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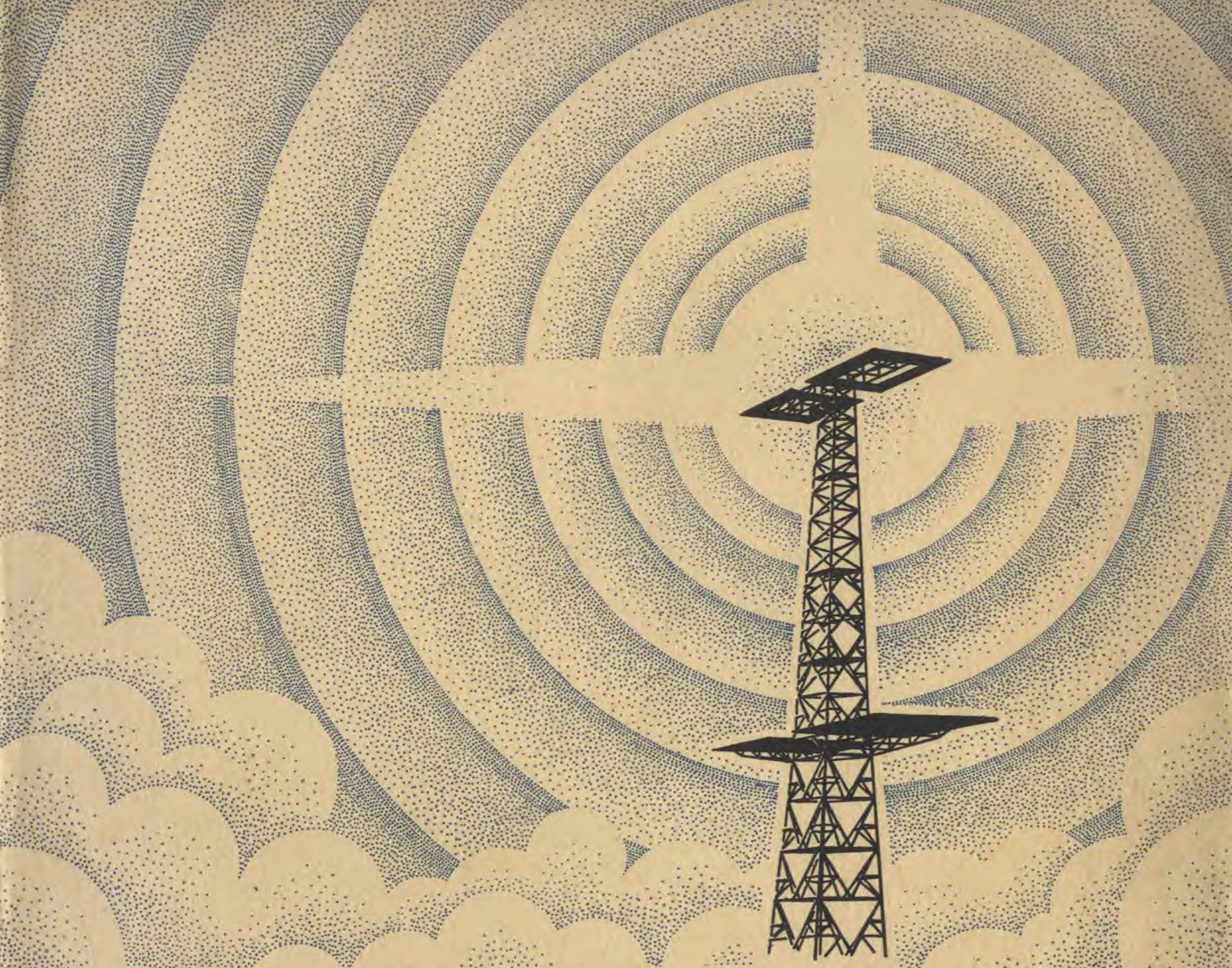
It is my hope that you find the file of use to you personally – I know that I would have liked to have found some of these files years ago – they would have saved me a lot of time !

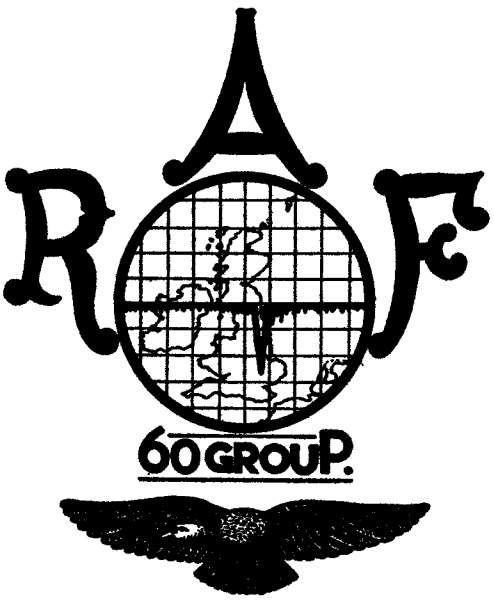
Colin Hinson
In the village of Blunham, Bedfordshire.



RADAR BULLETIN

GROUP

Victory Souvenir Number — 1945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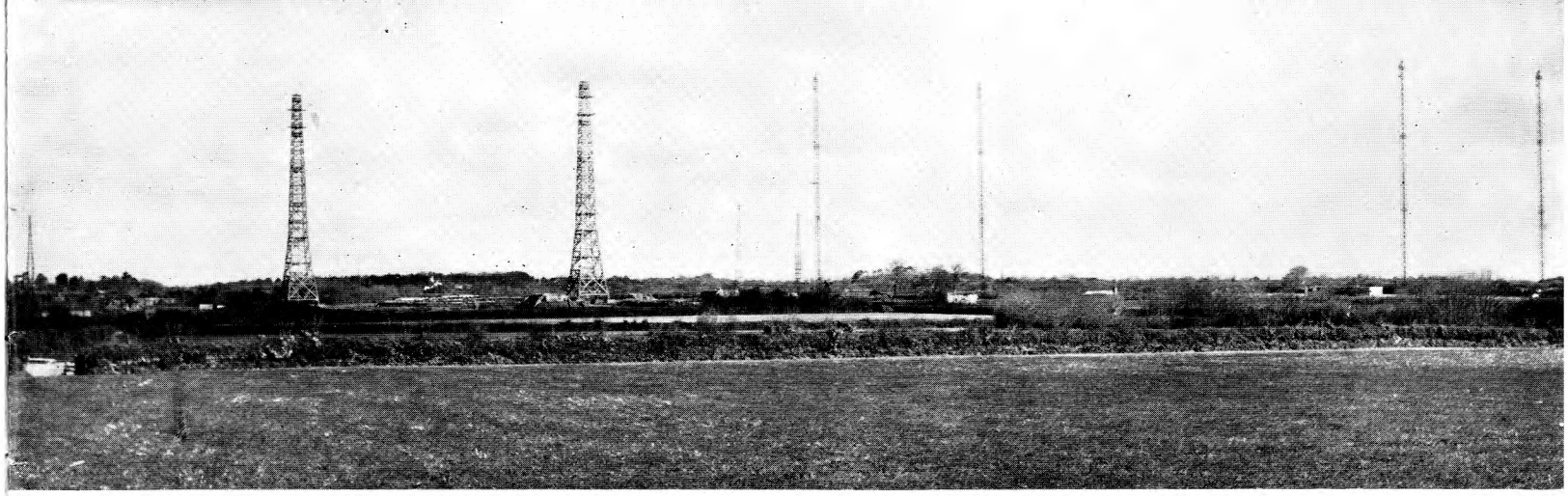
60 GROUP.

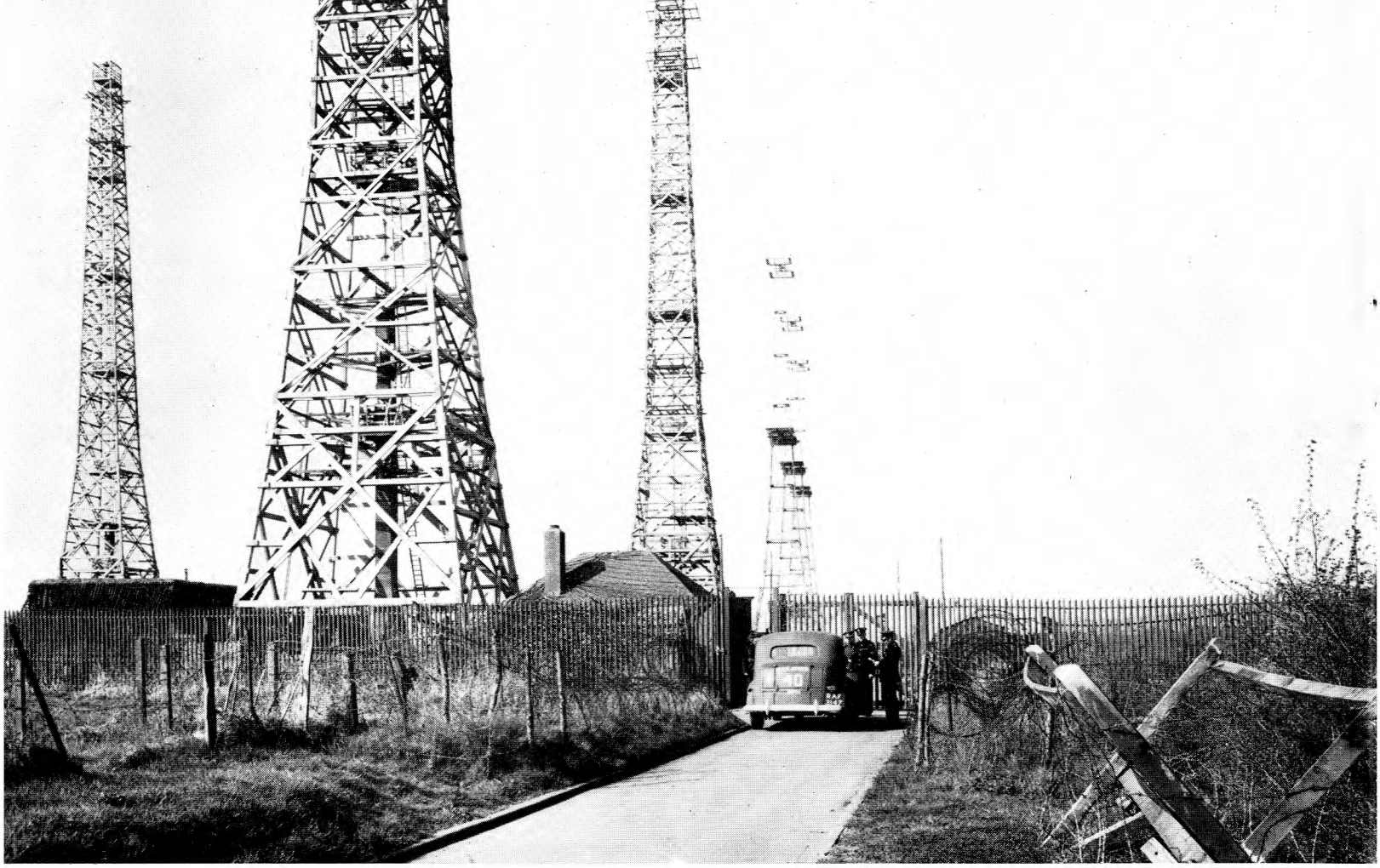


CONTENTS

ACKNOWLEDGEMENTS

No individual acknowledgements are made to any of the contributors to this special issue of the RADAR BULLETIN; *no mention has been made of those many contributors whose regular support made possible all the earlier numbers. Their work is much appreciated and the Editors thank them all.*

Apologies are also due to the many, many units and branches whose good work is not mentioned in these pages —Renscombe, Cardington, Thame, Calibration, the Schools, the Filter Rooms—there just was not room for you all. You have not been forgotten. You were always there and you are part of the story.



From our A.O.C.

Secrecy has been a very necessary watchword in 60 Group throughout the war. Our Radar has always been ahead of the enemy's, and we have had to guard our progress closely. With constant care and good self-discipline throughout the Group our secrets were preserved, and one by one the new Radar systems came on the air, unknown to the enemy, to play their essential part in his final defeat.

Secrecy has meant that you could not talk to your friends about your work, that the Press could not write about it as they did about many Service activities of less importance, and that Commanders in Chief could not openly congratulate you on your work, so closely connected with the success of their operations.

The RADAR BULLETIN celebrates the raising of the curtain with a Victory Souvenir Number, dedicated to all those who have played their part in 60 Group during the war, and to act as a worthy reminder of service in the Group and all it has meant. I am sure you will all read with pride the messages sent by the Commanders in Chief of Fighter and Bomber Commands and by the Director General of Signals at the Air Ministry.

From our A.O.C.-in-C.

In the past, for security reasons the AOC-in-C has been unable to express publicly Fighter Command's appreciation of the inestimable services rendered by No. 60 Group during the last five and a half years, or to refer to the activities of the Group and the way in which it has contributed to the success of the great air battles that have been fought.

Since its formation in early 1940, No. 60 Group has been the eyes of Fighter Command, and it is of interest to record that nearly 5,000 enemy aircraft were destroyed as a direct result of Radar information it supplied. I have no hesitation in saying that without No. 60 Group and Radar, the Battle of Britain, even the War itself, could not have been won.

Because of the great secrecy in which the activities of No. 60 Group have been shrouded, it may be felt that insufficient tribute has been paid to the devotion of the crews of the Ground Radar Stations, who carried on their arduous duties with such gallantry during the intensive attacks against their Stations in the Battle of Britain. That this gallantry is appreciated you may rest assured. You should also accept as a tribute to your work, the fact that the enemy was driven to attack your Stations with such ferocity.

As for the future, we must turn our minds to ways and means of countering new weapons, and of dealing with aircraft capable of very great speeds. As in the past, no Fighter defence system can achieve success unless adequate warning of the approach, and precise information as to the whereabouts, of the enemy is available. Radar must continue to provide this information in the future, and No. 60 Group must remain an indispensable part of the air defence system. In peace, as in war, we must work closely together, and strive by a full knowledge of the operational implications to design and build up a system which will leave this country secure for posterity.

I thank you all for your great efforts, technicians and operators alike, and all those who go to make up the vast administrative machine behind Radar. In the Service or in civil life I extend to you my very best wishes for the future.

Air Marshal,
Air Officer Commanding-in-Chief,
FIGHTER COMMAND.

From The A.O.C.-in-C. Bomber Command

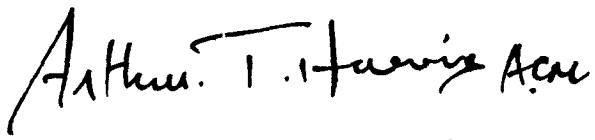
Now that something of the immense part that has been played by Radar in winning the War has been made public, it is possible to acknowledge that without the background work of No. 60 Group, Bomber Command could not have brought its task to a successful conclusion.

