

LIST OF PERMANENT STORES FOR WIRELESS TELEGRAPHY.

Pattern No.	Species of Stores.	Denomination.	Allowed to each Set.				Remarks.
			Service Mk. I.		"C" Tune Mk. II.		
			Ships.	Signal Stations Abroad.	Ships.	Signal Stations Abroad.	
1199	B. 9. Hydrometers - - (d)	No.	2	2	—	—	If supplied with electrolytic interrupters.
1070	B. 10. Pulleys - - - (d)	"	2	2	—	—	
	Drums, iron galvanised (d) 5 gallons.	"	—	—	13	13	
306	E. 5. Clocks, deck, with (d) second hand 8-inch face.	"	1	1	1	1	Pattern 305 will be issued in lieu until stock is exhausted.
1831	F. 1. Apparatus, wireless telegraph. Gear for:— Buzzer, terminal - (d)	"	3	3	3	3	
2288	Choking coil - - (d)	"	—	—	1	1	
1784	Coils, induction, 10-inch (d) sparking case.	"	2	2	1	1	One in addition when W.T. expert is borne.
2174	Condensers, telephone - (d)	"	1	1	1	1	
2254	" glass plate - (d)	"	—	—	2	2	
2282	" No. 1, Mark II. (d)	"	1	1	1	1	Pattern 2172 to be issued in lieu until stock is exhausted.
2274	" No. 2, Mark II. (d)	"	1	1	1	1	Pattern 2173 to be issued in lieu until stock is exhausted.

PERMANENT STORES--continued.

Pattern No.	Species of Stores.	Denomination.	Allowed to each Set.				Remarks.
			Service Mk. I.		"C" Tune Mk. II.		
			Ships.	Signal Stations Abroad.	Ships.	Signal Stations Abroad.	
2290	F. 1--cont. Condensers, No. 3 aerial (d)	No.	1	1	1	1	
2291	„ No. 4 - - (d)	„	1	1	1	1	
2249	Converter, rotary, Mark II.	„	—	—	1	1	
2250	Starter for rotary, Mark II.	„	—	—	1	1	
2251	Outfits for rotary, Mark II.	„	—	—	1	1	
2067	Detectors, magnetic, (d) double wound.	„	2	2	2	2	One in addition when W.T. expert is borne.
2279	Inductance, adjustable, (d) Mark II.	„	1	1	1	1	Pattern 2177 to be issued in lieu until stock is exhausted.
2284	Interrupter, electro- (d) lytic, Isenthal's.	„	1	1	—	—	For all ships and stations having 100 volts until present stock is exhausted.
2076	Jars, Leyden :— Trays for 6 jars - (d)	„	1	1	—	—	
2077	„ 15 „ (d)	„	1	1	—	—	
2065A	Keys, side lever, Mark II. (d)	„	1	1	—	—	Pattern 2065 or 1791 converted, to be issued in lieu until stock is exhausted. 1 in addition where W.T. expert is borne.
2311	Oscillator, secondary -	„	—	—	1	1	
2072	Resistance for spark coil (d)	„	2	2	—	—	Where required until stock is exhausted.
2252	Resistance, field regu- (d) lating.	„	—	—	1	1	
2299	Spark gap silencer - (d)	„	1	1	—	—	For all ships with 100 cycle rotaries.
1602	Telephone receivers - (d)	Prs.	2	2	2	2	
1602A	Head gear for - (d)	Sets	2	2	2	2	To be issued until worn out. No more to be repaired.
2335	Telephone receivers - (d)	Prs.	2	2	2	2	2 in addition where W.T. expert is borne.
2336	Head gear for - - (d)	Sets	2	2	2	2	
2181	Tuners for magnetic (d) detector.	No.	1	1	1	1	
2248	Transformer, 2-K.W. (d) Mark II.	„	—	—	1	1	
2178	Wave meters :— Box A. - - - (d)	No.	1	—	1	—	Flagships only, 1 in addition where W.T. expert is borne.
2179	„ B. - - - (d)	„	1	—	1	—	
2175	Condenser - - (d)	„	1	—	1	—	
2188	Inductances - - (d)	„	1	—	1	—	
2180	Thermo-galvanometer - (d)	„	1	—	1	—	
1056	Keys, single current P.O., (a) Pattern B.	„	3	3	4	3	
2340	Earthing clip for W.T. (d)	„	1	1	1	1	
4	Keys, magnetic - - (d)	„	—	—	1	1	

PERMANENT STORES—continued.

