

RAF

TPT AC AND HELS

PERFORMANCE DETAILS OF TPT AC

Ac.	Cruise Speed (kts)	Runway or Strip (yds)	Fuel	Max payload/ Tps	Max range/ (lbs/nm)	Max range/ payload (lbs/nm)	Utilisation (hrs/month)	Remarks
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
WIA C1	300	1,800	AVTAG/AVTAG	113	35,000/2,800	16,000/5,900	70	Typical load = 4 x 1-ton ROVERS + 4 x 1-ton tugs + 11 tugs.
C2	418	1,900	AVTAG/AVTAG	44	44 tps/1,900	32 tps/2,300	100	Tps and kit only: can carry 6 stretcher patients.
Y C1	240	900	AVTAG/AVTAG	70	27,000/500	6,000/1,700	70	Typical load = 3 x 1-ton AUSTIN trucks.
LEY C1	150	1,400	AVGAS	94	37,000/150	3,000/2,000	60	Typical load = 3 x FERRERS Mk 1 + 6 tugs.
NGS C2	200	1,800	AVGAS	44	15,600/1,150	5,500/2,200	60	Typical load = 2 x 1-ton ROVERS + 2 x 1-ton tugs with drivers.
OU	160	540	AVGAS	32	7,525/100	3,500/950	Not known as yet	Can carry 22 stretcher cases in the cas evac role. Has capacity for 2 jeans.
ER CC1	100	300	AVGAS	4	1,000/100	0/750	65	Can carry 1 stretcher + 2 passengers in cas evac role.
PIONEER CC1	95	375	AVGAS	12	3,000/100	2,000/600	50	Can carry 9 x stretchers + 2 passengers in cas evac role.
DERE	100	-	AVTAG	18	5,000/50	1,800/300	40	Can carry 12 stretchers in the cas evac role.
X 2	95	-	AVTAG	14	3,800/40	1,800/300	40	Can carry 8 stretchers in the cas evac role.
WIND 10	85	-	AVTAG	8	1,800/50	500/300	40	Can carry 6 stretchers in the cas evac role.

Performance figures are quoted for take-off at sea level in temperate conditions. High altitude airfields (eg NAIROBI - 6,000 ft) and high runway temperatures will reduce payloads significantly.

Radius of action for MR and SR ac can be calculated approx by taking 50% of the ranges quoted if the return flt is unladen or 40% of range if the return flt is with load.

Max range/payload in colm (g) for each ac is the max range with a useful load. Absolute max ranges for reinforcement are, in fact, a little higher in the majority of cases.

GLOSSARY OF SIG TERMS

The fol are some of the terms frequently used in connection with comms. Those marked * are the agreed NATO terms. The more tech ones have been omitted.

