

**B.R.340
CJP1/2 RECEIVER**

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VOLUME I

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B.R.340

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B.R.340

PART 1

643-CJP1/2

TRANSMITTER-RECEIVER

SYSTEM

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I BRIEF DESCRIPTION AND SPECIFICATION

1 BRIEF DESCRIPTION AND SPECIFICATION

PLATE 1.1 643-CJP1/2 100W TRANSMITTER-RECEIVER

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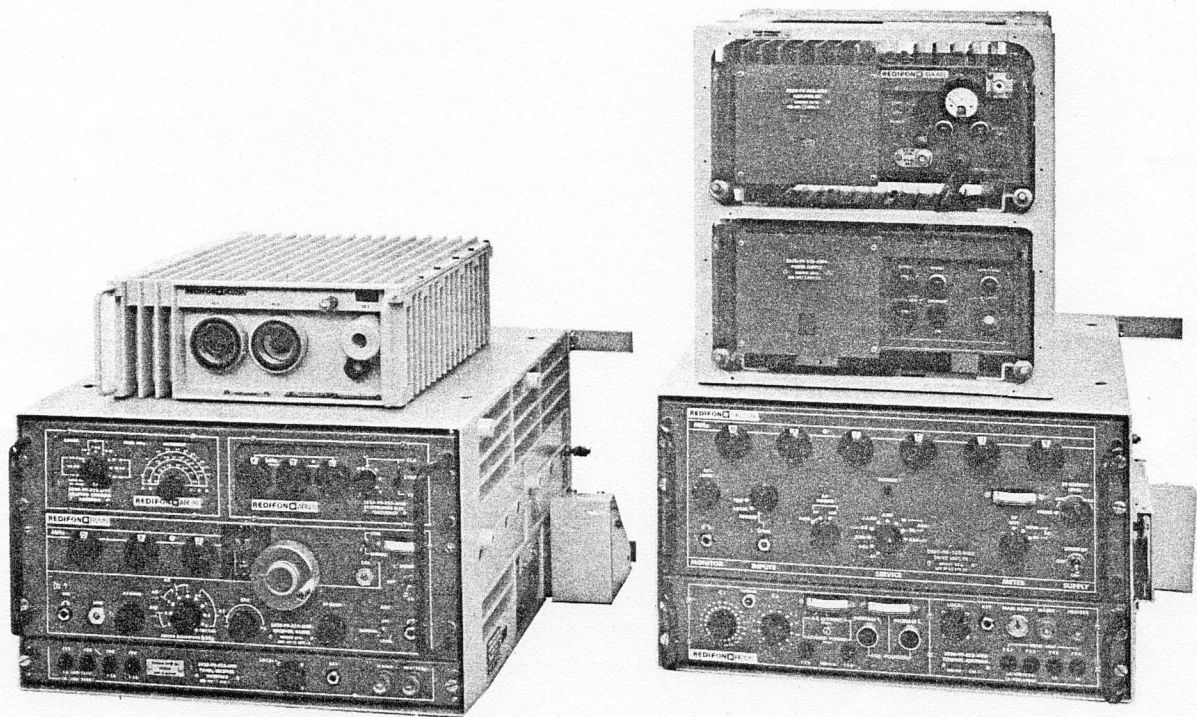
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1 BRIEF DESCRIPTION AND SPECIFICATION

1.1 BRIEF DESCRIPTION

1.1.1 General

The 643-CJP1/2 equipment is a 100W all solid-state transmitter-receiver.

The receiver or transmitter may be operated separately from each other or combined as a simplex or duplex radiotelephone.

The complete outfit consists of four main constituent parts:—

The receiver cabinet, the transmitter driver cabinet, the RF power amplifier and the aerial coupling unit.

1.1.2 Receiver

The CJP1 receiver is contained in an aluminium alloy cabinet 5820-99-525-6193 and comprises the main tunable receiver type R551N Receiver, Radio 5820-99-525-6189, an extension frequency synthesiser type ARU11N Synthesiser, Electrical Frequency 5820-99-525-6190 and the Panel, Receiver Interface 5820-99-525-6191. If the receiver is required to operate with several other receivers from a common aerial feeder line then the unit becomes a CJP2 unit and an ARU18A Adaptor, Common Antenna 5820-99-525-6192 is additionally fitted within the cabinet.

1.1.3 Transmitter

The transmitter driver unit is contained in a similar cabinet to that of the receiver, Cabinet, Electrical Equipment 5820-99-525-6187 and comprises the GK203N Drive Unit, Transmitter 5820-99-525-6182, the transmitter interface panel and the RC126A Control, Antenna 5820-99-525-6185 for the aerial coupling unit.

The RF power amplifier type GA481N Amplifier, Radio Frequency 5820-99-525-6183 together with its AC mains power supply unit type PU220N 5820-99-525-6184 is contained in an open framework. For extremely high temperature operation or high transmit duty cycle a cooling fan is automatically switched on to avoid overheating.

The aerial coupling unit type ACU15A Tuning Unit, Radio Frequency 5820-99-525-6186 is in a fully sealed cast aluminium container which can be situated remote from the RF amplifier. Complete monitoring information of the aerial current, state of match and tuned circuit element selection is fed back to the RC126A Control, Antenna at the operating position.

1.2 SPECIFICATION

1.2.1 Transmitter

Frequency Range:

1.5 to 24MHz (some of the equipment units operate up to 30MHz)

Frequency Selection:

In 100Hz steps by decade switches

Frequency Stability and Accuracy:

Within 1 part in 10^7

Modes of Transmission:

Telegraphy A1 cw, A2J, A2 mcw

Telephony A3 dsb, A2H, A3H, A3A, A3J usb

Where only one sideband is generated, it is always upper sideband

Power Output:

(a) High Power

100W pep +0-1.6dB into 50Ω resistive load connected directly to GA481N Amplifier, Radio Frequency, for all modes of operation, with supply voltage of 28.0V DC to the amplifier.

(b) Low Power

Nominally 3dB below High Power output

(c) Carrier Power

A1 cw 100W +0-1.6dB
A2J At least 40dB below A1 cw power
A2 mcw 25W ±1dB when fully modulated
A3 dsb 25W ±1dB when fully modulated
A2H 25W ±1dB when fully modulated
A3H 25W ±1dB when fully modulated
A3A—16 16dB ±1dB below A1 cw power
A3A—26 26dB ±2dB below A1 cw power
A3J usb At least 40dB below A1 cw power

(d) Power into Test Loads Simulating Naval Whip Aerials

Test loads connected to Aerial and Earth terminals of ACU15A Tuning Unit, Radio Frequency

3 to 24MHz, not less than 25% of (a) High Power and (b) Low Power figures above

1.5 to 3MHz, not less than 10% of (a) High Power and (b) Low Power figures above

Harmonic Radiation:

At least 36dB below wanted output when ACU15A Tuning Unit, Radio Frequency correctly adjusted

Intermodulation Distortion:

With a two-tone signal at 100W pep into 50Ω resistive load all intermodulation product levels are at least 31dB below 100W pep

Overall Frequency Response:

A3J usb mode, not more than 6dB below peak of response between 350 and 2700Hz

AF Sensitivity:

Inputs switch to LOCAL position, 0.4mV rms pd across 200Ω input impedance will produce full power output or full modulation depending on mode

Inputs switch to REMOTE position, 0dBm (0.775V rms pd across 600Ω input impedance) to line input will produce full power output or full modulation depending on mode

Keying:

A1 cw Up to a maximum speed of 30 bauds

A2J On-off keying up to a maximum speed of 30 bauds

FST 850Hz shift centred on 1700Hz up to a maximum speed of 75 bauds

1.2.2 Receiver

Frequency Range:

100kHz to 30MHz

Modes of Reception:

Telegraphy A1 cw, A2J, A2 mcw
Telephony A3 dsb, A2H, A3H, A3A, A3J
Teleprinter F4 (with adaptor)

On single sideband either sideband can be selected by front panel control

Frequency Stability and Accuracy:

Within 1 part in 10^7

Aerial Input Source Impedance:

- (a) Above 1MHz 50Ω or 75Ω
- (b) Below 1MHz $10\Omega + (200 \text{ to } 600\text{pF})$

Noise Figure:

Above 1MHz less than 10dB

Intermodulation:

Two equal unwanted signals, not closer than 10kHz to the receiver tune frequency, must be at least 70dB above $1\mu\text{V}$ emf to produce an equivalent $1\mu\text{V}$ emf signal input.

Selectivity:

- (a) A3J
 - usb 3kHz 3dB Bandwidth: +350 to +2700Hz w.r.t. carrier frequency
 - 60dB Bandwidth: -700 to +3800Hz w.r.t. carrier frequency
 - lsb 3kHz 3dB Bandwidth: -350 to -2700Hz w.r.t. carrier frequency
 - 60dB Bandwidth: +700 to -3800Hz w.r.t. carrier frequency
- (b) A3 dsb
 - 8kHz 6dB Bandwidth: > 8000Hz
 - 60dB Bandwidth: < 40,000Hz
 - 3kHz 6dB Bandwidth: > 3000Hz
 - 60dB Bandwidth: < 6000Hz
- (c) A2 mcw
 - 3kHz 6dB Bandwidth: > 3000Hz
 - 60dB Bandwidth: < 6000Hz
 - 1kHz 6dB Bandwidth: > 1200Hz
 - 60dB Bandwidth: < 3500Hz
- (d) A1 cw
 - 8kHz 6dB Bandwidth: > 8000Hz
 - 60dB Bandwidth: < 40,000Hz
 - 3kHz 6dB Bandwidth: > 3000Hz
 - 60dB Bandwidth: < 6000Hz
 - 1kHz 6dB Bandwidth: > 1200Hz
 - 60dB Bandwidth: < 3500Hz
 - 0.3kHz 6dB Bandwidth: $250 \pm 50\text{Hz}$
 - 60dB Bandwidth: < 2000Hz

ARU18A Adaptor, Common Antenna

Allows receiver to be connected to a 75Ω trans-

mission line over the frequency range 1.5 to 30MHz with a VSWR less than 1.5 at frequencies greater than 4% removed from its tune frequency.

Insertion Loss of ARU18A Adaptor, Common Antenna:

Less than 6dB at tune frequency

1.2.3 System Power Supply Requirements

Complete 643-CJP1/2 equipment operating in Transmit A1 cw mode with key down, i.e. 100W output:

- (a) $115\text{V} \pm 8\%$ AC 45 to 65Hz, or
- (b) $230\text{V} \pm 8\%$ AC 45 to 65Hz, or
- (c) $220\text{V} \pm 6\%$ AC 45 to 65Hz, or
- (d) $240\text{V} \pm 6\%$ AC 45 to 65Hz
400W or 735VA maximum

Anti-Condensation Heater Supply:

115 or 230V 40W

1.3 NATO STOCK NUMBERS

1.3.1 Equipment Units

1.3.1.1 Transmitter Driver Cabinet Units

GK203N Drive Unit, Transmitter 5820-99-525-6182
RC126A Control, Antenna 5820-99-525-6185
Cabinet, Electrical Equipment 5820-99-525-6187

1.3.1.2 Transmitter RF Amplifier Frame Units

GA481N Amplifier, Radio
Frequency 5820-99-525-6183
PU220N AC Power Supply Unit 5820-99-525-6184
Frame, Electrical Equipment 5820-99-525-6188

1.3.1.3 ACU15A Tuning Unit, Radio

Frequency 5820-99-525-6186

1.3.1.4 Receiver Cabinet Units

R551N Receiver, Radio 5820-99-525-6189
ARU11N Synthesiser, Electrical
Frequency 5820-99-525-6190
Panel, Receiver Interface 5820-99-525-6191
ARU18A Adaptor, Common
Antenna (CJP2 only) 5820-99-525-6192
Cabinet, Electrical Equipment 5820-99-525-6193

1.3.1.5 Interface Unit for Remote Operation with Carbon Microphone (when fitted)

Interface Assembly, Carbon
Microphone 5820-99-527-5988

1.3.2 Equipment Unit Modules

1.3.2.1 GK203N Drive Unit, Transmitter, Modules

Module 1 AF Compressor 5820-99-527-1886
Module 2 Ancillary 5820-99-527-1887
Module 4 Combiner 5895-99-527-1862
Module 5 Power Supply 5820-99-527-1864
Module 6 Signal Line 5820-99-527-1866
Module 7 Sub-Octave Filters 5915-99-527-1871
Module 8 38 to 68MHz Synthesiser 5820-99-527-1874
Module 9 3.4 to 4.4MHz
Synthesiser 5820-99-527-1881
Module 10 Frequency Reference 5820-99-527-1884
Module 12 Phase Lock 5820-99-527-1892

1.3.2.2 R551N Receiver, Radio, Modules

Aerial Filter	5915-99-527-1910
RF/AGC	5820-99-527-1953
IF/AF	5820-99-527-1958
5.6 MHz Oscillator/BFO	5820-99-527-1960
38 to 68 MHz VCO	5820-99-527-1963
4.1 to 5.0 OMHz VCO	5820-99-527-1970
VFO	5820-99-527-1976
Power Supply	5820-99-527-1979

