

P.188

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# WORKING INSTRUCTIONS

WIRELESS SET No. 22

## HANDCART

**NOT TO BE PUBLISHED**

The information given in this document is not to be communicated, either directly or indirectly to the Press or to any person not holding an official position in His Majesty's Service.

ZA 20137



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HANDCART READY FOR TRANSPORTATION. FIG. 1.

## WIRELESS SET NO. 22 HANDCART

### I. General

(1) Handcarts No. 1 are provided for beach landing and general service purposes. The equipment is packed in a waterproof bag and is considered immersion proof for the period of a normal beach landing.

(2) The set may be operated on RT under water. The load-carrying section of the handcart may be removed from the chassis if required, after removal of the four locking pins normally inserted in the uprights at the corners of this section. A waterproof cover may be fitted over the whole equipment.

(3) The handcart comprises:—

- (a) The chassis.
- (b) Load carrying section.
- (c) Waterproof cover.
- (d) Pump.
- (e) Repair outfit.

(4) The items packed on the handcart are:—

- (a) Wireless Set No. 22 with its power supply unit, carrier and securing strap.
- (b) Two Satchels Signal No. 1 holding Microphone and Receiver Headgear Assembly No. 1 and Key and Plug Assemblies No. 2B.
- (c) One Battery Secondary portable 12 volts 75 Ah.
- (d) One Battery Secondary portable 12 volts 22 Ah carried as a spare battery.
- (e) Cases Spare Valve No. 4C.
- (f) Antennae Rods F Cases carrying No. 1 holding F section Nos. 1, 2, 3, Aerial Bases No. 11 and spike, alternatively the Aerial Bases No. 11 and spike may be carried in one of the signal satchels.
- (g) Bags Aerial Gear No. 2 Mk. II holding Antennae Rods D Sections and accessory equipment associated with the remainder of Aerial Vertical 34 ft.

(5) The approximate weights and overall dimensions of the equipment are tabulated on next page.