<u>Term or Abbreviation</u>	<u>Meaning</u>
ACT	Apparatus Carr Tele (see Carr Eqpt).
ADPS	Automatic Data Processing Systems. A complete system based on the use of electronic computers for the solution of problems and the storage of info of a mil nature. The term also inclns the means of comm between computers and between the input device and the computer when they are separated.
AM	Amplitude Modulation (see Modulation).
*Audio Freq	A freq which can be detected as a sound by the human ear. The range of audio freqs extends from 20 to 20,000 cycles per sec.
Bandwidth	All those freqs lying between two particular pts in the freq spectrum. It is usually expressed by the difference between these freqs.
Carr Eqpt	Eqpt which can provide more than one speech channel over a comm system.
CFS	Carr Freq Shift. A method of tg usually found on radio systems where a sig is transmitted by slightly displacing the fundamental freq on which the eqpt is working.
Channel	A band of freqs which can be used to provide either speech or tg comms between two places.
Channelling Eqpt	See Carr eqpt. The two are synonymous.
*Cipher, Off-line	A method of encryption which is not associated with a particular transmission system and in which the resulting cryptogram can be transmitted by any means.
*Cipher, On-line	An automatic method of encryption associated with a particular transmission system, whereby sigs are encrypted and passed dir to line to op the reciprocal eqpt at the distant sta.
*Circuit	An electronic path between two or more pts capable of providing a no of channels.
Circuit, 2-wire	A comm system where the sigs originated at each end use the same path, eg a normal tele pt to pt link over a cable pair.
Circuit, 4-wire	A comm system where the send and receive dirs of signalling are kept physically or electrically separate.
Crystal Con	The use of the mech and electrical properties of a crystal (quartz or other similar minerals) to con the operating freq of a radio system. This method is noted for its accuracy and stability.
*Cycle	One complete positive and one complete negative alternation of a current or voltage.
*Duplex	The provision of comm between two pts in both dirs simultaneously.
Exchange CB	Central bty exchange. An exchange with CB facilities is one where the user lifts his tele to call an op. The op sees a lamp lit up for the extension concerned. The power to op this lamp is provided from a bty system loc at the exchange.
*Facsimile	A system of telecommunication for the transmission of fixed images with a view to their reception in a permanent form.
*FDM	Freq Div Multiplex. A multiplex system in which two or more sigs are transmitted simultaneously over a common path, each sig occupying a different freq band.
Freq	The no of cycles occurring in a fixed period of time, usually one sec.
FM	Freq Modulation (see Modulation).
Freq Spectrum	All freqs ranging from the lowest (ie sub-audio) to the highest yet detected (ie cosmic rays).
Generator	Apparatus for producing AC electricity.

GLOSSARY OF SIG TERMS (Cont.)

<u>Term or Abbreviation</u>	<u>Meaning</u>
Modulation	Varying a fixed sig with the particular sig to be transmitted. This can be done in a no of ways eg amplitude modulation varies the amplitude of the fixed sig in dir sympathy with the characteristics of the sig to be transmitted. Freq modulation varies the instantaneous freq of the fixed sig in dir sympathy with the characteristics of the sig to be transmitted, etc.
*Multiplex	Denotes the simultaneous use of a no of channels on a single circuit.
PM	Phase Modulation (see Modulation).
Printed Circuit	A production method whereby internal wiring of eqpt is dispensed with and replaced by an insulating material on which lines of metal are deposited in such a manner that an electric current can flow to and from components mtd on the material.
Radio Relay	A means of providing circuits comparable with a line circuit by using radio techniques.
Repeater	A device to amplify a sig.
SHF	Super High Freq. 3,000 to 30,000 Mc/s.
*Sideband	The freq band above or below the carr, produced by the process of modulation.
Simplex	The provision of comms in one dir only at any one time.
*Swbd Magneto	A manual tele exchange at which the subscribers and ops call and clear by means of magneto generators.
*Tape Relay	A method of receiving and retransmitting msgs in tape form.
*TDM	Time Div Multiplex. A multiplex system in which the total avail circuit time is divided between the no of channels to be transmitted.
*Telecommunication	Any transmission, emission or reception of sigs, signs, writing, images and sounds or int of any nature by wire, radio, vis or other electro-magnetic systems.
*Tg	A system of telecommunication for the transmission of int by the use of a sig code.
*Telephony	A system of telecommunication set up for the transmission of speech or, in some cases, other sounds.
Transistor	A device using semi-conductor materials which displays many of the advantages of the thermionic valve but requires less power and is smaller. At the present it suffers from limitations of freq and power handling capacity.
UHF	Ultra-High Freq. 300 to 3,000 Mc/s.
Watt	A unit of power. A powerful electric lt bulb uses 100 watts. A single bar electric fire uses about 1,000 watts.
Wavelength	The distance, usually measured in metres, between any two adjacent identical pts on a waveform.
VF	Voice Freq, ie audio freq tones.
VHF	Very High Freq. 30 to 300 Mc/s.
Yagi Aerial	A particular type of directional aerial to handle VHF sigs.