1.3.3 Printed Circuit Board Assemblies

1.3.3.1 GK203N Drive Unit, Transmitter, PCB Assemblies

Module 1	AF Compressor PCB Assembly	5820-99-527-1886
Module 2	Ancillary PCB Assembly	5820-99-527-1887
Module 4	Modulator PCB Assembly	5820-99-527-1863
Module 5	Power Supply PCB Assembly	5820-99-527-1865
Module 6	39.4MHz Crystal Oscillator PCB Assembly	5820-99-527-1869
Module 6	38MHz Amplifier PCB Assembly	5820-99-527-1868
Module 6	ALC/Preamplifier PCB Assembly	5820-99-527-1870
Module 6	RF Amplifier/Meter Buffer Assembly	5820-99-527-1867
Module 7	Aerial Filter No 1 PCB Assembly	5820-99-527-1872
Module 7	Aerial Filter No 2 PCB Assembly	5820-99-527-1873
Module 8	38 to 68MHz Phase Loop PCB Assembly	5820-99-527-1875
Module 8	38 to 68MHz VCO PCB Assembly	5820-99-527-1876
Module 8	38 to 68MHz VCO Amplifier PCB Assembly	5820-99-527-1877
Module 8	Variable Divider PCB Assembly	5820-99-527-1878
Module 8	3 to 32MHz Filter Amplifier PCB Assembly	5820-99-527-1879
Module 8	35 to 36MHz Filter Amplifier PCB Assembly	5820-99-527-1880
Module 9	3.4 to 4.4MHz Synthesiser PCB Assembly	5820-99-527-1882
Module 9	3.4 to 4.4MHz Filter PCB Assembly	5820-99-527-1883
Module 10	Frequency Reference PCB Assembly	5820-99-527-1885
Module 11	Output Level Control PCB Assembly	5820-99-527-1888
Module 11	Mixer PCB Assembly	5820-99-527-1889
Module 11	Decoupling PCB No 1 Assembly	5910-99-527-1890
Module 11	Decoupling PCB No 2 Assembly	5910-99-527-1891
Module 12	Phase Lock PCB Assembly	5820-99-527-1892

1.3.3.2 GA481N Amplifier, Radio Frequency, PCB Assemblies

TLC/Preamplifier PCB No 1A Assembly	5820-99-527-1893
Control PCB No 2 Assembly	5820-99-527-1896
Decoupling PCB No 3 Assembly	5910-99-527-1895
Voltage Regulator PCB No 4A Assembly	5820-99-527-1894
Voltage Regulator PCB No 4B Assembly	5820-99-527-1897
Output PCB No 5 Assembly	5820-99-527-1900
100W Power Amplifier Module	5820-99-527-1898
Bias Compensation PCB Assembly	5820-99-527-1899

1.3.3.3 PU220N AC Power Supply, PCB Assembly

Dual Regulator PCB Assembly	5820-99-527-1903
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1.3.3.4 ACU15A Tuning Unit, Radio Frequency, PCB Assemblies

VSWR PCB Assembly	5820-99-527-1901
Aerial Current Detector Assembly	5820-99-527-1902

1.3.3.5 R551N Receiver, Radio, PCB Assemblies

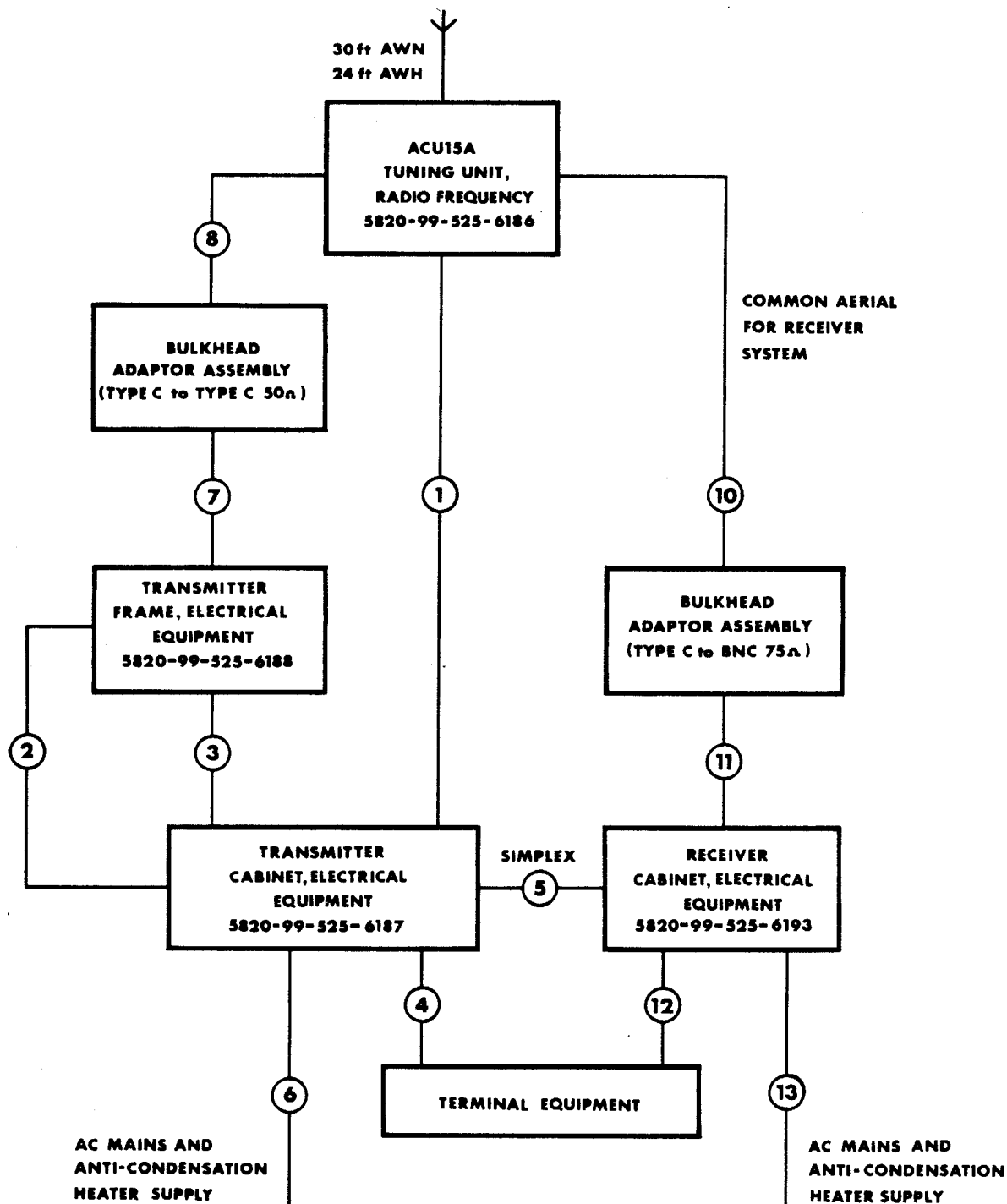
12kHz PCB Assembly	5820-99-527-1985
Aerial Filter No 1 PCB Assembly	5820-99-527-1911
Aerial Filter No 2 PCB Assembly	5820-99-527-1952
38MHz Amplifier PCB Assembly	5820-99-527-1954
38 to 68MHz PCB Assembly	5820-99-527-1956
39.4MHz Crystal Oscillator PCB Assembly	5820-99-527-1955
Wideband Amplifier PCB Assembly	5820-99-527-1957
3 to 32MHz Filter PCB Assembly	5820-99-527-1964
Variable Divider PCB Assembly	5820-99-527-1965
35 to 36MHz Filter PCB Assembly	5820-99-527-1966
VCO Amplifier PCB Assembly	5820-99-527-1967
38 to 68MHz PCB Assembly	5820-99-527-1968
1 to 10MHz Phase Loop PCB Assembly	5820-99-527-1969
Switch Filter PCB Assembly	5820-99-527-1971
4:1 to 5MHz VCO/Mixer PCB Assembly	5820-99-527-1972
50kHz Phase Discriminator PCB Assembly	5820-99-527-1973
Variable Divider Output PCB Assembly	5820-99-527-1974
Variable Divider Input PCB Assembly	5820-99-527-1975
VFO PCB Assembly	5820-99-527-1977
VFO Lampboard Assembly	5820-99-527-1978
Power Supply PCB Assembly	5820-99-527-1980
Oscillator Locking PCB Assembly	5820-99-527-1961
BFO PCB Assembly	5820-99-527-1962

1.3.3.6 ARU11N Synthesiser, Electrical Frequency, PCB Assemblies

Digital Circuit PCB Assembly	5820-99-527-1905
Band Pass Filter PCB Assembly	5915-99-527-1906
DC Amplifier PCB Assembly	5820-99-527-1907
VCO PCB Assembly	5820-99-527-1908
Clarifier PCB Assembly	5820-99-527-1909

1.3.3.7 ARU18A Adaptor, Common Antenna, PCB Assembly

Tuned Circuit PCB Assembly	5820-99-527-1904
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Typical Small Ship's Radio System —
Simplex and Two Frequency Simplex Only

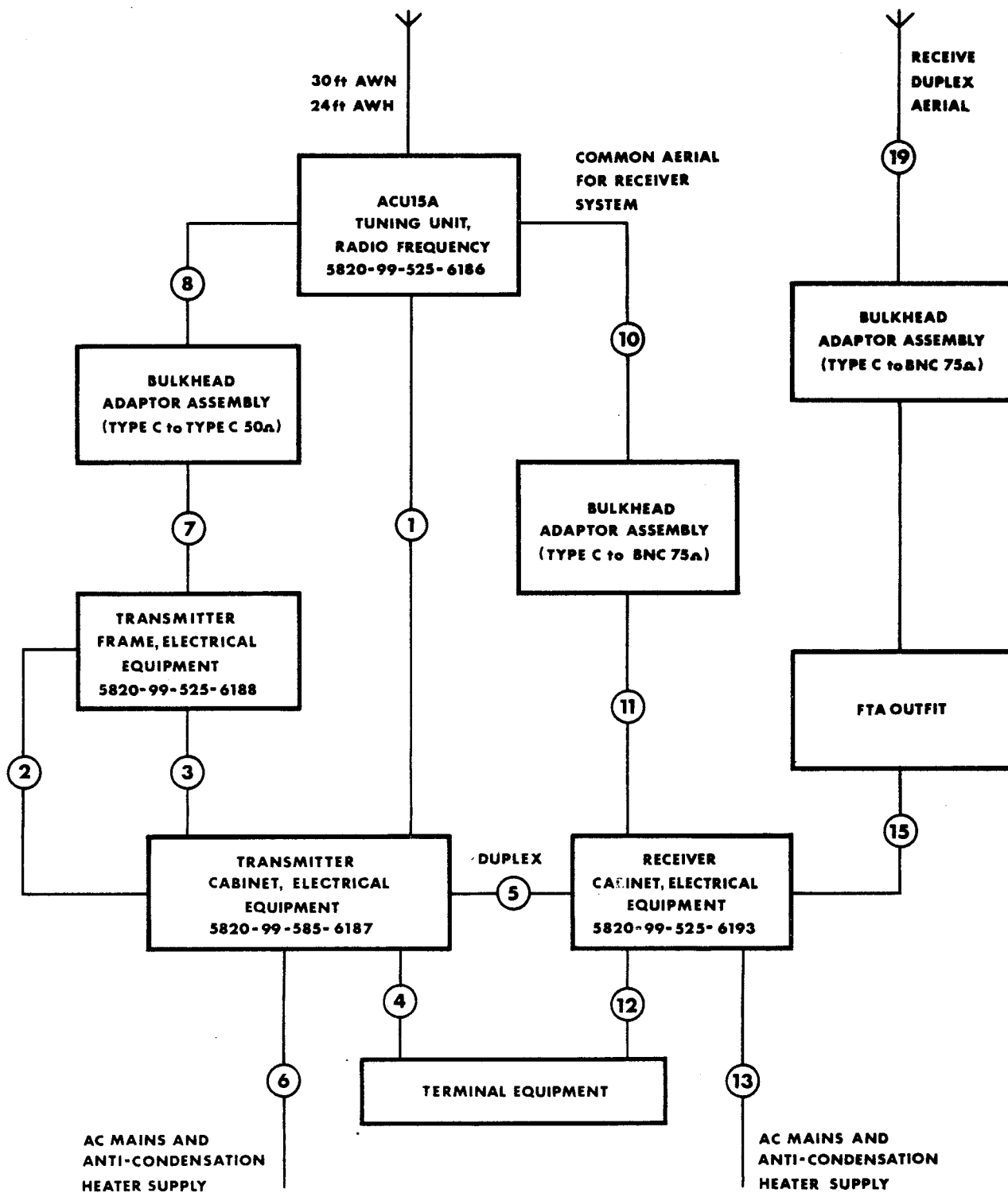
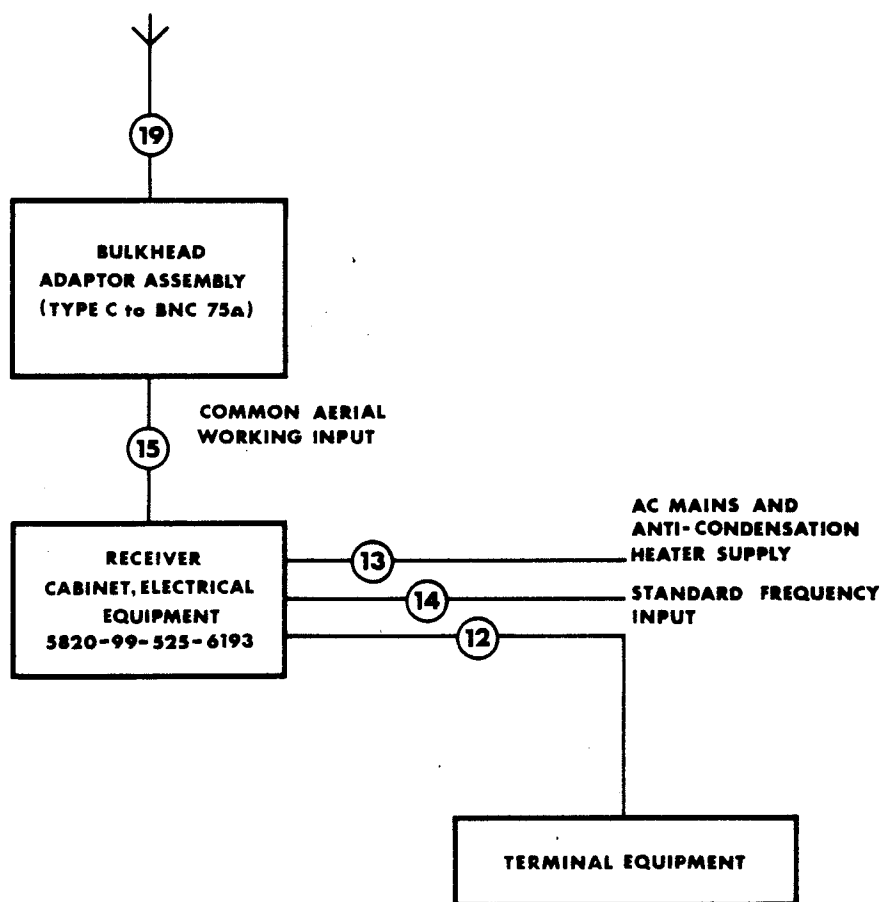


