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**USER HANDBOOK**  
for  
**RADIO INSTALLATION ASSU TENTACLE**  
[ WS BE 201 / 62 & WS CDN 52 / R209 ]  
in  
**TRUCK  $\frac{1}{4}$  - TON GS 4x4 ROVER Mk. 3**  
and  
**TAILER  $\frac{1}{2}$  - TON GS CARGO 2 - WHEELED Mk. 2**

**PUBLISHED UNDER THE AUTHORITY OF  
THE SIGNAL OFFICER-IN-CHIEF  
THE WAR OFFICE  
WHITEHALL S.W.1.**

Prepared and Printed for the Ministry of Aviation,  
Signals Research and Development Establishment, Christchurch, Hants.,  
under the authority of the Director.

**MAY 1960**



## IDEAS, SUGGESTIONS & DEFECTS

**YOU** are the user of this equipment - can it be improved?

If you have any good suggestions about this or **ANY** Signals Equipment, The War Office (and others) are interested.

### IDEAS & SUGGESTIONS

If you can suggest

- (a) An improvement in design or shape,
  - (b) A better method of installation, operating, or servicing,
  - (c) Other equipments which might do the job better,
- the procedure is quite simple-pass it to your OC or Adjutant for transmission to the local Chief Signal Officer.  
It will remain **YOUR** idea.

### DEFECTS

If there is something wrong with the equipment **AS IT STANDS** other than a fair wear and tear fault, it is a defect.

Again, don't keep it to yourself, pass it to your OC. The procedure for him to follow is given in **ACI 469 of 1957** (**AF G 3660** is the form to use).

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A S S O C I A T E D    H A N D B O O K S

Aerial 100-ft. No. 5 Working instructions	WO Code No. 1576
Wireless set No. 62 Mk. 2 Working instructions	WO Code No. 1548
Wireless set Canadian No. 52 Vehicle and ground stations Working instructions	Cat. No. ZA/CAN 4231
Wireless station Burndept BE 201 Working instructions	WO Code No. 11147
Wireless set No. 31 (Manpack) Mks. 1 and 2	WO Code No. 4067
Charging set 300 watt Mk. 1 (when provided)	Cat. No. ZB11918 (or as issued)
Reception Set R209 Mk. 2 User handbook	WO Code No. 10710

# CHAPTER I

## GENERAL DESCRIPTION

### Section 1. Purpose and facilities

This handbook contains a general description of a Radio Installation ASSU Tentacle, with instructions for installing the equipment in a Truck  $\frac{1}{4}$ -ton GS 4x4 Rover Mk. 3 and a Trailer  $\frac{1}{2}$ -ton GS Cargo 2 Wh. Mk. 2. Diagrams showing layout of equipment in truck and trailer are shown on pages 5 and 7.

Instructions on packing the vehicles for parachute dropping are not included.

Facilities are provided by Wireless sets Cdn 52, No. 62 and BE204 for communication between aircraft, air support formations and ground forces, and also for rebroadcasting information to other wireless stations working on the 1.6 to 10 Mc/s frequency band. Reception set R209 Mk. 2 is included in the trailer. A man-pack WS 31 is stowed in the truck.

The wireless equipment can be dismantled from the vehicles and set up as a ground station. WS 31 includes a man-pack carrying harness. WS 62 is also fitted with a man-pack carrying harness and an attachment by which a rod aerial can be mounted directly on the set. Connections for a ground station would in general be the same as those for the vehicle station described in this handbook. Further information on dismantability is given on page 51.

All wireless sets can be operated simultaneously if required but truck and trailer will probably have to be spaced some 500 yards apart in order to avoid mutual interference between the sets. See page 10. Keying units are provided for CW operation on WS 62 and on WS Cdn 52. For RT operation send-receive switching is achieved by means of microphone pressel switches in headgear connected directly to the wireless set and no control harness or remote control units are supplied.

If either vehicle is evacuated, all installation kit items must be removed and held ready for installation in a replacement vehicle. General views of truck and trailer ready for operation are shown on pages 33 and 49 respectively.

### Section 2. Wireless sets

Full descriptions of the wireless sets are contained in the user handbooks issued with the sets. See page iv opposite. The sets forming the installation and

their respective roles and facilities are as follows. Note that mileage ranges quoted here are arbitrary figures and may vary considerably according to operating conditions and environment.

(1) Wireless set Canadian No. 52

For the air support formation net, this sender-receiver has a frequency range of 1.75 to 16 Mc/s. Using a 16-ft. rod aerial its voice range is approximately 40 miles, with up to 100 miles on CW keying. Greater ranges may be obtained with the use of horizontal wire aerials.

(2) Wireless set No. 62 Mk. 2

This sender-receiver is used for voice or CW keying operation on the Army formation HF net. Its frequency range extends from 1.6 to 10 Mc/s. Its average working range when on the move should be approximately 10 miles for RT or 20 miles for CW. When stationary these ranges should be 15 miles for RT or 25 miles for CW.

(3) Wireless set Burndept BE201

For ground to air voice communication on the frequency band 100 to 156 Mc/s, this sender-receiver has a range of 25 miles to an aircraft flying at 2,000 ft. This range increases as the height of the aircraft increases, and vice versa.

(4) Reception set R209 Mk. 2

This receiver covers the frequency band from 1 to 20 Mc/s.

(5) Wireless set No. 31

WS 31 is not fitted but is stowed in the truck by the user. This VHF FM infantry man pack sender-receiver uses the frequency band 40 to 48 Mc/s. Its maximum working range should be approximately four miles.

### Section 3. Aerials

For normal operation of the wireless sets in a mobile role the following rod aerials are used:

- WS Cdn 52 : 16-ft. rod (four antennae rods 'F' section),  
or two such rods in 'V' form.
- WS 62 : 14-ft. antennae rods (Aerials vertical, 14-ft. No. 1)
- WS BE201 : One antennae rod 'G' section (1-ft. 8-in. or 2-ft. 1-in.)
- R209 : 12-ft. antennae rod (three 'F' sections)

When operating the trailer in a static role an end-fed horizontal wire aerial can be employed for sky-wave working with WS Cdn 52. It should be erected on improvised supports. A reeled Aerial horizontal 4-section is provided in the kit and instructions in its use are contained in the relevant handbook.

A 100-ft. wire aerial is provided for use with WS 62.



#### Section 4. Power supplies

Twelve-volt power supplies for all installed wireless sets are obtained from secondary batteries as follows:

(1) In the truck

Two 12V 75 Ah batteries, one for WS 62 and one for WS BE201. No spare batteries are carried.

(2) In the trailer

Four 6V 170 batteries, one pair connected in series to form battery No. 1, the other pair similarly connected to form battery No. 2. Batteries No. 1 and 2, each of 12 volts, are then connected to a fuse box and switch assembly on the front wall and used in parallel to provide power for WS Cdn 52 and R209. No spare batteries are carried.

Details of power consumption for the various sets are given in the individual user handbooks.

No facilities are provided in this station for battery charging and the Switchboard charging No. C5 is not installed. All batteries must be charged under unit arrangements.

A power supply modification kit may be issued with WS Cdn 52. This kit consists of a rotary transformer unit to be mounted on the top of the wireless set and two connectors by which it is connected to the supply unit. Necessary modifications to the wireless set to enable the new transformer to be fitted will have been carried out, if the modification kit is issued. No references to this modification appear in the WS Cdn 52 handbook. EMER Tels Modification Instruction No. 15 refers

#### Section 5. Equipment

(1) Installation kit

A complete station list is contained in the latest issue of CSL 606/3 or in the relevant CES. The installation kit includes the following kits:

(a) WS Cdn 52 Kit No. 1

This is the WS Cdn 52 set kit and all the equipment contained in it is essential for the operation of WS Cdn 52.

(b) WS Cdn 52 Kit No. 2

This is the WS Cdn 52 operating kit and it includes tools and spares and certain items which are not required in this installation.

Equipment lists for kits (a) and (b) are contained in the user handbook for WS Cdn 52.

Certain additional packaging materials are required when the station is prepared for parachute dropping.

(2) Layout in truck and trailer

A complete station, installed in the truck and trailer, is distributed as shown in the following paragraphs. This ensures that both truck and trailer are self-contained units and can be operated independently if necessary.

(a) In the truck

A table mounted across the rear of the truck carries WS 62 and WS BE201, mounted as shown in fig. 1. Below the table are two batteries for power supplies. Aerials are mounted on the truck. For parachute dropping the two wireless sets are removed and stowed on the floor, and the overall height of installed equipment reduced below that of the vehicle body.

(b) In the trailer

WS Cdn 52 is installed across the centre of the trailer, its carrier mountings being attached to wheel arches. Two pairs of batteries are fitted in diagonally opposing corners of the trailer and the general arrangement is shown in fig. 2. Other equipment fitted in the trailer includes an operator's seat, spares and aerial gear. For parachute dropping, WS Cdn 52 is repositioned fore and aft down the centre of the trailer and the remaining equipment stowed below the level of the side walls.

(3) Tables of main items of equipment

This wireless station includes the following main items of equipment, with the addition of inter-unit connectors shown separately on pages 34 and 49.

Screws and nuts as required are provided in linen bags attached to the various brackets, etc.

TABLE 1 - MAIN ITEMS IN THE TRUCK

Description	Remarks	Fig.1 ref.	See page
Aerial base No. 28 (ZA41843)	For WS 62	9	29
Baseboard, 30 x 16 x $\frac{1}{4}$ -in. (ZB14900)	Fitted under the battery carrier in the truck		23
Battery secy lead acid, 12V 75 Ah	Two used in the truck	7	33
Carrier battery, 17 $\frac{1}{2}$ x 16-in. (ZB14743)	Carries batteries		23
Carrier set No. 51 (ZA32059)	For WS 62		28
Carrier set No. 86 (ZB14969)	For WS BE201		26
Microphone and receiver headgear assembly No. 10			

TABLE 1 (continued)

Description	Remarks	Fig.1 ref.	See page
Mounting aerial base, 18-in. No. 1 (ZB14939)	For WS 62 aerial		29
Mount dipole, 34-in. (ZA51166)	For WS BE201 aerial	1	31
Plate and screw assembly, 9.11/16 x x 9½-in. No. 1	Fitted under right hand front wing	2	
Plate assembly stiffening, 12 x 3-in. (ZB14916)	Fitted to wheel arches		24
Power supply unit No. 42	For WS BE201	5	33
Runner assembly, 19 x 5 x 3½-in. (ZB14898 (pair)	For the table	3	24
Sections antennae rod 'F'	For WS 62		
Sections antennae rod 'G'	For WS BE201		
Table top, 4-ft. 2-in. x 16½ x 3⅛-in. (ZB14899)		4	25

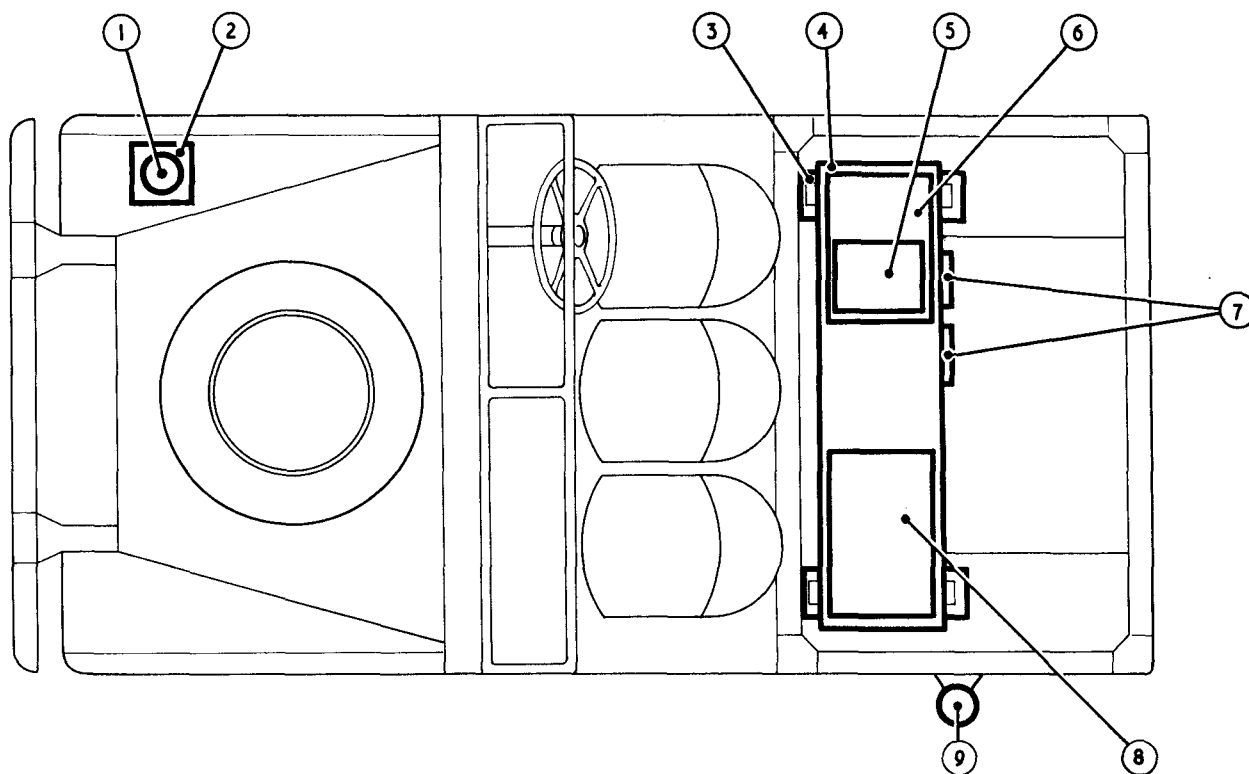


FIG.1 LAYOUT IN THE TRUCK

TABLE 1 (continued)

Description	Remarks	Fig.1 ref.	See page
User handbooks			
Wireless set No. 62 Mk. 2		8	33
Wireless set Burndept BE201		6	33
Wireless station No. 31 Mk.2 manpack	Held by units		

TABLE 2 - MAIN ITEMS IN THE TRAILER

Description	Remarks	Fig.1 ref.	See page
Aerial base No. C2	For WS Cdn 52	3	46
Aerial base No. 28 (ZA41843)	For R209	10	46
Aerial tuning unit No. C1	For WS Cdn 52	5	42
Bags aerial gear Cdn (filled)	For WS Cdn 52	6	
Baseboard assembly, 5-ft. 9-in. x 4-ft. x 1 $\frac{1}{8}$ -in.			38
Batteries secy port 6V 170 Ah		1	
Box tool No. 1 WS Cdn 52			
Brackets for aerial and hood supports			38
Cable electric HT P13 Mk. 1			
Carriers battery 17 $\frac{1}{2}$ x 16-in.			40
Carrier set No. 48	For R209		40
Chair, tubular frame, 20 x 17 x 15 $\frac{1}{2}$ -in. Mk. 2		7	40
Charging set 300 watt		12	
Clamp assemblies, 16 $\frac{3}{4}$ x 4-in.	Fitted to Wheel arches	4	40
Fuse box and switch assembly, 12 $\frac{1}{2}$ x 8 x 5 $\frac{3}{4}$ -in.	Switches batteries in parallel or OFF	2	38

TABLE 2 (continued)

Description	Purpose	Fig.2 ref.	See page
Headgear assemblies for WS Cdn 52	For the trailer		38
Hood with hoopsticks			
Microphone and receiver headgear assembly Cdn type 10			
Microphone hand No. C3 or No. 7	For the aerial bases		46
Mounting aerial base, 37½-in.			
Receivers headgear for R209		8	
Reception set R209 Mk. 2			
Sections 'F' antennae rods			
Wireless set Cdn No. 52 (sender, receiver & supply units)		11	42
WS Cdn 52 modification unit (when provided)		9	

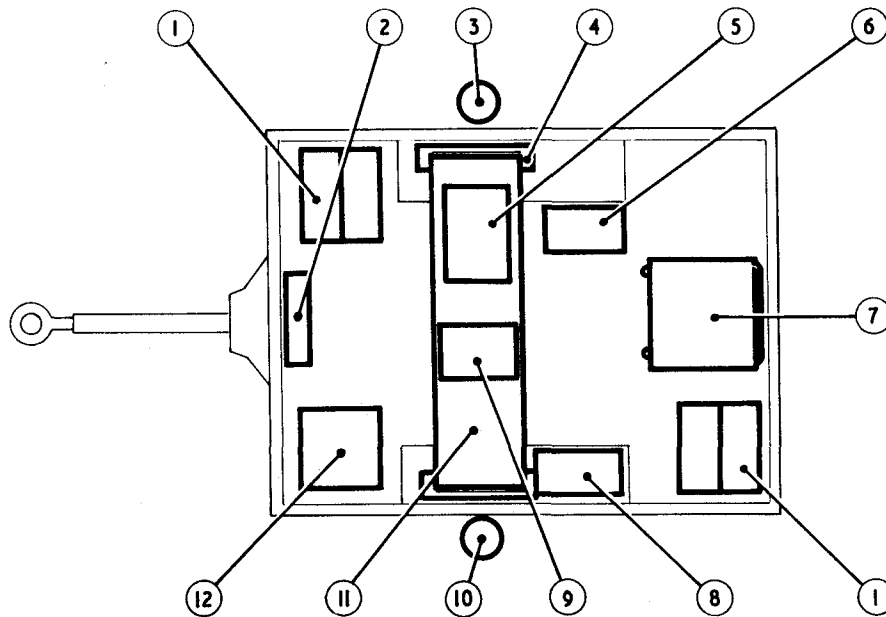


FIG.2 LAYOUT IN THE TRAILER

TABLE 3 - WEIGHTS AND DIMENSIONS

In the following table are the approximate weights and overall dimensions of the main items of equipment. Figures are for single items.