You in 60 Group, working in the control stations for the Radar navigation and bombing systems used by Bomber Command, must have wondered if your long and arduous hours were contributing to the War effort, and even perhaps if they were worth while. You had necessarily to be kept in ignorance of the operational planning and of the results that were being achieved by your labours.

It is now common knowledge that Radar, and the personnel that operated it with such outstanding success, completely revolutionized bombing. The navigational aids made it possible to concentrate great forces and the bombing aids enabled those forces to deliver with precision the heaviest attacks. Without the assistance of Radar, in the form in which it was used by Bomber Command, such results would not have been possible. All ranks in No. 60 Group may therefore be sure that their contribution was of the utmost importance.

The future is no less important, and the aids that have helped to wreak such destruction will, during peace, bring an increased safety to air communication. No. 60 Group will then measure its success, not in terms of acres of devastation, but by the contribution it will make to the safety of flight.

On behalf of Bomber Command, I want to thank all ranks of No. 60 Group for the part they have played and to wish them the future success that they so much deserve.



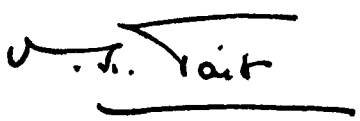
Air Chief Marshal,
Air Officer Commanding-in-Chief,
BOMBER COMMAND.

From The Director General of Signals

In the Battle of Britain, day and night, in the coastal defence of the United Kingdom, in the mighty bomber offensive carried out by Bomber Command, and the United States Army Air Force, in the Allied invasion of Europe, and in the final battles which completed the destruction of the German armed forces, No. 60 Group has always played a great part.

To carry out this part in both defensive and offensive warfare has required enthusiasm, initiative, and an unquestioning belief in the ability of the Group to meet the needs of the ever-changing battle. The personnel of the Group, from the operator and mechanic on stations to the Group Headquarters staff, have always displayed this spirit. Their individual efforts were welded together into a magnificent team which has successfully achieved the great tasks they were set. This resulted in a major contribution to our winning the war.

There are still many difficult tasks ahead of 60 Group, an urgent requirement for our Air Forces which must be fulfilled. Our occupation forces must be well served if we are to reap the full benefits of victory: air transport services are urgently required to bring back our released prisoners of war and take urgently required supplies to devastated parts of the world. The systems the Group operates are vital to our Air Forces if they are to carry out these tasks: therefore because all our enemies have now surrendered and demobilization has commenced you cannot sit back and say the job is finished. The Group must keep up the great work they have carried out so well during the past six years to enable the re-organization to a real and lasting peace condition to be fulfilled quickly, and with success.



Air Vice Marshal,
Director General of Signals.

FIVE YEARS AT OXENDON

I REMEMBER vividly my first nervous view of Oxendon, Plantation Road, Leighton Buzzard —the place that was to become the brains of the eyes of the Air Force.

I remember the glorious summer weather of 1940, the smell of the pines, the ugly, sturdy grey stone façade of the house that stood among them, the frightful bedroom wallpaper in our offices, lunch in the little wooden golf house across the way (bread and cheese and a glass of beer, tenpence). Smallest, yet in a way the most significant of all, little painted notices dotted here and there upon the wide lawns surrounding the house, asking us to "keep off the grass."

Keep off the grass! At Oxendon! And now every square foot of it except that under the big cedar is gone—covered with huts which are still not big enough for the unending ramifications of the British Radar Headquarters.

APRIL 1940

I remember my first arrival there, standing in the AOC's office—the only room in the place which has never changed its title—listening to Air Commodore Gregory with his long cigarette-holder and that odd twitch of the shoulders as though he were for ever easing some imaginary parachute harness.

I was a brand new PO, A & SD, PA to the AOC, lost and bemused in the welter of initials and contractions that were to haunt us for the next six years, and he was telling me what seemed to be one of the most marvellous stories of war and the preparation for war, the story of RDF, CH, and CHL, and how our eastern and south-eastern coastline was already covered with the unending watch against our enemies.

To us old ones, Tech, or Admin, Air Commodore Gregory was, and always will be, the father of 60 Group. He, with Group Captain C. P. Brown as his SASO (now Air Commodore D of Radar) and Group Captain Reeve SAdO (still with us as Air Commodore SASO, the undisputed doyen of the Headquarters) planned and worked out the details of expansion and development very much as it afterwards came to pass.

None of us very clearly foresaw RNA, precision bombing, centimetre technique, and the later miracles, but the key people knew the potentialities were there, and that RDF was going to be something lasting and vital. Plans were made from the start which would allow for growth and adaptation, for the expansion of the Headquarters, camps, and messes, a WAAF influx to do jobs which many thought only men could do, and top-line servicing, country-wide, through decentralization under the RSS's or signals wings.

I remember that I was either a very bad PA or else the AOC was impatient of petty assistance—I like to believe it was the latter—because I lost my job within a very few weeks and became an F/O and then F/Lt in a new branch being formed called "Organization". In that capacity I invented a means of diffusing information and instructions called an "Organization Circular", a simple device which was later to be carried to vertiginous heights of detailed circumlocution under the authoritative and didactic leadership of Wing Commander Nicol, burgeoning, unsuspected, as a Station CO.

Like many other good inventions, it appeared that Org Circulars had been invented by some one else before me, but never, I am sure, in the shape they afterwards developed in 60 Group. I still have Org Circular No. 1, a clean and simple document of one paragraph asking CTM to move something from A to B, and I am quite prepared to be indignantly told by the entire Tech branch that he had already done it.

B.M.H.Q.

It was Squadron Leader Dorte in those days (now Group Captain OC 75 Wing) and I am not sure whether he was called CTM or whether that came later. He was Big Boss over the Base Maintenance Headquarters, anyway, in a requisitioned house some three-quarters of a mile away, called Carlton Lodge.

I had to go to Carlton Lodge once a month to collect Sports subscriptions, as we had no mess and no mess funds. That was when I first discovered the elusiveness of Tech bodies. They were always out on a job, and the fund languished.

Who else do I remember in those early days? Mr Thwaites, Mr Enticknap, Mr Sanctuary—all civilians; Mr Fennessy and Doctor Seward coming like Tweedledum and Tweedledee to take charge of CH and CHL Installation Programmes, scrapping in the traditional Lewis Carroll manner and for much the same reasons.

I remember the AOC saying he must have the best engineering brains in the country for aerials and aerial arrays, and along came Group Captain W. Proctor Wilson of the BBC, causing mad flutterings in the hearts of our also newly-arrived Waafies—a fluttering of which he probably knew and still knows nothing.

They were a grand team, our first AOC and his three Group Captains—and no disrespect to the many good officers who took their places later.

The Western Chain shot up. The RADAR BULLETIN was born, and so was that other more private and more scurrilous rag *Half-A-Minute*, produced one copy at a time for Headquarters only, with rude but scholarly verses from Very High Officers who believed in fun as well as labour.

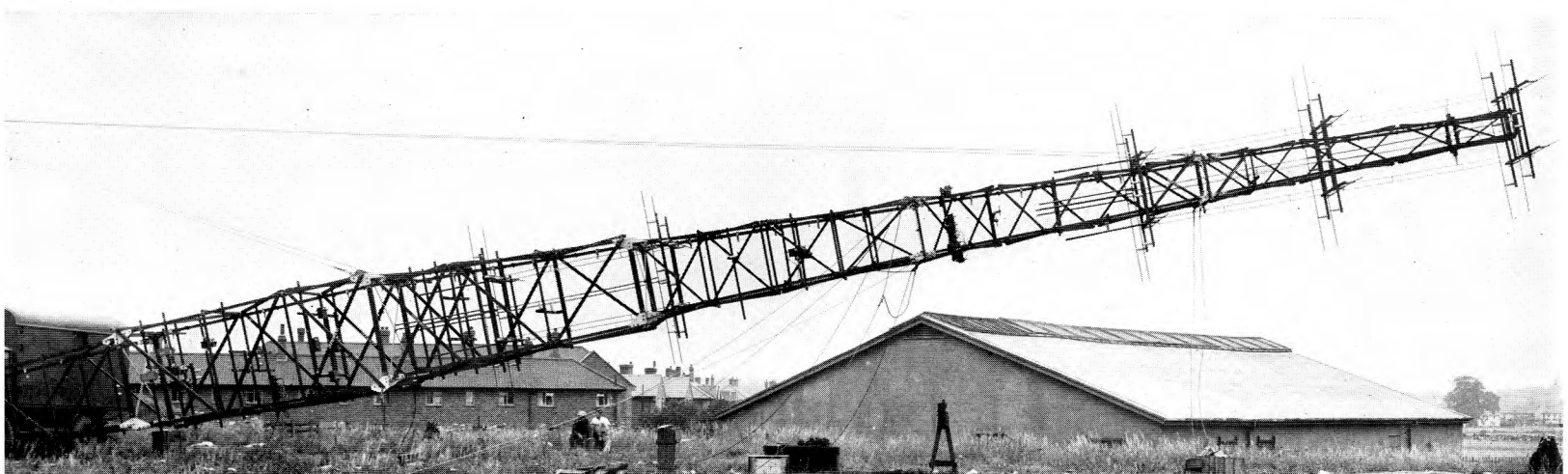
ROUND THE STATIONS

Who could ever forget that grand old lady the Baroness de Serclaes, our first WAO? She travelled fast and worked hard, a welcome figure everywhere with her two rows of last war medals and her astonishingly naive habit of telling the rudest stories in the most mixed and unsuitable company. I went on my first trip to stations with the Baroness. Stoke Holy Cross, Dunkirk, Dover—it was not called Swingate in those days—and she showed me with sour disapproval a six-foot barbed wire fence which some misguided reformer had put up between the RAF and WAAF huts. "Bits of blue cloth hanging on it every morning!" she declared, which was a gross libel of course and she knew it. She did not believe in treating men and women like bad schoolchildren. The fence was pulled down and the invisible barrier of plain decency took its place, much more effectively, at all the stations.

The CO who welcomed us at Stoke was Flight Lieutenant Ridley, now Group Captain in 72 Wing.

Tommy Bouch? You would not remember him unless you are a very old 60 Grouper. He was our first Camp Commandant. An old English country gentleman stepped straight from the pages of George Moore; wealthy, a literary dilettante, hard-working and kind-hearted. It was said that after sternly ordering the forfeiture of some culprit's pay in the morning, as required by KR's and all that, he would make up the sum in the afternoon out of his own pocket, and sometimes a bit over.

The airmen had no camp in those days, they were all billeted in the town, and every new arrival was a



problem. The local Drill Hall had been "borrowed" from the Territorials under some vaguely understood "gentlemen's agreement" and turned into messing and kitchen for other ranks and Sergeants. We had no M-T yard and precious little M-T. The men were taken down and back for their midday meal by one of the local bus companies, under contract.

We had no Establishments Branch, no Principal Works Officer, no Welfare Officer, no Gas and Fire Officer, no Defence Section. Three Org types, one of whom was always travelling, coped, more or less, with all of it.

If we wanted two more huts at High Street Darsham, we rang up the Chief Engineer, Fighter Command, and asked for them. And we got them. There was just no time to argue about it or go into the finer aspects on whether we really wanted them 60 ft long or 40 ft. AMES's were top line priority, and no one dared to say us nay.

It was much the same with Establishments and Defence. We sent the bodies needed for a job and asked Air Ministry afterwards to add them to Establishment. If somebody thought the Germans might land to-morrow at Easington, we rang up the local Army Commander and he rushed extra men to the station. More than likely he rushed them back again next day because somebody more important thought the Germans might land somewhere else, but that could not be helped.

There was no RAF Regiment, and guarding stations was the responsibility of the Army. They lived on our stations and were constantly changing. Every new Commander had different ideas on standards of living for his men and defence schemes for a station, and the history of invasion panics can be read to this day in the meaningless chunks of concrete and crumbling slit trenches with which the older sites are dotted.

Much happened at Leighton Buzzard in the first few months of 1940, and time has lost its perspective. It seemed an age, although it could only have been months, before hutting began to spring up over the smooth lawns we had been asked to "keep off", before "The Heath" was taken over and an Officers' Mess begun, before Waafies began to trickle in, a little bewildered and new, a Sergeants' Mess formed, and the horrible muddle of billeting with subsistence faded out.

Duty Officer, that night bind none of us ever grew to love, came round once in ten days at the beginning—and Group Captains took their turn! Four years later it was once in five weeks, and only in the rank of Squadron Leader and Flight Lieutenant.

The new Tech Block went up. Then a bit was added to it, then a bit more. Unit Accounts and the three-position PBX found homes of their own, relieving the overcrowded house. The stables of Oxendon, once our only Equipment store, grew and expanded and long rambling huts began to creep out from behind them. M-T bays, pits, and workshops were built. Medical, Catering and Cyphers, P Staff and Group Accounts, Calibration and Education multiplied and flourished, and all the activities of the Headquarters were reflected in microcosm in the equally busy branches at the ten Wings—Inverness, Aberdeen, Dollar, Malton, Cambridge, Keston, Bristol, Liverpool, Ashburton, and Portadown.

NEW CUSTOMERS

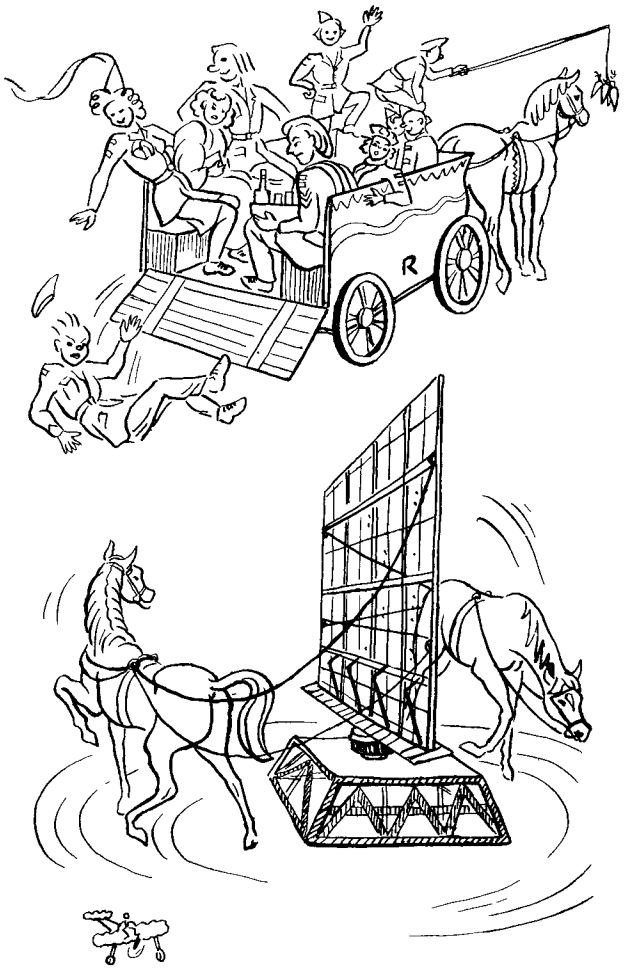
We began to serve the Army and the Navy. We sent our people to the States to make the Americans Radiolocation-minded and bring their vast resources into production for the War they were now entering in earnest. We came back with the horrid word "Radar" which is still with us, although whether this is in fact more horrid than "Radiolocation" is a moot point.