Fig. 1.4.2

Typical Ship's Emergency Transmitter-Receiver Installation — Duplex or Simplex Operation



2 INSTALLATION

2 INSTALLATION

2.1 CABLEFORMS

- 2.1.1 Cableform 1
- 2.1.2 Cableform 2
- 2.1.3 Cableform 3
- 2.1.4 Cableform 4
- 2.1.5 Cableform 5 (Simplex)
- 2.1.6 Cableform 5 (Duplex)
- 2.1.7 Cableform 6
- 2.1.8 Cableform 7
- 2.1.9 Cableform 8
- 2.1.10 Cableform 10
- 2.1.11 Cableform 11
- 2.1.12 Cableform 12
- 2.1.13 Cableform 13
- 2.1.14 Cableform 14
- 2.1.15 Cableform 15
- 2.1.16 Cableform 19

2.2 TERMINATIONS ON INTERCONNECTING CABLES

- 2.2.1 Cables Terminated in Cabinets
- 2.2.2 Cables Terminated at Equipment Units
- 2.2.3 Cableform 1
- 2.2.4 Cableform 2
- 2.2.5 Cableform 3
- 2.2.6 Cableform 4
- 2.2.7 Cableform 5 (Simplex or Duplex)
- 2.2.8 Cableform 6
- 2.2.9 Cableform 7
- 2.2.10 Cableform 8
- 2.2.11 Cableform 10
- 2.2.12 Cableform 11
- 2.2.13 Cableform 12
- 2.2.14 Cableform 13
- 2.2.15 Cableform 14
- 2.2.16 Cableform 15
- 2.2.17 Cableform 19

FIG. 2.1 TRANSMITTER-CABINET, ELECTRICAL EQUIPMENT
5820-99-525-6187 WIRING

FIG. 2.2 TRANSMITTER-FRAME, ELECTRICAL EQUIPMENT
5820-99-525-6188 WIRING

FIG. 2.3 RECEIVER-CABINET, ELECTRICAL EQUIPMENT
5820-99-525-6193 WIRING

2 INSTALLATION

2.1 CABLEFORMS

The cableforms detailed below are used for inter-connections between the various units of the 643-CJP1/2 system as shown in the block system drawings Figs. 2.1, 2.2 and 2.3.

2.1.1 Cableform 1

Connects Transmitter-Cabinet, Electrical Equipment to ACU15A Tuning Unit, Radio Frequency. Comprises two separate cables which are run together.

Cable	Transmitter-Cabinet, Electrical Equipment Terminal No	ACU15A Tuning Unit, Radio Frequency Terminal No	Function	Colour or Number of Lead
I	TSA4	PL1/N	Tx Control cut out	6
	TSA14	PL1/S	Aerial Changeover	3
	TSA15	PL1/T	Aerial Changeover	2
	TSC1	PL1/B	C1 Selection	17
	TSC2	PL1/A	C1 Selection	18
	TSC3	PL1/C	C1 Selection	16
	TSC4	PL1/D	C1 Selection	15
	TSC5	PL1/E	C1 Selection	14
	TSC6	PL1/H	C2 Selection	11
	TSC7	PL1/J	C2 Selection	10
	TSC8	PL1/F	C2 Selection	13
	TSC9	PL1/G	C2 Selection	12
	TSC17	PL1/L	Increase L	8
	TSC18	PL1/K	Decrease L	9
	TSC19	PL1/M	ACU15A Heaters and Motors 230V AC	7
	TSC20	PL1/R	Common (earth)	4
	TSB12	PL1/P	+28V DC	5
	TSC16	PL1/U	Tuning Lamp	1
	Ferrule	Case	Screen	Screen
	II	TSC10	PL2/C	AE Current
TSC11		PL2/D	Screen (earthed at ACU15A end only)	Screen
TSC12		PL2/E	Coil Position	Red
TSC13		PL2/F	Screen	Screen
TSC14		PL2/B	Screen	Screen
TSC15	PL2/A	Reverse Power	Neutral	

Cable I Overall Screened 18way 6145-99-521-6986

Cable II Individually Screened 3way 6145-99-521-6975

2.1.2 Cableform 2

Connects Transmitter-Cabinet, Electrical Equip-

ment to Transmitter-Frame, Electrical Equipment.
Comprises two separate cables which are run together.

Cable	Transmitter-Cabinet, Electrical Equipment Terminal No	Transmitter-Frame Electrical Equipment (GA481N Amplifier RF) Terminal No	Function	Colour of Lead
I	SK1	SKA	RF Drive Screen	Inner Screen
II	TSA16 TSA17 Ferrule	SKB/C SKB/D Shell	PA Activate Common Screen	Red Blue Screen

Cable I 50Ω Coaxial 6145-99-014-9542 (URM76)

Cable II Overall Screened 2way DEF 61-12 (Part 5) 16-2-2C 6145-99-111-6717

2.1.3 Cableform 3

Connects Transmitter-Cabinet, Electrical Equipment to Transmitter-Frame, Electrical Equipment.

Transmitter-Cabinet, Electrical Equipment Terminal No	Transmitter-Frame, Electrical Equipment (PU220N AC Power Supply Unit) Terminal No	Function	Colour of Lead
TSB14	PLA/A	Mains Out—Live	Red
TSB15	PLA/B	Mains Out—Neutral	Blue
TSB16	PLA/C	Mains Out—Earth	Green
Ferrule	Shell	Screen	Screen

Cable Overall Screened 3way DEF 61-12 (Part 5) 16-2-3C 6145-99-111-6724

2.1.4 Cableform 4

Connects Transmitter-Cabinet, Electrical Equip-

ment to External Terminal Equipment.
Comprises two separate cables which are run together.

Cable	Transmitter-Cabinet Electrical Equipment Terminal No	Function	Colour of Lead
I	TSA5	Remote Pressel	Red
	TSA6	Remote Key	Blue
	TSA10	Common to Remote	Yellow
	TSB13	+28V DC to Remote	Black
	TSB19	Remote in Use	White
II	Ferrule	Screen	Screen
	TSA18	600Ω Line Input M+	Red
	TSA19	600Ω Line Input M2	Blue
	TSA20	Common	Screen

Cable I Overall Screened 6way DEF 61-12 (Part 5) 16-2-6C 6145-99-111-6735

Cable II Overall Screened 2way DEF 61-12 (Part 5) 16-2-2C 6145-99-111-6717

2.1.5 Cableform 5 (Simplex)

Connects Transmitter-Cabinet, Electrical Equip-

ment to Receiver-Cabinet, Electrical Equipment.

Comprises four separate cables which are run together.

Cable	Transmitter-Cabinet, Electrical Equipment Terminal No	Receiver-Cabinet, Electrical Equipment Terminal No	Function	Colour of Lead
I	TSA8	TSA8	Sidetone	Red
	TSA9	TSA9	Common	Blue
	Ferrule	Ferrule	Screen	Screen
II	TSB1	TSB1	Microphone Input	Red
	TSB2	TSB2	Common	Blue
	Ferrule	Ferrule	Screen	Screen
III	TSA11	TAS11	Headset Output	Red
	TSA12	TAS12	Common	Blue
	Ferrule	Ferrule	Screen	Screen
IV	TSB3	TSB3	Local Pressel	Green
	TSB4	TSB4	Local Key	Yellow
	TSB11	TSB11	Receiver Desensitising	Blue
	TSB10	TSB10	Receiver Muting	Red
	Ferrule	Ferrule	Screen	Screen

Cables I, II and III Overall Screened 2way DEF 61-12 (Part 5) 16-2-2C 6145-99-111-6717

Cable IV Overall Screened 4way DEF 61-12 (Part 5) 16-2-4C 6145-99-111-6728

2.1.6 Cableform 5 (Duplex)

Connects Transmitter-Cabinet, Electrical Equipment to Receiver-Cabinet, Electrical Equipment.

Comprises four separate cables which are run together.

Cable	Transmitter-Cabinet, Electrical Equipment Terminal No	Receiver-Cabinet, Electrical Equipment Terminal No	Function	Colour of Lead
I	TSA8 TSA9 Ferrule	TSA8 TSA9 Ferrule	Sidetone Common Screen	Red Blue Screen
II	TSB1 TSB2 Ferrule	TSB1 TSB2 Ferrule	Microphone Input Common Screen	Red Blue Screen
III	TSA11 TSA12 Ferrule	TSA11 TSA12 Ferrule	Headset Output Common Screen	Red Blue Screen
IV	TSB3 TSB4 TSB11 TSB10 Ferrule	TSB3 TSB4 TSB11 TSB10 Ferrule	Local Pressel Local Key Receiver Desensitising Receiver Muting Screen	Green Yellow Blue Red Screen

NOTE: For Duplex operation, terminals TSB10 and TSB13 must be linked at rear of terminal strip in Receiver-Cabinet, Electrical Equipment 5820-99-525-6193.

Cables I, II and III Overall Screened 2way DEF 61-12 (Part 5) 16-2-2C 6145-99-111-6717
Cable IV Overall Screened 4way DEF 61-12 (Part 5) 16-2-4C 6145-99-111-6728

2.1.7 Cableform 6

Connects Transmitter-Cabinet, Electrical Equipment to Mains Supply.

Transmitter-Cabinet, Electrical Equipment Terminal No	Function
TSA1	Mains Supply—Live
TSA2	Mains Supply—Neutral
TSA3	Mains Supply—Earth
TSB8	Anti-condensation Supply—Live
TSB7	Anti-condensation Supply—Neutral

2.1.8 Cableform 7

Connects GA481N Amplifier, Radio Frequency to Bulkhead Adaptor Assembly.

GA481N Amplifier Radio Frequency	Bulkhead Adaptor Assembly	Function
SKF		RF Power Output

Cable 6145-99-014-9538 (URM67)

2.1.9 Cableform 8

Connects Bulkhead Adaptor Assembly to ACU15A Tuning Unit, Radio Frequency.

Bulkhead Adaptor Assembly	ACU15A Tuning Unit, Radio Frequency	Function
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SK1 RF Power Output

Cable 6145-99-520-4330

2.1.10 Cableform 10

Connects ACU15A Tuning Unit, Radio Frequency to Bulkhead Adaptor Assembly.

ACU15A Tuning Unit, Radio Frequency	Bulkhead Adaptor Assembly	Function
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SK2 Receiver Aerial

Cable 6145-99-924-7529

2.1.11 Cableform 11

Connects Bulkhead Adaptor Assembly to Receiver-Cabinet, Electrical Equipment.

Bulkhead Adaptor Assembly	Receiver-Cabinet, Electrical Equipment	Function
---------------------------	----------------------------------------	----------

SK3 Receiver Aerial

Cable 6145-99-014-9544 (URM90)

2.1.12 Cableform 12

Connects Receiver-Cabinet, Electrical Equipment to External Terminal Equipment.

Receiver-Cabinet, Electrical Equipment Terminal No	Function	Colour of Lead
----------------------------------------------------	----------	----------------

TSA5	Common	Screen
TSA6	600Ω Line Output R+	Red
TSA7	600Ω Line Output R2	Blue

Cable Overall Screened 2way DEF 61-12 (Part 5) 16-2-2C 6145-99-111-6717

2.1.13 Cableform 13

Connects Receiver-Cabinet, Electrical Equipment to Mains Supply.

Receiver-Cabinet, Electrical Equipment Terminal No	Function
----------------------------------------------------	----------

TSA1	Mains Supply—Live
TSA2	Mains Supply—Neutral
TSA3	Mains Supply—Earth
TSB8	Anti-condensation Supply—Live
TSB7	Anti-condensation Supply—Neutral

2.1.14 Cableform 14

Connects External Standard Frequency Source to Receiver-Cabinet, Electrical Equipment.

External Standard Frequency Source	Receiver-Cabinet, Electrical Equipment
---------------------------------------	-------------------------------------------

SK4

Cable 6145-99-014-9542 (URM76)

2.1.15 Cableform 15

Connects Bulkhead Adaptor Assembly to Receiver-Cabinet, Electrical Equipment.

Bulkhead Adaptor Assembly	Receiver-Cabinet, Electrical Equipment	Function
------------------------------	-------------------------------------------	----------

SK3

Receiver Aerial

Cable 6145-99-014-9544 (URM90)

2.1.16 Cableform 19

Connects Common Aerial Working System to Bulkhead Adaptor Assembly.
Cable 6145-99-924-7529

type HC2246/H20 (5340-99-971-9170). The pins are then inserted into the terminal blocks using a Hellerman handtool type HC1449 (5120-99-580-9627). The same tool may be used also for extracting the pins from the blocks.

2.2 TERMINATIONS ON INTERCONNECTING CABLES

2.2.1 Cables Terminated in Cabinets

Each wire is soldered to a taper pin, Hellerman

2.2.2 Cables Terminated at Equipment Units

Each cable terminated at an equipment unit will be fitted with the appropriate mating connector.

