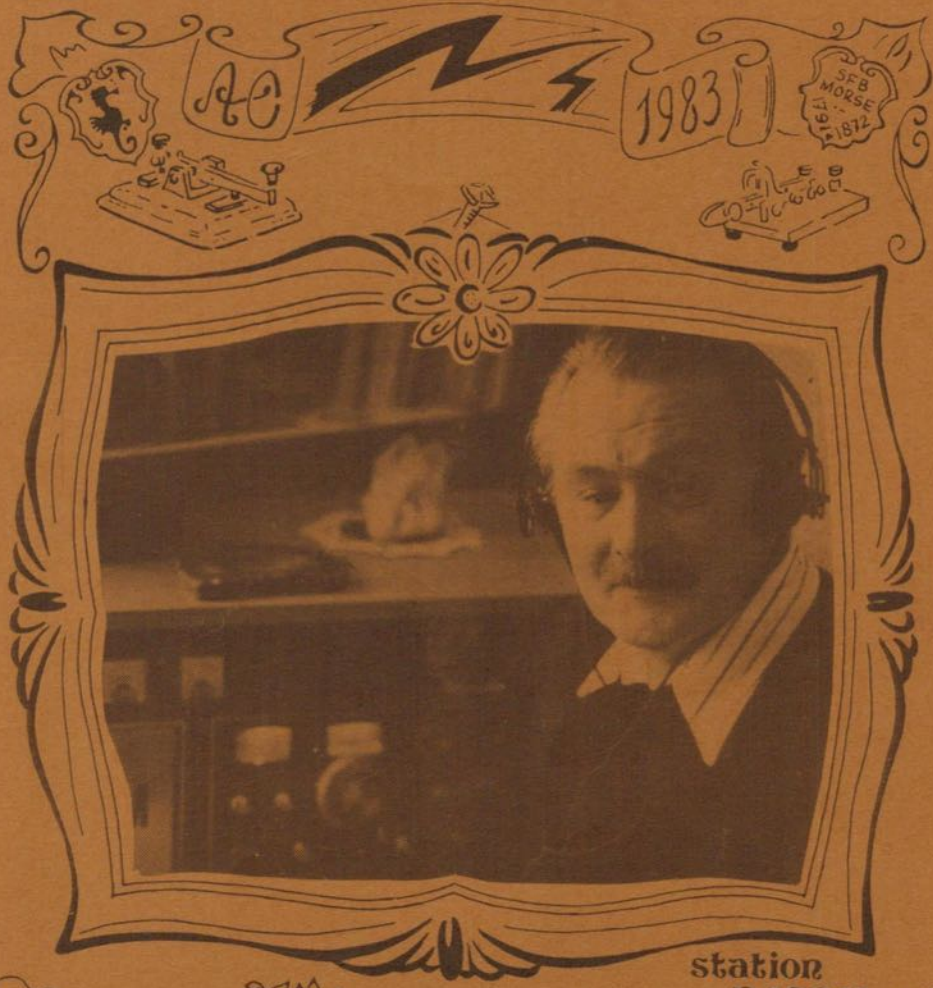


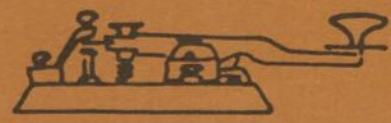
station
DJ6QM

Morsum magnificat

magazine for morse-telegraphy

nr 5
autumn 1987

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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Just rambling

After reading my article on the Titanic in MM Nr 3, Louise Moreau, W3WRE, wrote to say that the first SOS from a liner at sea was sent not from the Titanic but from the Arapahoe, in 1910. If anyone has details about what happened on that occasion, please write to me.

In the last issue, under "The Echo" and "The Bored Operators", the author's name should, of course, have read "Ray Hunting". Sorry Ray!

As the first renewal subscriptions came in many were accompanied by the most appreciative letters any magazine could wish to receive. Rinus, Dick and I are most grateful for all your kind remarks and for your continuing support of MM. A common phrase in your letters is "Keep up the good work!" We will try our best to do just that, but its not our work alone which produces what we modestly think is a quite unique publication. MM would not be what it is without the very fine material which our contributors send to us. So let us in turn say to you, "Thanks a lot, and keep up <u>your</u> good work too!"

May I draw your attention to the EUCW Fraternising CW QSO Party on 14-15 November, details elswhere in this issue? EUCW is an association of CW clubs across Europe dedicated to promoting CW activity on the amateur bands. Everyone can participate in this event, licensed or SWL, member or non-member of an EUCW club. QRO or QRP, its a great opportunity to get on the air with the key, confident that there will be plenty of action, with the exchanges making contacts more meaningful and interesting than the usual contest "599 QRZ?" This event is intended to stimulate CW activity - so why not be stimulated and help to show that amateur Morse is still very much alive and well!

Hpe cu then! 73,

Tony

EUCW Fraternising CW QSO Party

Open to all amateur radio and SWL stations in Europe.

Dates and frequencies

14th Nov. 1987: 1500-1700 UTC. 7.010-030 & 14.020-050 MHz
1800-2000 UTC. 7.010-030 & 3.520-550 MHz
15th Nov. 1987: 0700-0900 UTC. 7.010-030 & 3.520-550 MHz
1000-1200 UTC. 7.010-030 & 14.020-050 MHz
Please keep to these freqs to allow others QRM free QSOs.
All contacts 2 x CW, single operator, only.

Classes: A - Licensed members of EUCW organisations using more than 10w input or 5w output.
B - As class A, but using QRP (less than above).
C - Non-members using any power.
D- SWLs.

Exchanges: Class A - RST/QTH/Name/Club/Membership Number.
Class B - As class A.
Class C - RST/QTH/Name/NM (= "Not a member").
Class D - To claim points, the exchanges of both stations must be logged.
European CW Association (EUCW) member organisations are: SCAG; AGCW-DL; G-QRP; TOPS; SARS; BQRP (Benelux QRP); HSC: VHSC; INORC; HCC; BTC; UFT; SHSC.

Call "CQ EUCW". Stations may be worked (& SWLs logged) only once per band per day.
Scoring: Class A, B, C: 1 point with own country.
3 points with other countries.
Class D : 3 points for each complete QSO logged.
Multipliers: 1 for each EUCW organisation worked or logged per day and band, for all classes.

Logs: Must show date, UTC, band, call-sign, info sent, info received, & points claimed for each contact.
Summary sheet: Must show name, address, own call, score claimed, and details of rig including power used. Signature.
Awards: HSC will issue certificates to first 3 stations in each class. Send logs by 20th December to DJ2XP, Guenther Nierbauer, Illingerstr. 74, D 6682 Ottweiler, Federal Republic of Germany.

Press Wireless memories

by Don deNeuf,
WA1SPM.

"Press Wireless was an intriguing institution franchised by the pre-FCC Federal Radio Commission back in 1929 as an h.f. point-to-point communications outfit assembled by several large newspapers and press services for worldwide news exchange. Much of PW's commercial DX talent came up through the ham ranks. By 1944 the system was handling a hundred million words of press per year between enough countries to make instantaneous DXCC. They pioneered in photo transmission, multiplex, RTTY and other information-moving h.f. radio techniques.

PW participated in some fantastic field days too. As D.K. deNeuf recalls in a recent issue of Morse Telegraph Club's "Dots and Dashes", teams of Press Wireless ops and techs scrambled ashore with Eisenhower and MacArthur at Normandy and Leyte in WW2 to keep the world informed of invasion progress. The PW crew en route to Berlin made two dozen set-up stops, stretched 26,000 feet of antenna wire and operated 8,600 hours to handle eight million words of press and hundreds of network voice newscasts.

Another wartime PW legend is the tale of YTG. That call's prefix represented Yugoslavia then as now. After the Nazi invasion of '41, many Yugoslav troops continued resistance in the mountains. A squad of Yank radiomen was parachuted to hard-pressed units commanded by ill-fated General Draja Mikhailovich. They succeeded in keeping the outside world aware of battle action via hit-run c.w. skeds with Press Wireless DX hounds at WPK on Long Island."

(from "How's DX" by Rod Newkirk, W9BRD, in QST, March 1977)

By chance I happened to run across the above. It struck me as being a sort of, shall we say, a milepost sign in the skyrocketing advances of international telecoms over the past few years. A decade has gone by since Rod wrote this about "Old PW". And some forty years has passed since the events he mentions took place. He was explaining the purpose of the colossal shortwave layouts PW and others had. Today virtually all of them (RCAC, PW, Mackay, AT&T, Tropical) have been abandoned in favour of satellite circuits and underseas coaxial cables. (I don't know much about the military today).

I remember W.A. ("Frosty") Winterbottom, Pres. of RCAC shortly before WW2 testifying before the FCC on something or other. He was asked by a Commissioner (FCC) if he could "place a value in dollars" on a frequency (h.f.) assigned to RCAC. "Yes", he said after a few moments of thought, "Yes, I'd say about one million dollars". H.F. was all RCAC had - it was their life blood. Coaxial cables and satellites were many years away.

I wonder if the stimulation, fascination, mysteries and challenges of those days of d.c. submarine cables and h.f. radio competition exists in the telecom technology of today?* But I suppose that when we consider h.f. ZFO's, Dellinger curtains, ZFB's, ZSU's, ZWT's, ZAN's, submarine d.c. cable breaks, earth currents, unbalances, etc, things today are more reliable with fewer headaches than they used to be. I guess. But the excitement of...."we've got him!".... "he's coming thru now...."AL balance OK now - GA tfc".... "tell him to ZSF to 200 wpm now" still sparkles in fading memories of an old communicator.

So mote it be. Alas - or rather joy, oh joy. I guess.

73, Don deNeuf, WA1SPM.

*Cable salesman's pitch: "Oh you know how these radio circuits are - the weather changes and wham! they are "out" for hours on end".
Radio salesman's pitch: "Well those cables are fine when they work, but along comes an earthquake or some ship's anchor and BUST goes the cable - out for weeks at a time! Play safe - use radio".
Both: You ought to use radiograms or cablegrams, not the telephone.... you know speech is so often hard to understand, and so often phonetic errors take place which can be a disaster!"

RON GLASSOP VK2RF
(now VK4BG)

Ham radio in 2036

A Prophecy

Jim leant back in his shack chair, removed his cans and massaged his ears gently to restore circulation. He felt very pleased with himself, by which you might guess the rig had been getting out to his satisfaction. A glance at his log would have confirmed your judgement. Six QSOs, including four continents, not to mention a new country, all worked within two hours, was the tale it told. What ham with a license dating back only three months would not have felt equally pleased?

A clock struck in the next room with a single reverberating stroke. Jim gave a start at this intimation that the time was 1 am, and only then began to realise how sleepy he felt.

A fire was still smouldering in the comfortably warm shack, and Jim settled a bit lower in the chair, half closed his eyes, and let his thoughts roam unhindered. And as anyone can guess, he was thinking about how good he was at working DX.