Description	per kit	Approx. dimensions in inches	Weight lb
Aerial base No. C2	1	20 x 6 $\frac{1}{2}$ dia.	11
Aerial base No. 28	2	5 x 5 dia.	3
Aerial tuning unit No. C1	1	17 x 10 $\frac{1}{2}$ x 9	15
Baseboard assembly	1	69 x 48 x 1	
Baseboard, 30 x 16 x $\frac{1}{4}$ -in.	1	30 x 16 x $\frac{1}{4}$	20
Batteries secy port, 6V 170 Ah	4	16 x 13 x 7	110
Battery secy lead acid, 12V 75 Ah	2	17 x 11 x 8	80
Carriers Battery, 17 $\frac{1}{2}$ x 16 in.	3	17 $\frac{1}{2}$ x 16 x 1 $\frac{1}{2}$	10
Carrier set No. 48	1	14 x 11 x 10	4
Carrier set No. 51	1	20 x 10 $\frac{1}{2}$ x 2 $\frac{1}{2}$	10
Carrier set No. 86	1	17 $\frac{1}{2}$ x 13 $\frac{1}{2}$ x 4	20
Chair, tubular frame	1	20 x 17 x 15 $\frac{1}{2}$	10
Clamp assemblies for WS Cdn 52	2	17 $\frac{1}{2}$ x 6 x 2	8
Clamps for aerial and hood supports	8	5 $\frac{1}{2}$ x 3 $\frac{1}{4}$ x 4	1
Fuse box and switch assembly	1	12 $\frac{1}{2}$ x 8 x 5 $\frac{3}{4}$	
Hood with hoopsticks	1	70 x 57 x 35	33
Mounting aerial base, 18-in. No. 1	1	18 x 5 dia.	7
Mounting aerial base, 37 $\frac{1}{2}$ -in.	2	40 x 5 dia.	10
Mount dipole, 34-in.	1	34 x 5 x 5	10
Plate and screw assembly	1	9.11/16 x 9 $\frac{1}{2}$	3
Plate assembly stiffening, 12 x 3-in.	4	12 x 3	1
Power supply unit No. 42	1	13 x 9 x 7 $\frac{1}{2}$	23
Reception set R209 Mk. 2	1	12 $\frac{1}{2}$ x 9 x 8 $\frac{1}{2}$	24
Runner assembly, 19 x 5 x 3 $\frac{1}{2}$ -in. pairs	1	19 x 5 x 3 $\frac{1}{2}$	11
Sections antennae rod 'F' sets	2	48 x $\frac{1}{2}$ dia.	3
Sections antennae rod 'G'	2	25 x $\frac{1}{4}$ dia.	1
Table top, 4-ft. 2-in. x 16 $\frac{1}{2}$ x 3 $\frac{1}{8}$ -in.	1	50 x 16 $\frac{1}{2}$ x 3 $\frac{1}{8}$	50
Wireless set No. 62 Mk. 2	1	20 $\frac{1}{2}$ x 13 x 10 $\frac{1}{2}$	30
Wireless set Burnddept BE201	1	17 x 13 $\frac{1}{2}$ x 7 $\frac{1}{2}$	30
Wireless set No. 31 (including battery)	1	17 x 12 x 6	Mk.1 - 22 Mk.2 - 31
WS Cdn 52	1	44 x 18 x 14	255
	1		



## CHAPTER 2

# OPERATION

### W A R N I N G S

Do not touch the WS Cdn 52 aerial base nor the aerial terminals on the equipment while the set is transmitting, or you will receive a severe RF burn

THERE IS VERY HIGH VOLTAGE  
ON THE AERIAL SYSTEM WHEN  
THE WS CDN 52 IS ON 'SEND'

If a rod aerial is near or touching a power wire DO NOT reach up and remove the aerial nor step out of the truck. Just drive the vehicle clear of the wires. NEVER change aerials near overhead wires.

The above warnings should be brought to the notice of all personnel who may be exposed to the dangers.

## Section 6. Operating instructions

Full operating instructions for the wireless sets and associated equipment are contained in the user handbooks issued with the sets. These should be read in conjunction with the following sections. Reference numbers of all associated handbooks are given at the front of this handbook.

## Section 7. General notes

### (1) Interference

When all the wireless sets are being operated simultaneously it will normally be found necessary to move the truck some distance from the trailer in order to avoid mutual interference between the sets. The extent of the interference depends upon the frequencies being used, and upon the screening effect of the terrain. In practice distance between vehicles will depend largely upon the amount of interference that can be tolerated, but is seldom likely to be less than 500 yards. The most suitable operating positions which permit this spacing to be kept to a minimum can best be found by trial and error.

### (2) Intercommunication

No equipment is provided with the station for intercommunication between truck and trailer, when the two are spaced apart. Users should establish a telephone link between the two vehicles by means of apparatus obtained from unit resources.

### (3) Trailer power supply

In the trailer, switch the power supply on at the battery switch unit to connect WS Cdn 52 and R209 to the batteries.

### (4) Power consumption

Remember that the current consumption of WS Cdn 52 on high power 'send' can rise above 50 amps, resulting in rapid battery discharge.

## Section 8. Preliminary checking

- (1) Before starting an operation, tune each set as instructed in the relevant user handbooks. These preliminary checks should be made by an operator to ensure that the installation is in working order.
- (2) Attach the required number of headset assemblies to the various sockets and drop leads. Check that the snatch release plugs are correctly fitted.
- (3) The wireless sets should be allowed to warm up for at least five minutes, or fifteen if possible.

- (4) The equipment gives visible or audible indications that it is operating satisfactorily. If it does not give the correct indication, or if the operator is unable to obtain the correct indications by using the resources at his disposal and from the suggestions given in the handbooks, the fact should be reported in the normal way.

### Section 9. Erecting aerials

- (1) Aerial arrangements for WS BE201 and WS Cdn 52 differ slightly from those described in the relevant handbooks. Attention is drawn to the warnings regarding high RF voltage on the WS Cdn aerial base, printed on page 9 and in the user handbook for that set.

(2) On the move

For normal operations in a mobile role, erect rod aerials on the truck and trailer as follows:

(a) WS Cdn 52

Mount a sixteen-foot rod aerial (four antennae rods 'F' section) in Aerial base No. C2 on the mounting at the right hand side of the trailer. See fig. 19 on page 46.

(b) WS 62

Mount a twelve-foot rod aerial (three antennae rods 'F' section) on Aerial base No. 28 on the mounting on the left hand side of the truck. Use an Adapter aerial base No. 1 if required and set it to the desired angle. See fig. 10 on page 29.

(c) WS BE201

Mount an antennae rod 'G' section in the dipole aerial base on the right hand front wing of the truck. See fig. 11 on page 30. Two lengths are supplied for use on frequency ranges as indicated in the wireless set user handbook.

(d) R209

When this set is required for use, fit a twelve-foot rod aerial in the mounting on the left hand side of the trailer. See fig. 18 on page 46.

(3) At the halt

For operation at the halt use the following alternative types of aerial when they are available.

(a) WS Cdn 52

In a static role the WS Cdn 52 can be connected to a horizontal wire aerial in order to give improved results. Improvised supports should be

arranged for the horizontal aerial, which is described in the WS Cdn 52 handbook. The station does not include telescopic masts for use with WS Cdn 52.

(b) WS 62

Alternative types of aerial for use with WS 62 at the halt are described in the user handbook issued with the set. These include horizontal wire and vertical radiator, but they may not be supplied with this station.

(c) WS BE201

In a static role WS BE201 in the truck can be operated with the Aerial dipole No. 24, for which detailed instructions are included in the WS BE201 handbook. This aerial can be mounted on a nearby tree or pole or other convenient support. Aerial dipole No. 24 and the coaxial connector (Aerial feeder 27-ft. No. 1) may not be supplied with this station.

(d) R209

No alternative aerial is provided, but a wire aerial can be connected direct to the set.

(4) Manpack aerial

The manpack WS 31 uses a 5-ft. 4-in. rod aerial. Assemble the aerial and screw it into the aerial socket on the set in accordance with instructions contained in the handbook issued with this set. Keep the aerial vertical.

WARNING

Do not switch WS 31 to 'send' if the aerial is not properly connected, or the set may be damaged.

(5) Stowing aerials

Rod aerial sections should be removed from aerial bases and stowed in cases provided for the purpose when the wireless equipment is not in use.

Section 10. Stowing loose items

(1) In the truck

(a) Pack the following items in Haversacks No. 1 for stowage in the truck:

Headsets for use with WS 31  
Lamp operator No. 2 for WS BE201  
Lamp operator No. 6B for WS 62  
Microphone and receiver headgear assemblies No. 10 (three)  
User handbooks and working instructions

(b) Stow the following items safely in the truck:

Aerial dipole No. 24 when this is supplied for use with WS BE201  
Aerial feeder 27-ft. No. 1 for use with Aerial dipole No. 24  
Aerial 100-ft. No. 5  
Case carrying No. 2 antennae rods 'F'  
Case spare valves No. 4K with spares for WS 62  
Case spare valves No. 21 with spares for WS BE201  
Covers waterproof No. 26 Mk. 2 for WS 62  
Haversacks No. 1 filled as in paragraph (a) above  
Sections antennae rod 'F' for WS 62  
Sections antennae rod 'G' for WS BE201  
WS 31 complete station including aerials for manpack operation

(2) In the trailer

(a) Pack the following items in the haversack for stowage in the trailer:

Charts tuning WS Cdn 52  
Key and plug assembly, Cdn No. 9 type 2  
Microphones and receiver headgear assemblies  
User handbooks and working instructions

(b) Stow the following items safely in the trailer:

Adapter, 'V' Laporte  
Aerial horizontal, 4-section  
Bags aerial gear No. 2 Mk. 2 (filled)  
Case carrying antennae rod No. 5  
Case carrying No. 2, antennae rods 'F'  
Case spare valve No. 16 Mk. 2 (for R209)  
Case spare valves and parts (for WS Cdn 52) (filled as required)  
Covers waterproof (when not fitted on the equipment)  
Haversack (filled as in paragraph (a) above)  
Sections antennae rod 'F'  
Tool box (for WS Cdn 52)

(c) When stowing loose items in the trailer for road movement, care must be taken to ensure that the load remains evenly distributed about the axle, for if this balance is unduly disturbed a strain is thrown upon the tow-bar connection. All heavy items of equipment are secured in carrying frames which are positioned to give correct weight distribution.

- (d) Loose items for which no fixed carriers are provided include haversacks, antennae rod cases, etc., and these items should be distributed evenly over the floor of the trailer.
  
- (e) Contents of the spares case, tool box and aerial bag for WS Cdn 52 are listed in the relevant user handbook.



## CHAPTER 3

# SERVICING

### Section 11. Servicing on the task system

- (1) No installation can be expected to work properly unless it is kept in first class condition by regular servicing, conscientiously carried out. This servicing is the responsibility of the NCO or man who is in direct charge of the equipment and responsible for its operation, NOT of workshop or repair staffs, though workshop personnel may be called upon to carry out certain servicing tasks.
- (2) To guide the NCO or man responsible for servicing, and to ensure that it is done, it has been laid down that signal equipment will be serviced on the task system and that completion of each task will be recorded on Army Form B2664 - Unit servicing log.
- (3) A facsimile of this log is reproduced at the end of this handbook. Completion of servicing tasks will be recorded by initialling in the spaces provided on the front of the form; all repairs and replacements will be recorded on the reverse. The form lasts 24 weeks and replacements should be obtained on indent in the normal way. Current and completed forms should be kept in the pocket in the back cover of this handbook.
- (4) Servicing tasks to be carried out daily, weekly and monthly by the user are listed in the servicing chapters of the relevant user handbooks, which show the full servicing required for an installation in continuous use. In conditions where this does not apply, the frequency with which each task is carried out will be detailed by the commander concerned.
- (5) The following additional servicing tasks are applicable to this installation and should be carried out as indicated.

### Section 12. Battery servicing

#### (1) Servicing

Battery servicing should be carried out daily on an installation in constant use, and weekly if the batteries are not being used continuously. In this installation two 6-volt batteries are connected in series to provide the necessary 12-volt power supply for WS Cdn 52 and R209 Mk. 2 in the trailer; in

the truck separate 12-volt batteries are connected to WS 62 and WS BE201.

Attend to battery servicing as follows:-

- (a) Ensure that battery connectors are firmly attached, referring to figs. 14 and 20. Remove any corrosion from terminals, connecting plugs, sockets, etc. Examine battery leads and ensure that they are not frayed or chafed.
- (b) See that vent holes in filling plugs are clear.
- (c) Check the level of the electrolyte in each cell and add distilled water as necessary according to the instructions on the lids of the batteries. Dry off any spilt water.
- (d) Test the battery voltage with the wireless set power supply unit switched ON. If the voltage is below 11.5 volts, replace the batteries at once and have them recharged. A battery should be recharged when the specific gravity of the electrolyte in any cell, read with a hydrometer, falls below approximately 1.18.
- (e) Do not allow batteries to stand in a discharged condition.

(2) Charging

Wireless batteries must be changed when necessary and charged under unit arrangements.

(3) Connections

Note that where two batteries are connected in series, in this installation the 6-volt batteries in the trailer, the series connector should always be fitted between the batteries before the battery leads to the equipment are fitted. The reason for this is that if the negative battery lead is attached first and the series connector is then attached to the positive terminal of the same battery, the other end of the series connector can, by touching any surrounding metal, cause a heavy short circuit on this battery. The chances of such short circuits occurring are increased by the use of metal cased batteries.

Section 13. Routine servicing

DAILY

- (1) Keep the wireless sets and all associated equipment clean, dry and free from dust.
- (2) See that headsets are stowed in haversacks provided for the purpose when they are not in use, to protect them from damage.

WEEKLY

- (3) See that the ends of rod aerial sections are clean and straight and that they fit together. Inspect aerial bases for damage and ensure that connections are tight and in good condition.

- (4) Check the clamping screw securing the dipole aerial mounting to the right hand front wing on the truck and tighten if necessary.
- (5) Check that the clamps securing the two aerial mountings to the trailer are securely tightened.

#### MONTHLY

- (6) Inspect all detachable leads and connectors and ensure that they are correctly fitted and that insulation and terminations are in good order. Make sure that connectors have not become trapped or chafed by equipment in the vehicle.
- (7) Inspect all mounting frames, carriers, etc., and particularly the aerial mountings, and ensure that all screws and nuts are secure.

#### Section 14. Fault finding

- (1) External faults are much more common than internal trouble. If the radio installation does not operate satisfactorily in the vehicle, first carefully check all connections in accordance with the diagrams on pages 35 and 48 and ensure that all terminations are correctly fitted.
- (2) Then see that all switches and controls on the wireless equipment are adjusted as instructed.
- (3) If the above action does not eliminate the fault, refer to the user handbooks for the wireless sets.