2.2.3 Cableform 1 (See para. 2.1.1)

Cable I	Transmitter-Cabinet, Electrical Equipment:
	ACU15A Tuning Unit, Radio Frequency Plug PL1:
Cable II	Transmitter-Cabinet, Electrical Equipment:
	ACU15A Tuning Unit, Radio Frequency Plug PL2:

Taper Pins

Thorn Bendix PTG B55 SE-14-19S 5935-99-525-7907 and Outlet Fitting 05-0415-14-19S 5935-99-525-7910

Taper Pins

Thorn Bendix PTG B55 SE-10-6S 5935-99-525-7908 and Outlet Fitting 05-0415-10-6S 5935-99-525-7911

2.2.4 Cableform 2 (See para. 2.1.2)

Cable I	Transmitter-Cabinet, Electrical Equipment:	Taper Pins
	Transmitter-Frame, Electrical Equipment GA481N Amplifier, Radio Frequency Socket SKB:	Thorn Bendix PTG B55 SE-10-6P 5935-99-525-7909 and Outlet Fitting 05-0467-10-6P 5935-99-110-4198
Cable II	Transmitter-Cabinet, Electrical Equipment Socket SK1:	Greenpar GE35070C10 5935-99-013-1601
	Transmitter-Frame, Electrical Equipment GA481N Amplifier, Radio Frequency Socket SKA:	Greenpar GE35070C10 5935-99-013-1601

2.2.5 Cableform 3 (See para. 2.1.3)

Transmitter-Cabinet, Electrical Equipment:	Taper Pins
Transmitter-Frame, Electrical Equipment PU220N AC Power Supply Unit Plug PLA:	Plessey Mk7 508/1/07206/220 5935-99-013-1530 with Adaptor 508/1/03021/301 5935-99-014-9277

2.2.6 Cableform 4 (See para. 2.1.4)

Transmitter-Cabinet, Electrical Equipment:	Taper Pins
External Terminal Equipment:	To suit installation, including use of Interface Assembly, Carbon Microphone 5820-99-527-5988

2.2.7 Cableform 5 (Simplex or Duplex) (See paras. 2.1.5 and 2.1.6)

Transmitter-Cabinet, Electrical Equipment:	Taper Pins
Receiver-Cabinet, Electrical Equipment:	Taper Pins

2.2.8 Cableform 6 (See para. 2.1.7)

Transmitter-Cabinet, Electrical Equipment:
Mains Supply:

Taper Pins
To suit installation

2.2.9 Cableform 7 (See para. 2.1.8)

GA481N Amplifier, Radio Frequency Socket SKF:
Bulkhead Adaptor Assembly:

Greenpar GE40051 5935-99-943-7576
Plug 50Ω Type C 5935-99-580-7060

2.2.10 Cableform 8 (See para. 2.1.9)

Bulkhead Adaptor Assembly:
ACU15A Tuning Unit, Radio Frequency Socket SK1:

Plug 50Ω Type C 5935-99-924-0778
Gland 5975-99-519-9353 assembled as Fig. 2.2 in B.R.339 Part V, ACU15A Tuning Unit, Radio Frequency, section of handbook

2.2.11 Cableform 10 (See para. 2.1.10)

ACU15A Tuning Unit, Radio Frequency Socket SK2:
Bulkhead Adaptor Assembly:

Gland 5975-99-519-9353 assembled as Fig. 2.2 in B.R.339 Part V, ACU15A Tuning Unit, Radio Frequency, section of handbook
Plug 75Ω Type C 5935-99-519-9349

2.2.12 Cableform 11 (See para. 2.1.11)

Bulkhead Adaptor Assembly:
Receiver-Cabinet, Electrical Equipment Socket SK3:

Plug 75Ω BNC 5935-99-580-1774
Greenpar GE37570C12 5935-99-580-1774

2.2.13 Cableform 12 (See para. 2.1.12)

Receiver-Cabinet, Electrical Equipment:
External Terminal Equipment:

Taper Pins
To suit installation

2.2.14 Cableform 13 (See para. 2.1.13)

Receiver-Cabinet, Electrical Equipment:	Taper Pins
Mains Supply:	To suit installation

2.2.15 Cableform 14 (See para. 2.1.14)

External Standard Frequency Source:	To suit installation
Receiver-Cabinet, Electrical Equipment Socket SK4:	Greenpar GE35070C10 5935-99-013-1601

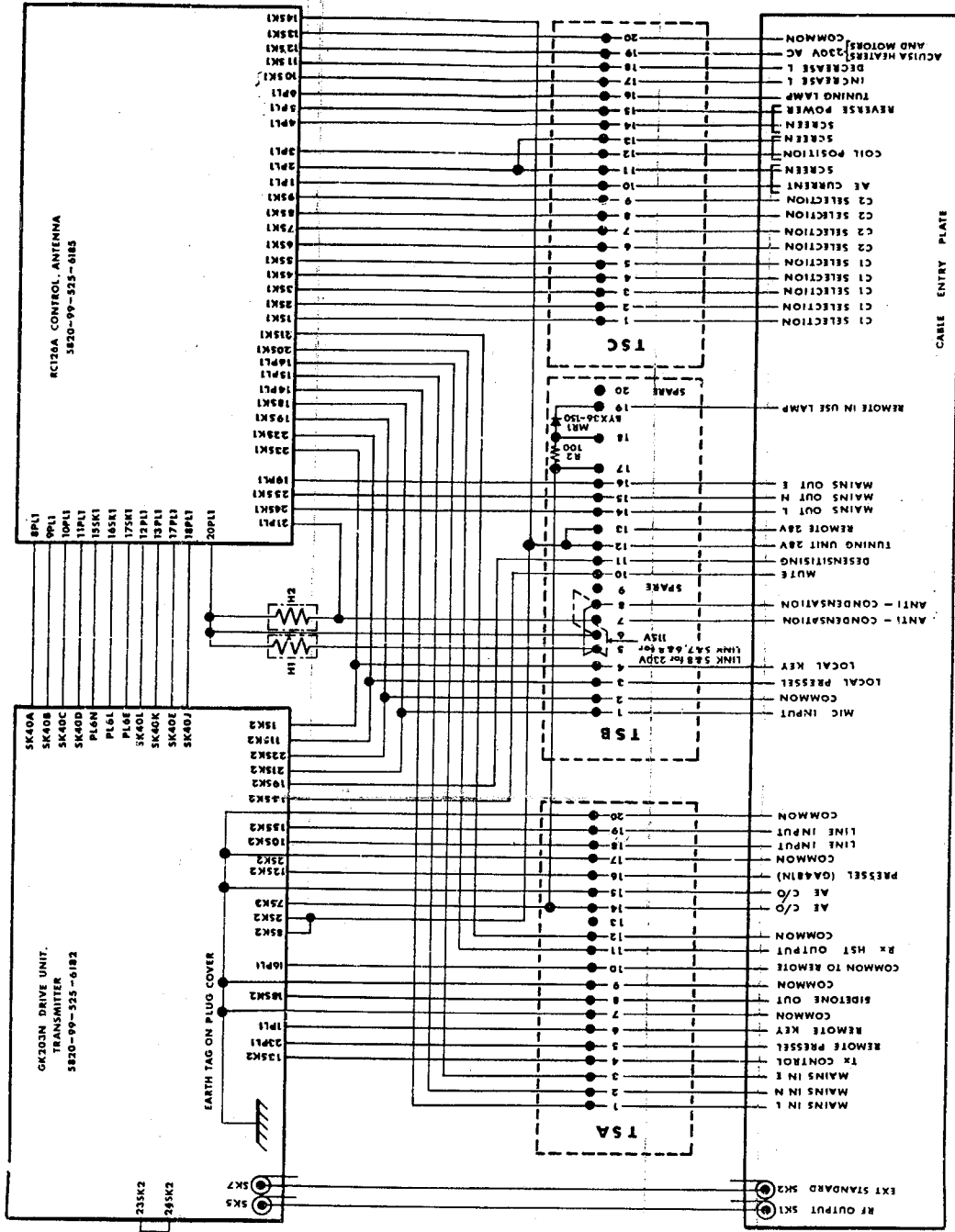
2.2.16 Cableform 15 (See para. 2.1.15)

Bulkhead Adaptor Assembly:	Plug 75 Ω BNC 5935-99-580-1774
Receiver-Cabinet, Electrical Equipment Socket SK3:	Greenpar GE37570C12 5935-99-580-1774

2.2.17 Cableform 19 (See para. 2.1.16)

Common Aerial Working System:	To suit installation
Bulkhead Adaptor Assembly:	Plug 75 Ω Type C 5935-99-519-9349





COMPONENT LIST

- RESISTOR**
R2 1000Ω ±2%, 1W Electrofil TRS 5905-99-4013-5971
- HEATERS**
HI 120V 10W Heating Elements 4590-99-519-3715
H1 120V 10W Heating Elements 4590-99-519-3715
- DIODE**
MR1 Mullard BYX36-150 5961-99-037-3730
- PLUGS**
SK1 25way Belling & Lee L1328P 5935-99-056-2007
SK2 25way Belling & Lee L1328S 5935-99-056-2007
PL1 10way Pvc M10P/LS/HVC 5935-99-056-2008
PL4 Coaxial 50Ω Greenpar GEI35070C10 5915-99-106-8386
PL5 Coaxial 50Ω Greenpar GEI35070C10 5915-99-106-8386
- SOCKETS**
SK1 Coaxial 50Ω Greenpar GEI3509C10 5915-99-057-3166
SK2 Coaxial 50Ω Greenpar GEI3509C10 5915-99-057-3169
SK3 25way Belling & Lee L1328S 5935-99-056-2008
SK4 25way Belling & Lee L1328P 5935-99-056-2007
SK5 25way Belling & Lee L1328S 5935-99-056-2008
- TAGSTRIPS**
TSA 20way Ultra 2B60000A.2P20 5940-99-519-4880
TSB 20way Ultra 2B60000A.2P20 5940-99-519-4880
TSC 20way Ultra 2B60000A.2P20 5940-99-519-4880