"Not such a bad effort," he thought, "with all reports T8 or 9 and at least R6. These electron-coupled oscillators can push out a good note if you go about it in the right way. Wonderful the advances made in the game in the last few years. I suppose if a fellow had worked that string I got tonight about 15 years ago they'd have thought him a marvel; but when you look at it that way, I suppose that I'd open my eyes if I could see a ham station of the future. Say a hundred years from now. A hundred years - a

hundred years".

"A hundred years," a voice was saying as Jim opened his eyes, "that's how long you've been asleep. You've been here in the ham section of the museum all this time. I'm the caretaker, and just noticed you stirring as I was locking up for the night".

"I can hardly believe it," said Jim, "is it really 2036?"

"Yes, 2036," said the caretaker. "What a change you'll notice. They'll be asking you to give your impressions at one of the television stations in no time."

"So television is here at last," exclaimed Jim.

"Yes", the caretaker chuckled, "we don't have newspapers now. We see events as they happen all over the world. But I suppose the first thing you want to see is a ham shack."

"You bet," cried Jim enthusiastically; "you must have elaborate shacks now. Where's the nearest ham?"

"Oh, I'm a ham," remarked the caretaker, though Jim noticed that the way he said it did not appear to suggest much pride in his ham status. "I'm VK2XFG8K2".

"What a long call!" said Jim. "What's the idea?"

"Well, there are two million licenses in Australia now, so it's necessary."

"Holy smoke. How do you get through the QRM?"

"There isn't any QRM now. Our automatic receivers can copy through any interference."

"Well, that's a help. Now where's your shack. I'm anxious to see it."

"It's on the 251st floor of this building. We used to be a lot higher, but the missus used to get nervous at the height."

"Cripes, what a skyscraper! By the way, I notice the human race hasn't changed much. All I can see different about you is that your mouth is larger, ears are flatter, and the fingers of your right hand are stumpier."

"Yes, that's the effect of a few generations of hams,"

replied VK2, etc. (we'll call him that for short). Big mouth from talking into mikes; flat ears from wearing cans; stumpy fingers from pounding brass. However, since there's been no need to do these things we're getting back to normal."

"What!" screamed Jim, no talking into mikes, no listening, no brass pounding. How can you possibly QSO?"

"Oh, things are much easier now. Here's the shack. Come in and see for yourself."

Jim entered, prepared to see almost anything. He would not have been surprised to see 20 large relay racks end on end, tubes four feet high, and a receiver with 50 tubes. Instead, he could scarcely repress an exclamation of disappointment at the meagre amount of gear in the room. All there was, and there could be nothing hidden, was a closed box-like affair about four feet long, two feet high and two feet deep, and a panel a yard square, covered with push-buttons, each labelled.

"Everything is in the one unit now," said VK2, etc.; "It's all automatic, and controlled from this panel."

"I see," said Jim. "How different from my old rig. Now how about some technical details? Tube line-up and all that kind of thing."

"As a matter of fact, I don't know what's inside the box. It's sealed down, and can only be opened by an Amateur Station Service man, in the employ of the World Government."

"What!" howled Jim, "you didn't build it? You don't even know what's inside it?"

"No, of course I don't. You see, any form of experimenting is forbidden now. Years ago it was realised that there wasn't much left to discover, so all experimenting is now left to the Radio Development Department of the World Government. When anyone wants a ham licence he applies, pays the fee of two-shillings, and the Government sends him a rig, with a pamphlet on how to work it".

Visions of hard swotting of theory, countless hours spent copying code, the AOPC, 30-shilling fee, and the building up of his gear flew through Jim's mind. How easy it was to be a ham now. Too easy, in fact. Couldn't be

so much fun in it now, he ruminated.

"When I was on the air," said Jim, "we used to get a lot of fun out of building things, having them go wrong and fixing them."

"Yes, it must have been fun," replied VK2, etc, rather enviously, "but what we've never had we'll never miss. Like to see me have a QSO?"

"Go ahead, and you might like to explain things to me as you go along, like a good fellow."

"Oh, there's nothing much in it. Here's how it works. As we came through the door we broke an electron beam, and that switched things on. Now, who do you want to work?"

"Cripes, is it as easy as that working anyone you want? Well, see if you can raise an EA."

"Yes, we can raise any country at any time of the day these times. Well, to raise an EA, all I do is to press this button labelled CQ, and this one EA. You'll notice that there's a button for every country, in alphabetical order. The pressing of these buttons causes an automatic CQ EA call to go out in a narrow beam straight at Spain. The box contains the antenna, by the way. The outside affairs used to get mixed up with auto. Pressing the EA button automatically points the transmitting and receiving antennas at EA."

He pressed the buttons. "The call is going out now with a thousand kilos behind it. It lasts about 15 seconds, and the transmitter automatically switches over to the receiver as it signs "K" at the end of the call. See that light that just switched on at the bottom of the panel? That means an EA station has answered. The receiver swings around the band until it finds a station calling us. Now you'll notice the light has gone out; that means he's over and we're getting back to him. By pulling the switch we give him an over."

"Very snappy," Jim remarked, flabbergasted at the ease with which everything worked. "What do you - I mean the transmitter - say to him?"

"Oh, just 'Gn om es tnx fer call - vy psd to QSO. Ur sigs hr T9 QSA5 R9 (by the way, all reports are T9 QSA5 R9 now) pse QRK? pse QSL - QRU 73 cuagn gn!"

"Well," said Jim grimly, "I notice that rubber stamp QSOs haven't changed."

"Of course," explained VK2, etc, "by pressing this button marked "Ragchew" we would give him a report on the weather and condx. A barometer inside the box does that. But since we were able to control the weather and make it the same everywhere it's hardly worth while. Besides, if I prolong the QSO for more than two minutes the other fellow may be annoyed."

"I see, just like that, eh?" Jim was beginning to feel annoyed at the easy way modern ham radio worked.

"Yes, there's nothing to get worried about now. By pulling this tray out of the box we find a slip which has printed on it all the other fellow said. Of course, it's the same as we said to him, so that in the rare case of any QRM we'll know what he said. In fact, I hardly ever bother to read it. By the way, as the transmitter signed sk at the end of the QSO, it automatically printed a QSL card, stamped it, and shot it down a shute to the mail box. The EA will get it by the high-speed plane tomorrow morning. Now, what do you think of the way we do things, old man? Don't you wish you'd had a shack like this?"

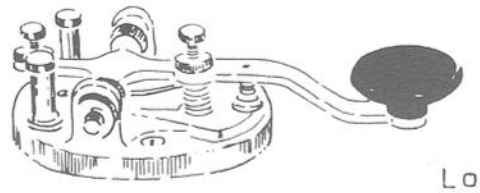
"Not a bit of it," yelled Jim, "I wouldn't swap you for a thousand pounds. Millions of hams, practically free licences, no technical knowledge, no building up, no operating, any DX any time; why you're not a ham at all!"

"What! yelled VK2, etc, "How dare you insult me? I'll teach you. Take that: and that: and that." He struck Jim on the head with his fist, in a frenzy of rage.

Jim opened his eyes. He was in his own shack, and his brother was standing beside him playfully tapping him on the head with a dud 45. "Cripes," said Jim, "I've never appreciated this station as much as I do now. Three cheers for 1936!"

(Reprinted, with permission, from Amateur Radio, journal of the Wireless Institute of Australia, 1st September 1936).

"The Key"



Louise Ramsey Moreau
W3WGZ

NOT ALL COLLECTIONS begin with a desire to amass as much of something as possible. Take keys, some times referred to by the phone ranks as "idiot sticks", here the initial desire was to be surrounded by keys. That was back in my happy novice year. In my blissfully ignorant mind surrounded meant four keys: the surplus J-38; a "telegraph key"; a Johnson speedex and a bug. The J-38 I had, the Speedex was the OM's key, I conned a neighbor's kid out of the KQB with a key on it for the telegraph, and about then I discovered that there was more than one kind of "Bug", so my goal increased to five keys, a Vibroplex (I still was unaware that there was more than one kind) and the Military J-36 that I managed to acquire through a shrewd swap. The OM had that Vibroplex, so I was happy. I was surrounded.

Back in the five key stage, I was told by the doyen of Collectors, W2ZI, that anyone can just amass, but the true excitement comes from the different kinds of construction, and dating and the history of the antique.
From that sage advice, came what every collector knows best - research.
So I drove librarians mad hunting out of print books. The sight of me not only turned them old and gray before their time, but increased the sale of tranquilizers. (One sure way to send a librarian into a state of sheer terror is to ask for a book from the Library of Congress. It's a word that turns them a deep green.

But insist and it is possible to get the reference -- over their quivering nerves.

Thanks to Ed's advice, my own curiosity, and a long line of harrassed librarians, the collection, and the history behind the keys symbolises the 143 years of history from the 1840's. There are the elegant keys of the 19e century that reflect the period and the master craftmanship of those manufacturers. So perfect in balance that there is no need to fasten them to the table to keep them from tilting when operating and with so light a touch that one can almost breathe on them to operate.

The efficient keys of this century solely for the business of working and no frills. Those incredibly large spark keys all had to be redesigned to balance the huge contacts, and at the same time provide safety factors that would protect the operators from the very high current.

Bugs - there are 46 of them.
The layman, the noninitiate, will insist that grandpa's old bug is very ancient from "back

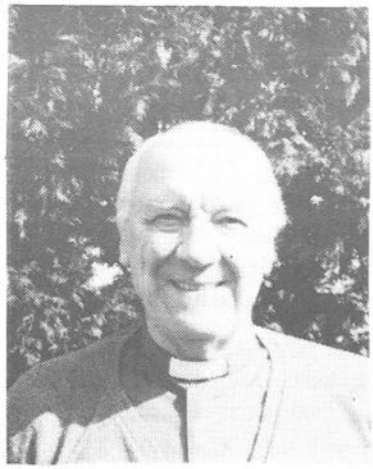
in the 1800's". He's wrong, of course. They came into being in 1903, with Horace Martin's Autoplex, and the next year, his Vibroplex, with which he sewed up the market for almost twenty years. But there are the equally excellent "Bootleg Bugs" and the "Bastard Bugs" that tried to buck Vibroplex, and failed.

And there the Strap, Cable, Pole Changer, Police and Fire Alarm keys, Practice of Learner's sets, and military and Foreign Keys.
There are more than four hundred patents for this country alone for keys, and that is in addition to the many, many military types and the foreign kinds.

All keys have a story as well as a history, whether it is the pet one we use in operating, or one that wrote history on the air or wires such as the one that Ray Meyers used to send the SOS from Sir Hubert Wilkins' Polar Expedition in 1931. A miniature bug that was used on the press desk at the Dempsey-Tunney Fight. A "Bastard Bug" that sent out the news beat from that famous "smoke filled room" that Harding had been chosen. The 1889 Johnston Flood Key, and others, but these are among the few.

