PARK AIR ELECTRONICS LIMITED

TECHNICAL HANDBOOK

3000 SERIES TRANSCEIVERS

(TYPES 3010, 3030 AND 3050)

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PAE Part Number 31-13050000



AMENDMENT RECORD

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RECORD OF ADVANCE INFORMATION LEAFLET (AIL)

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RECORD OF SERVICE TEMPORARY AMENDMENT LEAFLETS (STAL)

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MANUFACTURERS DATA

MINISTRY OF DEFENCE
Jul 03

Amendment 1
to
AP115H-3738-12

TECHNICAL HANDBOOK
3000 SERIES TRANSCEIVERS
(TYPES 3010, 3030 AND 3050)

INTRODUCTION

An error has been noted in this publication. Until it is corrected by the equipment manufacturer issuing a formal amendment, a handwritten correction must be incorporated, as detailed below.

INSTRUCTION

At the following location

SECTION 5	(FAULT DIAGNOSIS)
PAGE	5
TABLE	5-2
COLUMN	Display (1) (Associated text = Tx modulation etc)

Change the reference 2-8 to read **2-9**

THIS INSTRUCTION SHEET

Insert this sheet in front of the publication for future reference.

RELATED/ASSOCIATED PUBLICATIONS

Reference should be made to the Related/Associated Publications family tree in AP 215H–3700–13A

WARNINGS

HAZARDOUS SUBSTANCES

1 Before using any hazardous substance or material, the user must be conversant with the safety precautions and first aid instructions:

1.1 On the label of the container it was supplied in.

1.2 On the material Safety Data Sheet.

1.3 In local Safety Orders and Regulations.

WARNINGS AND PRECAUTIONS

2 Observe all warnings and precautions displayed within the equipment units, and highlighted within the various categories of the equipment handbook.

WARNINGS

1 BERYLLIUM OXIDE. BERYLLIUM OXIDE IS TOXIC. REFER TO JSP(F)395, CATALOGUE OF HAZARDOUS STORES.

2 CERTAIN ELECTRONIC COMPONENTS MAY USE BERYLLIUM AS AN INSULATOR OR THERMAL CONDUCTOR. IN NORMAL USE OR HANDLING, NO HAZARD EXISTS AND NO SPECIAL PRECAUTIONS ARE NECESSARY, BUT AS A PRECAUTIONARY MEASURE COMPONENTS SHOULD NOT BE BROKEN UP AND, IN PARTICULAR, THE OUTER ENVELOPES OF SEMICONDUCTOR DEVICES SHOULD NOT BE OPENED. BERYLLIUM OXIDE IS HAZARDOUS IF:

2.1 BERYLLIUM MATERIALS ARE ABSORBED INTO THE BODY TISSUES THROUGH THE SKIN, MOUTH OR WOUND.

2.2 THE DUST CREATED BY THE BREAKAGE OF A BERYLLIUM COMPONENT IS INHALED.

3 FLUORELASTOMERS. COMPONENTS MADE FROM FLUORELASTOMERS (EG VITON, FLUOREL, TECMOFLON) ARE USED IN THIS EQUIPMENT AND CABLING EG FOR HEATSHRINK AND FLEXIBLE CONDUITS.

3.1 THESE MATERIALS ARE SAFE UNDER NORMAL TEMPERATURES AND CONDITIONS.

3.2 WHEN HEATED EXCESSIVELY (GREATER THAN 200 °C) HYDROFLUORIC ACID FUMES ARE RELEASED, THESE FUMES ARE HIGHLY CORROSIVE AND DANGEROUS TO PERSONNEL. REFER TO AP 100B–10 LEAFLET S.2602.

3.3 PERSONNEL MAY BE AFFECTED BY HYDROFLUORIC ACID WITHOUT BEING AWARE OF CONTAMINATION. ANYONE INVOLVED IN AN INCIDENT MUST BE TREATED IN ACCORDANCE WITH LOCAL INSTRUCTIONS.

3.4 IN THE EVENT OF EQUIPMENT CONTAMINATION, LOCAL PROCEDURES FOR DECONTAMINATION MUST BE FOLLOWED.

3.5 GREAT CARE MUST BE TAKEN WHEN USING SOLDERING IRONS, HOT AIR BLOWERS OR ANY OTHER SOURCE OF HEAT NEAR FLUORELASTOMERS.

3.6 DO NOT SMOKE WHEN WORKING WITH OR NEAR FLUORELASTOMERS.

4 FIRE. IN THE EVENT OF AN ANTENNA AND PALLET ASSEMBLY FIRE, OPERATE THE EMERGENCY OFF BUTTON ON THE TOP OF THE LOCAL CONTROL UNIT (AT THE END OF THE PALLET ASSEMBLY) TO SWITCH OFF. IF IT IS NOT POSSIBLE TO APPROACH THE ANTENNA, THE EMERGENCY OFF BUTTON ON THE END–FRAME OF THE RMC CABIN CAN BE USED TO SWITCH OFF. FOR ISOLATION PURPOSES SWITCH OFF CIRCUIT BREAKER CB13 IN THE RMC AC DISTRIBUTION UNIT.

5 IN THE RMC, OPERATE THE EMERGENCY OFF BUTTON ON THE FRONT OF THE CABIN AC DISTRIBUTION UNIT TO SWITCH OFF THE RADAR SYSTEM. FOR ISOLATION PURPOSES SWITCH OFF MAIN CIRCUIT BREAKER CB1 AND UPS OUTPUT CIRCUIT BREAKER CB18.

6 TO ISOLATE THE TRANSMITTER COMPLETELY IT IS NECESSARY TO SWITCH OFF THE FOLLOWING CIRCUIT BREAKERS AT THE AC DISTRIBUTION RACK:

CB29	TRANSMITTER 440 V
CB24	TRANSMITTER CONTROL
CB34, 35 AND 36	TRANSMITTER FANS

CIRCUIT BREAKERS CB34, 35 AND 36 ARE PUSH BUTTON DEVICES MOUNTED ON THE ANCILLARIES PANEL ON THE BACK WALL OF THE AC DISTRIBUTION RACK. EXTREME CAUTION MUST BE TAKEN WHEN OPENING THE AC DISTRIBUTION RACK TO ACCESS THESE DEVICES. REFER TO DEF. STAN. 61–15, PRECAUTIONS AGAINST ELECTRIC SHOCK IN MAINTENANCE AREAS. ALTERNATELY, CB9 CAN BE SWITCHED OFF AT THE AC DISTRIBUTION RACK, BUT IT SHOULD BE NOTED THAT THIS REMOVES THE FAN SUPPLIES FROM ALL OTHER RACKS.

7 NOTE THAT THIS DOES NOT ISOLATE THE UPS BATTERY, UPS INVERTER OR UPS OUTPUT SUPPLY CABLES. TO ISOLATE THE UPS INVERTER AND UPS OUTPUT SUPPLY CABLES, THE UPS BATTERY ISOLATOR MUST ALSO BE SWITCHED OFF.

8 HIGH CURRENT. THE DC POWER SUPPLIES WITHIN THE EQUIPMENT UNITS ARE OF A HIGH CURRENT CAPACITY. CARE MUST BE TAKEN NOT TO SHORT CIRCUIT ANY POWER SUPPLY AS THE ASSEMBLY WIRING COULD BE DAMAGED, AND A FIRE MAY RESULT.

9 X–RAY HAZARD. THIS EQUIPMENT CAN EMIT X–RAY RADIATION. CHECK FOR X–RAY RADIATION LEAKS MUST BE MADE AT REGULAR INTERVALS. REFER TO JSP392.

10 RADIO FREQUENCY HAZARD. RF RADIATION IS A HEALTH HAZARD. WHILE THE LEVEL OF POWER BEYOND 4 METRES FROM THE ANTENNA IS WITHIN NATIONALLY ACCEPTED SAFETY LEVELS (REFER TO THE SYSTEM HANDBOOK FOR DETAILS), PERSONNEL SHOULD NOT STAND OR LINGER IN THE VICINITY OF THE ROTATING ANTENNA. (NOTE THAT AN INTERLOCK PREVENTS TRANSMISSION IN THE MAIN EQUIPMENT WHEN THE ANTENNA IS STATIONARY, BUT NOT THE IFF EQUIPMENT). DO NOT CLIMB ONTO CABIN ROOFS WHILE THE TRANSMITTER IS OPERATING.

11 ACCESS TO THE DWC CABIN ROOF SHOULD BE DENIED WHILE THE RADIO EQUIPMENT IS OPERATING.

12 RADIATION HAZARD. PRE–TR CELLS IN THE WAVEGUIDE ASSEMBLIES CONTAIN RADIO–ACTIVE TRITIUM. THE UNITS ARE SAFE UNLESS AN INTERNAL GLASS CONTAINER IS DAMAGED OR BROKEN. DAMAGED ITEMS MUST BE HANDLED AND DISPOSED OF USING LOCAL INSTRUCTIONS FOR RADIO ACTIVE MATERIAL.

13 INFRA–RED RADIATION. INFRA–RED RADIATION IS EMITTED WHEN THE FIBRE OPTIC CABLE BETWEEN THE DISPLAY INTERFACE AND THE SIGNAL PROCESSOR IS DISCONNECTED WITH POWER APPLIED TO THE DATA LINK.

14 LETHAL VOLTAGES. EQUIPMENTS IN OPERATIONAL USE CARRY LETHAL VOLTAGES. OPERATIONS INVOLVING THE REMOVAL OF COVERS/PANELS SHOULD ONLY BE UNDERTAKEN BY PERSONNEL AWARE OF THE HAZARDS INVOLVED. REFER TO DEF. STAN. 61–15, PRECAUTIONS AGAINST ELECTRIC SHOCK IN MAINTENANCE AREAS.

14.1 THE ANTENNA AND PALLET ASSEMBLY IS SUPPLIED WITH 440 V 3–PHASE SUPPLIES FROM THE RADAR MANAGEMENT CABIN. WHENEVER POSSIBLE, SWITCH OFF THE MAINS SUPPLIES TO ALL ANTENNA AND PALLET ASSEMBLY EQUIPMENTS AT THE RMC AC DISTRIBUTION CUBICLE BEFORE OPENING OR REMOVING ANY PANELS ON THE ASSEMBLY.

14.2 DANGEROUS VOLTAGES (UP TO 50 KV) EXIST WITHIN THE TRANSMITTER EQUIPMENT IN THE RMC.

15 CIRCUIT BREAKER LOCKS. WHENEVER POSSIBLE, WHILE WORKING ON EQUIPMENT REMOTE FROM THE CIRCUIT BREAKER(S) CONTROLLING IT, LOCK THE CIRCUIT BREAKERS IN THE OFF POSITION USING THE PADLOCKS PROVIDED.

16 FLUID SPILLAGE. ANY HYDRAULIC OIL, LUBRICATING OIL OR COOLANT SPILLAGE MUST BE WIPED UP IMMEDIATELY.

17 HIGH TEMPERATURE. THE TOP OF THE TRAVELLING WAVE TUBE REACHES TEMPERATURES OF UP TO 200°C. REFER TO THE WARNING LABEL ATTACHED LOCALLY.

18 CASTELLATED LOCKING KEY. WHENEVER SERVICING IS CARRIED OUT ON THE ANTENNA, ENSURE THAT THE TURNING LOCK CASTEL SAFETY KEY IS REMOVED FROM THE AC DISTRIBUTION UNIT IN THE RADAR MANAGEMENT CABIN (RMC), AND IS IN THE POSSESSION OF THE PERSONNEL OPERATING THE ANTENNA.

19 STAINLESS STEEL CABLE MARKERS. SOME CABLES USED ON THIS SYSTEM HAVE STAINLESS STEEL MARKERS. THESE MAY HAVE SHARP EDGES WHICH COULD CAUSE CUTS. IT IS THEREFORE ADVISABLE TO WEAR PROTECTIVE GLOVES WHEN HANDLING SUCH CABLES.

20 NOISE. NOISE LEVELS ARE HIGH WITHIN THE GENERATOR CABINS WHEN THE GENERATORS ARE IN USE. PERSONNEL WORKING WITHIN AN IN–USE CABIN MUST WEAR EAR DEFENDERS.

21 LITHIUM BATTERIES. THE UHF/VHF EQUIPMENTS CONTAIN LITHIUM BATTERIES. THESE ARE SAFE DURING NORMAL USE, BUT PRESENT A DANGER OF EXPLOSION IF INCORRECTLY CONNECTED OR CHARGED. THE BATTERIES MUST NOT BE PUNCTURED, PIERCED OR INCINERATED.

22 ANTENNA STABILITY. PARTICULAR NOTE SHOULD BE TAKEN OF ANY PRECAUTION NECESSARY TO ENSURE ANTENNA STABILITY DURING DEPLOYMENT AND OPERATION.

23 ELECTRICAL STORMS. WORK ON THE ANTENNA DURING ELECTRICAL STORMS OR POTENTIAL LIGHTNING STRIKE SITUATIONS SHOULD BE AVOIDED, AS IT PRESENTS A PERSONNEL SAFETY HAZARD. THE CONVOY COMMANDER MUST MAKE THE FINAL DECISION ON ANY SUCH OPERATION.

CAUTIONS

STATIC SENSITIVE DEVICES (SSD)

Some semiconductor devices are susceptible to damage if subjected to static electrical charges.

The assemblies and pec incorporating semiconductor devices that are susceptible to damage if subjected to static electrical charges are fitted with a yellow warning label. To avoid possible damage to these devices observe the following precautions:

(1) Store SSD or any pec incorporating them in conductive wrappers.

(2) Except when fitted in the equipment keep SSD leads or pins shorted together or in contact with conductive material.

(3) Keep the pec edge connector covered by a shorting strip until immediately before use. Replace the shorting strip immediately after removing the pec from the equipment. Do not handle the edge connector contacts.

(4) Switch off power supplies before inserting or removing SSD or pec. Do not apply input signals to the SSD with the power off.

(5) Take care that test voltages applied to the pec are of the correct polarity and do not exceed the recommended SSD supply voltage.

(6) Connect soldering iron tips, tools and handling devices to ground. Use only low voltage soldering irons.

(7) It is recommended that work bench tops, stools etc. should be covered with grounded conducting material and that operatives should wear skin contact wrist straps with a ground leakage resistance between 100 k and 1 M ohms.

MODIFICATION RECORD

The following record confirms that this publication incorporates all technical changes necessitated by the modifications listed below. Information on modification titles, classification categories and Mark applicabilities is given Category 8.

Mod. No.

TECHNICAL HANDBOOK

3000 SERIES TRANSCEIVERS

(TYPES 3010, 3030 AND 3050)

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TELEX: 32456 PAELEC G

NOVEMBER 1994

PART NO: 31-13050000

WARNINGS

LETHAL VOLTAGES

Equipments in operational use contain lethal voltages and operations involving the removal of covers or panels should only be undertaken by skilled personnel who are aware of the hazards involved.

BERYLLIUM/BERYLLIA

The equipment covered by this Handbook contains components incorporating the highly toxic material Beryllium and/or its oxide Beryllia. These materials are especially hazardous if:

1 Beryllium materials are absorbed into the body tissues through the skin, mouth or wound.

2 The dust created by breakage of Beryllia is inhaled.

3 Toxic fumes are inhaled from Beryllia/Beryllium involved in a fire.

LITHIUM BATTERIES

This equipment contains lithium batteries. These batteries present a danger of explosion if incorrectly connected or charged. Batteries must be disposed of in accordance with current regulations. Lithium batteries must not be punctured, pierced or incinerated.

CAUTION

ESDs

The equipment covered by this Handbook contains electrostatic sensitive devices (ESDs). Observe handling precautions to avoid static charges which may damage these devices.

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The amended text is indicated by a vertical bar in the margin adjacent to the changed text.

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Amendment record
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Modification record
Glossary of terms

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Section 2 - **SPECIFICATION**

Section 3 - **TECHNICAL DESCRIPTION**

Chapter 1 - **MAINFRAME**

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Section 4 - **MAINTENANCE AND ALIGNMENT**

Section 5 - **FAULT DIAGNOSIS**

Section 6 - **PARTS LIST**

Appendix 1 - **Guard Receiver Option**

MODIFICATION RECORD

Refer to the modification plate attached to the equipment to identify the appropriate modifications.

MOD NO.	DETAILS	DATE

GLOSSARY OF TERMS

The words used in this manual have the first spelling and meaning given in the Concise Oxford Dictionary except for the following:

WARNING	A warning is used to denote a danger to personnel of injury or death.
CAUTION	A caution is used to denote a possibility of damage to equipment or material.
Note	A note is advice and is used to convey, or draw attention to, information that is extraneous to the immediate subject of the text.
Lethal voltages	A voltage exceeding 30 V (rms) or 50 V (peak) ac; or 50 V dc
Inspect	Measure, examine, test, gauge or otherwise compare the item with the applicable requirements.
Check	Make a comparison against a specified standard.
Ensure	Make certain that the specified conditions are correct, and if necessary take action to achieve the specified conditions.
Test	Ascertain, by using the appropriate test equipment, that a component or system functions correctly.
Examine	Undertake a comprehensive scrutiny, supplemented by measurement and physical testing, to determine the condition of the item. For example the condition of an item can be impaired by one or more of the following: (1) Insecurity of attachment. (2) Corrosion, contamination or deterioration. (3) Loose or missing rivets, bolts, screws, nuts, etc. (4) Faulty or broken locking devices. (5) External damage. (6) Faulty or broken audio/visual indicating devices.
Fit	Correctly attach one item to another.
Refit	Fit an item which has been previously removed.
Disconnect	Uncouple or detach cables, plugs or connections.
Reconnect	Recouple or reattach cables, plugs or connections previously disconnected.
Remove	Correctly disconnect and detach the item from its mounting or position.
Replace	Remove an item and fit a new or serviceable item.
Function	Check, as far as can be determined without the use of test equipment or reference to measurements, that the item or system is serviceable and operates correctly.
NB:	A mandatory instruction.

PARK AIR ELECTRONICS

CERTIFICATION OF RECEIPT

DATE: _____

COMPANY NAME: _____

DEPARTMENT: _____

ADDRESS: _____

_____

_____

INSTRUCTION MANUAL INFORMATION:

MODEL No. Transmitter/Receiver Type _____ AMENDMENT: _____

SERIAL No. _____ ISSUE No. 3000/NOV. 94

COMMENTS:

IN ORDER TO KEEP YOUR INSTRUCTION MANUAL CURRENT, PLEASE COMPLETE THIS FORM AND MAIL TO:

PARK AIR ELECTRONICS LIMITED
NORTHFIELDS
MARKET DEEPING
PETERBOROUGH
ENGLAND
PE6 8LG

ATTENTION: TECHNICAL PUBLICATIONS

PAE

PARK AIR ELECTRONICS LTD

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FAULT REPORT

In accordance with PAE policy of continuing product improvement we wish to gather as much information as possible about equipment faults. In the unlikely event of an equipment fault or failure please complete this report form and return to PAE.

Customer: .....

Address: .....

EQUIPMENT DETAILS:

Equipment model: .....

Equipment Serial No: .....

SERVICE DETAILS:

Commissioning date: .....

Failure/repair date: .....

Power Supply: ..... Volts AC/DC

*Transmitter keying: Continuous / approx 50% / occasional use

*Equipment environments: Office area / dedicated equipment room / heated / air conditioned

FAULT DETAILS:

Symptoms of fault: .....

Results of any tests: .....

Any repairs carried out: .....

Comments / Action requested: .....

Note if a claim under warranty is being made a completed copy of this form MUST accompany the claim submittal

.....
Technician/Engineer

*Delete as applicable

Date .....

Paragraph

1 Introduction
8 Equipment overview
9 The mainframe
18 The transmitter
22 The receiver
25 The synthesiser
29 Options
35 Control of equipment
37 Equipment cooling
38 Types of installation

Table

1.1 Series 3000 transceiver options

INTRODUCTION

1 This handbook contains the technical description of the Park Air Electronics (PAE) Series 3000 transceivers; it should be read in conjunction with the Series 3000 Operator's Handbook which contains the operating and installation instructions.

2 Each Series 3000 equipment is a combined transmitter and receiver operating in the following frequency bands:

- Between 108-155.975 MHz (3010 VHF transceiver)
- Between 225-399.975 MHz (3030 UHF transceiver)
- Between 108-155.975 and 225-399.75 MHz (3050 VHF/UHF transceiver)

3 Channel spacing is 25 kHz.

4 The equipment operates in amplitude modulation (AM), or frequency modulation (FM) modes, and can be configured for speech (narrow-band), data (wideband), encryption, and Link 11 applications (3050 and 3030 transceivers only).

5 The transmitter provides a maximum RF carrier output of 40 watt in AM mode, and 60 watt in FM mode. The transmitter's carrier frequency is generated by a microprocessor controlled synthesiser. The synthesiser also generates the receiver's first and second intermediate frequency (IF) injection signals.

6 The equipment's operating frequency is selected using the front panel's numeric data keys. Up to 99 preset channels can be stored in the equipment's memory. Each stored channel contains frequency and operating mode information. Preset channels can be recalled for operational use, or recalled for display without altering the operational frequency.

7 A built-in test equipment (BITE) facility provides continuous monitoring of essential equipment parameters. This facility assists during periods of fault finding, and provides a user confidence check of the equipment.

EQUIPMENT OVERVIEW

8 The equipment can be divided into five functional areas (refer to Figs. 3-1 and 3-2):

- The mainframe (including front and rear panels, power supply unit, and the BITE assembly)
- The transmitter
- The receiver
- The synthesiser
- Options

The Mainframe

9 The mainframe assembly comprises the equipment's chassis, manufactured from heavy gauge aluminium, fitted with two interconnection PCBs. The interconnection PCBs are fitted with connectors which accommodate a number of plug-in modules. The modules which plug into the mainframe assembly are:

- Transmitter control, module 2
- Synthesiser, module 3
- Guard receiver option, module 4 (if fitted)
- Remote control, module 5
- Receiver RF, module 6
- Receiver IF and audio, module 8

10 Also included in the mainframe assembly is the power supply unit (PSU), BITE assembly, front panel assembly, rear panel assembly, and the antenna filter.

Power Supply Unit

11 The equipment operates from a 110/120 V, or 220/240 V ac input supply, or from a low voltage dc supply. The appropriate ac input supply is selected by removing a plate on the equipment's rear panel, and setting two switches. Full details of the switch settings are provided in the installation section of the operator's handbook.

12 Both ac and dc input supplies can be connected to the equipment. When both ac and dc is connected, operation from the ac supply takes priority; automatic change-over to the dc supply will occur if the ac supply fails. On restoration of the ac supply, the equipment reverts to ac operation.

BITE Assembly

13 The BITE assembly contains microprocessor controlled test and monitor circuits for key parameters within the equipment. The assembly, which is fitted behind the front panel, also provides an interface between the front panel assemblies, and the plug-in modules.

14 The BITE functions in three different ways:

(a) It allows certain equipment parameters, for example transmitter output power, to be displayed only when selected by the user.

(b) It continuously performs certain test routines while the equipment is operating.

(c) It provides a complete check of the equipment when selected to do so by the user. During this operation, normal operation of the equipment is suspended.

Front Panel Assembly

15 The front panel controls and indicators are located on four separate panel assemblies: transmitter, receiver, synthesiser, and mainframe front panels. Each front panel assembly is connected to the BITE assembly through ribbon cables.

Rear Panel Assembly

16 The rear panel assembly forms part of the PSU. The panel is fitted with the ac and dc input supply connectors and fuses, the facilities and remote control unit connectors, and separate transmitter and receiver antenna connectors.

Antenna Filter Assembly

17 The antenna filter assembly is located within the PSU compartment. The filter is connected to the receiver's RF signal path prior to the receiver RF module (or the guard receiver, if fitted) in order to remove any high order frequency components of the input. In the 3050 transceiver two filters are used, one for UHF and the other for VHF.

The Transmitter

18 The transmitter provides AM and FM, speech or data transmissions. The transmitter comprises the following assemblies:

- Transmitter control (plug-in module 2)
- RF power amplifier assembly (RFPA)
- Filter/coupler assembly

Transmitter Control

19 The transmitter (Tx) control is a plug-in module (module 2) which controls the transmitter's functions. The module also contains the audio processing circuits, transmitter BITE interface, and the CPU control interface.

RFPA Assembly

20 The RF power amplifier assembly provides the RF amplification for the transmitter's carrier frequency. The RFPA assembly is located on the right-hand heatsink (viewed from the front of the equipment) side panel. The RFPA assembly in the 3050 transceiver has two PAs (with associated drivers), one for UHF and the other for VHF.

Filter/Coupler Assembly

21 In the 3030 and 3010 transceivers this assembly contains a low-pass filter (UHF and VHF respectively), and a directional coupler. In the 3050 transceiver this assembly contains both UHF and VHF low-pass filters and directional couplers. Connected to the output of the RFPA; the directional coupler provides loop detection of the forward and reflected power. The assembly, located on the equipment's left-hand heatsink (when viewed from the front), also provides regulated supply voltages for the power amplifier circuits.

The Receiver

22 The receiver provides AM or FM, speech or data reception in the UHF band (3050 and 3030 transceivers) and VHF band (3050 and 3010 transceivers). The receiver comprises the following assemblies:

- Receiver RF (plug-in module 6)
- Receiver IF and audio (plug-in module 8)

Receiver RF

23 The receiver RF is a plug-in module which comprises the RF filters, RF converter, RX BITE and control interface circuits. The RF signal is passed through a series of band-pass filters, and RF amplification to the 1st mixer where it is mixed with a reference frequency to provide a 1st IF frequency. The signal is then routed to the receiver IF and audio module.

Receiver IF and Audio

24 The receiver IF and audio is a plug-in module containing the receiver IF and audio processing circuits. The signal from the receiver RF module is amplified and applied to the 2nd mixer which produces a resulting 2nd IF. Further stages of IF amplification and mixing produce a 3rd IF which has its audio component detected, filtered and passed to the audio output amplifiers.

The Synthesiser

25 The synthesiser is a plug-in module (module 3) which generates the RF drive (carrier frequency) for the transmitter, and the first and second IF injection frequencies for the receiver. The synthesiser module comprises the following circuits:

- Synthesiser control
- Voltage controlled oscillators (VCO)
- Synthesiser

Synthesiser Control

26 This circuit provides microprocessor control for the synthesiser front panel, the voltage controlled oscillators, and the synthesiser circuits. The circuit contains memory for the operating program, and a back-up battery supply to ensure stored information is not lost if the power fails, or is switched off.

Voltage Controlled Oscillators

27 Seven voltage controlled oscillators, each designed to operate in one range of frequencies, cover the total frequency range of the equipment. The appropriate VCO is selected by the synthesiser control circuit. It should be noted that the total frequency range covered by the VCOs, may exceed the frequency range of the equipment (ie, 3030 and 3010 transceivers); in this case, those VCOs outside the equipment's frequency range will not be used.

Synthesiser

28 The synthesiser circuit provides phased-locked-loop control of the selected VCO, using the frequency information provided by the synthesiser control circuit. A 60 MHz crystal oscillator provides the receiver's 2nd local oscillator injection frequency.

Options

29 The options available for the Series 3000 transceivers are shown in Table 1.1 and described in the following paragraphs:

TABLE 1.1 SERIES 3000 TRANSCEIVER OPTIONS

Option (1)	3050 (2)	3030 (3)	3010 (4)	Description (5)
01	Yes	Yes	Yes	Guard Receiver
02	Yes	No	No	Single Antenna Port
03	Yes	Yes	No	Link 11 Antenna Port Configuration
04	Yes	Yes	Yes	External Filter Drive
05	Yes	No	Yes	100-163 MHz VHF Frequency Increment

Guard Receiver (Option 01)

30 The guard receiver continuously monitors the international VHF distress frequency of 121.5 MHz (3050 and 3010 transceivers) or UHF distress frequency of 243 MHz (3050 and 3030 transceivers) during normal operation of the equipment.. In the VHF/UHF 3050 transceiver the distress frequency monitored depends on the selected operational frequency of the receiver. When a received distress signal is detected, the guard receiver's audio is routed to the equipment's loudspeaker or headset.

Single Antenna Port (Option 02)

31 Provides a single combined VHF/UHF antenna port for use with a wideband antenna PAE type B8400.

Link 11 Antenna Port Configuration (Option 03)

32 Provides independent UHF Tx and UHF Rx antenna ports which are necessary to accommodate the fast Tx/Rx switching required for Link 11 operation in the UHF band. In the 3050 TR a single combined VHF Tx/Rx antenna port is provided for general purpose VHF communications.

External Filter Drive - Parallel Frequency Data (Option 04)

33 Provides binary coded data (BCD) outputs representing the radio tune frequency for interfacing with auto-tune antenna filters etc. Connections via a 37 way D type rear panel connector.

100-163 MHz VHF Frequency Extension (Option 05)

34 Provides extension of the VHF operation band to 100-163 MHz.

CONTROL OF EQUIPMENT

35 The equipment can be controlled in local, or remote modes. In local mode, control of the equipment is through the front panel controls and indicators. In addition to the front panel controls, a number of inputs, outputs and control facilities can be configured through the rear panel facilities socket. A full list of the facilities can be found in section 3 of the operator's handbook.

36 As an alternative to local control, a PAE series 3000EB remote control unit (RCU) can be connected (through suitable land lines) to the equipment. The 3000EB RCU replicates many of the T/R's front panel controls and indicators, and provides operation from a remote position.

EQUIPMENT COOLING

37 The equipment has a low speed cooling fan fitted in the PSU compartment.

TYPES OF INSTALLATION

38 The 3000 Series T/Rs can be installed in one of four ways:

- Mounted on fixed runners within a standard 483 mm (19 inch) equipment rack
- Fitted on telescopic slides within a standard 483 mm (19 inch) equipment rack.
- As a free-standing desk-top equipment using the PAE free-standing accessory kit.
- In mobile applications using the PAE free-standing accessory kit plus an anti-vibration mount kit.

39 Full details of the various types of installation, and details of the required accessory kit, is contained in the installation section of the 3000 Series operator's handbook.