Pattern No.	Species of Stores.	Denomination.	Allowed to each Set.				Remarks.
			Service Mk. I.		"C" Tune Mk. II.		
			Ships.	Signal Stations Abroad.	Ships.	Signal Stations Abroad.	
5	F. 1—cont. Spark gap, "C" tune - (d)	No.	—	—	1	1	
2341	Ammeter hot wire, 6 to 60 ampères. (d)	"	—	—	1	1	
2342	Voltmeter hot wire, 50 to 80 volts. (d)	"	—	—	1	1	
2343	Frequency meter 50 to 70 volts. (d)	"	—	—	1	1	
2316	Rotary converter, 100 cycle, 100 volts. (b)	"	1	1	—	—	Vide Admiralty appropriation.
2317	Field regulating resistance for do. (d)	"	1	1	—	—	Do. do.
2318	Starter for do. - (d)	"	1	1	—	—	Do. do.
2320	Frequency meter for (d)	"	1	1	—	—	Do. do.
2321	Rotary converter, 100 cycle, 80 volts. (b)	"	1	1	—	—	Do. do.
2322	Field regulating resistance for do. (d)	"	1	1	—	—	Do. do.
2323	Starter for do. - (d)	"	1	1	—	—	Do. do.
2325	Frequency meter for do. (d)	"	1	1	—	—	Do. do.
2339	Adjustable inductance for primary. (d)	"	—	—	1	1	Do. do.
	F. 2.						
1223	Batteries, test, 1 cell - (d)	"	1	1	1	1	
1918	Pushes, pear-seaped - (d)	"	1	1	1	1	
	Additional stores to be supplied to shore stations:—						
	B. 11.						
666	Turncrews, handled, 6-inch. (d)	"	—	1	—	1	
468	Pliers, bright side cutting (d)	Prs.	—	2	—	2	
1055	Bits, soldering copper, beech handle. (d)	No.	—	1	—	1	
1095A	Hammers, chipping, steel not helved, 1-lb. (b)	"	—	1	—	1	
326	Files, smooth half round taper 4 ins. (d)	"	—	2	—	2	
	E. 4.						
452	Boxes, white deal, torpedo work. (d)	"	—	1	—	1	
	E. 12.						
1996	Mallets, heaving L.V., with handle. (d)	"	—	1	—	1	If demanded.
1024	Mallets, serving, L.V. with handle. (d)	"	—	1	—	1	Do.
1025	Mallets, serving, L.V. with handle. (d)	"	—	1	—	1	Do.
	F. 2.						
2147	Cells, transport, large - (d)	"	—	As required.	—	—	Pattern 1656 to be issued in lieu until stock is used up.

LIST OF CONSUMABLE STORES FOR WIRELESS TELEGRAPHY.