Now I AM surrounded by keys.
Those five of the original goal have grown into 283. They line the walls of the shack. They take up little room and are so easy to care for. That is, until someone asks to see the collection. Then comes a frantic flurry as I pull 283 plastic baggies off the keys, bundle them into a cupboard so I can show off. But the "Ziplock" bags keep 'em clean, and dustless.
The only problem is that five was fun, but now I'm "hooked".

END



A letter from Churchill by Morse

By Ray Hunting, G3OC.

At the peak of the blitzkrieg in May 1940, I was 'borrowed' by the Royal Navy to work for Vice Admiral Ramsey at Dover. I was then a wireless detachment NCO in the Royal Signals, using a mobile wireless station near the castle to control a net of three other Army stations in France, located at Boulogne, Calais and Dunkirk. My call-sign was LDV, an abbreviation of Wireless Link Dover Vice Admiral. By coincidence, the same letters were being used for the new Local Defence Volunteers, later known as Dad's Army.

The Battle of Northern France was being lost, and by the time station LDQ was in operation at Boulogne, the German XIX Panzer Korps was encircling the port.

Casualties were so heavy, even the cipher operators were missing, and consequently all Morse messages had to be sent across the Channel in plain language. As every signal was being read by the enemy as it was transmitted, I decided to make an occasional copy for myself as a reminder of that tragic period in our history.

After the Panzer Korps had taken Boulogne, they launched an assault on Calais. As the battle developed, the sound of the German six-inch guns could be heard in Dover as a continuous rumble of thunder, and the windows of my wireless vehicle vibrated from the shock waves. From Boulogne, 30 miles away, dense black oil smoke rose high in the sky and spread like a dark curtain along the French coast.

Calais was being defended by the 30th Brigade with some 4,000 men, commanded by Brigadier Claud Nicholson, a most able soldier who had been Commandant of the Imperial Defence College.

The Brigade was under incessant attack from German aircraft, artillery and tanks, resulting in numerous casualties and a heavy loss of vehicles and ammunition. Both food and water were in short supply. I saw two naval cipher officers go aboard a warship in the harbour, but sadly, both were killed as they went ashore in France.

Morse messages in plain language poured in from the Citadel in Calais urgently calling for sea shelling to silence enemy artillery batteries, and for ships to evacuate the wounded. On Saturday 25th May the situation was critical. The Luftwaffe, operating from French airfields, began bombing the Brigade unmercifully. A message came in for the Vice Admiral at 10.10 hours, "Must have continual air protection and reinforcements immediately and naval protection. This is from Major Brown, Queen Victoria's Rifles."

In the early afternoon, a Flag Lieutenant entered the wireless vehicle and sat by my side. "Please get in touch with the Citadel", he said quietly. "Ask Brigadier Nicholson to come to the wireless set to receive an important message in person".

I keyed the information to the LDR operator, and as we waited for the Brigade Commander, the naval officer removed a folded sheet of paper from a long white envelope. When the Brigadier was ready, the Flag Lieutenant opened the paper and told me to send the entire text. I saw at a glance it was a personal letter from the Prime Minister, and began to send in slow precise Morse to enable the LDR operator to make a good clear copy.

"From 10 Downing Street 25/5/40

To Brigadier Nicholson

The defence of Calais is of the highest importance to our country. The eyes of the Empire are upon the defence of Calais, and His Majesty's Government are confident that you and your gallant troops will perform an exploit worthy of the British name.

W.S. Churchill"

The Brigadier must have been reading the text as it was written, because as soon as I ended the transmission he sent an acknowledgement.

As the battle raged in the town, an unidentified officer sent a desperate signal to the Vice Admiral, "The Rifle Brigade at Calais casualties 30 maybe 60 per cent. Brigadier's fate unknown. Am trying to contact KRRCS fighting in the centre of the town. Rifle Brigade driven to the quay. Send all available bombing and shelling required to support us. Quay intact despite severe bombardment."

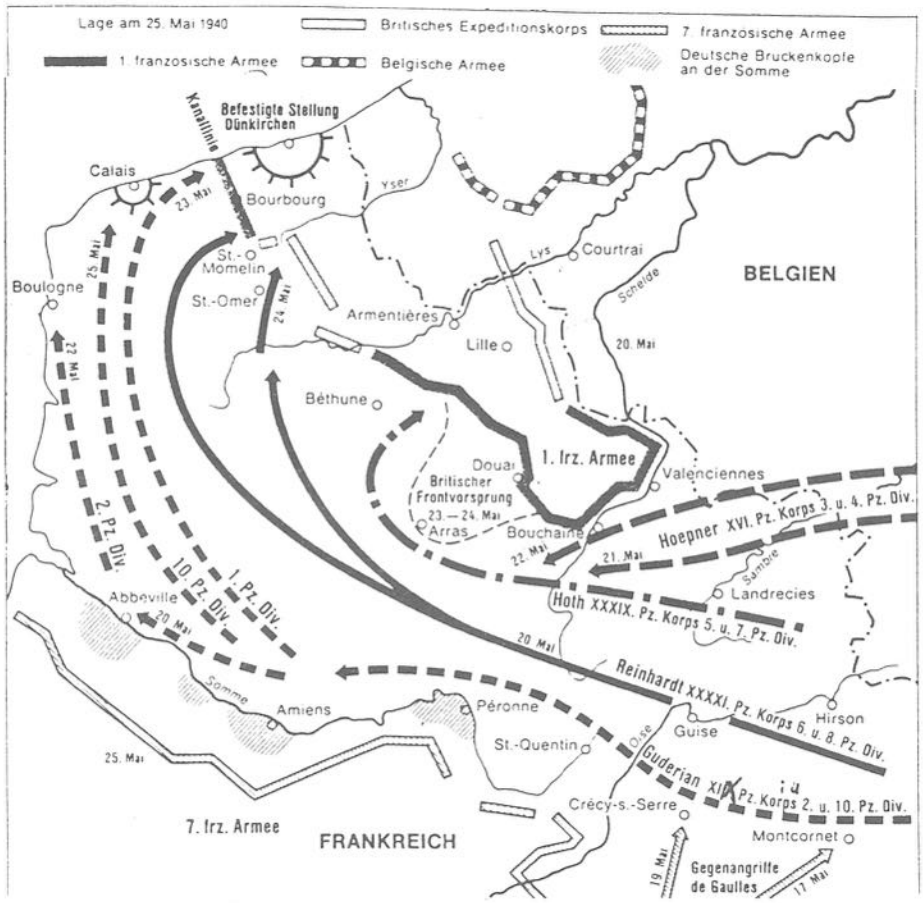
As the situation became grave, wireless activity increased when warships began to send coded messages to the Vice Admiral through LDV. The naval telegraphists were in a higher league in Morse operation and some of their traffic was tearing into Dover up to 40 wpm.

The continuous tension and lack of sleep began to take their toll. After one long and difficult session on the key, I lay on my bed in the afternoon almost exhausted. I tried to sleep, but imaginary Morse signals were still pounding in my ears. I woke suddenly, saturated with cold perspiration, and saw several sailors grinning at me and asking what my nightmare was about. I could have told them that I was dreaming about frantic Morse signals being sent to me at speeds I could not copy. I said nothing - they would not have understood.

That splendid Brigade held on to Calais through four days of hell on earth, and only after their ammunition boxes were empty was the enemy able to run up the Nazi flag over the ruins of the Citadel. Among the prisoners was Brigadier Claud Nicholson. Regretfully, this brave soldier died in a prisoner of war camp at the age of 42.

It should always be remembered that the stubborn defence by the 30th Brigade engaged two Panzer divisions complete with regiments of infantry. If those five hundred tanks and thousands of troops had been free to move along the coast to Dunkirk, the story of the great Evacuation and our continuation of the war could have had a different ending.

The next day, station LDV became part of Operation Dynamo, when the Vice Admiral controlled the remarkable



evacuation of 338,226 men from the Dunkirk beaches. My last transmission to Dunkirk was an order to a naval officer to destroy the station LDP.

Our work completed, the aerial was dismantled, and we prepared to leave. During the war, many a Morse man laboured hard and long without as much as a mumbled word of appreciation, but not this time. A naval officer accompanied by a squad of sailors came to the wireless vehicle to say farewell. The officer presented us with a hamper of rare food items and packs of cigarettes, then led cheering and applause as we drove from the castle.

On our return to the Army, the detachment received a Commendation from the Admiralty and another from the War Office. It was comforting to know that the efforts of Morse-men had been recognised - officially.

Reflections from Uncle Bas

4

SOS

What feelings these letters aroused in a youngster of 18, at the marine training school in Amsterdam. The most important things you learned there were handling the key, and the emergency procedures. Boy, oh boy!, the rules for SOS, emergency, safety, and security, had to be learned by heart, and the main part of the examination was concerned with these matters.

I had been at sea for six years before I heard a real distress signal, and then I was abruptly told to shut up!

I was manning the radio station on a Norwegian ship of about 5000 tons. Most of the time it was more under the water than on it, and it had a kind of weekly service between New York and Havana.

It was a quiet morning in February. We had left the Ambrose light-ship behind a few hours previously, and were bound for Cape Hatteras, the usual route to Caribbean waters. Visibility was reasonable, although there was a hazy mist over the sea, the surface of which was as flat as a mirror.

As a good and reliable radio-officer, I was listening on 500 Kcs (what else can you do on a ship?), thinking of all those beautiful girls in Havana, where we would arrive in four days time.

Suddenly, an SOS came thundering out of the speaker, followed by an Italian call-sign. I realised later that the guy never gave the alarm signal, which activates the alarm bells when the telegrapher is visiting the loo!

To cut a long story short, with the desperation of a hunted man, I switched the transmitter on and sent QSL, which is part of the procedure. Such an event is unique in a telegrapher's life, and already I saw myself on the front page of the newspapers as "Radio Op Saves Ship" !

I had scarcely touched the key when one of the big New York coastal stations signalled me with his 10KW to QRT, and this was repeated a second later by the US Coastguard.

Not very nice for a future radio-hero! I had not looked in the international call-book, so I did not know it was one of the largest Italian passenger ships, the "Andrea Doria"!

The surrounding waters were crowded with ships, plus the Coastguard, which is always present in those waters. They were not waiting for a small rusty Norwegian boat trying to spoil the ether with her tiny Morse-peeps, let alone trying to save all those millionaires in her dirty lifeboats!

Afterwards I learned from the newspapers there had been a collision between the Swedish liner "Stockholm" and the "Andrea Doria", the latter being on her maiden voyage! Both ships had double-radar, full crews on the bridge, look-outs fore and aft, because of the fog, but neverthelss they collided!

The Andrea Doria took ten hours to sink, so there was ample time to get everyone off the ship. According to the papers, a movie star broke her leg, but it might just have been a publicity stunt.

Nothing further has been heard of that Dutch sparks on his rusty boat. But I know from a reliable source that he still talks about his moment of near glory.

He heard the SOS first!

Bas

exclusive for MM

The perfect cache

by John Lingards Sykes.