#### Section 15. Opening a sealed unit

- (1) Reception set R209 Mk. 2 and WS 31 are sealed. Operators must not loosen any fixing screws or in any way attempt to remove cover plates from boxes or control units. Furthermore, none of the control knobs may be tampered with as the spindle sealing glands might become damaged thereby.
- (2) When adjustments or replacements are required which involve opening a sealed box, the box should be sent to workshops.
- (3) Royal Signals radio technicians may open a unit for servicing, so far as their technical ability and the equipment and spares in their possession allows, subject to the following conditions:
  - (a) On the initiative of the radio technician, when absolutely necessary to restore essential communications, or
  - (b) On the authority of the Officer Commanding.

These are the only occasions when Royal Signals radio technicians may break the seals.

- (4) If a sealed unit is opened in accordance with the above conditions, it should be done only in a clean and dry situation. Ensure that the risk of dust or dampness getting into the equipment is as small as possible.
- (5) The equipment must be sent to workshops for testing of the seals, and drying out if necessary, as soon as possible after an emergency opening.

Section 16. Spares

(1) Case spare valve No. 21 (for WS BE201)

Fuses cartridge glass, 150 mA 250V AC (Z1/5920-99-940-9435)	- Qty 6
Fuses cartridge No. 1, 500 mA (ZA3577)	- " 6
Lamps filament 6V 2.2W MES clear (Y3/6240-99-995-1112)	- " 3
Lamps filament 12V 2.2W MES clear (Y3/6240-99-995-1219)	- " 4
Valves electronic CV131	Qty 2
CV133	" 1
CV138	" 3
CV140	" 1
CV309	" 2
CV492	" 1
CV511	" 1

(2) Case spare valve No. 16 Mk. 2 (for R209)

Desiccator, tubular, panel mounting	- Qty 1
Vibrator non-synchronous, shunt driven, 12V	- " 1
Fuse link cartridge ceramic 3A 440V AC (X2/5920-99-059-0111)	- " 1
Valve electronic CV131	Qty 1
CV284	" 1
CV782	" 1
CV784	" 1
CV785	" 1

(3) Case spare valves No. 4K (for WS 62)

Fuse link cartridge ceramic 250 mA 440V AC (X2/5920-99-059-0107)	- Qty 12
Valve electronic CV65	
CV281 or CV1347	
CV1091	
CV1306	
CV1331	
CV1510	

(4) Case spare valves and parts

This case holds spares for WS Cdn 52 and its contents are listed in the user handbook for that set.

- (5) As spares are used, replacements should be obtained through normal channels to maintain a complete spares kit. Do not put defective components back in the spares case.

# CHAPTER 4

## INSTALLATION

**NOTE: THE LEFT AND RIGHT HAND SIDES OF THE VEHICLE ARE THOSE WHICH WOULD BE ASSUMED BY A PERSON SITTING NORMALLY IN THE DRIVER'S SEAT.**

### Section 17. Procedure

#### (1) Action by REME workshops

Before the wireless equipment can be installed in the truck and trailer, these vehicles must be modified in accordance with the EMERs quoted on pages 24 and 36. The table top for the truck should be drilled as shown on page 24 and if the modifications are being undertaken by REME workshops, certain items of the installation kit as shown on pages 24 and 37, must be sent to the workshops.

#### (2) Installation

After the necessary vehicle modifications have been completed and the table drilled, users should install the complete kit as instructed in this chapter. For this purpose a selection of spanners and screwdrivers are required.

This installation chapter is divided into two parts. Part 1 covers the truck installation and part two the trailer.

If REME assistance is obtained in installing the equipment, this user handbook should be sent to workshops with the vehicle and the complete installation kit.

## PART I - TRUCK INSTALLATION

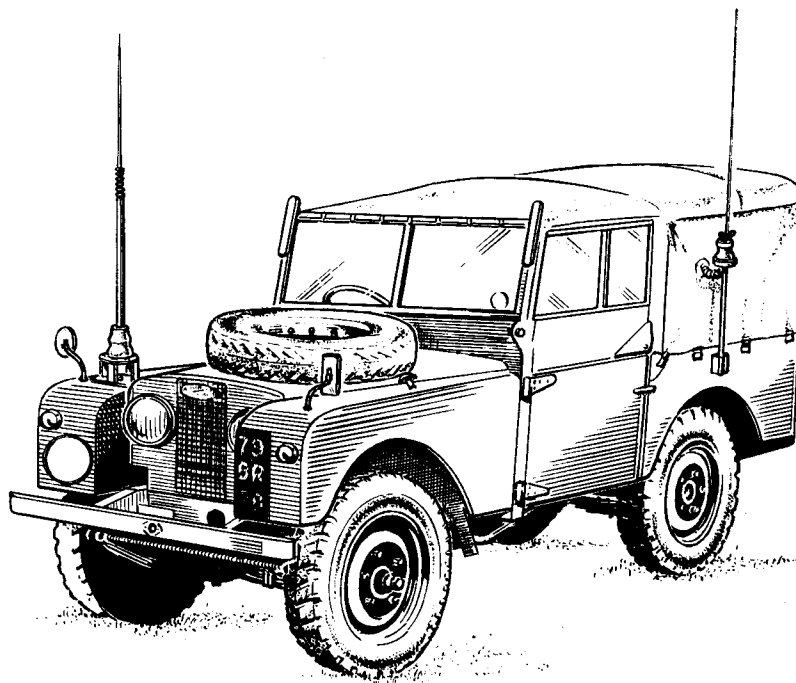


FIG. 3 TRUCK 1/4-TON ROVER



Section 18. Vehicle modifications

- (1) In the following paragraphs are relevant extracts from the EMERs, specifying the part of the modification which is required for this particular installation. This list does not include the full contents of the EMER modification instruction and is included here for information only. The kit is intended for installation in a Trucks  $\frac{1}{4}$ -ton GS 4x4 Rover Mk. 3 (86-in. wheel base).
- (2) EMER WV Q.027 Mod. Instr. No. 3
  - (a) Holes are drilled in the right hand front wing for the WS BE201 aerial mounting and a Plate and screw assembly 9.11/16 x  $9\frac{1}{2}$ -in. No. 1 is fitted.
  - (b) Eight holes are drilled in each wheel arch for bolts securing stiffening plates and table mountings. See page 24.
  - (c) Four holes are drilled in the left hand side wall for the WS 62 aerial mounting bracket. See page 29.
  - (d) Four holes are drilled in the floor for the battery carrier base frame. See page 23.
  - (e) Holes are drilled for clamps retaining the coaxial connector. See page 32.
  - (f) A hole is provided in the canvas hood for the WS 62 aerial lead. It is reinforced with a Disc rubber rivet assembly.
- (3) All equipment necessary in order to carry out the modifications is supplied with the installation kit, and there is no necessity for any local provisioning of mod. stores.
- (4) It is essential that all trucks are suppressed to current standards, and the necessary modifications to achieve this carried out in accordance with the relevant EMERs.

Section 19. Installation kit items to be fitted by workshops

- (1) The items listed below are fitted or used by REME when carrying out the modifications. Extract them from the kit complete with all fixings and send them with the vehicles when they go to workshops to be modified.
- (2) Plate and screw assembly, 9.11/16 x  $9\frac{1}{2}$ -in. No. 1

This assembly strengthens the right hand front wing and is fitted initially by the REME workshops which modifies the vehicle.
- (3) Disc rubber and rivet assembly,  $3\frac{1}{2}$ -in. dia. (ZB14980)

This disc reinforces the aerial outlet in the canvas hood.

Section 20. Preparing the truck

(1) Canvas hood

It may be found convenient to remove the canvas hood from the rear portion of the truck during fitting operations, in order to improve accessibility. Release the straps and retaining cords and roll the canvas forward to open up the rear of the truck. Note that when the hood is finally replaced the aerial lead to WS 62 must be passed through the inlet hole in the rubber disc which has been attached to the hood.

(2) Redundant fittings

The following items, fitted in the Rover when it is issued, are not required in this installation and must be taken out of the vehicle. Together with all fixing screws, etc., they should be adequately packed and labelled and should bear the number of the truck from which they were removed. They should be deposited in unit stores ready for replacement if the truck should revert to a normal role.

- (a) If they have not already been taken out, remove the two complete seat and backrest assemblies from the rear wheel arches and leave the wheel arches clear.
- (b) If the spare wheel is fitted inside the rear of the truck, remove it and attach it to the alternative mounting on the top of the bonnet. Secure it firmly.
- (c) Detach the clamp and chain by which the spare wheel was secured to the cross member behind the centre seat.

(3) Cleaning

See that the interior of the truck is thoroughly clean and dry before starting the installation.

- (4) Note that UNF screws and nuts are used throughout this installation. All new carrying frames and brackets are supplied with small linen bags containing suitable screws, nuts and washers as required. To secure other items of equipment, suitable screws are supplied with the trailer baseboard.

Section 21. Battery carrier

(1) Baseboard, 30 x 16 x  $\frac{1}{4}$ -in.

Place the metal base plate on the floor of the truck with the smaller section to the left as shown in fig. 4. Secure it by means of four counter-sunk screws  $\frac{1}{2}$ -in. long as at 'A' in fig. 4. Fit backing plates, nuts and lock nuts below the floor. If it is found that any backing plate fouls an angle bearer under the floor, cut a strip from one side of this backing plate so that

it can be fitted correctly. All four backing plates must be fitted against the underside of the aluminium floor to strengthen it.

(2) Carrier battery. 17 $\frac{1}{2}$  x 16-in.

Attach the battery carrier to the base plate as shown in fig. 4, using six countersunk screws  $\frac{3}{8}$ -in. in length as at 'B' in fig. 4. The remaining four screws are not used in this installation.

Section 22. Table assembly

(1) Table top, 4-ft. 2-in. x 16 $\frac{1}{2}$ -in. x 3 $\frac{1}{8}$ -in.

The table top is made of wood  $\frac{3}{4}$ -in. thick, bolted into a steel frame, to the ends of which are welded the two channel section runners carrying the clamps. This truck table, which forms part of the installation kit, should be drilled by REME workshops or under unit arrangements and should accompany the truck when it is sent into workshops to be modified.

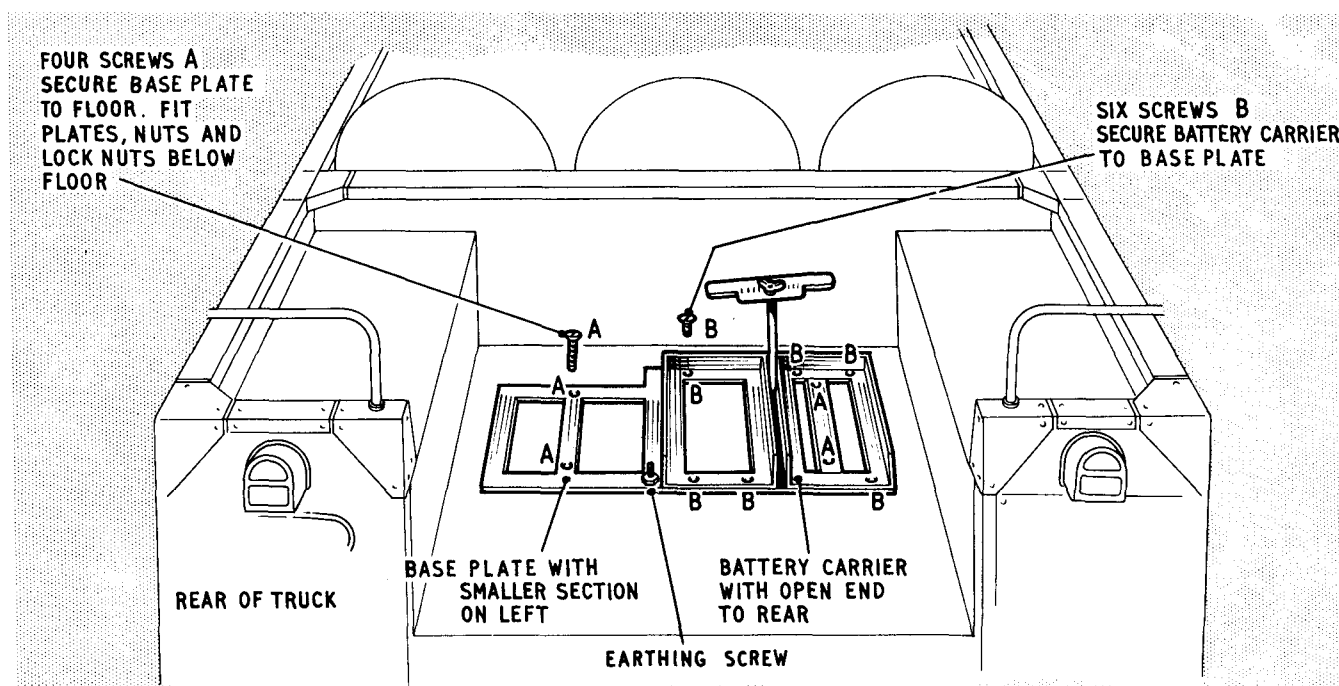


FIG. 4 BATTERY CARRIER IN LAND ROVER

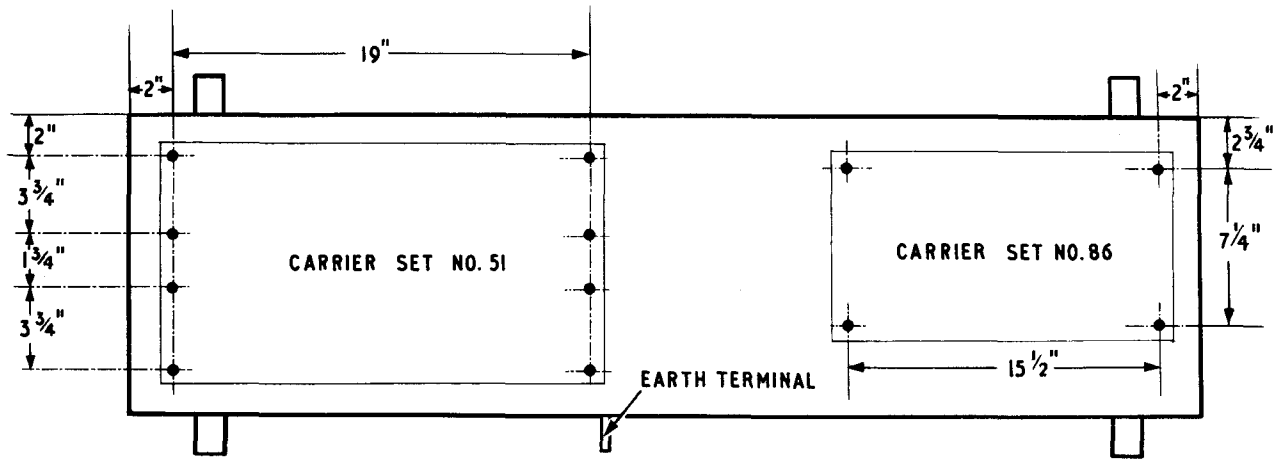


FIG. 5 TABLE DRILLING DIAGRAM

(2) Drilling the table top

Mark off twelve holes as shown in the drilling diagram. Note that the dimensions are taken from the outside of the metal table frame. Drill the twelve holes 5/16-in. diameter.