**Table I—Weights and Dimensions**

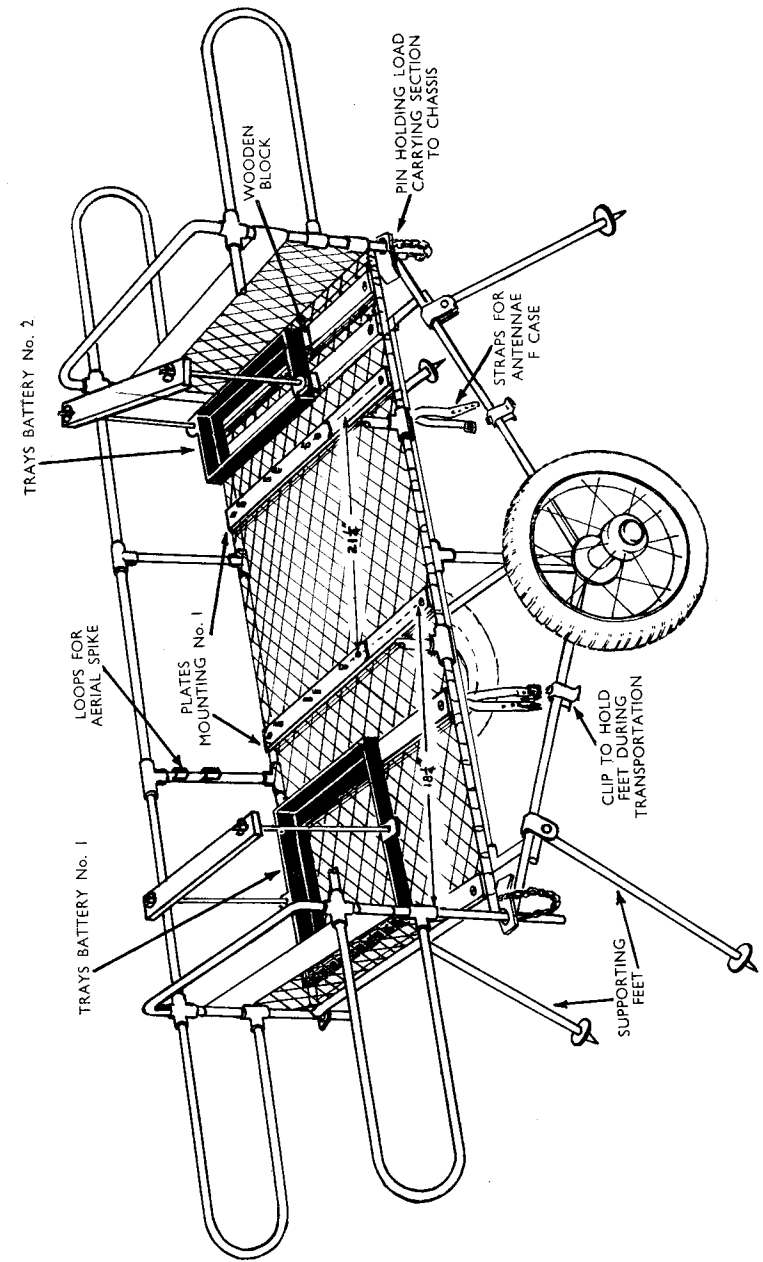
<i>Equipment</i>	<i>Length (in.)</i>	<i>Width (in.)</i>	<i>Height (in.)</i>	<i>Weight (lbs.)</i>
Handcart No. 1 .. .. .	80	27½	35	70
Wireless Set No. 22 .. .. .	17½	13½	8½	36½
Power Supply Unit .. .. .	7	13½	8½	20¾
Battery 12 v. 75 Ah. .. .. .	16¾	8	11	80
Battery 12 v. 22 Ah. .. .. .	12½	6¼	10	35
Cases Spare Valve No. 4C .. .. .	6	6	7	5½
Bags, Aerial Gear No. 2 Mk. II and contents .. .. .	42	6½	6½	22½
Antennae Rods F Cases carrying No. 1 and contents .. .. .	51	2	2	3¼
One Satchels Signal No. 1 and contents .. .. .	3	11	10	6½
Plates Mounting No. 1 .. .. .				16¼
Trays Battery No. 1 .. .. .				5½
Trays Battery No. 2 .. .. .				6

**2. Preparing Handcart for Fitting Equipment (Fig. 2)**

(1) In the following description the loops attached to the upright bar carrying the aerial spike are considered to be at the rear side of the handcart.

(2) In order to fix to the handcart the battery trays and carrier for the No. 22 Set, two pairs of metal strips are provided with each item. One strip is fitted immediately below the wire meshing of the handcart and above the horizontal metal bars to which the meshing is attached. Difficulty may be experienced in fitting this strip and the meshing may have to be levered away from the bars. The second strip which has countersunk bolt holes at the ends, is placed immediately above the meshing with countersunk holes uppermost and fixed to the first strip with nuts and bolts provided. It may be necessary to bend the wire meshing in order to pass the bolts into the strips.

(3) The holes drilled in the rectangular portion of the Trays Battery No. 1 to bolt it to the fixing strips are located nearer to one end of the tray than the other. The end nearer to the holes is the left hand end of the tray. The strips are to be fixed in position so that the holes through which the tray is bolted lie towards the rear of the handcart. Bolt the rectangular tray to the upper fixing strips so that the heads of the countersunk bolts are on the tray,



**HANDCART AFTER FITTING W.S. No. 22 SPECIAL FITTINGS. FIG. 2.**

care being taken to ensure that correct holes in the strips are used so that the conditions mentioned earlier in this paragraph are fulfilled and that the countersunk holes in the fixing strips are uppermost.