RNA, born in secret and bred in mystery, grew—and grew—and grew—. It smashed the Ruhr, smashed Berlin, smashed the German army and the German will to fight. Every bomb upon its trajectory owed something to Oxendon, something to a Wing, to a Station. Our part in the war is no mean thing to look back upon.

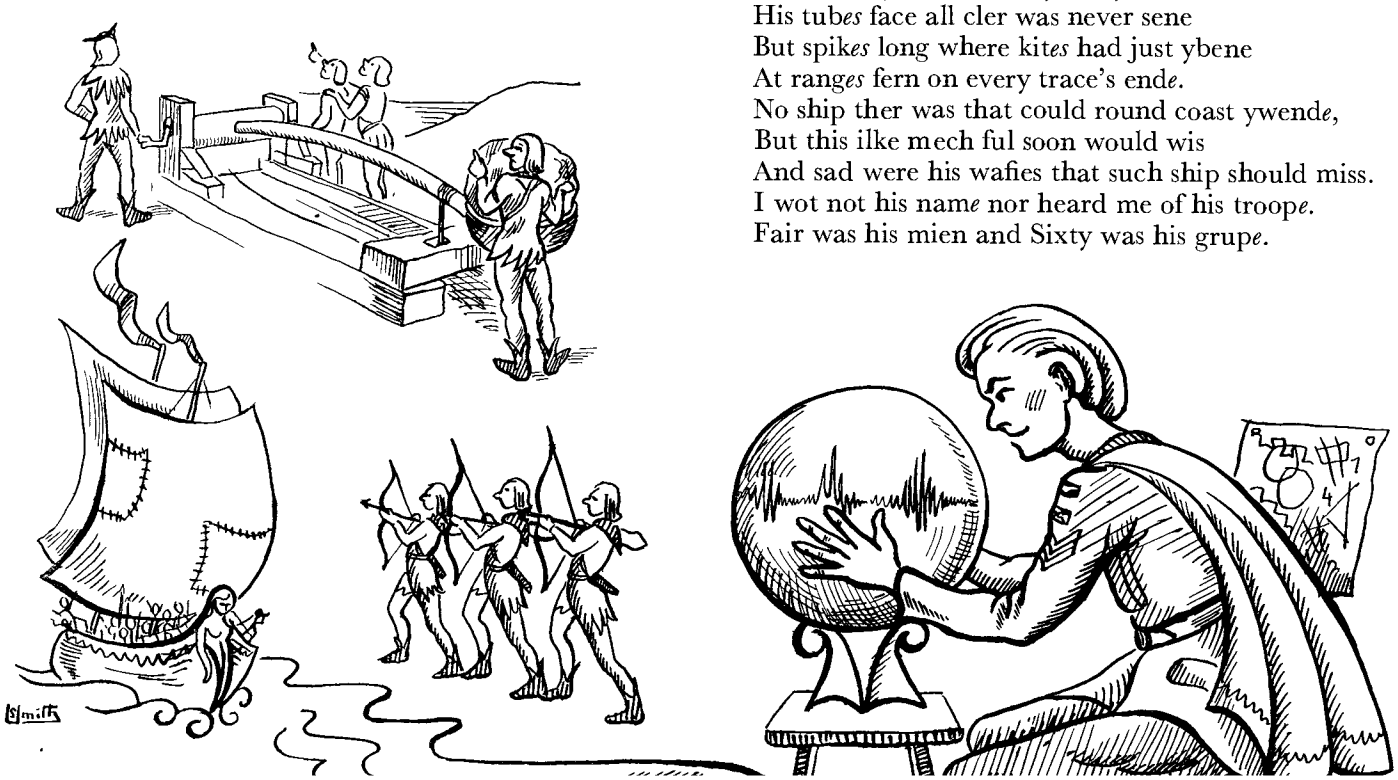
All these things and many more I remember, bright things and shadowy things, odd folk, grand folk, drifting over five and a half urgent and magnificent years of history. Memories to last a lifetime.

Most of all I remember and am most sad to say good-bye to the friendliness and the comfortable intellectual level of 60 Group Headquarters—never grievously highbrow, never, *never* banal. If we cannot somehow keep together, keep some of this spirit alive, I for one am going to miss my Service life more than I expected.

The Radar Mech at Agincourt



A Mech ther was and that a worthy wight
Who wel coulde sodder and jointes make ful tight.
To collecten gen had been his joy alway,
And noon ther was that might his lore gainsay.
Al clad in blue he was and priked with buttones bright
That hadde birdes winges, glistering like sterres light.
No helm upon his head he wore,
But clothen cap and badge of brass that bore
A rune ful rare of letters three
Y-wreathed round with laurel tree,
And crowned al with kinges crown.
Much hadde he been in ferne winges
Of Dunkirk and Alemein he oft did singe.
Upon his breast he bore a sterre
That him hath gotten in his kinges werre.
Ne sword hadde he nor yet longbow,
But lightning flashes did his craft yshow.
Of frigger mech knewe he alle tricks.
To irkes raf was he somdel strict
If that they swynken nat arund his backe.
Heavy was his honde and big his bootes blacke.
None ther was nor yet hath been
That coil could tune so sweet I ween,
Ne trimmer turn, nor fuse ymend.
His MTR he prompt would sende.
His lechers bright with joy were fulle
And sparkes long he wel could pulle
From bigge grid on tallen spire.
Full tight ystretched his feeder wire.
Ne Diesel gear for burton was ygonne,
But alle day right sweetly did yronne.
His tubes face all cler was never sene
But spikes long where kites had just ybene
At ranges fern on every trace's ende.
No ship ther was that could round coast ywende,
But this ilke mech ful soon would wis
And sad were his wafies that such ship should miss.
I wot not his name nor heard me of his troope.
Fair was his mien and Sixty was his grupe.



STEAM WIRELESS

MEMORIES OF "OLD FAITHFUL"

If you ever find a real old-timer in Radar, and whisper the words "Steam Wireless" to him, he will invariably become misty-eyed and reply "Those were the days!" And so they were. "Steam", first used as a somewhat derisive term by the "beam" protagonists, has become a term of affection.

Perhaps it is that the early days, when nothing but the CH stood guard around our coasts, are now far enough away to have become suffused with romantic and possibly fictitious memories. But Old Faithful bore the brunt of the Battle of Britain, and Old Faithful, in new array, still carried on, four years later, in the Battle of the V-Weapons.

This is the story of a happy family at work on a busy CH in 1940. It started with a mere handful of technical bods—about twenty-five—who were all billeted out. The transmitter was an MB1, the receiver an RF5 with an optical converter, and apart from the occupants of those two huts, there was no one else in the compound but a few Air Ministry warders. This, our only channel, was on the air for twenty-three hours a day, plotting Ansons, Swordfish, and the occasional Walrus.

Then came the WAAF's—twelve freshly-trained RDF operators—who calmly and confidently took over the RF5 and never again surrendered it. There followed cooks, MT drivers, Works and Bricks, more RAF personnel, and a positive deluge of Boffins. Truly it appeared that something was going to happen.

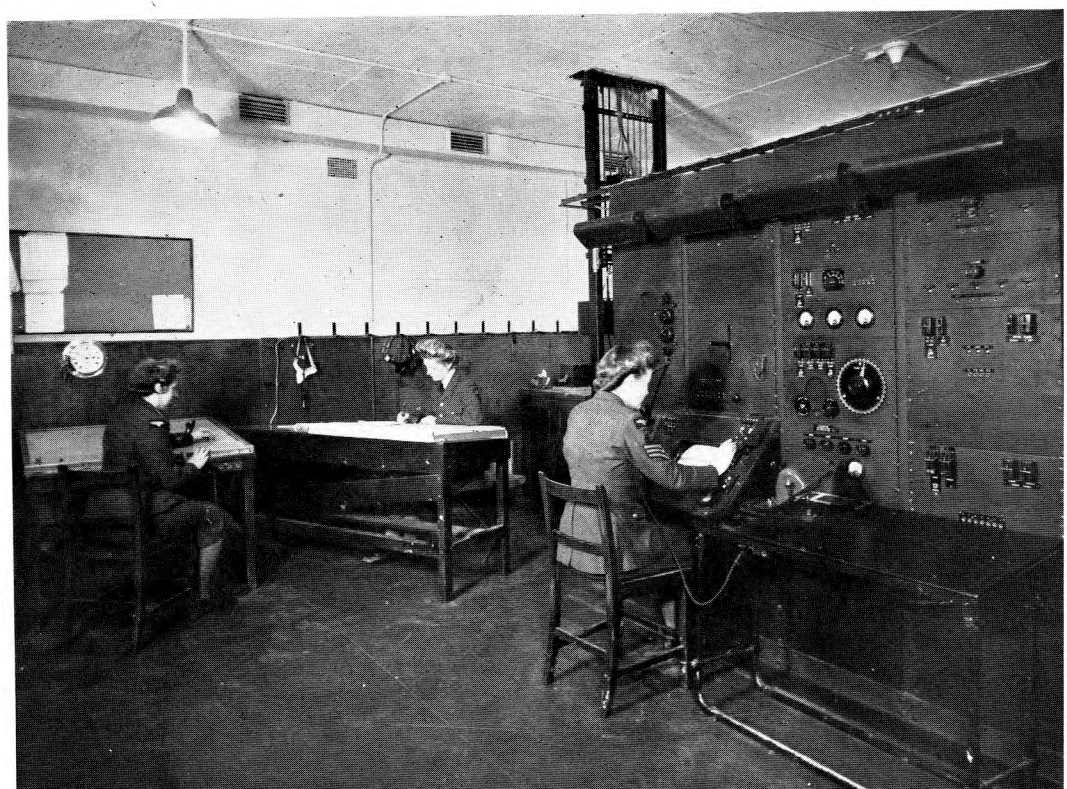
It did! The real "steam" CH transmitter in the T Block was commissioned and went on the air, and up went ranges from the previous 80-100 miles to a matter of 150-180. Of course, 180 miles didn't take us anywhere near hostile territory—the phoney war was still on—but one never knew when a real hostile might stray into the English Channel to give us our red-letter day.

The B-site was going up rapidly, and more bodies seemed to be arriving every day; yet we could never muster enough technical people to keep the four-watch system going smoothly. We had MT drivers, but no transport except the hired bus from the town, complete with the driver who had been with it for the last ten years; we had cooks, but nowhere to do the cooking. But we had operators, and did they operate! Filter Room frequently told us to shut up—they simply couldn't cope with the plotting at that rate.

HOSTILES

So 1940 rolled on until, in April or May, we saw our first hostile. Down the Channel it came (after dark, of course) with so many eyes on it that it must have been self-conscious. We even heard it! Our first "Yellow" and then our first "Red" came up, and the townspeople inspected their cellars, but nothing happened. But when this went on night after night, it was clear that something would happen one day.

Then came the fall of France—and overnight we were facing hostile territory. The word "hostile" no



INTERIOR OF a CH "R" Block, as it was in 1940.

longer caused that slight change in the observer's voice; this was it, and it was here to stay. Night after night the stooging Heinkels were plotted, and *still* nothing happened, except that a searchlight two miles from us actually picked one of them out, and got shot up for its trouble.

June and July showed a steadily-increasing tempo; masses of hostiles had been seen over the French coastline. And then came August.

For the first few days nothing happened except attacks on convoys. The rumour that the Hun was too scared to start bombing ground targets was still current. But when a convoy only six miles out was attacked by more than a hundred JU 87's (of which a large number were shot down by the nine Hurricanes that intercepted them) we felt that life was going to be interesting before long.

It was! On the 11th Portland and Weymouth were heavily attacked, and we began to see what the trace of an RF5 could do in the presence of "200 plus". The optical converter quietly gave up the struggle—mass raid technique had not been developed, and there was no refinement about "inners and outers" then! Next day we had our own private show, together with most of the South Coast CH's. We plotted the very raid that was going to hit us, coming right up the line of shoot. The WAAF's treated it in a very matter-of-fact manner as just another raid, and were most resentful at being ordered out of the "R" hut when the formation was some ten miles away. There wasn't much "R" hut left to go back to after that day, but the raid hastened the commissioning of the RF6 and calculator, so that when we did come back on the air after licking our wounds we were in a beautiful new "R" Block with every modern convenience.

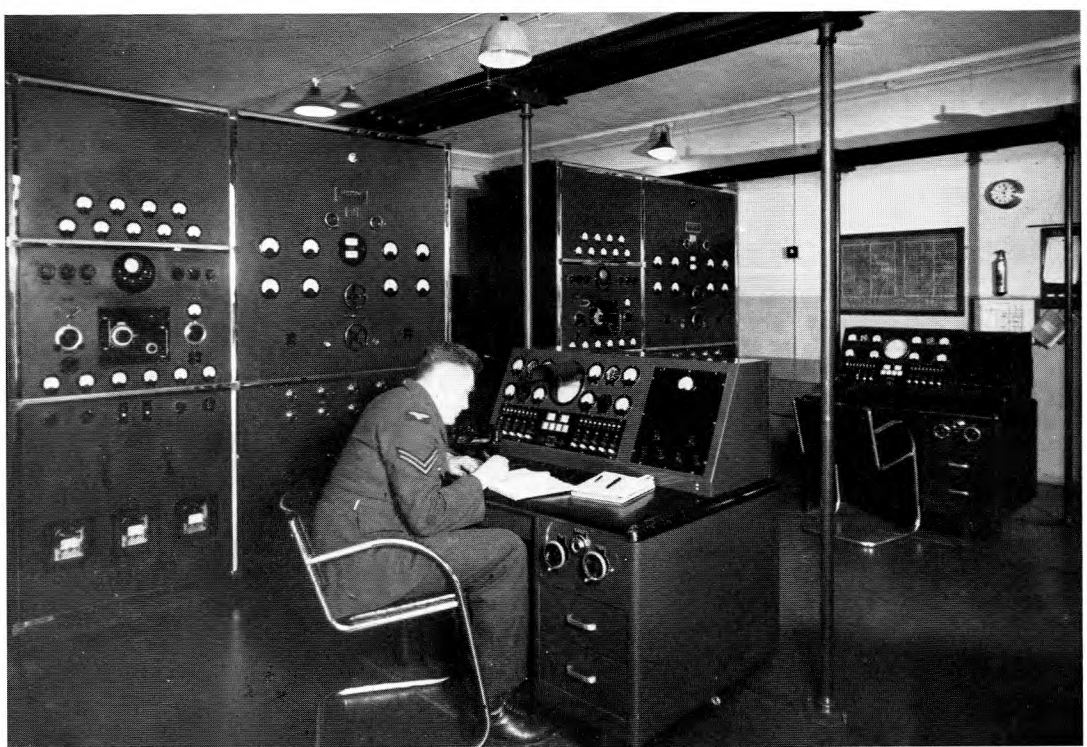
To our great regret, though, we were definitely out of commission for a while. Even the MRU that had started off in our direction for use as a mobile reserve had not arrived—some one else had caught it and their need was apparently greater than ours. So we wandered disconsolately up to the site and spent much time clearing up the mess, extremely hurt because the Hun could now sneak up on us and do it again without our having any other warning than the town siren!