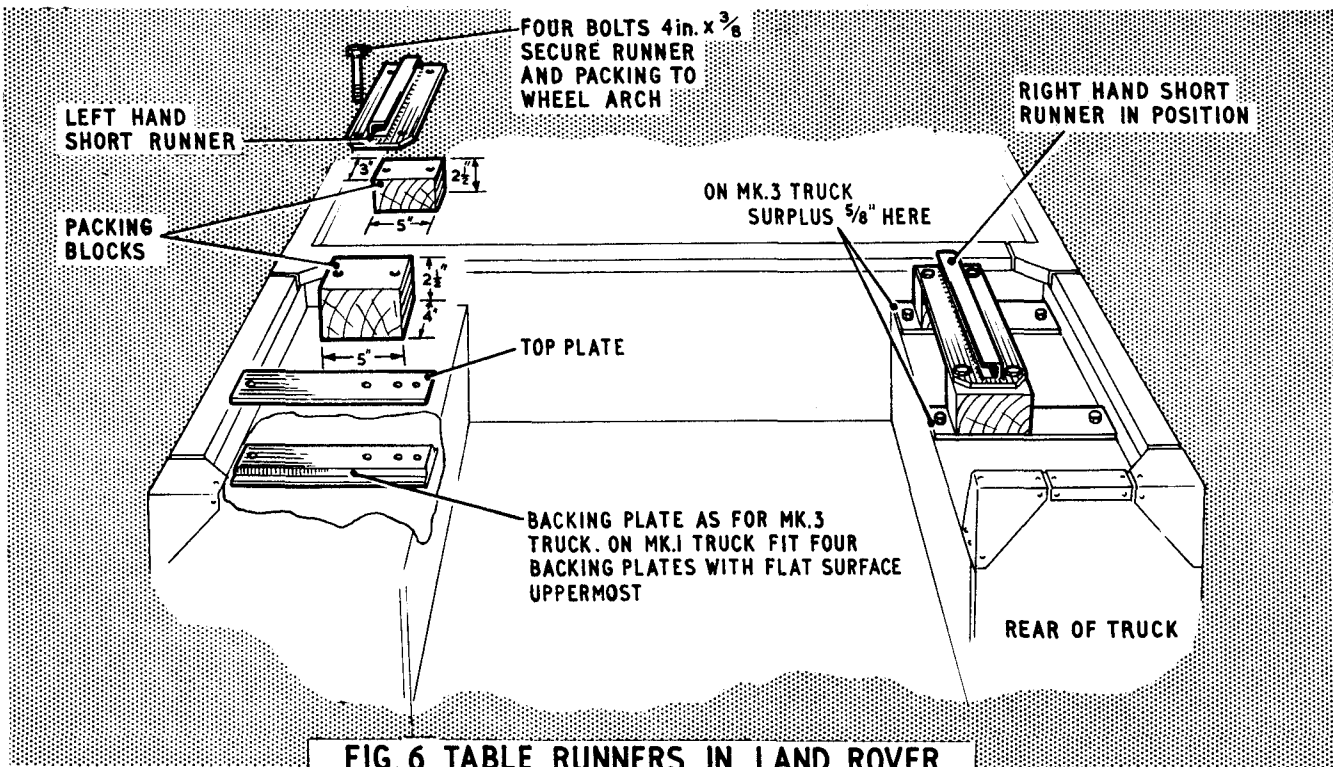


FIG. 6 TABLE RUNNERS IN LAND ROVER

(3) Plate assemblies stiffening, 12 x 3-in.

Place four plain top plates on the top surfaces of the wheel arches and align the fixing holes with holes drilled in the wheel arches, as shown in fig. 6. Backing plates for the underside of the wheel arches have a flat surface on one side and a narrow stripwelded to the other side. Below the wheel arch assemble four backing plates with flat surfaces downwards and bolt top and backing plates together. The top plates extend beyond the edges of the wheel arch. File off protruding corners to a radius of approximately  $\frac{1}{8}$ -in. if this has not already been done.

(4) Runner assemblies, 19 x 5 x  $\frac{3}{8}$ -in.

Position four wood blocks as shown in fig. 6, arranged to provide horizontal bases for runners. Assemble a runner assembly on each pair of blocks, with the mitred corners towards the rear of the vehicle. Bolt down using eight bolts 4-in. in length on each assembly but do not tighten these bolts until the table top has been fitted.

(5) Fitting the table top

The table top should now be attached to the runners with the front (indicated by the earth terminal) towards the rear of the vehicle. To secure the table, unscrew the four clamps completely and remove them with the angle brackets, lift the table top onto the runners, and then re-assemble the clamps and brackets in their original positions. Fit the free end of the 14-in. copper braid connector supplied with the table to the left hand rear bolt on the left hand table mounting. Finally tighten the eight bolts holding the runners, and then the four table clamps.

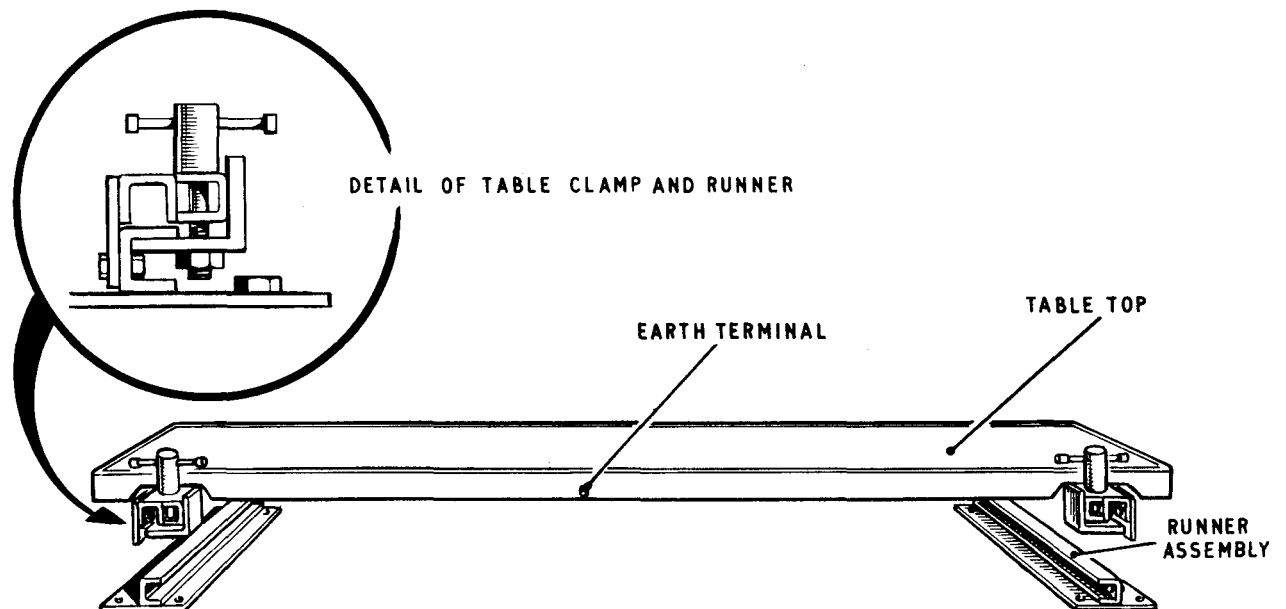


FIG. 7 TABLE TOP

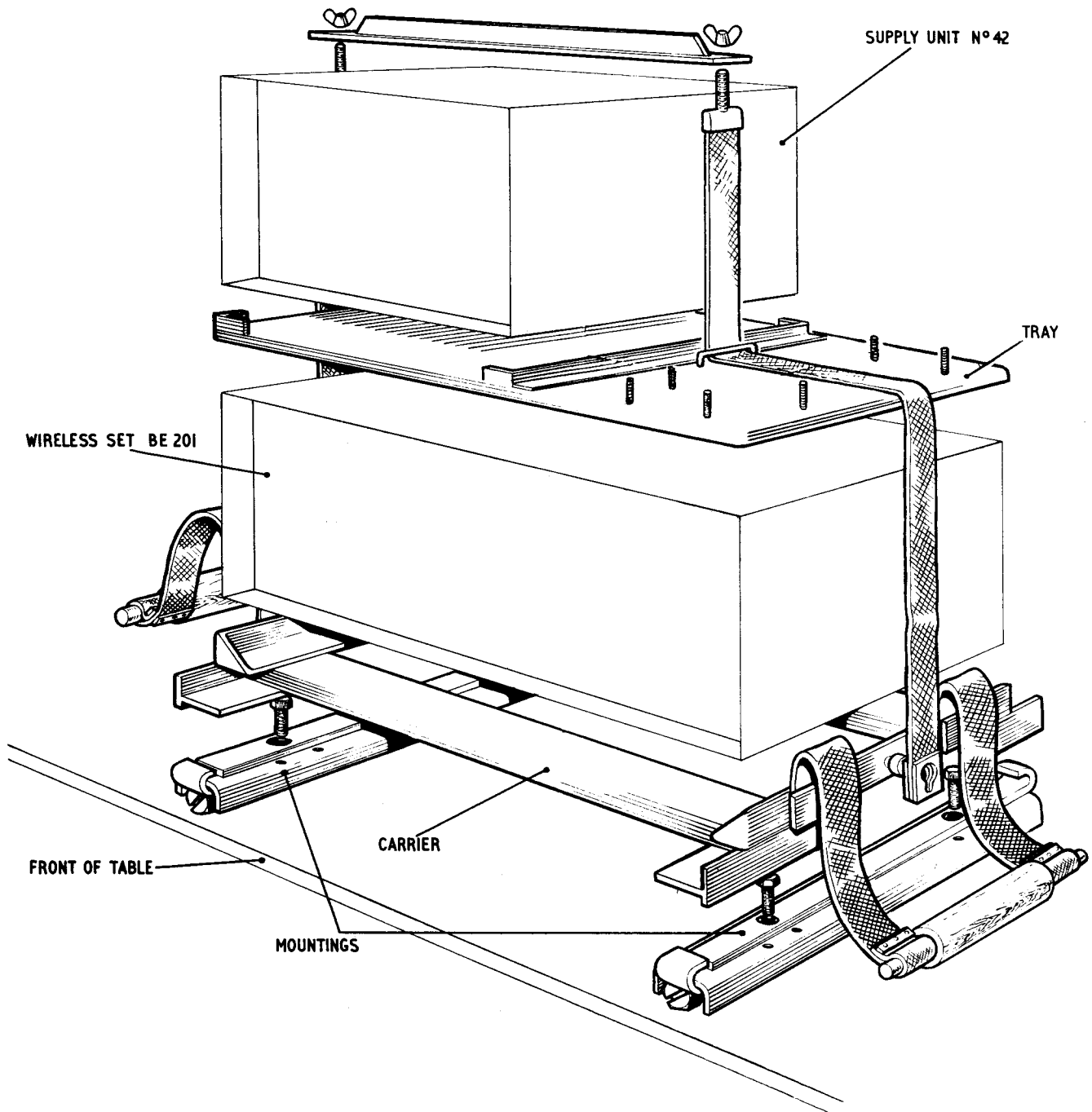


FIG 8 METHOD OF FITTING WS BE 201

Section 23. Wireless set BE201 assembly

(1) Mounting carrier, 12 $\frac{1}{2}$ -in. x 2 $\frac{7}{8}$ -in. x 1.9/16-in. 20 lb. loading

Refer to fig. 8 and locate four holes at the right hand end of the table to suit these mountings. Attach the two mountings as shown, securing each with two bolts, nuts and spring washers, and keeping the clamping screws towards the front of the table.

(2) Carrier set No. 86

Insert the carrier into the retaining hooks on the two mountings, and with the projecting ends of the carrier base engaging in the clamping screws, secure the screws. Do not over-tighten these screws.

(3) WS BE201

Place the wireless set in the carrier, with the front panel towards the front of the table.

(4) Tray

The tray forms part of Carrier set No. 86. Place it on the wireless set with the supply unit holder towards the left hand end of the wireless set, as shown in fig. 8. Six studs at the right hand end of the tray are not used in this installation. On these studs tighten the nuts down to retain the four rubber mounting blocks when they are included on the tray.

(5) Power supply unit No. 42

Place the supply unit on the tray as shown.

(6) Retaining straps

Attach the slotted ends of the two web retaining straps to the studs on the sides of the carrier as shown, passing the long strap through the loop in the tray.

(7) Clamping bar

Pass the threaded ends of the two straps through holes in the top clamping bar and fit two wing nuts. Screw the wing nuts down to tighten the straps and secure the assembly.

Section 24. Wireless set No. 62 assembly

(1) Carrier set No. 51

Locate four holes in the table top to suit this carrier. Attach it by fitting eight  $\frac{1}{4}$  x  $1\frac{3}{4}$ -in. screws down through the resilient mountings and through the table top. Make fast with nuts and washers on the underside.

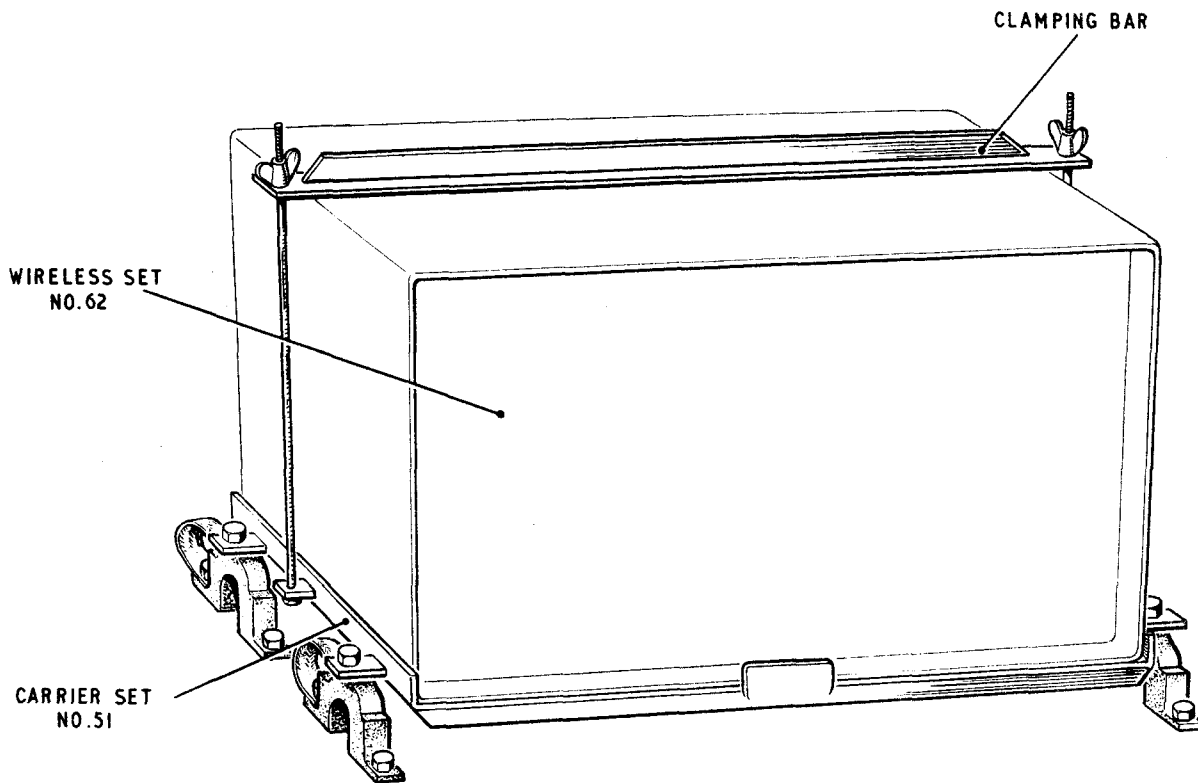


FIG. 9 METHOD OF FITTING WS 62

(2) WS

Place the wireless set in the carrier as shown in fig. 9 with the control panel towards the rear of the truck. Secure the clamp across the top of the set.

Section 25. Aerial assembly for WS 62

(1) Aerial base No. 28

If a pigtail connector is supplied inside this aerial base it must be removed. Assemble the aerial base on the top of the Mounting aerial base, 18-in. No. 1 as shown in fig. 10 and bolt together using six screws  $\frac{1}{4}$  UNF  $\frac{5}{8}$ -in. long with nuts and washers. Attach the external copper braid connector to one of these screws. Before this assembly can be fitted the following brackets must be attached to the truck.

(2) Bracket mounting aerial base,  $4\frac{5}{8}$  x  $3\frac{3}{4}$ -in. No. 1

Bolt this bracket to a Bracket MS, 12 SWG, 6 x  $2\frac{1}{8}$  x 4-in., using four screws  $\frac{1}{4}$  UNF  $\frac{5}{8}$ -in. long with washers, nuts and lock nuts fitted inside the bracket. See fig. 10 and note that the locking screw on the bracket mounting must be at the bottom.



- (3) Bracket MS 12 SWG. 6 x 2 $\frac{1}{8}$  x 4-in.