Paragraph

1 General
2 Input supplies
3 Dimensions and weight
4 Environmental
Transmitter
5 RF characteristics
6 Modulation characteristics (speech A3E, F3E)
7 Modulation characteristics (data AXX, FXX)
Receiver
8 RF characteristics
9 AF characteristics (speech A3E, F3E)
10 AF characteristics (data AXX, FXX)
11 Remote control decoder
12 Options

GENERAL

1 The 3030 T/R general specification is:

Frequency range	
3010 TR (VHF)	108-155.975 MHz
3030 TR (UHF)	225-399.975 MHz
3050 TR (VHF/UHF)	108-155.975 MHz and 225-399.975 MHz
Frequency error	≤ 3 ppm in the temperature range -20°C to +55°C
Ageing	≤ 1 ppm per year
Channel spacing	25 kHz
Preset channels	Up to 99
Time for frequency change	≤ 8 ms
Classes of emission:	(a) Amplitude modulated speech (A3E) (b) Amplitude modulated data (AXX) (c) Frequency modulated speech (F3E) (d) Frequency modulated data (FXX)
Compatibility	Link 11 compatible (3030 and 3050 transceivers only)

INPUT SUPPLIES

2 The equipment operates from an ac or dc input supply. The input voltage ranges and supply currents are:

ac supply	110/120 V ac at 45 to 65 Hz or, 220/240 V ac at 45 to 65 Hz Note ... The correct transformer tap must be selected to suit the incoming ac supply.
Typical ac power consumption	700 VA
dc supply voltage (negative earth)	Between 22 and 32 V dc (nominally 28 V)
Typical dc supply current	18 A

DIMENSIONS AND WEIGHT

3 The dimensions and weight of the equipment are:

Maximum width	430 mm (16.93 inches)
Maximum height	178 mm (7 inches)
Maximum depth	543 mm (21.38 inches)
Nominal weight	32 kg (70.6 lb)

ENVIRONMENTAL

4 The temperature ranges in which the equipment will operate are:

Operating ambient temperature range	-20°C to +55°C (-4 to +131°F)
Storage temperature range	-40°C to +70°C (-40 to +158°F)
Duty cycle	Continuous operation up to 55°C (131°F)

TRANSMITTER

RF Characteristics

5 The characteristics of the transmitter's RF output are:

AM carrier output power	40 W +0 to -10 dB front panel adjustment
FM carrier output power	60 W +0 to -10 dB front panel adjustment

Power reduction	Output power is automatically reduced when: (a) the VSWR ≥ 2.5:1 (gradual reduction to -10 dB at infinite VSWR) (b) the dc input supply is ≤26 V (1 dB nominal) (c) the heatsink temperature rises above 80°C (3 dB nominal reduction) (d) the heatsink temperature rises above 90°C (6 dB nominal reduction)
Permissible mismatch	Infinite VSWR
Harmonic outputs	≥70 dBc (≥60 dBc 225 to 230 MHz)
Spurious outputs	≥ -90 dBc (>1 MHz from carrier)
Broadband noise (typical)	≥ -160 dBc/Hz (3 MHz from carrier) typical

Modulation Characteristics (Speech A3E, F3E)

6 The characteristics of the transmitter's speech modulation are:

Frequency response	300 Hz to 3.4 kHz (+1.5 dB/-3 dB referenced to 1 kHz). At 75 Hz: -20 dB. At 6.8 kHz: -30 dB
Modulation index	M=0.9 (AM), 5 kHz (FM)
Distortion	≤5% THD. M=0.8
Signal to noise ratio (A3E)	≥40 dB referenced to M=0.9 (1 kHz)
Microphone input	600 ohm. Level adjustable between 0.5 mV and 30 mV
VOGAD	30 dB dynamic range for ±2% change in modulation depth <10 ms attack time 1 second decay time for 10 dB step input
RF clipper	6 dB (±2 dB) clipping depth. Provides an increase in average modulation depth
Mute	Adjustable to open from 3 mV microphone input. 5 ms response time for 20 dB step input from 10 dB below VOGAD threshold. Hang time is 1.5 seconds ±50%

Modulation Characteristics (Data AXX, FXX)

7 The characteristics of the transmitter's data modulation are:

Frequency response	25 Hz to 20 kHz (±3 dB referenced to 3 kHz)
Modulation index	M=0.9 (AM), 20 kHz (FM)

Differential group delay	≤100 μs (500 Hz to 20 kHz)
Line input	600 ohm (nominal) balanced. Level adjustable between -20 dBm and +10 dBm

RECEIVER

RF Characteristics

8 The characteristics of the receiver's RF circuitry are:

Sensitivity (for S+N:N of 10 dB)	A3E: ≤2 μV (-101 dBm). M=0.3 with 1 kHz modulation F3E: ≤1 μV (-107 dBm). Deviation of 3.5 kHz with 1 kHz modulation AXX: ≤4 μV (-95 dBm). M=0.6 measured in a 23 kHz bandwidth FXX: ≤4 μV (-95 dBm). Deviation of 5.5 kHz measured in a 23 kHz bandwidth. Note ... Sensitivity is reduced by 3 dB when the optional guard receiver is fitted.
Spurious response suppression	≥80 dB (2 exceptions 70 dB)
Desensitisation (for S+N:N of 6 dB)	Wanted signal: 2 μV M=0.3 Interfering signal: 0 dBm at 5 MHz
Cross modulation (for a 20 dB ratio)	≥100 dB at 5 MHz (ref 1 μV)
Intermodulation (ref 1 μV)	≥80 dB for equal amplitude signals ±250 kHz or greater from f_c
Antenna radiation	≤20 μV at antenna connector.
Maximum RF input	20 V without damage (for a maximum of 30 seconds)
IF bandwidth (A3E and F3E)	≥24 kHz for 3 dB ≤50 kHz for 80 dB
IF bandwidth (AXX and FXX)	≥52 kHz for 6 dB ≤120 kHz for 60 dB
AGC (RF)	≤3 dB change in audio output for input signals in the range 2 μV to 700 mV
AGC (AF)	≤1 dB change in audio output for M=0.3 to M=0.9

Time constants:

Long time constant	The attack and release times are between 100 ms and 550 ms for input levels up to 100 mV
Short time constant	Attack and release times are between 5 and 10 ms for signals up to 100 mV

AF Characteristics (Speech A3E, F3E)

9 The characteristics of the receiver's audio are:

Line output	600 ohms nominal balanced transformer. Level adjustable -20 dBm to +10 dBm
Frequency response	300 Hz to 3.4 kHz ±3 dB (ref 1 kHz); -20 dB at 75 Hz; -30 dB at 6.8 kHz
Internal loudspeaker	8 ohm 1.5 W
Distortion	AM: M=0.8 ≤5% THD
	FM: F=3.5 kHz ≤5% THD
Noise blanking	AM only. Impulse noise removed by audio blanker which operates for M=0.9 or greater. ON/OFF switch provided
Mute (A3E/F3E)	S/N operated with carrier override adjustment.
	Range 6-16 dB S+N/N
	Response time: ≤50 ms with step input 10 dB above the threshold
	Hang time: ≤50 ms
	Hysteresis: ≤3 dB

AF Characteristics (Data AXX, FXX)

10 The characteristics of the receiver's data signals are:

Wideband output	600 ohms nominal balanced. Adjustable -20 dBm to +3 dBm
Frequency response	25 Hz to 20 kHz ±3 dB ref 1 kHz. Differential group delay ≤100 µs 500 Hz to 20 kHz
Link 11 Output (3030 and 3050 TRs only)	Wideband receiver audio is filtered in a 5th order Bessel low pass filter with a 5 kHz cut off frequency. An amplifier stage provides a nominal 600 ohm output, with the output level adjustable from -30 dBm to +10 dBm for ±20 kHz deviation at 1 kHz

Linearity (FM) (3030 and 3050 TRs only)	With 935 Hz and 1045 Hz tones of 10 kHz deviation the level of the third order products is less than -30 dB relative to either tone

REMOTE CONTROL DECODER

11 The 3000 Series transceivers are fitted with an internal remote control module which may be configured for operation over dc or ac circuits. The specification of the decoder is:

dc connected circuits	Provides a serial interface for operation with a PAE series 3000EB remote controller up to a distance of 2 km, when a dc path is available
	Audio circuits: 4-wire 600 ohms nominal balanced transformer. Level adjustable -20 dBm to +10 dBm
	PTT: via separate contact closure or phantom audio circuit link
	Data circuits: 4-wire serial control interface, RS422 compatible
ac connected circuits	Provides serial interface for operation with a PAE series 3000EB remote controller over ac coupled lines/networks with a maximum loss of 17 dB
	Audio circuits: 4-wire 600 ohms nominal balanced transformer. Line operating level fixed at -13 dBm, automatic gain adjustment for line losses up to 17 dB
	PTT: via 2930 Hz tone on audio circuit
	Data circuits: 4-wire 600 ohms nominal serial control interface, CCITT V23 compatible (internal modem)

OPTIONS

12 The following options are available:

Option 01 - Guard Receiver

Part No: 68-30000054

Mode	AM speech only
Frequency	
3010 TR	121.5 MHz
3030 TR	243 MHz

3050 TR	121.5 MHz or 243 MHz. VHF or UHF automatically selected depending upon main receiver frequency band in use
Frequency error	≤10 ppm
Sensitivity	3 µV M=0.3 at 1 kHz (for S+N:N of 10 dB)
IF bandwidth	≥22 kHz for 6 dB

Option 02 - Single Antenna Port (3050 TR only)

Provides a single combined VHF and UHF antenna port for use with a wideband antenna PAE type B8400.

Option 03 - Link 11 Antenna Port Configuration (3030 and 3050 TRs only)

Provides independent UHF Tx and UHF Rx antenna ports which are necessary to accommodate the fast Tx/Rx switching required for Link 11 operation in the UHF band. In the 3050 TR a single combined VHF Tx/Rx antenna port is provided for general purpose VHF communications.

Option 04 - External Filter Drive (Parallel Frequency Data)

Provides BCD outputs representing the radio tune frequency for interfacing with auto-tune antenna filters etc. Connections via a 37 way D type rear panel connector.

Option 05 - 100 to 163 MHz VHF Frequency Extension

Provides extension of the VHF operation frequency band to 100-163 MHz.

Paragraph

1 Introduction

Chapter

1 Mainframe
2 Transmitter
3 Receiver
4 Synthesiser
5 Remote control decoder

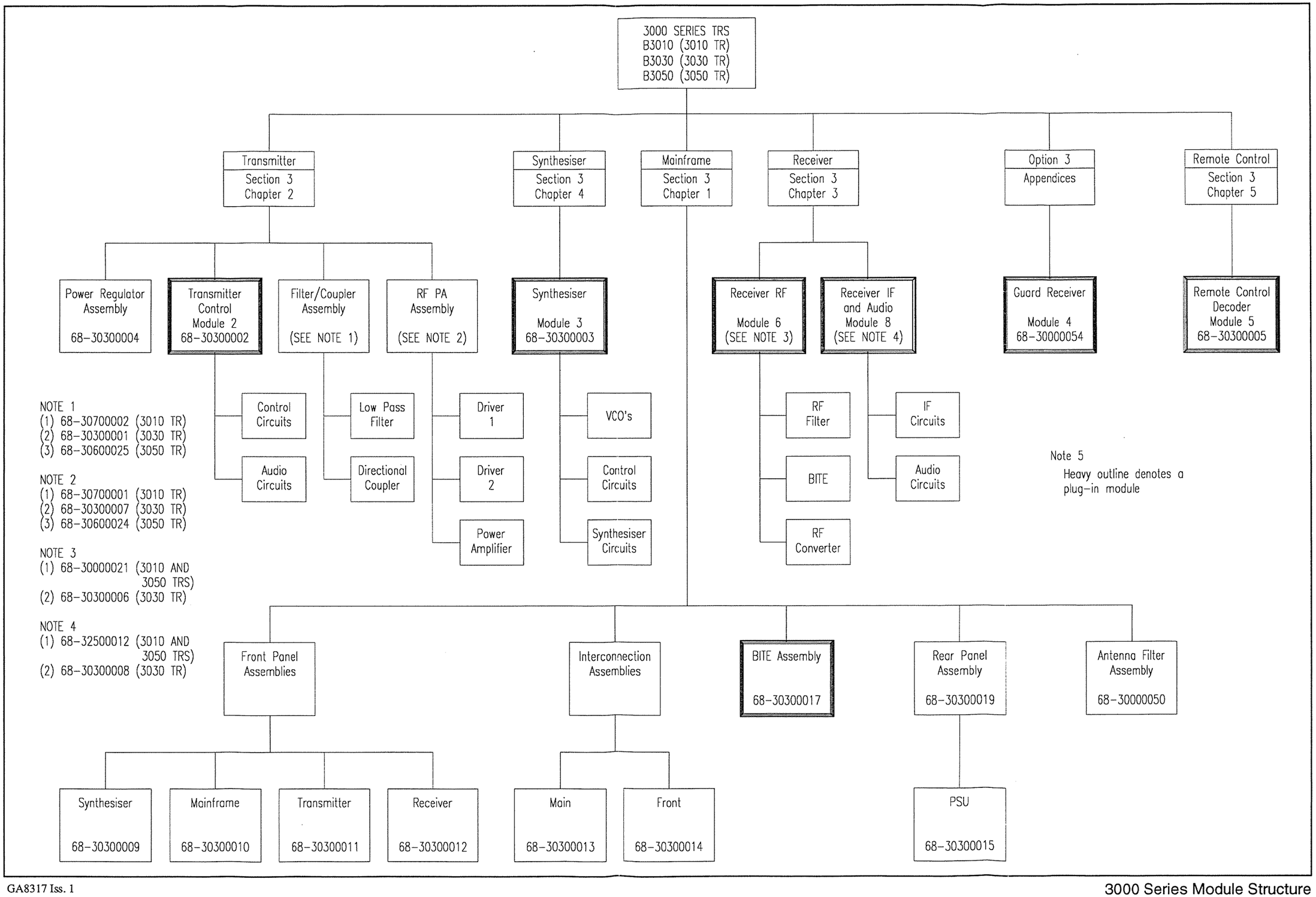
Figure

3-1 Series 3000 T/R module structure GA8317
3-2 Series 3000 T/R module/assembly GA5891

INTRODUCTION

1 This section has been arranged into separate chapters as detailed above. Each chapter contains the technical description and associated drawings applicable to one aspect of the equipment.

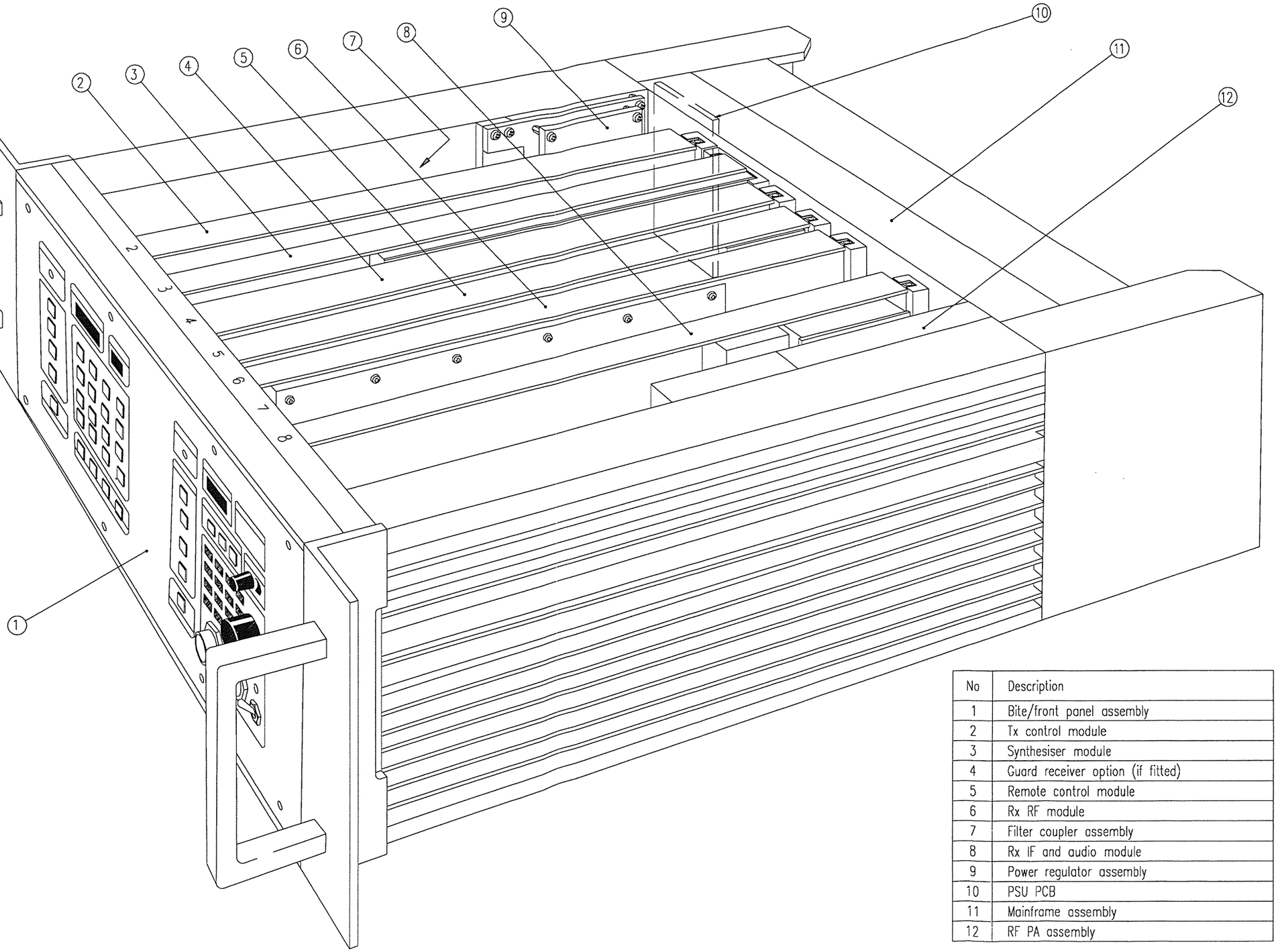
2 The relevant drawings are bound at the end of each chapter and are identified by the section, chapter and figure number, for example, Fig. 3-1-2, translates as Fig. 2, chapter 1, section 3.



GA8317 Iss. 1

3000 Series Module Structure

Fig. 3-1



No	Description
1	Bite/front panel assembly
2	Tx control module
3	Synthesiser module
4	Guard receiver option (if fitted)
5	Remote control module
6	Rx RF module
7	Filter coupler assembly
8	Rx IF and audio module
9	Power regulator assembly
10	PSU PCB
11	Mainframe assembly
12	RF PA assembly

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3000 Series Module/Assembly

Fig. 3-2

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1	Introduction
	INTERCONNECTION
5	Configuration
6	Front interconnection assembly
9	Main interconnection assembly
	FRONT PANEL ASSEMBLIES
12	Transmitter front panel PCB
16	Receiver front panel PCB
20	Mainframe front panel components
21	Audio and supply functions
26	Display/BITE functions
31	Synthesiser front panel components
	POWER SUPPLY UNIT
35	General
36	AC/DC input
39	Power supply PCB
	BITE ASSEMBLY
42	General
43	Microprocessor control
44	Power fail reset and watchdog circuit
47	Front panel and module interface
49	BITE hardware functions
55	BITE software functions
56	Continuously monitored functions
57	Receive mode monitor function
63	Transmit mode monitor function
70	User selected monitor functions
71	Interruptive self test routine
74	Receive mode test loop
77	Transmit mode test loop
84	Audio power amplification
	ANTENNA FILTER ASSEMBLY
87	Description

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Figure

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3-1-2 Front interconnection assembly connector pin designations GA5895
3-1-3 VHF RF, IF, and power supply interconnection diagram GA8346
3-1-4 UHF RF, IF and power supply interconnection diagram GA8349
3-1-5 VHF/UHF RF, IF and power supply interconnection diagram GA8323
3-1-6 Equipment interconnection chart - Part 1 ..... GA6448
3-1-7 Equipment interconnection chart - Part 2 ..... GA6451
3-1-8 Tx/Rx front panel assembly circuit diagram GA5330

3-1-9	Mainframe front panel assembly circuit diagram	GA5272
3-1-10	Mainframe front panel assembly circuit diagram	GA5329
3-1-11	Synthesiser front panel assembly circuit diagram	GA5327
3-1-12	Front panel assemblies component location diagram	GA5893
3-1-13	Power supply component location diagram	GA8342
3-1-14	Power supply unit circuit diagram	GA5326
3-1-15	Power supply PCB component location diagram	GA5903
3-1-16	BITE assembly circuit diagram	GA5319
3-1-17	BITE assembly component location diagram	GA5914
3-1-18	Antenna filter assembly circuit and component location diagram	GA8325
3-1-19	Antenna changeover assemblies circuit and component location diagram	GA8321

INTRODUCTION

1 This chapter details the components and assemblies that are detailed under the mainframe heading (see Fig. 3-1).

2 The mainframe metalwork is constructed from heavy gauge aluminium front and rear box sections with aluminium extrusion side members for strength and heat dissipation. The rear box section comprises the power supply components with an attached hinged panel containing the rear panel connectors and cooling fan. The front box section contains the BITE circuit and front panel assemblies.

3 Viewed from the front of the unit, the right hand heatsink extrusion has the rf power amplifier circuits mounted to it and the left hand heatsink extrusion the filter/coupler components.

4 The construction of the rear and front box sections, coupled with a base plate provides for a series of plug-in modules to be installed. Cooling within the unit is achieved by fan assisted natural convection. Air from the temperature controlled fan is directed along both the heatsink extrusions and through the main body of the equipment when required.

INTERCONNECTION

CONFIGURATION

5 The interconnections between the assemblies mounted on the mainframe and the plug-in modules are made through two interconnection printed circuit boards (PCBs): the Main Interconnection and Front Interconnection PCBs. The interconnection PCBs are fitted to the mainframe's base plate allowing the modules to be plugged into the connectors fitted to the PCBs (see Fig. 3-1-1).

FRONT INTERCONNECTION ASSEMBLY

6 The Front Interconnection PCB is located towards the mainframe's front panel, and is fitted with seven 64-way connectors which provide the connection for the connector (CN2) on each plug-in module. The interconnection PCB is also fitted with a 64-way angled connector which interfaces with CN11 on the BITE assembly.

7 The interconnection PCB provides each plug-in module with a common communication link for the front panel audio/control functions, and the power supplies. The BITE circuitry provides an interface between the front panel assemblies, power supply unit and the interconnection PCB.

8 The pin designations for the BITE (CN11) and plug in module connectors are detailed in Fig. 3-1-2.

MAIN INTERCONNECTION ASSEMBLY

9 The Main Interconnection assembly is located towards the rear of the mainframe and is fitted with seven connectors which provide the connections for the connector (CN1) on each plug-in module. The interconnection PCB is also fitted with a 64-way edge-mounted connector (CN2) which interfaces, through a wiring loom, to the rear panel facilities 2 and remote 1 connectors. Adjacent to the seven connectors, are red coding strips which mate with similar strips on the plug-in modules to ensure the correct module is installed in that position.

10 The interconnection PCB provides the signal, RF and IF interconnections between the plug-in modules (see Fig. 3-1-3 (3010 TR), Fig. 3-1-4 (3030 TR) or Fig. 3-1-5 (3050 TR)), the RF drive to the power amplifier assembly and the remote control facilities through CN2 to the rear panel connectors. The pin designations and interconnections are detailed in Figs. 3-1-6 and 3-1-7 and should be read in conjunction with Fig. 3-1-1.

11 Monitoring levels from the RF Power Amplifier assembly and power regulator circuits are connected to the Transmitter Control module through CN3 and CN1 respectively (see Fig. 3-1-1).

FRONT PANEL ASSEMBLIES

TRANSMITTER FRONT PANEL PCB

12 A 16-way ribbon cable terminated in DIL connectors connects the transmitter front panel PCB (CN1) to the BITE assembly (CN13). A blue identifier on the ribbon cable indicates pin 1. Fig. 3-1-8 details the pin designations and circuit diagram for the transmitter front panel PCB.

13 The SET POWER adjustment is connected to the input circuitry of IC29a, located on the Transmitter Control module and provides a 10 dB user adjustment of the output power to a maximum of 40 W (AM) and 60 W (FM).

14 Switches S1 to S5 are connected to IC2 (a non-inverting transparent latch) on the BITE assembly (Fig. 3-1-16). When no switches are selected, the switch drive lines CN13 pins 2 to 6 are pulled low and the common line CN1 pin 8 is monitored at IC8 on the BITE assembly. When a switch is selected, a low is detected at IC8. The switched drive lines are pulled high, sequentially strobed, and the selected switch detected as a high on the common line at IC8.

15 The LEDs D1 to D5 are driven by the microprocessor controlled display driver IC7 located on the BITE assembly.

RECEIVER FRONT PANEL PCB

16 A 16-way ribbon cable terminated in DIL connectors connects the receiver front panel PCB (CN1) to the BITE assembly (CN19). A blue identifier on the ribbon cable indicates pin 1. Fig. 3-1-8 details the pin designations and circuit diagram for the receiver front panel.

17 The SET MUTE adjustment is connected to the input circuitry of IC20b, located on the Receiver IF and Audio module and provides a user adjustment of the receiver mute threshold over the range 6 dB to 16 dB (S+N:N).

18 Switches S1, S4 and S5 (S2 and S3 are not used) are connected to IC1, a non-inverting transparent latch, on the BITE assembly. With no switch selected the switch drive lines CN19 pins 2, 5 and 6 are pulled low and the common line CN1/8 is monitored at IC8 on the BITE assembly. When a switch is selected, a low is detected at IC8; the switched drive lines are pulled high, sequentially strobed and the selected switch detected as a high on the common line at IC8.

19 The LEDs D1-D5 are driven by the microprocessor controlled display driver IC7 located on the BITE assembly.

MAINFRAME FRONT PANEL COMPONENTS

20 The mainframe front panel components are described in the following paragraphs.

Audio and Supply Functions

21 The combined loudspeaker on/off and volume control (VOL), Mic/Headset socket, and loudspeaker are all mounted on the front panel metalwork, and connected, through a 9-way DIL connector, to the BITE assembly (CN22) as shown in Fig. 3-1-9.

22 Gate IC27c, located on the output of IC34a on the BITE assembly, provides the receive audio disable when a transmit sidetone is being monitored.

PTT

23 When the MIC PTT facility is operated, a low is provided at IC9 pin 3, located on the BITE assembly, and read by the microprocessor which then puts a PTT signal on the data bus.

MIC Audio

24 The microphone audio is routed through gate IC27b, which will be enabled during normal operations, to IC29. The output of IC29 is routed to the Tx Control module's audio circuits.

Supply

25 The DC SUPPLY switch, AC and DC SUPPLY indicators are directly mounted to the front panel metalwork and connected through a 6-way DIL connector to the BITE assembly (CN23). From CN23 the interconnections are routed to the Power Supply assembly through CN12.

Display/BITE Functions

26 A 16-way ribbon cable terminated in DIL connectors interfaces the display/BITE functions (CN1) to the BITE assembly (CN21). A blue identifier on the ribbon cable indicates pin 1. Fig. 3-1-10 details the circuit diagram for the display/BITE functions and the pin designations which are connected in a pin-to-pin configuration. For example, CN1 pin 1 is connected to CN21 pin 1, CN1/6 is connected to CN21/6.

27 The display comprises DP1 to DP4, seven segment LED displays, driven by display driver IC1. Clock, enable and serial data information, controlled by the microprocessor IC17 on the BITE assembly, is routed through the transparent latches IC4 and IC1 to the display driver IC1.

28 Switches S1 to S3 are connected to IC2, a non-inverting transparent latch located on the BITE assembly. With no switches selected the switch drive lines CN21 pins 2 to 4 are pulled low and the common line CN1 pin 9 is monitored at IC9 pin 2 by the microprocessor.

29 On selection of a switch, a low is detected at IC9, the switched drive lines are pulled high, sequentially strobed, and the selected switch detected as a high on the common line at IC9.

30 The LEDs D1 to D3 are driven by the microprocessor controlled display driver IC6 located on the BITE assembly. TR1 in association with the divider RV1/R1 provide the user with a front panel brightness control (DIM) for the LED indicators and displays on the Synthesiser and Mainframe front panels.

SYNTHESISER FRONT PANEL COMPONENTS

31 A 16-way ribbon cable terminated in a DIL connector connects the Synthesiser front panel (CN3) to the BITE assembly (CN16). A blue identifier on the ribbon cable indicates pin 1. Fig. 3-1-11 details the pin designations and circuit diagram for the Synthesiser front panel.

32 The frequency and channel displays are mounted on a separate circuit pcb and comprises seven segment LED displays, DP1 to DP8, which are connected through CN1/CN2 to the display drivers IC1/IC2. Clock, enable (EN1/EN2) and serial data information, controlled by the microprocessor IC17 on the BITE assembly, is routed through the transparent latches IC1, IC2 and IC3 to the display drivers IC1 and IC2.

33 Switches S1 to S20 are connected to IC3 which is controlled, through the transparent latches IC1 and IC3 on the BITE assembly, by the microprocessor IC17. With no switches selected the switch drive lines from IC3 are pulled low and the switch common line CN3 pin 8 is monitored at the transparent latch IC8 pin 8 by the microprocessor. On selection of a switch, a low is detected at IC8 pin 8, the switch drive lines are pulled high, sequentially strobed, and the selected switch detected as a high on the common line at IC8 pin 8.

34 The LEDs D1 to D12 are driven by the display driver IC3 under the control of the microprocessor IC17. Fig. 3-1-12 shows the component locations for the front panel assemblies.

POWER SUPPLY UNIT

GENERAL

35 The Power Supply Unit (PSU) is located at the rear box section of the T/R 3030 as shown in Fig. 3-1-13, and comprises the ac/dc input circuitry and power supply PCB. The equipment operates from a 110/120 V or 220/240 V ac supply, or from a 22 to 32 V dc supply. The correct ac supply setting is selected by removing a plate on the equipment's rear panel, and positioning the switches to the appropriate positions before refitting the plate. When both ac and dc supplies are available, switchover to the dc supply is automatic in the event of an ac supply failure. Both the ac and dc input supplies are fuse protected; the 28 V dc unregulated PSU output is also fuse protected. Two LEDs on the equipment's front panel indicate the presence of the ac and dc supply voltages.

AC/DC INPUT

36 The circuit diagram of the PSU is shown in Fig. 3-1-14. With S3 (the front panel AC SUPPLY switch) set to the on position, a mains rectifier comprising transformer T1, diodes D7, D8, D10, D12 and capacitor C25 provide a 28 V dc unregulated output at connector CN2 pin 3. Relay RLB will be energized and the front panel AC SUPPLY indicator will be lit.

37 If a dc supply is connected it will be indicated, when the front panel DC SUPPLY switch (S4) is in the on position, by the front panel DC SUPPLY indicator being lit. On failure of the ac supply, RLB de-energizes. Contact RLB1 changes over, providing a grounding contact to energize relay RLA. The input dc supply is then routed through RLA1 to provide a dc output at CN2 pin 3. SCR1 triggers before the RLA1 contact has changed over, to protect the contacts from spark damage.

38 TABLE 3-1-1 details the rating of the input supply fuses and the dc equipment fuse (FS3).

TABLE 3-1-1 REAR PANEL FUSE RATINGS

Fuse (1)	Rating (2)	Size (3)	PAE stock number (4)
ac supply fuse (110/120 V)	8 A anti-surge	20 mm	29-01210102
ac supply fuse (220/240 V)	4 A anti-surge	20 mm	29-01120102
dc supply fuse	20 A	Size 0 (1 1/4 in.)	29-01350201
dc equipment fuse	4 A	20 mm	29-01120101

POWER SUPPLY PCB

39 Referring to Fig. 3-1-14, switch mode regulator IC3, in conjunction with a three-terminal negative regulator IC4, is used to provide a -10 V supply. IC3 contains the necessary circuit elements to provide a pulse width modulated regulator with energy storage provided by L4. The output from IC3 is set to -14 V by R9 and R10; IC4 then regulates this voltage to -10 V and also reduces the switching transients produced by IC3. Additional filtering and switching transient suppression is provided by LC filters L1, C2, C3, C4 and L2, C7, C8, C9 and C10.

40 IC5, TR2, TR3, TR4 and TR5 form a 20 V regulator. This regulator has a p-channel FET TR3 controlled by a differential amplifier TR4/TR5, and a reference voltage provided by IC5. R14 and TR2 provide current limiting and D6 is for short circuit protection. The output of this regulator is also used to supply IC6 and IC7 which provide regulated 10 V and 5 V outputs respectively.

41 An unregulated 28 V dc high current output is provided from the rectifier output (at C25) which is used to supply the transmitter modulator circuits. Fig. 3-1-15 shows the component location of the power supply pcb.

BITE ASSEMBLY

GENERAL

42 The BITE assembly PCB is located directly behind the front panel and can be accessed by removing the front panel. The BITE assembly (refer to Figs. 3-1-16 and 3-1-17) provides the following circuit functions:

- Monitoring key parameters within the transceiver.
- A microprocessor controlled data interface between the front panel and plug-in modules.
- An audio interface between the front panel and the plug in modules.
- Interconnections between the power supply unit, the plug-in modules, and the front panel assembly.

MICROPROCESSOR CONTROL

43 The CPU is designed around an 8031 8-bit microprocessor (IC17) with a 27256 non-volatile EPROM IC15 which contains the program instructions. IC14, a 6116 static RAM, stores the channel frequencies and operating parameters. The address decoder for the RAM is provided by IC18. In the event of a power supply failure, battery B1 provides a reserve power supply for the volatile memory (IC14); this prevents the loss of stored channel information. IC16 is configured as an address latch for the lower part of the microprocessor address ports.

POWER FAIL RESET AND WATCHDOG CIRCUIT

44 The input power supply is monitored through the Power Supply Unit's 20 V line by IC21 and associated components. If the 20 V level falls below 18 V (detected by zener diode D5) an interrupt signal (low) is sent to the microprocessor (IC17 pin 13) from IC21e. Also a low from IC21c is applied to IC21f which provides, through TR2, a low volts inhibit signal for the TX Control and Synthesiser plug-in modules.

45 If the output of IC21c stays low for a time determined by R5/C17 (38 ms) the output of IC21d provides a reset signal, via IC21a and TR5, for the microprocessor (IC17 pin 9). Any operational data currently being actioned by the microprocessor will be down loaded into the RAM memory until power is restored.

46 IC37 provides a watchdog circuit for the microprocessor. During normal operations the microprocessor continually strobes IC37. If the microprocessor becomes 'locked up' no strobe pulses are passed to IC37. This causes the output at IC37 pin 9 to go low; D18 conducts and puts a low on the input of IC21b. The action of IC21 and associated circuitry is the same as if a low volts had been detected (refer to previous paragraphs).

FRONT PANEL AND MODULE INTERFACE

47 The front panel LED and switch drives, the enable and data signals, and the clock and module select data, are interfaced through the non-inverting transparent D-type latches IC1 to IC4, and driven by IC12 and LED display drivers IC6/IC7. The switch inputs (common line) are interfaced to the microprocessor through non-inverting buffers IC8/IC9 and buffer select IC13.

48 Input buffer IC10, with buffer select IC13; and non-inverting latch IC11, with latch driver IC12, provide the BITE Data Bus interface for the microprocessor. IC10 is clear to receive information, but IC11 requires an enable signal from IC5 before sending information.

BITE HARDWARE FUNCTIONS

49 The BITE is designed around IC22, a low power 3.5 digit analogue to digital converter (ADC) which forms a dual slope A/D converter with automatic zero correction and polarity detection. It converts the input signal to digital values at the rate of once every 50 ms.

50 Using the Data Bus, the microprocessor can address the individual module BITE control/test interfaces, selecting any one of a number of test points and connecting it directly through a common Monitor line (CN11 pin 27c) to the input of the ac to dc converter and dc attenuator circuits.

51 IC25a and associated components convert the ac level to a dc level which is equivalent to the peak value of the ac input level. The dc level output from the dc attenuator R18/R19 is 0.353 times the input dc level. The outputs from the attenuator and converter circuits are connected to the input of the ADC through an analogue switch IC26a which is controlled by the microprocessor.

52 On completion of the analogue to digital conversion cycle IC22 will send an interrupt signal to the microprocessor which will initiate a BITE interrupt handler; this compares the output data of IC22 with pre-programmed data levels. The analogue multiplexer IC32, controlled by the microprocessor through transparent latch IC5, selects the BITE assembly test points and outputs them to the ADC over the Monitor line.

53 On selection of a BITE interruptive self test routine, a tone select signal from the microprocessor, through transparent latch IC5, is connected to IC30b. The output of IC30b closes gate IC27a and opens gate IC27b putting a 1 kHz tone, generated by IC33, onto the microphone audio lines through the differential amplifier IC29 for test purposes.

54 The drive voltage for controlling the speed of the rear panel cooling fan is derived from IC35/TR3 and associated components. The fan runs at a low speed until one of three sensors detects a high temperature and generates, through the microprocessor, a fan switch signal at TR3 to increase the speed of the fan.

BITE SOFTWARE FUNCTIONS

55 The BITE software provides a facility for monitoring and comparing key parameters with pre-programmed data, the result of which is shown in the mainframe front panel MONITOR display. The software facility can be divided into the following routines:

- Continuously monitored functions.
- User selected monitor functions.
- Interruptive self test routines.

CONTINUOUSLY MONITORED FUNCTIONS

56 After 2 seconds from setting the AC and/or DC SUPPLY switches to their on positions, the BITE system will commence a continuous testing routine during normal transmit and receive operations.

Receive Mode Monitor Function

57 When the transceiver is in the receive mode, individual test points are continuously measured in a sequential order as defined by the BITE software. Each test point measurement is identified as a measurement cycle.

58 On completion of a test point measurement cycle (equivalent to two ADC cycles) the ADC reading is compared with the upper and lower limit values stored in the BITE software for that test point. If the reading is within the preset limits, a PASS message will be indicated in the MONITOR display.