ED RADIO AND RR EQPT

Item No. 1)	Replacing	Principal Role	Other Roles	System	Freq Coverage (Mc/s)		Range (miles) (Note 2)		No. of Channels	Wt (lbs) incl Batts	Remarks
					(c)	(d)	(e)	(f)			
0	68T	Inf Pl/coy (in spec condit.)	-	AM	2-10	Voice <u>5</u> <u>TG</u> 11	3	4.	20 (incl. dry batts)	Channels are pre-set, crystal con. This is an AUST set for use in jungle areas and elsewhere where VHF is unsatisfactory. Shortwave ranges of up to 40 miles voice and 120 miles CW may be obtained with correct choice of aerial and freq.	
	-	Para Bde GP	-	AM	6-10	Voice <u>15</u> <u>TG</u> 25	10	-	29	Replacement set for this role is under development.	
	-	Para Bde GP (para-dropped)	-	AM	2-12	Voice <u>only</u> <u>Up to</u> 800	20	-	30	Morse only. Replacement set is under development.	
52	SLES	Cond nets in divs and bde GPS	Sles Regt rear links. HF radio links at corps.	AM	2-16	Voice <u>25</u> <u>TG</u> 50	18	Free tuning	120	Basic HF set for R SIGS. Transmitter only; R210 is associated receiver and weighs 35 lbs.	
19 and 19 terim)	RAC	Armd C regt HP	Misc Svcs; LOS and SOS at div and bde HQ until C13 becomes avail.	AM	1.6-10	Voice <u>15</u> <u>TG</u> 30	10	Free tuning	80		
19, 19 HP and C12	RAC	Armd C regt - within signs	Arty CB comm LAA regts. As replacement for C12. Misc LOS and SOS at div and bde HQ.	AM or PM	1.5-12	Voice <u>20</u> <u>TG</u> 40	15	Free tuning	80	Current HF set for all arms use. Same size and connectors as C42 and C45. Can work to C13 HP on PM. Airtrbl in AIRTEC containers.	

FD RADIO AND RR EQPT (Cont)

Set Note 1)	Replacing (C)	Principal Role	Other Roles (e)	System (f)	Freq. Coverage (Mc/s)		Range (miles) (Note 3)		No. of Channels (K)	Wt (lbs) excl Btys (1)	Remarks
					Day (g)	Ni (h)	Ni (i)	Free tuning			
3 HP	52 and 19 HP	RAG Armd C regt net	-	PM	1.5-12	Voice 40 Tx 80	30 50	Free tuning	160	Can not work on AM. Can therefore only work to another G13 HP or G13 (low power). Airpbl in AIRTEC containers.	
1	53	Sigs Corps and Army Sig regts	-	AM	2.1-20	Voice 35/70 Tx 100	25/60 60	Free tuning	500	Skywave ranges up to 1500 miles using suitable aerials.	
3	-	Sigs Army Sig regts; rear link from Rd from HQ to COMCAN net- work	-	AM	2.1-22	Voice 50/ 100 Tx 150	40/80 100 80	Free tuning 2 x 1-ton vehs	2,000	Skywave ranges up to 2,000 miles using suitable aerials.	
0	88	req overlap is shown in diagrammatic form on page 323 Inf Pl/coy Sec/pl				FM	47-55	1½	6 (pre-set)	8 (incl dry btys)	Voice only. Whisper facility. Based on CDN set (GPRC 26). Sets will be issued as Type A and Type B. They will each have 3 exch channels and 3 common channels.
1	31	Inf Coy/bn Pl/coy	Inf Pl/coy/bn to tks. Mor pl. Arty ROO to Inf.	FM	38-55	3	3	170	22 (incl dry btys)	Voice only. Facilities for remote op and remote aerial. Based on CDN set (GPRC 510).	
2	38	Arty ROO's set	-	FM	26-38	3	3	120	22 (incl dry btys)	Identical to A41 apart from freq coverage.	
3	interim)	Sigs ASSU tcl ground to air	Arty NGSEO parties. Inf In AW ops ship to shore. EAGs Ground/ air	AM	Type R 244-300 Type M 245-259	25 at 11,000 ft optical	Little difference	6 (pre-set)	Type R 30 lbs Type M 22 lbs (incl dry btys)	Voice only. Mappack. Type R uses re-chargeable btys or will op from 12 v DC sup and is suitable for veh instr. Type M dry btys only. Both types have whip and aerials.	