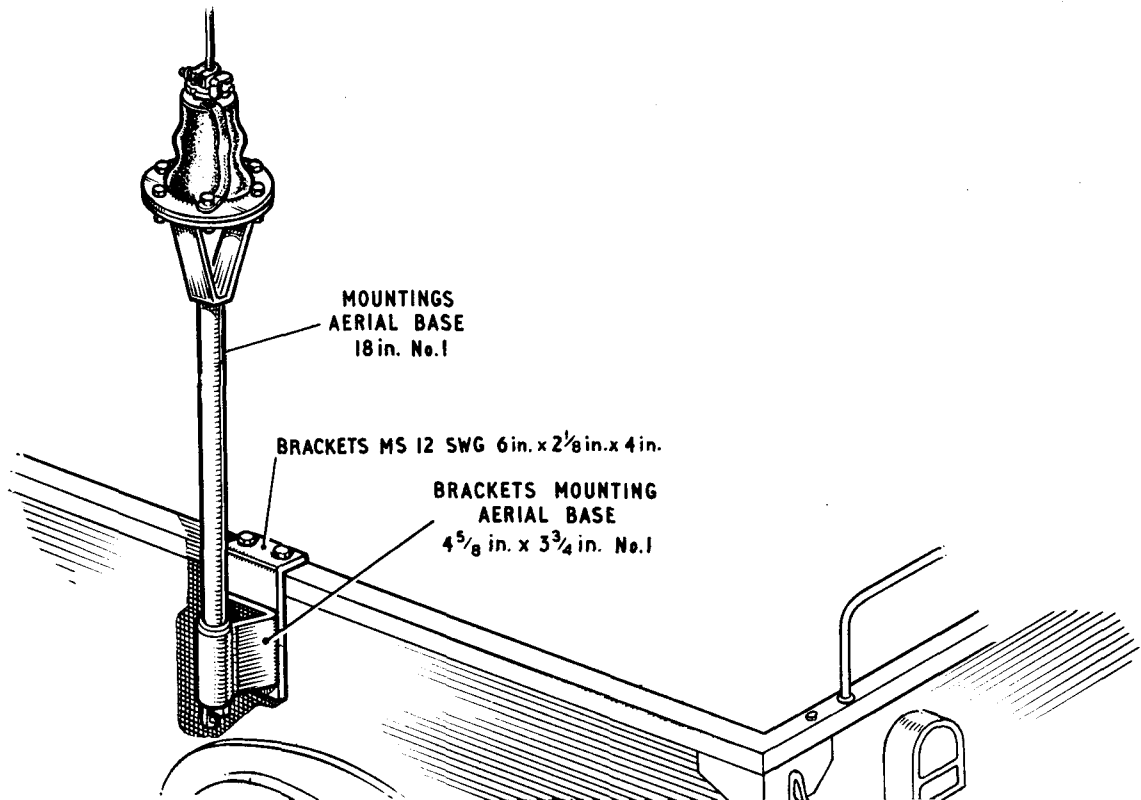
Bolt this bracket to the left hand side of the Rover approximately 30 $\frac{1}{2}$ -in. from the left hand rear corner, where four suitable holes are provided, two in the top rail and two in the side. Secure it by means of four screws  $\frac{1}{4}$  UNF 1-in. long with lock nuts.

- (4) Mounting aerial base, 18-in. No. 1

To complete the aerial assembly, fit this mounting, carrying the aerial base, into the socket on the Bracket mounting aerial base. Secure it by means of the captive locking screw in the base of the socket. See fig. 10.

- (5) Disc rubber and rivet assembly, 3 $\frac{1}{2}$ -in. dia.

This disc is fitted round the aerial inlet hole in the canvas hood. It should be fitted when the vehicle is modified. See page 21.



**FIG. 10 METHOD OF FITTING AERIAL BASE AND MOUNTING FOR WS 62**

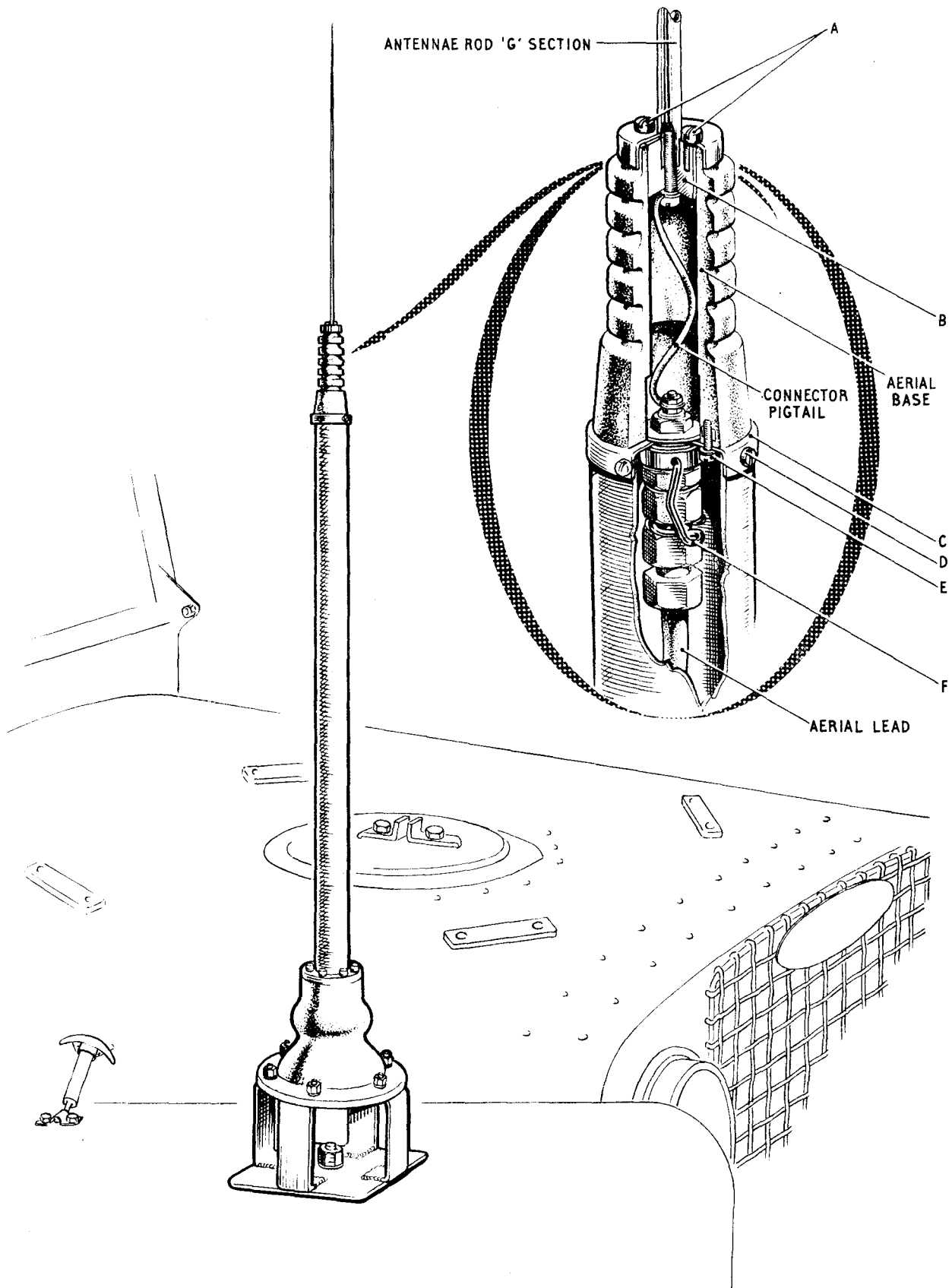


FIG. II DIPOLE AERIAL FOR WS. BE. 201

Section 26. Aerial assembly for WS BE201

- (1) Plate and screw assembly, 9.11/16 x 9 $\frac{1}{2}$ -in. No. 1

This plate should be fitted when the truck is modified. See page 21.

- (2) Mounts dipole, 34-in. long

The Mount, dipole, 34-in. long consists of a light alloy tube which forms the lower arm of the dipole. At the top is fitted an aerial base with four No. 4 BA fixing screws. At the bottom is a rubber aerial base, a mounting bracket and a heavy clamping screw.

To mount the assembly on the truck, position it on the right hand front wing as shown in fig. 11 and engage the locating dowels in the bracket with holes in the top of the wing. Secure it by means of the heavy clamping screw, which is inserted from below the wing. Tighten the screw firmly by hand.

- (3) Pigtail connector

To check the pigtail connector in the upper aerial base, take out four screws 'D' in the inset to fig. 11 and remove the upper aerial base from the top of the dipole tube. Screw an antennae rod 'G' section into the socket in the upper aerial base. Remove screws 'A' and 'E' in the inset. Loosen cap 'C' and push the insert 'B' down through the moulding by means of the rod.

Check that the pigtail connector is fitted between the two terminals as shown in the diagram. Re-assemble by pulling insert 'B' up to the top of the moulding by means of the aerial rod and refit screws 'A'. Reposition cap 'C'. Replace and secure screws 'E'.

- (4) Connector coaxial No. 132, 15-ft.

This is connector 'G' in the table on page 34. It has a straight entry coaxial socket at the aerial base end and an angled socket at the set end. The aerial base end is fitted inside the dipole tube and is protected by a rubber sleeve.

In order to fit the connector the upper aerial base must first be removed as instructed in paragraph (3). After removing this aerial base, pass the straight entry end of the connector up through the rubber aerial base and through the tube, and draw it clear at the top. Fit the straight entry coaxial socket to the plug on the underside of the upper aerial base. Engage the spring clip, indicated at 'F' in the inset to fig. 11, to retain the connector. Secure clip 'F' with a short length of copper wire as shown in the diagram to prevent it springing off and releasing the connector. To reassemble, push the upper aerial base down on to the top of the tube and secure by replacing the four screws 'D' in fig. 11.

Instructions for clamping the coaxial connector to the side of the truck are given on page 32.

- (5) Section antennae rod 'G'

One antennae rod 'G' section forms the upper half of the dipole aerial. It is utilised to remove and replace the insert at the top of the upper aerial

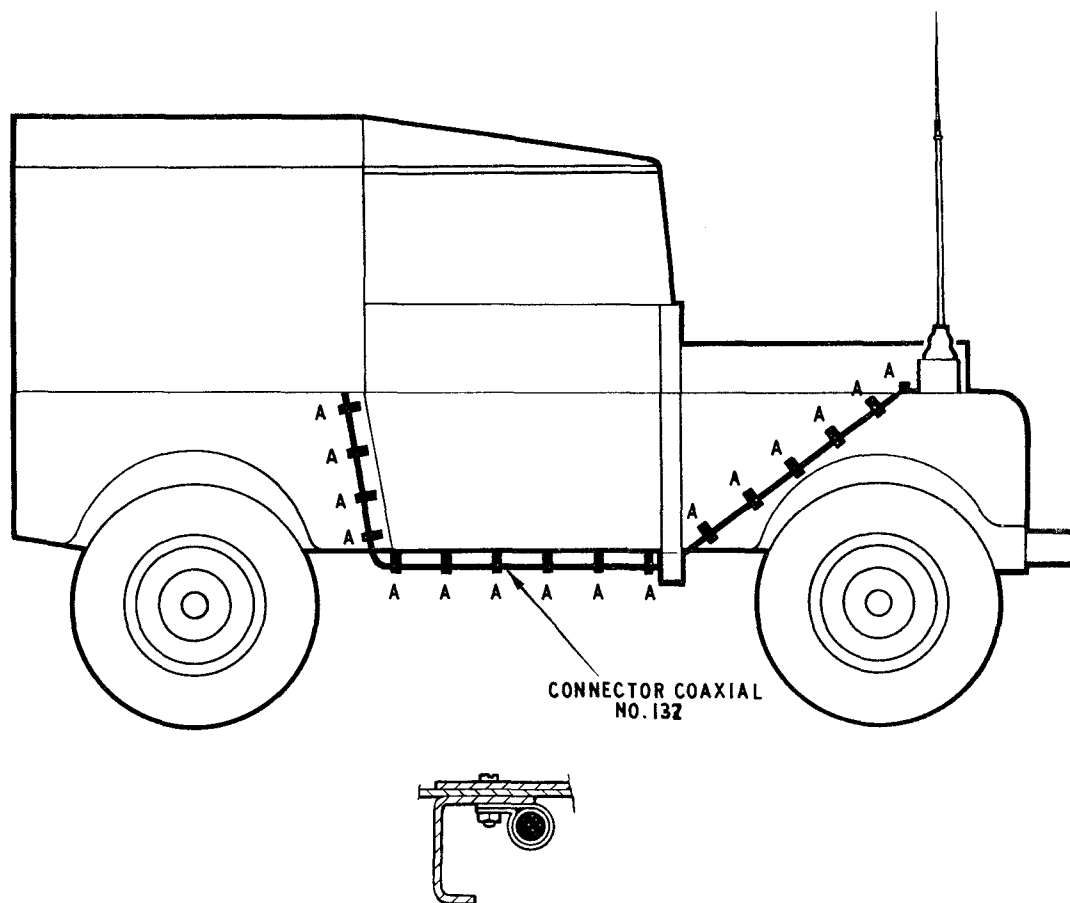


FIG. 12 FITTING CABLE CLAMPS

base (see paragraph (3)) but should not remain fitted when the set is not in operation.

(6) Clamping Connector coaxial No. 132

Clamps indicated at 'A' in fig. 12 are secured by means of No. 2 BA screws and nuts, for which holes have been drilled in the truck. The clamps, screws, nuts, etc., are supplied with the connector.

First fix the flexible conduit at each end with clamps against the ferrules. Then fit five clamps on the side of the right hand front wing, six along the underside of the door, four on the side wall, and two more on the top of the bulkhead, a total of nineteen clamps. The three clamps on the top of the bulkhead are not shown in fig. 12. Pass the connector behind the bottom of the door pillar, and note the method of securing the clamps below the floor.

(7) Paint the flexible conduit

Paint the flexible conduit covering the coaxial connector after clamping it to the truck, using priming and finishing paints appropriate to the theatre. Ensure that the paint is well worked into the seam in the conduit, and round the underside. Clamps, screws and nuts should also be painted.

Section 27. Batteries

- (1) Place two 12V batteries in the carrier on the floor of the truck. Position each battery with the output socket to the rear. Tighten the diagonal clamp to retain the two batteries.
- (2) These batteries provide two separate 12V supplies, one for WS 62 and one for WS BE201. Connections are shown on page 34.

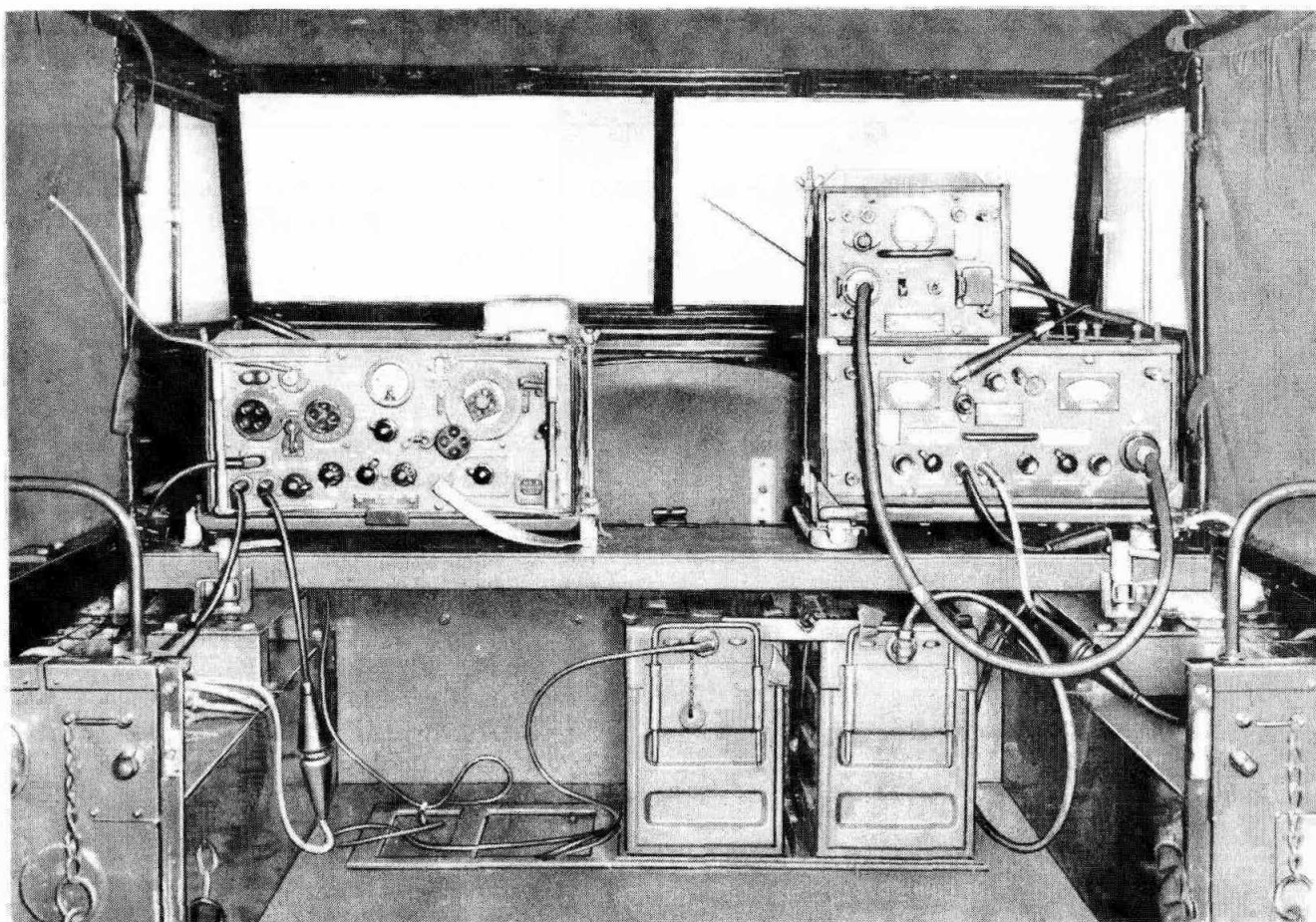


FIG. 13 TRUCK INSTALLATION

Section 28. Connectors in the truck

- (1) Connectors to be fitted between units in the truck are shown in the diagram on the opposite page and in the table below. Fit these connectors or check that they are in position.
- (2) Microphone and receiver headgear assemblies should not be attached to the wireless sets until they are required for use.
- (3) Note that connector 'A' is cut from the length of cable electric P13 supplied in the kit. Strip the ends of the cable back for approximately one inch and twist the strands firmly together to make a neat connection. Do not allow loose whiskers of wire round the terminals.