Pattern No.	Species of Stores.	Denomination.	Allowed to each Set.				Remarks.
			Service Mk. I.		"C" Tune Mk. II.		
			Ships.	Signal Stations Abroad.	Ships.	Signal Stations Abroad.	
—	D. 5. Lines, white, 20 fathoms, (x) 3 lbs. each.	No.	*	1	—	—	*To be obtained from Boatswain. See page 240 of Establishment.
8A	E. 2 Indiarubber, vulcanised (xx) sheet, 2 ft. by 2 ft. by $\frac{1}{4}$ in.	Sheets	1	1	1	1	
23	Tubes, glass, external (xx) diameter $\frac{5}{32}$ in., in- ternal diameter $\frac{5}{32}$ in., in 1-foot lengths.	No.	3	3	3	3	
2	E. 7. Acid, sulphuric, S.G. (x) 1.84.	Gal.	1	1	—	—	If supplied with elec- tolytic interrupter.
42A	Knottling - - - (x)	"	†	1	†	1	†To be obtained from the Carpenter. See page 246 of Establish- ment.
1314	Varnish, insulating - (xx)	"	1	1	—	—	
44	Oil, insulating, Wake- field's. Gallons. (xx)	"	—	—	80 40	80 40	First supply. Maintenance.
447	E. 8. Wax, paraffin - - (xx)	Lbs.	4	1½	4	½	
7	E. 11. Brushers, painters, tool, sash, No. 2. (x)	No.	1	1	1	1	
22	Skins, chamois leather (x)	"	2	2	2	2	
981	E. 12. Cloth, emery, flour - (x)	Sheet	‡	6	‡	6	‡To be obtained from the Gunner. See page 250, &c. of Estab- lishment.
982	" " " - (x)	"	‡	6	‡	6	
501	Spreaders, ash, 12 ft. by $3\frac{1}{2}$ ins., tapering to 3 ins. at the ends. (x)	No.	4	4	—	—	
1148	Dusters, feather - - (xx)	"	2	2	2	2	
—	Seccotine in tubes - (x)	"	1	1	—	—	
1798	F. 1. Back contact of ham- (xx) mer.	"	1	1	1	1	
1799	Screw, adjusting - (xx)	"	1	1	1	1	
1789	Contacts for keys, sig- (xx) nalling.	Pairs	1§	1	—	—	Pattern 1789a to be issued in lieu to ships having Pattern 2065 key until stock is ex- hausted. §Two pairs in addition where W.T. expert is borne.
1899	Hoods, ebonite, to cover (xx) long insulators.	No.	16	16	16	16	16 in addition where W.T. expert is borne.
1807	Insulators, ebonite, long (xx)	"	16	16	16	16	Do. do.
2253	Converter, rotary, Mark II. — Brushes, spare, for - (xx)	Set	—	—	1	1	
1600	Detectors, magnetic:— Springs for - - - (xx)	No.	1	1	1	1	
1601	Bands for - - - (xx)	"	2	2	2	2	

CONSUMABLE STORES—continued.

Pattern No.	Species of Stores.	Denomination.	Allowed to each Set.				Remarks.
			Service Mk. I.		"C" Tune Mk. II.		
			Ships.	Signal Stations Abroad.	Ships.	Signal Stations Abroad.	
2082	F. 1—cont. Felt, white, $\frac{1}{2}$ inch thick (xx)	Sheet	2	2	2	2	
1815	Foil, tin - - (xx)	Lbs.	6	6	6	6	
2285	Containers, glass for (xx) electric interrupters.	No.	1	1	—	—	If supplied with electrolytic interrupters.
2066	Jars, Leyden :— Complete, with fittings (xx)		30	30	—	—	30 in addition where W.T. expert is borne.
2066A	Without fittings - (xx)	"	6	6	—	—	
2081	Keys, side lever cord (xx) for.	Yards	10	10	—	—	
2286	Springs, spiral, for side (xx) lever key, Mark II.	No.	2	2	—	—	
2300	Spark plugs for spark (xx) gap, Pattern 2299.	"	4	4	—	—	If supplied with spark gap, Pattern 2299.
2301	Bushes, ebonite for - (xx)	"	2	2	—	—	Do. do.
2009	Telaupads - -	"	6	6	6	6	
726	Cable, electric :— Unarmoured - - (xx)	Yards	12	12	12	12	
611	" - - (xx)	"	200	200	200	200	300 yards in addition where W.T. expert is borne.
1871	Flexible - - (xx)	"	50	50	50	50	
1972	Wire, Copper :— Double cotton covered, (xx) 13 L.S.G.	Lbs.	3	3	3	3	
2007A	Aerial for W.T. appa- (xx) ratus 14 L.S.G.	Yards	800	800	1,200	1,200	500 yards only to "Sentinel" class. 1,000 yards in addition where W.T. expert is borne. Pattern 2007 to be issued in lieu until stock is exhausted.
2111	Bare, soft, 20 L.S.G., (xx) on 1-lb. reels.	Reels	2	2	2	2	
2312	Oscillator, secondary, (xx) ebonite rods for.	No.	—	—	2	2	
2313	Insulators, ebonite - (xx)	"	—	—	12	12	
2319	Brushes, spare, for 100- (xx) volt rotary con- verter, Pattern 2316	Sets	1	1	—	—	If supplied with 100-volt rotary.
2324	Do., for 80-volt rotary (xx) converter Pattern 2321.	"	1	1	—	—	Do., 80-volt rotary.
2272	Wire for winding oscil- (xx) lators.	Yards	—	—	35	35	
—	F. 2. Cells, delafon - - (xx)	No.	5	5	5	5	Pattern 1655 or 2146 to be issued in lieu until stock is exhausted.
2292	Compound, Chatterton's (xx)	Lbs.	1	1	1	1	
1731	Ebonite :— Sheet, unpolished, (xx) 1 in. thick.	Sq. ft.	2	2	2	2	2 square feet in addition where W.T. expert is borne.
	Sheet, unpolished, (xx) 1 ft. 6 ins. by 1 ft. 6 ins. by $\frac{1}{2}$ in.	Sheet	2	2	2	2	
1737	Rod, 2 ins. diameter, (xx) 24 ins. long.	No.	2	2	2	2	Two in addition where W.T. expert is borne.
2166	Wire, copper, silk- (xx) covered, 38 L.S.G.	Lbs.	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	