OF MY FIVE voyages as radio officer of U.S. Freighter S-S West-Kamak , number three, from Bremerhaven in Germany to Houston in Texas, stands out in my memory. Both Germany and America were in tormoil with the collapsing Mark spreading economic disaster in the one and Prohibition spreading lawlessness and corruption in the other.

Throughout our three week stay in Bremerhaven every seaman and almost every officer drank to excéss, not because of any depraved craving but simply because it was available in every conceivable variety and, in terms of the American dollar, for next to nothing. Back in the states the choice would lie mainly between rot-gun gin at ten dollars a bottle and super rot-gut gin at twenty dollars a bottle.

As was to be expected, everyone aboard planned to buy brandy or other high grade spirits in Germany and sell it in America. Fortunes seemed to be there for the making but I have never come across a bootlegging seaman of any rank or nationality, who ever made very much at the end of the day. Either they drank the intended contreband themselves on the homeward voyage or had it confiscated by Customs Officers, who invariably turned out to be just that bit smarter than the would-be smuggler gave them credit for.

My ten years in the British Merchant Navy had taught me the folly of trying to smuggle booze; the attempt invariably failed and it could lead to loss of job and loss of liberty and I didn't fancy either.

Aboard West Kamak my ploy had been to buy and sell accumulator batteries such as were still being used to power domestic wireless sets. But anyone, who carried a heavy battery from the centre of Bremerhaven back to the ship and at the other end from the ship to some customer in the residential area of Houston, earned his few dollars profit. Certainly there was no fortune in it and I did much better from my extra curicular duties as ship's safety officer or drunk controller, charged with the onerous task of ensuring that no-one, whether drunk of sober, fell down a hold or off a gangway during working hours. Captain Williams was a reasonable man, who would never dispute the inalienable right of every freeborn American citizen to fall down wherever he pleased, in his own time. My pay, two dollars a day, came out of the fines, he imposed on such as he considered to be both drunk and incapable of work.

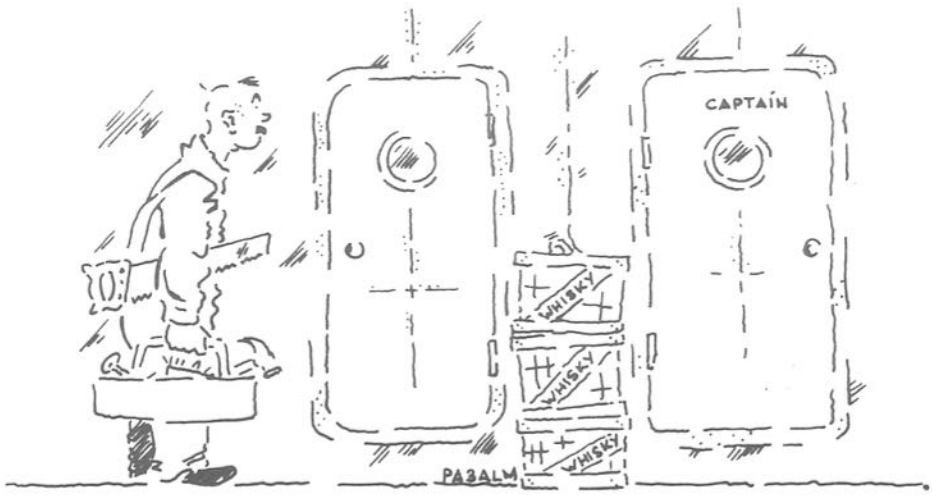
I think it must have been on the forenoon of our third or fourth day in Bremerhaven, that the Chief Engineer burst into the officers mess to give his exciting news: "I've found it! Listen youse guys, I tell you I've found it, the perfect cache, a fifty bottle hidy-hole, that no customs officer will ever find !" Response from his coffee drinking colleagues was slow to come - we had all heard it before and it never proved true. Never-the-less we were a captive audience and perforce had to listen to our scottish genii. We learned that the partitions between cabins comprized a double sheet of wallboard on 3" x 3" battons, the whole forming a kind of enclosed honeycomb which, if access could be made to it and afterwards concealed, would house and hide several dozen standard wine and spirit bottles. Our generous well-wisher now informed us that access was easy.

"All you have to do is take down your wall mirror, bore four holes just big enough to take a hacksaw blade and saw out a rectangular panel

a little smaller than the mirror." The mirror, when screwed back on the wall, would, or so we were told, hide every trace of vandalism.

Just how many of our colleages fell to the tempter's wiles I have no means of knowing, but I do know of one who both succumbed and quickly came to regret it.

Mr. Phillips, our Chief Mate or First Officer, clearly took the tip at its face value, but would have special difficulty in applying it. His cabin was next door to the Captain's and separated from it by a mirror-carrying malch-board-partition. He would have to do this wall cutting in the evening after the captain had gone ashore, but the task was a simple one and working in near darkness posed no problem. How was a simple sailorman to know, that his partition was only one board thick and that after pulling out his 29" X 23" panel he would have nothing to show for his labour apart from a 29" x 23" rectangular hole smack in the middle of his captain's erstwhile unsullied bulkhead ?



Well, if he didn't ken beforehand, he kenned the noo.

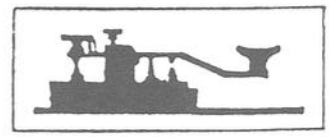
Horror stories have always been beyond my feeble pen and it would take an Edgar Allan Poe to put into words the agony of that moment. On the few occasions, when I have attempted to recount the story some of my listeners or readers have purported to find something funny in it. Such persons would laugh at a hanging, were it not their own !

The next encounter between captain and mate is something about which I have no direct knowledge, but I have heard rumours, that the mate tried to explain his inexplicable action as arising from a nightmare or even a bout of delirium tremens, under which he conceived the impression that he was trapped in his locked and burning cabin from which he cut his way with great presence of mind, not to mention a screwdriver, gimlet and hacksaw !

I kmow, it is a very thin story, but it is all I have and the next chapter opens a week after leaving port, homeward bound to Houston, Texas.

Jack.

Spark-gap 17



ON4WD's article ("Home-brewed C", MM Nr 3) reminded me of an article years ago in the Journal of the Royal Signals Institution, by a WW1 Signals Officer who was working in the Red Sea area in 1916. One of his jobs was to instal two fairly high power spark sets, but one was damaged in transit, a plate glass separator in the COC condenser being shattered.

After a little thought our hero removed a similar separator and its associated plate from the other transmitter, and went ahead and installed them both. They worked away quite happily for the rest of the war without anyone realising that they were operating 100m or so off their allocated wavelength.....

Gus Taylor, G8PG.

Not guilty!

The story you are about to hear is true. Only the identity has been withheld to avoid embarrassment!

The central characters are our Morse-test candidate; his wife, Brenda; and their "best friend", a red setter called Honey. Candidate took the Morse test at the recent Oldham club rally.

Five days later, his two test colleagues, among others, had been notified of the results. When the postman failed to call at his Oldham address after eight days, Candidate's suspicions fell upon Honey, and the "naughty corner" where she usually deposited items snatched from the letterbox. Nothing there either.

What followed, I am assured by utterly reliable sources, is absolutely true.

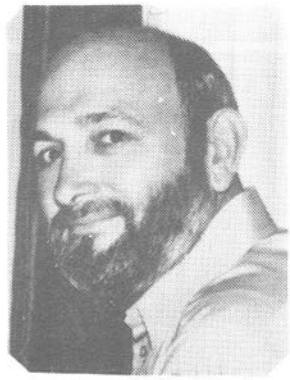
Candidate summoned Brenda to a conference. Together, they cleared the "naughty corner"and Honey was called upon to stand by the front-door letter-hole. Brenda was then despatched to "deliver" several documents.

Carefully, one at a time, she "posted" them through her own front door, while Candidate relentlessly stalked each of Honey's pick-ups, hoping to find a new hiding place!

That test was a failure - but he passed the Morse one. The postman delivered the long-awaited certificate the following morning!

(From "Amateur Radio News" by Derek Nicholls, GØGTC, in the "Rochdale Observer", 11th February, 1987.)

Introducing the BATH Telegraph



Tony Smith G4FAI

Readers of ARRL's "200 Meters and Down, the story of Amateur Radio", by Clinton B. DeSoto, may recall the following passage:

"In the latter years of the nineteenth century there existed a considerable body of these experimenters, of all ages, who made small electromagnets, motors, batteries, static machines, erected neighbourhood telegraph lines, and built all the other experimental electrical apparatus within their ken - purely as a hobby, and with no commercial interest whatsover.

"The fascinating new art of radio received many converts from their ranks. Particularly in the case of the neighbourhood telegraphists did the possibility of signalling without .... wires hold appeal."

Long before the advent of wireless, there was amateur enthusiasm for Morse telegraphy in the United States, as evidenced by Bunnell's Students' Manual of 1884, to which we shall return later. Of course, a good number, of those early "amateurs" were set on becoming "professionals", members of the exciting fraternity of telegraphers in a booming and expanding industry.

When those professionals eventually retired or left their trade behind them, they never forgot their skills and, with the advent of wireless, many became amateur radio operators, continuing to use their Morse not for profit, but for pleasure.

Transpose that situation to the 1980's, and there are still many ex-professional telegraphers who are now "amateurs", continuing to enjoy their beloved Morse.

And in the United States a number of ex-profess-

F.W. Thomas, Chief Engineer of the BATH Telegraph Ltd.

ionals keep the old ways going not by wireless , but by wire - the modern day neighbourhood telegraphists!

In Clearwater, Florida, two ex-railroad men, F.W. Thomas (Tommy to his friends), and L.A. Bailey

(known simply as "Bailey") have rented a wire from the General Telephone Co. This provides a circuit between their homes in which is installed old-time keys, relays, and sounders. They communicate with each other daily using American Morse, fondly referred to by land-line telegraphers as "the mother tongue".

Says Tommy, "It's more than a hobby. I could live to 100 with all the interest I have in this. I enjoyed my work, and I would miss it if I didn't have this to fall back on".

The set up is known as The BATH Telegraph Ltd, BA for Bailey, TH for Thomas, from their wire signs and, as Bailey says, "We only have two offices so we are definitely 'Limited' !"

Born in 1900, Tommy is the Chief Engineer and the elder statesman. "Basically what we are using is a series metallic circuit. I furnish the battery (rectified house current) at about 40 milliamperes. We have two stations (our individual homes), and each terminal is equipped with regular radio $\frac{1}{4}$-inch phone jacks in series with the line.

"In my home I have two circuits, one to the dining area and one to the bedroom, which I can disconnect at will by removing the plugs from the jacks.

"I thought it might be more interesting to build it in such a way that we could use it as a telephone circuit by flipping a toggle switch at the end of the line.

"Later I got the idea of putting cassette recorders at each end, flipping another pair of toggles to have two telegraph circuits with ground returns. One line was for communication and the other to control the other station's recorder..."

Bailey again, "this last feature we do not keep in permanently, but we can activate each other's recorder, transmit a message in Morse, turn off the recorder, and a small pilot light remains on until the message is taken

off the tape."