To fit the Trays Battery No. 1 on to the handcart, fix the lower left hand fixing strip as near as possible to the left hand end of the cart with the holes for the rectangular tray towards the rear. Position the second lower fixing strip with the aid of the rectangular tray so that the holes in each pair of fixing strips are collinear and bolt the strips through the holes in the ends of the strips.

(4) The wooden blocks provided with Trays Battery No. 2 serve to raise the battery so that the coupling plug is clear of the cross member of the handcart. Place the blocks one on each of the upper fixing strips so that the holes are collinear with those in the strips and the countersunk holes in the wood are uppermost, and the edge of the wood is flush with the edge of the tray. Place the rectangular tray in position on these blocks and bolt to the upper fixing strips.

Fix the right hand lower fixing strip for the Trays Battery No. 2 as near as possible to the right hand end of the handcart and position the lower left hand strip with the aid of the rectangular tray. Fix the tray in position in a manner similar to that described in para. (3) above.

(5) (a) The Plates Mounting No. 1 comprises a set of metal strips which provides the means of securing the set carrier to the handcart.

Each set includes a long metal strip having two threaded studs fixed to it which is placed below the wire meshing, a second similar strip but without studs and a third short strip carrying four threaded studs. The two longer strips are the fixing strips.

(b) Assemble the wireless set carrier to the plates mounting No. 1 as follows:—

- (i) Place the short metal strips  $21\frac{1}{4}$  in. apart.
- (ii) Place the Straps Securing No. 10 across the centre of the two strips, care being taken to see that the securing strap is the correct way round, i.e., with the spring to the right.
- (iii) Take the set carrier holding it with the rubber pads to the left and thread the loop at the end of the braided lead connected to the corner of the carrier over the front stud of the right hand strip.
- (iv) Place the carrier on the strips so that the studs pass through the holes in the mounting and securing

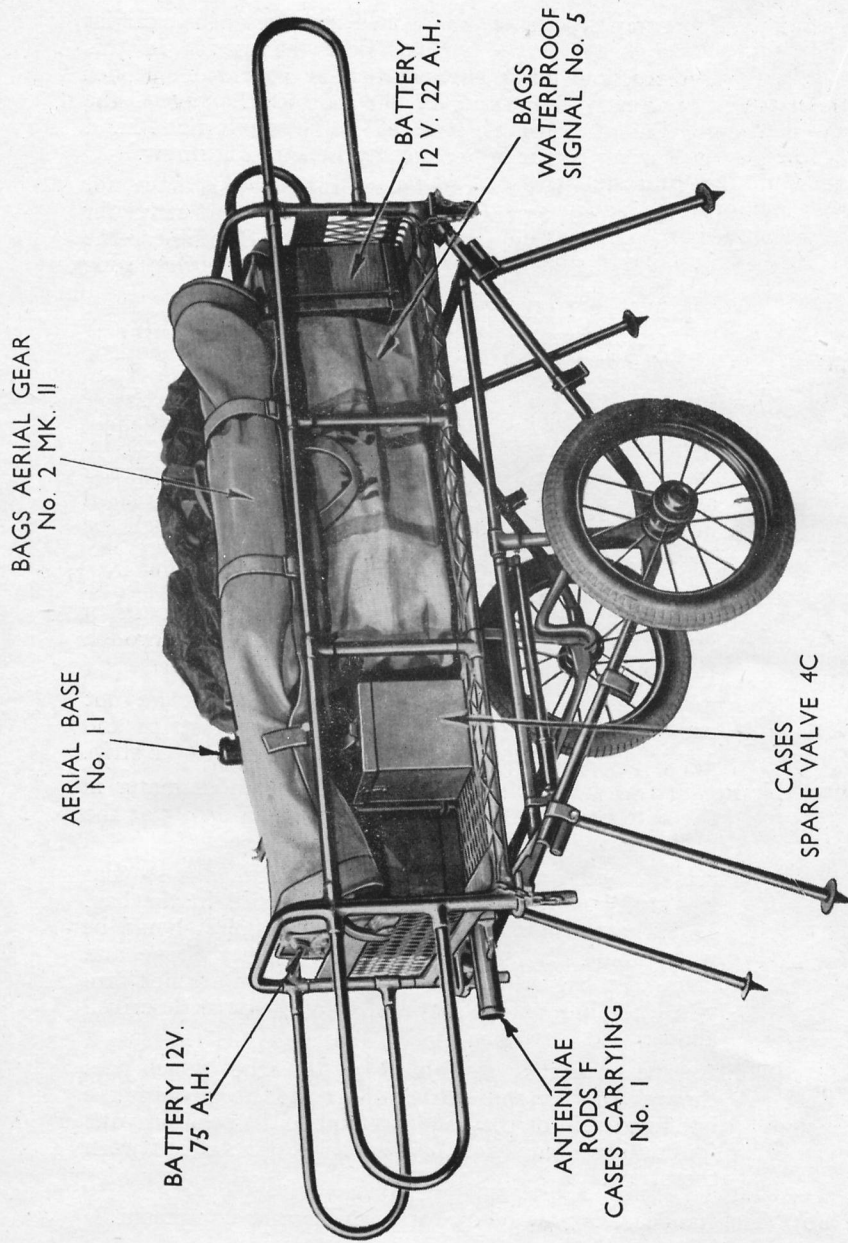
strap lies below the channel members of the carrier and above the strips. Bolt the carrier in this position using the eight nuts provided. If not already connected, fit the loop at the end of the Connector Single No. 10D to the front right hand corner of the set carrier by means of a screw.

