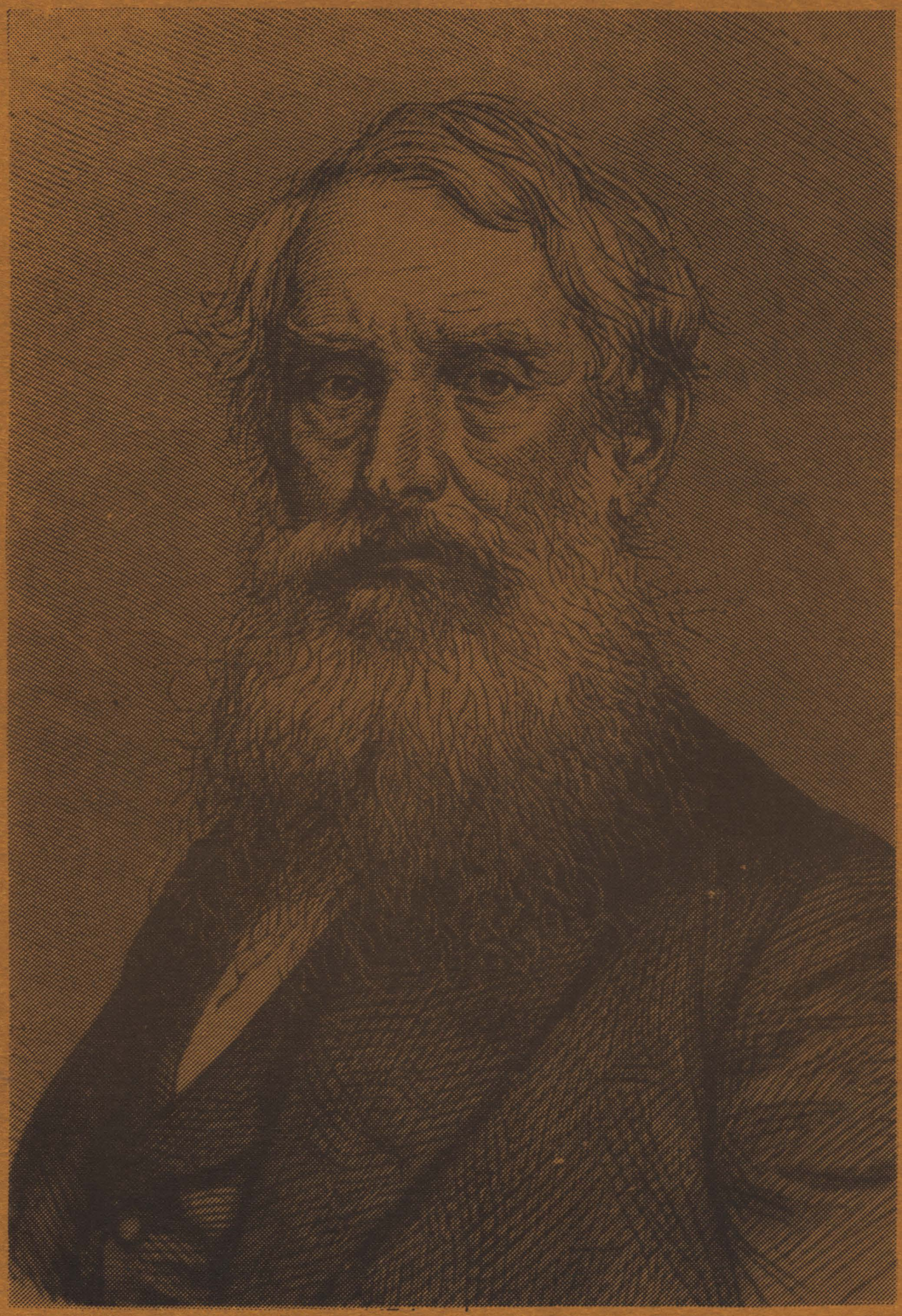
Sitting here in peaceful reverie,
With God's world all vast and still,
I know it's just one step to heaven
From this Arizona hill.

'Santa Fe magazine, 1930).





"Pin-writer"



Samuel F. B. Morse