BACK ON THE AIR

Many days were spent on the "B" site watching the incredible dog-fights of August and September and wondering who was doing all the plotting—and whether they were as good as we should have been. We visited other stations and relieved the weary staff; we kept vigil with the Home Guard on the night of 15th September after hearing the news that 185 had been shot down. And then, as we came back on the air, we suddenly found that the day watches had little to do, but the night birds had everything.

How different it was from the later GCI technique! Across the tube of the RF6 there would be a stately procession of single hostiles, perhaps two or three miles apart, starting as weak echoes beyond the French Coast, and coming up to saturation as they followed each other in. We heard them going overhead; we read newspapers in the compound by the light of great fires at inland towns; we watched incendiaries dropping all over the open fields and wondered what was the master plan behind it all.

And so this life went on. But the CH—Old Faithful—was never off the air and was always passing its loads of information in the same quiet unruffled way.



ON THE AIR in an East Coast type CH Transmitter Block.

Of course, the technical staff had their troubles. The bombing had left some Gremlins in the CH transmitters; they went for rides on the contactors and made clacking noises as soon as one's back was turned. They crawled along the ducts and tripped transmitters—they lit the wrong lights on the control desks—they nearly drove one particular watch straight into Colney Hatch. But one transmitter or other was always either on the air or at instant readiness, and our Monthly Technical Report, month after month, showed "Nil" for "Time off the air".

That continued until the end of our association with "steam"; but by the time we escaped from the problems of one station we realized that all through 1940 a tremendous new chain had been built. Starting with MRU's, going on to ACH's (more or less transportable), then to ICH's, using permanent towers but temporary buildings, the Finals arrived, and the original chain from Netherbutton to Ventnor had been stretched to cover the entire coastline.

Yes—let the beam enthusiasts say what they like; let the centimetre fans talk lovingly of their wave-guides; let the GCI types sing the praises of the night chase. Unless they grew up with the old CH they don't know what thrills were. The CH was once all we had; and, by Heck, it did its stuff!

"BIG BEN"

Right through to 1944 the quiet efficiency of the CH stations was maintained; and then came the V2 period, which started a magnificent flap. Stations in the South-East corner were modified beyond all recognition; many mysterious bits and pieces were added, the technique of which still can't be disclosed because it is Top Secret. But it is no secret that the CH added still further to its reputation during the Big Ben flap, just as the multifarious beam equipments did their bit towards the vanquishing of V1.

Perhaps, by now, "steam" has lost some of its glamour; but it is interesting to reflect that there is, as yet, no single type of beam channel that can replace a CH station. Combinations of them, yes—but single types, definitely no. That is why it was so fortunate that we had the CH when we did!

LIFE IN FLY-BOMB ALLEY

Divers details at Fairlight

Once upon a time there was a quiet little CHL station called Fairlight. It sat peacefully on the cliffs near Hastings and looked out into the blue waters of the English Channel; nothing ever happened there, except for routine matters like hostile low-fliers, outgoing mass raids of 500 plus, night raiders heading for London, U-boats and E-boats stooging around the Channel. It was an ideal home of rest for tired-out WAAF's from the North of Scotland.

Even on D-day the Fairlight people didn't have much to do except to plot on shipping and aircraft—and, even if there was quite a lot of that, well, it was a nice restful occupation.

But some eight days later a rude noise was heard in the sky, and what appeared to be a flaming aircraft pursued a straight and very rapid path Londonwards—and that was how Fairlight's calm was shattered. After several days and nights of what the Min. of Inf. was pleased to call "pilotless aircraft" it became obvious that things were going to happen to Fairlight.

V.I.P.s AND OTHERS

The Air Ministry and Fighter Command wheels started rolling, and the Backroom boys started thinking. The machine started moving, and eventually ploughed a clear path right through poor little Fairlight. Visitors arrived—hundreds of them. Some, much perturbed by the rude noises in the night, went away again; others, apparently liking the music, stayed on and refused to move. A committee headed by a VIP met on the site, and even this solemn meeting was interrupted by a doodlebug

which committed suicide a quarter of a mile away. But the committee made some decisions, and then things began to happen.

Along came a Type 13, a Type 24, Type 26, American MEW; the CHL was turned inside out to make it a GCI; its aerial array was rebuilt and then unbuilt again; a Mighty Wurlitzer tracking console was installed in a special building of its own; a photographic section was established; along came Y watch, photographers, controllers, filterers, Works and Bricks, CME's, operators, clerks, more MT, more Diesels, more telephones. . . And then the guns arrived—hundreds of them! A heavy battery in front of the station, Bofors behind it, light stuff all round it.

On one occasion there were 56 bods in the Ops-Room (all working, so far as one could see). On another there were three enormous Type 24 Cheeses and more than a hundred bodies on the forward site. And all the time the doodlebugs roared overhead—those that didn't crash in the sea or within the ten-mile belt destined to become their chief graveyard.

NOISY CUSTOMERS

The chief problem at Fairlight, then, became one of sleeping. The extra bodies on the site were mostly working by night, when the customers were most numerous; but if they tried to sleep by day, they were rudely awakened by a kind of vibro-massage from the barrage every few hours. Those who worked by day were jerked out of bed by the midnight performance, and again at 3 or 4 a.m. So it just became a matter of doing without sleep!

On one hectic night the gunners hit a Diver at a height of 1,000 feet and directly over the CHL Ops-room. Equipment and operators jumped several inches off the floor, and a minor fire was started inside the Type 13 receiver by displacement of components! Still Divers crashed all round, shell fragments fell like hail, and every half-hour or so during a noisy period the visual spotters would report one making straight for the station—often losing height as it came.

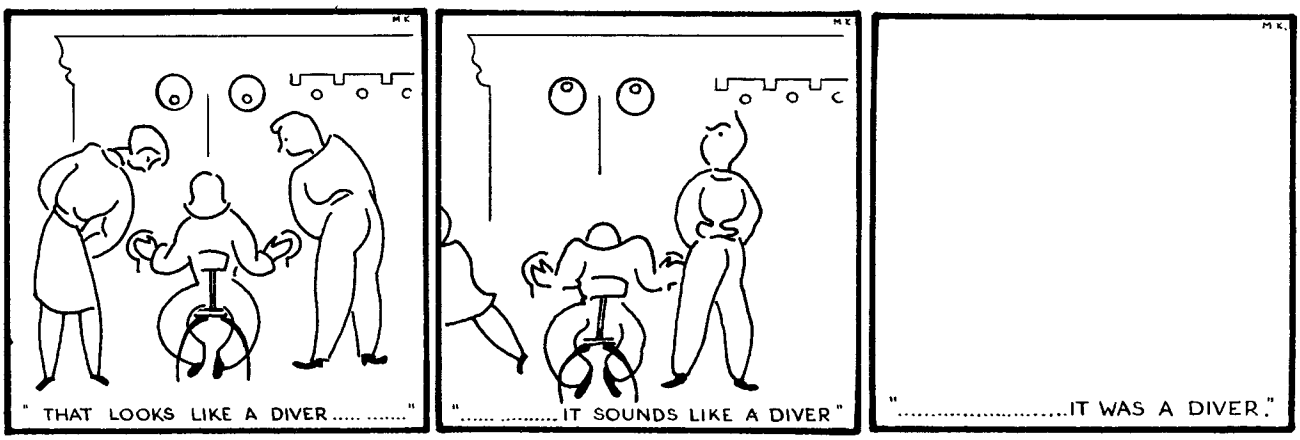
But Fairlight survived. After it had counted nearly 5,000 Divers the Allied armies in France forced the enemy away from the sites at the other end of Fairlight's tramlines, and Rye, Dymchurch, Hythe, and Swingate were left to carry on the good work. On the great day when 97 out of 101 were shot down, the peak was reached.

Fairlight is now a quiet little Radar station basking in the sunshine (on the days when the sun shines) and looking out across the Channel. It is not complacent, but now and then it does dream of the days when it played its big part in one of the greatest "flaps" in the history of Radar.

★

Doodlebug, doodlebug,
Where do you roam?
Fairlight no longer
Is plotting you home.
Over the roof-tops,
Each night you are skimming 'em,
Plotted by Happisburgh,
Hopton, and Trimingham.

(Also by Foreness, Whitstable, all stations to Goldsborough, and many others which don't rhyme.)

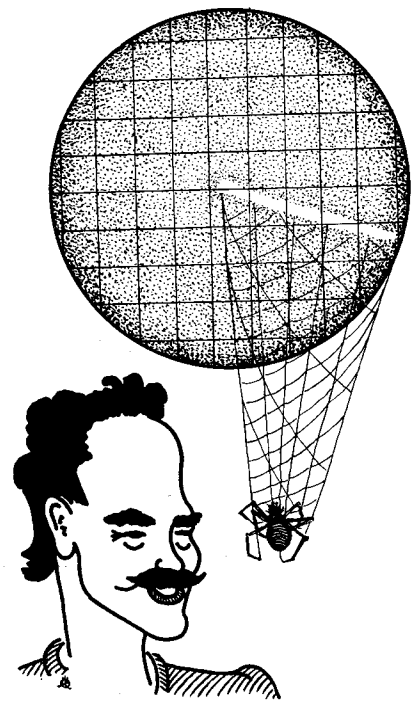


ida the spida

with apologies to
archie
mehitabel
don marquis, and
any others who think they ought
to be apologized
to

its a funny thing boss but once
i knew a waaf who kept a spider
named
ida
with a lot of silk
insider.
ida
was plenty smart although
the c.o.
said no,
just an ordinary spider.
ida
lived on a gci
and you would always find her
near the middle of the ppi.
she might have been worth quids
spinning distorted grids
but no
she lived on a gci
and just sat
in the middle of the ppi.
she hadn't even got a fly
and with all the electrons present
she became fluorescent.
on the filter table
you would see ida
come up as m for mabel
moving ever so slowly over
the table.
one day she became a p.e.
another time she nearly met a sad fate,
got chased as hostile one-two-eight
but the old finger was well in
and she wasn't shot down.
so ida
went into business as a
writer . . .

well said ida
i know they give me a good time
but what some of them get paid for
i don't know.
i've sat on this ppi
shining like a blooming glow-worm
for six weeks
and only been plotted twice.
of course for a nice sleep
i get on the iff console
and no one ever looks at me at all
except a nice man with curly hair
who pops in
about once a year.
i get a lotta kick out of visitors
sorta psychology i suppose
but they all strike me as kinda
screwy.
it's a good thing we haven't had
that wing-co from group,
dead nuts on dust he is
and if he looked at my ppi



i'd get wiped off.
then there's another one
who switches off the iff
and every one says
good show
they're going to take it out,
but he only wants to see
if they noticed it,
no luck at all.
there are some awfully
nice types
mostly those with wings and a dfc
and lovely moustaches.
ever so handsome they are
and they all look at me and say
good show
and i think they
mean it.
but i take a mighty dim view
of these video mods
as they call them.
the trace is so bright now
i can hardly sleep
and this 8 kv business
burns my feet.
they tried to off-centre me the other
day
and i had to move
halfway across the bowl
but they changed their minds
and i'm back in the middle again.
then we had the boffins in
talking about skiatrons.
they're all right for some
but not ida.
i've been nearly drowned in hot tea
before
and i don't like it.
besides i like these dark cabins
the things that go on sometimes
you wouldn't believe.
funny how the innocent looking
blue-eyed waafs
are always the ones.
the officers say they need training
and give them a course.
some training say i
and i know.
now they say there's a type 13
coming.
none of that for ida
going up and down
and i don't want my height taken
all day.
no p.e.'s to hide in either
so i'm looking for a new place
for some sleep.
i'll probably get inside a
1497
and see what that's like

ida

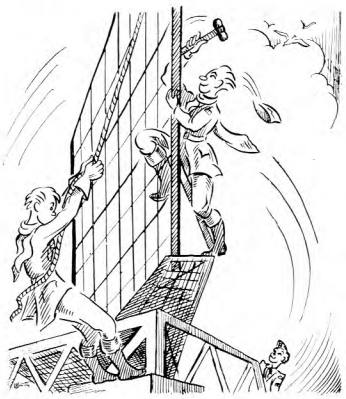
String and sealing wax

In the early days of 1940, RDF meant, except to the highly-privileged few, mighty towers, impressive T-blocks full of "steam-engines", and somewhat zig-zag tracks. "The few" were devotees of a new art known variously as "CDU", "CHL", or just "string and sealing-wax". This new art enabled straighter tracks to be drawn, and also filled the serious gap below the CH's main lobe.

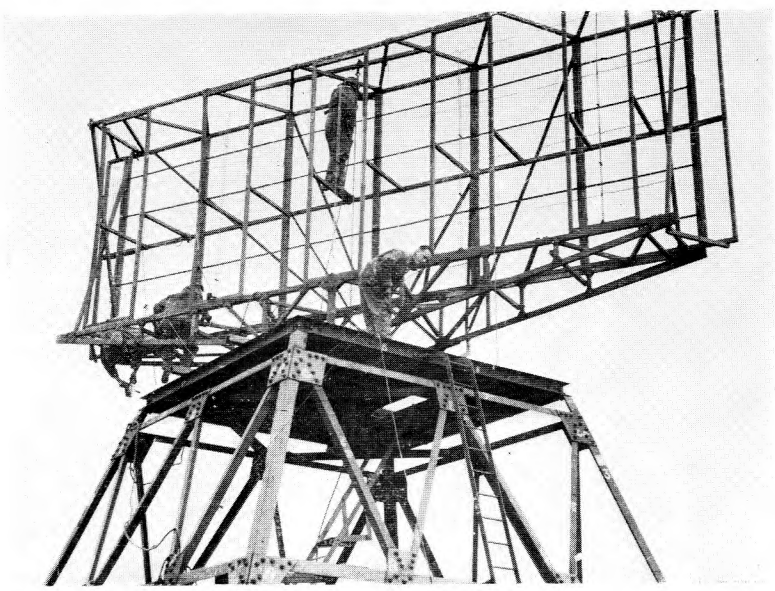
The chain, in those days, was maintained by a civilian organization known as Base Maintenance Headquarters (BMHQ for short). It was largely concerned with the vital job of keeping all its CH stations on the air all the time. But other jobs were also in hand.

At this time some 20 stations were in course of erection, including the very first CDU's at Foreness, Walton, and Anstruther. TRE (then AMRE) and No. 2 IU were doing the job. The Navy was also mysteriously involved, and every now and then an odd request arrived for spares to be dispatched to Scapa Flow for "Admiral Somerville's job". The Northern mists lifted later to disclose six Admiralty Experimental Stations, including the famous Fair Isle and Saxavord—stations which put up some amazingly good performances with early and crude equipment.