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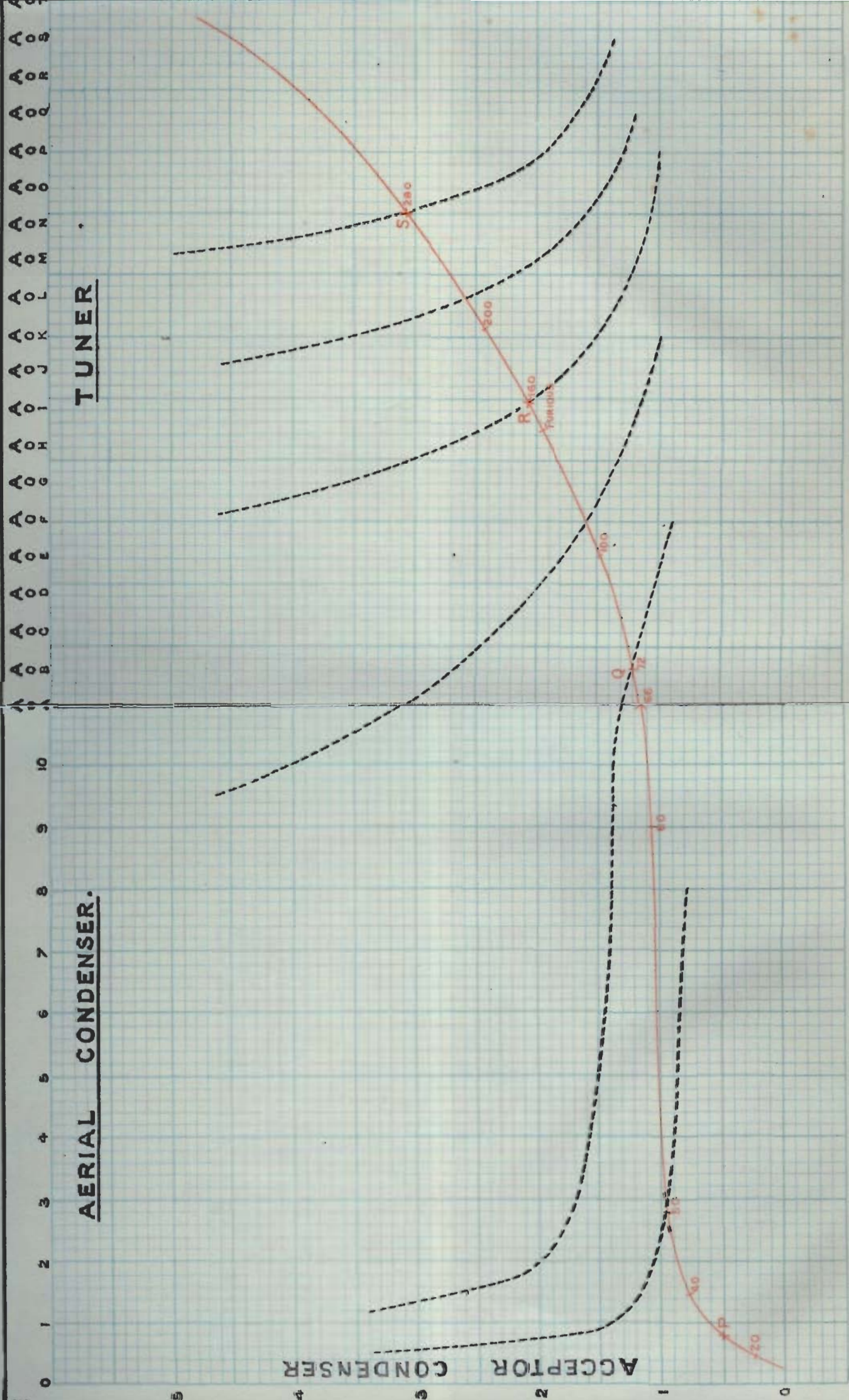
TUNER

AERIAL CONDENSER.