Fig. 14 ref.	Connector	Position
A	Cable electric HT P13, 27-in. length	External wing nut clamp on Aerial base No. 28 to AERIAL terminal on WS 62
B	Connector twin No. 274 (ZA38539)	12V INPUT plug on WS 62 to the output socket on one 12 volt battery
C	Connector copper braid No. 23, 8-in. (ZA46905)	EARTH terminal on WS 62 to terminal on the edge of the table
D	Connector copper braid No. 23, 8-in. (ZA46905)	Earth terminal on Carrier set No. 86 to earth terminal on table
E	Connector 6-pt. No. 62, 3-ft. 6-in. (ZA29749)	PSU No. 42 to POWER INPUT plug on WS BE201
F	Connector twin No. 363, 6-ft. (ZA38539)	12 VOLT plug on PSU No. 42 to the output socket on one 12 volt battery
G	Connector coaxial No. 132, 15-ft. (ZA51165)	Dipole aerial base on the right hand front wing to the AE FEEDER plug on WS BE201
H	Connector copper braid (supplied with table top)	End of table to bolt holding table runner to wheel arch. Ensure clean contact.
J	Headsets as required	

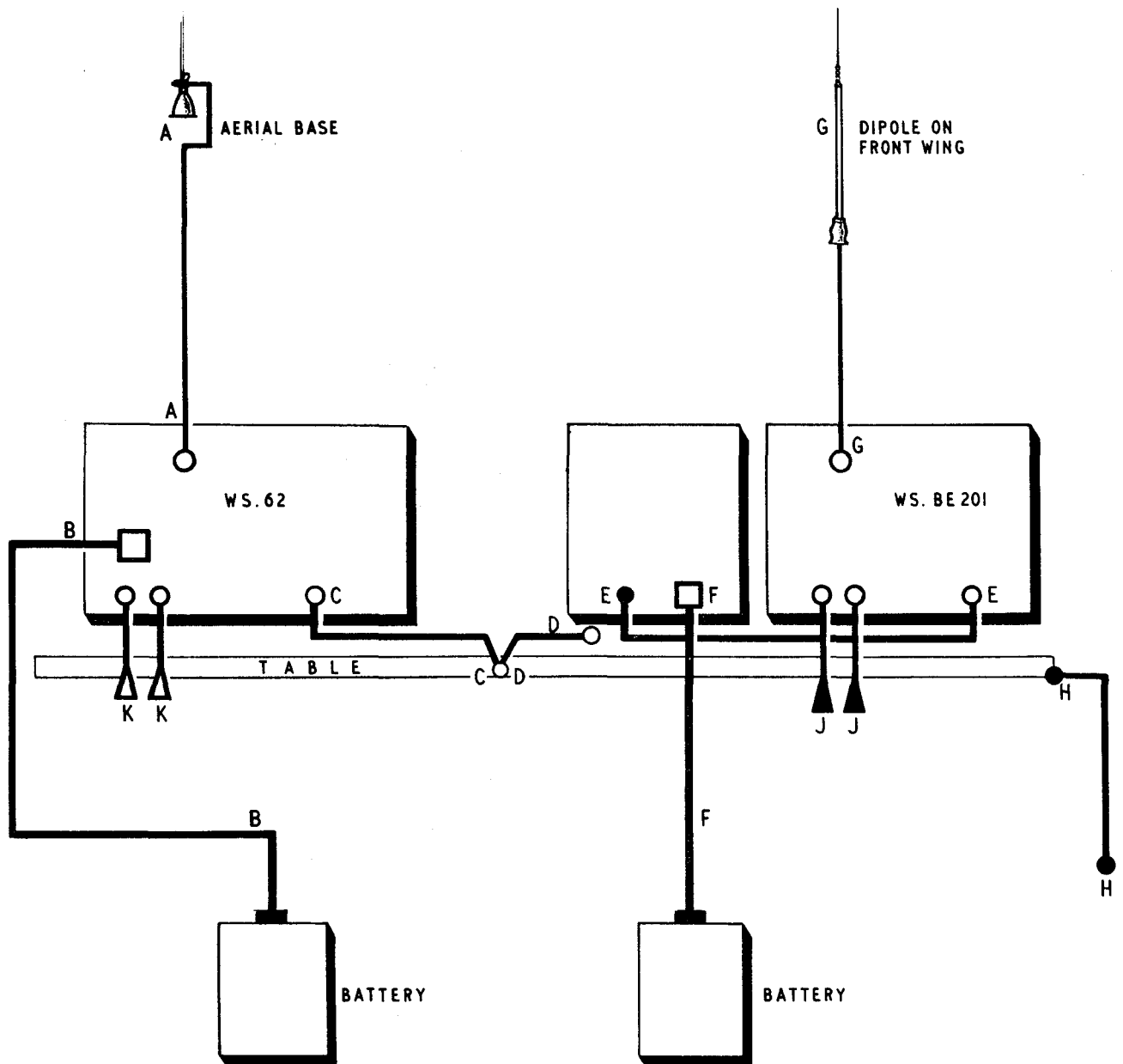


FIG. 14 TRUCK CONNECTOR DIAGRAM

## PART 2 - TRAILER INSTALLATION

### Section 29. Vehicle modifications

- (1) In the following paragraphs are relevant extracts from the EMERs, specifying the part of the modification which is required for this particular installation. This list does not include the full contents of the EMER modification instruction and is included here for information only. The kit is intended for installation in a Trailer  $\frac{1}{2}$ -ton GS cargo 2 wh. Mk. 2.
- (2) Essential modifications
  - (a) Sixteen holes are drilled in the floor for bolts which secure the base-board to the trailer chassis. Eight of these are used with four 'U' clamps and eight with plate assemblies.
  - (b) Ten holes are drilled in each wheel arch for screws which secure plates and clamps to hold WS Cdn 52 in its operating position.
  - (c) Four holes are drilled in the front wall for screws securing the fuse box and switch assembly.
  - (d) Four holes are drilled in the left hand wheel arch for screws which secure the adapter frame for the R209 carrier.
  - (e) Two aerial inlets with protecting flaps are provided in the canvas hood, one on each side.
  - (f) Eight locating marks are scored on side wall top flanges for hoop stick and aerial mounting clamps.



(3) Additional holes in the trailer

The following holes may also be drilled in the trailer, but these are not required for the installation in its present form.

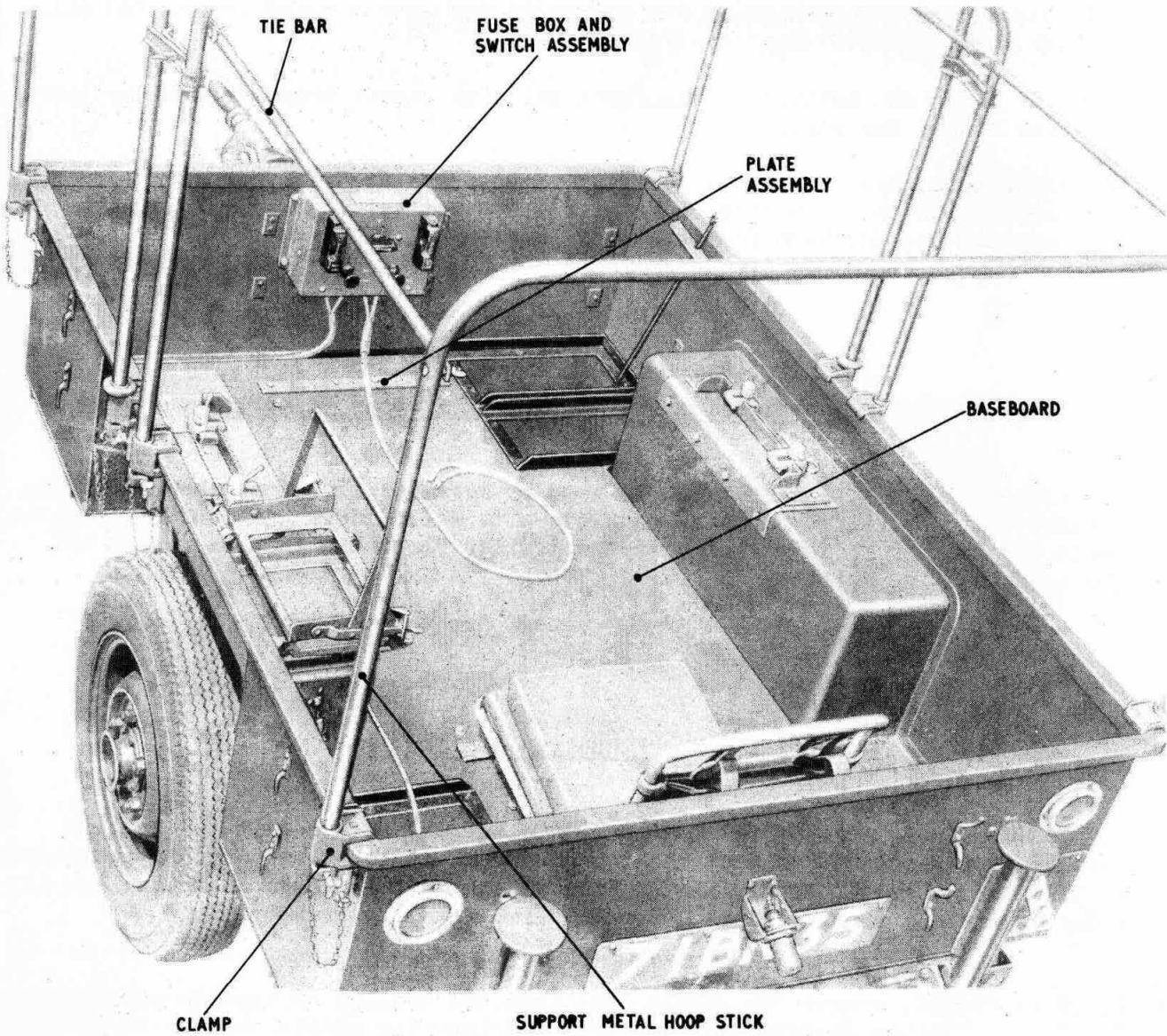
- (a) 18 holes are drilled in side and end wall top flanges for bolts which secure wooden battens. These battens, which increase the height of the walls, are required for parachute packing.
- (b) Four holes are drilled in the rear wall for screws which secure the charging switchboard adapter strips.
- (c) Six holes are drilled in the front wall for screws which secure the jerrican holder and strap.
- (d) Four holes are drilled in the right hand wheel arch for screws which secure the plate holding one end of a web retaining strap. This strap secures the jerrican in its stowed position.

Section 30. Installation kit items to be fitted by workshops

The wooden baseboard assembly can be used by workshop personnel when modifying the trailer. Extract it from the kit complete with all fixings and send it to workshops with the trailer. Fixing holes in the trailer floor can then be marked off from the baseboard in position.

Section 31. Preparing the trailer

- (1) Before commencing work on the trailer installation, ensure that the trailer hand brake is applied and that the three supporting legs are correctly adjusted to take the weight of the trailer. Firmly tighten the clamps on these legs in order to prevent tipping when personnel climb into the trailer.
- (2) If it is fitted, remove the canvas hood from the trailer to improve accessibility during fitting operations. See that the interior of the trailer is quite clean and dry.
- (3) Check the position of the towing eye on the two-bar assembly. This can be varied to suit the height of the hook on the towing vehicle and in this installation it must be in its lower position.



**FIG.15 TRAILER LOOKING TO THE FRONT**

Section 32. Trailer base board assembly

(1) Baseboard assembly, 5-ft. 9-in. x 4-ft. x  $\frac{1}{8}$ -in. thick

A wooden baseboard is to be fitted to the floor of the trailer. This baseboard is secured by means of 'U' clamps at the corners, and by two sets of plates. It is drilled where necessary and is fitted with a number of 'T' nuts (4 x  $\frac{5}{16}$ -in. and the remainder  $\frac{1}{4}$ -in.) by which the various carrying frames are screwed down. A 'T' nut is a metal insert which is driven into the wood from the underside, where it is retained by a flange. In this way it forms a tapped hole in the wood.

Note that a quantity of Screws, countersunk,  $\frac{1}{4}$ - 28 UNF 2A 1-in. in length are provided with the baseboard to secure battery carriers, which are issued without separate fixing screws. These screws, which fit the  $\frac{1}{4}$ -in. 'T' nuts, are supplied in a linen bag attached to the baseboard.

(2) 'U' clamps

Locate the baseboard on the trailer floor as shown in fig. 15. Pass four 'U' shaped clamps down through the baseboard and floor from above. On each 'U' clamp fit a fish-plate to secure it to the trailer chassis section. Secure each 'U' clamp with washers, nuts and lock nuts.

(3) Plate assembly,  $16\frac{5}{8}$  x 2-in.

Position a plate on the baseboard at the front end as shown in fig. 15 and align the four fixing holes with holes drilled through the baseboard and floor. Against the underside of the floor assemble two short backing plates, as a full length plate cannot be fitted here. Secure the assembly with four  $\frac{5}{16}$ -in. x  $2\frac{1}{8}$ -in. screws passed down through from above, with nuts and lock nuts fitted under the floor.