- (v) Apply Bostic Compound C (if leather washers are not provided) to the underneath of the short strips for waterproofing, in particular apply Bostic near the holes through which the studs from the lower fixing strip will pass.

NOTE: SPECIAL CARE MUST BE TAKEN IN WATERPROOFING THESE HOLES.

- (c) Fit one pair of fixing strips to the handcart, with the studs towards the back of the handcart pointing upwards and with the centre of the strips at a distance of  $18\frac{1}{4}$  in. from the left hand end of the handcart. Thus the carrier assembly will lie just clear of the battery when it is placed in its tray No. 1. Bolt the strips together through the holes in the front end only (see Fig. 2).
- (d) Fix the second pair of fixing strips at a distance of  $21\frac{1}{4}$  in. to the right of the first pair so that these two pairs of strips will support the carrier assembly. Bolt through the holes in the front end only.
- (e) Apply Bostic Compound C (if leather washers are not provided) to the top surface of the upper strips and apply generously round the studs from the lower strip.
- (f) Punch four holes of a quarter-of-an-inch in diameter in the bottom of the Bags Waterproof Signal No. 5 at the positions marked by black circles.
- (g) Place the waterproof bag over the fixing strips so that the studs pass through the holes punched in the bag. If leather washers are provided, these holes should be waterproofed by placing a leather washer above and below the bag on each stud. If washers are not provided, the holes are waterproofed by Bostic as described above.
- (h) Place the set carrier assembly over the studs which pass through the bag so that the rubber pads are towards the left hand side of this handcart and fix in position with four nuts, rubbing back the Bostic as it oozes out between the strips.

- (6) The handcart is now ready for installing the equipment.



HANDCART FITTED WITH W.S. No. 22 EQUIPMENT. FIG. 3.

### 3. Installing the Equipment

(1) Well grease the Batteries Secondary Portable by smearing the battery terminals and vent plugs with Army Grease Type A, also smear around the junction between the lid and the box and connector fittings. If the station is going to be operated during submersion, the coupling plug of the battery to be used must be thoroughly greased. Secure and grease the blanking caps on the coupling plugs of batteries not in use. The aerial base should also be greased when it is carried in the loops at the back of the handcart.