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ACCEPTOR CONDENSER

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CURVE FOR WAVES UP TO L.S. = 400

Pattern No.	Species of Stores.	Denomination.	Allowed to each Set.				Remarks.
			Service Mk. I.		"C" Tune Mk. II.		
			Ships.	Signal Stations Abroad.	Ships.	Signal Stations Abroad.	
1812	F. 2—cont. Wire, platinum, $\frac{1}{4}$ in. (x) diameter in $\frac{1}{4}$ -oz. pieces.	Oz.	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	
	Additional stores to be supplied to shore stations:—						
	A. 2. Sawdust, pine - - (xx)	Lbs.	—	$\frac{1}{2}$	—	$\frac{1}{2}$	
	B. 7. Solder, tinman's - - (xx)	„	—	1	—	1	
	K. Oil, olive - - (x)	Pts.	—	1	—	1	
81	D. 3. Fearnought, white - (x)	Yds.	—	$\frac{1}{4}$	—	$\frac{1}{4}$	
256	E. 2. Tape, I.R., $\frac{1}{2}$ in. in 2-oz. cylinders.	—	—	1	—	1	
248	Solution, I.R., in 3-oz. (x) collapsible tubes.	Tubes	—	2	—	2	
154	E. 6. Copper sulphate - - (xx)	Lbs.	—	$\frac{1}{2}$	—	$\frac{1}{2}$	
48	E. 10. Tape, white, $\frac{1}{2}$ in. wide (x)	Yds.	—	60	—	60	
317A	E. 12. Helves, ash, hammer, (xx) riveting.	No.	—	1	—	1	
249	Solution, soldering, (xx) chloride of zinc (in 8-oz. bottles).	Bot.	—	2	—	2	
1803	F. 1. Wire, copper, cotton (x) covered, 18 L.S.G.	Lbs.	—	$\frac{1}{2}$	—	$\frac{1}{2}$	

CURVES OF TUNER AND ACCEPTOR CONDENSER.

Adjustments for Waves of Various Lengths.

The curves shown on Plates were devised by Lieut. B. M. Money, R.N. For quickly getting the tuner and acceptor into adjustment, they should prove very useful, and it is recommended that ships should obtain their own curves from practical trials, and post them up in the silent cabinet for the benefit of the operators.

Lieut. Money's Curves.

Construction of the Curves.

Main Curves.—The main curve is based on the fact that there must always be a strict relation between tuner and acceptor values for every wave length. It is plotted by taking all known acceptor condenser adjustments as ordinates and the corresponding tuner values as abscissa, and so obtaining points through which the curve is drawn.

N.B.—The two main curves shown on Plates XI & XII do not form one continuous curve, because the lower switch of tuner does not integrate uniformly between the stops of the upper switch. The lower value curve (below L. 5,400) includes all waves for which the lower switch can, by itself, tune the aerial. (The corresponding error of the centre switch has been neglected.)

Lieut. Money's
Curves.

Dotted Curves.—These give a series of adjustments with which, for a given wave, the whole circuit (aerial + tuner + acceptor condenser + M.D.) is in resonance, but the two halves of it, *i.e.*—

- (1) Aerial + tuner,
- (2) Acceptor condenser + magnetic detector,

are not independently in resonance; in other words the circuit is not tuned on the acceptor principle. The manner of practically using the dotted curves is explained on Plate .