Tommy's first assignment as a telegrapher was on February 9, 1917, at Niagara Falls, New York, and nine days later he was promoted to manager of a small postal telegraph office at Hornell, NY. He was 16 years old. On May 13, his 17th birthday, "I thought I was a man and applied for employment on the Erie Railroad". They paid 50% more than the Postal Telegraph Company.

His mother signed a release as he was under-age, but he didn't know it was unlawful for a 17 year-old to handle telegraphic train orders and run (control) trains. Because so many operators had joined the armed forces, however, he was permitted to do the work until the railroad could get some older men. Then on June 6th, 1917, the RR assigned him to other duties with longer hours and less pay until he reached the age of 18.

He resigned and went to work for the Western Union Telegraph Company in Buffalo, NY, but he still hankered for the railroad. Shortly after his 18th birthday he joined the New York Central RR, but eventually ended up working in a war plant until the war was over.

He spent four years in the US Naval Radio Service, but by 1924 he was back with Western Union again, this time in Chicago, where he received special training in testing and regulating, and learned teletype operating. After a year in Chicago he was transferred to the late night chief operator's position in St. Petersburg, Florida, where he remained until WU abolished the position.

Rather than leave Florida, he joined the Atlantic Coast Line RR in Clearwater, where he worked as a telegraph clerk for 40 years until retiring in 1967.

Bailey is the younger of the two. He began his career as a Western Union Messenger in 1943, at the age of 16. He became a freight clerk with the ACL RR in 1948. He met Tommy then and they have been friends ever since. At that time Tommy suggested he change from a clerk to an operator, and in 1949 he attended the Huntington School of Telegraphy, West Virginia, to qualify for his new career. He subsequently served the railroad in a number of posts for a period of 23 years, until the decline of telegraphy.

L.A. Bailey, President of The BATH Telegraph Ltd.

He says, "I was among the last of them, and an exciting time it was for which there are no regrets. Telegraphy gave me much that I could have gained in no other way! " Today he is a banker, but he has never lost his love of Morse telegraphy. He is a Director of the Morse Telegraph Club, an international organisation dedicated to the memory of the inventions of Samuel F.B. Morse, and he is President, to Tommy's Chief Engineer, of The BATH Telegraph Ltd.

Between them, these modern-day neighbourhood telegraphists have a wealth of telegraphic stories to tell from the days of the key and sounder. Look out for "Tales from the BATH Telegraph" in future issues of Morsum Magnificat!

G4FAI.

The fullerphone

by L. MEULSTEE, PAØPCR.

A historical and technical description of a Service signal instrument, invented in 1915 by Captain A.C. Fuller and still in use during and after WW2.

1915... two large armies were densely packed in their trenches, at places only a few hundred yards apart. Signal communication was mainly by telephone and various buzzer telegraph instruments, connected via single cable and earth return. The earth was thus alive with buzzer and telephone induction.

During mid-1915 the Germans were extraordinarily well informed of Allied plans. Carefully planned raids were met by hostile fire exactly timed and directed. Relieving troops would be greeted, if not by shells, by shouts of welcome from the opposing trenches.

On one occasion a Scottish battalion took over its new front to the strains of its regimental march played by a German cornet! Espionage was suspected but an interned British civilian brought back the information that induction of cables led to widespread interception of signals.

Experiments carried out within the Allied lines left no doubt of the cause of the leakage, and measures against eavesdropping were hastily introduced by using metallic circuits (two twisted wires), instead of an earth return,

within 4000 yards of the front-line.

The solution to the problem came toward the end of 1915 when Captain (later Major General) A.C. Fuller invented the Fullerphone, a small direct current Morse telegraph instrument. In October 1915, Fuller brought two prototypes to 5 Corps in Flanders. His invention was tested on a five mile loop of cable, part of which ran in the water-filled moat of Ypres, with a 10 ohm leak to earth. The instruments worked well and were obviously the answer to the problem of interception by induction which had brought the BEF signals system almost to a standstill.

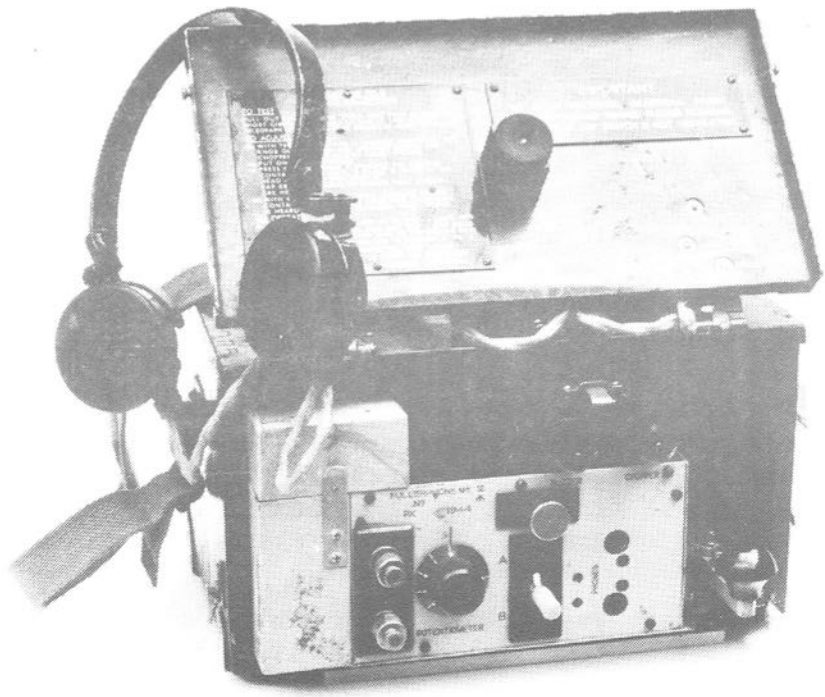


Fig. 1. Fullerphone MkV, tropicalised version of the WW2 standard instrument. The control panel carries the line terminals, potentiometer control knob, reversing switch, and phone sockets. The Morse key is mounted at the bottom right-hand side of the unit. The buzzer-interrupter (chopper) unit slides into position on the top right-hand side.

Break-in possible

The Fullerphone is essentially a d.c. Morse telegraph instrument with high sensitivity. Morse signals can be sent and received by the same instrument; no send-receive switch is used, so 'break-in' working is possible. When sending, a very small direct current will flow through the line and the receiving instrument. A readable signal will be produced with a line current of only 0.5 microamp. For reliable communication, however, a current of 2.5 microamp is considered essential.

To make the d.c. Morse signals audible, Fuller added an interrupter device to change the steady current into an intermittent current suitable for producing a note in the headphones. He completed the circuit by inserting capacitors and l.f. chokes to keep the current in the line constant as long as the key is down. The current from the sending battery passes through the sending operator's 'phones, enabling him to hear his own buzzer signals and to judge the strength of signals to the line.

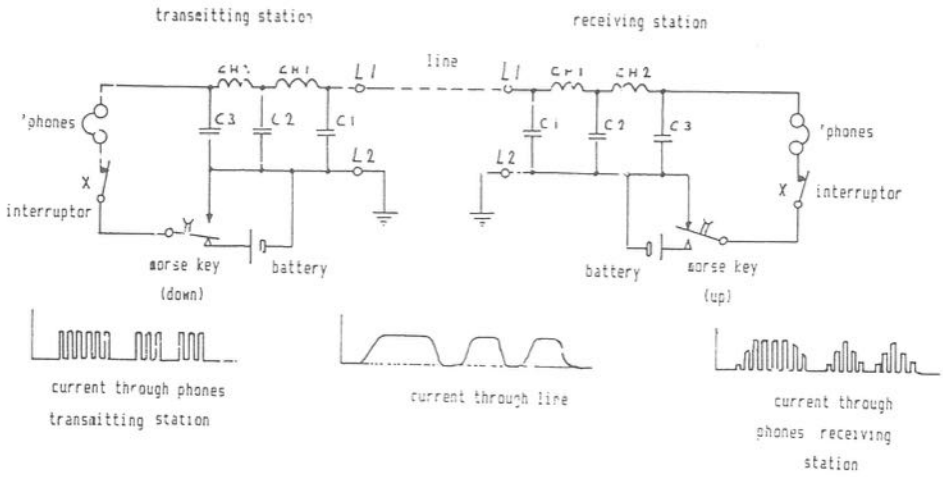


Fig. 2. Simplified diagram of Fullerphone circuit.

Should the line be cut or the distant operator's interrupter go out of adjustment, he is immediately notified by hearing musical clicks instead of his own

buzzer signals. Should his own interrupter go out of adjustment, he will hear nothing at all.

The arrangement of chokes and condensers not only prevents any appreciable variation in the line current, but also prevents any l.f. currents (such as produced by induction from other circuits) from passing through

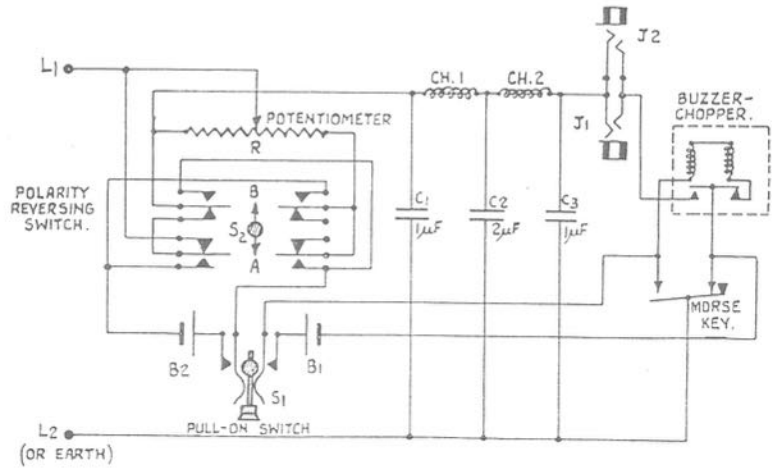


Fig. 3. Circuit diagram of Mk IV Fullerphone (1939).

the operator's headphones.

The effect of the capacitors and self-inductance of the coils also prevents the possibility of Morse signals being read from clicks by the enemy, or clicks interfering with telephony carried over the line simultaneously with Morse signalling.