(2) Fix the Battery Secondary Portable 12 volts 75 Ah. in the Trays Battery No. 1 with the coupling plug to the left. Fix in position with the metal bar and the long wing screws provided.

(3) Fix the Battery Secondary Portable 12 volts 22 Ah. Mk. I in the Trays Battery No. 2 in a similar manner, with the coupling plug to the right.

(4) Place the Wireless Set No. 22 in position on the right hand side of the carrier and power supply unit on the left.

(5) Strap the wireless set and power supply unit in position with the webbing strap.

(6) Place the two Satchels Signal No. 1 on top of the Wireless Set No. 22. If required, the signal satchels may be secured with the man-pack harness on the wireless set.

(7) Gather together the top of the Bags Waterproof Signals No. 5 and tie tightly with the tapes provided ensuring the bag is waterproofed at this point. Then fit the cap.

(8) Place the Cases Spare Valve No. 4C in front of the Battery 12 volts 22 Ah. as shown in Fig. 3.

(9) The Antennae Rods D and Accessory Aerial Equipment is carried in Bags Aerial Gear No. 2, Mk. II. Place this bag on top of the equipment as shown in Fig. 3.

(10) If the Aerial Base No. 11 and spike are to be carried on the Antennae Rods F Cases Carrying No. 1, the spike is inserted in the end of the case, and the aerial base secured to the spike by the wing nut. The cap normally closing the case is not used.

Strap the Antennae Rods F Cases Carrying No. 1 underneath the load carrying section of the handcart in the straps provided.

(11) Finally cover the hand cart with the waterproof cover provided and strap as shown in Fig. 1.



#### 4. Operating the Station on the Ground

(1) The station may be removed from the handcart and operated on the ground in the usual manner or alternatively, may be operated on the handcart.

(2) When the station is operated on the ground, use Connector Single No. 10F between the aerial and the AERIAL socket on the set and use Connector Single No. 33 between the EARTH terminal on the set and the counterpoise leads. The battery in use is connected to the power supply unit by Connector Twin No. 78. The 75 Ah. battery is normally used but as an alternative it may be replaced by the 22 Ah. battery.

#### 5. Operating the Station on the Handcart (Fig. 4)

(1) When operating the station on the handcart a 12 ft. aerial is normally used. The aerial base No. 11 is fixed on to its spike by the wing nut, and the spike is slipped into the loops at the back of the handcart. Assemble Antennae Rods F Sections Nos. 1, 2, 3 to form a 12 ft. aerial and mount the aerial in the base No. 11.

(2) Connect the aerial to the AERIAL socket on the set by Connector Single No. 10F. Connect the earth lead, Connector Single No. 10D, which is attached to the set carrier to the EARTH terminal on the set. The battery in use is connected to the power supply unit by Connector Twin No. 78. The 75 Ah. battery is normally used, but as an alternative it may be replaced by the 22 Ah. battery.