ED RADIO AND RR EOFT (Cont.)

Set Note 1)	Replacing	Principal Role	Other Roles	System	Freq Coverage (Mc/s)	Range (miles) (Note 3)	No. of Channels	Wt (lbs) excl Bry	Remarks
(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(m)
47	88 AFV	RAC Armd and armd C regts for comms	Misc Lt liaison ac.	FM 38-56	5/7	5/7	175	30	Voice only. Ground to air range 10/20 miles.
48	38	Artv OP veh set	Artv Air OP set.	FM 28-38	5/7	5/7	120	30	Identical to B47 apart from free coverage.
49	-	SLES Bde gp sig sns, div and corps sig regts	SLES Comm 2 area.	FM 50-100	Near opti- cal	Near simul- taneous in con- junction with carr end	240	This RR sept will progres- sively replace US ANTRC now in use.	
52	19 in armd RAC	Armd regts	Enger Within fd sns.	FM 36-60	10/15	10/15	240	90	Voice only. Elevated aerials can be used to give range of 25 miles when static.
55	19	Artv Rd and med regts	Inf Bos/ coy. EME ARV comms. Mise APC comms.	-	23-38	10/15	150	90	Voice only. Similar to C42 but lower freq range; facilities for remote op and remote serial. Can work auto rebroadcast with B48.
5001	-	SLES ASSU tcl ground to air	-	FM 100-156	60 (to ac at 5,000 ft.)	(to ac at 5,000 ft.)	Depend- ing on crystal aval	54	To be replaced by A43. See Serial 13.
58	-	SLES ASSU tcl ground to air	-	AM 225- 399.9	Line of sight	Line of sight	Free tuning 100 Kcs stepping	80	Based on US ac set AN/ARC- 52 in a more robust mount- ing for veh use. Limited issue only.

FD RADIO AND RR EOFT (Cont.)

Set Note 1)	Replacing (b)	Principal Role (c)	Other Roles (d)	System (e)	Freq Coverage (Mc/s) (f)	Range (miles) (Note 3) Day (g)	No of Channels (h)	Wt (lbs) excl Btys (i)	Remarks (m)
70	-	SLES	-	FM	4,550- 4,850	Line of sight	4 simul- taneous in con- junction with car- eoft.	120	RR eoft. May accept up to 12 simultaneous channels.

1. Nomenclature of Radio Sets. Radio sets are designated by a ltr and a two figure no, eg A10.
Ltr indicates power consumption and gives some indication of the size of the eqpt. No indicates the freq band in which the set ops:-

<u>Ltr</u>	<u>Power Consumption</u>	<u>Typical Size</u>	<u>No</u>	<u>Freq Band</u>	<u>Wavelengths</u>
A	below 10 watts	Map pack	10-39	{ MF HF	300 Kc/s 3 Mc/s
B	10-100 watts	Mapportable			1,000 metres
C	100 watts-1 kilowatt	Vehicular	40-69	{ VHF UHF	100 metres
D	1-10 kilowatts	Mob or transportable			10 metres
E	above 10 kilowatts	Transportable or static	70-99	{ SHF	1 metre
					10 cms
					1 cm

2. Only sets in the same freq band and using the same method of modulation can inter-work.
3. Range depends on type of aerial used. Figures given are those for vertical rod of average height. With HF sets greater ranges can of course be obtained by using horizontal wire aerials.