The early stations would have delighted Heath-Robinson fans; their aerials were turned by a bicycle chain, the handles being merely the pedals of an upturned bicycle frame. This gave a nice easy control in still weather. When it was windy, however, if the operator once let go, the pedals flew round until the aerial finally came to rest with a terrifying crash which usually broke the chain and wound the feeders round all the other gubbins. How many readers of this, we wonder, can claim the distinction of having the top of a finger ripped off by these contraptions?



One of the first jobs was to improve the turning gear, and, inspired by the genius of a mechanic at Walton who was using an old Austin Seven steering-box instead of the pedals, BMHQ, RAE, and Austin's developed the once famous "Hopkins" turning gear. This later enabled WAAF's to develop mighty biceps and to keep the aerials turning until the still later advent of the mechanized age.



Those were the days of "split", and claims of accuracy down to a quarter of a degree of azimuth were common. As there were two or three degrees of play in the various bits of the turning gear this couldn't have been very important! Split, however, died the death soon after the newly-formed 60 Group had begun to be rude about it, with a noticeable improvement in reliability. The Group got into action very rapidly and the happy, but hardly carefree days of BMHQ were over. No longer did one stop the Night Express to Scotland as it went through Leighton Buzzard, to put on a CH filament for Douglas Wood or Netherbutton; one was in the RAF now.

During the Battle of France it became urgent to provide cover in the South-West, and this was one of the Group's first big jobs. In May 1940 instructions were received to install 20 CHL's and a large number of ACH's. A crash party of three took on the CHL's, allowing one week per station to install the equipment, test it, and get it on the air. Those 20 stations were complete in six weeks. In the meantime the CH boys were working equally hard and much good-natured rivalry was springing up between "beam" and "steam". The CHL gang were very proud of their azimuthal accuracy and ever-increasing ranges, but kept quiet about lashing in high winds and lack of height-finding.

The wind-locking business seriously worried the AOC at that time, and as a result of his many suggestions about wind-shields a prototype was evolved. This invoked the aid of a vacuum cleaner and a model CHL array, with various arrangements of wooden-slats—horizontal and vertical. The best arrangement was translated to a life-size version which was installed at Bempton, in spite of prolonged croakings from the Boffins, who declared that the structure, when wet, would reduce the efficiency to nil. But Bempton was surrounded by a circle of telegraph poles joined with slats made up of poles and tarred felt.

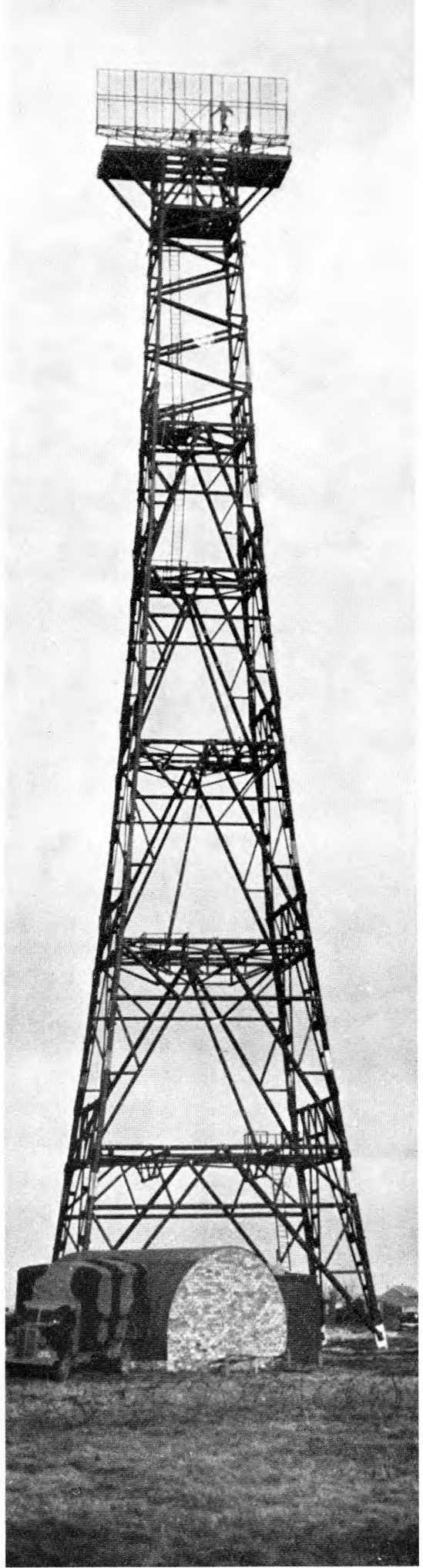
The scheme worked. Even in heavy gales Bempton stayed on the air, and range did not appear to suffer. But for the timely appearance of Caledon power turning, England might well have been lined with imitation gasometers on the Bempton pattern.

All this time CHL transmitter feeders were of the "ladder" type, with Perspex insulators every three inches, held by kinks in the wire. These feeders worried us for a long time, but by dint of being persistent, and, let it be confessed, by short-circuiting "normal channels", we succeeded in evolving a strained feeder system which used quarter-wave stubs as insulators. They had never before been used at these frequencies, but they worked, and with the introduction of common-aerial technique and higher powers the performance of the CHL rose to its present level. Ranges of 200 miles were achieved even in 1941.

By the end of that year many more stations were planned and built. The present-day CHL with concrete block was, in fact, known as the "1941 CHL", although most of them were built in 1942. The adoption of the PPI in these stations speeded up the plotting until the envious CH's were frequently choked with information.

Combined directional plotting was an inspiration which joined the CHL in a sound, happy partnership with the CH. The advantages of the two types were combined and the team became a formidable combination which may well be of great value in future Radar reporting.

In conclusion, a word is due to the stalwarts on the South-East coast who never aspired to "1941" stations. No new blocks were installed for Swingate, Fairlight, Beachy Head, Truleigh Hill—they carried on with the old wooden huts and sandbags, and with the coming of the V1 they showed that the improvization was at least as good as the final conception. Their gantries creaked, their turning-gears groaned, their roofs leaked, but they stayed on the air—and even now, when many of the 1941 CHL's are being closed down for the last time, they still do their stuff.



RADAR ON THE OFFENSIVE

RNA, or in full, Radar Navigational Aids, was the somewhat ambiguous title which covered a great part of 60 Group's activity for the last three years of the war. Its four main systems, Gee, G-H, Oboe, and Loran, all of which grew from very small beginnings, played a vital part in the destruction of the German war machine.

It all started back in 1941. We had been at war for more than a year and British Bombers had been going out in small strength but with great determination and courage, to attack German industry. The BBC announcements about the bombing of Hamm were becoming a stock phrase. But only those who have flown in bad weather at night can appreciate the problem of finding a target many hundreds of miles away when all the time the enemy is doing his best to destroy you. He is using flak and night fighters, and also trying to confuse you by lighting up dummy fires and displaying the lights of fake cities.

Small wonder that despite the courage and skill of our bomber crews we were not effectively injuring German industry. In fact, not five per cent of our bombs were falling on the target, a serious waste which was very early appreciated by Bomber Command itself. What they needed was an instrument which would enable the bomber to plot its own course to the target, and then, having completed its mission, to solve the equally difficult problem of finding its way home, to that narrow strip of concrete hidden in the early mist somewhere in East Anglia.

"GEE" THE BASIS

So Bomber Command Staff Officers went to TRE, where scientists had already produced a basic idea christened "Gee". In fundamental plan it was simple—a master station to transmit pulses and two slave stations, some 50 or 100 miles distant, also to transmit pulses which were locked to the master.

Aircraft would carry a receiver with a cathode ray tube on which these pulses could be displayed, in conjunction with a time scale to measure the time difference between arrival of the pulses. By translating the information thus obtained through a special map known as a Lattice Chart, the navigator in the air could determine precisely where his aircraft was.

60 Group, whose reputation in the field of detection and interception Radar was already established, was given the task of building, maintaining, and operating the ground system, and on the night of 8th March, 1942, the Eastern Gee Chain was ready for its first attack on Germany. This chain had as its Master the BBC-manned station at Daventry. The unique combination, despite forebodings in some quarters, proved a great success.

The target was Krupps works at Essen. Bomber Command put up a force of four hundred aircraft—in those days a very heavy raid indeed, and of this four hundred some eighty were Gee equipped, and were to lead the attack.

Some of you will remember that first raid; the monitoring station at Great Bromley from which the control of the chain was carried on, and the tenseness of the night when, for the first time in history, Radar became an offensive weapon, and the heavy bombers droned out across the North Sea towards the heart of German industry.

ON THE TARGET

From that historic night, events moved rapidly. Gee was a success—a tremendous success. The bomber crews accepted it at once. No more wild guessing as to where the target was, and no more worry on the way home, searching with one anxious eye on the petrol gauges, for that mist-shrouded base.

Soon came the first thousand-bomber raid, only possible because of the ability now given by Gee to marshal such a vast air armada, concentrate it on the target, and return it to base safely.

The U-boat war was developing, and the submarine pens on the west coast of France became primary objectives. So did the French armament works, and the great industrial plants of northern Italy. This called for Gee cover over France, and so, on 15th May 1942 the Southern Chain came into operation.

CHASING THE U-BOATS

After that, in support of Coastal Command's determined and unceasing struggle against the U-Boats, came the Northern Chain, and later the South-Western Chain.

By the summer of 1943, apart from a gap in the North-West, the United Kingdom had Gee cover not only over the whole of its surrounding seas, but deep into enemy territory, and Gee had become the standard aid to navigation in Bomber and Coastal Commands, and in the heavy and medium aircraft of the great American Air Forces then starting to build up in this country. The handful of Radar mechs and operators who had played their part in the initial attack on Krupps in March 1942 had grown to a very considerable force spread all over the British Isles.

The operators had the dullest of jobs. They came from the excitement of CH, CHL, and GCI, with memories of the Battle of Britain, and were asked to sit for hours on end watching one pulse on a tube and keeping it steady. How easy to nod, and let a pulse slip away down the tube—but if they did, an aircraft making its bombing run would be thrown off target, or, more important still, an aircraft breaking cloud in the proximity of hills might crash.

Throughout all the years of Gee operation they maintained this watch with an efficiency which was astounding.

Later came Loran, the American version of Gee. Its particular application in Europe was the SS system, with a chain that spanned the Continent—Port Errol in Scotland locked with Bizerta in North Africa. A late comer in the struggle, it still managed to deal some heavy blows in the winter of 1944 and early 1945, particularly against Berlin.

DID YOU DO THIS—? The V1 supply dump at St Leu D'Esserent, before and after an Oboe-guided raid, 1944.

Gee had solved the problems of navigation. It enabled bombers to find their target. But to destroy an industry like the German armament industry, the scale and pace of destruction had to be increased so that the enemy could not rebuild as fast as we knocked down. To achieve this it was necessary to develop a pin-point technique. The target to be attacked must be marked with such precision that all the bombs would fall in a concentration centred on this pin point.

This would ensure wrecking, by HE and incendiaries, on such a scale that the enemy's ground defences and powers of reconstruction would be paralysed. Once again Bomber Command turned to TRE, and here, after much discussion and work on the problem, the first great blind bombing device was produced—Oboe.

Oboe was, and probably still is, the most precise method of determining the position of aircraft from considerable distances, but it was a highly specialized device, not one which could be fitted to every aircraft. It was, in other words, a very fine tool to carry out a very special job. Its success was due not only to the ingenuity of the technique employed, but also to two other new weapons which had just become available. One was the Mosquito, capable of flying at 30,000 feet, the other was the Target Indicator, a form of incendiary bomb which marked the target with a display of coloured fire so distinctive that the enemy's attempts to imitate it by dummy fires were foredoomed to failure, and to extinguish it almost impossible.

OBOE, QUIET BUT DEADLY. Exterior of the Mk. III block at Winterton IV.

The Air Staff of Bomber Command therefore planned to use Oboe in the following manner. The main force was to be scheduled for concentration on the target in waves: the duration of the complete attack was to be as short as possible—not exceeding half an hour. The accuracy of navigation afforded by Gee would ensure that every aircraft would arrive over target within two minutes of its schedule, and to lead each wave there would be an Oboe-guided Mosquito whose only function was to pin point the target with its target indicator. This Mosquito was to be supported by heavy Pathfinder aircraft who would quickly attack the target indicated with HE, incendiaries, or additional markers. By this means, such a conflagration could be started right on the selected pin point, that the follow-up force would have no difficulty in identifying their correct target.

To achieve all this, 60 Group was once more given the task of installing, maintaining, and operating the necessary ground stations. The first lot, the old Mark 1's, were built at Swingate, Hawkshill Down, and Trimingham, and the early attacks, from December 1942, were in the nature of calibration and experimental runs, and were not on a large scale.

MONITORING the Eastern Gee Chain from Barkway.

OBOE FOR PRECISION

Early in 1943 the real battle started. Oboe began to lead heavy forces to the factories of the Ruhr, and the terrible concentration achieved by the combination of Gee and Oboe destroyed great German cities completely overnight.

Throughout the summer of 1943 the battle of the Ruhr was relentlessly pursued by Bomber Command, with 60 Group playing its vital part,

and Oboe went from success to success. Other blind bombing instruments quickly came into production, but Oboe maintained a lead which, although challenged, was never snatched from it. Worth Matravers and Sennen dealt with the U-boat pens of Brest, Lorient, and St Nazaire. Mobiles at Tilly Whim and Beachy Head, backed by the static stations at Swingate, Hawkshill Down, and Sennen, joined in the great invasion battle and destroyed the ten enemy gun positions covering the landing beaches—this in the two hours preceding landing!

When the enemy started his great V-weapons attack, Oboe was again called on, to lead both British and American bomber forces against the launching sites—both V1 and V2. Winterton had come into the picture by now, and had played an important part in the destruction of the Ruhr and all the subsequent attacks on invasion targets in Northern France and the Low Countries.

Unlike Gee, Oboe was not a monotonous job. True there were long periods of waiting, but these were amply compensated for by the tense excitement of the attack. Mechanics had the heavy responsibility of maintaining a system which was being worked to the limit day and night, and for which little, if any, reserve equipment existed. Operators had the tense and important job of ensuring that the attack was successfully carried out. All who worked on Oboe will remember throughout their lives the excitement and the labour on stations from Norfolk to Lands End, and, among those who went forward with 72 Wing, as far east as the borders of Czechoslovakia.

Less in the limelight than Oboe, but contributing immensely to the destruction of the enemy, was G-H. A blind bombing system not so precise as Oboe but giving a greater degree of tactical freedom and more suited for pure blind bombing through 10/10 cloud, G-H played its major part after D-day.

Although valuable work was done from the stations at High Street, Grangewood, Worth, and Kilter, its story lies chiefly in 72 Wing, whose six heavy convoys rolled forward across Europe in the wake of the retreating enemy, switching from site to site with lightning rapidity. Frequently they had dismantled, travelled a hundred miles, and become operational again in the space of thirty hours.