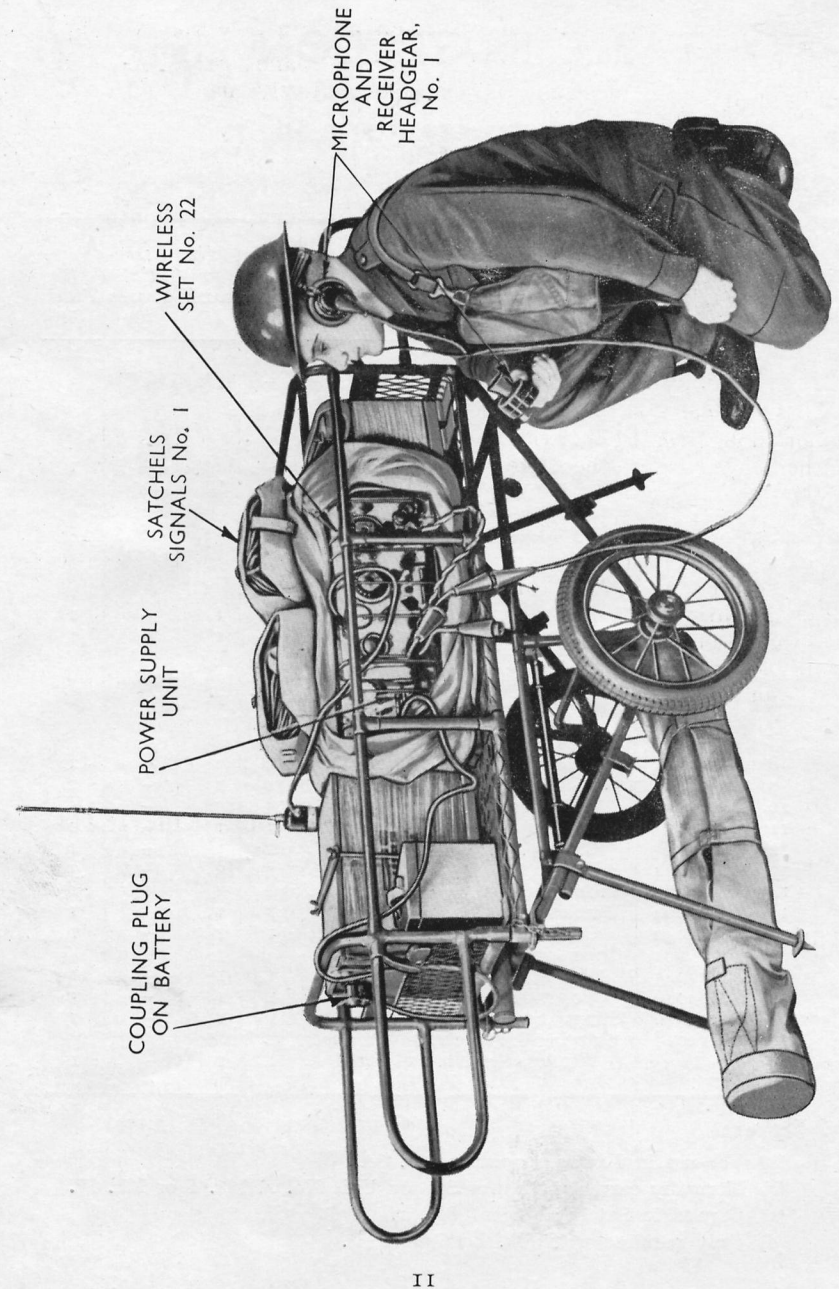
(3) The set may now be operated in the normal manner.

#### 6. Working the Station during the Beach Landing Operations

(1) The station may be operated during a landing when the handcart is submerged. If it is required to operate the equipment under these conditions, the station is set up as in Section 5 above. The aerial lead (Connector Single No. 10F) to the microphone and receiver headgear assembly and the L.T. supply lead (Connector Twin No. 78) should be brought out through the top of the Bags Waterproof Signal No. 5.

(2) The ON-OFF switch on the power supply unit is operated by locating it from the outside of the waterproof bag. Since the microphone pressel switch serves as a send-receive switch, the set is operated in the usual manner.

(3) If it is intended to operate a set under water, special care must be taken in waterproofing by greasing the coupling plug at the battery end of the Connector Twin No. 78.



STATION OPERATED ON HANDCART. FIG. 4.