COMPONENT LIST

RESISTOR

R2 100Ω ± 2% 1/4W Electrosil TR5 5905-99-013-5971

HEATERS

H1 120V 10W Heating Elements 4590-99-519-3715

H2 120V 10W Heating Elements 4590-99-519-3715

DIODE

MR1 Mullard BYX36-150 5961-99-037-5730

PLUGS

PL1 25way Belling & Lee L1328/P 5935-99-056-2007

PL2 25way Belling & Lee L1328/P 5935-99-056-2007

PL3 10way Pye M10P/LS/H19C 5935-99-112-4319

PL4 Coaxial 50Ω Greenpar GE35070C10 5935-99-106-8586

PL5 Coaxial 50Ω Greenpar GE35070C10 5935-99-106-8586

SOCKETS

SK1 Coaxial 50Ω Greenpar GE35059C10 5935-99-527-3369

SK2 Coaxial 50Ω Greenpar GE35059C10 5935-99-527-3369

SK3 25way Belling & Lee L1328/S 5935-99-056-2008

SK4 3way Bulgin P430 5935-99-940-9381

SK5 25way Belling & Lee L1328/S 5935-99-056-2008

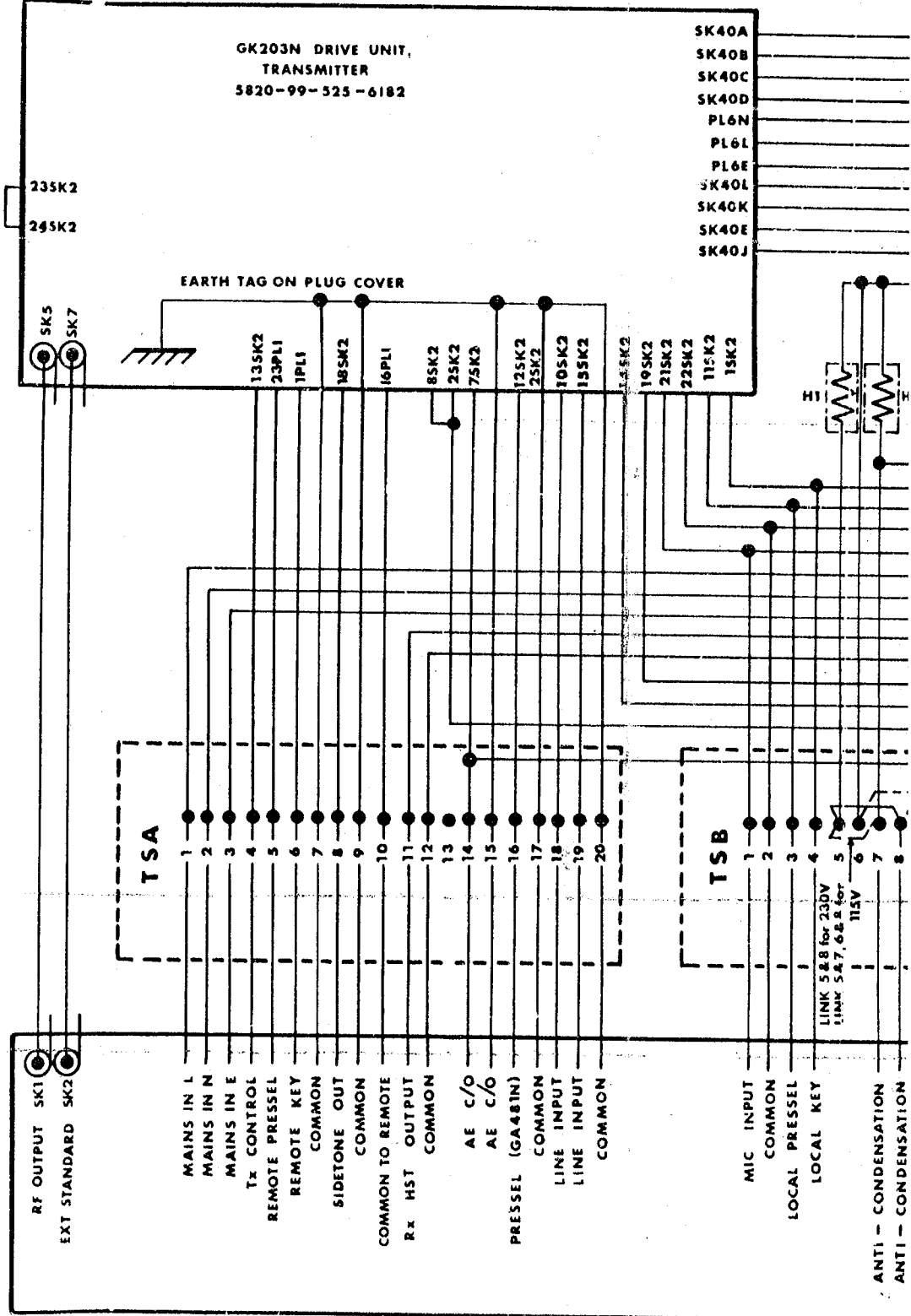
TAGSTRIPS

TSA 20way Ultra 2B60000A2P20 5940-99-519-4880

TSB 20way Ultra 2B60000A2P20 5940-99-519-4880

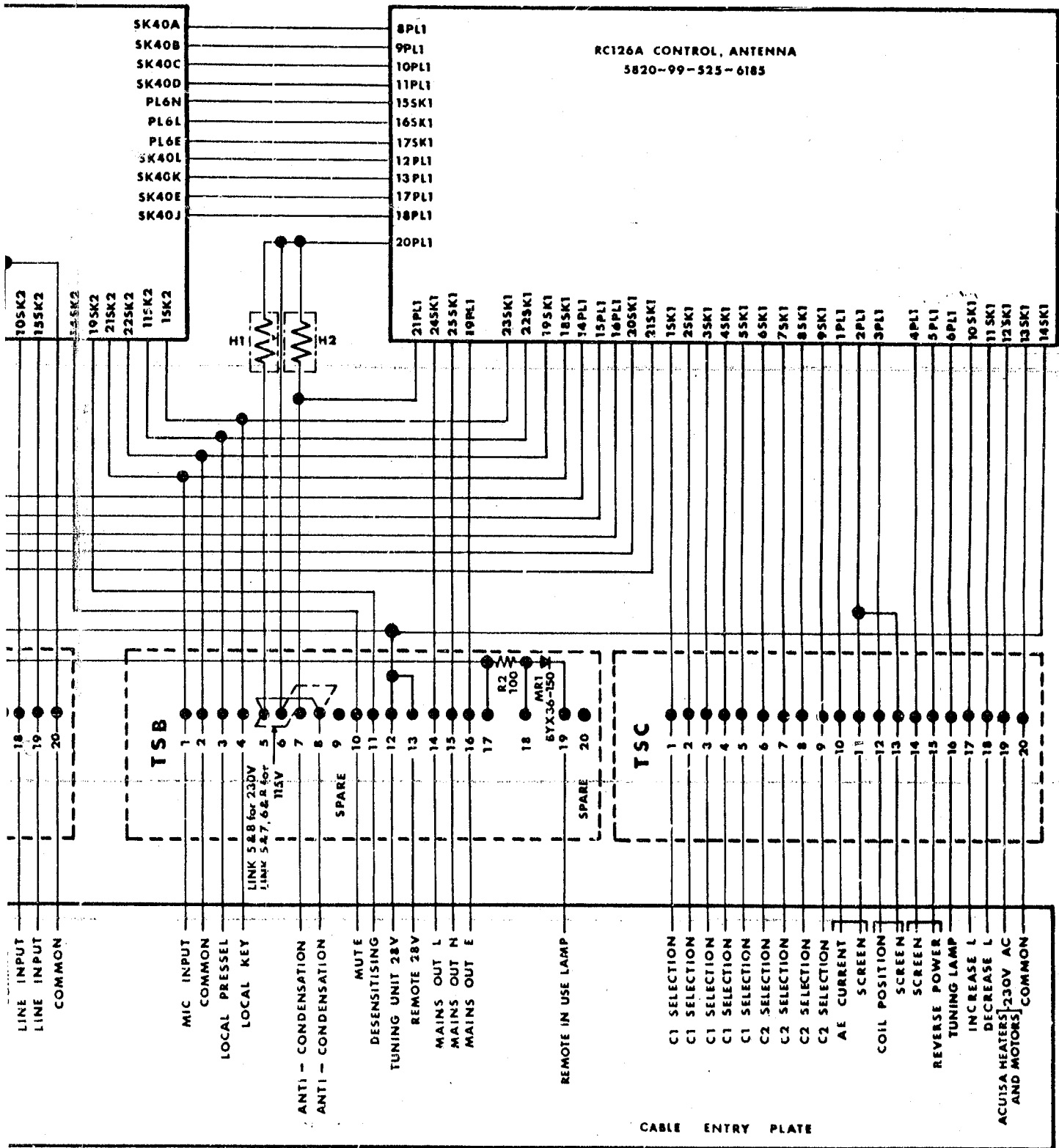
TSC 20way Ultra 2B60000A2P20 5940-99-519-4880

**GK203N DRIVE UNIT,
TRANSMITTER
5820-99-525-6182**



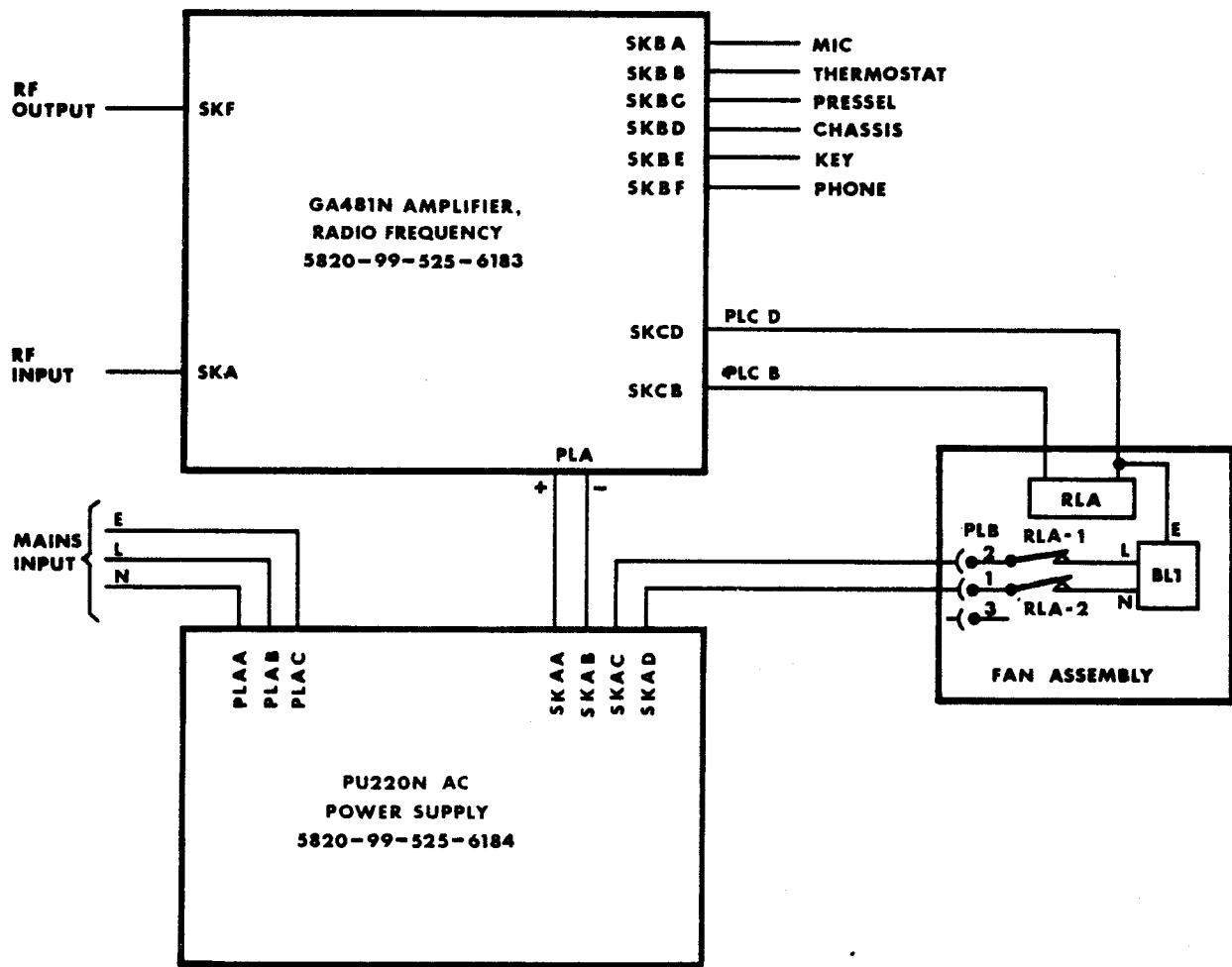
COMPONENT LIST

- R
1 ±2% 1/2W Electrosil TR5 5905-99-013-5971
- S
10W Heating Elements 4590-99-519-3715
10W Heating Elements 4590-99-519-3715
- ard BYX36-150 5961-99-037-5730
- y Belling & Lee L1328/P 5935-99-056-2007
y Belling & Lee L1328/P 5935-99-056-2007
y Pye M10P/LS/H19C 5935-99-112-4319
ial 50Ω Greenpar GE35070C10 5935-99-106-8586
ial 50Ω Greenpar GE35070C10 5935-99-106-8586
- ial 50Ω Greenpar GE35059C10 5935-99-527-3369
ial 50Ω Greenpar GE35059C10 5935-99-527-3369
y Belling & Lee L1328/S 5935-99-056-2008
Bulgin P430 5935-99-940-9381
y Belling & Lee L1328/S 5935-99-056-2008
- 2S
/ Ultra 2B60000A2P20 5940-99-519-4880
/ Ultra 2B60000A2P20 5940-99-519-4880
/ Ultra 2B60000A2P20 5940-99-519-4880



TRANSMITTER-CABINET, ELECTRICAL
EQUIPMENT 5820-99-525-6187 WIRING

FIG. 2.1



COMPONENT LIST

RELAY

RLA ITT 4190HD 5945-99-053-0473

FAN

BL1 115V AC AK Fans WS2107F-110

PLUGS

PLB 3way Bulgin P429

PLC 6way Amphenol 62GB-56J10-6P

TRANSMITTER-FRAME, ELECTRICAL
EQUIPMENT 5820-99-525-6188 WIRING

COMPONENT LIST

RESISTORS

R1 150k Ω $\pm 2\%$ $\frac{1}{4}$ W Electrosil TR5 5905-99-013-6047
R2 390k Ω $\pm 2\%$ $\frac{1}{4}$ W Electrosil TR5 5905-99-013-6057
R3 680 Ω $\pm 2\%$ $\frac{1}{4}$ W Electrosil TR5 5905-99-013-5991

HEATERS

H1 120V 10W Heating Elements 4540-99-519-3715
H2 120V 10W Heating Elements 4540-99-519-3715

LAMPS

ILP1 Thorn L1016 6240-99-996-9215
ILP2 Thorn L1016 6240-99-996-9215

JACK

JKA Rendar R32748/Chrome 5935-99-527-6282

FUSE LINKS

FS3 2A for 100-125V wkg TDC 134 2A: 5920-99-119-8828
FS4 1A for 200-250V wkg TDC 134 1A: 5920-99-104-7982
FS5 1.5A Bulgin F310/1.5 5920-99-527-3515
FS6 1.5A Bulgin F310/1.5 5920-99-527-3515

PLUGS

PL1 Coaxial 75 Ω Greenpar GE37570C12 5935-99-948-7729
PL2 Coaxial 75 Ω Greenpar GE37570C12 5935-99-948-7729
PL3 Coaxial 75 Ω Greenpar GE37570C12 5935-99-948-7729
PL4 Coaxial 50 Ω Greenpar GE35070C10 5935-99-106-8586
PL5 25way Belling & Lee L1328/P 5935-99-056-2007
PL6 10way Pye M10P/LS/H19C 5935-99-112-4319

SOCKETS

SK1 Coaxial 75 Ω Greenpar GE35050 5935-99-972-6827
SK2 Coaxial 75 Ω Greenpar GE35050 5935-99-972-6827
SK3 Coaxial 75 Ω Greenpar GE35050 5935-99-972-6827
SK4 Coaxial 50 Ω Greenpar GE35059C10 5935-99-527-3369
SK5 19way Amphenol 62GB-12E14-19S 5935-99-221-6528
SK6 3way Bulgin P430 5935-99-940-9381

TAGSTRIPS

TSA 20way Ultra 2B60000A2P20 5940-99-519-4880
TSB 20way Ultra 2B60000A2P20 5940-99-519-4880