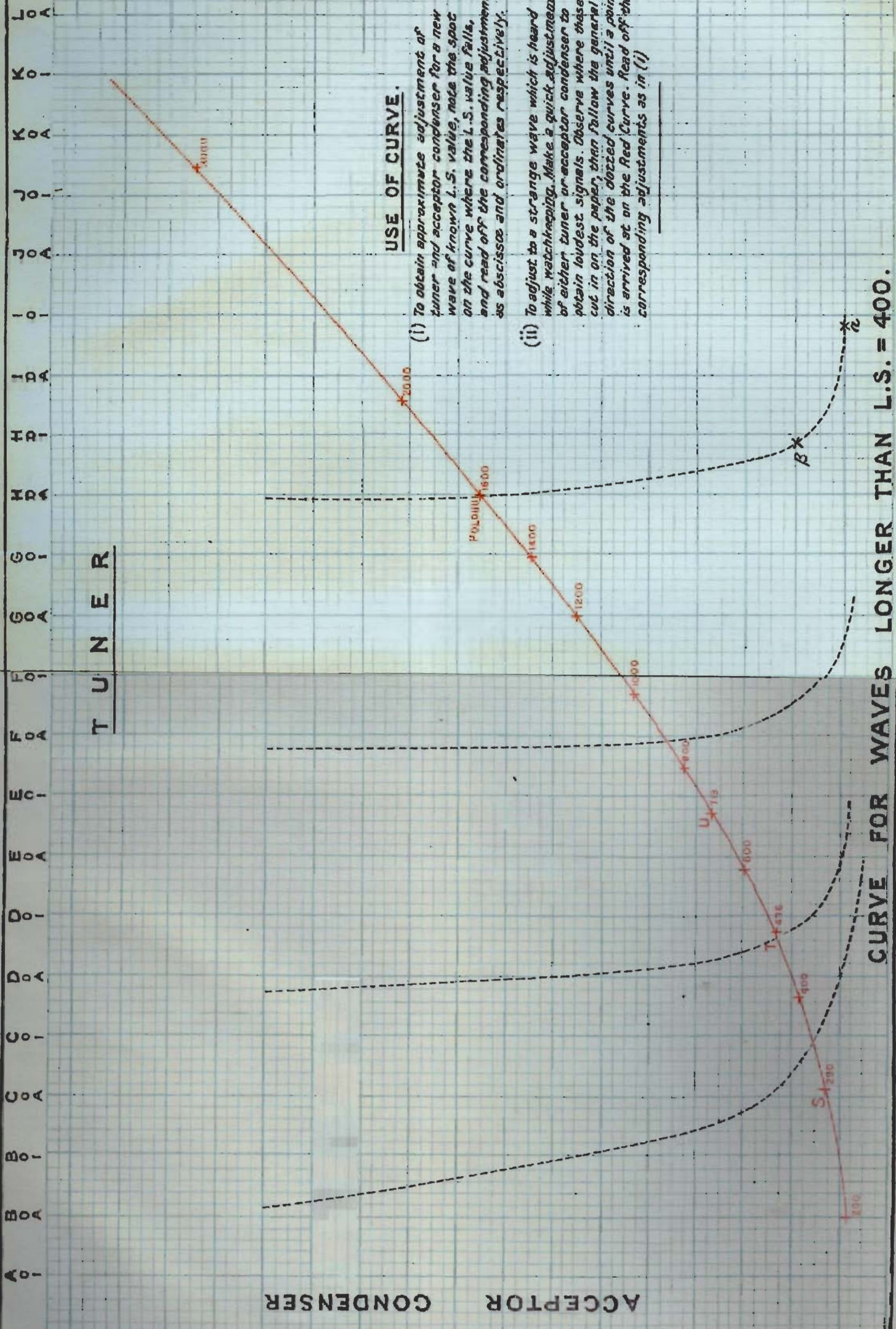
Dotted Curves.—Each dotted curve is obtained by practically obtaining a few points through which the curve must pass, and filling in the curve in the following manner.

Take Poldhu as an example. Place the acceptor condenser at, say, two jars; adjust tuner for loudest signals; this gives point a on dotted curve. (See Plate XII.)

Now put acceptor to, say, four jars and adjust tuner for loudest signals; this give point β and so on for, say, 10, 20, and 30 jars. The curve can then be filled in. Proceed in the same manner for the other dotted curves by getting a ship to send the Service wave lengths, *i.e.*, take different values of the acceptor condenser and obtain the loudest signals by adjusting the tuner for each of them or *vice versa*.

REPORT ON LONG DISTANCE EXPERIMENTS BETWEEN "VERNON" AND "FURIOUS,"
dated 20th December 1906.