They were responsible for guiding the Lancasters of 3 Group Bomber Command, and some eight hundred Fortresses and Liberators of the American Eighth Air Force in deadly attacks upon the enemy. They were particularly successful in their specialized work of dealing with his oil refineries and troop concentrations, and their disruption of his troop movements during the critical phase of the Ardennes offensive was probably a major factor in the defeat of that last gamble.

72 WING

Justice to the work of 72 Wing cannot be done in a mere paragraph; the work of this great Wing and the stories and experiences of its officers and men would fill a book. It was the all RNA Wing, designed to deploy the ground systems essential to our bombing offensive on the Continent of Europe. It entered Europe by the beach heads of Normandy and began the deployment of Gee, G-H, and Oboe stations on an ever-increasing scale.

It first found itself putting up stations in what was almost a vacuum, for the enemy's retreat of last autumn across France and Belgium was so rapid that even the fast-moving 72 Wing could not keep pace.

Later he made a stand, building up fronts which for months to come were to withstand our attacks, and against these fronts 72 Wing proceeded to deploy its many convoys in such a manner that all the Allied air forces were given the best and maximum cover. Gee chains particularly sprang up in a week, where previously they had taken three months.

Oboe, that most complex Radar device, also moved with a rapidity that astonished everybody,

THIS WAS a U-boat pen at Brest, pin-pointed by Oboe, wrecked by a twelve thousand pounder.

and G-H, methodically destroying the enemy's oil resources, took every advantage of forward movement of the front line to snatch at the last few miles of cover. Risks were taken, and adventures were many. The enemy knew by now what was hitting him, and his Ardennes offensive had amongst its objectives the capture of the RNA stations sited at Laroche. However, 72 Wing's anticipation of the situation enabled the units to be whisked away from under the very guns of the advancing Panzer units.

THE LAST PHASE

With the early spring of 1945 came the final assault on Germany. Conferences between Staff Officers of 60 Group and SHAEF had ensured that all the necessary plans were prepared, and this, combined with the skill of personnel, now battle trained in 72 Wing, enabled the whole vast complex of RNA cover to spread forward over Germany as rapidly as the forward infantry elements could clear the sites of German snipers.

The standard method of siting was to go forward with the infantry in a jeep, flash the essential siting data back to 72 Wing Headquarters by W/T, and within a matter of hours an Oboe convoy or a Gee system would be moving up. Before the war ended, Berlin had been repeatedly attacked from Oboe stations sited deep within Germany. The remaining oil targets had been battered by the G-H system, and the whole of Germany lay under Gee cover.

These magnificent results were achieved only because of the great work of every one who contributed to the RNA system. It was successful not because one link in it was good—it was all good, and *you* played your part in ensuring this success, whether you were maintaining the complicated apparatus, driving M-T, cooking a meal for the watch, chasing equipment, or just being generally useful.

Every one who worked on RNA at Group, on Wings, or on the stations, can claim with great pride and justification that they played a vital part in the destruction of the great German army, and the industry that nourished it. It was *your* work; no one could have done a better job.

On being Posted out of 60 Group

I remember happy lonely sites
And friendly people,
Binding weather, hockey, gala nights.

Towers climbing high into the blue,
The "A" Site transport
And a chorus from the crew.

Weary night-binds with a lone patrol,
And thrilling watches
With a fight to man the "bowl".

D-day landings on our lines of shoot,
Unceasing masses
Plotted down the well-worn route.

Chinagraph complexion, blackened hand,
The sudden quiet
When a "mass" moved overland.

I remember tea at 3 and 6,
And ghostly stories;
Talks on life and politics.

"Night watch sleeping" pinned up on the door,
The Radar Bulletin
And a polished Ops-Room floor.

Happy memories to take away—
Best wishes, Sixty,
And here's to getting back some day.

BULLETIN REVIEW

If you want to learn the history of 60 Group—but we mean the "human story", not the coldly worded official documents—you cannot do better than find some tidy-minded person who has a file of RADAR BULLETINS and is prepared to lend it to you. We recently found such a person, here at Headquarters, and we confess that we have learnt a lot. We will therefore proceed to hand on some of our information to our under-nourished readers.

The "RDF Bulletin" first saw the light in April 1941. It consisted of three foolscap sheets and was very grim and businesslike (just as 60 Group was in those days). Hostiles were seen by all and sundry, from Deerness to Ventnor and from Bawdsey to the Isle of Man. There was also a note that "recent heavy raids have made necessary the introduction of a rough and ready system of mass reporting." An article on Births and Deaths heralded the arrival of "Penolver, a fine child of South Cornwall", and adds that Cocklaw, Crustan, and Loth are growing up in the North. The only light relief was a moral little poem called "AME Stations" which explained what the various abbreviated station names meant.

Nothing much happened until the publication of No. 4 in July 1941; the preceding issues were full of mass raids, gloomy promises of what was to come, and more announcements of births. The July issue was full of crashing hostiles, from the Scillies to the Shetlands, but—sign of hope!—published some official instructions on the method of reporting Fighter Sweeps.

SCHARNHORST AND GNEISENAU

In August 1941 we find the long-distance competition thriving, with Hillhead claiming 210 miles on an MB1a/RF6, and South Ronaldsay claiming the CHL record with 178 miles (on VT58's). Macroscopic reporting was accepted as normal procedure; PPI's were in operation at Sango, Navidale, Cocklaw, and Grutness; and the temporary lack of hostiles was causing gloom.

In October 1941 (Bulletin No. 6) we find 11 Group claiming 79 hostiles destroyed and 24 "probables", and there is a report of a new Fighter Group covering Northern Ireland. In November, Shotton CHL (long since departed!) broke the CHL record with 203 miles and the Bulletin broke into frivolous verse for the first time.

The next issue "January 1942" mentions "the disappointing story of the German Battleships". (It was not known at the time that the Radar picture was satisfactory, considering the difficulties created by the first serious jamming barrage let loose by the Hun.) CHL's were being warned to keep a special lookout for low fliers (there was no centimetre chain then, of course). Among the "new boys" we hear for the first time of Kendrom, Rodel Park, Islivig, Eorodale, and Point of Stoer—the "Battle of the Atlantic" stations.

February 1942 brought news of the Bruneval commando raid, from which our anonymous heroes brought back bits of German 50 cm. equipment. All the Fighter Groups reported bloody encounters with hostiles, and Grutness burst into the record-breaking class with 226 miles on a CHL.

BUSINESS FROM THE WEST

The March 1942 issue (No. 10) said farewell to our first AOC—Air Commodore Gregory—and welcome to our second, Air Commodore (now Air Vice Marshal) Aitken. Nevin claimed the long distance record with 90 million miles (on sunspots) and Grutness added to its fame with the claim of 190 plots of over 150 miles in one month. Incidentally there were still ten Wings being mentioned in this Bulletin, 76 at Bristol and 74 at Cambridge both being very active.

April 1942 reported the dissolution of nightly knitting parties and backchat with plotters—life was earnest once again. It also pointed out that there were 290 reporting channels, as compared with 125 in January 1941 and 25 in January 1940. 9 Group and 10 Group were reporting the completion of West Coast Final CH's in June 1942, and 11 Group mentioned 51 offensive sweeps in 14 days. The famous CD/CHL's had been taken over from the Army and put on air reporting, and hostiles were still plentiful in all areas.

The Bulletin then languished until November 1942, when 11 Group remarked upon the benefit of the new direct lines from CHL's to Filter Rooms —reminding us that some of you young readers may not realize that the CHL was once a kind of accessory to the nearest CH station.

Another gap until July 1943, when things were apparently dull, judging by the little homily about the importance of carrying out the dull tasks as well as the more spectacular ones. We also read of 81 Fortresses crossing the Welsh coast—a sign of things to come. A "CHEL" chain was growing, with a strength of 5 Type 14's and 5 aircraft-reporting "Katies". Bomber Command's mounting offensive was occupying the East Coast stations at nights, with a growing amount of American activity by day.

By August 1943 the surface-watching chain, in full swing, was saving convoys from minefields, plotting enemy surface craft and controlling Albacore interceptions, and generally working up to the grand job that it did from then until the end of the war.

MASS FRIENDLIES

For the rest of 1943 the chief concern was with very heavy friendly bomber activity and with surface craft; E-boat alley was becoming really busy, and the East Coast centimetre tower stations were doing their stuff. In November we read that Combined Directional Plotting was introduced on what was to become the D-day Coast, and a sweep of 350 aircraft over the Cherbourg Peninsula was reported—more signs of things to come. Searchlights were in the news, 13 Group were still shooting down HE 177's and JU 88's, and a new machine called the "Mk III Interrogator System" was beginning to achieve a certain amount of publicity for itself!

January 1944 saw the "Deaths" column increasing in size, with obituaries to Kendrom, Navidale, Rodel Park, Blackhead, and Crannock Hill Type 31. There are notices of the impending demise of Stoer, St Bees, Formby, Westburn, Oxwich, and Habost. The war is shifting south with a vengeance. Down South, at this time, flocks of Mitchells and Marauders are attacking "enemy installations in the Pas de Calais", and the new ME 410's and JU 188's are beginning their fast attacks on London. "Window" is in the news, too.

March 1944 sees an admirable piece of prose beginning "From Sennen to Skaw the CH stations remain, now as always, the real backbone of the Radar cover." Good old Steam! 10 Group, 11 Group, and 12 Group were really busy and the other areas somewhat slack. April saw a good-bye message to Loth, Scarlet, Dalby, Wylfa, Castell Mawr, Kilkeel, and Greystone CH's, and Prestatyn, Ballymartin, Roddans, Port and South Stack CHL's. Grutness, the one-time record-breaker, which came on the air at Christmas 1939, also closed—on 15th March 1944.

DIVER! DIVER!

The May 1944 issue is historic. D-day is past; activity on an unheard-of scale has been seen and plotted by all the South Coast stations. This, of course, means that the May issue must have appeared in June—but that is not unheard-of! The June issue proper carries the exciting news of the first flying bombs and the almost continuous "Diver" alert that followed. July announces the forcible evacuation of 75 Wing from Keston to Broadstairs, a Diver having practically wrecked their home after some weeks of nerve-racking existence. The Diver story is mentioned elsewhere in this issue.

By November, the Bulletin records that hostile aircraft activity is nearly over; the Calais gun-sites are captured, the crews at Swingate sleep once more. "Big Ben" is much in evidence, but not in the Bulletin, because of secrecy. Occasional mentions of the "V-Chain" occur, but give a poor impression of the real work of the CH's from Stoke to Dover. 12 Group say a joyous farewell to the Tirpitz; and the veil is partly lifted from RNA. Incidentally the November 1944 Bulletin was the first to be graced with a real cover. It told the story of Fairlight of Fly-Bomb Alley, and paid tribute to the work of 72 Wing—"Hands Across the Sea".

GOOD-BYE NAVY

From then onwards the story is too well known to need repetition here. The Home Radar Chain devoted itself more and more to friendly activity while the RNA Chain became more and more offensive. The Navy's contributions came to an end with the closing of the Naval Plots; VE-day and VJ-day were announced. And finally came the inspiration that brought this Souvenir Number into being.

A potted and incomplete history, no doubt; but the fortunate possessor of a complete file of RADAR BULLETINS is the owner of a personal story of 60 Group which does not exist elsewhere.

FLY-BY-NIGHTS

The Story of G.C.I.

IN 1940, the Battle of Britain showed every one connected with Radar just what it was worth. That tremendous showdown with the Luftwaffe had left us all intensely stimulated and excited, but, nevertheless, wondering what was going to happen next.

We soon knew! After a lot of meaningless sparring around, in mid September the Hun really turned on our cities by night. Night after night came the ceaseless drone of Heinkels, Dorniers, and Junkers over the South Coast, serenely sailing in at quite low speed, bombing London and the other great cities, and apparently getting away with it time after time. Our night fighters were striving valiantly, but, with their primitive AI, were having no luck at all. They *must* be controlled from the ground and placed within AI range.

For three months this continued—those never-to-be-forgotten three months of the Night Blitz, when weary Londoners rose morning after morning, shook themselves and went off to work with the certainty that their next night would be more or less the same.

The Radar answer to this was known—it was the Plan Position Indicator, already tried out with huge success at Foreness CHL. Six mobile equipments were being built, so rumour had it, but where were they?

CHRISTMAS PARTY

We soon knew. Out they came in quick succession, to be installed on ready-picked sites at Sopley, Durrington, Willesborough, Waldringfield, Orby, and Avebury. The Sopley party took place on Christmas Eve, 1940—a party which many officers in this Group will never forget.

There was the GCI—and if ever a piece of defensive Radar equipment was urgently needed, this was it. Even TRE, its progenitors, wouldn't have called it beautiful. It consisted of two of the familiar aerial trailers (hand-turned and kept in step with each other by watching a galvanometer needle), a Park Royal receiver vehicle and a similar transmitter vehicle.

SOPLEY'S DISCOVERY

The aerials had to be stopped to take heights (there was an operator in the receiving aerial cabin who had to line up the two halves of a "split" echo until they were the same size, and then to take a reading on his differential gain control)—and at no time could they be turned rapidly. Then they were always finding themselves up against the stop and having to reverse. Hints of better things to come were emanating from Sopley, but meanwhile Durrington and Willesborough were both bagging the odd hostile and the night fighters' score was slowly and steadily creeping upwards.

Then out came Sopley's news: by "guessing" the ratio of the two halves of the echo it was possible to take a snap height without stopping the aerials, and it was also possible to remove the extra receiver and operator from one of the aerial cabins. The natural suspicion of what seemed like guesswork was soon allayed by Sopley's records—four kills in one night, and another four later in the same week.

So all the other five convoys had to be "Soplified"

—by yesterday! What a party! This was probably an example of the closest co-operation between the Boffins and the Services that there has ever been. We all worked together—seventeen hours a day, seven days a week—until the job was finished and those convoys were all doing their stuff.

Meanwhile, a provisional design having been settled, six more convoys—production models—were on the way. At the same time, for improving the low cover, six transportables with 35-foot aerials had been put in hand. These were the fellows that used gantries with the 35-foot aerial above and a 10-foot aerial below, with power turning. The gantries were mounted on concrete slabs and a new vehicle—a control cubicle for the power turning—was added to the convoy. We never discovered who thought of calling these "transportable". They must have been 60 Group's best and biggest headache up to that time.

But up they went—at Langtoft, Hack Green, Comberton, Avebury, Wrafton, and Hampston Hill. And out came a new batch of mobiles, for St Quivox, Dirleton, Northstead, Neatishead, Treleaver, Trewan Sands, and the rest. Not all of these stations had customers, but those that did, shot them down.

HAPPIDROMES

By now it was apparent to any one in the GCI section of 60 Group that nothing else mattered in this War! It had gathered momentum. Meetings, discussion, siting parties, arguments, brawls, nearly free fights... The steam-roller ran over them all, and out came Intermediates—mobiles for some sites, transportables for others, but all hutted now, all with common-aerial technique and increased power and range. The PPI's improved, the height systems grew better, the operators grew slicker and more confident, and, by 10th May 1941, came the night when 33 Huns were shot down. That marked the best score ever, and the end of the large-scale night raids.