59 If the results of the comparison are outside the preset limit values, then the BITE software will initiate a further test point measurement cycle. This action will be repeated for four test point measurement cycles. If after four consecutive fail results, that test point measurement cycle is deemed to have failed. The module location in the fault memory is checked and if it is empty, the test point number is stored in that location; the MEM indicator on the mainframe front panel lights to indicate that a fault is stored in the fault memory, and a 'BITE' message will be shown in the MONITOR display.

60 The exception to the fail recording procedure, is the dc power supply monitor test point. If this fails, the message in the MONITOR display will read PSU and an additional power supply fail location in the fault memory is set.

61 On completion of a test point measurement cycle, fail or pass, the BITE test point selectors are disconnected from the Monitor line. The next test point is then addressed, connected to the Monitor line, and a measurement cycle commenced.

62 Certain test points, when they have completed and passed the measurement cycle, initiate further test routines as follows:

- Temperature Test Points This routine compares the ADC reading of the PSU, modulator, and power amplifier temperature monitor test points with a preset limit in the BITE software. A FAN SWITCH signal to increase the fan speed is initiated, if any of the monitored test points exceed 65°C. Readings above 80°C detected at the modulator and power amplifier temperature test points cause the power output of the transmitter to be progressively reduced. Any reduction in RF power will result in a °C message being shown in the MONITOR display, a temperature fault location in the fault memory being set, and the MEM indicator being lit.

- Synthesiser VCO and 60 MHz Test Point This test routine is used to detect an out of lock condition for each of the synthesiser VCOs. When an out of lock condition is detected, the fault is recorded in the fault memory as test point 24 (60 MHz) and test point 25 (main VCO) in the Synthesiser module location. These test points are classed as dummy test points as they do not exist on the synthesiser PCB, the test is actually done through the microprocessor.
- Power Supply Monitor Test Point This routine transmits a power supply ready message to the remote controller (if fitted) when the power supply test had previously failed but has now passed.

Transmit Mode Monitor Function

63 When in the transmit mode the action for the continuous testing routine is identical to the receive mode as previously detailed.

64 The transmit mode continuous test commences its test point measurement cycle with synthesiser out of lock monitor test point continuing with the -10 V, Tx drive and PTT inhibit on the Tx control module.

65 Next a reading is taken from the Tx control module's forward directional coupler monitor test point. If this test point fails the fault is recorded, a Tx carrier fault message is sent to the remote controller (if fitted), the PTT indicator on the Tx front panel becomes unlit, the sidetone is disabled and the test point selector is reset to the beginning of the continuous test loop (synthesiser out of lock). If the test point passes then a Tx carrier ready message is sent to the remote controller (if fitted).

66 The next three measurement cycles are the psu, modulator and power amplifier temperature test points which, when passed, initiate further test routines as detailed in paras. 68 and 69.

67 The exception to the fail recording procedure detailed in para. 65 is the dc power supply monitor test point. If this fails then the message in the MONITOR display will read PSU, the MEM indicator is lit and an additional power supply fail location in the fault memory is set. If the dc power supply test point had failed but passes on consecutive test point measurement cycles then a power supply ready message is sent to the remote controller (if fitted).

68 The Tx control power reduction output test point is tested next. If it fails the fault is recorded and the test point selector is reset to the beginning of the test loop. If it passes then its value is recorded and used in the next test.

69 The Tx control analogue multiplier input test point is read next. If it fails the fault is recorded. If it passes, its reading is compared with the Tx control power reduction output value and if the two readings are within 30 mV of each other then a VSWR OK message is sent to the remote controller (if fitted) if there had been a previous VSWR fault indicated. If the values are not within 30 mV of each other an ANT 1 (VHF) or ANT 2 (UHF - 3030 and 3050 TRs only) message, as appropriate, will be shown in the MONITOR display and a VSWR fail message is sent to the remote controller (if fitted).

USER SELECTED MONITOR FUNCTIONS

70 Selection of the front panel MONITOR functions initiates the microprocessor to carry out a reading of the relevant test point every seven continuous measurement cycles. The output power, reflected power, line input and line output readings are converted to the correct units using look up tables before being shown in the MONITOR display. For the FM

modulation and RX AGC the readings are scaled and directly displayed in the MONITOR. The AM modulation depth requires two successive readings, ac and dc.

INTERRUPTIVE SELF TEST ROUTINE

71 This test is inhibited for 6.5 secs after setting the AC and/or DC SUPPLY switches to their on positions. The interruptive self test routine is initiated by pressing the TEST button, located on the Mainframe front panel, or providing a BITE start signal at the remote control interface. Normal operation of the TR is disabled while the interruptive test routine is carried out indicated by the front panel TEST indicator flashing.

72 At the beginning of the test the fault memory is cleared and the MEM indicator is unlit. The current frequency and operating instructions are stored, the upper and lower band edges are set to their maximum limits and the AM narrow band mode is selected.

73 If the test was initiated from the front panel TEST button the test loop will be carried out on a set number of frequencies (two for the 3010 TR, five for the 3030 TR and seven for the 3050 TR) in both the receive and transmit mode. The Guard Receiver (if fitted) will be tested on its preset frequency.

Receive Mode Test Loop

74 The TR is set to one of the following test frequencies:

- 102 or 136 MHz (3010 TR)
- 238, 272, 306, 340 or 374 MHz (3030 TR)
- 102, 136, 238, 272, 306, 340 or 374 (3050 TR)

75 The RF test oscillator and 1 kHz tone generator are selected. Test point measurement cycles are carried out on the 60 MHz oscillator and main VCO out of lock state, the 1 kHz tone level, the receiver, RF local oscillator drive level and IF audio output level. This test loop is carried out on all the test frequencies.

76 If any test fails then the receiver test loop is aborted and all subsequent receiver tests during this interruptive test are inhibited. The fault test point is located in the fault memory and the software will initiate the transmit mode test loop.

Transmit Mode Test Loop

77 The transmitter is set to one of the following test frequencies:

- 102 or 136 MHz (3010 TR)
- 238, 272, 306, 340 or 374 MHz (3030 TR)
- 102, 136, 238, 272, 306, 340 or 374 (3050 TR)

78 The 1 kHz tone generator is selected and the synthesiser circuit is set to the PTT condition (the equipment will still be in the receive mode and no transmit power generated).

79 Test point measurement cycles are carried out on the main VCO out of lock state and the Tx drive level from the Tx Control module.

80 The transmitter is now keyed generating output power. Test point measurement cycles are carried out on the PTT inhibit, the forward directional coupler output, power supply monitor, power reduction output, analogue multiplier input and the modulation depth. If a remote controller is connected the remote control audio output level is tested. This test loop is carried out on all the test frequencies.

81 If any test fails then the transmitter test loop is aborted and all subsequent transmitter tests in the band are inhibited. The fault is stored in the fault memory and BITE is shown in the MONITOR display.

82 If the test was initiated from the remote controller then the receive test loop will be carried out on a single frequency in the same band as the current operating frequency and the transmit test will be carried out on the current operating frequency. The Guard Receiver (if fitted) will not be tested at all.

83 On completion of the self test routine the current operational frequency, mode and band edges are restored and either a PASS or BITE message will be shown in the MONITOR display. On a BITE indication the relevant information is detailed in the fault memory.

AUDIO POWER AMPLIFICATION

84 The BITE assembly also provides audio power amplification for the front panel loudspeaker, and MIC socket facilities.

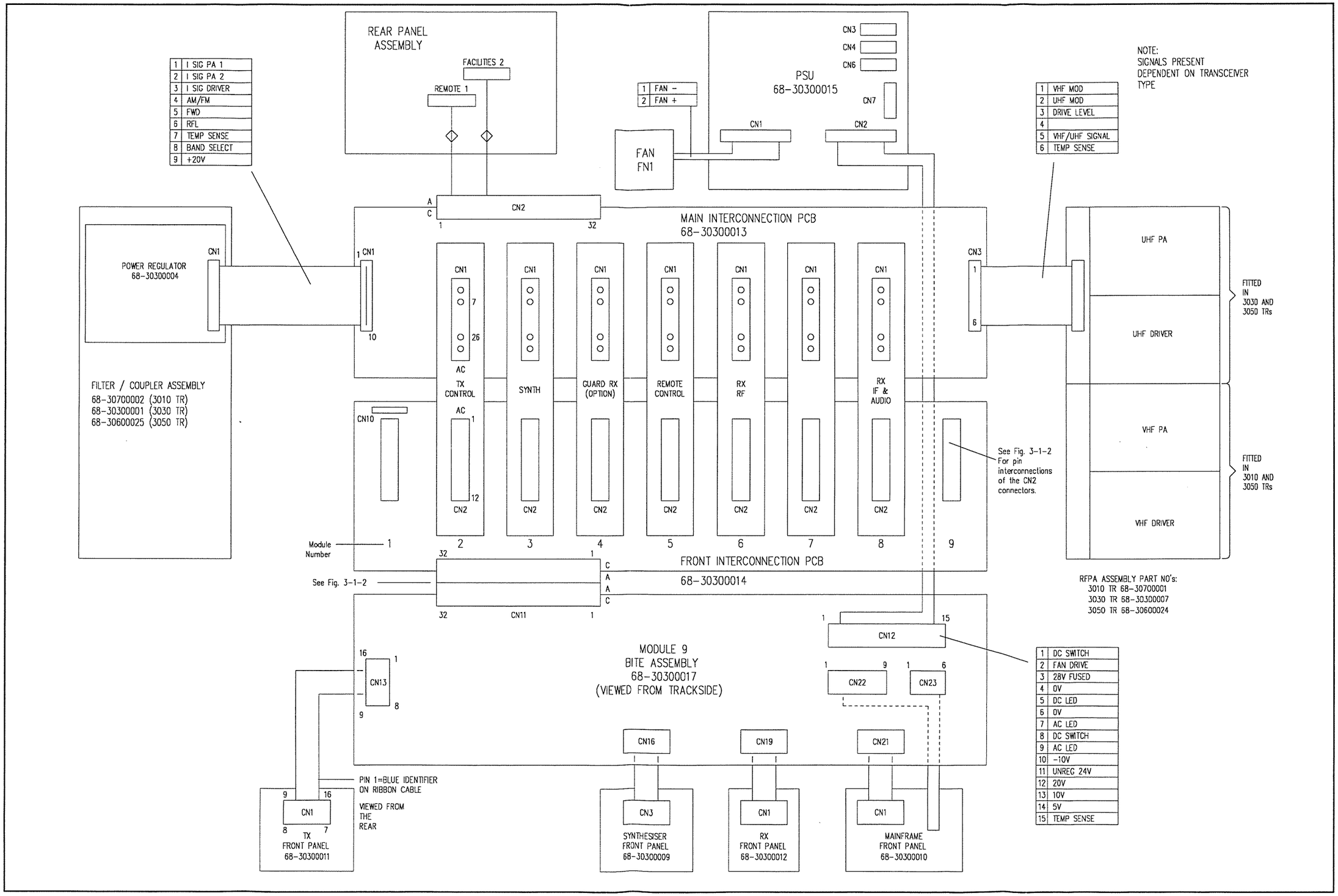
85 The receive audio input CN11 pins 31a-c is amplified by IC34 and routed through the front panel volume control (VOL) for further amplification by IC36. The output of IC36 is then connected to the front panel loudspeaker (if selected) or to the mic/headset socket. The level of audio can be controlled by the front panel volume (VOL) control. During periods of transmission the receive audio is disabled by IC27-c.

86 The transmit audio sidetone input CN11 pins 30a-c is amplified by IC34 and routed to the front panel MIC sockets. If the loudspeaker switch is set to its on position, and the transmitter keyed locally via the mic connector, then Tx sidetone will be heard in the speaker. If the loudspeaker select switch is set to its headset position then the loudspeaker is disabled and the Tx sidetone is passed to the headset via the mic connector..

ANTENNA FILTER ASSEMBLY

DESCRIPTION

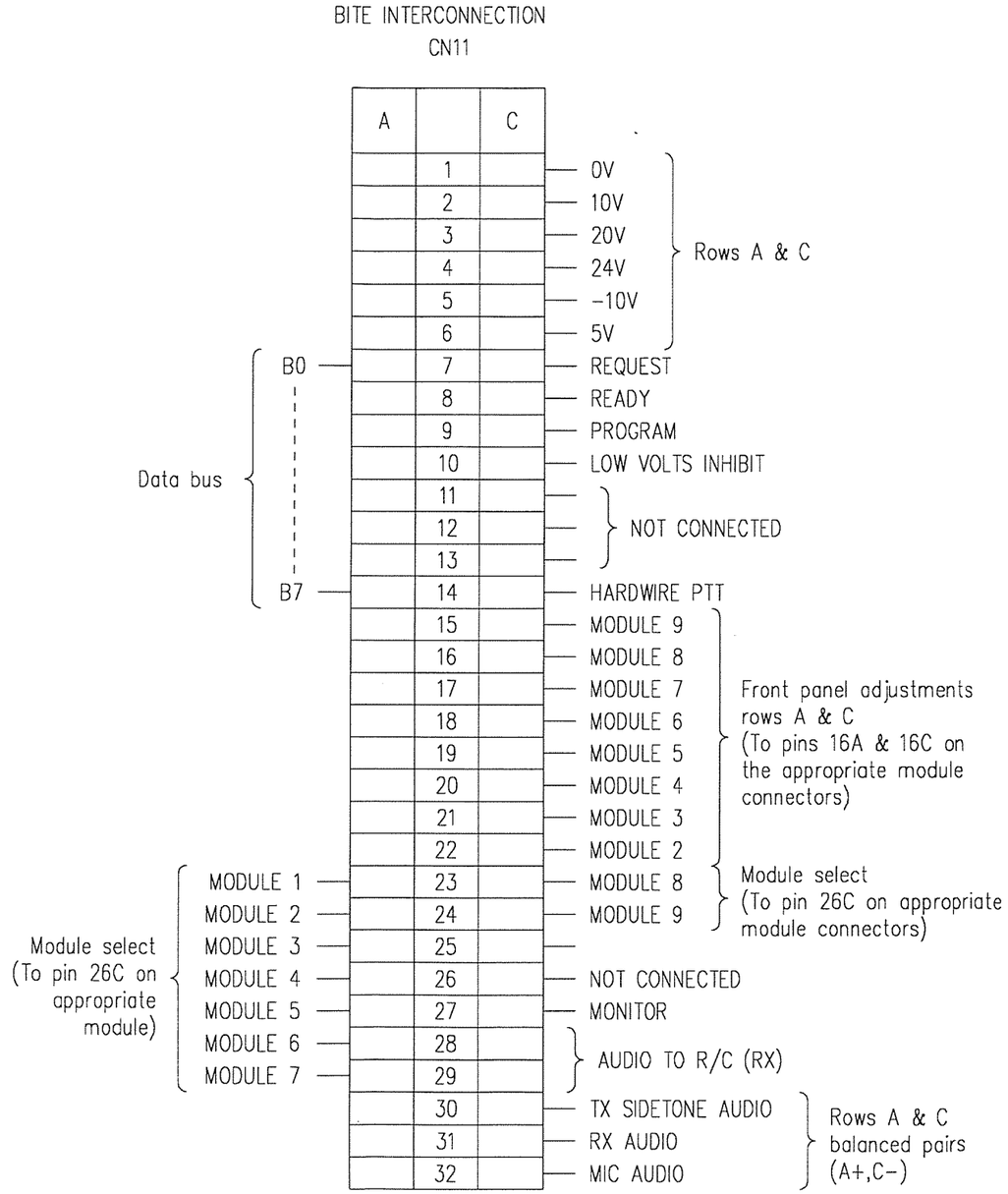
87 The antenna filter assembly is located within the PSU compartment as shown in Fig. 3-1-13. The assembly is connected in the receiver's RF path between the antenna and the RF stages to remove the high order components of the RF input. In the 3050 TR the antenna filter assembly contains both VHF and UHF filters. The circuit and location diagram for the various assemblies are shown in Fig. 3-1-18.

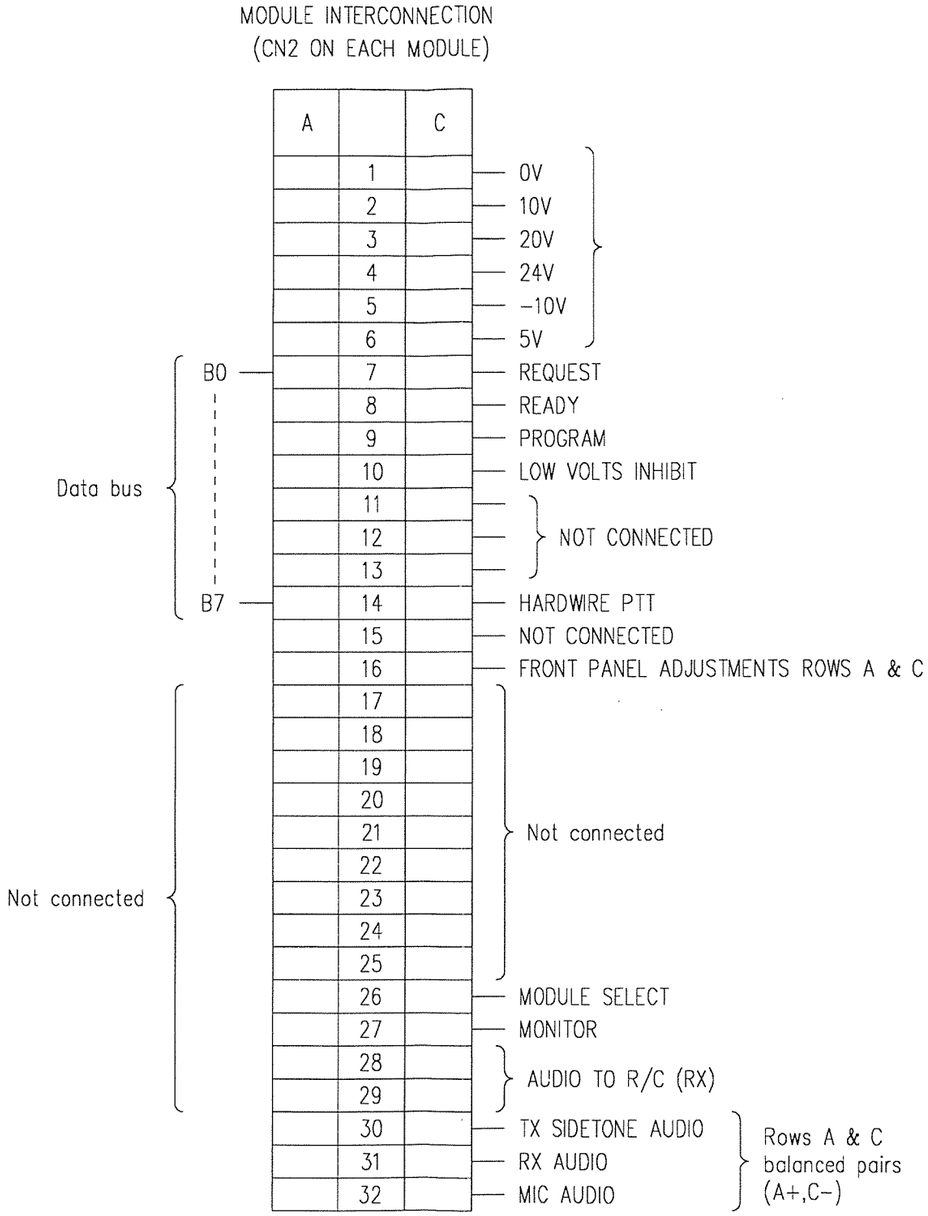


GA8318 Iss. 2

Module Interconnection Diagram

Fig. 3-1-1





Note...

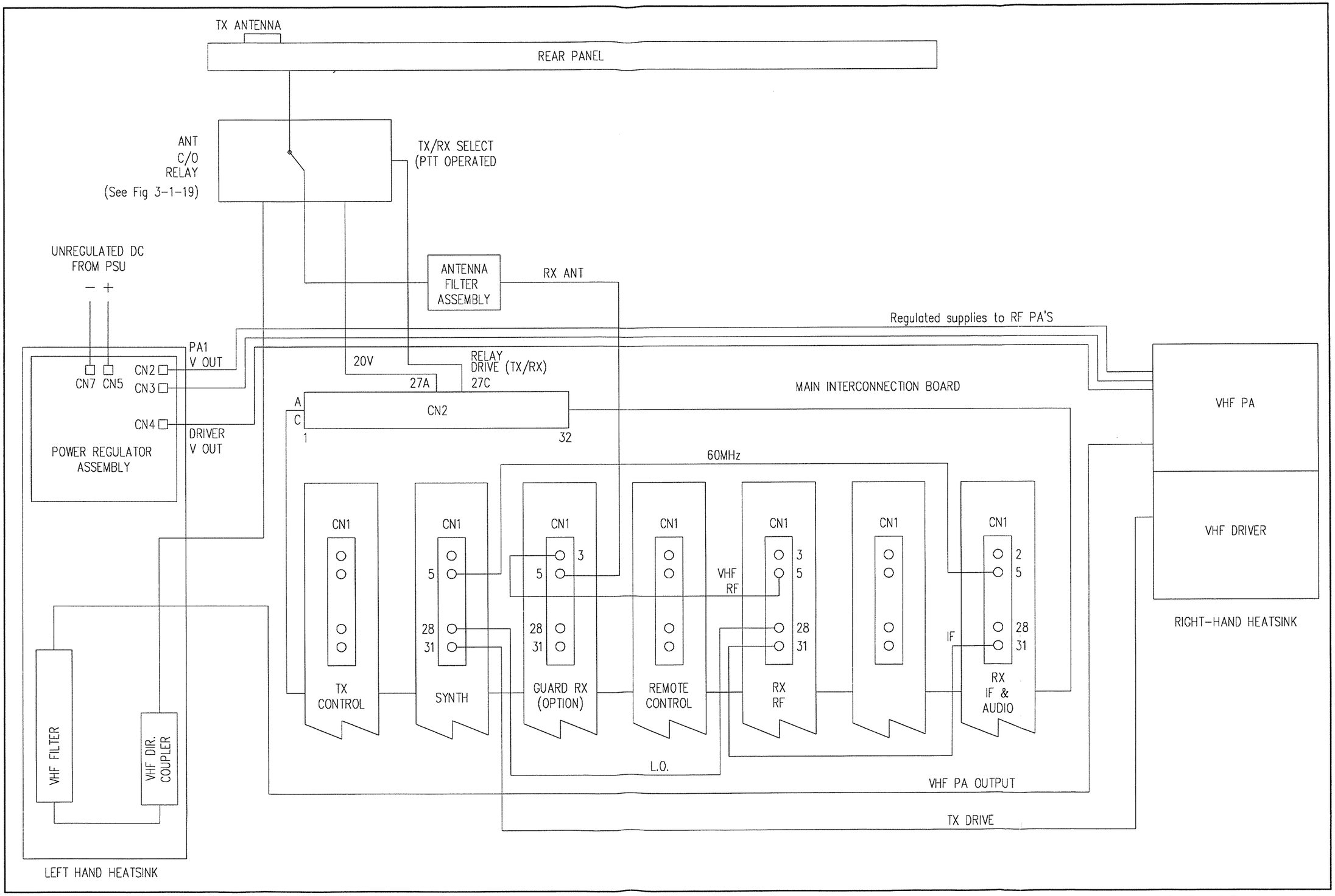
All pins are parallel connected between connectors with the following exceptions :

BITE connector (CN11) 15A–29A AND 15C–26C

Module connector (CN2) 16A, 16C AND 26C

Front Interconnection Assembly
Connector Pin Designations

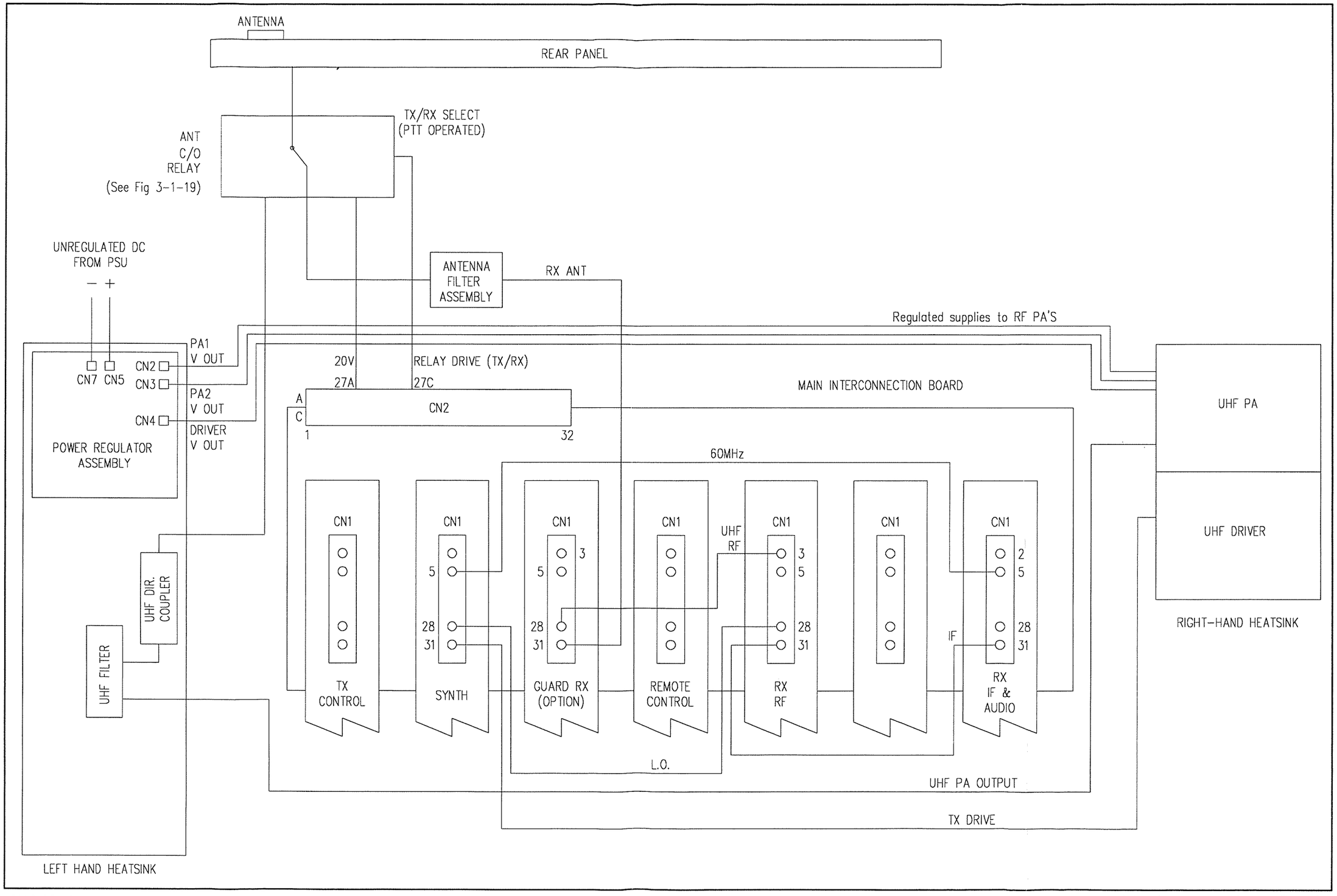
Fig. 3-1-2



GA8346 Iss. 1

VHF RF, IF and Power Supply
Interconnection Diagram

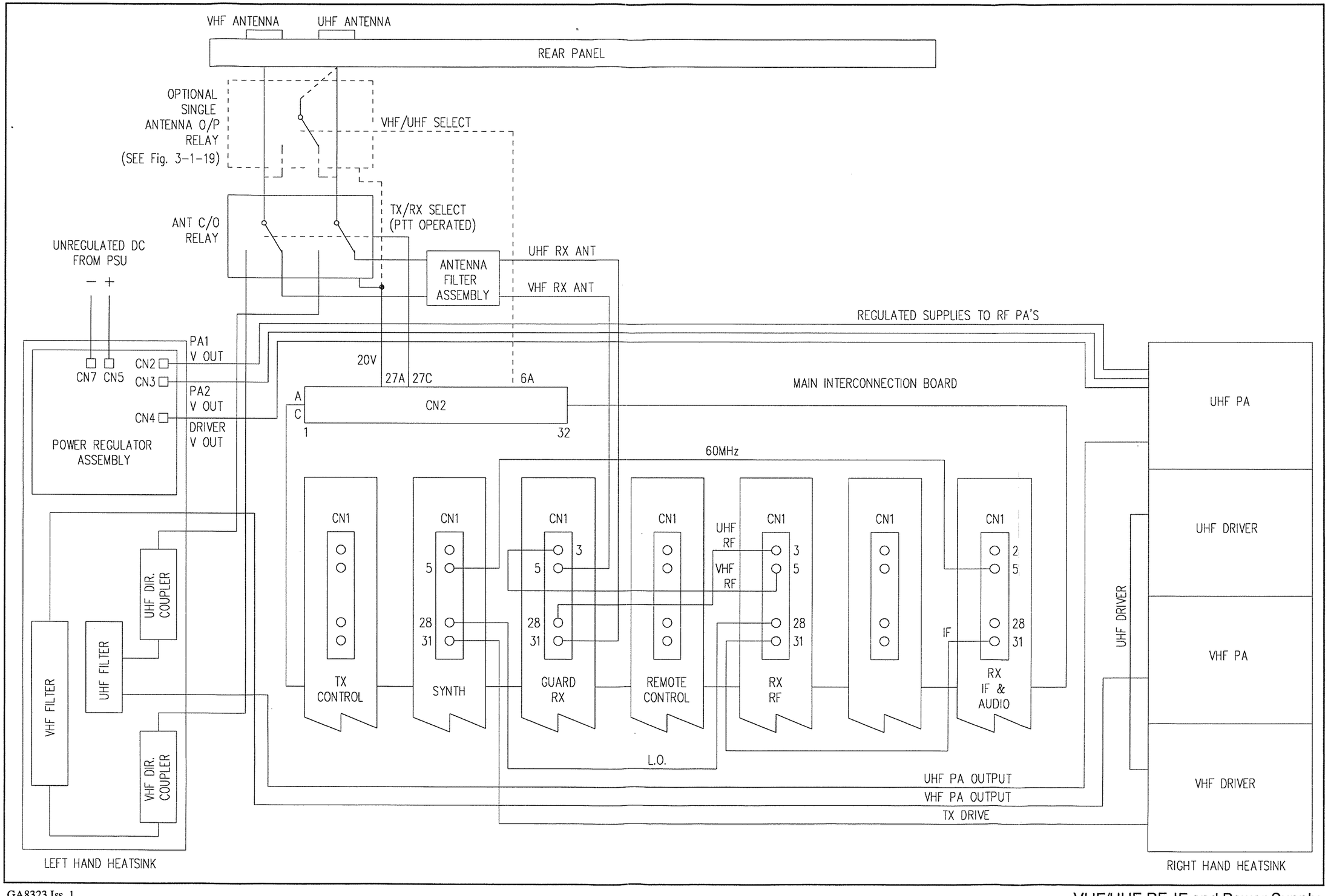
Fig. 3-1-3



GA8349 Iss. 1

UHF RF; IF and Power Supply
Interconnection Diagram

Fig. 3-1-4



GA8323 Iss. 1

VHF/UHF RF, IF and Power Supply Interconnection Diagram

Fig. 3-1-5

INTERCONNECTIONS / FUNCTIONS		MAIN INTERCONNECTION ASSEMBLY CONNECTORS							MAINFRAME ASSEMBLIES		REAR PANEL CONNECTORS		MAIN INTERCONNECTION ASSEMBLY DECOUPLING CAPACITORS
		M5	M8	M10	M4	M2	M7	M6					
		SYNTHESISER	RECEIVER RF	RECEIVER IF AND AUDIO	TRANSMITTER CONTROL	CN2	REMOTE CONTROL	GUARD RECEIVER OPTION	POWER REGULATOR CN1 (1)	TRANSMITTER RF PA CN3	REMOTE 1	FACILITIES 2	
RECEIVER AUDIO TAPE INPUT				14C	14C								C11
UNPROCESSED AUDIO OUTPUT			15A	15A		32A						20	C9
			15C	15C		32C						21	C10
RX WIDEBAND OUTPUT			17A	17A		1A						1	C7
			17C	17C		1C						2	C8
BUFFERD AGC (FACILITIES)			21C	21C		2A							C6
AGC (TO RF)			22A	22A									C1
MUTE RELAY CONTACTS (MAIN RX)				23A		31A							C5
				23C		31C							C4
BALANCED INPUT TO RX AUDIO FILTERS			25A	25A		3A						10	C2
			25C	25C		3C						11	C3
FM MODULATION SIGNAL		17C			17C								
		18C			18C								
TRANSMITTER INHIBIT		13C			13C								
ENCRYYPTION AUDIO INPUT			7C		7C	4A						16	
			8C		8C	4C						17	
ENCRYPTION AUDIO OUTPUT			9C		9C	5A						18	
			10C		10C	5C						19	
TRANSMITTER AUDIO (REMOTE)					19C		26A						
					20C		26C						
TX/RX AUDIO TAPE OUTPUT					22A	30A						5	
TX WIDEBAND INPUT (ENCRYPTED DATA)			11C		11C	28A						3	
			12C		12C	28C						4	
	COMMON				24A	30C							
PTT RELAY CONTACTS	NORMALLY OPEN				25A	29A							
	NORMALLY CLOSED				26A	29C							
ANTENNA CHANGE-OVER SUPPLY 20V					15A	27A/6C			9			14	
RELAY DRIVE (TX/RX)					15C	27C						13	
RF DRIVE LEVEL DETECT					23C					3			C14
VHF/UHF RELAY DRIVE					20A	6A							
VHF/UHF SELECT					21A					5			C15
CONTROL OUTPUT TO POWER MODULATOR					10A				4				
VHF POWER AMPLIFIER MODULATOR					25C					1			C12
UHF POWER AMPLIFIER MODULATOR					26C					2			C13
FORWARD (FWD) POWER					11A				5				
REFLECTED (RFL) POWER					12A				6				
TEMPERATURE SENSE	MODULATOR				13A				7				
	PA				22C					6			C16
BAND SELECT SIGNAL (0V = LOW BAND)					14A				8				
POWER AMPLIFIER(S) CURRENT SIGNALS	PA1				7A				1				
	PA2				8A				2				
	DRIVER				9A				3				