3-6047
3-6057
-5991

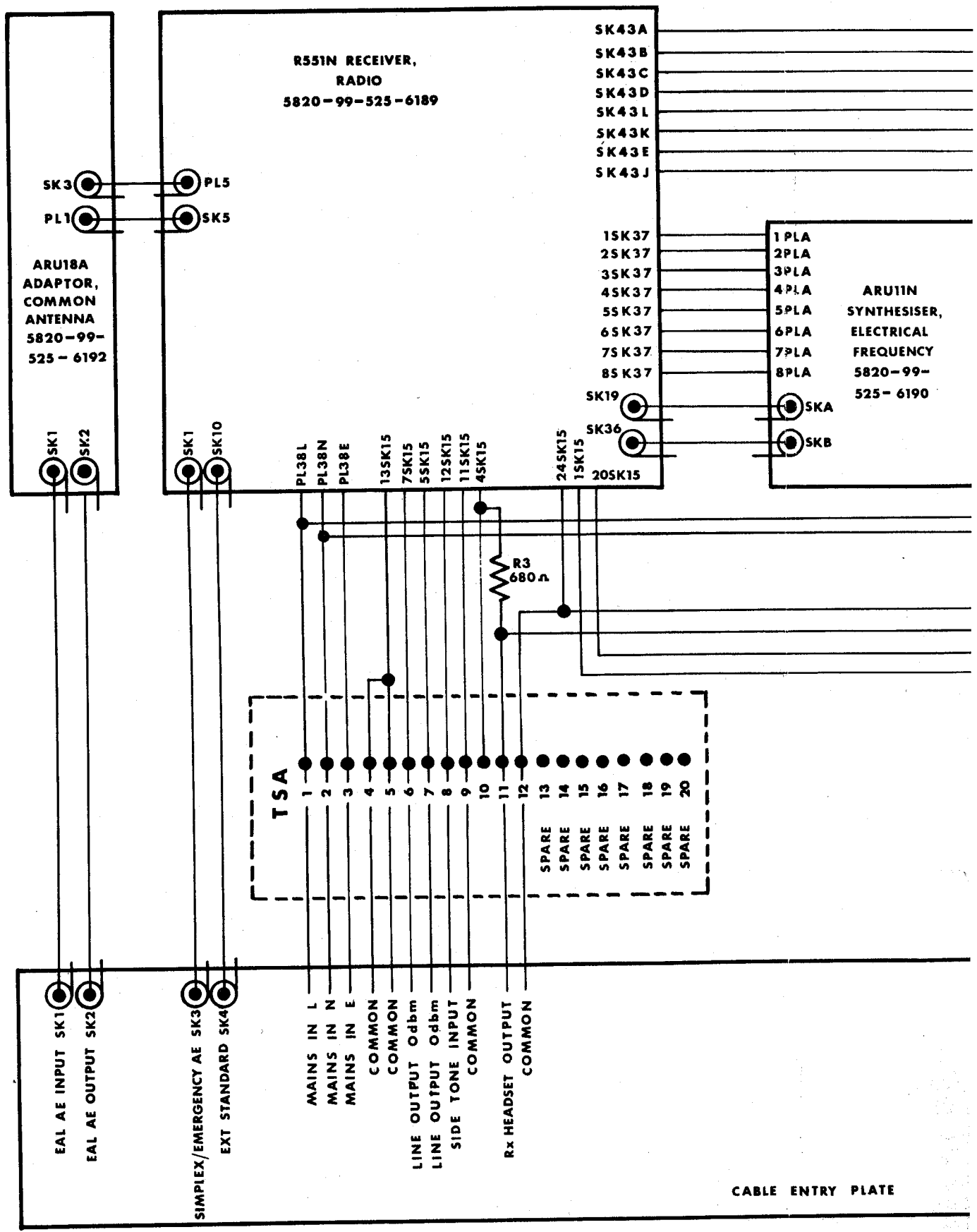
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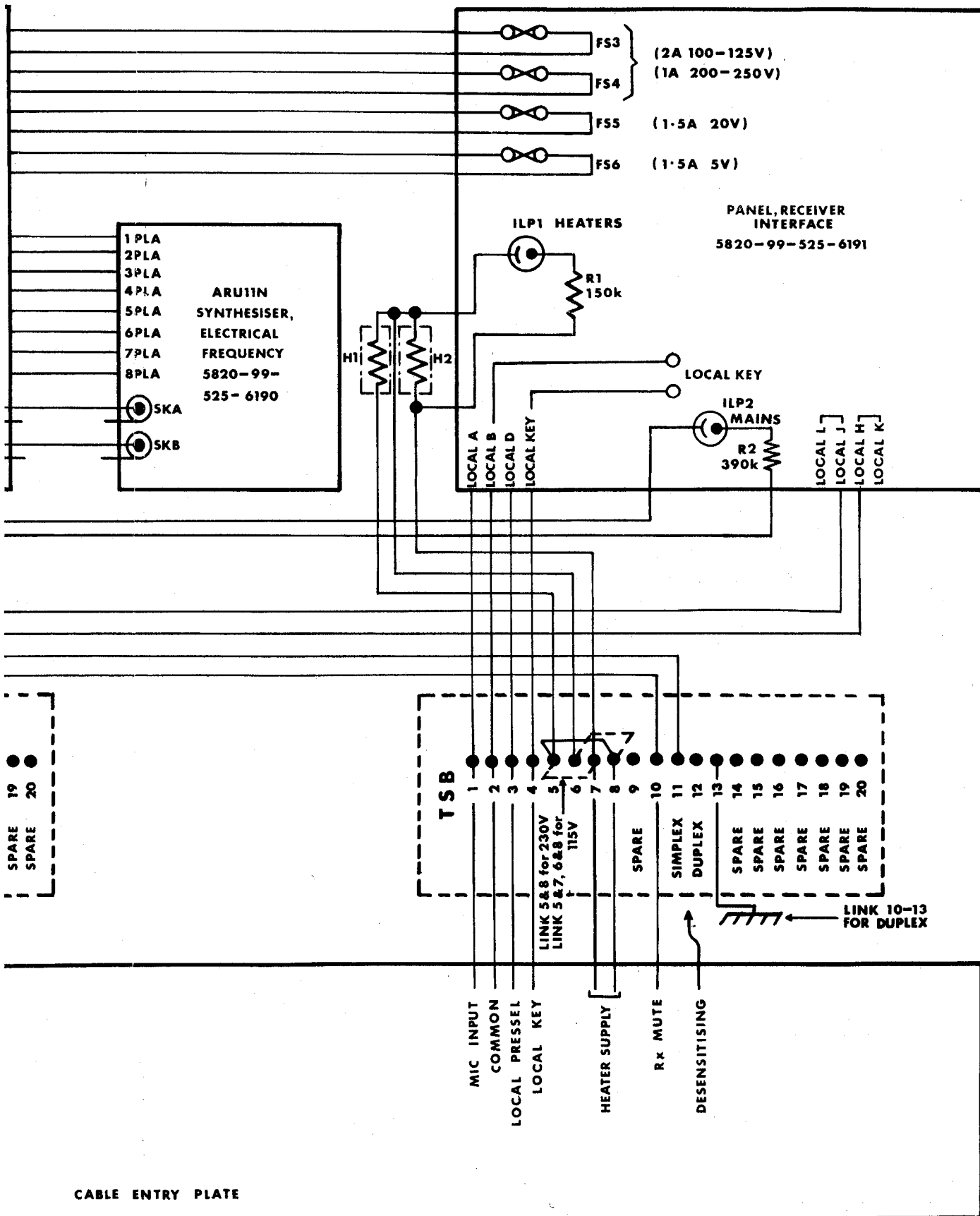
119-8828
104-7982

99-948-7729
99-948-7729
99-948-7729
99-106-8586
-2007
119

172-6827
172-6827
172-6827
99-527-3369
9-221-6528

4880
4880





RECEIVER-CABINET, ELECTRICAL EQUIPMENT 5820-99-6193 WIRING

FIG. 2.3

3 REMOTE OPERATION WITH CARBON MICROPHONE

3 REMOTE OPERATION WITH CARBON MICROPHONE

3.1 GENERAL

3.2 INSTALLATION

3.3 DESCRIPTION

3.4 PERFORMANCE CHECKS

3.4.1 Test Equipment Required

3.4.2 Testing Procedure

3.5 ILLUSTRATIONS

**FIG. 3.5.1 INTERFACE ASSEMBLY, CARBON MICROPHONE
5820-99-527-5988—Component List and Layout**

**FIG. 3.5.2 INTERFACE ASSEMBLY, CARBON MICROPHONE
5820-99-527-5988—Circuit Diagram**

3 REMOTE OPERATION WITH CARBON MICROPHONE

3.1 GENERAL

A carbon microphone with press-to-talk switch may be used at a location remote from the 643 transmitter by connecting an interface unit between the microphone and the input to the 600Ω line.

The unit, Interface Assembly, Carbon Microphone 5820-99-527-5988, may be used with most carbon microphone inserts, for example, Insert 5965-99-100-1944.

3.2 INSTALLATION

The unit is fitted by screws through three $\frac{9}{32}$ in diameter fixing holes. The positions of these holes are shown in Fig. 3.5.1.

3.3 DESCRIPTION

The unit is contained in a cast aluminium box fitted with removable lid.

The circuitry (see Fig. 3.5.2) provides DC energising for the microphone from an emitter follower, VT1, which has its base potential stabilised by a 24V zener diode, MR1. Microphone signal voltage is developed across the primary winding of transformer T1, the secondary winding providing a reasonable match to the 600Ω line input.

When the press-to-talk switch in series with the carbon insert is closed, relay RLA is energised and contacts RLA-1 connect SK1/C to SK1/D setting the equipment to the transmit mode.

3.4 PERFORMANCE CHECKS

3.4.1 Test Equipment Required

Oscilloscope: CRETE CT436

AF Signal Generator: CRETE CT433A

Power Supply: 28V DC at 0.1A

Two Multirange Meters: CRETE AVO-8SX

Switch: Single Pole on-off

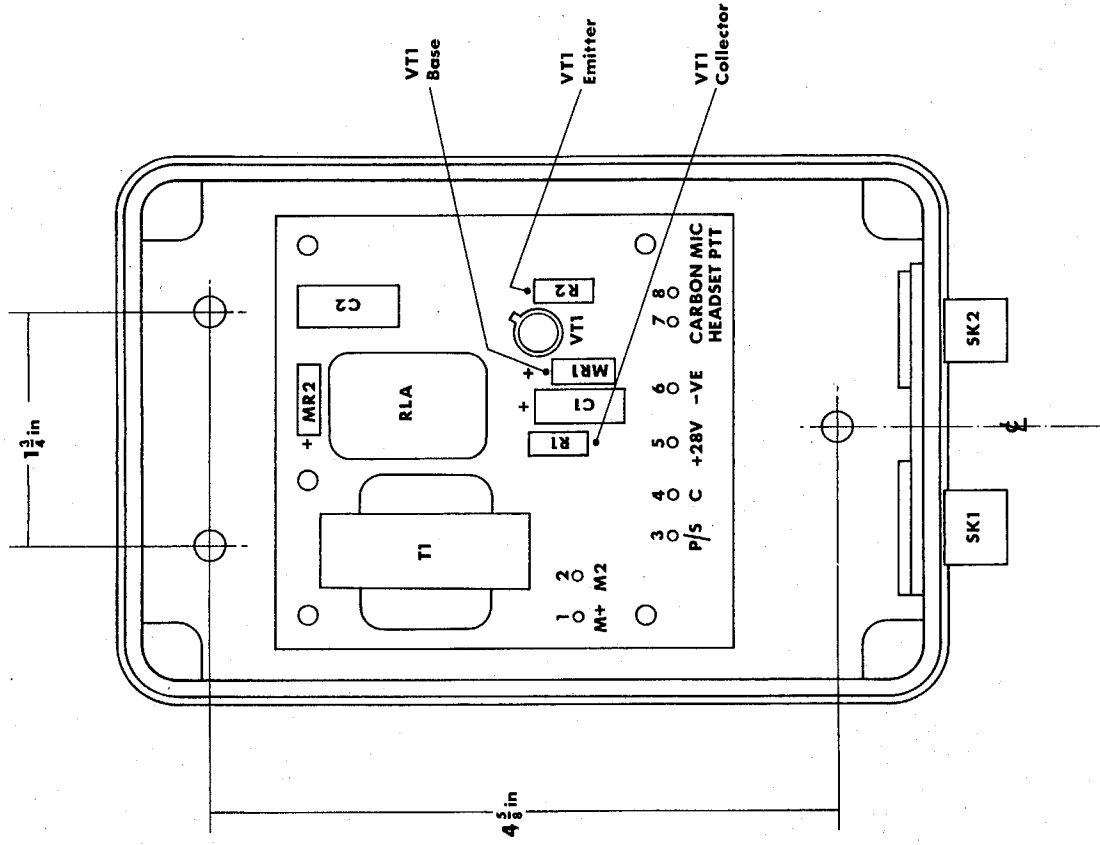
68Ω Resistor: 5905-99-013-5967

560Ω Resistor: 5905-99-013-5989

3.4.2 Testing Procedure

- (1) Connect 560Ω resistor between SK1/A and SK1/B.
- (2) Connect 68Ω resistor between SK2/B and switch.
- (3) Connect other terminal of switch to SK2/A.
- (4) Connect power supply positive terminal to SK1/E.
- (5) Connect power supply negative terminal to SK1/F.
- (6) Connect multimeter between SK1/C and SK1/D.
- (7) Set multimeter to indicate continuity.
- (8) Check that multimeter indicates an open circuit.
- (9) Connect second multimeter positive lead to SK1/E.
- (10) Connect second multimeter negative lead to SK1/F.
- (11) Set second multimeter to 100V DC range.
- (12) Set switch to OFF position.
- (13) Switch power supply ON and adjust output voltage until second multimeter indicates 28.0V DC $\pm 0.2V$.
- (14) Set switch to ON position.
- (15) If necessary, again adjust power supply output voltage until second multimeter indicates 28.0V DC $\pm 0.2V$.
- (16) Check that multimeter between SK1/C and SK1/D indicates a short circuit.
- (17) Switch power supply OFF.
- (18) Disconnect multimeter from SK1/C and SK1/D and connect negative lead to metal case.
- (19) Set multimeter to 100V DC range.
- (20) Switch power supply ON.
- (21) Measure VT1 electrode potentials and compare with figures below (see Fig. 3.5.1 for location of measurement points):

VT1 collector	28.0V $\pm 0.2V$
VT1 base	24.0V $\pm 5\%$
VT1 emitter	23.5V $\pm 5\%$
- (22) Switch power supply OFF.
- (23) Disconnect both multimeters.
- (24) Disconnect 68Ω resistor from SK2/B.
- (25) Connect AF signal generator 5Ω terminal to free end of 68Ω resistor.
- (26) Connect 'earthy' terminal of 5Ω AF signal generator output to SK2/B.
- (27) Connect oscilloscope input to SK2/A and 'earthy' connection to SK2/B.
- (28) Set AF signal generator frequency to 1kHz.
- (29) Adjust AF signal generator output level until oscilloscope indicates 1.0V peak-to-peak.
- (30) Disconnect oscilloscope.
- (31) Connect oscilloscope input to SK1/A and 'earthy' connection to SK1/B.
- (32) Measure signal voltage on oscilloscope.
Limits: 1.2V peak-to-peak $\pm 10\%$.
- (33) Disconnect all test equipment.