# TABLE II.—STATION LIST

## WIRELESS STATIONS No. 22

### ZA.22000/I. Kit I (Set Kit)

Item No. (1)	Cat. No. (2)	Designation (3)	"X" Items (4)	Min. for work (5)	Essential spares (6)	Total (7)
<i>Section W<sub>2</sub></i>						
1	WB.1490	Bulbs, 12 volt, F.	—	1(a)	2(b)	3
<i>Section X</i>						
2	XA.0926	Fuze wire, copper, 34 SWG. (c) 1-oz. reels	—	1	—	1
<i>Section Y</i>						
3	YA.2481	Straps, carrying, G. (d)	1	1	—	1
<i>Section Z<sub>1</sub></i>						
Covers protecting—						
4	ZA.2950	No. 1	1	1	—	1
5	ZA.2951	No. 2	1	1	—	1
Power supply Unit No. 4—						
6	ZA.14047	Mk. I	—	—	—	—
7	ZA.10478	Mk. I* or	1	1	—	1
Valves, W.T. type—						
8	ZA.7022	A.R.8	2	2	—	2
9	ZA.3056	A.R.D.D.5	1	1	—	1
10	ZA.7023	A.R.P.12	5	5	—	5
11	ZA.3493	A.R.P.34	1	1	—	1
12	ZA/CV.65	C.V.65	1	1	—	1
13	ZA.11244	V.T.52	3	3	—	3
14	ZA.3231	Vibrators, No. 5	1	1	1(b)	2
15	ZA.11694	Wireless Set No. 22	1	1	—	1
16	ZA.14042	Carriers, No. 1	1	1	—	1
Covers, waterproof—						
17	ZA.14045	No. 1	1	1	—	1
18	ZA.14046	No. 2	1	1	—	1
19	ZA.15449	Straps, Securing No. 10	1	1	—	1
20	ZA.14048	Working Instruction— Wireless Set No. 22, Part I	1	1	—	1

#### Notes:

- (a) For use in Lamps, Operator, No. 6A.
- (b) Normally carried in Power Supply Unit No. 4, Mk. I or Mk. I\*.
- (c) Carried in Satchels, Signal, No. 1.
- (d) Only required with Mk. I Power Unit.

## WIRELESS STATIONS No. 22

### ZA.22000/II. Kit II (Handcart)

Item No. (1)	Cat. No. (2)	Designation (3)	"X" Items (4)	Min. for work (5)	Essential spares (6)	Total (7)
<i>Section W<sub>2</sub></i>						
1	WB.1042	Wire, electric—	—	—	—	—
2	WB.1057	P.11, Mk. I yds. .. .. R.4, Mk. I yds. .. ..	—	—	12 41	12 41
<i>Section Z<sub>1</sub></i>						
3	ZA.19631	Bags, waterproof, signal No. 5	1	1	—	1
4	ZA.14041	Cases, spare valve, No. 4C.	—	1	—	1
Connectors—						
5	ZA.10924	Single, No. 10D	1	1	—	1
6	ZA.12577	No. 10F	1	1	—	1
7	ZA.10320	No. 33(a)(b)	1	1	—	1
8	ZA.11018	Twin, No. 78(b)	1	1	—	1
9	ZA.4444	Insulators, W.T. chain, small 3-link	—	—	4	4
Key and Plug Assemblies—						
10	ZA.4500	No. 2B(c)	1	1	—	1
11	ZA.4381	Slides, No. 1	—	1	—	1
12	ZA.12645	Lamps, Operator No. 6A	—	1	—	1
13	ZA.2784	Leads, counterpoise, No. 2, Mk. II(b)	—	1	—	1
14	ZA.2904	Microphone and Receiver Head- gear Assemblies, No. 1(c)	1	2	—	2
15	ZA.6292	Satchels, signal, No. 1	2	2	—	2
Valves, W.T. Type—						
16	ZA.7022	AR8	2	—	2(d)	2
17	ZA.3056	ARD5	1	—	1(d)	1
18	ZA.7023	ARP12	5	—	5(d)	5
19	ZA.3493	ARP34	1	—	1(d)	1
20	ZA.CV/65	CV65	1	—	1(d)	1
21	ZA.11244	VT52	3	—	3(d)	3
22	ZA.20137	Working Instructions— Wireless Set No. 22, Handcarts	—	1	—	1

#### Notes:

- (a) For connecting leads, counterpoise No. 2, Mk. II to Set.
- (b) Carried in bags, aerial gear No. 2, Mk. II.
- (c) Carried in satchels, signal No. 1.
- (d) Carried in cases spare valve No. 4C.