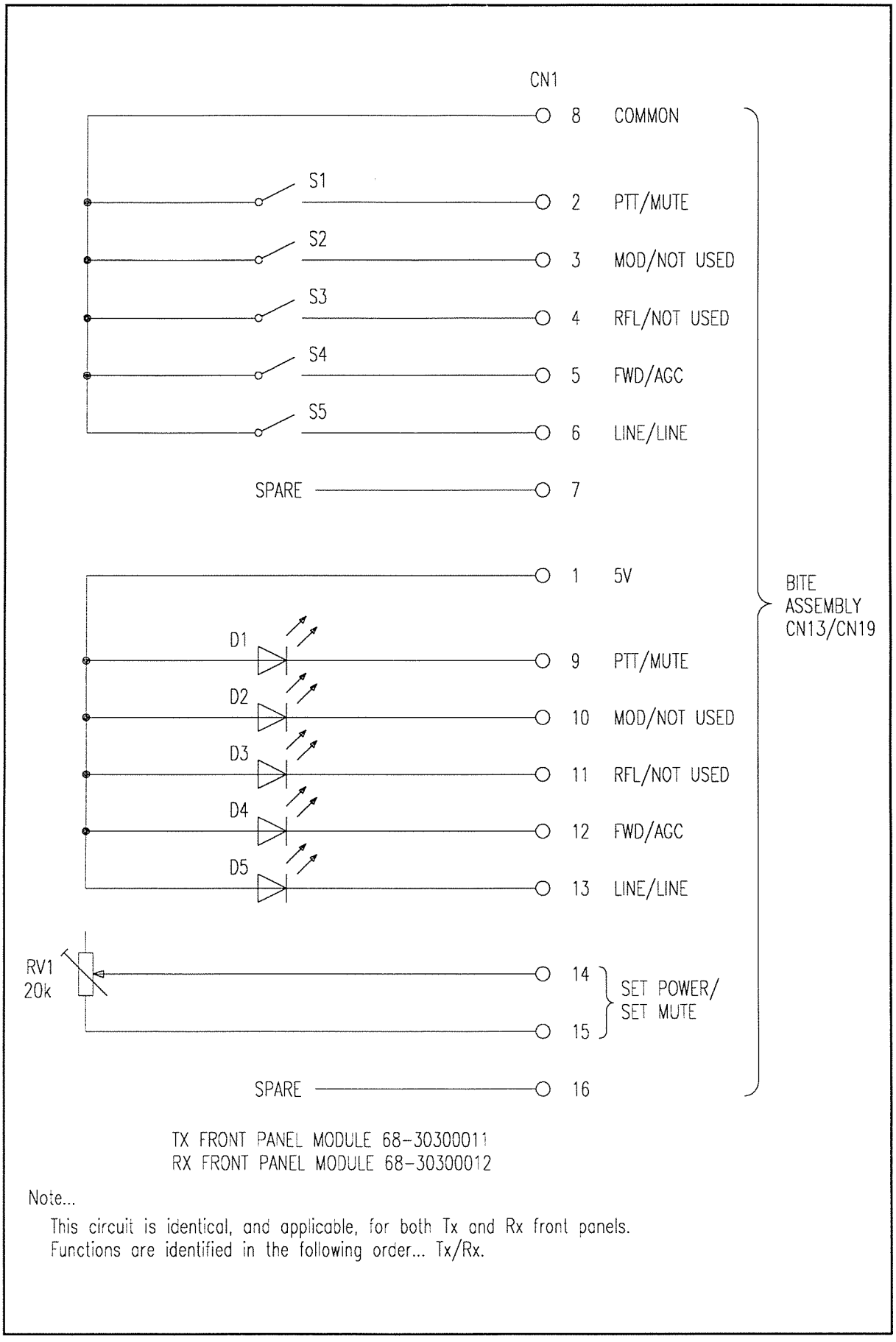
Equipment Interconnection Chart - Part 1

FUNCTIONS \ INTERCONNECTIONS		MAIN INTERCONNECTION ASSEMBLY CONNECTORS							MAINFRAME ASSEMBLIES		REAR PANEL CONNECTORS		MAIN INTERCONNECTION ASSEMBLY DECOUPLING CAPACITORS
		M5	M8	M10	M4	M2	M7	M6					
		SYNTHESISER	RECEIVER RF	RECEIVER IF AND AUDIO	TRANSMITTER CONTROL	CN2	REMOTE CONTROL	GUARD RECEIVER OPTION	POWER REGULATOR CN1 (1)	TRANSMITTER RF PA CN3	REMOTE 1	FACILITIES 2	
EXTERNAL POWER REDUCTION					23A	26A							
DATA OUTPUT	REMOTE CONTROL					11A	11A				1		
						11C	11C				2		
DATA INPUT						10A	10A				3		
						10C	10C				4		
RECEIVER AUDIO O/P						15A	15A				5		
						15C	15C				6		
TRANSMITTER AUDIO INPUT AND PTT						14A	14A				7		
						14C	14C				8		
GUARD RECEIVER LINE OUTPUT						25A		23A				8	
						25C		23C				9	
GUARD RECEIVER MUTE RELAY						2C		22A				7	
						26C		22C				6	
0V											9		
EXTENDED PTT						24C	24C						
HARDWIRE PTT						20A	20A					15	
MUTE STATE OUTPUT						20C	20C					12	
BITE OUTPUT						21A	21A					24	
WIDEBAND RECEIVER AUDIO INPUT													
FILTERED WIDEBAND RECEIVER OUTPUT						23A	23A					22	
						23C	23C					23	
SPARE						24A	24A						
SPARE						22A	22A						
SPARE						7A	7A						
SPARE						22C	22C						
SPARE						21C	21C						
0V		7–17, A+B											
0V		9–12, A+B											
0V		26, A+B+C											
0V		7–12, C											
0V		14–16, C											
0V		14–21, A+B+C											

GA6451 Iss. 1

Equipment Interconnection Chart - Part 2

Fig. 3-1-7

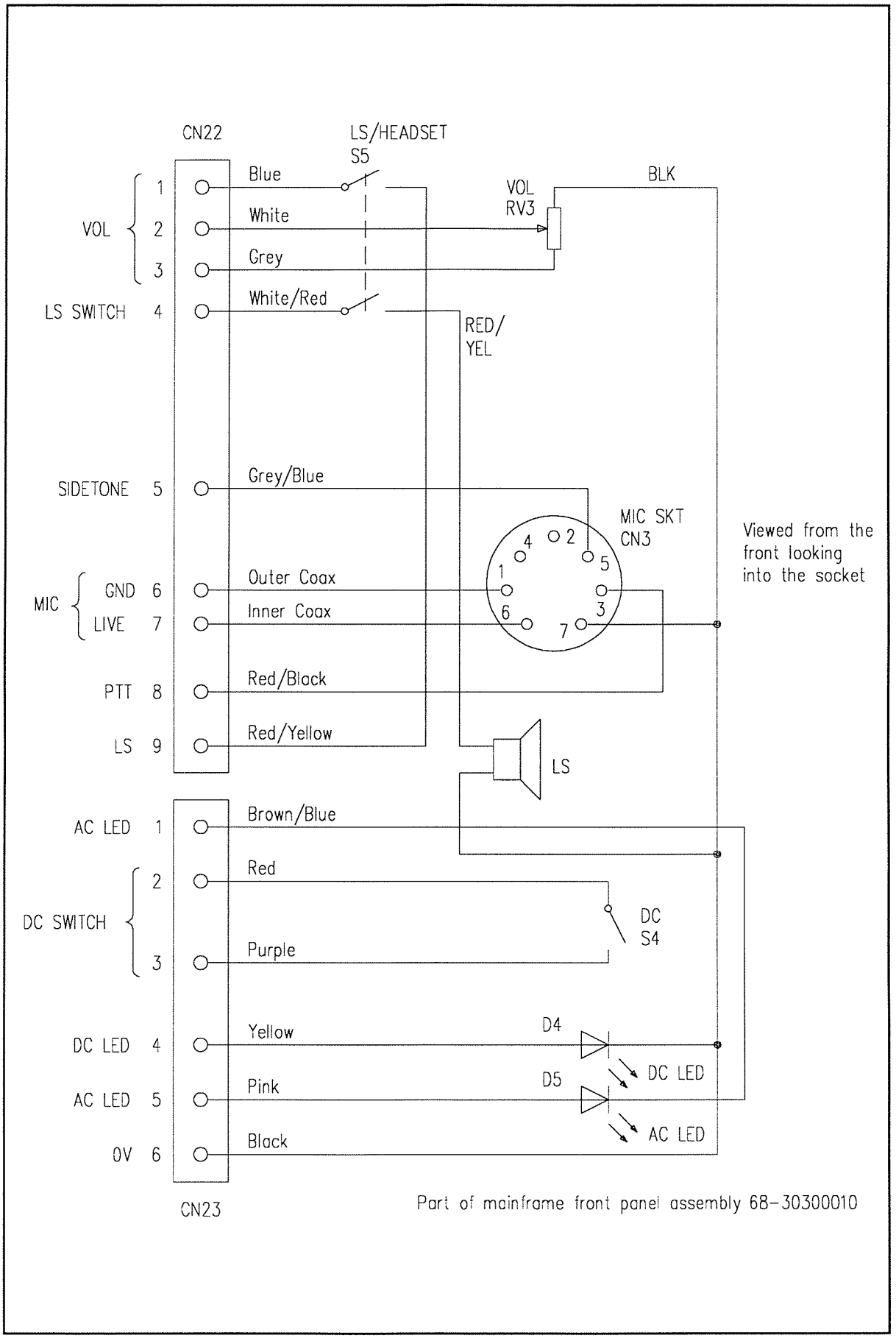


TX FRONT PANEL MODULE 68-30300011
RX FRONT PANEL MODULE 68-30300012

Note...

This circuit is identical, and applicable, for both Tx and Rx front panels. Functions are identified in the following order... Tx/Rx.

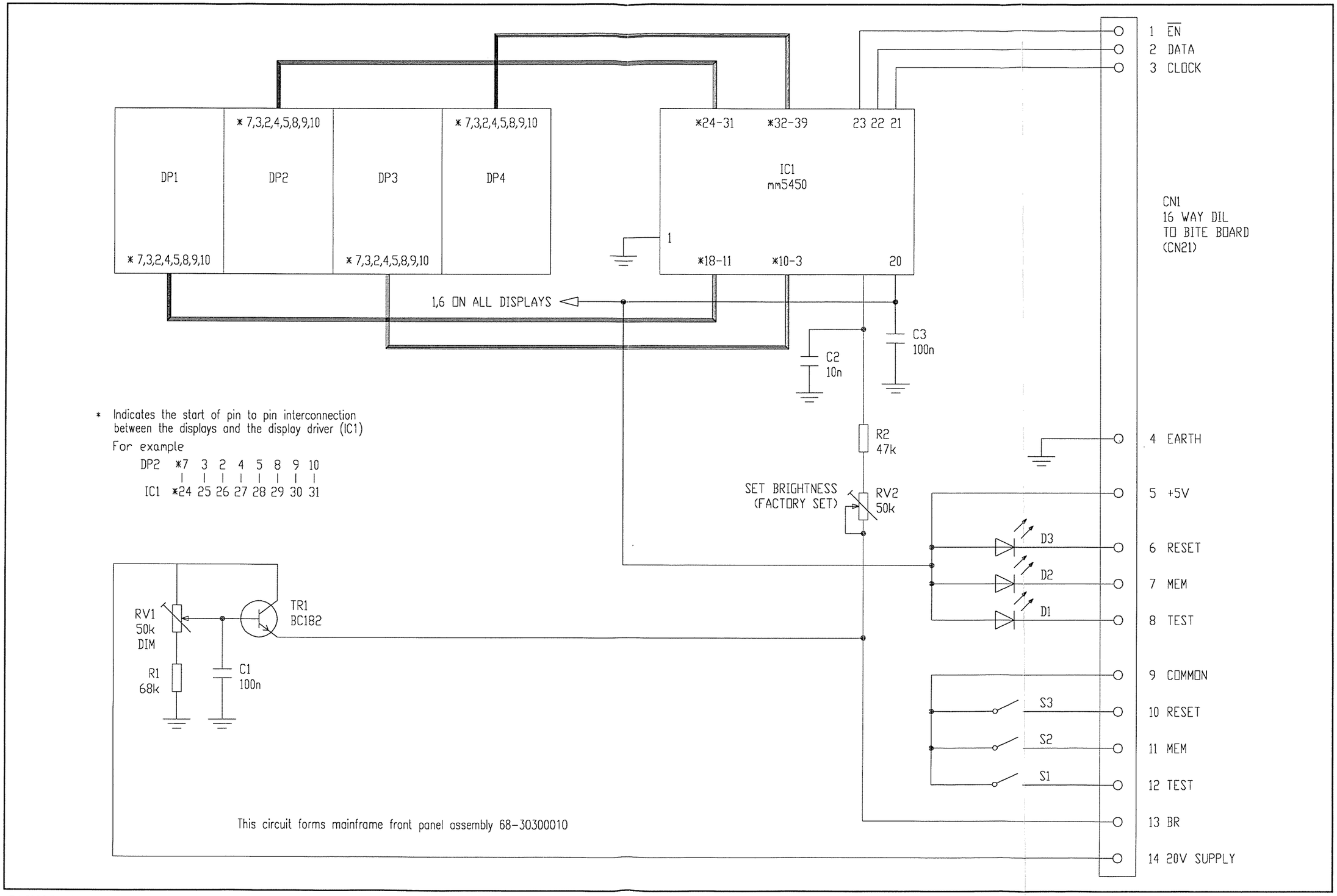
Tx/Rx Front Panel Assembly Circuit Diagram



GA5272 Iss. 1

Mainframe Front Panel Assembly Circuit Diagram

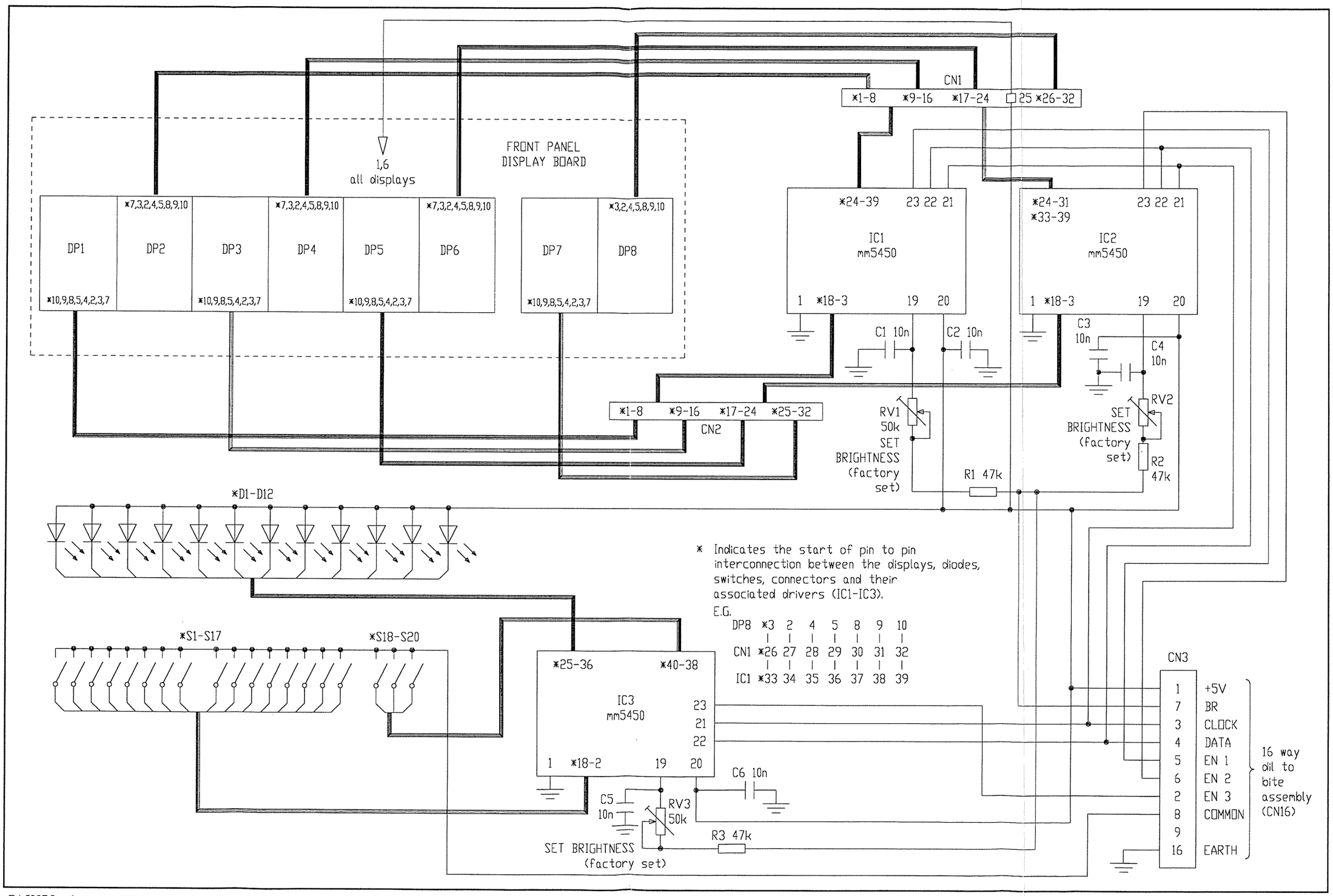
Fig. 3-1-9



GA5329 Iss. 1

Mainframe Front Panel Assembly
Circuit Diagram

Fig. 3-1-10



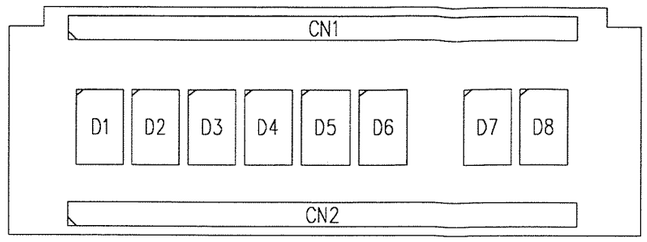
GA5327 Iss. 1

Synthesiser Front Panel Assembly
Circuit Diagram

Fig. 3-1-11

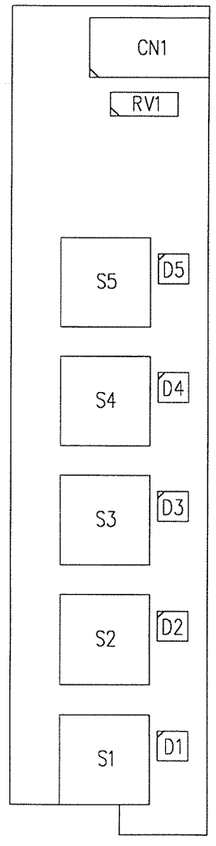
SYNTHESISER DISPLAY

AW0284



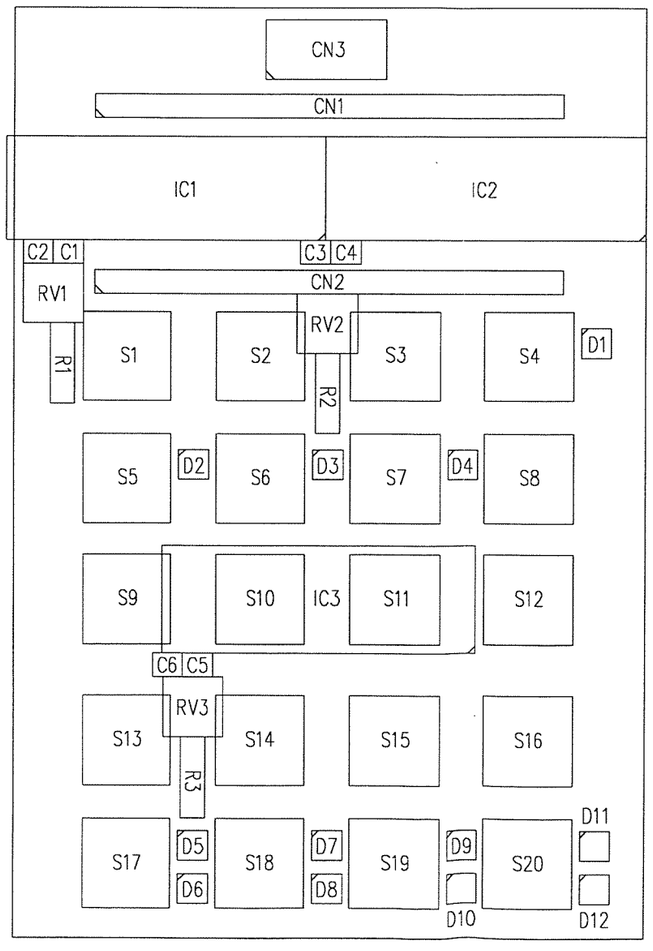
FRONT PANEL PCB.

AW0285



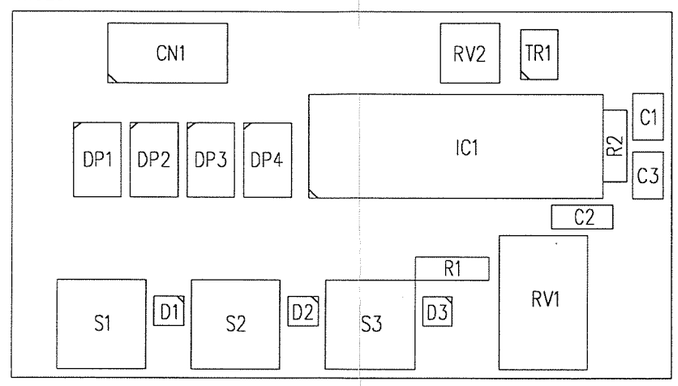
SYNTHESISER FRONT PANEL PCB.

AW0286



MAIN FRONT PANEL DISPLAY PCB.

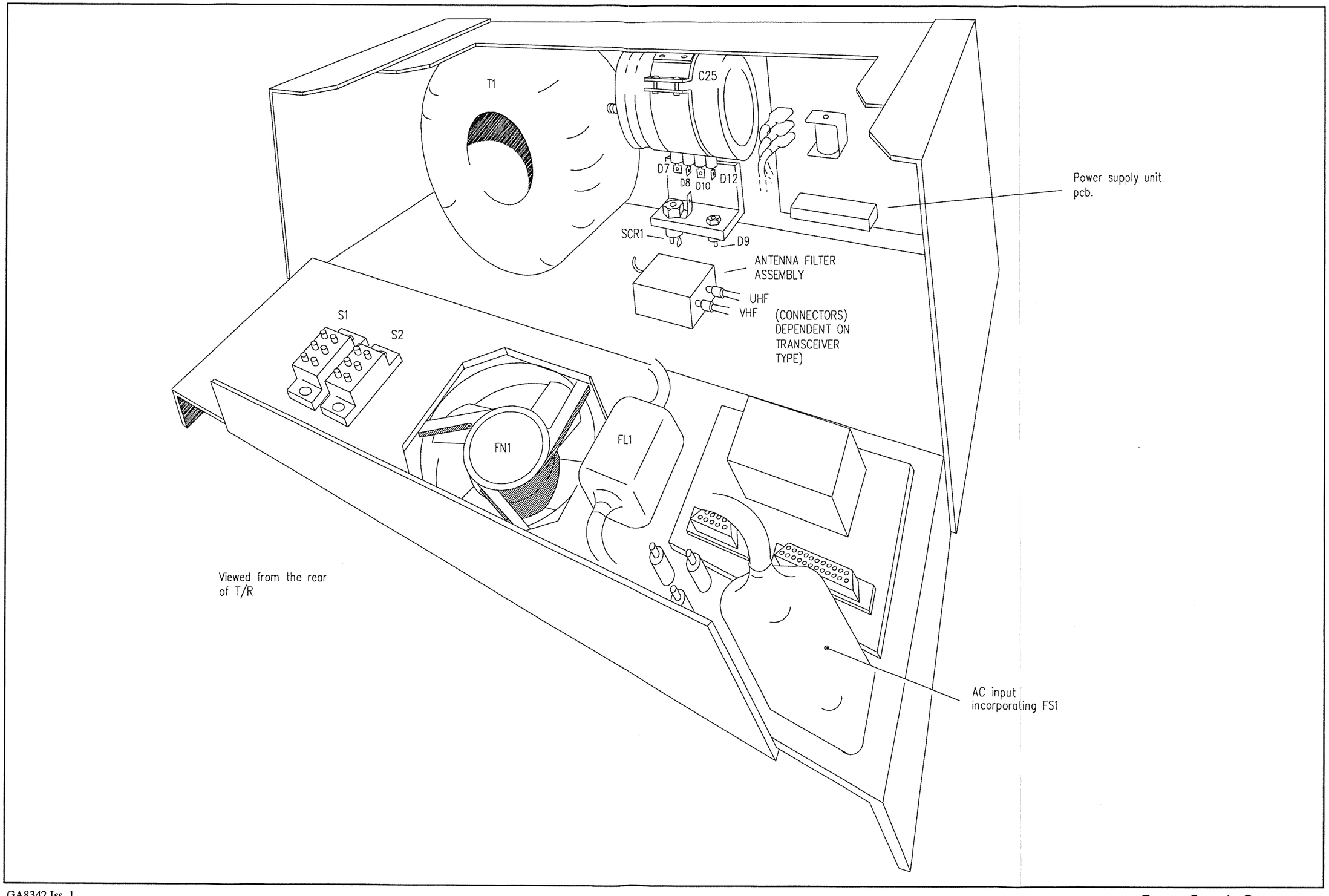
AW0287



GA5893 Iss. 2

Front Panel Assemblies Component Location Diagram

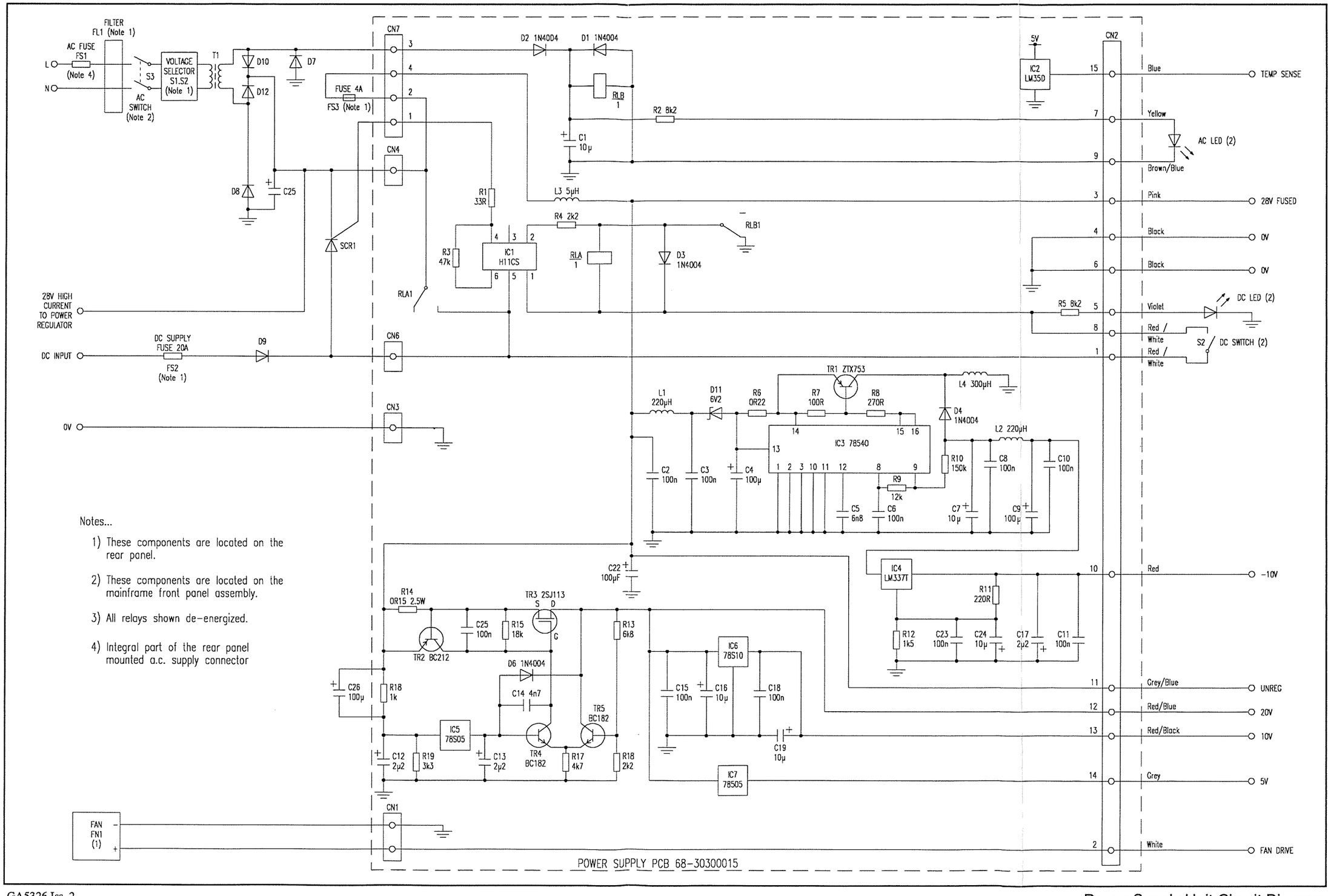
Fig. 3-1-12



GA8342 Iss. 1

Power Supply Component Location Diagram

Fig. 3-1-13



Notes...

1) These components are located on the rear panel.

2) These components are located on the mainframe front panel assembly.

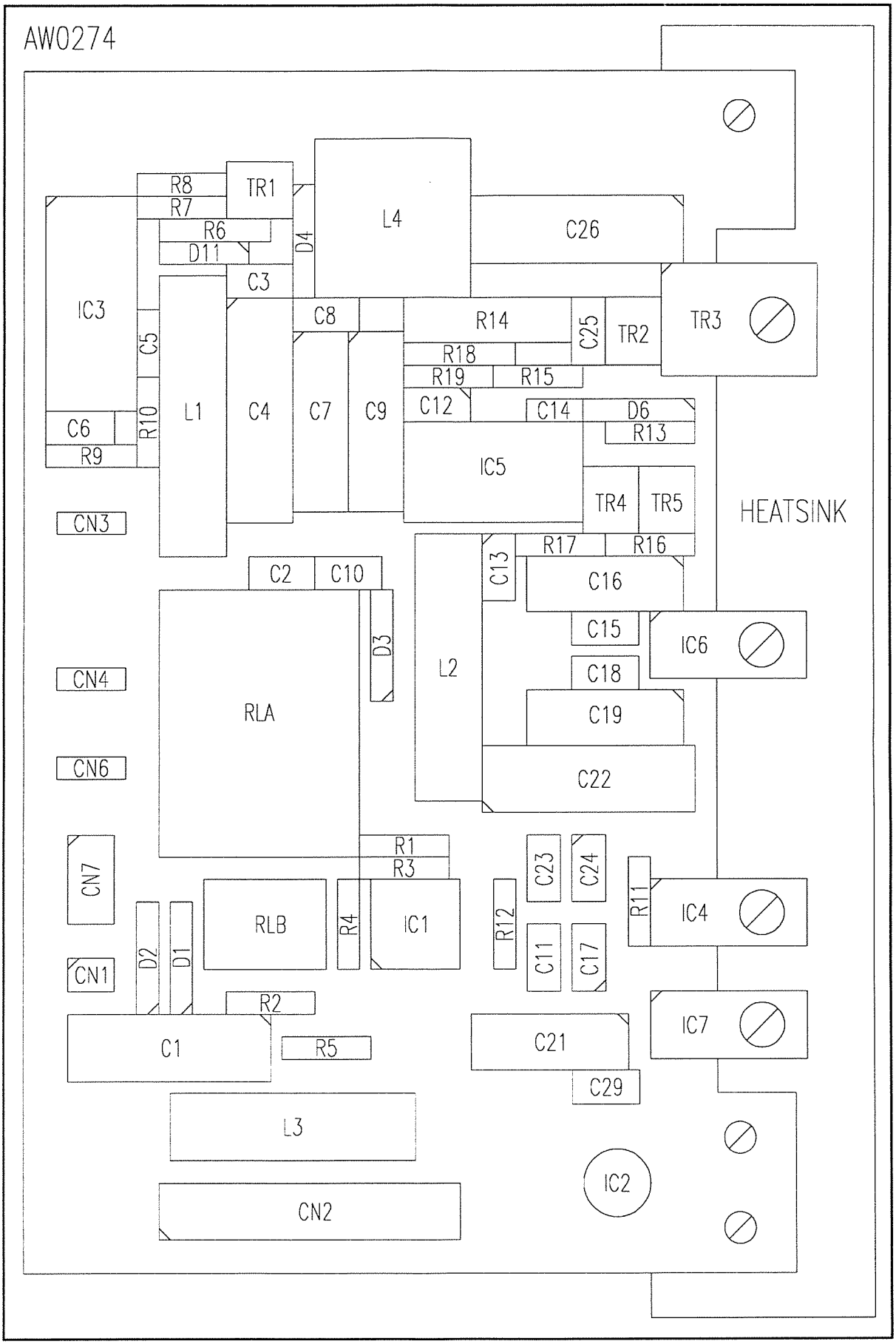
3) All relays shown de-energized.