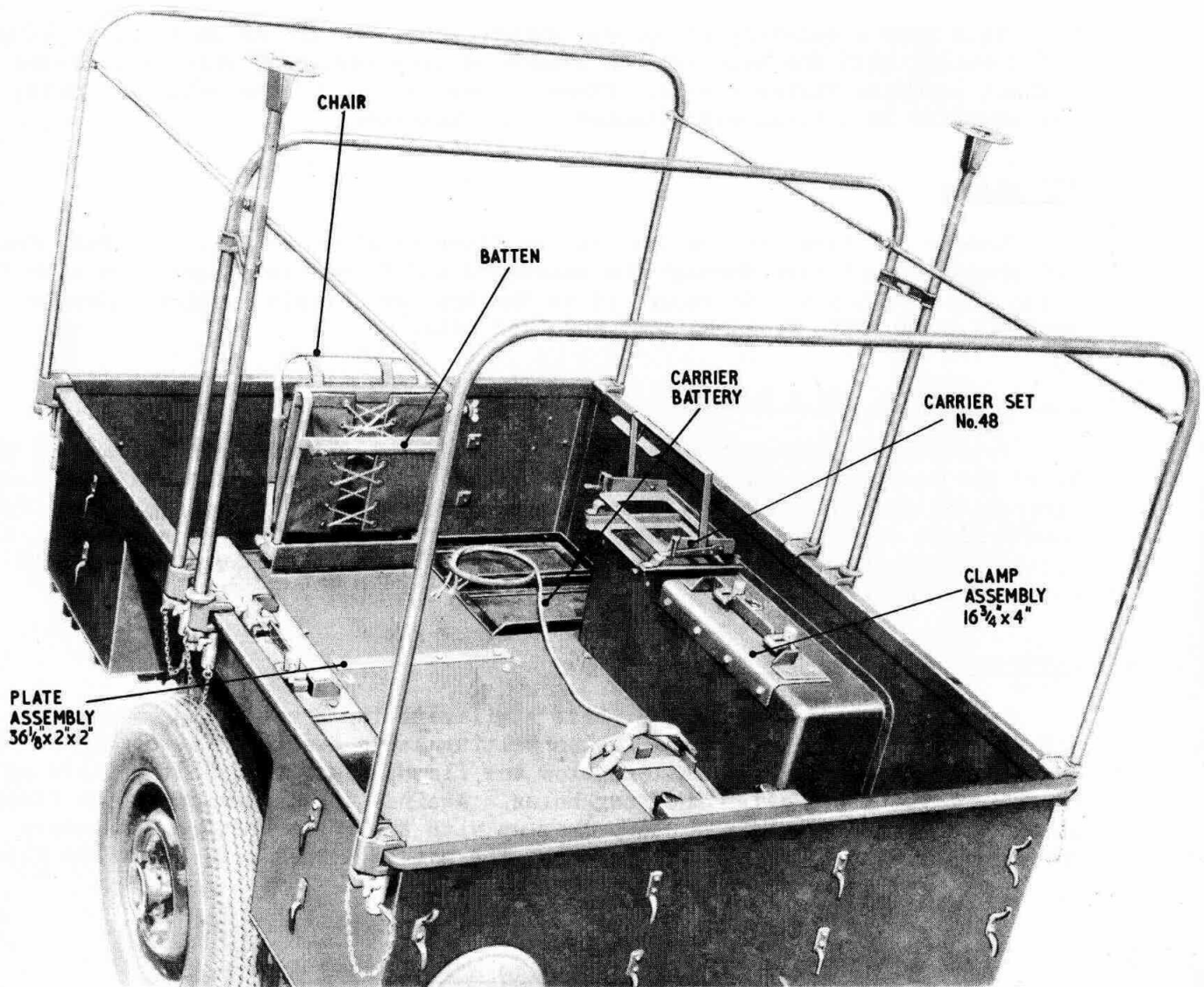
(4) Plate assembly,  $36\frac{1}{8}$  x 2 x 2-in.

For the rear assembly use a plate similar to the front fixing, together with two pieces of Balata transmission belting and a length of steel angle section fitted across the trailer below the floor. Position the top plate as shown in fig. 15 and align the four holes. Against the underside of the floor place two pieces of belting, clamp them up with the angle section and secure the assembly with four  $\frac{5}{16}$ -in. screws. Fit nuts and lock nuts below the floor.

Section 33. Fuse box and switch assembly

(1) Fitting the assembly

Locate four holes in the front wall of the trailer. Position the switch unit with the terminal panel downwards and secure it with four screws  $\frac{1}{4}$ -in. x 1-in. Fig. 15 shows the unit fitted.



**FIG. 16 TRAILER LOOKING TO THE REAR**

(2) Connections

The input terminals are concealed by a cover plate. Take out two No. 2BA screws and remove this plate. The four terminals on the insulating strip are for connections respectively to battery 1 (-) and (+) and battery 2 (-) and (+). Details of power supply connections are given on page 47.

Section 34. Batteries

(1) Carriers battery secy. port., 17 $\frac{1}{2}$  x 16-in.

Two battery carriers are to be attached to the wooden baseboard on the floor of the trailer. Place one battery carrier in the left hand rear corner as shown in fig. 16, with the open ends towards the centre. Secure it by means of ten  $\frac{1}{4}$  x 1-in. screws inserted into 'T' nuts. Place the second battery carrier in the right hand front corner, also with the open ends to the centre, and secure in a similar manner. These screws are provided with the baseboard.

(2) Batteries, secy. port., 6V 170 Ah

Place two batteries in each carrier, positioned so that the lids open outwards. Arrange the diagonal clamps on the carriers but do not tighten them down until after battery leads have been fitted, for which instructions are given on page 49.

Section 35. Operator's chair

(1) Chair tubular frame, 20 x 17 x 15 $\frac{1}{2}$ -in. Mk. 2

Remove the four wing nuts and screws from the seat base frame. These are not required and should be returned to stores. The holes are used to secure a wood batten and a hinge.

(2) Batten, wood, 13 x 1 $\frac{3}{8}$  x 1-in.

Attach the wood block to the under side of the strip at the front of the seat base frame. The block is supplied in the kit, together with two screws  $\frac{1}{4}$ -in. x 1 $\frac{1}{2}$ -in. It is indicated in fig. 16.

(3) Hinge assembly, 15 x 2 $\frac{1}{2}$  x -in.

Attach the hinge to the strip at the rear of the seat frame by means of two screws  $\frac{1}{4}$ -in. x 1-in. with nuts and washers. Then secure the hinge to the baseboard by means of three screws  $\frac{1}{4}$ -in. x 1-in. inserted into 'T' nuts. Fig. 16 shows the seat hinged upwards and fig. 15 shows it down for operating.

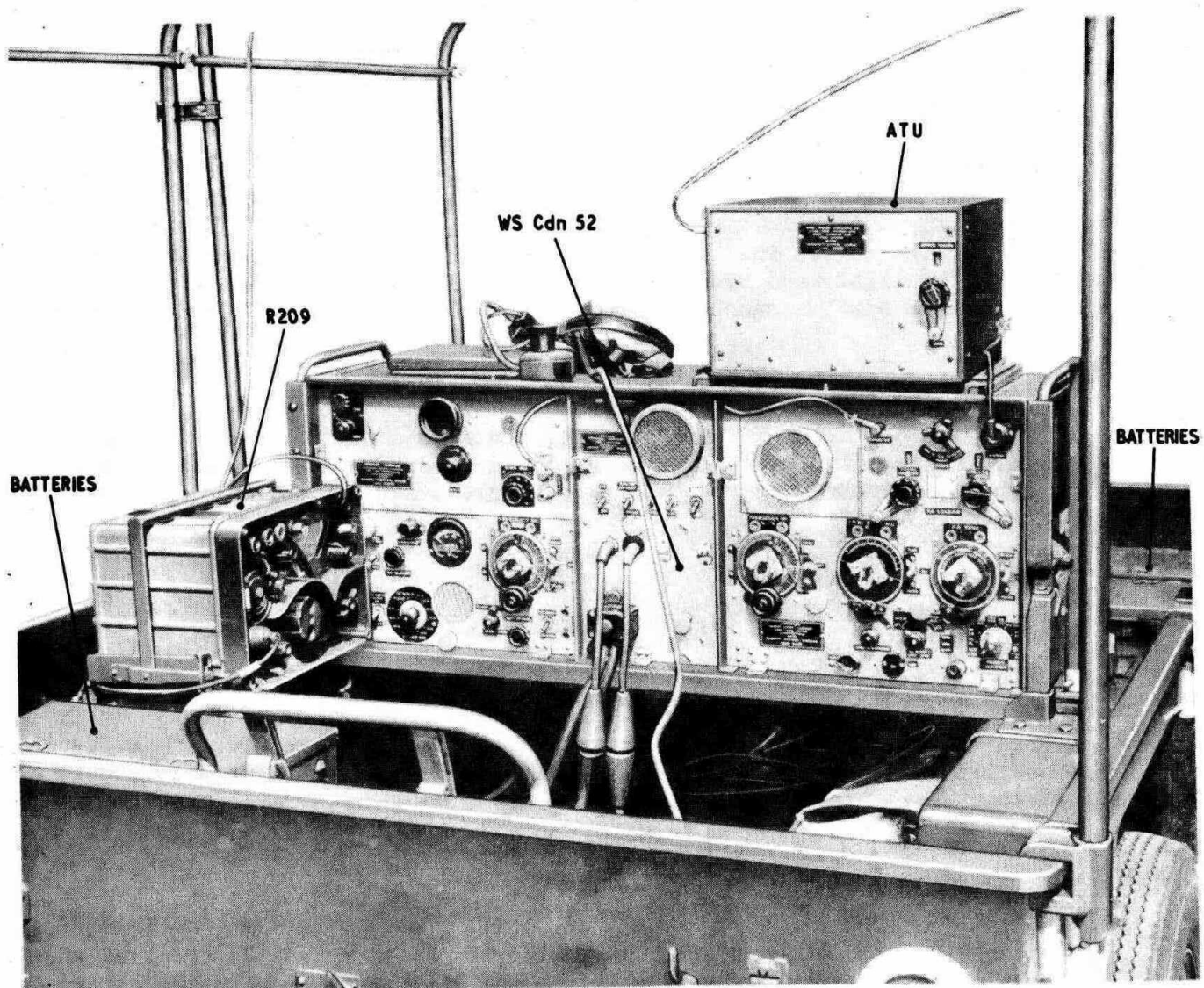


FIG.17 TRAILER INSTALLATION WITH HOOD REMOVED

Section 36. WS Cdn 52 assembly

(1) Clamp assembly,  $16\frac{3}{4}$  x 4-in.

WS Cdn 52 is mounted across the wheel arches, with a clamp at each end attached to a mounting plate. Locate ten holes in one wheel arch, six in the top and four in the side, and position an angled mounting plate over the holes as shown in fig. 16. This plate has a piece cut away on the outer edge.

(2) Plate assembly,  $17\frac{1}{2}$  x  $5\frac{3}{4}$ -in.

Position an angled backing plate inside the wheel arch, and fasten the two plates with four  $\frac{1}{4}$ -in. x 1-in. screws fitted in the upright portion of the wheel arch, with lock nuts inside the wheel arch. Place a clamp on the mounting plate as shown and secure with six  $\frac{1}{4}$  x 1-in. screws. Fit lock nuts inside the wheel arch.

In a similar manner mount the second clamp assembly and plate assembly on the other wheel arch.

(3) WS Cdn 52

Place the wireless set in its operating position in the trailer, where it rests across the wheel arches on its carrier. Fig. 17 shows the wireless set installed with its control panel towards the rear of the trailer. Retain the set by means of two screw clamps on each side, ensuring that each clamp engages in a slot in the end of the set carrier and is securely tightened down.

The WS Cdn 52 shown in the illustration is not fitted with the power supply modification unit.

(4) Aerial tuning unit No. C1

Mount this unit in its operating position on the top of WS Cdn 52 as shown in fig. 17. Secure it by means of four wing screws inserted into the top of the set and turned.

(5) Connectors

Connectors to WS Cdn 52 are shown in fig. 20 and in the table on page 49.

(6) Stowage position for WS Cdn 52

If it becomes necessary to stow the WS Cdn 52 on the floor of the trailer, the set clamps can be attached to the baseboard. These clamp assemblies are then used instead of the top plates mentioned in paragraphs (3) and (4) on page 39, each secured with the four 5/15-in. screws mentioned, plus two additional screws inserted into the baseboard.

Section 37. Reception set R209 Mk. 2

(1) Frame assembly,  $11\frac{1}{4}$  x  $10\frac{3}{8}$ -in.

Locate four holes and position this adapter frame at the rear end of the left hand wheel arch. Assemble a backing plate under the two holes in the top of the wheel arch and secure the assembly with two  $\frac{1}{4}$ -in. x 1-in. screws, fitting lock nuts against the backing plate inside the wheel arch. Fit two similar screws to hold the adapter to the side of the wheel arch, with lock nuts inside the arch. Fig. 16 shows the adapter plate fitted.

(2) Carrier set No. 48

Mount this carrier on the above frame, with the open side towards the centre of the trailer. Secure it by means of four screws  $\frac{1}{4}$ -in. x 1-in. passed through the resilient mountings and inserted into tapped holes in the frame. For stowage, Carrier set No. 48 can be secured to the baseboard in the right hand rear corner. The same screws are used, inserted into 'T' nuts in the baseboard.

(3) R209

Place the R209 in Carrier set No. 48 on the left hand wheel arch with the control panel towards the centre, as shown in fig. 17. Arrange the clamping device and tighten it down on each side to retain the set.

(4) Connectors

Connectors for the R209 are shown in fig. 20 and in the table on page 49.

Section 38. Canvas hood assembly

(1) Clamp assembly,  $5.11/16$  x  $3.5/16$  x  $3.1/16$ -in.

Six clamps are to be fitted to the top lips of the side walls for hoop sticks, three on each side, positioned as follows:

one as near the front as possible, one as near the back as possible, and one  $5\frac{1}{2}$ -in. to the rear of the plate marking the trailer centre of gravity.

The clamp at the left hand rear corner is indicated in fig. 15 and the others can be seen in this illustration. Tighten each clamping screw with the captive tommy bar.

(2) Supports metal hoop stick No. 1

Fit three tubular hoop sticks to the six clamp assemblies and tighten the wing screws on the clamps to hold the hoops down.

(3) Tie bars metal,  $35\frac{1}{8}$ -in. x  $\frac{5}{8}$ -in.

Fit four tie bars between the hoop sticks and secure them by means of the wing nuts on the hoop sticks. The assembly of hoop sticks and tie bars is shown in fig. 15.



(4) Hood canvas trailer, 70 x 57 x 35-in. No. 1

The hood must be in position before the aerial base mountings are fitted, as the mountings project through the aerial inlets. In the illustrations shown here the hood was left off for the sake of clarity. Arrange the hood over the hoop sticks but do not complete the lashing until the aerial mountings are in place.

Section 39. Aerial mountings

(1) Clamp assembly, 5.11/16 x 3.5/16 x 3.1/16-in.

Two clamps are to be fitted for aerial mountings; one of these is shown in fig. 18. Fit one to the lip of the wall on each side, located over the plate marking the trailer centre of gravity. Tighten the clamping screw with the captive tommy bar.

(2) Aerial mounting for WS Cdn 52

(a) Aerial base No. C2

Fit this aerial base to the undermentioned Disc and screw it up firmly. See fig. 19.

(b) Disc, non-metallic SRBP, 2.3/16 ID x 6-in. OD x  $\frac{1}{4}$ -in.

Bolt this disc to the undermentioned bracket assembly as shown in fig. 19.

(c) Bracket assembly MS, 6 x 5.11/16 x 3/16-in. thick

Bolt this bracket to the top of a mounting aerial base as shown in fig. 19. Use six screws with nuts and lock nuts.

(d) Mounting aerial base, 37 $\frac{1}{2}$ -in. No. 1 with Aerial base No. C2

Erect the mounting carrying Aerial base No. C2 in the clamp on the right hand side, passing it down through the inlet in the hood and screwing it tightly into the socket.

NOTE: If the locking screw is in the tapped hole in the base of the vertical mounting, remove it and screw it up into the base of the socket on the clamp before attempting to fit the mounting.