COMPONENT LIST

CAPACITORS
 C1 10uF ±20% 35V Union Carbide K1033S 5910-99-013-0511
 C2 1uF ±20% 100V ITT PMT2R-10-20-100

RESISTORS
 R1 470Ω ±2% 1/4W Electrofil TR5 5905-99-013-5987
 R2 56Ω ±2% 1/4W Electrofil TR5 5905-99-013-5965

TRANSISTOR
 VT1 Mullard BFY51 5961-99-037-4573

DIODES
 MR1 Mullard BZY88-C24
 MR2 Mullard 1N914 5961-99-037-3169

RELAY
 RLA ITT 4190GD 5945-99-011-9881

TRANSFORMER
 T1 Redifon SRT2698

SOCKETS
 SK1 Thorn Bendix PT07A-10-6S 5935-99-949-3145
 SK2 Thorn Bendix PT07A-8-33S

FREE PLUGS
 PL1 Thorn Bendix PTGB55SE-10-6P 5935-99-525-7909 (To mate with SK1)
 PL2 Thorn Bendix PT55SE-8-33P (149) 5935-99-327-6978 (To mate with SK2)

INTERFACE ASSEMBLY, CARBON MICROPHONE
 5820-99-527-5988—Component List and Layout

COMPONENT LIST

CAPACITORS

C1 10 μ F \pm 20% 35V Union Carbide K10J35S 5910-99-013-0511
C2 1 μ F \pm 20% 100V ITT PMT2R-1-0-20-100

RESISTORS

R1 470 Ω \pm 2% $\frac{1}{4}$ W Electrosil TR5 5905-99-013-5987
R2 56 Ω \pm 2% $\frac{1}{4}$ W Electrosil TR5 5905-99-013-5965

TRANSISTOR

VT1 Mullard BFY51 5961-99-037-4573

DIODES

MR1 Mullard BZY88-C24
MR2 Mullard 1N914 5961-99-037-3169

RELAY

RLA ITT 4190GD 5945-99-011-9881

TRANSFORMER

T1 Redifon SRT2698

SOCKETS

SK1 Thorn Bendix PT07A-10-6S 5935-99-949-3145
SK2 Thorn Bendix PT07A-8-33S

FREE PLUGS

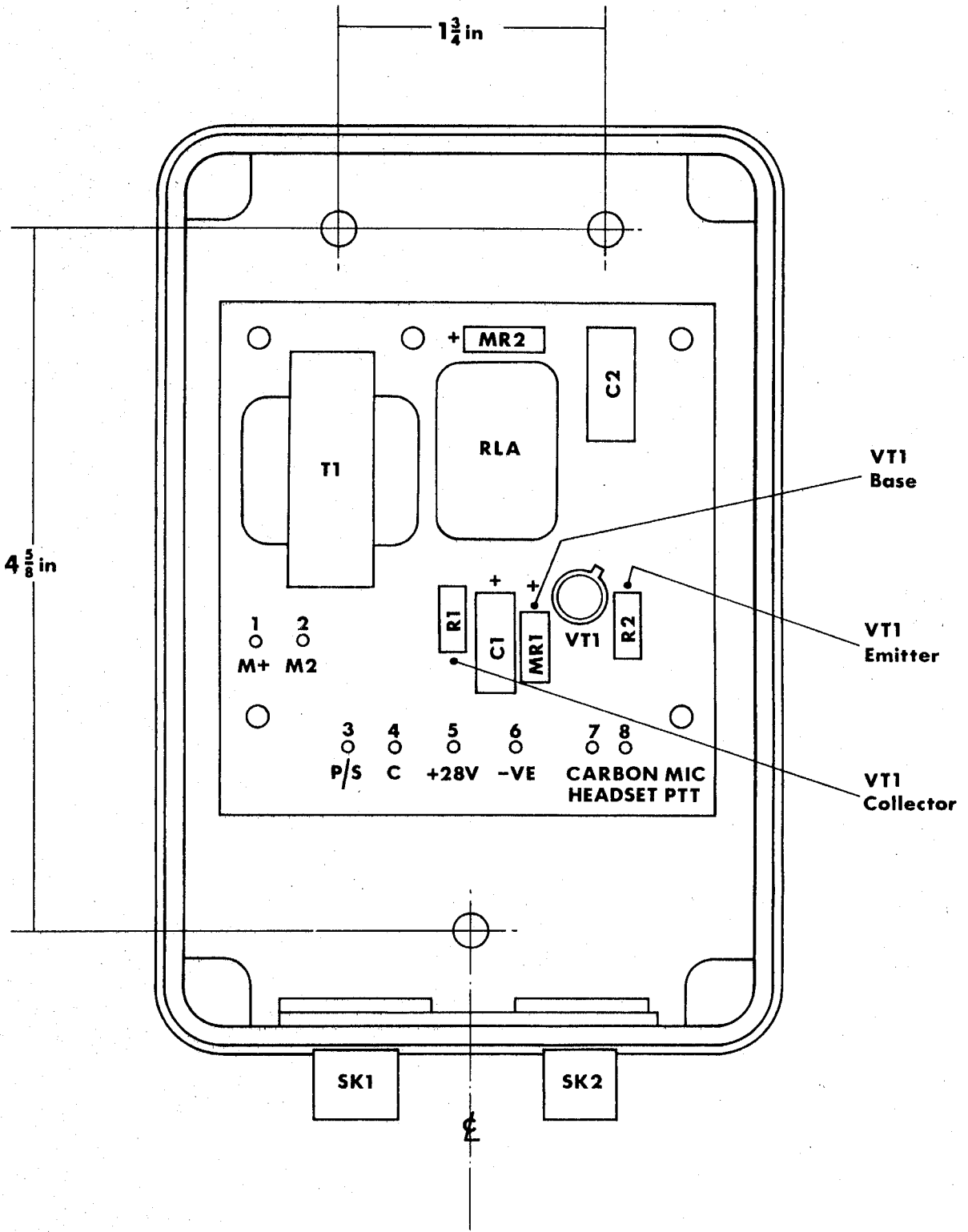
PL1 Thorn Bendix PTGB55SE-10-6P 5935-99-525-7909 (To
mate with SK1)
PL2 Thorn Bendix PT55SE-8-33P (149) 5935-99-527-6978
(To mate with SK2)

5910-99-013-0511
0

113-5987
13-5965

1-3145

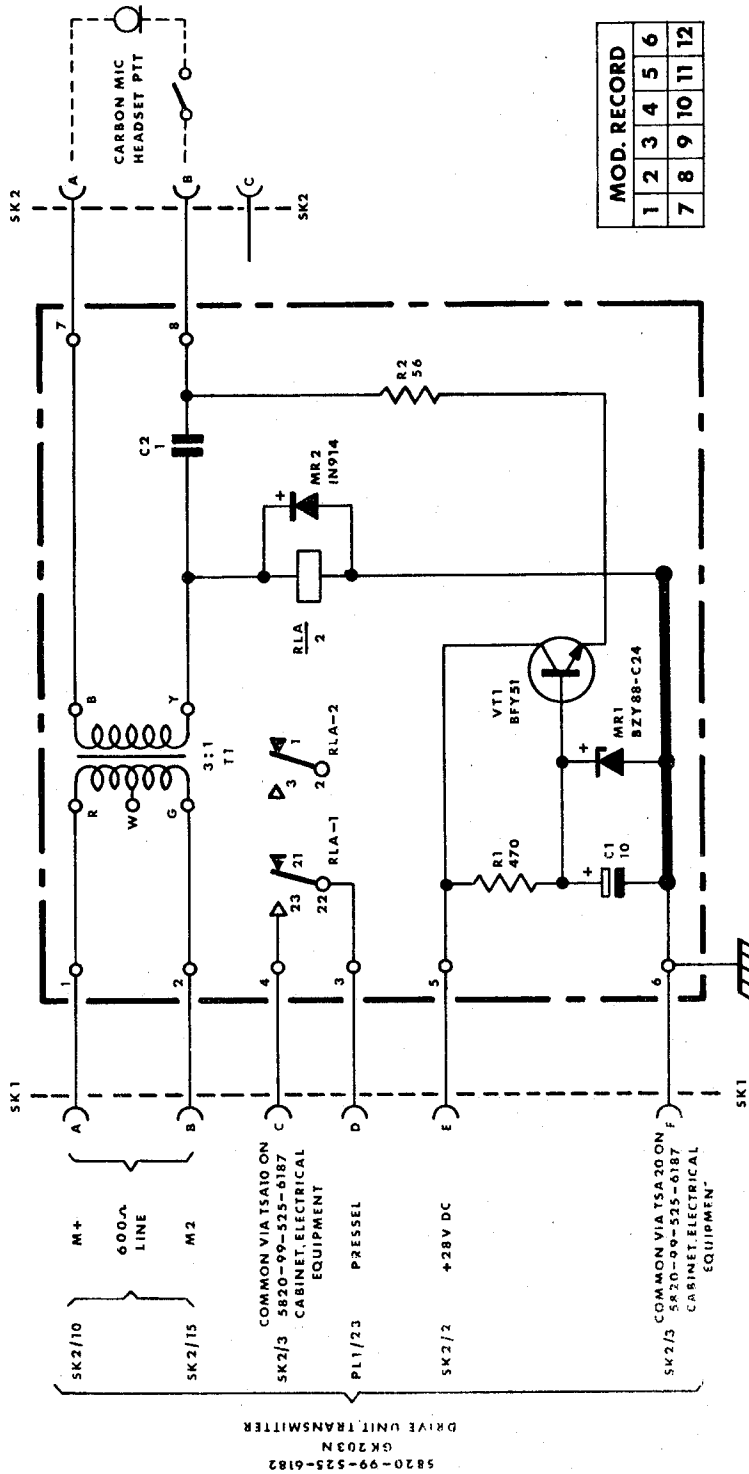
99-525-7909 (To
5935-99-527-6978



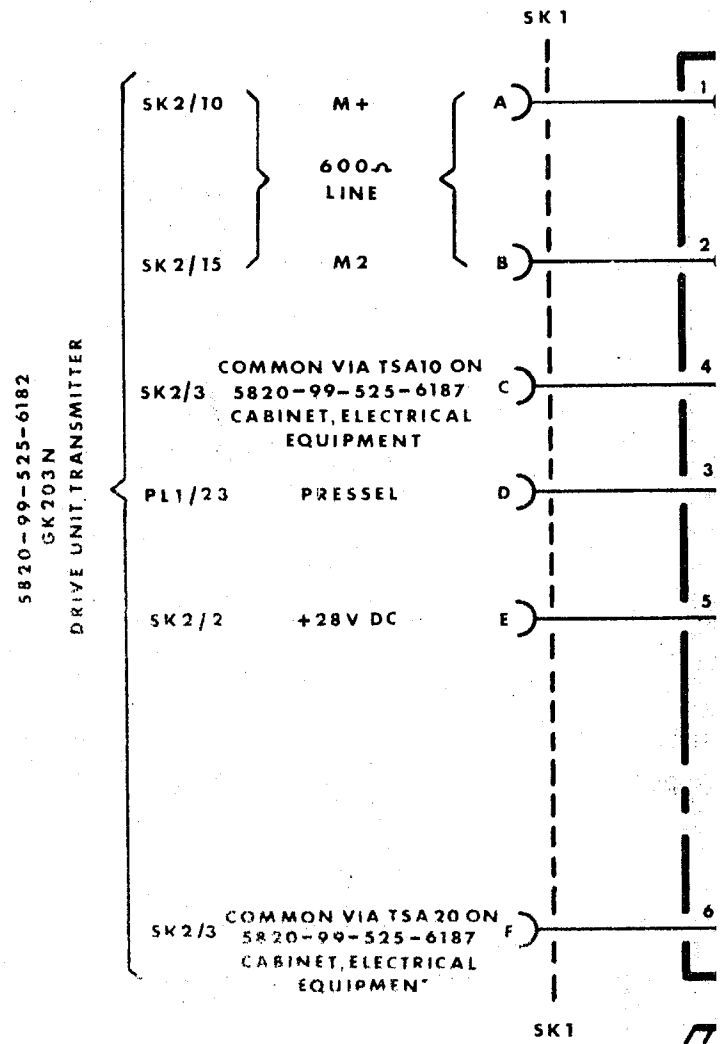
INTERFACE ASSEMBLY, CARBON MICROPHONE
5820-99-527-5988—Component List and Layout