4) Integral part of the rear panel mounted a.c. supply connector

GA5326 Iss. 2

Power Supply Unit Circuit Diagram

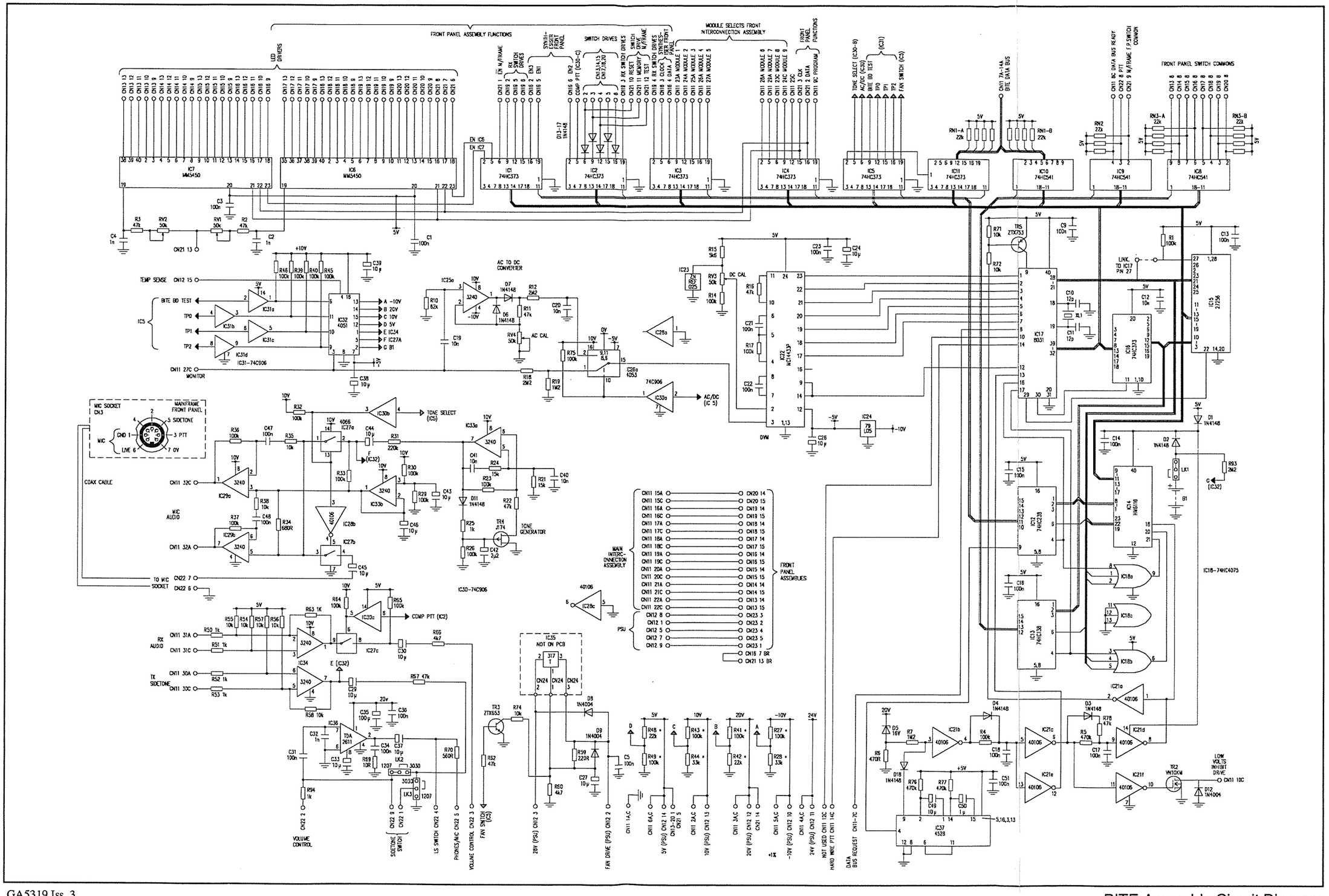
Fig. 3-1-14



GA5903 Iss. 1

Power Supply PCB Component Location Diagram

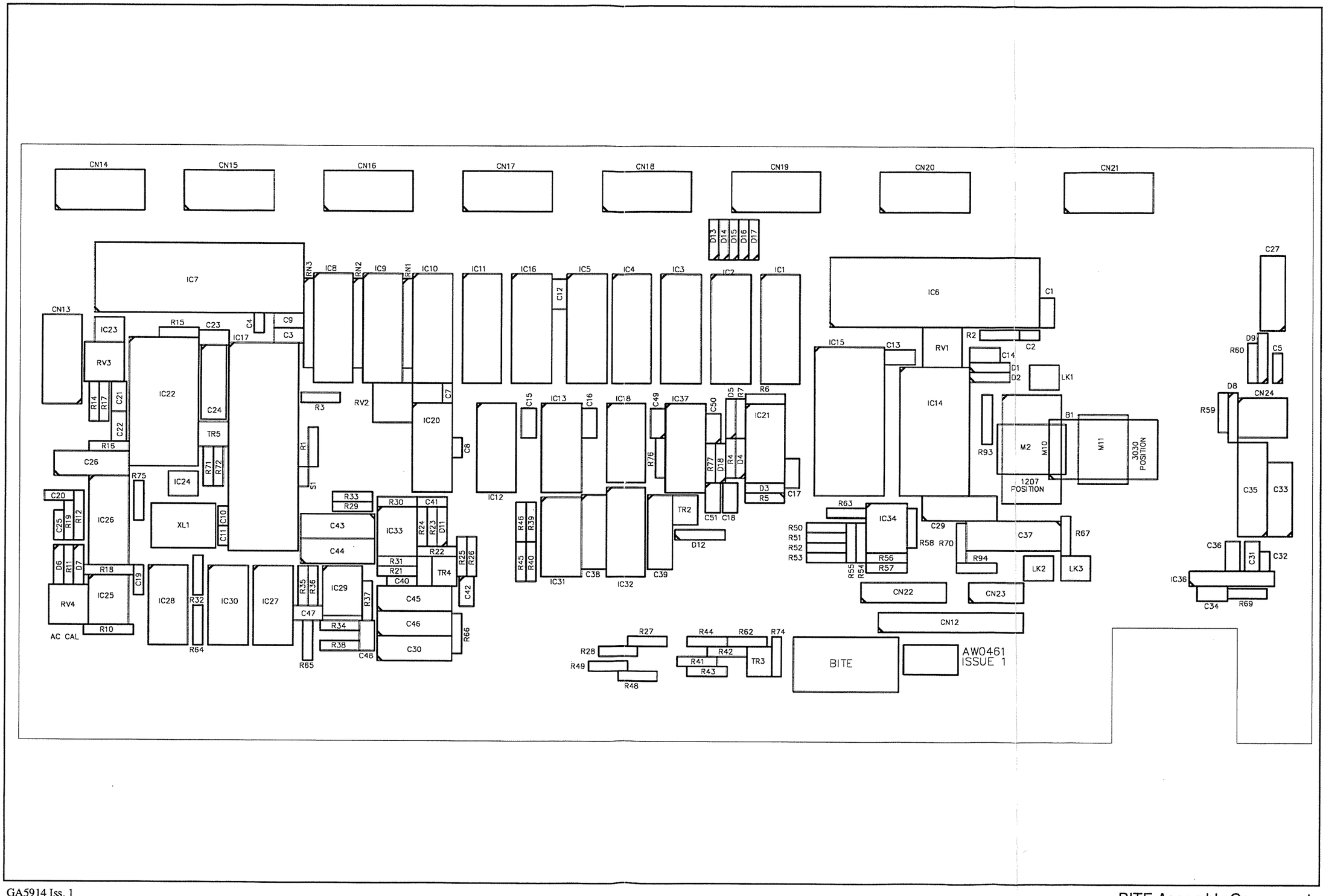
Fig. 3-1-15



GA5319 Iss. 3

BITE Assembly Circuit Diagram

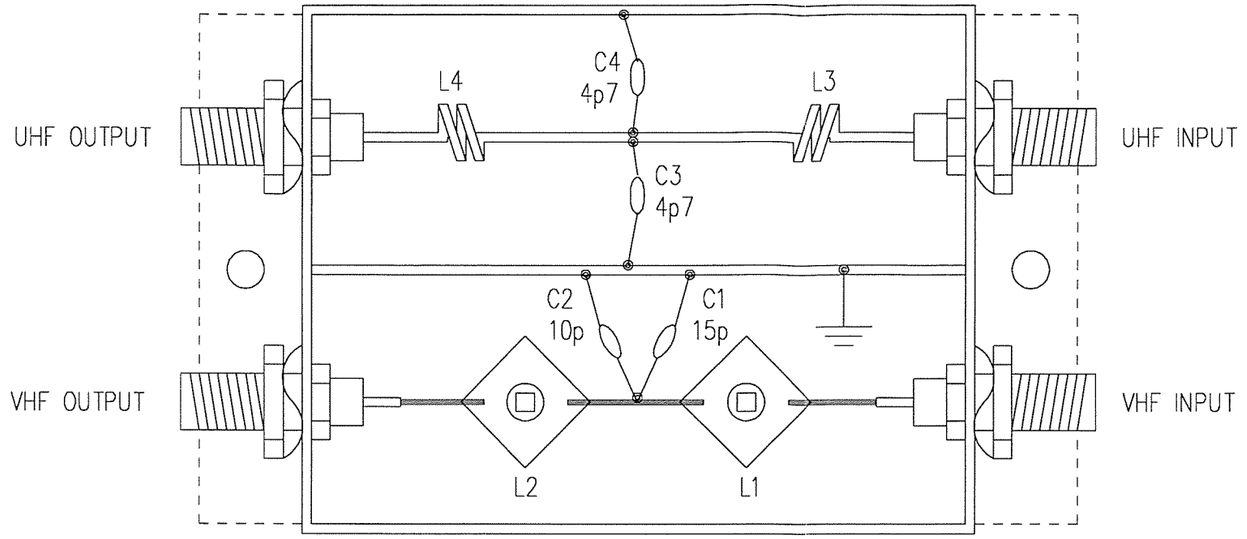
Fig.3-1-16



GA5914 Iss. 1

BITE Assembly Component Location Diagram

Fig. 3-1-17



COMPONENT LOCATION DIAGRAM

NOTE:
(1) VHF BOX COMPONENTS ONLY FITTED IN 3010 AND 3050 TRs

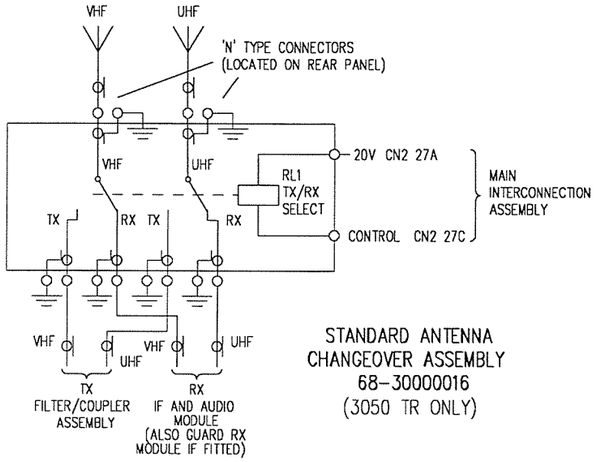
(2) UHF BOX COMPONENTS ONLY FITTED IN 3030 AND 3050 TRs

(3010 AND 3050 TRs ONLY)

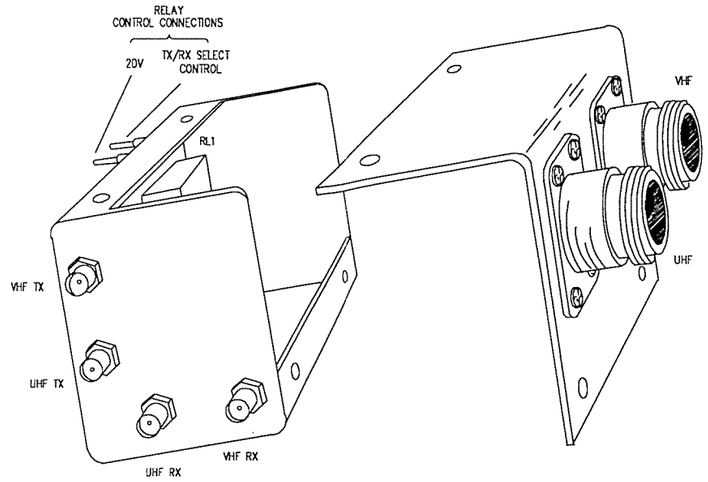
(3030 AND 3050 TRs ONLY)

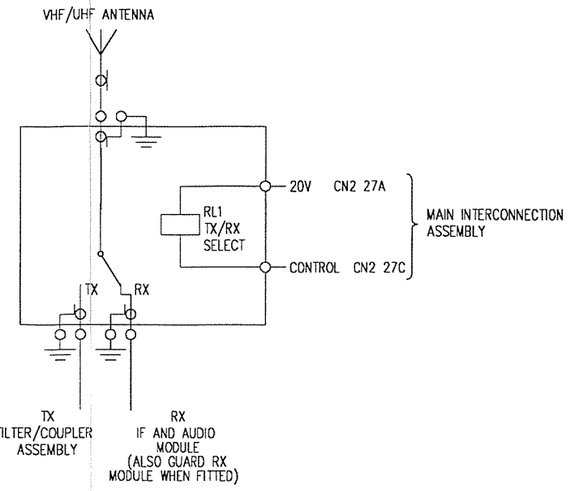
Antenna Filter Assembly Circuit and Component Location Diagram

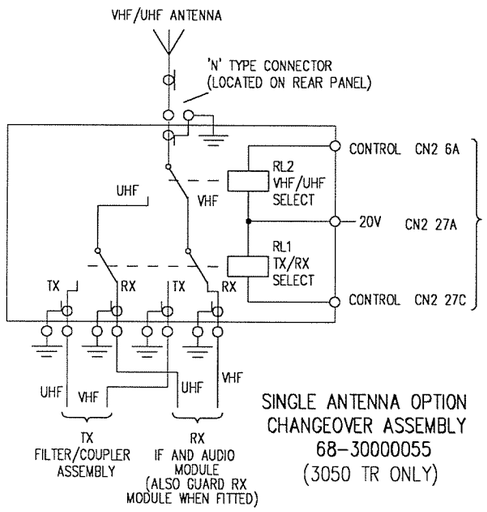
Fig. 3-1-18



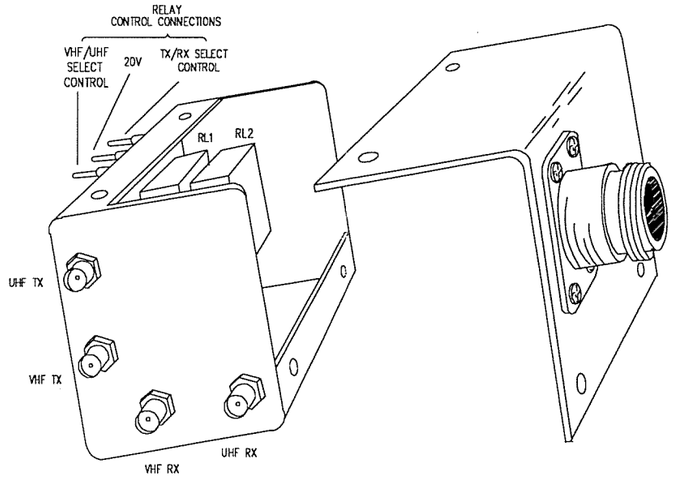
STANDARD ANTENNA
CHANGEOVER ASSEMBLY
68-30000016
(3050 TR ONLY)

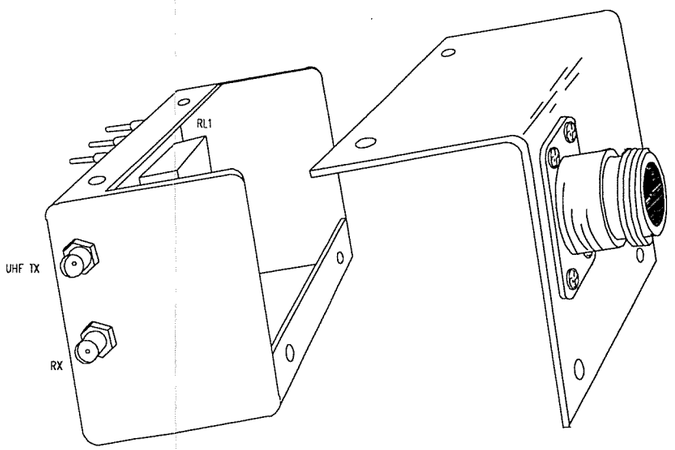






SINGLE ANTENNA OPTION
CHANGEOVER ASSEMBLY
68-30000055
(3050 TR ONLY)





ANTENNA CHANGEOVER ASSEMBLY
68-30000082 (3010 AND 3030 TRs ONLY)

GA8321 Iss. 1

Antenna Changeover Assemblies Circuit
and Component location Diagrams

Fig. 3-1-19

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INTRODUCTION

1 The transmitter is designed for amplitude modulation (AM) and frequency modulation (FM) operating modes using voice (narrow-band) or data (wideband) transmissions in the VHF (3010 TR) UHF (3030 TR) or VHF/UHF (3050 TR) frequency bands. It comprises a transmitter (Tx) control module, RF power amplifier (RFPA) assembly and a filter/coupler assembly. A simplified schematic diagram of the transmitter is shown in Fig. 3-2-1 and Fig. 3-2-2.

2 The Tx control is a plug-in module which is interconnected through the main and front interconnection assemblies at module position 2. The module contains the transmitter input/output control functions, the audio processing circuits and the BITE/control interfaces for the data bus.

3 The RFPA assembly is mounted on the right-hand heatsink as viewed from the front of the unit (see Fig. 3-2 and Fig. 3-2-11, 3-2-12 or 3-2-13 as appropriate).

4 The filter/coupler assembly is mounted on the left-hand heatsink, as viewed from the front of the unit. The assembly contains the requisite filter(s) (VHF, UHF or VHF/UHF), directional coupler(s), and the power regulator circuit (see Fig. 3-2-17, 3-2-18 or 3-2-19 as appropriate).

OVERVIEW

5 With reference to the schematic diagram Fig. 3-2-1 (3020 and 3030 TRs) or Fig. 3-2-2 (3050 TR). The transmitter circuitry is contained on the Tx control module, RFPA assembly, filter/coupler assembly, synthesiser, and the BITE module. The modules and assemblies provide the following functions.

- Tx control module. Processes the audio and provides control signals for transmitter operation.
- RFPA assembly. Provides the AM modulator, and the AM/FM power amplification for the RF carrier.

- Filter/coupler assembly. The filter coupler assembly contains: a low-pass filter(s) to remove any RF component above 160 MHz (3010 TR), 400 MHz (3030 TR), 160 MHz and 400 MHz (3050 TR). It also contains a directional coupler(s) which detects the forward and reflected power levels; and a power regulator assembly which provides the regulated power supplies for the RFPA circuits.
- Synthesiser module. Produces the carrier frequency for the RFPA assembly. In FM mode, the synthesiser's carrier frequency is modulated; in AM mode, the carrier frequency is modulated in the RFPA.
- BITE assembly. Supervises the PTT signals which can be activated from either the equipment's front panel, or a remote control unit. This assembly also provides pre-amplification for the microphone audio.

6 When the BITE assembly detects a local or remote PTT function has been activated, a PTT enable signal is sent to the Tx control module's BITE control and interface logic circuitry, through the data bus. When the synthesiser receives a PTT signal, the appropriate carrier frequency (fc) will be generated and routed to the RFPA.

7 When the Tx control module receives a PTT signal, the interface logic produces a PTT signal which is used to enable, providing no PTT inhibit signals have been generated, the RFPA.

8 When the RFPA is enabled, the carrier frequency, generated by the synthesiser, is amplified and routed to the Tx antenna through the filter/coupler assembly. The directional coupler monitors the forward and reflected power, and generates control feedback signals for the Tx control circuits.

9 The Tx control circuits accept the equipment's data and speech inputs, and provide amplification and control of local/remote, speech/data, and FM/AM modes of operation.

10 Detailed block diagrams of the transmitter control, control loop, and audio processing circuits are provided in Figs. 3-2-3, 3-2-5, and 3-2-7 respectively.

TX CONTROL MODULE

GENERAL

11 The circuit diagram for the Tx control module has been divided into two separate diagrams: Fig. 3-2-4 details the transmitter control and BITE interface circuits, and Fig. 3-2-8 details the audio processing circuits. Interconnections within the Tx control module and between the audio and control circuit diagrams are indicated by black arrowheads with associated annotations. External interconnections can be found by using the interconnection diagrams and charts in Chapter 1. The Tx control module's standard settings are shown in TABLE 3-2-1.

CONTROL CIRCUIT

12 The control circuit is detailed in Fig. 3-2-4 with a basic block diagram shown in Fig. 3-2-3 and these should be referred to while reading the following text. The control circuit is described in the following paragraphs.

TABLE 3-2-1 TX CONTROL MODULE - STANDARD SETTINGS

Component (1)	Function (2)	Standard setting (3)
RV3	Set tape output	-8 dBm
RV10	Wideband mod depth	AM=80%, FM=10 kHz deviation
RV2	Narrow-band mod depth	AM=80%, FM=5.6 kHz deviation
RV4	Set mute	1 mV
RV1	Microphone gain	5 mV
Link J1	VOGAD	Enabled
Link J5	Timeout	Out
Link J2	Mute	Enabled
RV8	Wideband sensitivity	+8 dBm

PTT Control

13 Control of the PTT function is through IC33 which requires a low (0 V) at pin 1 to enable a power control signal for the RFPA assembly circuits. If any of the following inputs to IC33 go high (10 V) the output will be high inhibiting the PTT function:

- PTT Enable. Operation of the local or remote PTT function provides a hardwire PTT enable signal from the pin 14 of IC17 (BITE assembly). This signal is applied to the base of TR6, turning it off and effectively providing a low at IC33 pin 13 via the inverter IC35e.
- Antenna Change-over Relay Delay. A low from IC35e causes IC34 to provide a high output pulse for a duration of 4 ms. This allows the antenna change-over relay to operate, connecting the transmitter to the antenna. After 4 ms a low is provided at IC33 pin 12. This circuit is provided to allow the antenna changeover relay time to operate (connecting the transmitter to the antenna) before power is produced.
- RF Drive Level Detect. When the PTT function is operated, the synthesiser module detects the PTT enable and provides drive for the RFPA assembly. The drive level is detected and fedback to IC36a on the control circuit where the output of IC36b provides a low (0 V) at IC33 pin 11. No drive will provide a high through IC36b to IC33 pin 11, and inhibit the PTT function.
- Low Volts Inhibit. The power reset circuit IC21 on the BITE assembly monitors the power supply through the 20 V line. If the power supply fails a low volt inhibit signal (0 V) is provided through IC21f/TR2 (BITE assembly) to IC35b on the control circuit. The output of inverter IC35b provides a high on IC33 pin 3 inhibiting the PTT function. Conversely with the power supply functioning correctly, a high (10 V) at the input of IC35b provides a low at IC33 pin 3.
- -10 V Supply Monitor. The -10 V circuit from the power supply unit is connected through the BITE assembly to the control circuit (CN2 5A/C) and monitored at TR11/IC35a. On the loss of the -10 V, TR11 will be turned off causing a high at the output of IC35a; this is detected at IC33 pin 4, and inhibits the PTT function. Conversely with -10 V operating normally, TR11 is turned on effectively providing a low at IC33 pin 4.

- Synthesiser Out of Lock Inhibit. A synthesiser out of lock condition will be signalled through TR2 on the synthesiser circuit as a low (0 V) and detected at D13 on the control circuit. This turns TR9 off, providing a high at IC33 pins 5 and 6 which inhibits the PTT function. With the synthesiser operating correctly a high will be detected by D13, TR9 will be switched on providing a low (0 V) at IC33 pins 5 and 6.

14 The output low (0 V) at IC33 pin 1 is connected to the base of TR4 causing it to turn off.

Modulation and Power Control

15 When TR4 is turned off, a dc control voltage is applied to the VX input of analogue multiplier IC31 pin 9. The control voltage has a maximum value of 2 V; R127 and C45 determine the rise time. The dc control voltage is derived from the potential divider network of R130, R131 and the transmitter's front panel SET POWER control. Adjusting the SET POWER control alters the dc voltage level at IC31 pin 9.

16 The corresponding reference input at IC31 pin 4 (VY) is provided by the audio processing circuits and consists of a 1 V dc level with the modulation signal superimposed on it in the AM mode. For FM, the dc level (no modulation content) is adjustable up to a maximum of 1.2 V. The analogue multiplier's scale factor is set at 0.5; therefore, in AM mode, with a reference level of 1 V and control level of 2 V, the resulting output level at IC30b (TP10) of 1 V (equivalent to an RF output of 40 W). For FM, the output voltage produced represents an RF power output of up to 60 W.

17 The reference voltage and modulation signal (AM only) from the output of IC30b is applied to IC29b part of the loop control circuit prior to connection to the RFPA assembly.

Loop Control

18 Fig. 3-2-5 shows a basic block diagram of the control loop system which is used to control the output of the transmitter. The inverting input of IC30a is connected to the output of IC29b, and is initially marginally negative. When PTT is activated, the initial marginally negative potential ramps towards the appropriate value as detailed in the previous paragraphs - Modulation and Power Control. The non-inverting input of IC29b is connected to the forward power output (FWD) of the directional coupler and is initially around 0 V.

19 On operation of PTT the initial conditions at IC29b will provide a control signal through IC30a to the driver stages in the RFPA assembly causing the PA stages to commence producing power. As the control signal ramps towards its maximum value, the directional coupler provides a dc voltage proportional to the forward power, which it feeds back to the non-inverting input IC29b effectively controlling the output of loop filter IC30a and thereby the gain of the RFPA driver stages.

Directional Coupler Compensation

20 To ensure a constant output level over the frequency range of the equipment, IC25 and IC26, controlled by the software, provides compensation to the forward (FWD) and reflected (RFD) outputs of the directional coupler.

21 When a frequency is selected, the installed program software employs look up tables to provide the degree of compensation required for that frequency. This information is transmitted over the data bus to bus expander IC40 which outputs the data to IC26/IC25

through non-inverting buffer IC43. IC26/IC25 selects the required value of resistors (R110 to R117), applying the required amount of compensation to the RFL and FWD dc levels.

VSWR Protection

22 To prevent damage to the transmitter due to antenna mismatch conditions, a VSWR detector and power reduction circuit has been incorporated.

23 During any high VSWR condition, the directional coupler provides a dc voltage proportional to the transmitter reflected power (RFD) which is connected to the non-inverting input of IC28b through IC27b. When the input level of IC28b reaches around 620 mV, the output of IC28b causes zener diode D4 to operate. TR3 will turn on causing the VX input of the analogue multiplier IC31 to reduce to a level which maintains the peak reflected power level at 20 W.

Power Reduction

24 On detection of the heatsink temperature rising above 80°C and 90°C by the temperature sensors, the BITE assembly will provide an input along the data bus, to bus expander IC40. From IC40, the data is routed through non-inverting buffers IC42 and IC43 to IC32.

25 The input will enable IC32 to connect a resistance value (R184 to R186) to R129 forming a potential divider network which reduces the dc voltage input to IC29a; this effectively reduces the output power. If the temperature increases, the circuit based around IC32 reduces the resistance value which is added to the potential divider network. This will cause the output power to be reduced by 3 dB at 80°C and 6 dB at 90°C. In addition the °C message will shown in the mainframe front panel MONITOR display.

26 A supply monitor circuit on the audio processing circuit (IC19b) also provides an input to IC32. When a low voltage supply is detected the low volts input of IC32 (pin 13) is enabled connecting R235 to the input of IC29a effectively reducing the power output.

BITE/Control and Test Point Interface

27 Bus expanders IC39 and IC40 provide the interface for the data bus and module select signal, which is connected to pin 6 (CS). IC41, IC42 and IC43 form non-inverting buffers.

28 The BITE test point interface comprises analogue multiplexers IC45, IC46 and IC47, each multiplexer has three address lines to select one of eight test points for output through the monitor line CN2C 27 to the BITE assembly. The enable signal for the multiplexers is provided by a two to four line converter IC44.

AUDIO PROCESSING CIRCUIT

29 The audio processing circuit is detailed in Fig. 3-2-8 with a basic block diagram shown in Fig. 3-2-7, and should be referred to while reading the following text. The audio processing circuits provide the following functions.

Audio Inputs (Narrow-band)

30 The local narrow-band audio input from the front panel microphone (through the BITE assembly) is amplified by IC1a; the output gain is controlled by RV1 and connected to gate

IC5a. The remote narrow-band audio input from the rear panel connector (through the remote control module) is connected to gate IC5a through buffer IC1b.

31 The remote/local select gate IC5a is controlled through the BITE control interface (see transmitter control circuit diagram) with a low (0 V) selecting the remote input, and a high (10 V) selecting the local input. The output of IC5a is connected to the VOGAD and mute circuits.

VOGAD

32 IC3b is configured as a non-inverting high input impedance amplifier with a gain of 101 set by R25 and R26. P-channel FET TR1 functions as a voltage controlled resistor which, in conjunction with R24, forms a potential divider at the input of IC3b. Transistor array IC6 forms a high gain amplifier controlling the gate voltage of TR1 which effectively determines the attenuation on the input of IC3b.

33 With no signal applied to IC3b, the gate of TR1 will present a high resistance and very little attenuation. As the signal level input increases, and the output voltage level approaches 2 V (p-p), IC6a and IC6b start to conduct causing the gate voltage at TR1 to reduce, thereby reducing the resistance. Any further increase will further reduce the resistance of TR1, increasing the attenuation on the input signal. Consequently, the output signal of IC3b stabilises at 2 V (p-p) for an input voltage variation in excess of 30 dB.

RF Clipper

34 The audio signals are passed from IC3b to the RF clipper which is designed to prevent overmodulation of the transmitter. In order to avoid generating additional distortion by clipping the modulating signal at audio frequencies, the modulating signal is transferred to a single sideband signal of 60 kHz before clipping and subsequent demodulation and filtering.

35 Dual operational amplifier IC7 is configured as a phase shifting network, providing two audio signals at TP33 and TP34 which are equal in amplitude but differ in phase by 90 degrees. This phase difference is maintained over the audio bandwidth of the transmitter (300 Hz to 3400 Hz). IC8 consists of four MOS bilateral switches configured to form a double balanced modulator. The necessary quadrature carrier signals are derived from an oscillator IC13 which provides a 250 kHz square wave to drive IC12 which is a dual MOD D-type flip flop connected to provide two pairs of quadrature outputs at 60 kHz. The double balanced modulator provides a single sideband output at 60 kHz by the phasing method.

36 The 60 kHz signal is applied to tuned amplifier IC9a before being further amplified and clipped by IC10. The 60 kHz signal is demodulated by applying two anti-phase signals from IC11 through switch IC14a. The output from the clipper circuit is applied to the mute gate IC14b.

Mute Detector

37 When switched in, this circuit mutes the transmitter audio circuits during no speech periods, thereby eliminating the transmission of line noise.

38 IC2a is configured as a non-inverting amplifier with RV4 (SET MUTE control) adjusting the gain and setting the detector's operating threshold. During no speech periods, transistor TR2 does not conduct and the collector voltage remains high. The output from comparator

IC2b (TP41) is low ensuring that the MUTE GATE IC14b remains de-selected (off position); this prevents line noise from reaching subsequent stages.

39 When the output signal from IC2a reaches approximately 1 V, TR2 conducts and the collector voltage falls causing the output of IC2b to go high. This enables the MUTE GATE IC14b allowing signals through to subsequent stages. To prevent the audio component of the signal affecting the operation of the mute gate, R20 and C14 provide the detector with a 'hang time' which is approximately 1CR.

Audio Filters

40 With the mute gate enabled, the signal from the RF clipper is passed through the audio filter circuits which comprise a 300 Hz high pass filter, and a 3.4 kHz low pass filter. IC15a, IC15b and associated RC components form the high pass filter, with a cut-off frequency of 300 Hz. C29, C31 to C37 and L3 to L5 form the low pass filter, with a cut-off frequency of 3400 Hz.

Audio Outputs

41 From the filter circuits the audio signal path will depend on the selection of AM or FM mode:

AM Mode

42 On selection of the AM mode, the AM/FM select gate IC16c, controlled through the data bus will be set in the AM position. The dc level and superimposed audio signal will be connected through RV7, IC16b (disabled and set in the narrow-band mode) and IC16c to the VY (TP45) input of the analogue multiplier IC31 located on the TX Control circuit.

FM Mode

43 On selection of the FM mode, the AM/FM select gate IC16c, controlled from the BITE assembly through the data bus, will be set to FM. A dc level set by RV9 will be connected to the VY (TP45) input of the analogue multiplier IC31 (located on the Tx control circuit). The audio signal is connected through RV5 (SET PEAK DEVIATION), IC16a (set in the narrow-band mode) and IC17 to the synthesiser module.

Tape Output

44 During periods of transmission in the AM mode, an audio signal, derived from the forward power, is connected through IC27a on the Tx control circuit to IC24b. With gates IC23b and IC23c enabled, the audio signal is connected to IC24a which provides a tape output facility, the level of which is controlled by RV3 (SET TAPE OUTPUT). The output of IC24a is connected to the rear panel FACILITIES connector through the main interconnection assembly.

45 During periods of transmission in the FM mode, the route for the tape output audio signal is the same as the AM mode except that a sample of the FM audio is fedback from the output of IC17b through gate IC23a (which will be enabled) to the input of IC24b.

Sidetone Audio

46 The tape AM and FM audio signals from IC23c are connected through IC22a to provide a sidetone audio output for the mainframe front panel MIC and PHONES connectors through the BITE assembly.

External Audio Connection

47 When incorporated within the software a control signal can be used to enable IC58 allowing the input audio from the VOGAD circuit to be connected, through IC4, to an external source such as an encryption unit. An audio input can be connected from an external source, such as a encryption unit, through IC3a to the audio processing circuit at the input of the RF clipper.

DATA (WIDEBAND) PROCESSING CIRCUIT

48 The data (wideband) circuit is detailed in Fig. 3-2-8 and should be referred to while reading the following text.

49 The data (wideband) input is connected from the rear panel FACILITIES 2 connector, through the main interconnection assembly, to the input transformer T1. The data, after amplification, is passed through a linear phase active filter configured around IC20 and limited by IC21.