Fullerphone signals cannot be overheard by induction or earth leakage, and can only be tapped by the direct connection of a similar instrument to the line. Working

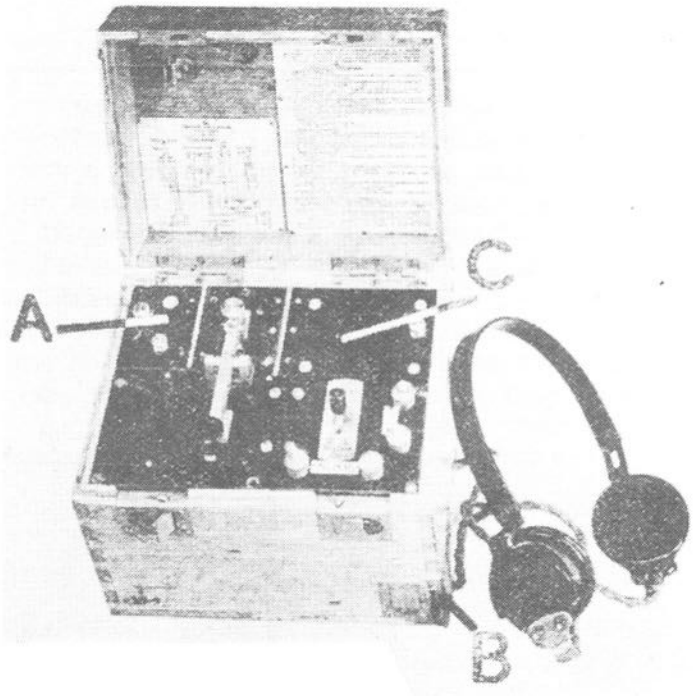


Fig. 4. "Apparado da campo per telegrafia ininter-cettabile - Mod. 1931". (Apparatus, field-telegraph, non-interceptable). The Italian Army copied the Fuller-phone in the early thirties. The circuit is similar to the British design, but no line balancing potentiometer is included.

via leaky or very long cables is possible, the normal range for reliable communication being 25-40 miles. Much greater ranges are possible under special conditions (eg, air lines in the desert) or by putting in a minor circuit change. As the Fullerphone works on d.c. only it can be used on one line simultaneously with a telephone set without any mutual interference.

Difficulties

Fullerphone circuits are, however, liable to some forms of interference. Difficulties in working are almost invariably due to interference from small currents picked up by the line, either by the earth, by earth faults, or by leakage from other currents. The interference caused by a steady earth current, or by leakage currents from other circuits, can be effectively balanced out at the receiving end by producing a current of equal strength but of an opposite direction to the interfering current. A potentiometer R, dry cell B2, and reversing switch S2 are provided for this purpose. Each station must adjust its own potentiometer as the currents which are picked up as earth faults will not necessarily be the same at each end of the line.

Fig. 5. Tobruk 1942... Mk IV Fullerphones in use at Australian Signal Headquarters in the desert.

Used in two wars

Initial issues of Fullerphones were made up from converted DIII field telephone sets. This type, however, was not the most successful. Toward the end of 1916, the Fullerphone was firmly established, and by 1918 most Divisions had adopted Fullerphones for all their forward circuits. After the armistice, improvements and modifications to the instrument were carried out. The basic principle, however, was never changed. During 1939 a

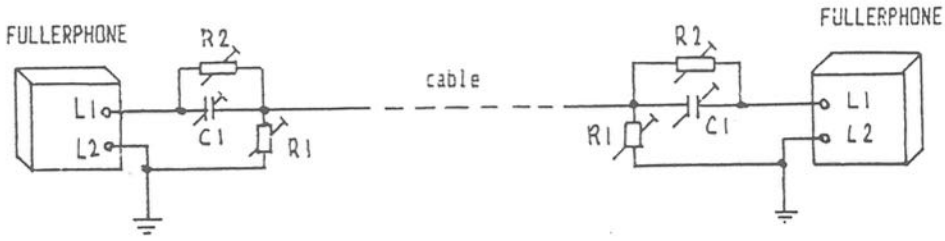


Fig. 6. Arrangement for cables up to 500-600 miles. Alterations to the standard Mk IV Fullerphone for this application included an increase of voltage on the line from 1.5 to 12 volts.

re-designed model, Mk IV, went into service. This was more sensitive than its predecessors, with a more easily adjustable buzzer/interrupter, and was simpler to use as it carried no telephone set.

The Fullerphone was designed as a non-interceptable signal instrument for static trench-warfare. But it was widely used during WW2 because of its other features, viz, the ability to work simultaneously with a telephone on the same line, and the capability of working through very long or leaky lines where telephone traffic was impossible.

In the South West Pacific, for example, the Australians made extensive use of the Fullerphone, and it more than lived up to its reputation when used in New Guinea resulting in a considerable saving of cables at a time when men and supplies were scarce resources.

During WW2 cases arose where a submarine cable circuit was available but the necessary terminal telegraph equipment was found to be totally destroyed or not immediately available. To ascertain to what extent Fullerphones could be used on submarine circuits of various lengths, trials were carried out, at the request of the War Department, by Cable & Wireless Ltd. The results exceeded all expectations, and ranges of up to 700 miles were obtained with faint but readable Morse signals at a maximum of 20 words per minute.

Finally

The attitude of signallers to their Fullerphones cannot be better described than in a poem written by Signalman R. Mellor and published in "Jimmy", the magazine of the Royal Signals in the Middle East.

ODE TO A FULLERPHONE

What is my greatest joy in life,
More precious even than my wife,
So comforting 'midst all this strife?
My Fullerphone.

How well I love your merry tricks;
Even when your buzzer sticks;
Delighting me with faint key clicks;
Oh Fullerphone.

How tunefully your buzzer throbs
As tenderly I turn those knobs.
Most fascinating of all jobs.
Oh Fullerphone.

Potentiometer, its true
I'm not sure what to do with you.
Yet even you add beauty to
My Fullerphone.

Oh how I pity those poor souls
Who daily work remote controls,
Attached to crazy wireless poles.
Oh Fullerphone.

They never hear the tuneful tones
Of perfect Morse within their 'phones:
Just atmospherics, shrieks and groans.
Oh Fullerphone.

But I must cease to write more verse.
Communication's getting worse.
No wonder that I rave and curse
At Fullerphone.

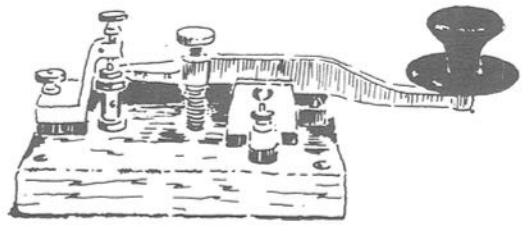
Asthmatic buzzers, - crazy keys.
How can one live a life of ease,
With damfool instruments like these
Foul Fullerphones!

Sigmn. R. MELLOR

Acknowledgements

The author is indebted to Major A.G. Harfield, B.E.M., Deputy Director of the Royal Signals Museum, for his help and permission to publish the photographs and diagrams in this article.

The Royal Signals Museum at Blandford Camp, near Blandford Forum, Dorset, is open to the public during weekdays from 8.30 to 1600, and a collection of Fullerphones is among many other signal instruments.



Sent by helio....

by George Stead, G6YQZ.

Capt Dupree

I'm moving North West from KOPJIES KRAAL Stop Clear farms near you and get in touch with my right as I come up and keep it.

Maj Kenna

Maj Kenna

Will keep in touch as you come up

Sent by Helio

Please send wagons and Cape carts to big farm in hollow west of helio

Capt Dupree

Sun 15th
To Col Heath

We move off at 11.30 am please confirm C.S.O.

Col Barker

XM O.C. Adj Ed

You are not to pursue but take up position and hold if we have outspanned for Midday halt

Col Heath

OC Rear gd

Remain out

II C OFF

George Stead, GØGSQ, from Rochdale, has sent us the above entries from the diary kept by his father when serving as a signaller in South Africa from October 1899 to September 1901. All of these Boer War messages were sent in Morse by heliograph.

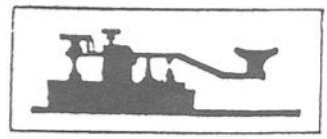
Lce Cpl J.C. Stead,
Signaller,
Southern Coy,
1st Mounted Infantry,
Field Forces,
South Africa.

Appointed Regimental Signaller, Mar 26, 1900. Awarded Queen's Medal, 1899, and King's Medal, 1901. Served in Great War (Signals), 1914-16. Died 1926.

Signaller Stead also records his acquaintance with a young Boer lady called Bettie Ebersohn living on a farm called 'Schuilhoeck'. She was very upset when he had to leave, and wrote her name and address in his diary for him. He told her not to worry, just see to the inner man and he would be on his way.

In his letter to MM. George says, "and how did they send a message with a mirror with the sun at the back? Answer, by using mirrors at the front HI. I used to wonder, as a youngster, about that mirror I had down in the cellar with a tube on its back. You never think a lot about such things at the time, but I learned later that these were mounted on sticks to reflect the sun back to the helio".

Spark-gap 18



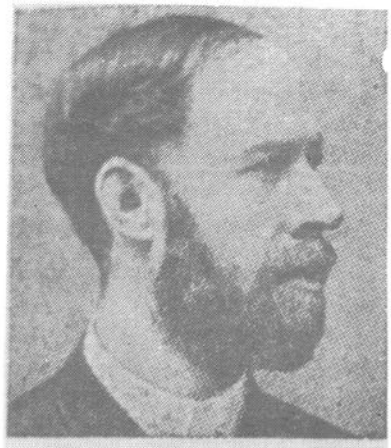
A Morse anxiety - 50 years ago

The pre-war Amateur Radio Licence had some unfamiliar restrictions. Power input was limited to ten watts; transmissions were permitted on two bands only, 20m and 40m; stations were allotted call-signals and not call-signs; it was forbidden to use "CQ", the word "Test" had to be sent by the calling station.

In those days most of us were CW operators, but there was even a restriction in that. The licence stated clearly (as it does today, Ed)"..... the call-signal ..... may be sent by Morse telegraphy at a speed not greater than 20 words per minute".

It seems strange, half a century later, that those of us who participated in the American high-speed CW nets were really anxious in case we might be reported to the Post Office for sending Morse too fast, and thereby forfeit our licences!

Ray Hunting, G3OC.



Heinrich Hertz,

It will never work!

In 1889, a Herr Huber enquired of Heinrich Hertz if there was any possibility of Hertzian waves being used for telegraphy or telephony. Hertz sent him the following reply:

Bonn, Dec. 3rd, 1889.