FIG. 3.5.1

R	1	2	R
C	1	2	C
Misc	SK1	T1 MR1 VT1 RLA 2 MR2	SK2 Misc



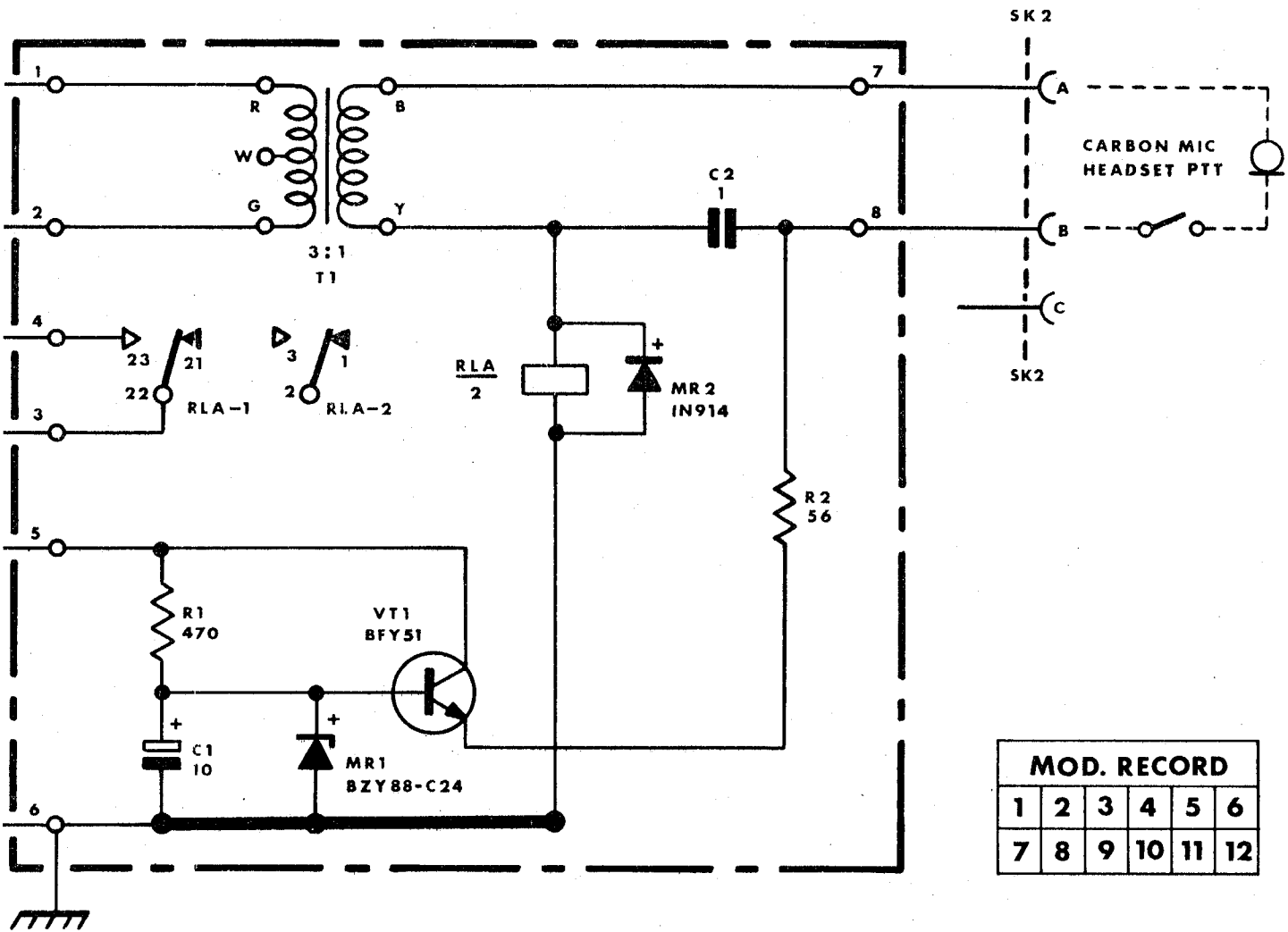
R	
C	
Misc	SK1



002/6909A/3 Iss. 1

950--1

1	2	R
1	2	C
T1 MR1 VT1 $\frac{RLA}{2}$ MR2	SK2	Misc



MOD. RECORD					
1	2	3	4	5	6
7	8	9	10	11	12

INTERFACE ASSEMBLY, CARBON
MICROPHONE 5820-99-527-5988

FIG. 3.5.2

4 REMOVAL OF EQUIPMENT UNITS

4 REMOVAL OF EQUIPMENT UNITS

- 4.1 TRANSMITTER-CABINET, ELECTRICAL EQUIPMENT
5820-99-525-6187**
 - 4.1.1 GK203N Drive Unit, Transmitter 5820-99-525-6182**
 - 4.1.2 RC126A Control, Antenna 5820-99-525-6185**

- 4.2 TRANSMITTER-FRAME, ELECTRICAL EQUIPMENT
5820-99-525-6188**
 - 4.2.1 GA481N Amplifier, Radio Frequency 5820-99-525-6183**
 - 4.2.2 PU220N AC Power Supply Unit 5820-99-525-6184**

- 4.3 RECEIVER-CABINET, ELECTRICAL EQUIPMENT
5820-99-525-6193**
 - 4.3.1 R551N Receiver, Radio 5820-99-525-6189**
 - 4.3.2 ARU11N Synthesiser, Electrical Frequency 5820-99-525-6190**
 - 4.3.3 Panel, Receiver Interface 5820-99-525-6191**
 - 4.3.4 ARU18A Adaptor, Common Antenna 5820-99-525-6192 (CJP2
only)**

4 REMOVAL OF EQUIPMENT UNITS

4.1 TRANSMITTER-CABINET, ELECTRICAL EQUIPMENT 5820-99-525-6187

4.1.1 GK203N Drive Unit, Transmitter 5820-99-525-6182

- (1) Before disconnecting, switch off all mains supplies to the equipment.
- (2) Remove headphones from Monitor socket on front panel.
- (3) Unscrew six captive knurled head fixing screws.
- (4) Hold unit by handles and slide out on runners to limit indicated by an audible click. In this condition the unit cannot be moved either inwards or outwards.
- (5) Disconnect all connectors at rear of unit.
- (6) Undo 4BA nut securing earth connection at rear of unit.
- (7) Press downwards with thumbs on the catch release on each runner and pull unit outwards about a further $\frac{1}{2}$ in only.
- (8) Hold unit underneath, one hand at each side, and withdraw completely from cabinet.

DO NOT ATTEMPT TO WITHDRAW UNIT COMPLETELY WHILST HOLDING BY HANDLES.

4.1.2 RC126A Control, Antenna 5820-99-525-6185

- (1) Before disconnecting, switch off all mains supplies to the equipment.
- (2) Remove connector from Local socket on Transmitter Interface.
- (3) Unscrew four captive knurled head fixing screws.
- (4) Pull out by handles and lay unit on bench.
- (5) Disconnect all connectors at rear of unit.

4.2 TRANSMITTER-FRAME, ELECTRICAL EQUIPMENT 5820-99-525-6188

4.2.1 GA481N Amplifier, Radio Frequency 5820-99-525-6183

- (1) Before disconnecting, switch off all mains supplies to the equipment.
- (2) Disconnect connectors at front and rear of unit.
- (3) Unscrew the two large knurled nuts at bottom of the front of unit until the pivoted screws drop clear of lip.
- (4) Pull unit out by handles only far enough to enable it to be held underneath, one hand at each side, before completely withdrawing it.

DO NOT ATTEMPT TO WITHDRAW UNIT COMPLETELY WHILST HOLDING BY HANDLES.

4.2.2 PU220N AC Power Supply Unit 5820-99-525-6184

- (1) Before disconnecting, switch off all mains supplies to the equipment.
- (2) Disconnect all connectors at rear of unit.
- (3) Unscrew the two large knurled nuts at bottom of the front of unit until the pivoted screws drop clear of lip.
- (4) Pull unit out by handles only far enough to enable it to be held underneath, one hand at each side, before completely withdrawing it.

DO NOT ATTEMPT TO WITHDRAW UNIT COMPLETELY WHILST HOLDING BY HANDLES.

4.3 RECEIVER-CABINET, ELECTRICAL EQUIPMENT 5820-99-525-6193

4.3.1 R551N Receiver, Radio 5820-99-525-6189

- (1) Before disconnecting, switch off all mains supplies to the equipment.
- (2) Remove headphones from sockets.
- (3) Unscrew six captive knurled head fixing screws.
- (4) Hold unit by handles and slide out on runners to limit indicated by an audible click. In this condition the unit cannot be moved inwards or further outwards.
- (5) Disconnect all connectors at rear of unit and two connectors at rear of ARU18A Adaptor, Common Antenna (if fitted).
- (6) Undo 4BA nut securing earth connection at rear of unit.
- (7) Press downwards with thumbs on to catch release on each runner and pull unit outwards about a further $\frac{1}{2}$ in only.
- (8) Hold unit underneath, one hand at each side, and withdraw completely from cabinet.

DO NOT ATTEMPT TO WITHDRAW UNIT COMPLETELY WHILST HOLDING BY HANDLES.

4.3.2 ARU11N Synthesiser, Electrical Frequency 5820-99-525-6190

- (1) Before disconnecting, switch off all mains supplies to the equipment.
- (2) Unscrew six captive knurled head fixing screws on R551N Receiver, Radio.
- (3) Hold R551N Receiver, Radio by handles and slide out on runners to limit indicated by an audible click. In this condition the unit cannot be moved either inwards or further outwards.
- (4) Disconnect all connectors at rear of ARU11N Synthesiser, Electrical Frequency.
- (5) Unscrew and remove four 4BA round head chrome fixing screws together with associated washers.
- (6) Unscrew and remove two 4BA cheese head screws, with associated washers, which fix the unit to R551N Receiver, Radio. These two screws are to be found, one on each side, at the rear of the unit.

(7) Raise front of unit about $\frac{1}{4}$ in and move backwards about 1in so that the control knobs clear the R551N Receiver, Radio panel opening, then remove completely.

4.3.4 ARU18A Adaptor, Common Antenna 5820-99-525-6192 (CJP2 only)

- (1) Before disconnecting, switch off all mains supplies to the equipment.
- (2) Unscrew six captive knurled head fixing screws on R551N Receiver, Radio.
- (3) Hold R551N Receiver, Radio by handles and slide out on runners to limit indicated by an audible click. In this condition the unit cannot be moved either inwards or further outwards.

(4) Disconnect all connectors at rear of ARU18A Adaptor, Common Antenna.

(5) Unscrew and remove four 4BA round head chrome fixing screws together with associated washers from the front panel of R551N Receiver which secure the ARU18A Adaptor, Common Antenna.

(6) Unscrew and remove two 4BA cheese head screws, with associated washers, which fix the unit to R551N Receiver, Radio. These two screws are to be found, one on each side, at the rear of the unit.

(7) Raise front of unit about $\frac{1}{4}$ in and move backwards about 1in so that the control knobs clear the R551N Receiver, Radio panel opening, then remove completely.



5 TEST EQUIPMENT SPECIFIED FOR 643-CJP1/2

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AF Valve Voltmeter: CRETE CT343

Multirange Meters (2 required): CRETE AVO-8SX
(superseded by CRETE CT498A)

RF Valve Voltmeter: CRETE CT471

Frequency Counter: CRETE CT488

Oscilloscopes: CRETE CT536A, CRETE CT484, CRETE SM111

RF Signal Generators (2 required): CRETE CT452
(or one GK203N Drive Unit, Transmitter 5820-99-525-6182)

AF Signal Generators (2 required): CRETE CT433A

AF Power Meter: CRETE CT44

Noise Level Meter: CRETE CT454

RF Power Meter: Marconi TF1020A/1
(or Dummy Load, Electrical, Portable 5985-99-918-6166 used with Indicator, Power and VSWR
5820-99-972-1990)

RF Spectrum Analyser: Marconi OA1094/A

Modulation Depth Meter: Airmec 409

Hybrid Unit: Hatfield Instruments N31BNC
(not required if a GK203N Drive Unit, Transmitter 5820-99-525-6182 is available)

Directional Wattmeter: Bird Thruline Wattmeter 43 with 100H insert
(or Indicator, Power and VSWR 5820-99-972-1990)

Power Supply 0 to 30V DC at 12A: Roband T113
(or PU220N AC Power Supply Unit 5820-99-525-6184)

Variac Transformer 230V AC 5A: AP801461

Variable Resistor (maximum of 2 to 5 Ω) 19A

Ammeter 0 to 20A DC: AP481

Cooling Fan: AK Fans WS2107F-310 230V AC

ADDENDUMB.R.340
Original

5.1 TEST EQUIPMENT REQUIRED TO SERVICE TRANSMITTER 643 AND RECEIVER CJP

5.1.1 Test Equipment Specified for Ship Routine Maintenance to Printed Circuit Board or Module Level

- (1) Multimeter (supersedes AVO-8SX which may be used): CRETE CT498A
- (2) Counter, Electrical Frequency: CRETE CT488
- (3) Oscilloscope SM111: CRETE CT570
- (4) RF Signal Generator (10 kHz to 72 MHz): CRETE CT452A
- (5) Multimeter, Electronic: CRETE CT471
- (6) Meter, Noise Level: CRETE CT454

5.1.2 Additional Test Equipment Required to Re-Align and Repair to Factory Standards (Dockyards, etc.)

- (7) AF Signal Generator (15 Hz to 50 kHz): CRETE CT433A
- (8) Voltmeter, Valve (1.2 mV to 400 V): CRETE CT343
- (9) Wattmeter, Absorption, AF: CRETE CT44
- (10) Spectrum Analyser Marconi OA1094/A: 6625-99-580-6737
- (11) Dummy Load, Electrical, Portable: 5985-99-918-6166
- (12) Indicator, Power and VSWR: 5820-99-972-1990

or

- (13) Bird Thruline Wattmeter: 6625-99-523-8438
and 100H Insert: 6625-99-523-8439

5.1.3 Subsidiary Non Test Equipment Items Specified in Test, Re-Alignment and Repair to Factory Standards

- (14) Hybrid Transformer (Required when GK203N Drive Unit, Transmitter not available): Hatfield Instruments N31 BNC
- (15) AC Power Supply Unit PU220N: 5820-99-525-6184
- (16) Variac Transformer 230 V AC 5A: AP 801461
- (17) Ammeter 0 to 20A DC: AP 481
- (18) Rheostat 19A at 28V
- (19) Cooling Fan 230V AC 50 Hz,
Air Delivery 95 to 100 cub. ft. per min. (Free Air): A.K. Fans
WS 2107F-310

5.1.4 Commercial Test Equipment Mentioned in Text

- (20) RF Signal Generator (alternative to (4)): Airmec 304
- (21) Modulation Depth Meter: Marconi TF1020A/1