50 When transmitting in the AM mode, the AM/FM select gate IC16c will be set to the AM position. The narrow-band/wideband select gates IC16a and b will be set to the wideband position. Control of these gates are from the BITE assembly through the data bus. The data signal will then be connected through RV8 to the VY input of the analogue multiplier IC31 on the Tx control circuit.

51 When transmitting in the FM/LINK 11 mode, the AM/FM select gate IC16c will be set to its FM position, this will connect the data signal through RV6 and IC17 to the synthesiser module.

RF POWER AMPLIFIER ASSEMBLY

GENERAL

52 The circuit diagrams for the RF power amplifier assemblies (RFPAs) are shown in Fig 3-2-9 (3010 and 3050 TRs)and Fig. 3-2-10 (3030 and 3050 TRs). The interconnections to the RFPA assemblies are detailed in Fig. 3-2-11 (3010 TR), Fig 3-2-12 (3030 TR) and Fig 3-2-13 (3050 TR) and should be read in conjunction with the layout and interconnection diagrams contained in chapter 1 of this section. The component layouts of the RFPAs are shown in Figs. 3-2-14 (VHF) and 3-2-15 UHF.

VHF RF POWER AMPLIFIER (3010 AND 3050 TRs)

53 The VHF RFPA consists of a VHF driver amplifier and power amplifier (PA). The circuits see Fig. (3-2-9) are described in the following paragraphs.

VHF Driver Amplifiers

54 The transmitter RF drive from the Synthesiser module is connected through C6 to a pin diode switching network consisting of D1 and D2 which is controlled by the VHF/UHF select signal from IC38 in the Tx Control circuit.

Note ...

The pin diode switching network is only functional in 3050 transceivers and the switching action described in the following paragraph is applicable to that type of transceiver only. The signal path described for the VHF mode is permanently enabled in the 3010 TR.

55 If a UHF frequency is selected then a high from the VHF/UHF select control will cause D2 to be reverse biased and D1 to switch on passing the RF drive to the UHF RFPA. Conversely a VHF frequency will provide a low select signal causing D1 to reverse bias and D2 to conduct passing the RF drive to the VHF RFPA. D3 is a synthesiser drive detector which under no drive condition will provide a signal to the Tx Control module to inhibit the PTT function.

56 When the VHF input signal is passed through D2 it is connected via a 3 dB matching pad to the gate of TR1, which is coupled to TR2 via C17. TR1 and TR2 are power FETs which have the 'power and modulation' control signal connected through RV1 and RV2 respectively to their gates.

57 The output of TR2 is matched by a bandpass network to TR2. With 'no power and modulation control' signal from the Tx control circuit, transistors TR4 and TR5 will bias TR3 off to prevent quiescent current being drawn when the transmitter is not keyed.

58 On application of a 'power and modulation control signal', TR5 and TR4 switch on, and through RV3 provide a drive signal for TR3. The control signal is also applied to the gates of TR1 and TR2 through RV1 and RV2 respectively; the potentiometers set the maximum quiescent currents for their associated devices. In AM mode, modulation of the carrier frequency takes place via TR1 and TR2. In FM mode modulation of the carrier takes place in the synthesiser module.

VHF Power Amplifier

59 The input to the power amplifier stage is via a 10 ohm matching impedance and is passed through to a Balun splitter T1 which equally divides the input power for application to the power amplifiers TR6 and TR7. The outputs of TR6 and TR7 are applied through Balun combiner T2/T3 to the output connector CN1.

60 A temperature sensor IC1 (fitted on 3010 TR only) provides a signal for the Tx control module and BITE/test interface circuit, for controlling the equipment cooling fan. The RF output from connector CN1 is routed to the filter/coupler assembly.

UHF RF POWER AMPLIFIER CIRCUIT (3030 AND 3050 TRs)

61 The UHF RFPA consists of two UHF driver amplifiers and a power amplifier (PA). The circuits (see Fig. 3-2-10) are described in the following paragraphs.

UHF Driver Amplifiers

62 The UHF RF drive input signal from the synthesiser (via the VHF RFPA in the 3050 TR) is connected, through CN1, to the gate of TR1. With 'no power and modulation control' signal from the Tx control circuit, transistors TR4 and TR5 will bias TR1 off to prevent quiescent current being drawn when the transmitter is not keyed. Diode D1 is a synthesiser drive detector which provides a signal, under no drive conditions, to the Tx control module to inhibit the PTT function.

63 On application of a 'power and modulation control' signal, TR5, TR4 switch on, and through RV1 provide a drive signal for TR1. The control signal is also applied to the gates of TR2 and TR3 through RV2 and RV3 respectively; the potentiometers set the maximum quiescent currents for their associated devices.

64 The output of TR3 is connected through transformer T1, a 50 ohm coaxial link, and transformer T2 to a further stage of amplification (UHF driver box 2 assembly). The RF signal passes through TR6 which comprises two transistors in a single package and connected in push-pull configuration. Transistor TR7, diodes D4 and D5 forward bias the base of TR6 thereby increasing its gain. The output of amplifier TR6 is taken through transformer T3 and a 50 ohm coaxial link to the power amplifier stage.

UHF Power Amplifier

65 The input to the power amplifier stage is connected through a Wilkinson splitter which divides equally the input RF power for application to power amplifiers TR8 and TR9. Each power amplifier is a balanced amplifier comprising two transistors in a single package connected in push-pull configuration. Transformers T4 and T6 provide 180° inputs through a bandpass network to drive each power amplifier in push-pull.

66 Bandpass matching networks match the output of the power amplifiers to T5 and T7 which are configured as balanced to unbalanced transformers. The outputs from T5 and T7 are connected, through a Wilkinson combiner, to the output connector CN2.

67 A temperature sensor IC1 provides a signal for the Tx control module and BITE/test interface circuit, for controlling the equipment cooling fan. The RF output from the RFPA assembly is connected to the filter/coupler Assembly.

FILTER/COUPLER ASSEMBLY

GENERAL

68 The circuit diagram for the filter/coupler assembly is shown in Fig. 3-2-16 with the exception of the power regulator assembly circuit which is detailed in Fig. 3-2-21. The component location of the filter/coupler assembly is shown in Figs. 3-2-17, 3-2-18 and 3-2-19 for the 3010, 3030 and 3050 TRs respectively. Figs. 3-2-20 and 3-2-22 detail the component layout of the directional coupler circuits and power regulator circuit respectively.

FILTER/COUPLER CIRCUIT

69 The RF signal from the RFPA assembly is passed through a low-pass filter to a directional coupler circuit (see Fig. 3-2-16). This circuit contains two coupling loops, one loop is for detecting the forward power, the other loop for detecting the reflected power.

70 With a reference voltage of 0.2 V provided to overcome the forward bias of the diode detectors, D1 and D2, the output from the coupler loops is applied through the diodes to the power regulator circuit. RV1 and RV2 calibrate the outputs of the directional coupler to provide 1 volt for 40 watts of transmitter power.

POWER REGULATOR ASSEMBLY CIRCUIT

71 The power regulator assembly (see Fig. 3-2-21), comprising three separate but identical circuits, provides the regulated power supplies for the PA1, PA2 and driver circuits which form the RFPA assemblies. The input to the power regulator assembly is an unregulated 28 V dc from the main power supply unit.

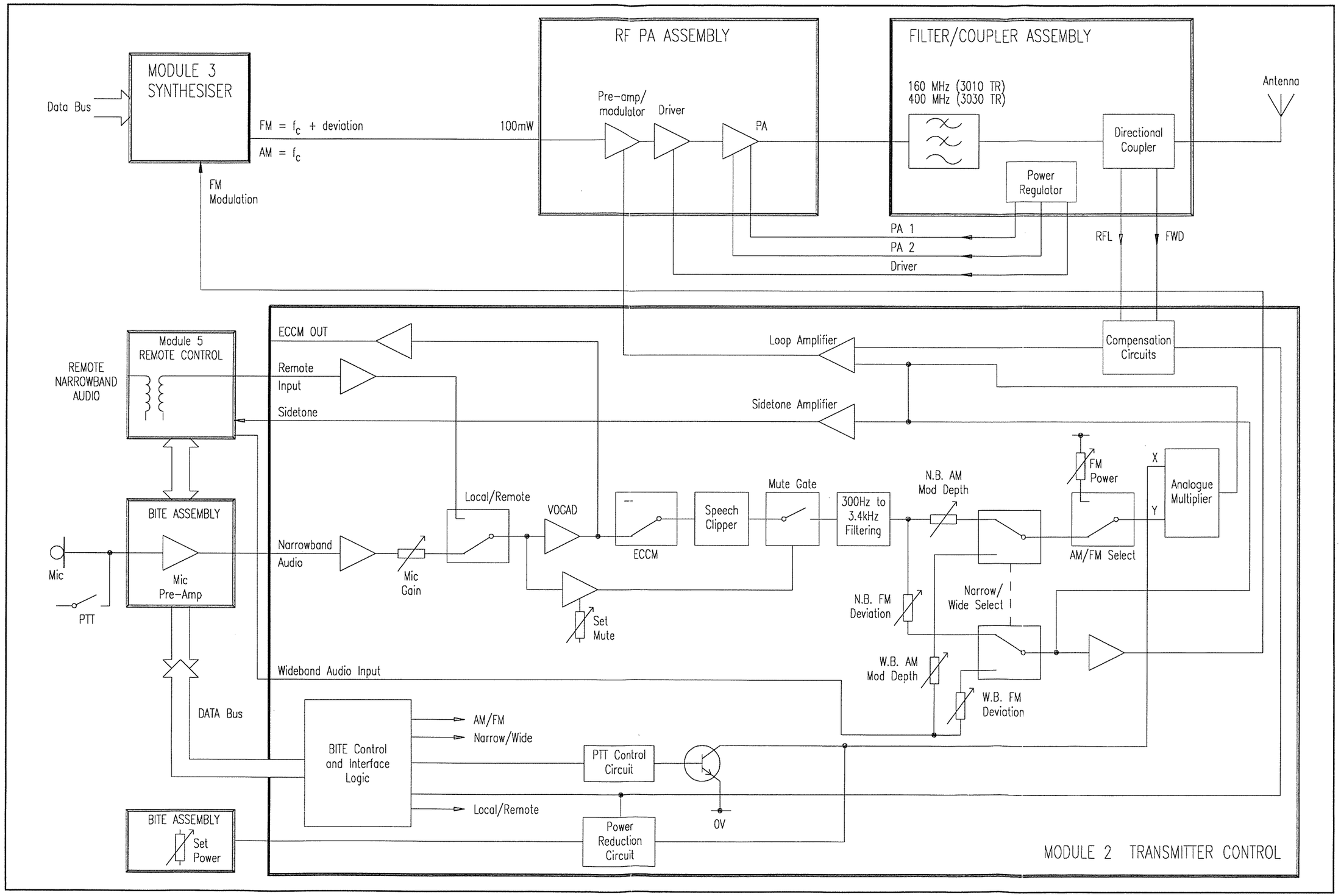
72 As the circuit action is identical for the three regulators, the following description for the circuit supplying PA1 will apply to the other two circuits. The unregulated dc input is connected to TR20 and TR21 which are configured to equally share the current load and heat dissipation. This is accurately controlled by monitoring the output from TR20/TR21, through a current to voltage converter circuit comprising R4/IC1/TR3 for TR20, and R15/IC2/TR6 for TR21. The resulting voltage is routed to one input of the differential amplifiers TR1/TR2 and TR3/TR4.

73 The other controlling input of the differential amplifiers is from the output voltage, fedback through a potential divider network R19/R20 to the inverting input of IC7. The non-inverting input of IC7 is provided with a reference voltage derived from the potential divider, network of R7, RV1, R71 and R83. The differential amplifiers control the gate voltage of TR20/TR21 and therefore the supply to the power amplifier circuit.

74 An AM/FM select signal is applied through TR26 which effectively short circuits R83 when in the FM mode. This reduces the reference voltage to IC7 and consequently the regulator output voltage. When AM mode is selected the output voltage is clamped to 25 V, and for FM, 22 V.

75 IC10a sums the individual regulator current monitor outputs to provide a current indication to the BITE assembly through the Tx control modules BITE/control interface.

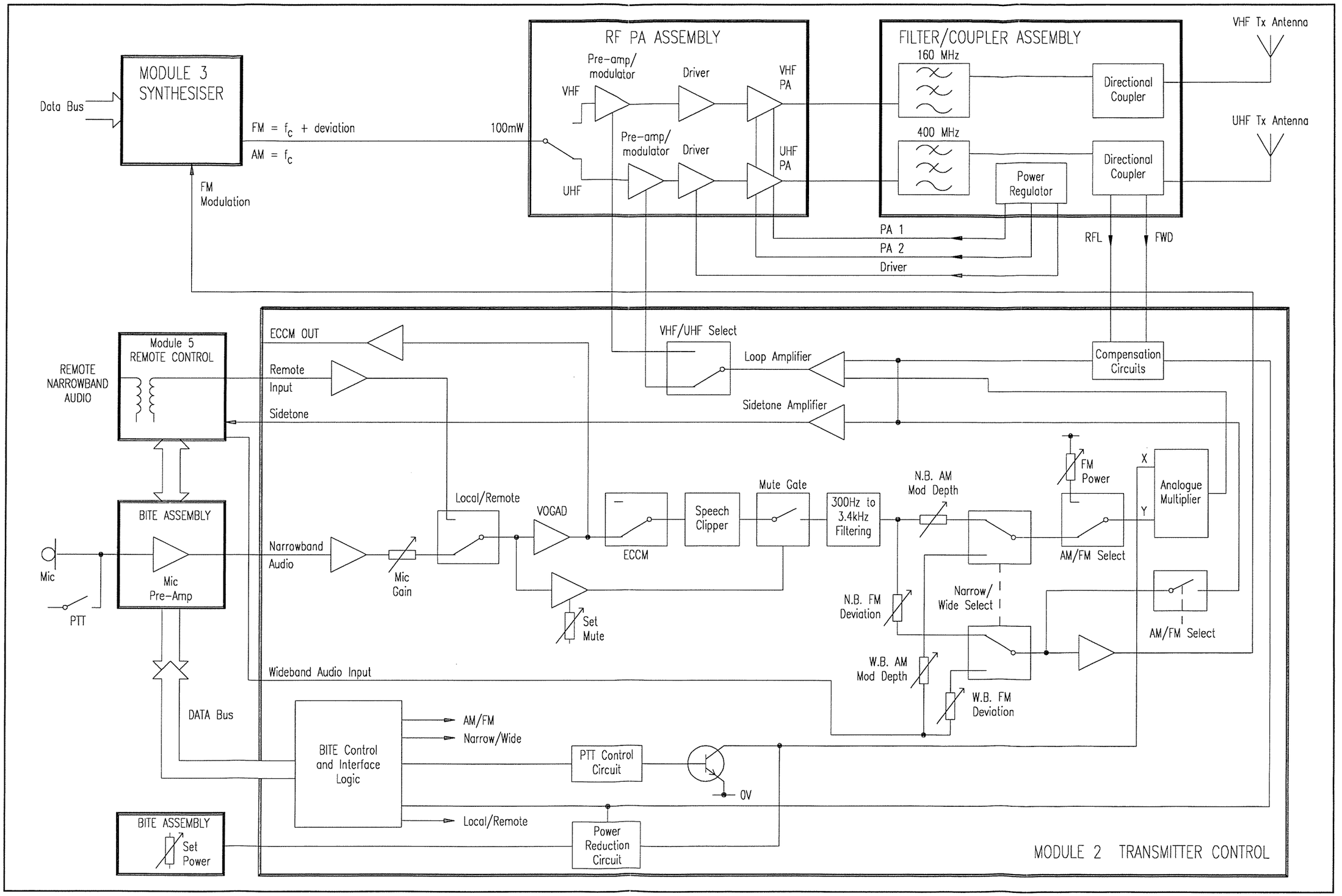
76 The dc levels representing the forward and reflected powers are connected from the filter/coupler assembly through the buffers IC12a and b to the Tx control module. IC13 provides the regulated 12 volt supply for the ICs on the power regulator assembly.



GA8314 Iss. 4

Transmitter Simplified Diagram
(3010 and 3030 TRs)

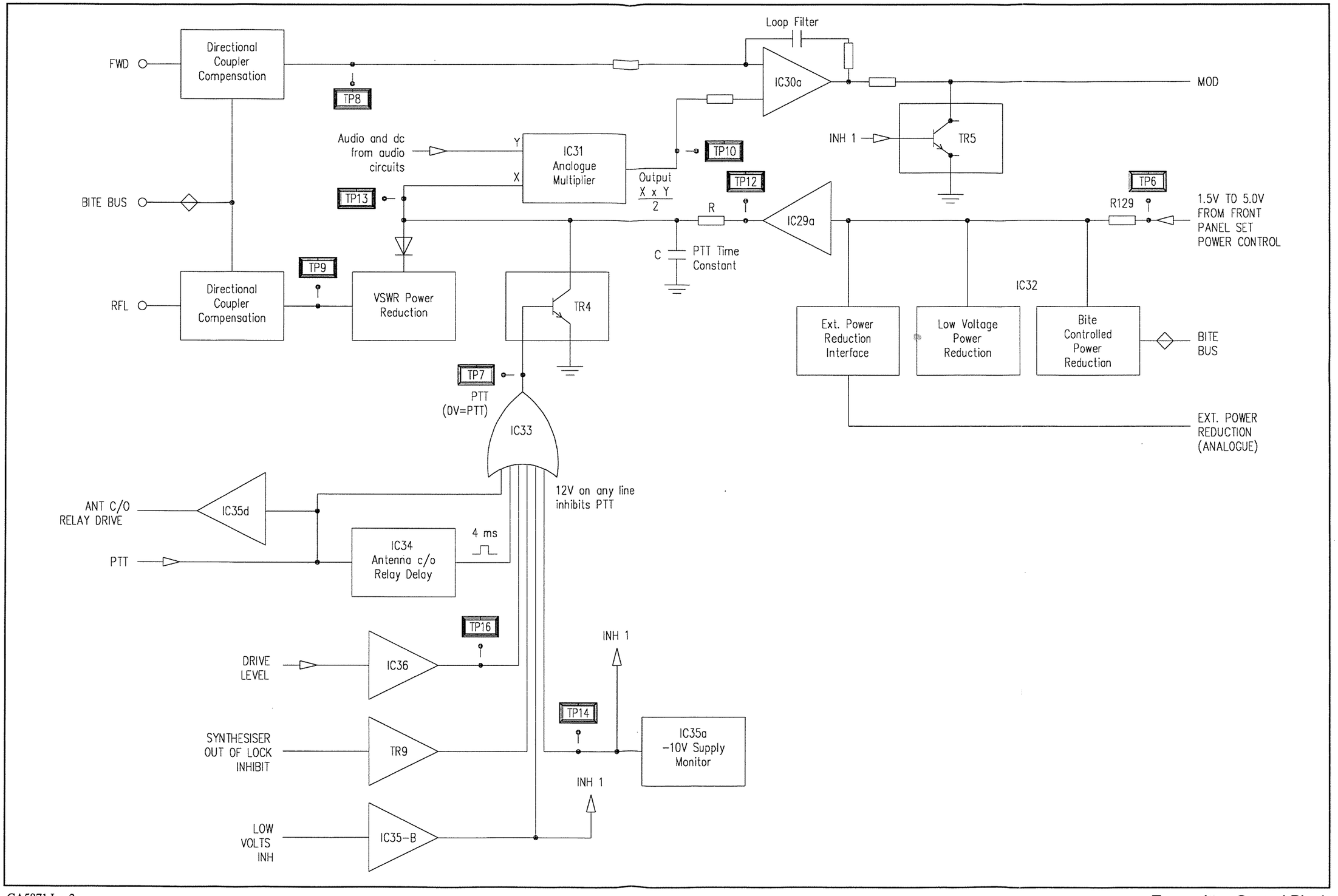
Fig. 3-2-1



GA8313 Iss. 2

Transmitter Simplified Diagram
(3050 TR)

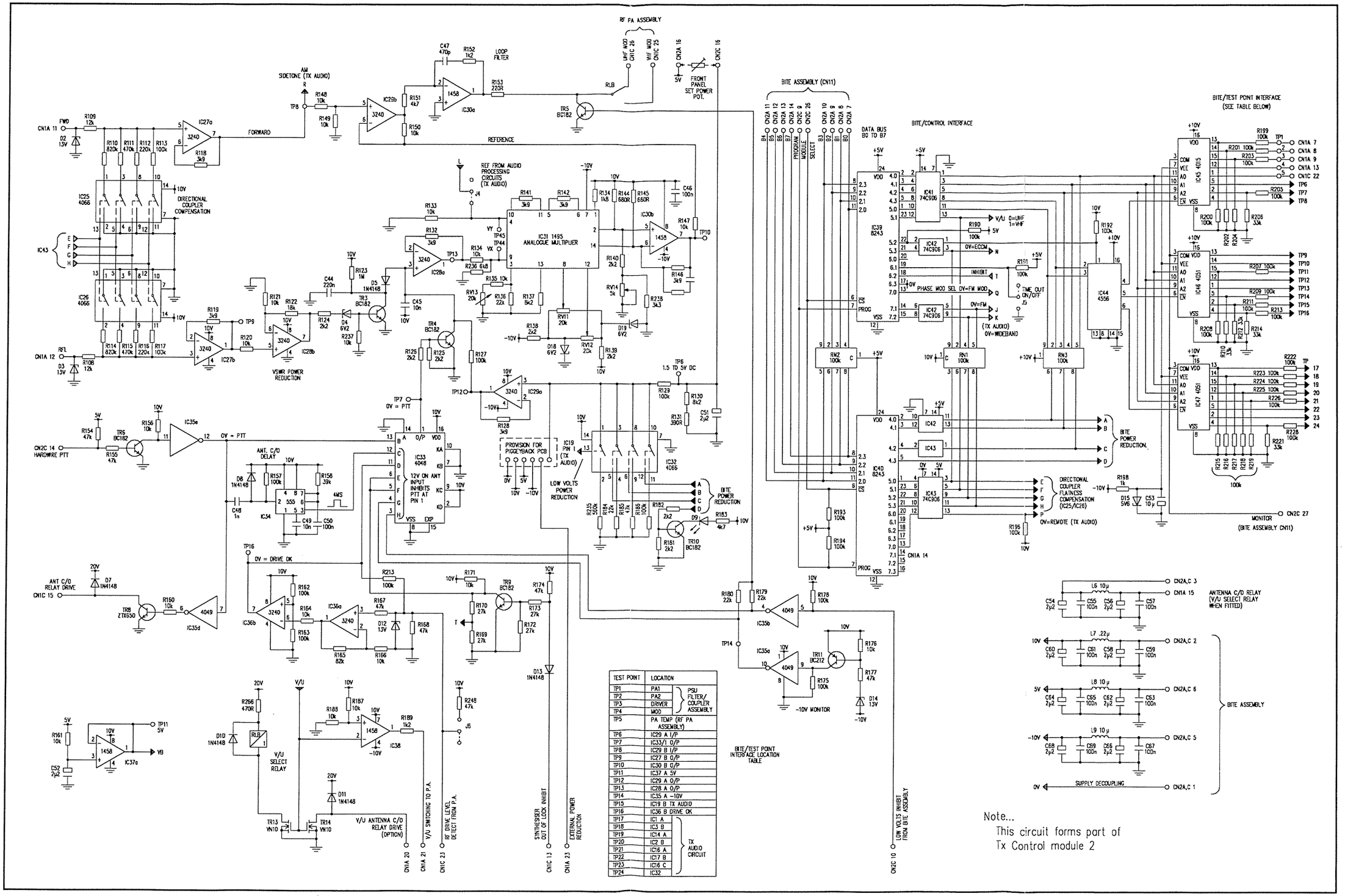
Fig. 3-2-2



GA5871 Iss. 2

Transmitter Control Block

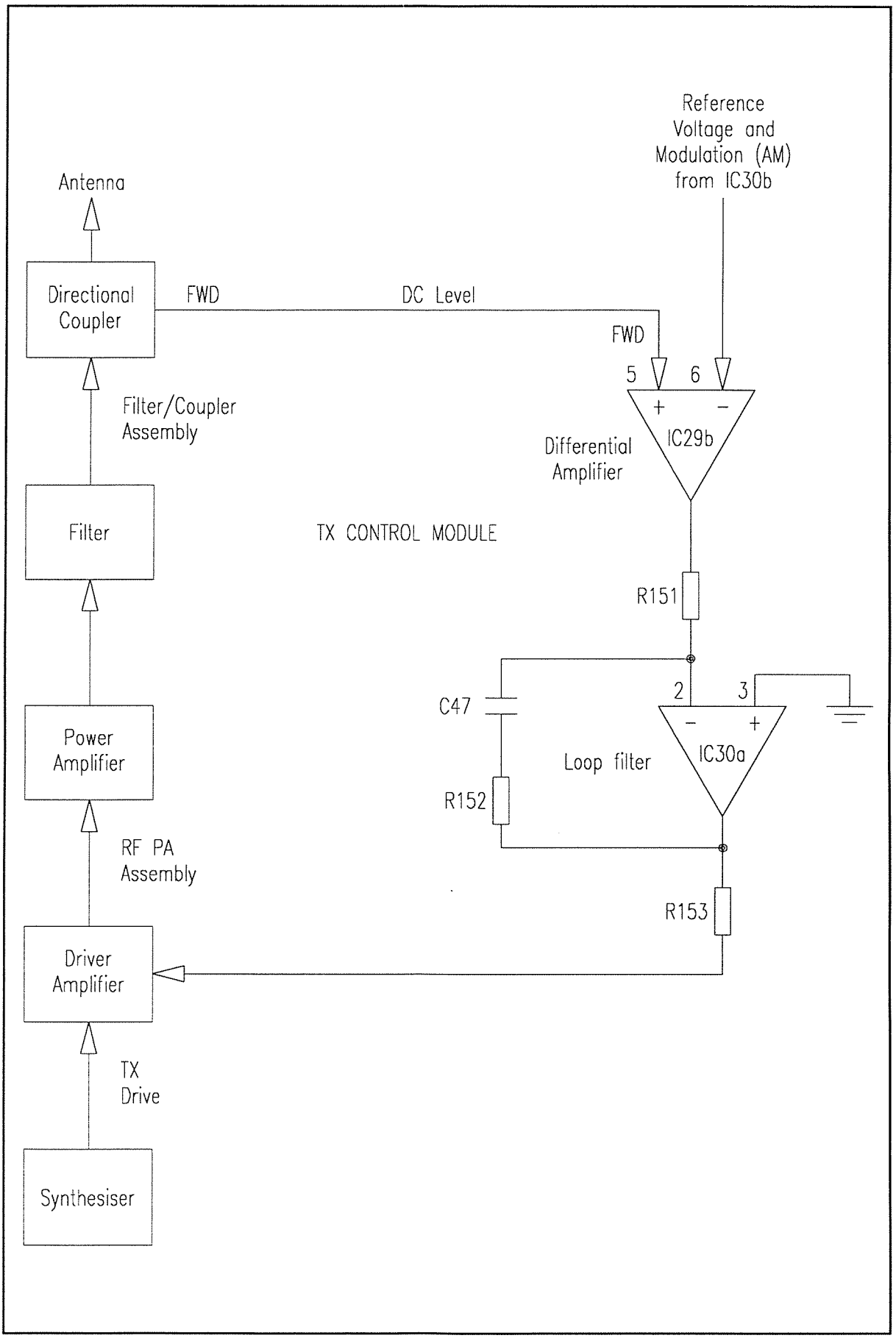
Fig. 3-2-3



GA5314 Iss. 4

Transmitter Control
Circuit Diagram

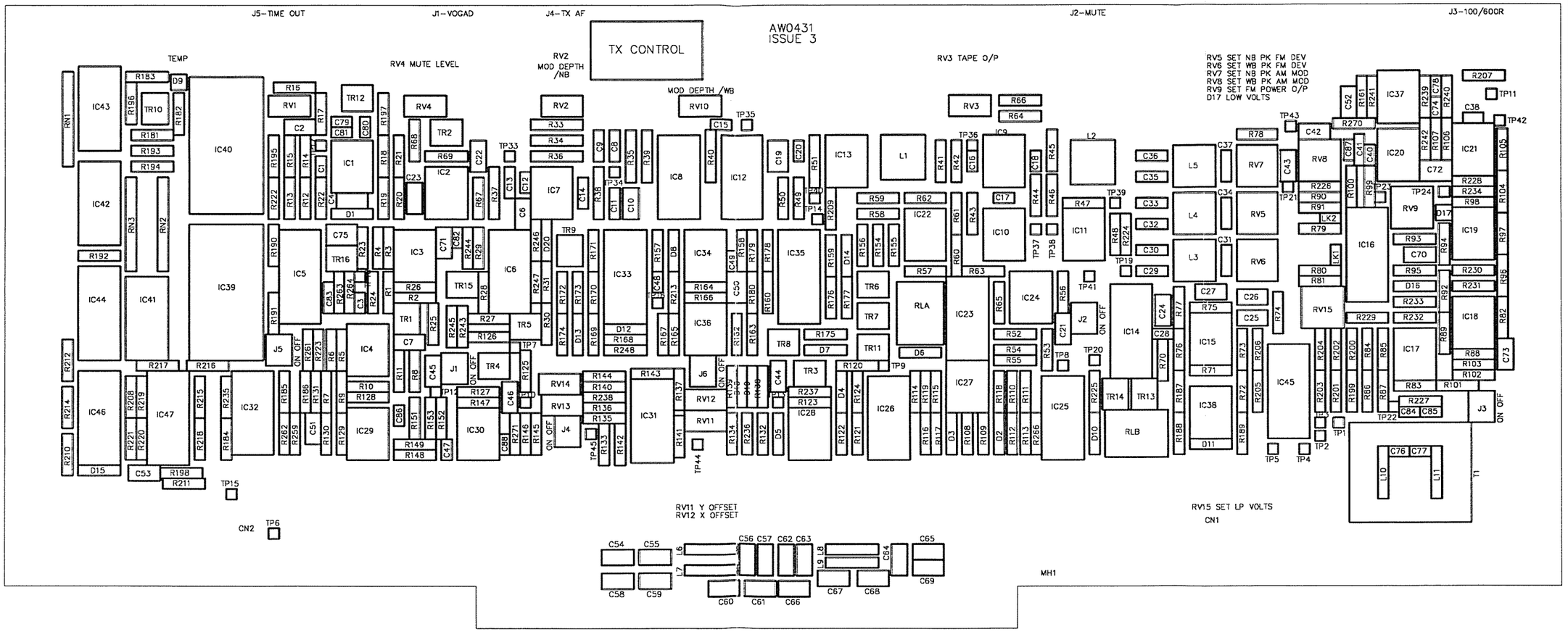
Fig. 3-2-4



GA5860 Iss. 1

Transmitter Control Loop System Block Diagram

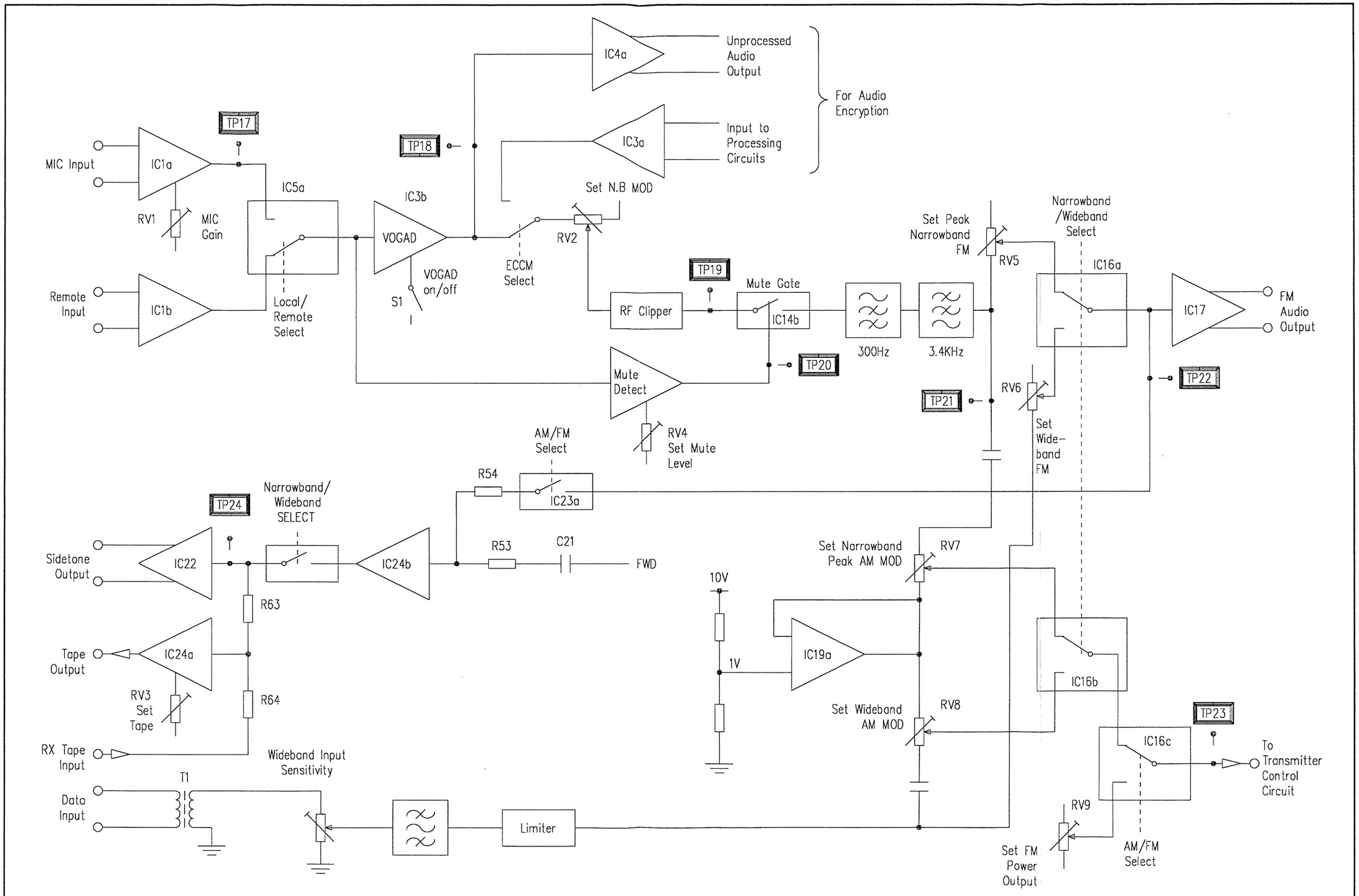
Fig. 3-2-5



GA5913 Iss. 1

Transmitter Control Module Component Location Diagram

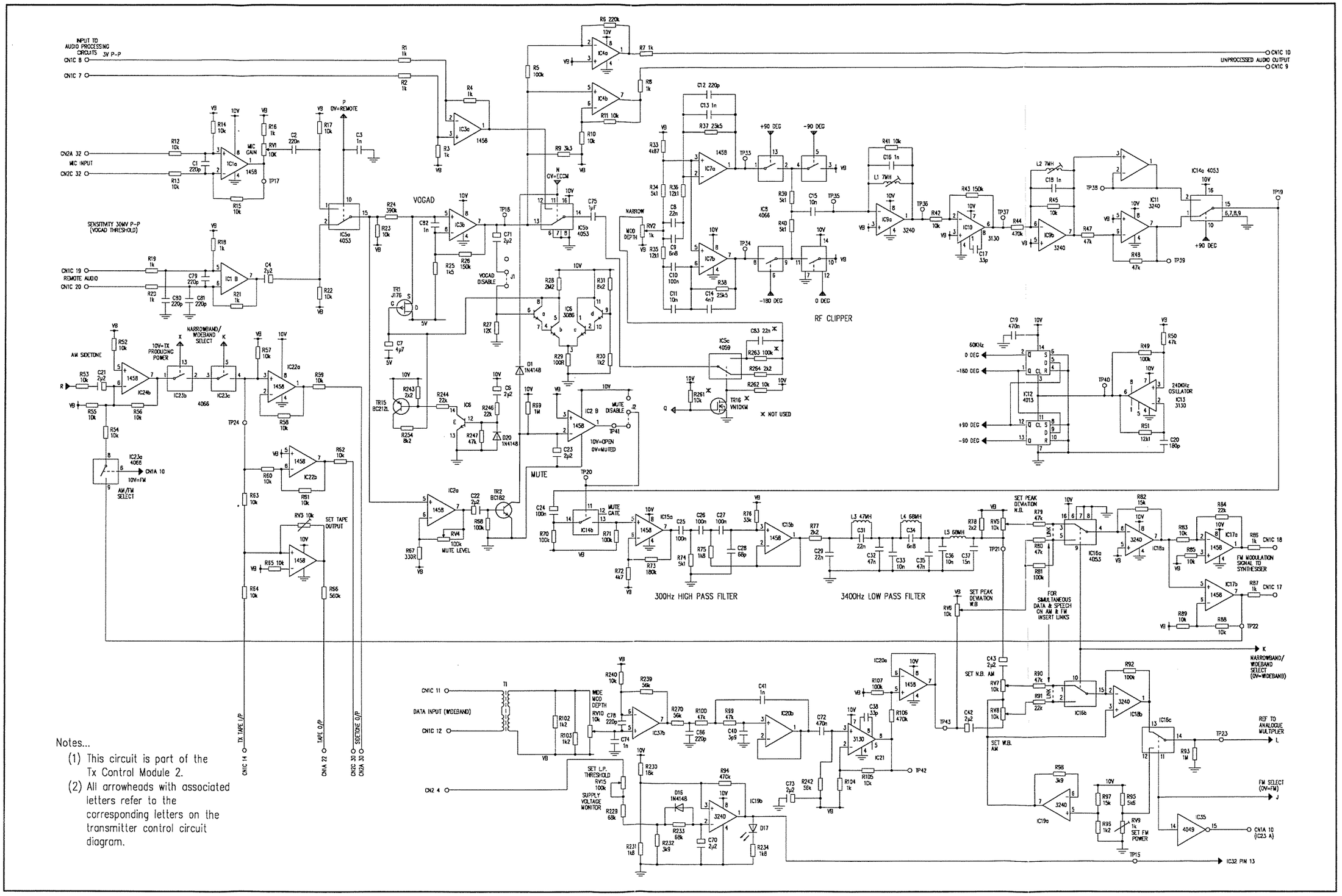
Fig. 3-2-6



GA5872 Iss. 1

Transmitter Audio Processing Block Diagram

Fig. 3-2-7



Notes...