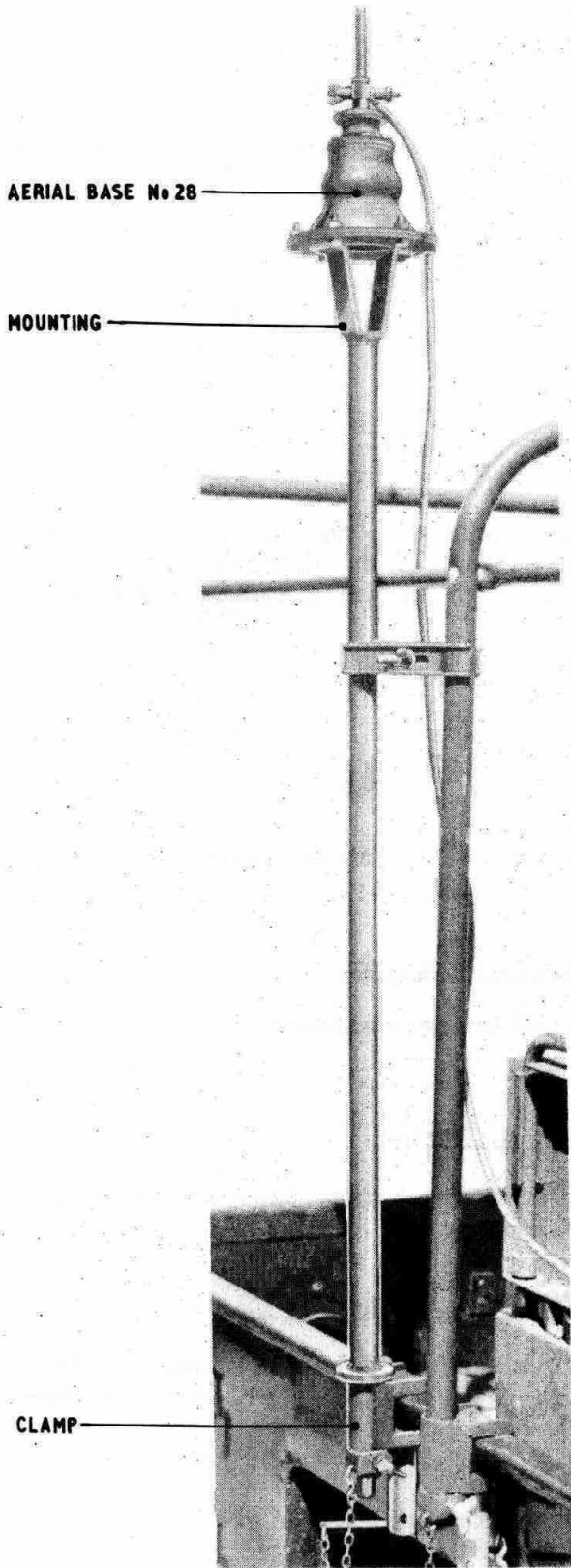


FIG. 18 AERIAL ASSEMBLY FOR R 209

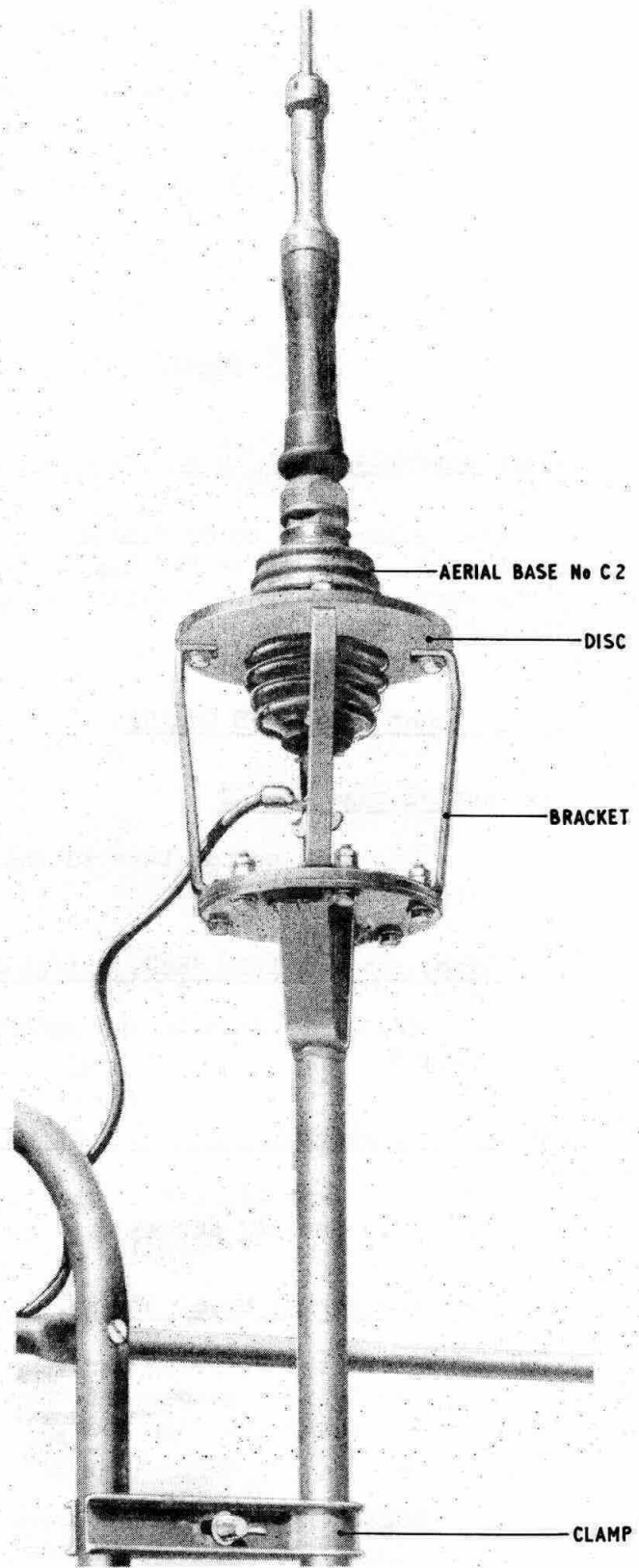


FIG. 19 AERIAL ASSEMBLY FOR WS CDN 52

(3) Aerial mounting for R209

(a) Aerial base No. 28

If a pigtail connector is supplied inside Aerial base No. 28 it must be removed. Bolt the Aerial base No. 28 to the top of a vertical Mounting aerial base  $37\frac{1}{2}$ -in., using six 1-in. screws, nuts and lock nuts, as shown in fig. 18. The copper braid connector which forms part of the aerial base should be secured externally between one of these six screws and one of the screws in the ring at the top of the aerial base.

(b) Mounting aerial base,  $37\frac{1}{2}$ -in. No. 1 with Aerial base No. 28

Pass the bottom of this tubular aerial base mounting down through the aerial inlet in the left hand side of the hood and fit it into the clamp on the trailer wall. Screw it tightly into the socket by means of the captive screw in the base of the socket and the captive tommy bar. See the Note above. Fig. 18 shows this assembly fitted on the trailer.

(4) Clamp assembly, SD/B.165761

Two clamps are provided to steady the top of the aerial mountings. Inside the trailer fit one clamp between each vertical aerial mounting and the adjacent hoop stick as shown in fig. 19. Position the clamps right up against the inlet in the hood and tighten the centre screw, adjusting the centre spacing as necessary.

Section 40. Connectors in the trailer

(1) Connector diagram

Details of wireless equipment connectors for the trailer station are shown in fig. 20 and in the table on page 49. Attach them as indicated or check that they are in position. Make sure that plugs and sockets are correctly located and that locking rings are screwed up firmly by hand. Arrange the connectors neatly and avoid large loops by threading long connectors under those that fit closely.

(2) Battery connections

When making battery connections, always fit the series connector and the battery negative earth lead before positive and negative connectors. Ensure correct polarity with all battery connections.

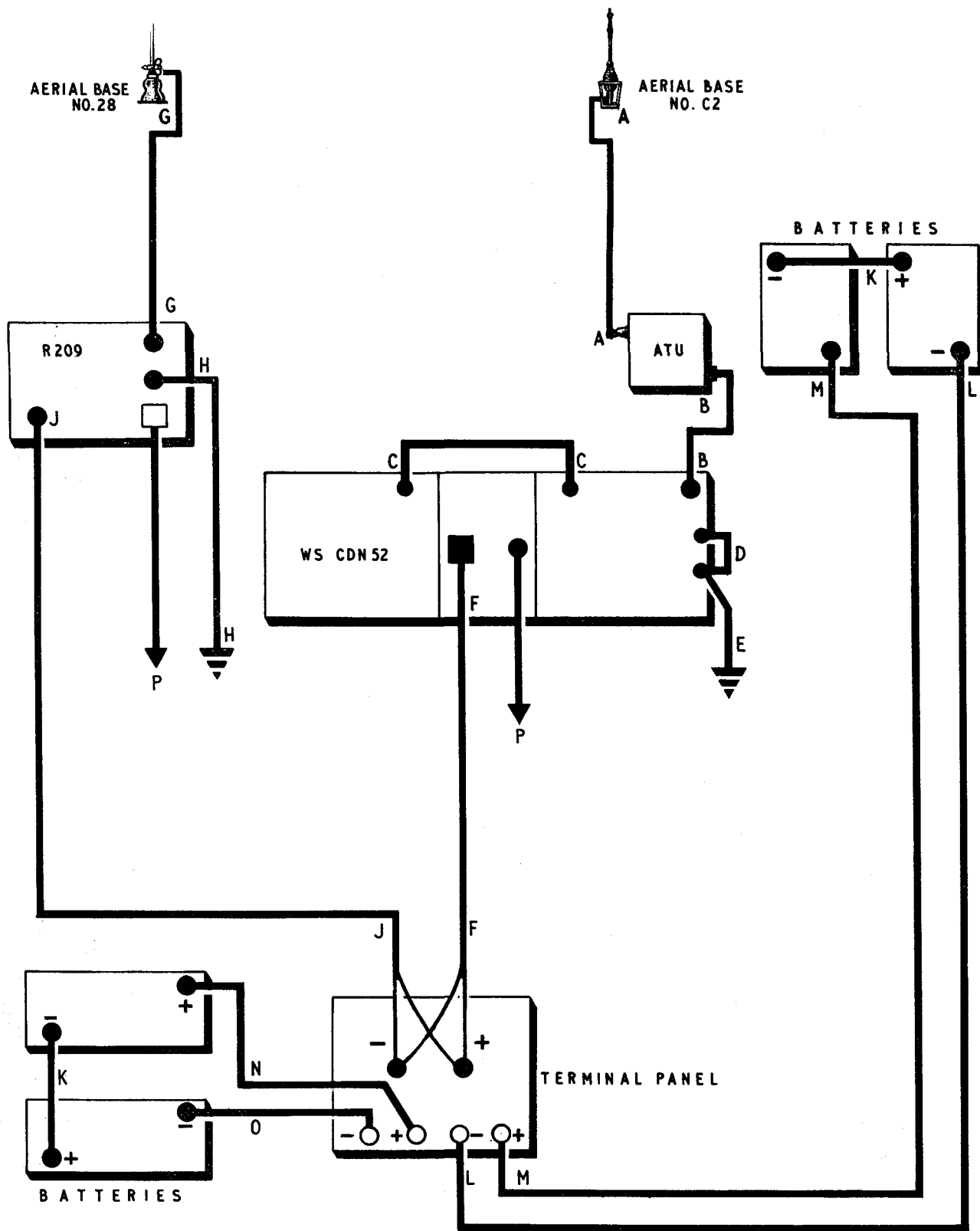


FIG.20 CONNECTOR DIAGRAM FOR THE TRAILER

Fig.20 ref.	Connector	Position
A	Leads aerial No. C1	Aerial base No. C2 to aerial terminal on ATU
B	Leads aerial No. C6	WS Cdn 52 sender AERIAL socket to terminal on right hand side of ATU
C	Leads aerial No. C7	WS Cdn 52 sender AERIAL terminal to receiver AERIAL terminal
D	Earth strips	Upper to lower portions of WS Cdn 52 carrier (RH side)
E	Connector copper braid 8-in.	WS Cdn 52 carrier to bolt on wheel arch (RH side)
F	Connector twin No. 17 Cdn	Terminal panel on Fuse box and switch assembly to WS Cdn 52 supply unit. Tighten retaining screw at supply unit end.
G	Cable electric P13, 5-ft. length	Wing nut terminal on Aerial base No. 28 to AERIAL terminal on R209
H	Connector copper braid No. 23, 8-in. (ZA46905)	Earth terminal on R209 to base of carrier
J	Cable assembly, 10-ft. (ZA54558)	12V INPUT plug on R209 to OUTPUT terminals on battery switch unit. Ensure correct polarity
K	Connector single No. 3A (ZA0781) (two)	Joins two 6V batteries in series One for each battery
L M	Cable assembly, 6-ft. 6-in. (ZA54555)	Front pair of batteries to Bty 1 terminals on the battery switch unit
N O	Cable assembly, 11-ft. (ZA54556)	Rear pair of batteries to Bty 2 terminals on the battery switch unit
P	Headsets as required	

NOT SHOWN	Connector 5-pt. No. 34 Mk. 1/1, 10-ft. 5-in. (ZA27295)	Headset extension lead
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ENSURE CORRECT POLARITY  
WITH BATTERY CONNECTIONS

Section 41. Spares and unused equipment

(1) Spare screws, nuts, etc.

Certain equipments are supplied with spare screws, nuts, washers, etc. Deposit them in unit stores.

(2) Unused equipment

Certain items supplied in the WS Cdn 52 Kit No. 2, the operating kit, are not required in this station. These items include the Switchboard charging No. C5 and various connectors used with it. They should be returned to stores on completion of the installation.

Various spares and other items supplied in this Kit No. 2 may not be required in the vehicle at all times. Any such items should be packed and labelled and deposited in unit stores.

Section 42. Test the installation

- (1) After completing the installation, inspect all fittings ensuring that bolts and nuts are securely tightened.
- (2) Check that the terminations of all connectors are firmly attached to the appropriate points.
- (3) Ensure that the installation is complete and that all items of equipment are clean and dry.
- (4) Examine the level of the electrolyte in the batteries and, if necessary, top up with distilled water.
- (5) Carry out a thorough mechanical test on the installation. This can best be achieved by driving the vehicle for a few miles over moderately uneven road surfaces. Check any brackets or other fittings which show defects, and repeat the test.
- (6) Although the wireless equipment should have been inspected when it was issued from stores, it is advisable to ensure that its serviceability has not since been impaired. Conduct normal routine tests on the wireless equipment in accordance with the user handbooks.

## CHAPTER 5

# DISMOUNTING THE INSTALLATION

### Section 43. Conversion from vehicle station to ground station

- (1) If the wireless equipment is dismantled from the vehicles for use in a ground station the general layout of units must remain unchanged in order to use the existing inter-unit connectors. Operating procedure is the same whether the equipment is fitted in a vehicle or on the ground.
- (2) Reception set R209 and WS 31 are sealed to withstand exposure. WS Cdn 52, 62 and BE201 are not sealed. These assemblies must therefore be kept clear of the ground and covered in wet weather.
- (3) The undermentioned points should be noted when the equipment is being dismantled.
- (4) Connectors

Before dismantling a wireless set assembly, release all connectors except those between units forming the assembly. In the ground station refit the connectors, referring to the instructions on pages 34 and 49. Inter-unit connections will in general be the same whether the wireless equipment is installed in a vehicle or a ground station.

- (5) WS Cdn 52

This set can be lifted from the trailer after releasing four clamps retaining it to the brackets on the wheel arches. The complete assembly weighs approximately 270 lb., or 255 lb. without the aerial tuning unit.

- (6) WS 62

Release the top clamping bar and lift the set from the carrier. The carrier remains in the truck. The weight of the complete WS 62 is approximately 30 lb.

(7) WS BE201

Slacken two screw clamps on the carrier mountings. Lift the carrier containing set and supply unit by means of the handles on the carrier. The two mountings remain on the table in the truck. See fig. 8. WS BE201 assembly weighs approximately 60 lb.

(8) R209

Release the side clamps on Carrier set No. 48 and lift out the set. The carrier remains in the trailer. The weight of the R209 is approximately 24 lb.

(9) Aerials

No provision is made for using rod aerials with the vehicle mounted sets in the ground station and all sets should be connected to alternative types of aerial as shown in paragraph 3 on pages 10 and 11, where these are supplied. The only exception is WS 62, which is fitted with an aerial base for use when the set is employed in the manpack role.

(10) Batteries

Power supplies in the ground station should be the same as those for the vehicle station. Remove the batteries from the carriers in truck and trailer and connect them in the ground station.

(11) Further information on weights and dimensions is given in the table on page 8.

Section 44. Recovering the installation kit from a vehicle to be evacuated

- (1) If either or both vehicles are evacuated as "beyond local repair", or if for any other reason they are removed from the charge of the unit holding the wireless equipment, all items of installation kit must be dismantled from the vehicle to be evacuated. This includes all equipment for which fitting instructions are given in this handbook and all stowed equipment. These items must be retained by the unit to await installation in a replacement vehicle.



- (2) Failure to remove installation kit items from an evacuated vehicle would cause considerable delay and difficulty in re-installing the wireless station in a replacement vehicle.
- (3) The fitting of the following item constitutes a modification to the truck and it should not be removed. Replacements should be obtained in order to complete subsequent installation.

Disc rubber rivet assembly  $3\frac{1}{2}$ -in. dia fitted on the canvas hood.

- (4) The following items, removed from the Rover in order to install the wireless station, should now be refitted in their original positions.

Seats on wheel arches

Clamp securing the spare wheel in the rear of the truck.





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