Even the Intermediates, as their name implied, were to be superseded. The Finals or "Happidromes" were already planned, and their building programme started—one more instance of the way in which British Radar has always been a move or so ahead of the times. Fortunately the contingency with which they were meant to deal never materialized—it was the mobiles that bore the brunt of the night attacks—but there is no doubt that the Finals, had they been called upon to do so, would have done their stuff magnificently.

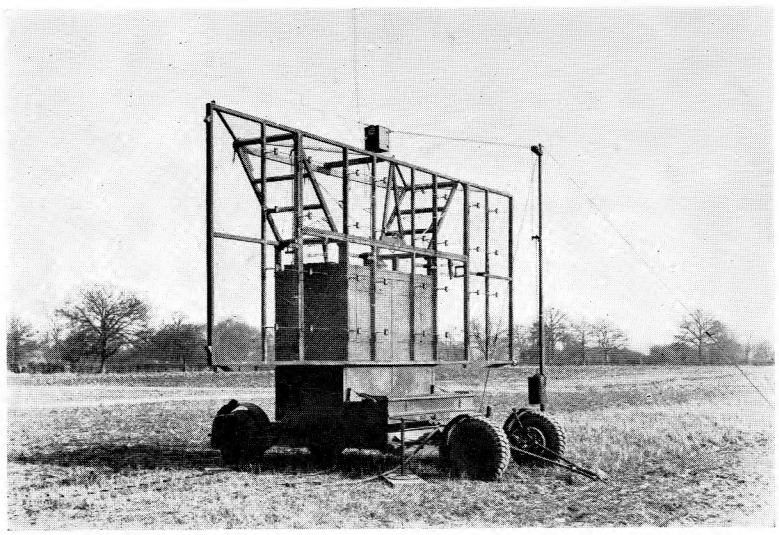
As it was, by the time they were operating there were relatively few customers for them.

Early in 1944, when the Hun started his fast hit-and-run raids on London, the Finals were fully occupied for a while; and later in the same year, when the V1 started its reign of terror, those Finals that were favourably placed did magnificent work. Wartling, alone, accounted for 380 Doodlebugs.

"TALLY-HO!"

But it is never the perfect present that one remembers—the very imperfect past was always so much more fun. The early struggles with diode switches; the phenomenon of the left-handed dipole; the crew struggling to jack up an aerial trailer higher and higher to get the right 10 : 6 ratio on PE's—these are the things that stick. And those mobiles with full crew inside on a hot day—phew!

There has probably been no thrill in Radar to compare with the night-chase on a GCI, culminating in the pilot's triumphant yell on the R/T. How some of those crews worked—and how little like work it seemed when the kill was inscribed on the wall next morning. Those were the days!



AERIAL TRAILER of a Mobile GCI with "yachting pole" and counterweight for strained feeders.

Installation Day

Our station's in an uproar—
Installation's in full swing,
And running round the Ops-Room
Are bags of bods from Wing.

The station mechs are busy
Running to and fro with tea;
Resplendent in their corduroys
Come types from TRE.

The Rx is in pieces,
It will surely work no more,
And all the bods with all their mods
Lie scattered on the floor.

Ops and Mechs and CME's,
Rings and tapes and LAC's,
Sergeants playing with a 'scope,
Giving AC's all the dope;
Squadron-Leaders use sig gennies,
Flight-Lieutenants toss for pennies.

Louder grows the noise and din—
But here's the TO squeezing in;
With sickly mien and palsied hand
He tries to quell the busy band.
His voice comes weakly, without tone,
"I've just had Group upon the 'phone . . . "
(He swallows hard, his face turns white)
"You're working on the wrong damn site!"

The Last Posting

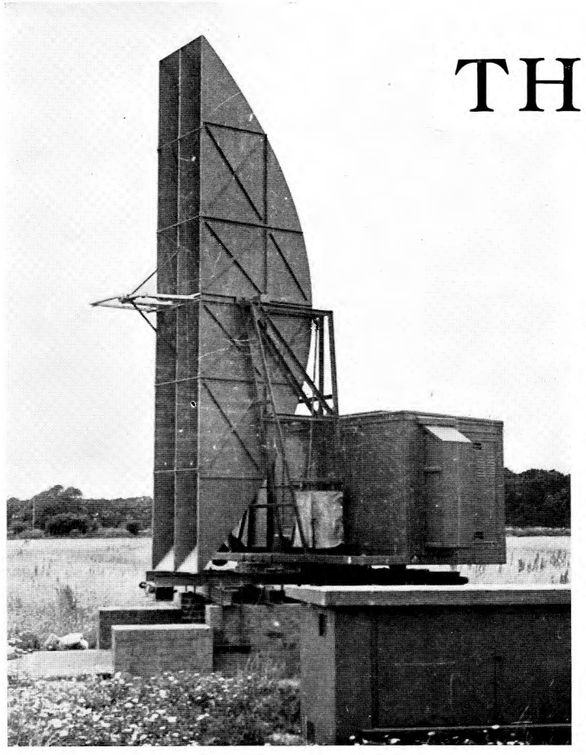
"Lor love a duck," said the Mech, "that's done it!
Just me alone with the gear to run it,
The TO's off on an admin course,
The WO's posted to Stoke Holy Cross,
Corporal Plum is in dock with the measles,—
No one to give me a hand with the Diesels!
We had two Canadians, but ain't that a laugh,
Last Friday they posted them to Second TAF.
No more mechanical personnel
Left on the station. Ain't war Hell!
Saw the CO and he's rung up Wing,
All of them say that they can't do a thing,
They blame it all on to Records, Gloucester.
Looks like I go on a one watch roster!"

He beats on his breast and he rages at Fate
Till a signal comes—"You're posted, Mate."
Posted! The very last mechanic!
None on the station—bags of panic—!

Nobody ventured to touch the set,
But it went all right, and it's going yet,
Just as it did in the days before
When it had maintenance galore.
So if they post every Mech from your station
Don't let it fill you with consternation,
Don't be downhearted, never moan,
Just leave the God-darn stuff alone!

THE CENTIMETRE STORY

How Radar turned from the skies to the sea; the conquest of wave hoppers, surface vessels, and other low types.



"BIG CHEESE"—the Type 13 Mk. II Height Finder for Final GCI.

E-BOATS! Low-flying minelayers! The East Coast shipping lanes and port approaches are in danger. That was the cry towards the end of 1942. The CH's could not cope with the new menaces, and the CHL's could not see E-boats; pick-ups on minelaying aircraft were rare.

Another panic was on. Boffins scratched their heads, Air Ministry meetings were called, the Army was brought in. Soon it was decided that the RAF would take over the Army's coast-watching centimetre stations, including the 200-foot Tower stations that they had built on the East Coast, for shipping cover.

"We want increased power," cried the RAF and the Navy together, "and we want stations all round the coast." "Cover must be provided against E-boats, minelayers, low-flying attacks on shipping, U-boat attacks; Radar must help shipping to keep clear of mines. On the success of this depend Britain's food and munition supplies, the African campaign, and any other campaign likely to start. Every inch of sea right round the coast of England, Northern Ireland, and most of Scotland and the outer islands must be watched day and night!"

What a commitment! Meeting followed meeting. Equipment channels were jammed with new demands, siting parties dashed round Britain, works erected Nissens, gantries and hard standing, while 60 Group prepared plans for a chain of centimetre stations that was to rival the existing CHL chain.

The Army stations were taken over and converted to high power; new lines were laid to Naval Plots at Yarmouth, The Nore, Dover, Newhaven, Portsmouth, Portland, Dartmouth, Plymouth, Falmouth, Liverpool, and the rest. The battle against the E-boats and U-boats was on.

It was a start, but only a start. The tower stations stretched at intervals from Bempton to Start Point, but there were serious gaps and more cover was required immediately. Not only was the East Coast being attacked, but E-boats were swooping in to the Sussex and Dorset coasts and sinking valuable shipping right under the noses of the CHL's. Low-flying attacks on our coastal towns were also beginning.

So the cry went up for mobile equipments to take over until high-power static stations could be built to fill the gaps. The Type 57 (then known as the Type 14 Mk II) was produced, and the first one (No. 2 in the Naval production series) went to Beachy Head. A cosy little unit it was, with hand-turning, and it produced amazing results. More followed, at Truleigh Hill, The Verne, Ventnor—a dozen or so, and the centimetre chain really got going.

So did the pulse transformers! Remember them, the famous 4815's? Frantic screams for spares brought in the odd one or two, but stations were going up at such a rate that spares were only obtained by delaying installation elsewhere. Other flaps also required NT 277 equipment, and the pulse transformer became more precious than platinum. Wings came to the rescue in grand style, and kept their stations going by feverish repairs and improvisations.

SUSIE AND MARY

During 1943 the E-boat menace continued unabated. Hopton and Trimingham, among others, saved many a convoy from attack, the Type 54's providing astonishing ranges with the aid of our old friend Anoprop. Type 51's at Beachy, Truleigh, and Deerness sprang up, other gantry-borne aerial systems were installed, and even the CH towers began to carry additional loads in the shape of Type 55's.

Nor have we forgotten Susie and Mary, the famous CMH equipments which came to Hopton from 78 Wing. Many a WAAF operator shed a silent tear when these grand old ladies were pensioned off and moved into retirement at Carlisle. What if their spinning dipoles gave up and had to be replaced by static aerials? What if their slip-rings (if we may mention so intimate a part of their anatomy) leaked and wobbled precariously? Susie, Mary, and the other sisters in the family at Deerness and elsewhere did a wonderful job.

With centimetre technique came new problems. Waveguides were new to us; gas switches and magnetrons were a headache. Twenty hours' life on gas switches and 200 on "maggies", and both as scarce as leave at the time. But they were put right eventually, and after many meetings and arguments the RAF, the Boffins, and the manufacturers settled them. Waveguides also gave trouble until we found that odd spots of solder at the bends, water in the rotating joints, insulating tape in the SE2 unit were not conducive to good E-boat detection.

Those at The Verne may remember a visiting officer who found a supply of tape and wood shavings on top of the matching plunger, and Fairlight will not forget its Type 24, which came from Start Point with a much-charred rectangular piece of wood firmly jammed in the wave-guide by the manufacturer. The wood had been left in by—well, no names, no packdrill—when the station was first installed at Start, and it had worked for six months in that condition, improving all the time!

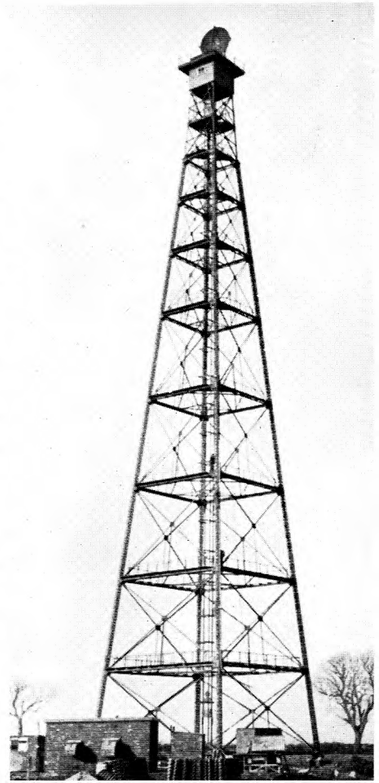
WINDOW

By the winter of 1943 the centimetre chain was well set up, with something like 40 high-power coast-watchers and a large number of Gibson boxes (Type 31's). The Navy was becoming interested in PPI's, and E-boat interceptions were being attempted with success. Many congratulatory signals were received from the Navy on the good work that was helping to keep the E-boats from the shipping lanes.

At the same time, another flap was in the offing. 60 Group was eventually brought into the picture and told that Bomber Command was to use "Window" against Germany. This meant that the Hun would retaliate, and we had, at the time, no equipment which would track aircraft through Window. So TRE set to work to produce an antidote that would be ready by the time the Hun started his Window raids on Britain. Three months was the allotted time.

This answer was the Type 21, and the anti-Window chain began installation in the autumn of 1943. Sandwich was on the air in January 1944, with Wartling a week later. Eighteen such stations were planned, with Types 13 and 14 working into a Final GCI. The first six went on the air at roughly weekly intervals, with installation parties raising clouds of dust and 60 Group and Wings flat out on the job.

The raids came; but they did not last for long. The Hun soon discovered that Window did not help him much, and that he was being tracked. The Type 14's cut through the



Window and the Type 13's gave good enough heights for interceptions to be carried out.

1944—D-day was approaching and activity becoming even more furious. E-boats were still at work and not one of the East and South Coast stations dared blink an eye. Liverpool was busy with "Western Approaches" and stations from Lands End to Northern Ireland swept the surface of the sea for the first pick-up of stray E-boats round the Scillies or low fliers snooping in the Irish Sea. Every ship of every convoy was watched and plotted with tireless accuracy.

Low-flying attacks had been defeated by the centimetre chain linked direct to the AA guns, but E-boats, U-boats, mines, and low-flying minelayers were still at work, and the enemy *must not* be allowed to get in close and see what we were doing. He was successfully kept out.

D-DAY AND DOODLEBUGS

Then came the great day, and once more the centimetre chain on the South Coast was called upon to plot and track without fail. Masses of shipping, clouds of aircraft going across to Normandy and back were faithfully recorded, and the fighter direction carried out by our big brothers, the 50-centimetre Type 16's, was of immense value. Even the successful pranging of the enemy's Radar on the opposite coast was largely due to the location of his rotating aerials by our own centimetre stations.

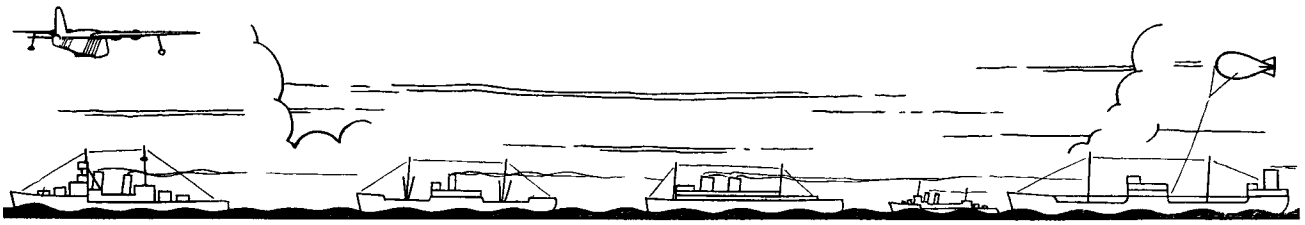
Then, one night, the expected happened. The first flying-bombs arrived. For a year this had been awaited, and a certain amount of equipment was available to counteract it. But streams of doodlebugs were roaring across the Channel and over Fairlight, Rye, Dover, Beachy Head on their way inland. Still more flap! New equipment was set up—Types 13, 14, 24, 51-57, MEW, and the American SCR 584 controlling the guns—and what happened to the flying bombs is now well known. Day by day a smaller number succeeded in reaching the London area.