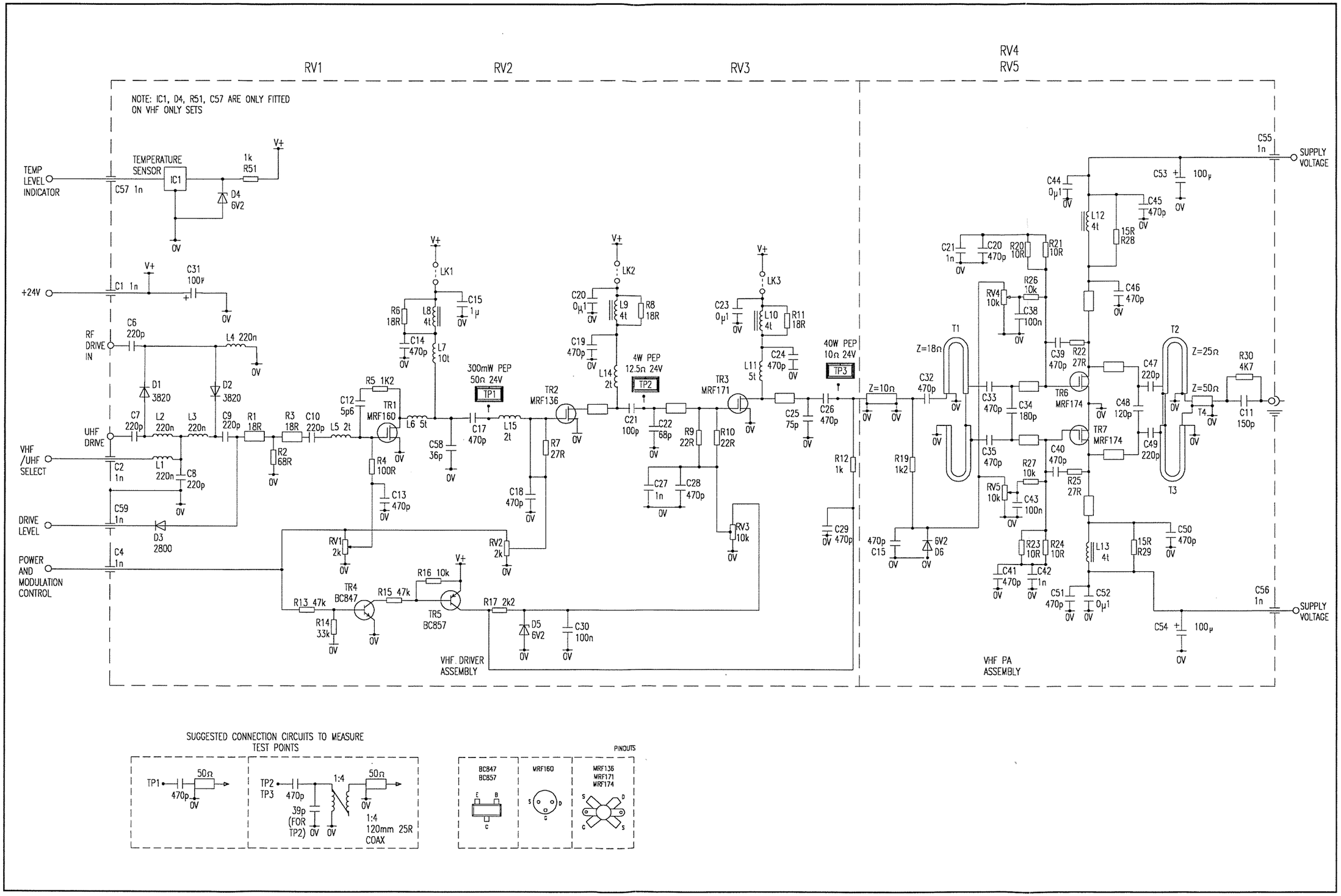
(1) This circuit is part of the Tx Control Module 2.

(2) All arrowheads with associated letters refer to the corresponding letters on the transmitter control circuit diagram.

GA5311 Iss. 3

Transmitter Audio Processing Circuit Diagram

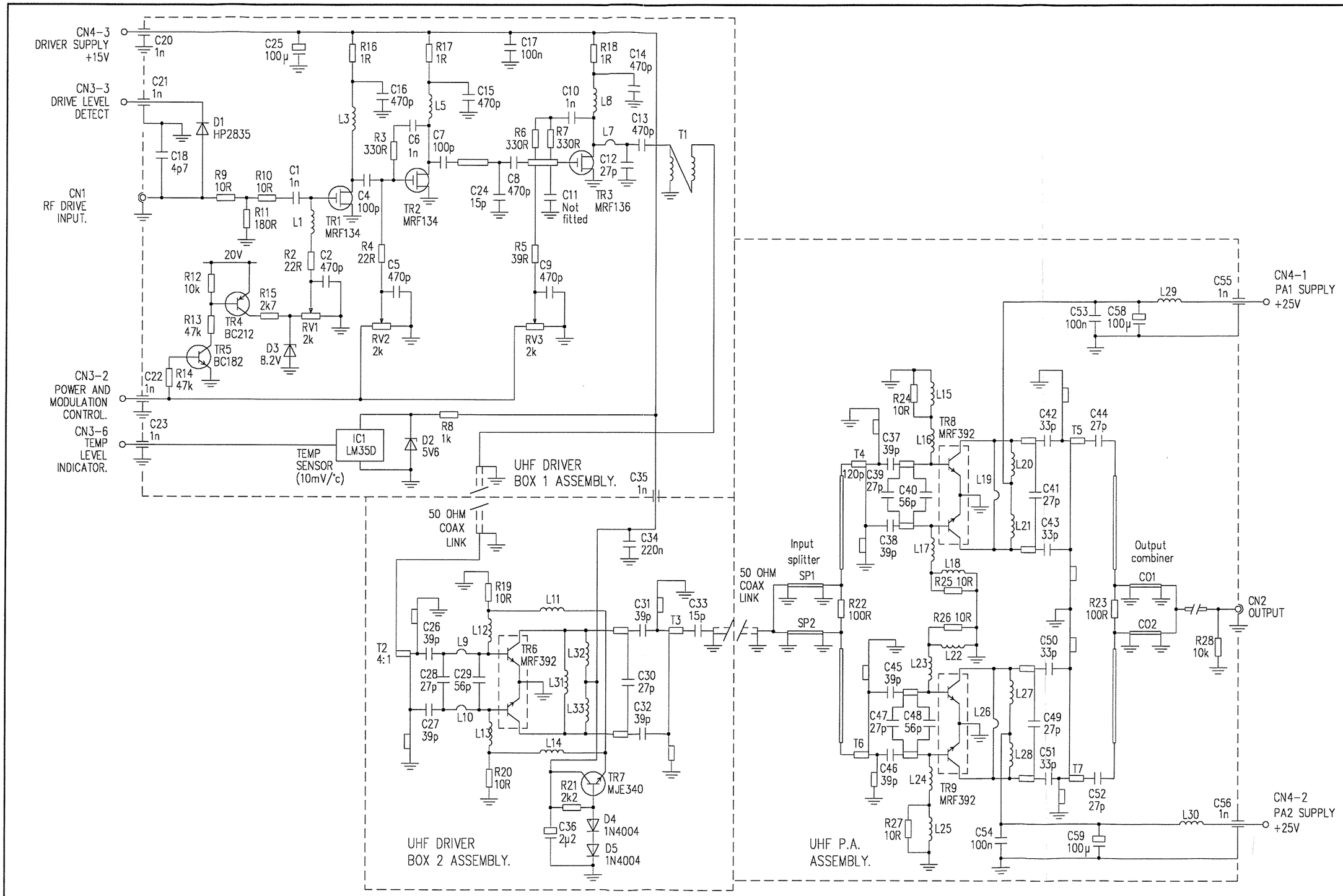
Fig. 3-2-8



GA7764 Iss. 4

VHF RF Power Amplifier Circuit Diagram (3010 and 3050 TRs)

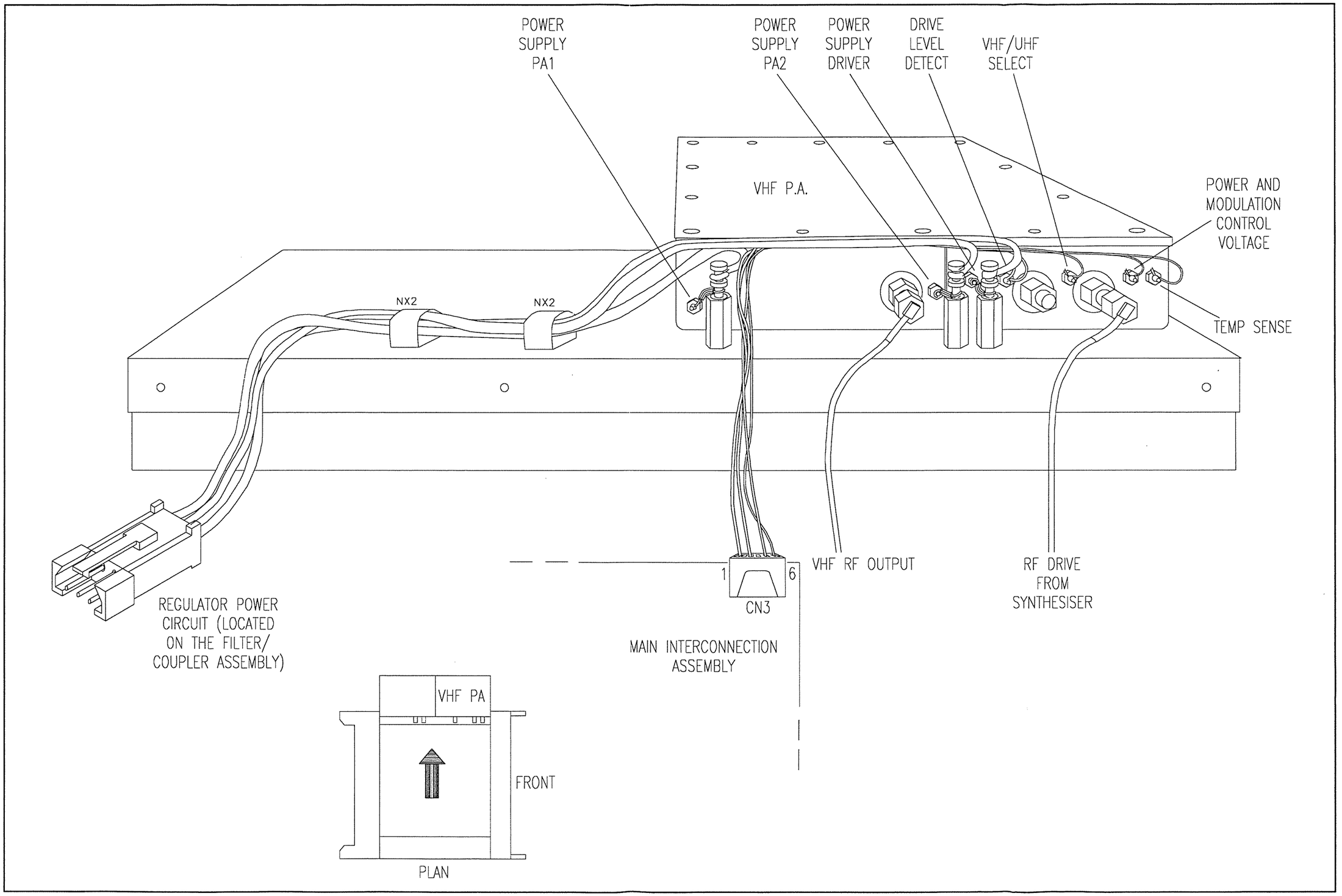
Fig. 3-2-9



GA5269 Iss. 1

UHF RF Power Amplifier Circuit Diagram (3030 and 3050 TRs)