DEAR SIR,

Replying to your kind letter of 1st, I have pleasure in giving you the following particulars:

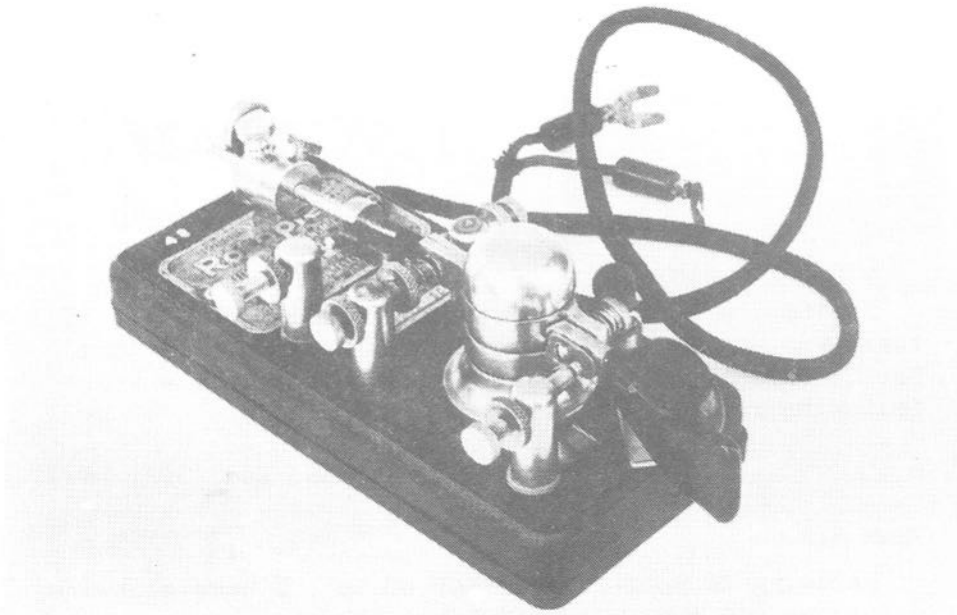
Magnetic lines of force may be propagated just as well as electric, as rays, if their vibrations are sufficiently rapid; in this case they proceed together, and the rays and waves dealt with in my experiments could be designated magnetic as well as electric.

However, the vibrations of a "Transformator" or telegraph are far too slow; take, for example, a thousand in a second, which is a high figure, then the wave-length in the ether would be 300 kilometres, and the focal length of the mirror must be of the same magnitude. If you could construct a mirror as large as a Continent, you might succeed with such experiments but it is impracticable to do anything with ordinary mirrors, as there would not be the least effect observable.

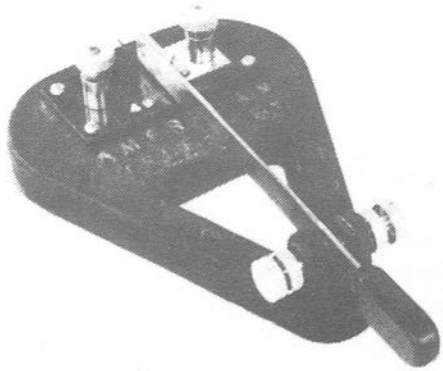
With kind regards, Yours - HERTZ.

Showcase

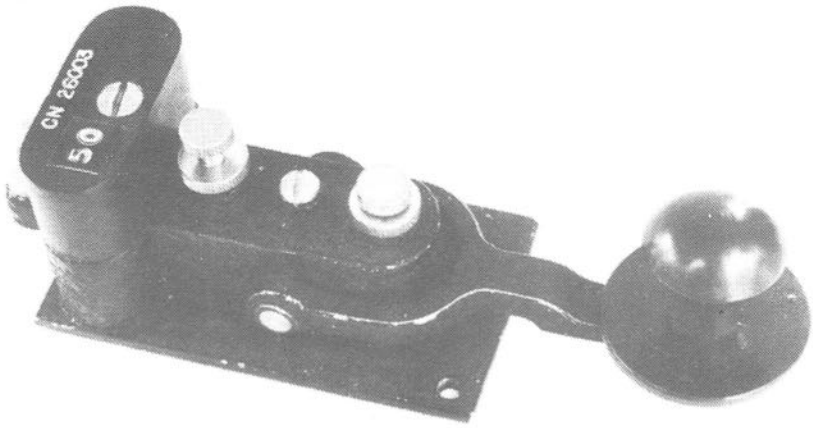
All keys property of W7GAQ



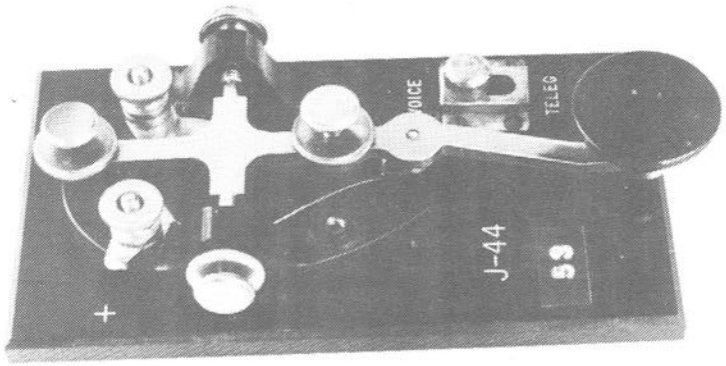
28 Horace G. Martin: Rotoplex



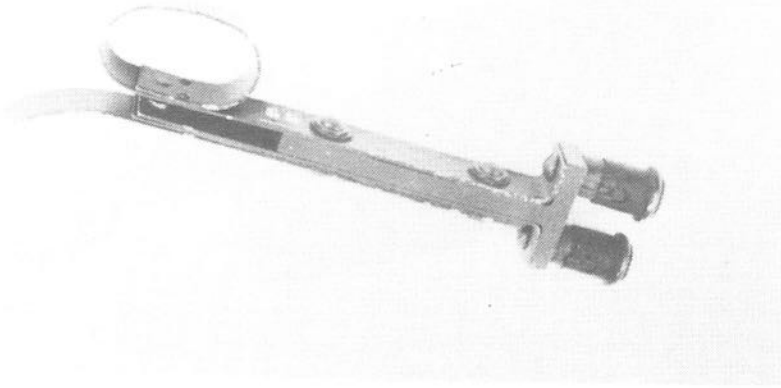
29 "American telekey"



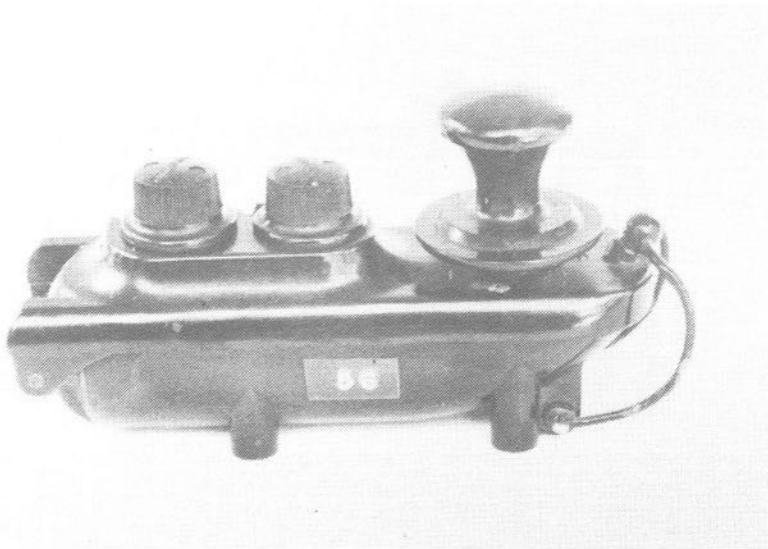
30 Bendix Radio Corp. CN 26003



31 Winslow 101 J-44

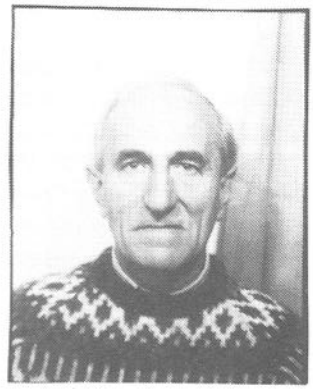


32 Unknown J-51



33 Unknown British "Boatkey"

A few measurements



by John Roscoe, G4QK.

I spent the first year of WW2 at Oxford, and although I could have continued for a second year, as I was reading physics, I opted out. Like practically all the Amateurs of that era, I had of necessity constructed my own gear, and therefore knew one end of a valve from the other. I was accordingly taken on by the Admiralty Signal Establishment. Towards the end of the summer of 1940 I found myself in a small research unit run by Bainbridge Bell, one of the pioneers of the cathode-ray tube.

The chief work of this unit was the development of equipment for Radio Finger Prints (RFP). Although this is not directly concerned with Morse, perhaps some mention can be made of it. The idea was to identify individual transmitters by their waveform. The rectified signals were applied to a cathode-ray tube, without a timebase, and photographed onto moving film.

The German naval transmitters were remarkably uniform, and showed little more than an initial damped oscillation - produced, perhaps, by a carbon-pile voltage regulator. The Italian mobile naval transmitters were remarkably erratic, and never looked the same twice; while their shore stations could often be identified by the ripple frequency of anything but 50 Hz. Our own signals revealed that a transmitter at Portsmouth when keyed from London (presumably a more important message) suffered from distinct relay bounce. Taken all round, RFP did produce results: see "Guilt Edged" by Merlin T. Minshall.

A subsidiary investigation was into the possibility of estimating the range of an incoming signal. This was done

by spreading out the leading edge of each Morse symbol and trying to fit the time of arrival of the various incoming components with reflections from ionosphere layers - and back from the earth. Ionosphere heights were constantly measured by the RAF to determine the maximum usable frequencies for their aircraft. Although equipment was developed for this purpose (Outfit REA 1), so far all the credit for work on this subject has been given to the Germans.

Morse characteristics

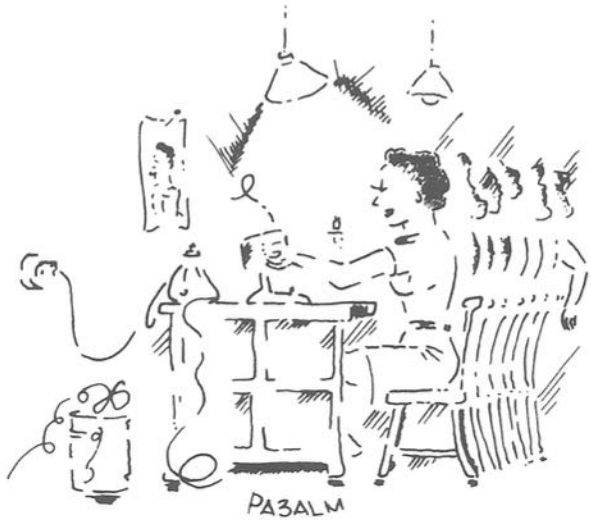
Since both of these operations involved tuning a receiver to the required signal and then switching on equipment, it was natural to add the recording of Morse characteristics to the recipe. The operation involved tuning the HRO (thank goodness: the CR100 was tried later, and a miserable set it was in comparison) in the usual way, then switching off the BFO, to obtain a DC signal, and switching on the bits and pieces. The "phasing" control of the HRO was screwed to the panel in the off position, so that the crystal could not be brought in accidentally.

The early recordings of Morse were made with a siphon pen recording on paper tape, a device also used for high-speed reception and known as an undulator. The code name for the operation was TINA - derived from the Latin "tinea" for (tape)worm. At a later date the Morse was recorded on 35-mm film with a slow running RFP machine: this allowed measurements to be made through considerable QRM, as a heterodyne waveform was usually clearly distinguishable from the components producing it.