## WIRELESS STATION No. 22

### List of Items to be issued separately from Ordnance Stocks to complete Handcart Station

Item No. (1)	Cat. No. (2)	Designation (3)	"X" Items (4)	Min. for work (5)	Essential spares (6)	Total (7)
<i>Section Z1</i>						
1	ZA.11519	Aerials, vertical, 34-ft. steel(a)	1	1	—	1
Handcarts, Wireless, No. 1—						
2	ZA.14591	Plates, mounting, No. 1 .. ..	2	2	—	2
3	ZA.14592	Trays, battery, No. 1 .. ..	1	1	—	1
4	ZA.14593	Trays, battery, No. 2 .. ..	1	1	—	1
<i>Section Z2</i>						
Batteries, secy., port.—						
5	ZB.10118	12-volt, 22 Ah., Mk. I .. ..	1	1	1	2
6	ZB.0220	12-volt, 75 Ah. .. ..	1	1	1	2

**Notes:**

(a) For details see list below.

### ZA.11519 AERIALS, VERTICAL, 34-FT. STEEL

#### List of Components

Item No. (1)	Cat. No. (2)	Designation (3)	"X" Items (4)	Min. for work (5)	Essential spares (6)	Total (7)
<i>Section F</i>						
1	FA.2137	Hammers, engineers, ball-pane, 8 oz. .. ..	—	1	—	1
<i>Section Y</i>						
2	YA.4080	Straps, carrying, H(f) .. ..	—	1	—	1
<i>Section Z1</i>						
3	ZA.11009	Aerial bases, No. 11(g) .. ..	1	1	—	1
4	ZA.11010	Spikes(g) .. ..	1	1	—	1

Item No. (1)	Cat. No. (2)	Designation (3)	"X" Items (4)	Min. for Work (5)	Essential spares (6)	Total (7)
Antennae rod—						
A—						
5	ZA.0374	Pegs(h) .. ..	8	8	2	10
6	ZA.0378	Peg bags(d) .. ..	—	1	—	1
D—						
7	ZA.5341	Reamers(d) .. ..	—	1	—	1
8	ZA.5346	Sections, 3-ft.(d) .. ..	6	6	4	10
9	ZA.5325	Spikes(d) .. ..	1	1	—	1
10	ZA.11536	Stayplates, No. 4(d) .. ..	1	2	—	2
F—						
11	ZA.4135	Adaptors, No. 1(g) .. ..	—	1	—	1
12	ZA.11011	Cases, carrying No. 1 .. ..	—	1	—	1
Straps retaining—						
13	ZA.11462	No. 1 .. ..	—	2	—	2
14	ZA.12764	No. 2 .. ..	—	1	—	1
Sections—						
15	ZA.0894	No. 1(g) .. ..	2	2	2	4
16	ZA.0895	No. 2(g) .. ..	1	1	1	2
17	ZA.0896	No. 3(g) .. ..	1	1	1	2
18	ZA.0437	Bags, aerial gear, No. 2, Mk.II	—	1	—	1
Insulators, W.T.—						
19	ZA.4432	B(d) .. ..	1	1	—	1
20	ZA.4444	Chains, small, 3-link(d) .. ..	—	—	4	4
21	ZA.6579	Staytighteners, small(d) .. ..	—	—	2	2

**Notes:**

- (d) Normally carried in Bags, Aerial Gear, No. 2, Mk. II.
- (e) Normally carried strapped to Antennae rod, F, cases carrying, No. 1.
- (f) For carrying Antennae rod, F, cases carrying, No. 1.
- (g) Normally carried in Antennae rod, F, cases carrying, No. 1.
- (h) Normally carried in Antennae rod, A, peg bags.