- Day signalling. By day signals were received up to a distance of 600 miles clear of land, pre-arranged signals were distinguishable up to 1,000 miles.
- Land effect by day. The effect of land on day signalling can only be stated as regards certain special cases, as the nature of the soil and formation of the land, its height and proximity to the transmitting and receiving stations, all influence the strength of signals. Messages were exchanged between Queestown and Portsmouth (300 miles) by day, 100 miles of land intervening. Inside Arosa Bay signals could not be exchanged.
- Night signalling. At night signals at 1,200 miles clear of land were strong and the limit of distance was not reached. Under the lee of Madeira, signals could not be received, in fact Poldhu was too weak to be read by "Furious."
- Land effect at night. Alongside the mole at Gibraltar, distance 900 miles with 540 miles of land intervening, signals were loud and easily readable by "Vernon." Inside Arosa Bay, similar results were obtained by night, that is, signals were easily exchanged between "Vernon" and "Furious."
- Long and short waves. Of the wave lengths used, the best for day use was found to be 2,500 feet, about R tune. A very long wave of 7,000 feet was found not to carry well. At night the shorter waves were also much the strongest, although weak signals on the 7,000 feet wave were received as far as Gibraltar from "Vernon."
- Musical note. The value of the musical note for reading through atmospherics and interference has been fully demonstrated throughout the trials. "Furious" messages were read at night from Gibraltar when "Culver" (6 miles distant from "Vernon") interfered on the same wave length. All reports comment on the extreme value of the musical note. It appears even better results will be obtained with a rather higher note than that used during those trials. A higher note will shortly be tried when the 400 cycle set now on order is delivered.
- Silent cabinet. The value of the silent cabinet cannot be over-estimated for telephone reception. In daytime the ship noises render even strong signals very difficult to read outside the cabinet, whereas these noises are entirely eliminated in the latest design. It is therefore strongly recommended that ships be fitted with one of this design as soon as practicable.
- Receiving instrument. It was found that tuned shunts had the property of increasing the strength of signals in addition to fulfilling their object in cutting out interference. Improvement in the driving mechanism to ensure noiseless running seems very desirable.



TUNER

ACCEPTOR CONDENSER

USE OF CURVE.

- (i) To obtain approximate adjustment of tuner and acceptor condenser for a new wave of known L.S. value, note the spot on the curve where the L.S. value falls, and read off the corresponding adjustments as abscissae and ordinates respectively.
- (ii) To adjust to a strange wave which is heard while watch-keeping. Make a quick adjustment of either tuner or acceptor condenser to obtain loudest signals. Observe where these cut in on the paper, then follow the general direction of the dotted curves until a point is arrived at on the Red Curve. Read off the corresponding adjustments as in (i)

CURVE FOR WAVES LONGER THAN L.S. = 400.

The light topgallant masts and W.T. yards fitted in "Furious" have proved themselves sufficiently strong to carry the large type of aerial wire.

Aerial wire, topgallant masts and W.T. yards.

Heavy weather was encountered on several occasions during the cruise, especially on one occasion off the south coast of Ireland, when the ship rolled and pitched considerably. Throughout the experiments, the fittings stood admirably.

The secret of preventing undue strains coming on the aerial wire, W.T. yards, and topgallant masts appears to be that of not securing the outhauls for the ends of the aerial, but allowing them to give by attaching weights or springs to the ends. This allows the aerial to automatically render when a severe strain comes on and to take up when the strain is released. The height of the "Furious" masts are 180 feet from truck to water-line; this height was absolutely necessary to obtain the above results.

Experiments were carried out to test the necessity and efficiency of insulated stays and rigging. The results showed the necessity of insulating the rigging as laid down in C.N. 2/6325/10700, 15th October 1906. With these precautions no appreciable shocks can be obtained.

Insulation of stays.

If a Jacob's ladder is fitted to the topgallant mast it should be of hemp.

In order to relieve the strain on the topgallant mast head due to the lifts of the yard, which now support the whole weight and strain of the aerial, it appears desirable, in addition, to support the bunt of the yard by shackling it to a suitable band on the mast.

Suggested improvements for rig.

Lignum vitae deadeyes and hemp lanyards appear unsuitable for positions close to the tops of the funnels, it is suggested that some other form of insulator, not damaged by heat, be tried for these positions.

From the results of these trials it is anticipated that in the final design of the Service Installation Mark II. a reliable range by day of 500 miles and 1,200 by night will be obtained clear of land in ships with masts 180 feet high on the three Service wave lengths R, S, and T; with the commercial wave length Q and the longest wave length U the ranges will probably be slightly shorter.

Future designs.