FREQ OVERLAP

FREQ OVERLAP OF VHF RADIO SETS

Arm'd	Set	Purpose	20	30	40	50	60
Armd	B47	Tk/armd G/APC - inf			38	Five/Seven	56
	C42	Revt. comms		36		Ten/Fifteen	60
Art'y	A41	FOO - inf			38	Three	55
	A42	Disimtd FOO - OP veh (C45/B48)	26	Three	38		
	B48	Relay set for disimtd FOO when range of A42 alone insufficient	26	Five/Seven	38		
	C45	Revt. comms	23	Ten/Fifteen	38		
	C42	OP - tks. (med regts (SP) only)			36	Ten/Fifteen	60
Inf	A40	(a) P1 to sec/coy to pl (b) Cov/obj/sec - arm'd (B47)				One and a quarter	55.4
	A41	(a) En - cov/coy - pl (b) En/cov/pl - arm'd (B47)		38	Three	55	
	C42	En - cov when range of A41 insufficient			36	Ten/Fifteen	60

- NOTES:
1. Apart from freq coverage, fol sets are identical pairs: A41 and A42; B47 and B48; C42 and C45.
 2. Freqs avai for allotment are one per 100 kilocycles (one tenth of a megacycle) for each set except A40 which has six pre-set crystal con channels.
 3. A40 is also used by sp top of arm'd C revt; engrs use C42 for son comms and A40 and A41 for comms to inf.

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TELES AND SWBDS

TELE

Serial	Type	Detail
1	F	The normal mil desk tele.
2	L	The lineman's tele.
3	J	Standard fd tele. Tropicalised improved version of tele L.
4	H	Sound powered, NO btys.
5	Future Development Tele Hand SP No 1	Sound powered, NO btys. Under consideration for gen adoption within the inf bn. Range much greater than tele H.
6	Gen Purpose Tele Handset	Under development to replace all existing types except tele F.

SWBDS

Serial	Level Used	Present Eqpt		Future Eqpt
		Swbd	Tele	Swbd
1	Bn regt	10 line	J, F	
2	Bde gp	40 line F & F and 10 line magneto	J, F	40/160
3	Div	80 line	J, F	40/160 line x 2
4	Corps	120 line	J, F	40/160 line x 3
5	Army gp	120 line	F	(a) Trunk CB20 x 4 (b) Satellite 40/160 x 3

FD CABLES

(Times of const. are for good conditions, in open country, in daylit)

Type of Cable	Speech Range in Miles (unloaded)	Det. for Laying	Speed of Const.	Remarks
Cable, electric, D10 (26 lbs/ $\frac{1}{4}$ mile coil)	10	(a) 1 or 2 men on ft. (b) 8 linemen, 2 1-ton and tiers, 1 1-ton truck.	2 mph 4 mph	Standard fd cable replacing D3, D8 and ast. cables at all levels. Wound in dispenser coils like a ball or string. This allows fast laying and laying by ac or hc.
Cable, electric, fd quad	20	10-20 linemen 1 1-ton and tier 2 1-ton trucks 1 3-ton truck (This det. is for poled route and can be reduced when cable is laid on the ground)	Poled Ground 3/4 mph 2 mph	Used for RR tails and heavier types of routes in rear of div. Obsolescent.
Cable, electric, carr quad, Type P Mk III (140 lbs/ $\frac{1}{4}$ mile drum)	28	Similar to Serial 2		Primarily for use with multi-channel systems. Lengths are joined by couplers supplied with each cable coil. Loading pots to give increased range can be inserted between couplers.
Future Developments Cable, electric, lt wt., quad (55 lbs/ $\frac{1}{4}$ mile coil)	19	Similar to Serial 2		Replaces cable at Serial 2 in its gen purposes emp and as RR tails. Lighter than Serial 2.
Cable, electric, 10 pair (plastic) (150 lbs/ $\frac{1}{4}$ mile drum)	24	Similar to Serial 2		Cable for fd use, primarily for local distr and inter-connection of echs of a RR.