At this time I was involved chiefly with RFP, and early in 1941 I was sent off round "the cape" in a Swedish cargo ship. It was decidedly uncomfortable in an Atlantic convoy reading "danger mine on your port bow" sent very slowly on an Aldis lamp by an escort vessel, and realising that nobody on the bridge understood English! After $2\frac{1}{2}$ years nursing an RFP set in Egypt, I returned to my unit and was transferred to TINA at the beginning of 1944.

By then, of course, this activity had been going on for quite a long time. Ian Fleming, who was in the depart-

ment of the Admiralty responsible for co-ordinating the various interception exercises, comments with accuracy and imagination on the results in "Dr. No" (page 10) and "Moonraker" (page 11), illustrated by an American example - presumably because at the time he was writing he was not allowed to quote British experience.



Attractive Wrens

The standard method of measuring Morse at that time involved eight Wrens per set (all very attractive girls!), two at a time: one read off the measurements from the film with an enlarger, and the other transferred them to graph paper. The dashes and dots were then marked with red and blue circles. Attempts at identification with previous records were made by direct comparison, which inevitably relied on the acuteness of observation - and perhaps memory - of the operator. I was given two ideas to pursue: (1) a method of recording that would permit simple and more rapid measurement; (2) a machine-compatible system for classifying the records.

Instead of recording the Morse along the film, a vertical deflection was applied to each mark and space. In conjunction with the horizontal motion of the film, this produced a saw-tooth waveform with a sloping leading edge, the height of each tooth being proportional to the duration of the mark or space. A small neon recorded the signals on the lower margin of the film. With a suitable scale laid along the film, the height of each peak could be read rapidly. Unfortunately a relay was used to switch the time-base at the beginning and end of each mark, and even allowing for its finite change-over time by using an offset zero on the scale, the method could not be persuaded to yield sufficiently consistent results.

The idea behind the mechanical classifying scheme was to extract parameters from the Morse that could be coded numerically and searched mechanically. In those pre-computer days the best machine available was a Hollerith 80-column punched card sorter with a built-in 8-column group selector, which worked at the astonishing rate of 400 cards per minute! However, before delving into this problem we should consider how Morse was generated in that era.

Sending by feel

All the Morse that we looked at was sent on straight keys. This does not mean that other types of key did not exist. By then the U.S. Signal Corps had produced enormous quantities of mechanical bug keys; and in fact my Lionel bug - obtained, I hasten to add, entirely legitimately - is dated 1942. There would, though, have been little point in examining the Morse they produced.

In addition, sidetone oscillators were uncommon, so practically all the operators would have been sending by feel. This is a point that I wanted to examine at the time, as it might have helped to identify an operator when he moved to a different set-up, or perhaps made attempts to alter his style. Quite a lot of work had already been done on motor reactions - on that supremely important problem, for example, of the ability to hit a fast-moving ball with a variety of implements - but I could find nothing of direct application.

During the war much higher priority was being given to other problems - for instance, how to react to a faint radar blip when you have just fallen asleep - and nobody was interested Once you start using sidetone, the art of sending in a regular rhythm is obviously governed by the same mechanism that regulates musical endeavours (which I can well understand, as I have been playing chamber music for over 55 years). Muscular feedback seemd to produce different results: most of the operators that I was concerned with had developed a highly consistent style, so their Morse obviously felt satisfactory to them. It certainly went with a swing, and was generally very easy to read, but it could not have been called perfect.

Characteristics

The most consistent characteristic was the ratio between an adjacent dot and dash in the longer symbols. For example, the dash might be markedly longer than the following dot in D, B, and 6: this would almost certainly be matched by a similar disparity in U, V, and 4. Invariably, A and N did not fit into this pattern. The fate of the other dots, in 4 and 6 for example, was a matter of individual taste. This simplified measurements, as there was no need to establish a notional average length for the dot. The ratio between adjacent elements could be immediately coded on a scale of 1 to 10, with adequate provision for the spread of results.

The most interesting application of this technique was to the U-boats in the North Atlantic. Although they carried more than one radio operator, only one appeared to do the transmitting, so reducing the number of our records. They were at sea, generally, for a maximum of 6 weeks, so a preliminary scrutiny could be made - and had to be made - in a few minutes of all records obtained within this period. More leisurely checks could then be made for long-term files. Of course this was only part of the picture, as direction-finding, RFP, decoding, etc., would also have contributed their "intelligence. There was never much feedback from the operational side, in the best traditions of the "silent service", but since they continued to pay our salaries we assumed that something useful did result. Of course the victims were well aware that they were being

taped, but since the U-boats invariably sent short messages (quite unlike the Italian submarines in the South Atlantic), they presumably felt the risk was small.

Spoof operations

The criticism has been voiced that it is easy to imitate an individual "fist". I am reminded of the story of Charlie Chaplin, who went in for a "Charlie Chaplin" contest and came second. He agreed that the winner had given a convincing performance by slightly exaggerating his characteristics, and awarded him a personal prize. I would like to think that we would have detected the same exaggeration in Morse.

We were well aware, of course, that the "opposition" were going through similar exercises, and gave them what encouragement we could. Spoof naval operations were undertaken, in which a complete flotilla appeared to put to sea. In fact all the transmitters, each one of authentic type, were likely to be in a small coastal vessel, and the complete "operation", with one operator per set, was recorded beforehand.

Later in the war U-boats were equipped with a simple rotating arm device to produce short high-speed transmissions. To save elements (and time), dashes were sent as two units. Some of our people were so steeped in the 3-unit dash that they completely failed to realise that the transmissions were in Morse!

(Editorial note: During WW2 the work described by John Roscoe was, of course, highly secret, and the slightest whisper about it could have been detrimental to the war effort. Not only that, but the slightest whisper could have been detrimental to the whisperer as well, if detected!

With such a background, and even though it was forty plus years ago, John, not surprisingly, was quite pleased when MM undertook to confirm through the Ministry of Defence that there would be no objection to his article being published.)

Never too young to learn

Reader Moe Lynn, VE6BLY, with his grandchildren, Mandy and Jason Lynn, who are both learning radio (international) code.

Grandpa hopes that one or both will also pick up American Morse as he did - on the Canadian National Railway - as a pre-schooler sending messages for his Dad, even before learning his A-B-C, in 1929.

The morse test

Have you ever had the feeling that your stomach's on
the ceiling
And your legs would turn to jelly if you stand,
It was in this kind of state, I arrived a little late,
With my xyl in tow to hold my hand.

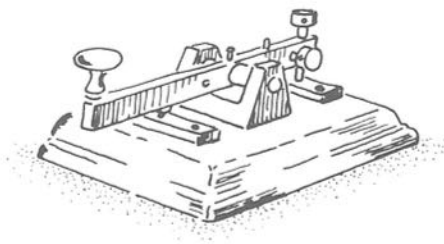
The examiner was a Scot so I knew I'd had my lot,
They're an awesome race of chaps these Gaelic hams,
"If yoooorr ready then weeeell goo",
I said "Oh, righty ho,
I'm sure I've been in many tighter jams".

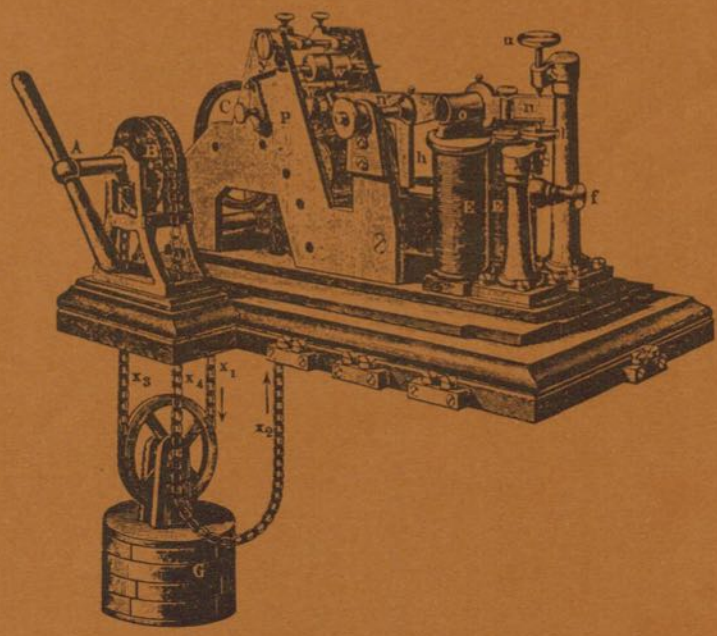
The wives began to chatter and my teeth began to clatter,
As he sent me dots and dashes at a pace,
A machine gun would be slower,
And less lethal than this goer,
For my pacemaker thought I was in a race!

Back home when it was over, with my whisky and my soda
And my pass slip now clutched tightly in my hand,
My wife sighed with a "Phew" and I changed my point
of view,
This c.w. was really rather grand.

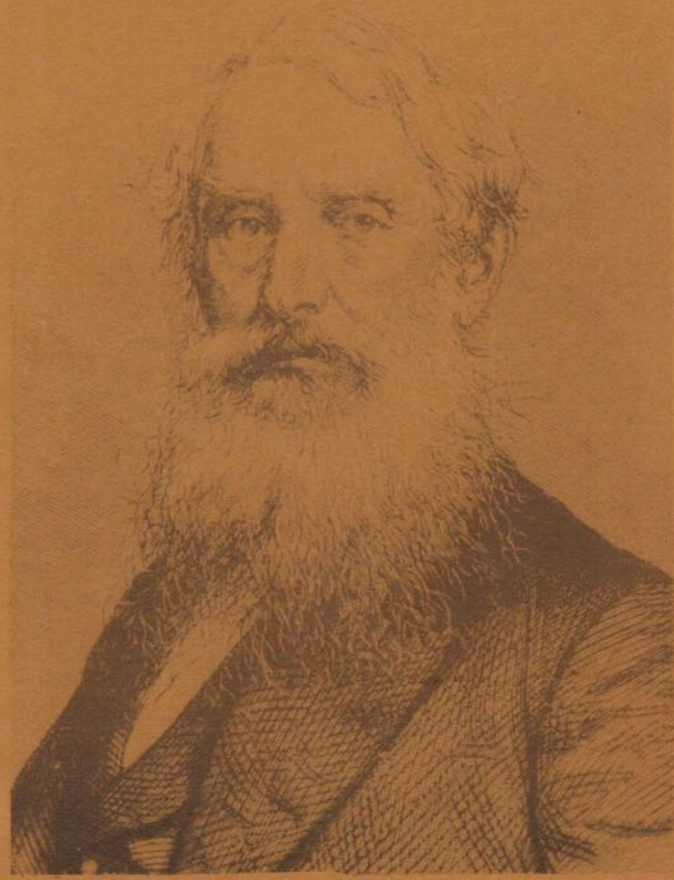
So console yourselves dear friends if the Morse that
someone sends,
Sounds a little bit too fast for comprehension,
It's a fact and oh so true that most hams are just
like you,
But with practice you will lose your nervous tension!

Keith Crittenden, GØCGB.





Morse-writer 1853



Samuel Finley Breese Morse