THE SCHNORKEL WAR

Everything after this was in the nature of an anti-climax, but let it not be thought that our work had ended. Much of the Fairlight equipment was torn down and rushed to Greyfriars to meet the threat of heavy Diver attacks on the East Coast; the West Coast had to meet the "Schnorkel" attacks of U-boats. But as the doodlebugs were smashed and the E-boat and U-boat bases captured, Germany disintegrated and the chain began to sit back and take it easy.

What a war! What a scramble! Flap after flap to get stations up without equipment; to modify and modify again and again as minor or major improvements were thought of; to meet special operational requirements at short notice or no notice at all. Despite the rush, the discomfort; despite the tedious climbing of 200-foot towers on filthy nights because the "maggie" had gone for six and the lift jammed; despite it all you have enjoyed it, haven't you? Even the mech who climbed Trimingham tower to watch a Diver coming in, and got scared stiff because it passed just *below* him!

None of the stations that are not mentioned in this story has been forgotten. They have all done grand work, whether they have been watching the approaches to Scapa Flow, the wild seas off the Shetlands or the Minches, or whether they have been down South in the thick of the excitement. Perhaps we wouldn't like to have it all again—but, well, it was worth it!



SALUTE TO SWINGATE

Five years in the Front Line

"YES, SIR," said the Air Ministry warder, casting a gloomy eye on the bomb crater in the "R" compound which had been his private and unofficial vegetable patch, "it fair takes the nourishment out of you." A more concise statement of life at Swingate during hectic periods has never been uttered—and hectic periods have been many since 1940.

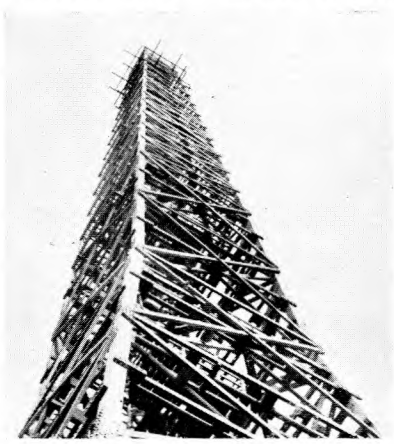
Swingate—for the benefit of the uninitiated—is the name given to the Radar station that had the distinction of being nearer to enemy territory than any other Home station, and also of being subjected more frequently and more unpleasantly to his attentions. The array of four steel and four wooden towers on the cliffs above Dover, clearly visible on most days from the French coast, seemed to constitute a continual challenge to the enemy.

NO KNOCKOUT

But never has so much spleen been vented on a Radar station with so little success. Not only did it fail to make either the CH or the CHL non-operational for any long period (although much ingenuity and many unofficial measures, including prayer, were frequently necessary to keep reporting going) but also it failed completely to affect the magnificent morale of all the station personnel.

This was always one of the most stimulating features of Swingate, and many visiting officers commented on it from time to time. The element of danger, as is well known, is easier to endure than boredom, and life at Swingate was never boring!

The CH was operational from the outbreak of war; and later the CHL was built right out on the cliff-edge—as near to the French coast as one could approach without getting one's feet wet. The conspicuous towers of the CH dwarfed the CHL into insignificance, and the latter did not receive the Hun's attention for quite a long time. The station had reported many enemy movements—Dunkirk, the raid on Paris, the attacks on Channel shipping and Dover harbour—before it received its baptism of fire in July 1940. This took place on a clear moonlight night, and HE bombs were dropped South of the "R" compound, with more HE and some incendiaries to the North East. There was neither damage nor casualties, but this was merely the prelude to more accurate and intensive attacks.



MEN ONLY

Later in July, during an attack on shipping in Dover Harbour, a section of the enemy force circled the station and dive-bombed it. This time three bombs dropped in the "R" compound and two more just outside. Some barrack accommodation was demolished, the standby transmitter was damaged, and there was a general shifting of walls, roofs, ceilings, and cobwebs. The "R" feeder lines showed their normal distaste for pressure waves, and their insulation went down in some sections.

Then, on the first of August, Swingate received some news which caused an indignation meeting. Instructions were received that all WAAF's were to be evacuated to a safer area—the main body of them went to Drone Hill. No greater insult could have been offered to our Radar Amazons, who departed speechless with rage and breathing mutiny. They did not return to the station until January 1943.

In actual fact this move was instigated by the Army, who were faced with the problem of removing all non-combatant personnel from the Dover Garrison area; the question of a "safer area" for WAAF was irrelevant. Every single body remaining might have to form part of that Garrison, although Swingate itself lay outside the defence perimeter, and the Garrison Commander was responsible for its protection as a "Vulnerable Point". The compounds were made into strong points, miles of barbed wire being laid; pillboxes were constructed, and even the "R" and "T" block

traverses were fitted with platforms where a last stand might have been made.

Many were the scares during this period, including fruitless searches for suspected parachutists and armoured-car operations around the compounds on pitch-dark nights. Happily for Swingate all these preparations proved unnecessary, and the station's ground defences were never in action.

AUGUST 1940

On 12th August Swingate shared battle honours with the other South Coast CH stations. A heavy attack was made, of which the "T" compound bore the brunt. There was wholesale destruction of feeders and their supports, and much damage was done by one bomb which landed on the blast wall of "T" block, shifting the ceiling and breaking glass panels, windows, and insulators. The station was off the air immediately, but the standby was run up and operation resumed some twenty minutes later.

A survey of the damage in "T" compound showed that local resources could effect a temporary repair to one feeder run, so every one set to work digging holes for telegraph posts and re-erecting the feeder. This work was finished some 97 minutes after the attack, and the main transmitter came triumphantly back on the air.

Life pursued its somewhat lively course through August and September, with every one having grandstand views of the great battles raging over the Channel and over Kent. Hawkinge and Manston were heavily attacked, and continued attacks on Dover Harbour made it untenable except as a base for small coastal craft.

NAVAL INTERCEPTION

At about this time close co-operation with the Naval types was started, and the CHL gave valuable aid to the Naval plot by tracking friendly and enemy coastal forces. Much to the Navy's delight, several successful interceptions by MTB's were brought off as a result of CHL plotting—the first occasion on which such information was successfully used and exploited by a Naval Command. Many acknowledgements on this aspect of the CHL's work were received from the Vice-Admiral, Dover.

This led, indirectly, to the installation of some centimetre equipment operated by the Army and the Navy, and offensive action was frequently taken either by coastal forces or heavy guns. This phase began to mean a lot to Swingate, for whenever the guns to the north opened up, the station was subjected to retaliatory measures from long-range guns on the other side. The first such incident took place in October 1940; no serious damage was done to any of the equipment, although some personnel were injured by splinters.

At about the same time another bombing attack scored a direct hit on the switch-room end of "R" block, wrecking it almost completely. The duty watch of eight airmen emerged from the remains of the block, covered from head to foot in lime and dust, but all intact. There was also much damage to feeders and calculator equipment, although the telephone system continued to work, but operations had to be transferred to the standby "R" hut. It was some months before "R" block was fully repaired.

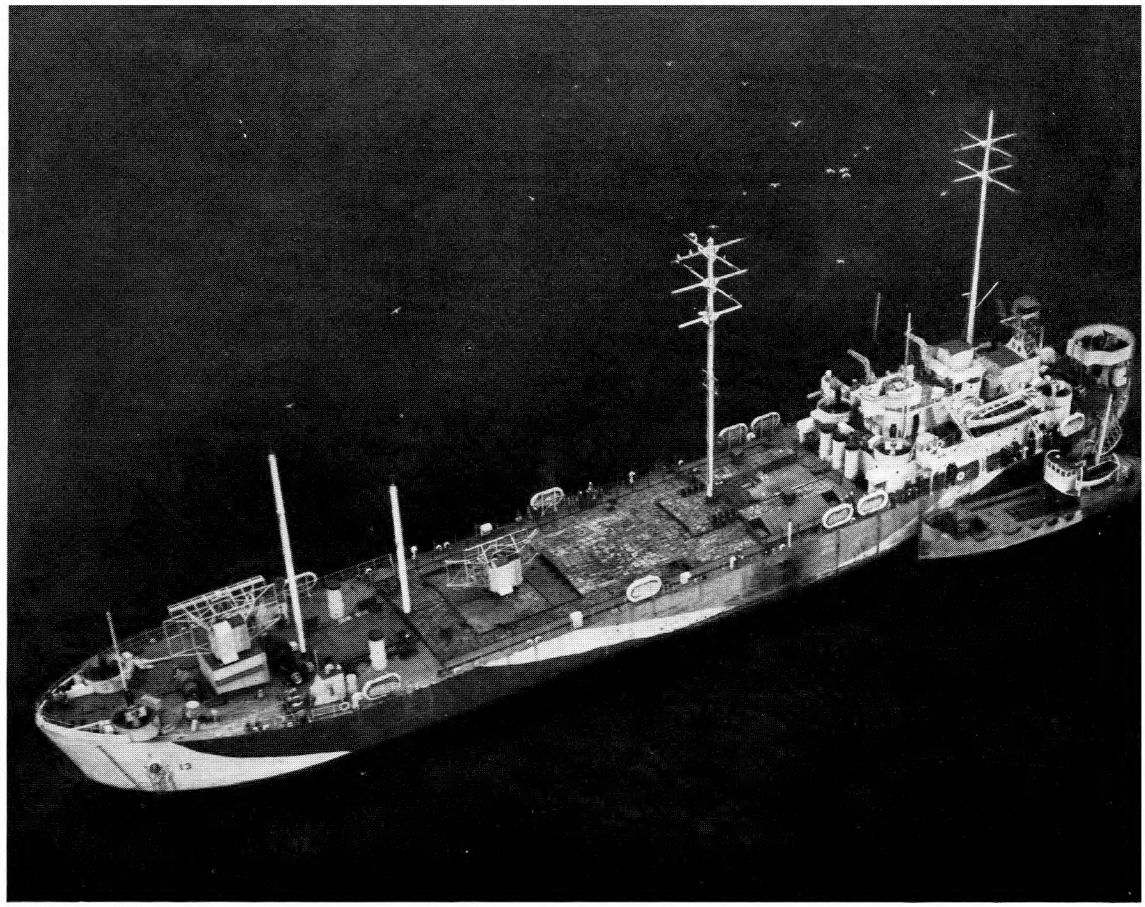
FATAL CASUALTIES

In November yet another heavy raid was made on the station, some 20 bombs being dropped. Technical equipment was undamaged this time, but the house used as the Sick Quarters and Officers' Mess became almost uninhabitable and was later abandoned. One bomb dropped into this house but failed to explode—a miraculous escape for the ten or so people in the building at the time.

During the next four years life at Swingate continued to be a succession of shelling and bombing incidents—sometimes a mixture of the two. The intensity of the shelling increased as the power of the Luftwaffe dwindled. There was a really serious incident in January 1944, involving fatal casualties to RAF and WAAF when a shelter at the "B" site suffered a direct hit. The CHL was damaged at the same time.

By now the surface-plotting capabilities of this channel were being used for controlling Air-Sea Rescue operations, and an extension to the CHL "R" hut had been built for this purpose. Many lives were saved by the work of this channel, from which controllers handled aircraft and search boats. Unfortunately a shelling attack in February 1944 scored a direct hit on this Ops-Room, completely demolishing it, and the control was moved to Dover Castle.

The tempo speeded up in 1944, and the "chug chug" of the Diesel locomotive pulling our heavy guns along their special railway lines north of the station became a sound to listen for. This invariably



OCTOBER 1945

RADAR GOES TO SEA. A Fighter Direction Tender as it was on D-Day, crammed with Radar equipment of every kind.

meant that one of the famous "Channel Gun Duels" was about to begin, and that the next few hours would be noisy and the wearing of tin hats fashionable.

And so the war moved on, until the great prelude to D-day. The almost incredible night operations preceding the landings will never be forgotten by any one who witnessed them from Swingate; and the following morning the station staff were rewarded by a magnificent visual on a huge stream of shipping pouring down the Channel. Gun flashes from the opposite coast and the familiar waterspouts among the convoy suggested that the Hun also had a good visual.

ACK-ACK AND V1

But Swingate's trial of endurance was by no means over. The last two months before the enemy was "winkled out" from his gun positions at Gris Nez were the most hectic of all. There was some very heavy shelling both by day and by night, and this pandemonium was increased by the launching of the flying-bomb campaign. Now, blended with the sharp crack of exploding enemy shells and our own guns' reply, was the staccato bark of many AA batteries and the awe-inspiring roar of the flying bombs themselves.

An American battery right on the CHL's doorstep made a great reputation for itself by hitting several "doodlebugs" right on the nose as soon as they were within range—and this frequently in the heat of a nasty shelling attack.

As the enemy realized that the game was up, instead of giving in, he merely made tremendous efforts to use up all his remaining ammunition in the most useful way; and when the papers were describing the joyful reactions of the citizens of Dover to our victories across the Channel, the said citizens were in reality having their worst time of the war. The last week or so of shelling caused some terrible damage in the town and was one of the most trying periods for the indomitable staff of Swingate.

The road across the cliffs to the CHL was a most unhealthy spot. The local farmers' cartloads of dead sheep, carried away morning after morning, testified to this.

In spite of all these trials and tribulations, however, Swingate has emerged from the war scarred and cratered, but with an unrivalled tradition of resolution and efficiency under conditions of the utmost difficulty and danger. Life there now is just like anywhere else again, and the warder can survey his cabbage patch with hope and equanimity. No longer are his precious stores of nourishment "untimely ripped" from out his quivering cold-frame.

So, Swingate, and all that have passed through your compounds, we salute you. Yours is one name that will never be forgotten in the annals of Radar. If you felt, in the heat of battle, that no one realized what you were doing, you were wrong; but the tale could not be told at that time. Now it has been told, at least in part. Thank you, Swingate.

A Final Message

THIS BULLETIN has been all about 60 Group and its works. It must not be thought, however, that we are insensitive to or ungrateful for the incalculable part played by others in making possible our work, and even our very existence.

In particular the Group owes a debt of gratitude to the scientists of TRE. To their profound knowledge, inventive genius, and untiring labour 60 Group owes thanks for the equipment of its AME Stations. Mention must also be made of the important part played in 60 Group's effort by the officers and men from the Dominions. Canada, in particular, supplied Technical Officers and Radar Mechanics of the highest quality—many of them are still with us. Thanks are equally due to all those thousands of men and women of the factories, whether they worked in Managers' Offices, Drawing Offices, or on the production line, for all the skill and hard work which went into the manufacture of Radar equipment.

Winston Churchill once said, "Give us the tools and we will finish the job." If wehave successfully finished the job of playing our part in the achievement of final victory, we have been enabled to do so only because the scientific establishments and the factories gave us the tools with which to do the job, and 60 Group gratefully acknowledges the debt that it owes to them all.