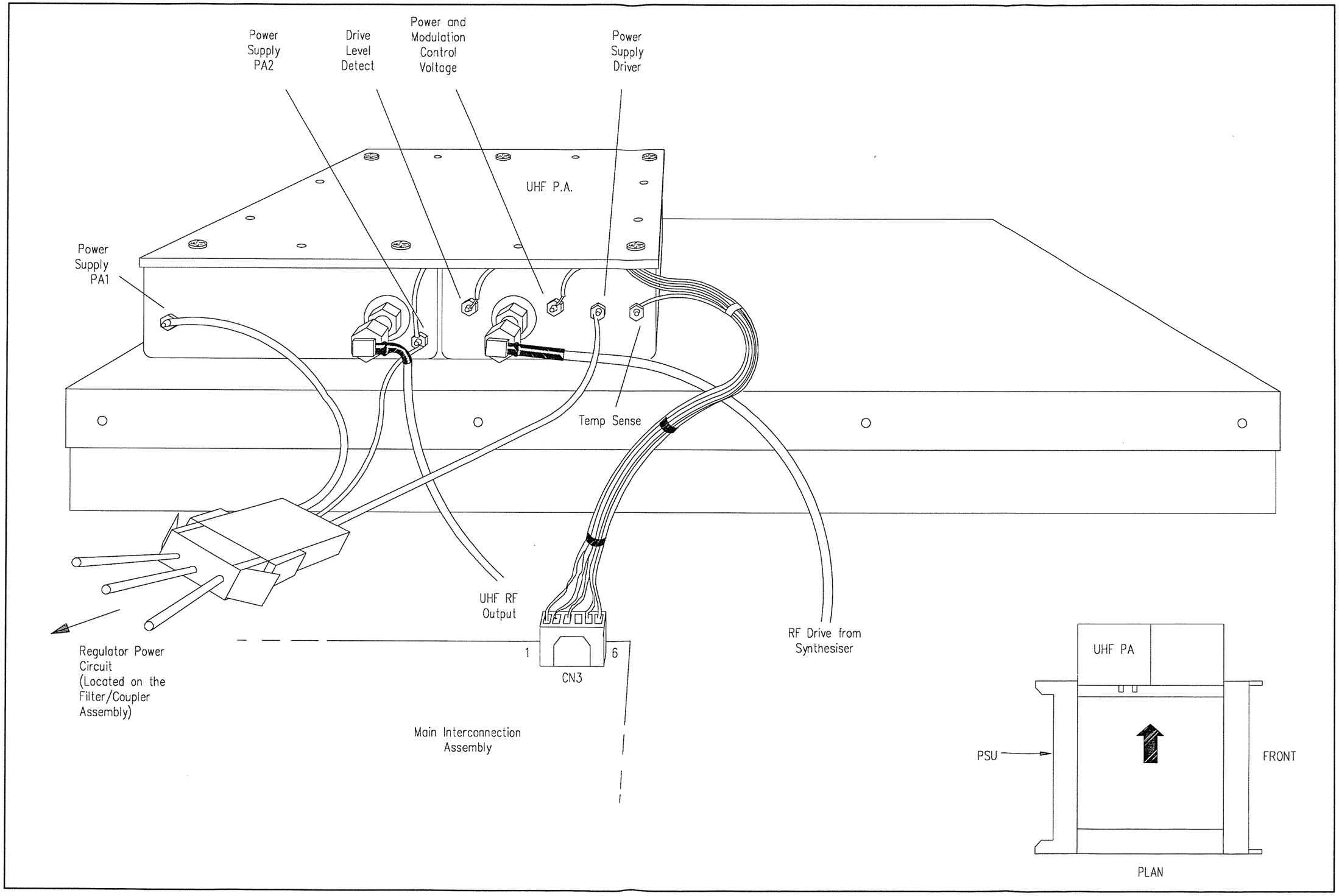
Fig. 3-2-10



GA8382 Iss. 1

VHF RF Power Amplifier Assembly
Input/Output Connections

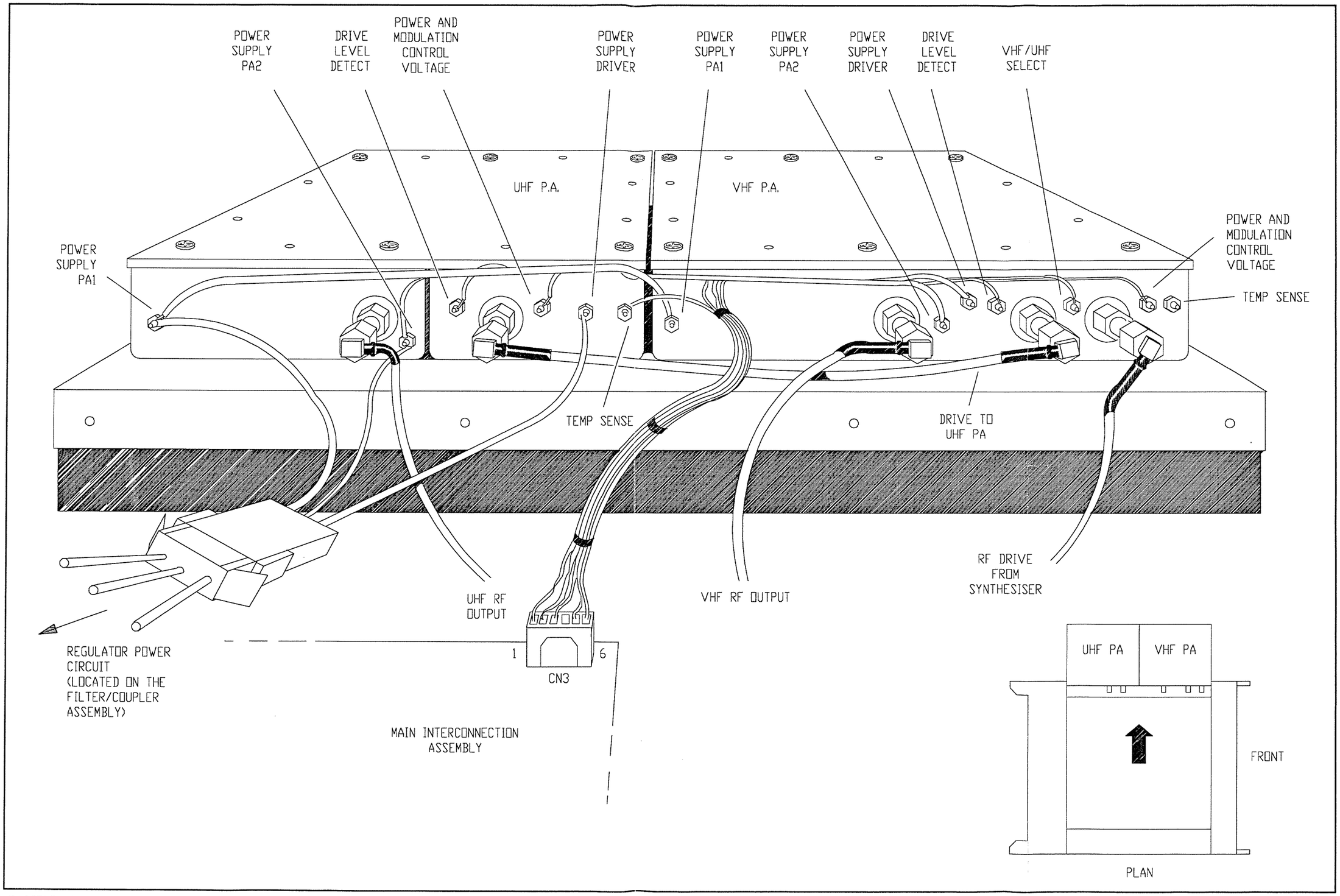
Fig.3-2-11



GA5905 Iss. 1

UHF RF Power Amplifier Assembly
Input/Output Connections

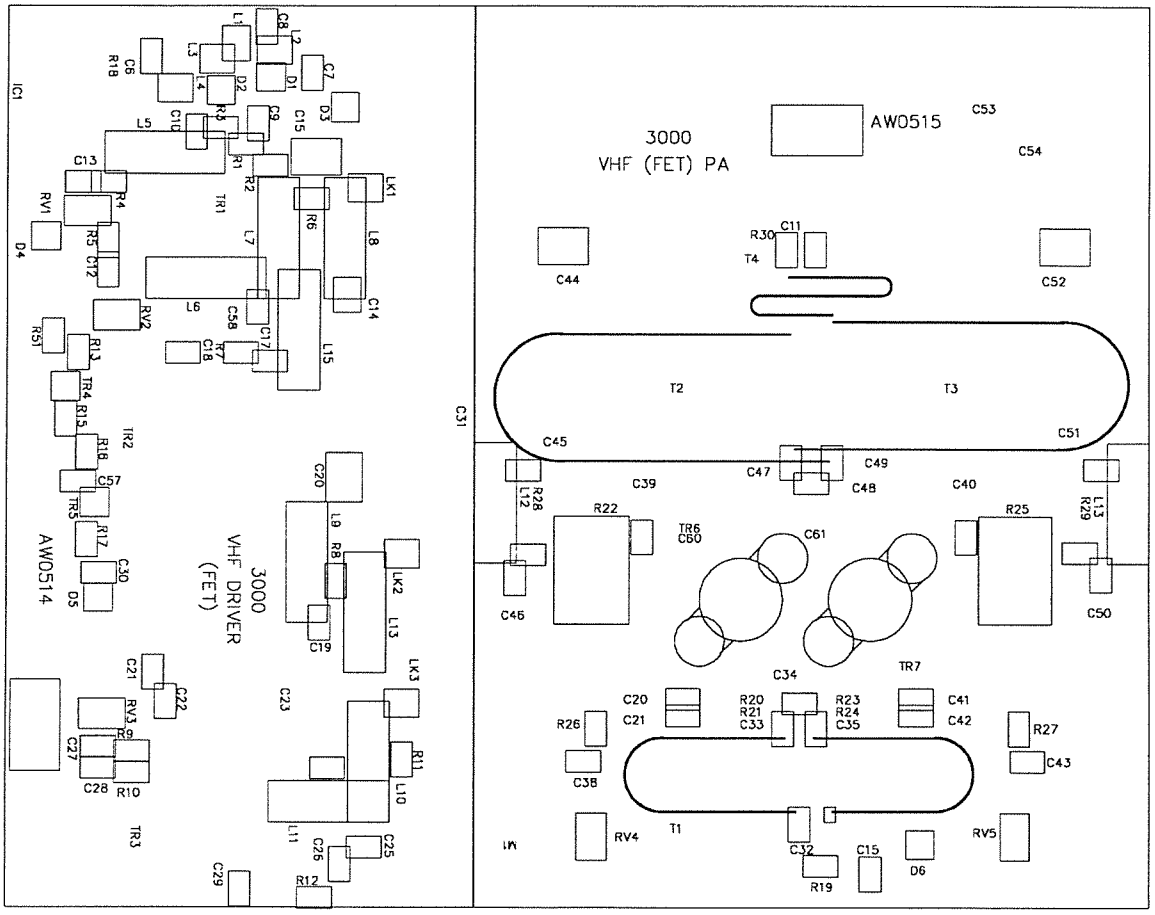
Fig. 3-2-12



GA3571 Iss. 1

VHF/UHF RF Power Amplifier Assembly
Input/Output Connections

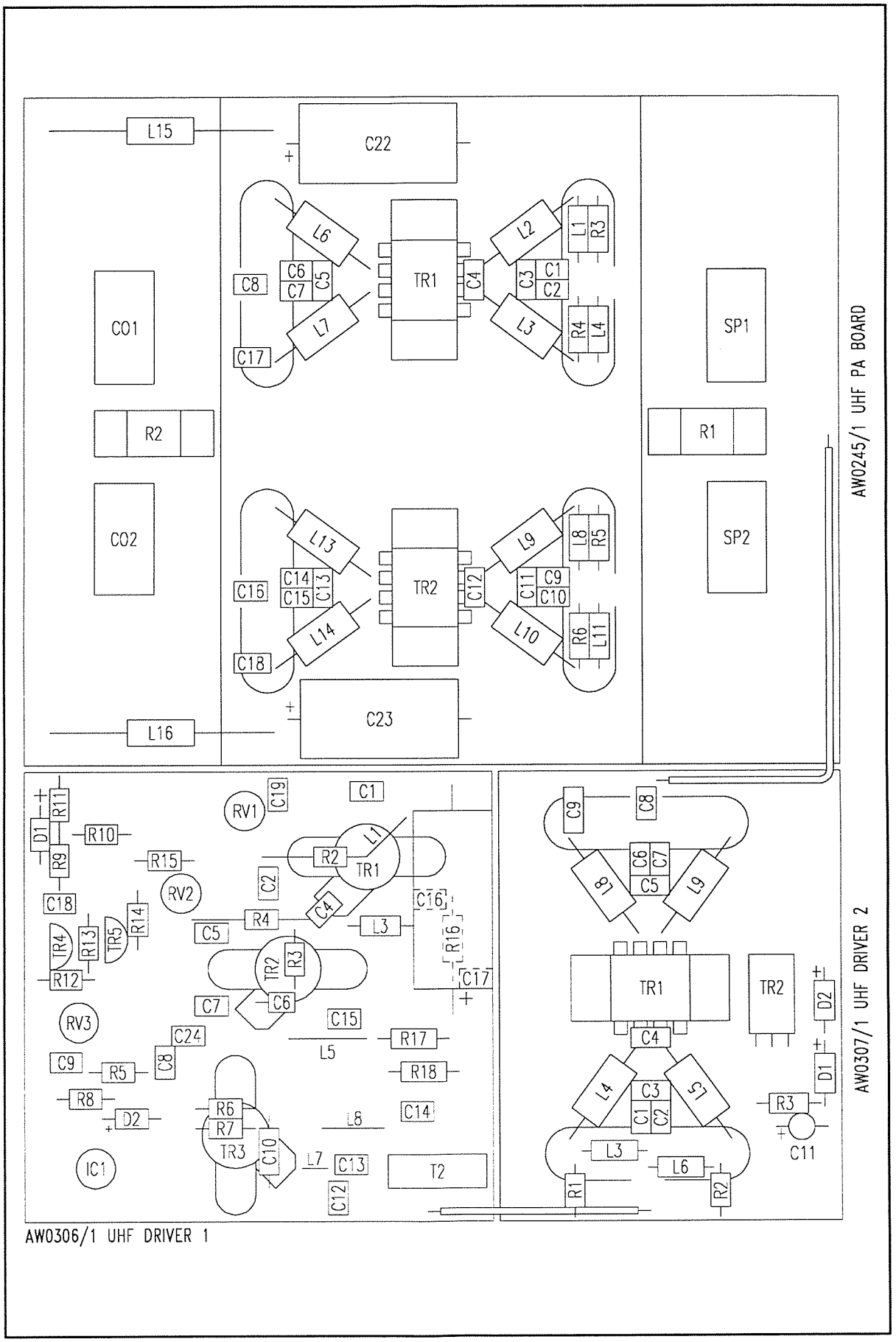
Fig. 3-2-13



GA6883 Iss. 1

VHF RF Power Amplifier Component Location Diagram

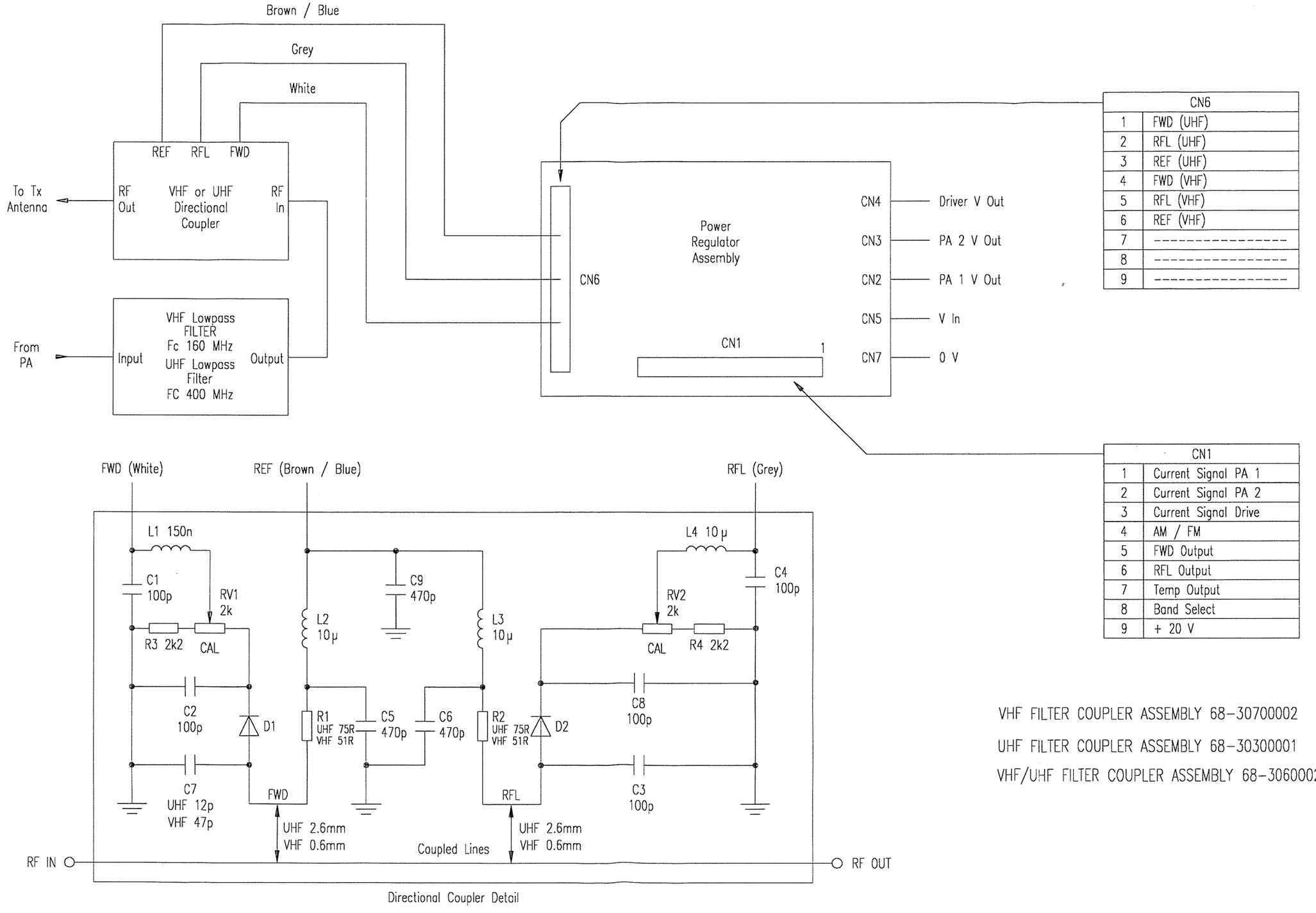
Fig. 3-2-14



GA5916 Iss. 1

UHF RF Power Amplifier Component Location Diagram

Fig. 3-2-15



VHF FILTER COUPLER ASSEMBLY 68-30700002

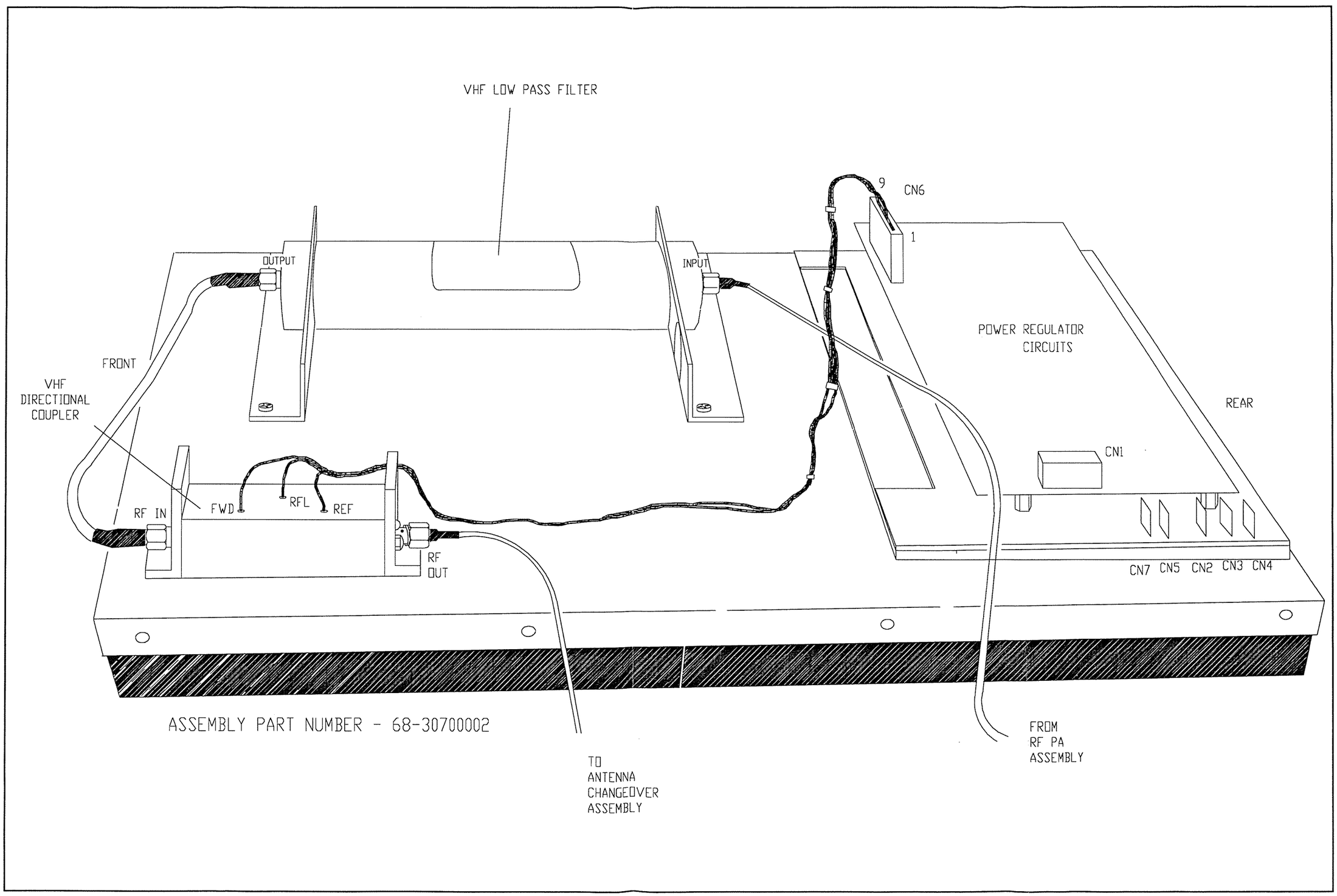
UHF FILTER COUPLER ASSEMBLY 68-30300001

VHF/UHF FILTER COUPLER ASSEMBLY 68-30600025

GA8333 Iss. 1

Filter/Coupler Assembly
Circuit Diagram

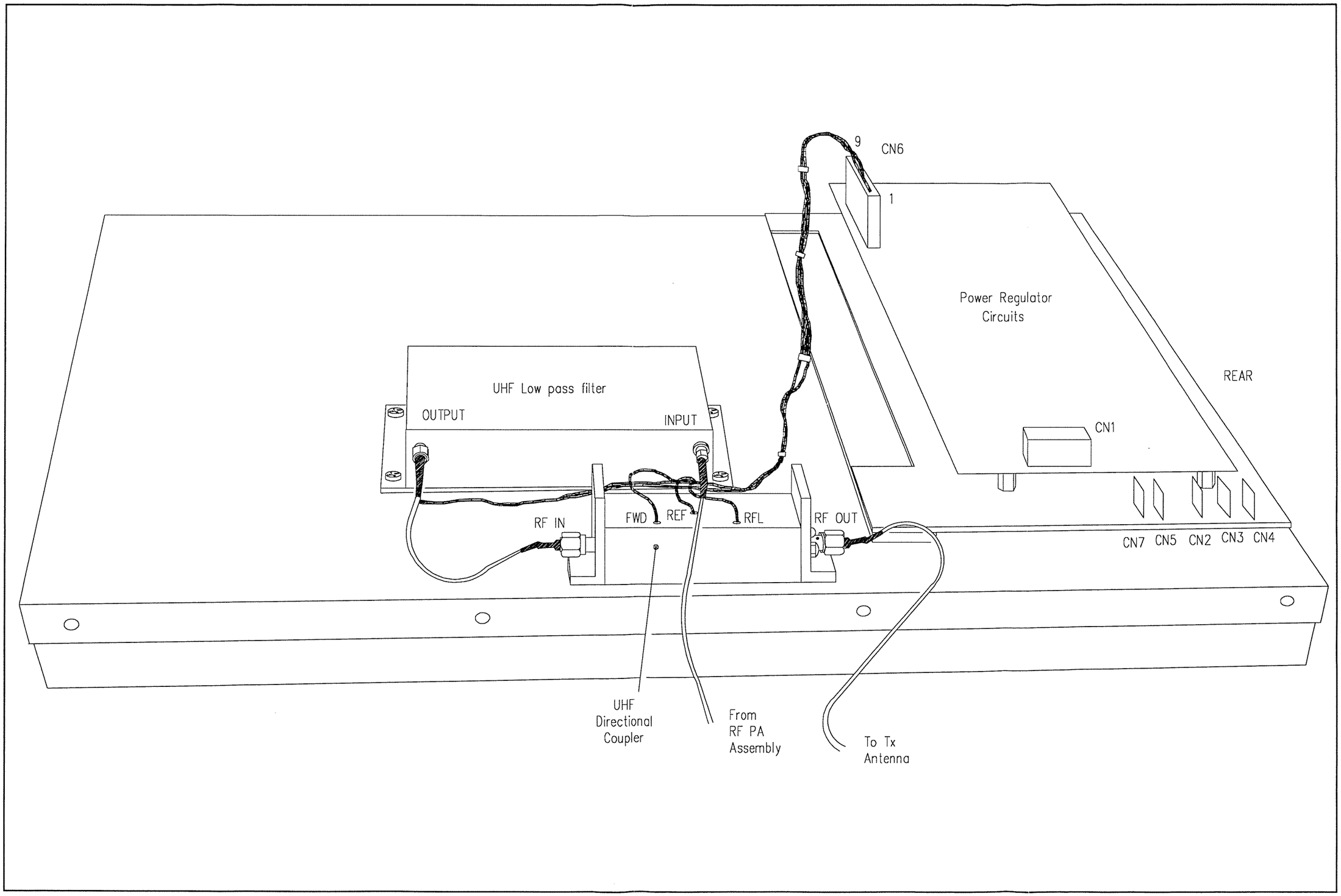
Fig. 3-2-16



GA8316 Iss. 1

VHF Filter/Coupler Assembly Component Location Diagram

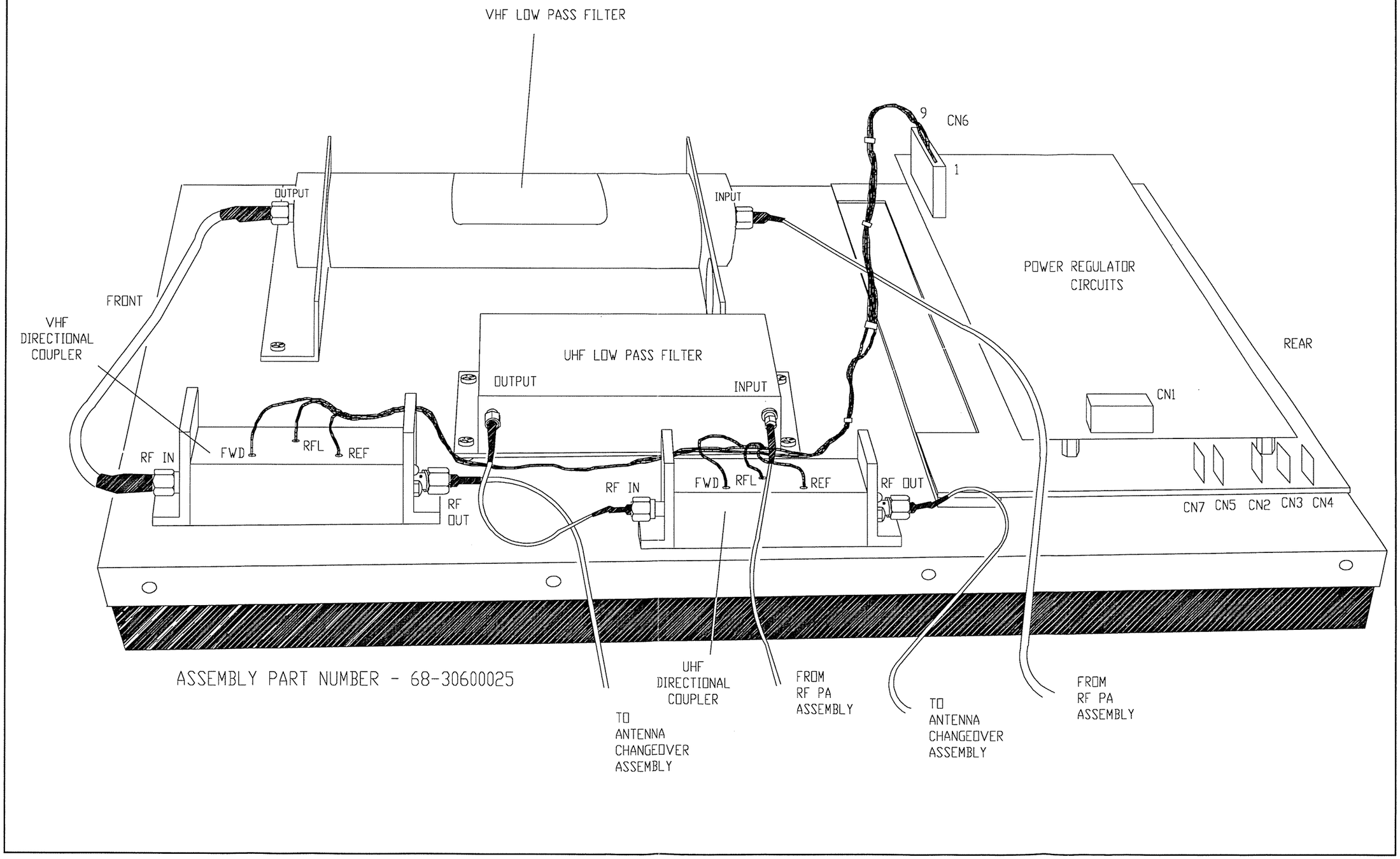
Fig. 3-2-17



GA5904 Iss. 1

UHF Filter/Coupler Assembly Component Location Diagram

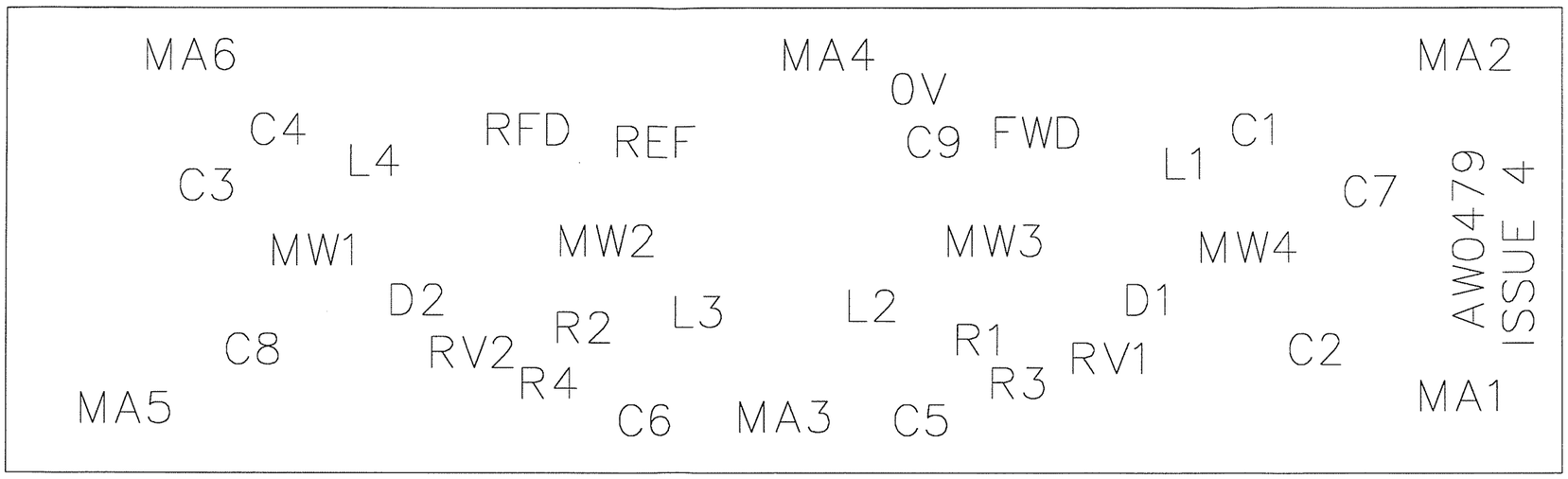
Fig. 3-2-18



GA3569 Iss. 1

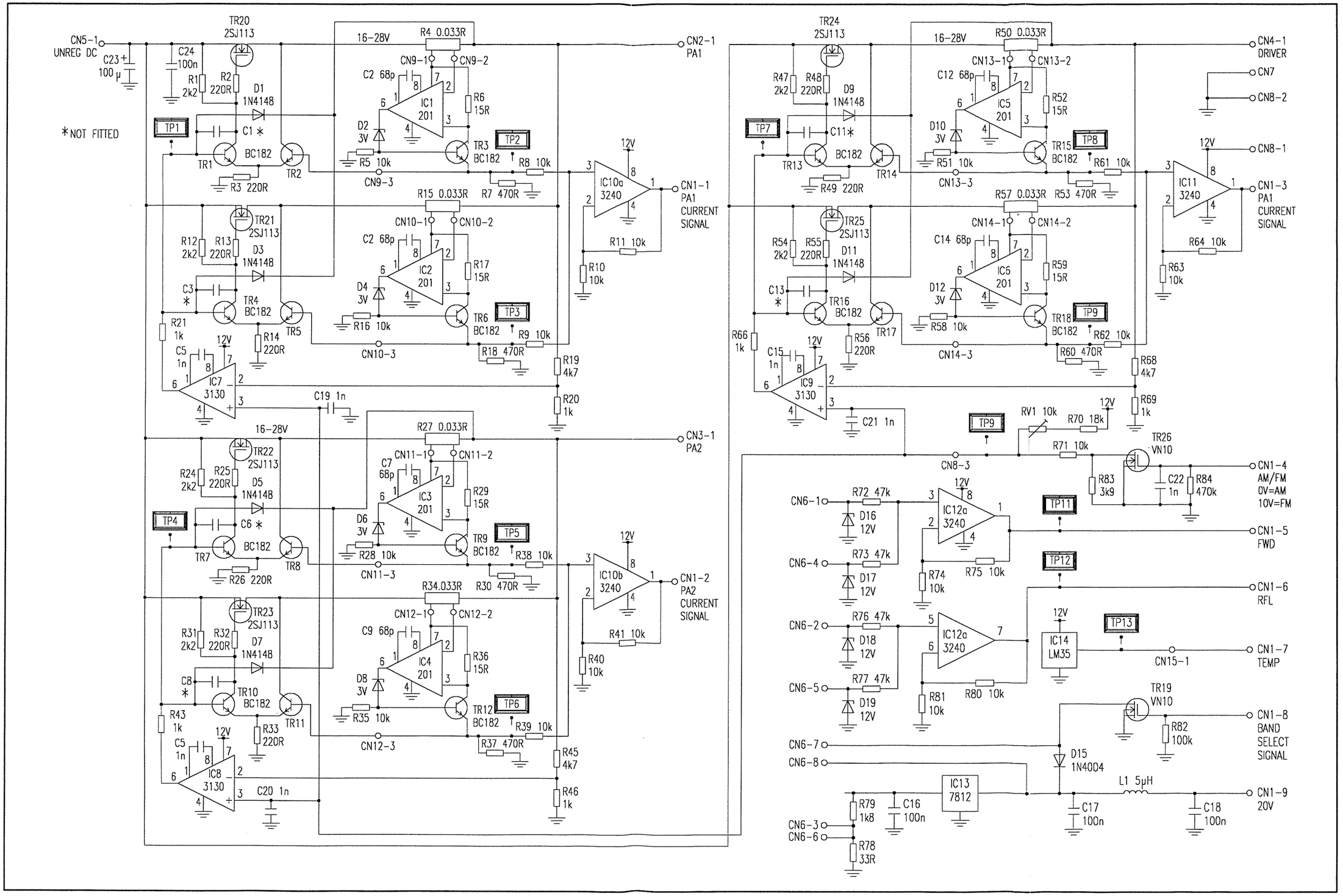
VHF/UHF Filter/Coupler Assembly
Component Location Diagram

Fig. 3-2-19



Directional Coupler Component Location Diagram

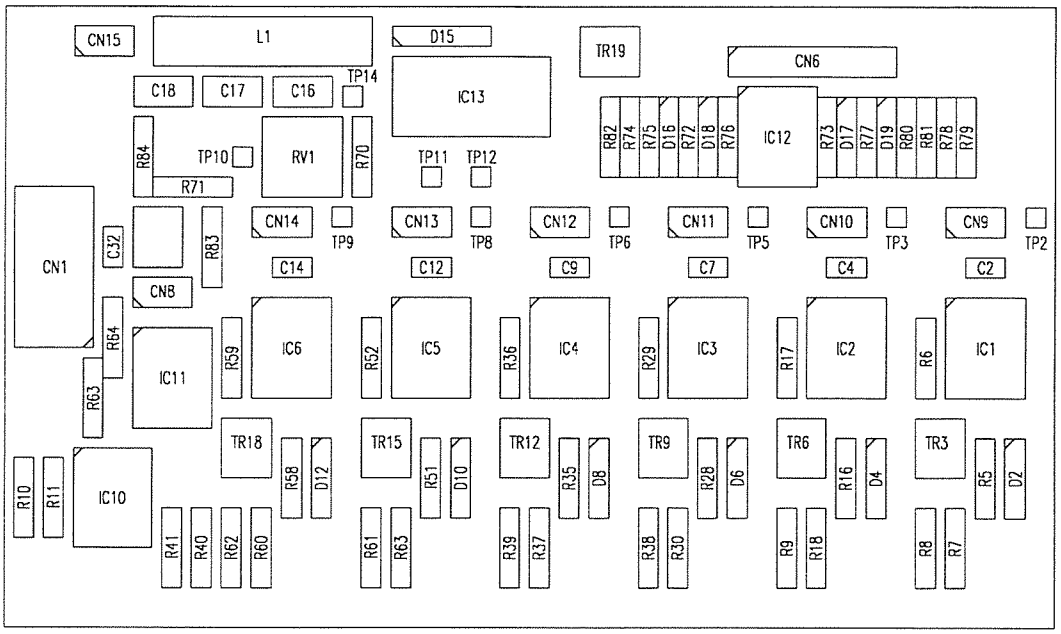
Fig.3-2-20



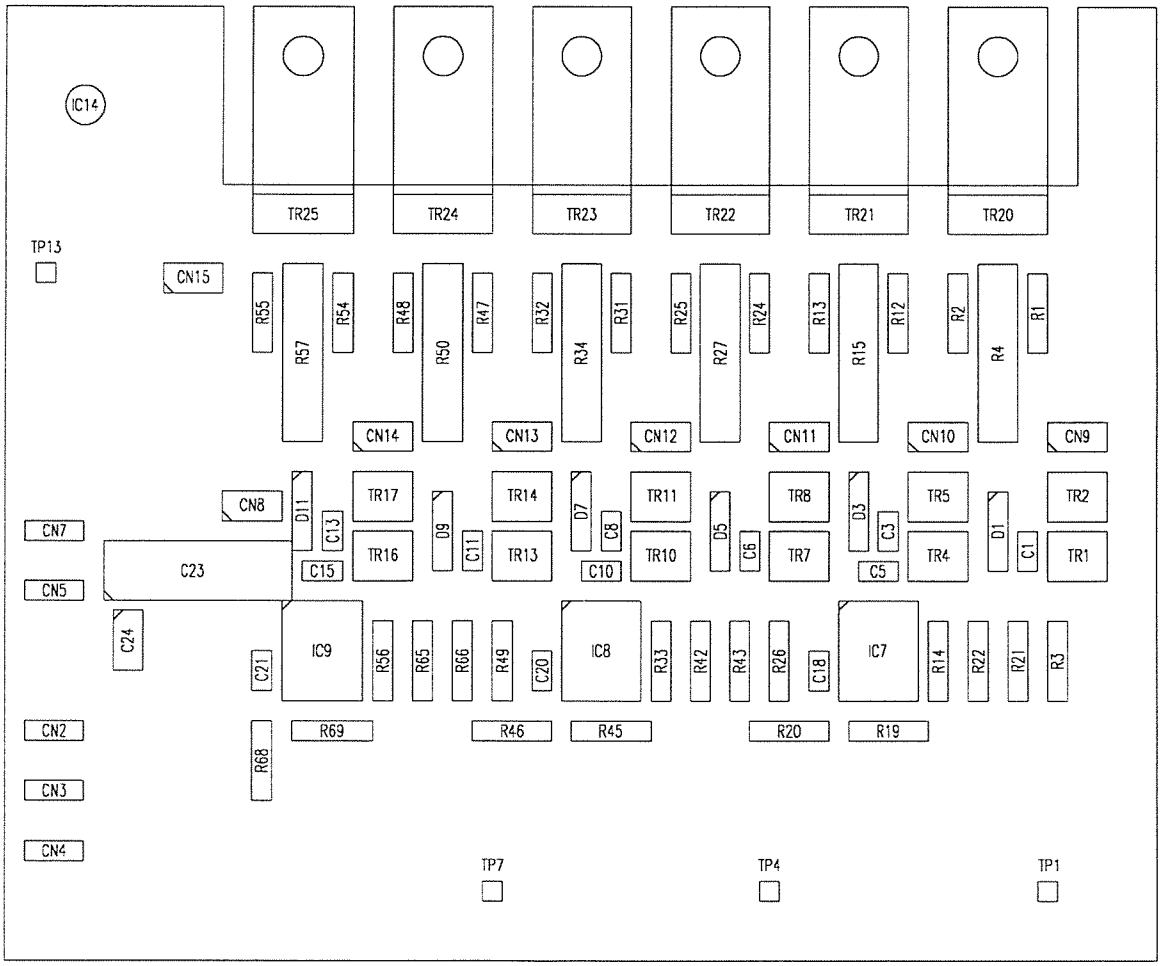
GA5336 Iss. 1

Power Regulator Assembly
Circuit Diagram

Fig. 3-2-21



AW0273/1



AW0272/1

GA5919 Iss. 1

Power Regulator Assembly Component Location Diagram

Fig. 3-2-22

Paragraph

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10 RF filter circuit (3030 TR)
13 RF converter circuit (3010 and 3050 TRs)
16 RF converter circuit (3030 TR)
19 RX BITE circuit
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Receiver IF circuits
22 2nd mixer (3010 and 3050 TRs)
28 2nd mixer (3030 TR)
29 2nd IF amplification
30 3rd mixer
32 AM/FM demodulation
33 AGC control
35 Receiver audio circuits
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48 Tape output
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3-3-11 Receiver IF and audio module component location diagram GA5928

INTRODUCTION

1 The T/R receiver circuitry is designed for operating in amplitude modulation (AM) or frequency modulation (FM) modes with the capability for speech (narrow-band) or data (wideband) reception in the VHF (3010 TR), UHF (3030TR) or VHF/UHF (3050 TR) frequency bands. The receiver comprises an RF module, and an IF and Audio module. A simplified schematic diagram is shown in Fig. 3-3-1.

2 Both the Receiver RF, and Receiver IF and Audio circuits are plug-in modules interconnected through the main and front Interconnection assemblies at module positions 6 and 8 respectively. The Receiver RF module contains the RF filters, RF converter and BITE/control interface circuits. The Receiver IF and Audio module contains the IF and audio circuits.

3 With reference to Fig. 3-3-1, the received signal is connected from the rear panel N-type antenna connector through an antenna filter assembly located in the PSU compartment (refer to chapter 1 of this section). The RF signal is connected to the Receiver RF module where it is routed through the RF filter circuit which comprises a series of band-pass filters, selected by a pin diode switching matrix and controlled by the software installed in the BITE assembly.

4 The output of the appropriate RF filter is connected to the first stage of RF amplification. From the amplifier stage the signal is connected to the 1st mixer and mixed with a drive signal from the Synthesiser module to produce the 1st IF signal. The resulting IF is amplified, filtered and connected through a coaxial interconnecting link to the Receiver IF and Audio module.

5 After a further stage of amplification the signal is applied to a 2nd mixer and mixed with a drive signal from the Synthesiser module, the resulting 2nd IF is then connected through a crystal filter to the wideband and narrow-band IF amplifier paths. It is mixed with a local oscillator frequency to produce a 3rd IF. The audio signals are detected, by AM and FM detectors (demodulators) then routed through the audio circuits to output amplifiers. The standard settings for the IF and audio module are detailed in TABLE 3-3-1; the identified component can be used to change the settings if required.

TABLE 3-3-1 RX IF AND AUDIO MODULE - STANDARD SETTINGS

Component (1)	Function (2)	Standard Setting (3)
RV1	Wideband output level	-8 dBm for 30% AM
RV2	Wideband mute level	1 µV pd
RV9	Mute carrier override	30 µV pd
RV13	RF gain	Maximum
RV7	VOGAD threshold level	30% AM
RV4	Tape output level	-8 dBm
Link 2	Noise blanker	Enabled
Link 3	VOGAD	Enabled

RECEIVER RF MODULE

GENERAL

6 The circuit for the Receiver RF module has been divided into separate diagrams: Figs. 3-3-2 and 3-3-3 (for the 3010/3050 and 3030 TRs respectively) detail the RF filter and BITE oscillator, and Figs. 3-3-4 and 3-3-5 (for the 3010/3050 and 3030 TRs respectively) detail the RF converter and receiver BITE/control interface circuit. CN3 and CN4 provide the interconnection, through ribbon cable connectors, between the filter, converter and BITE circuits.

Note ...

The RF filter and RF converter circuits for the 3010 and 3050 TRs are composite circuits covering both VHF and UHF frequency bands. In the 3010 TR the VHF/UHF switching is inoperative and the circuit is permanently enabled in the VHF mode.

RF FILTER CIRCUIT (3010 AND 3050 TRs)

7 With reference to Fig. 3-3-2 the RF signal is applied to the RF filter network through antenna input CN1/5 (3010 TR, and 3050 TR when selected to a frequency in the VHF band) or CN1/2 (3050 TR when selected to a frequency in the UHF band). Three filter circuits with bandwidths of 25 MHz cover the VHF frequency range and five filter circuits of 35 MHz cover the UHF frequency range.

8 The required filter is selected by pin diode switch networks at the input (D1-D24) and output (D25-D48) of the filters. Control of the pin diode networks is from the receiver BITE circuit (Fig. 3-3-4) through the filter select lines on CN3 (input select) and CN4 (output select). The RF output from the selected filter is connected through the relay contact of RLA to the RF converter circuit (Fig. 3-3-4); control of the VHF/UHF select relay RLA is from the BITE assembly through the receiver BITE circuit on CN4 pins 18 and 9.

9 On operation of the equipment self test routine the installed software will provide an enable signal (0V), through the receiver BITE circuit to TR13. This effectively causes the crystal controlled BITE oscillator, formed by TR9 and XL1, to switch on providing a 34 MHz signal, buffered by TR10, to be applied to a pin diode modulator D60 to D62. At the pin diodes the signal is modulated by a 1 kHz signal from the audio output circuit (CN11/CN32A and C) on the BITE assembly (refer to chapter 1 this section). The output from the pin diode modulator is connected through the filter input select lines where harmonics of the modulated 34 MHz signal are used to check each individual filter.

RF FILTER CIRCUIT (3030 TR)

10 With reference to Fig 3-3-3, the RF signal is applied to the RF filter network, from the Rx antenna, through connector CN1/2. The RF is routed through one of five filter circuits. Each filter has a 35 MHz bandwidth; together, the five filters cover the UHF frequency range 225 to 399.975 MHz.

11 The required filter is selected by pin diode switch networks at the input (diodes D1 to D15) and output (D25 to D39) of the filters. The appropriate pin diode network is selected from the receiver BITE circuit (Fig. 3-3-5) through the filter select lines on CN3 (input select)

and CN4 (output select). The RF output from the selected filter is connected to the RF converter circuit (Fig. 3-3-5).

12 When the equipment's self test routine is run, the installed software provides an enable signal (0V), through the receiver BITE circuit (Fig. 3-3-5) to TR13. This effectively causes the crystal controlled BITE oscillator, formed by TR9 and XL1, to switch on providing a 34 MHz signal buffered by TR10 to be applied to a pin diode modulator D60 to D62, where it is modulated by a 1 kHz signal from the audio output circuit (CN11/32A) on the BITE assembly (refer to chapter 1 of this section). The output from the pin modulator is connected through the filter input select lines where harmonics of the modulated 34 MHz signal are used to check each individual filter.

RF CONVERTER CIRCUIT (3010 AND 3050 TRs)

13 Refer to Fig. 3-3-4. The RF input signal, from the RF preselector filter, is connected to the first mixer BM1 through a wideband low noise RF amplifier TR2 and buffer TR3, which also provides further isolation between the antenna and the local oscillator. The carrier frequency f_c is mixed with the 1st local oscillator injection signal (fc + 250.7 MHz VHF) or (f_c + 70.7 MHz UHF) from the Synthesiser module to produce a 1st IF frequency of 250.7 MHz (VHF) or 70.7 MHz (UHF).

14 The IF from the 1st mixer is applied to the 1st IF amplifier TR4 (a low noise wideband amplifier), the output of which is passed through a either a 250.7 MHz (VHF) or 70.7 MHz (UHF) helical filter. In the case of 3050 TR the selection of the appropriate filter is through the operation of RLB and RLC controlled by the VHF/UHF select line (0V = UHF) from the BITE circuit (CN4/17). The output from the filter is applied to a wideband amplifier TR6 which provides further amplification of the IF signal, and then through AGC attenuator diodes (D53 to D55), and connector CN1/31 to the Receiver IF and Audio module.

15 AGC is achieved by feeding a signal back, from the Receiver IF and Audio module, and applying it to the first stages of RF amplification through pin diode attenuator D58. The signal is also routed through the phase splitter TR5 and associated pin diode attenuator network D50 to D52, to the output of the IF amplifier through phase splitter TR7 with associated pin diode attenuator network D53 to D55.

RF CONVERTER CIRCUIT (3030 TR)

16 Refer to Fig. 3-3-5. The RF input signal, from the RF preselector filter, is connected to the first mixer BM1 through a wideband low noise RF amplifier TR2 and buffer TR3, which also provides further isolation between the antenna and the local oscillator. The carrier frequency f_c is mixed with the 1st local oscillator injection signal (f_c + 70.7 MHz) from the Synthesiser module to produce a 1st IF frequency of 70.7 MHz.

17 The IF from the 1st mixer is applied to the 1st IF amplifier TR4 (a low noise wideband amplifier), the output of which is passed through a 70.7 MHz helical filter. The output from the filter is applied to a wideband amplifier TR6 which provides further amplification of the IF signal, and then through AGC attenuator diodes (D53 to D55), and connector CN1/31 to the Receiver IF and Audio module.

18 AGC is achieved by feeding a signal back, from the Receiver IF and Audio module, and applying it to the first stages of RF amplification through pin diode attenuator D58. The signal is also routed through the phase splitter TR5 and associated pin diode attenuator network D50 to D52, to the output of the IF amplifier through phase splitter TR7 with associated pin diode attenuator network D53 to D55.

RX BITE CIRCUIT

19 The RX BITE circuit is mounted on the Receiver RF module and interconnected through two ribbon cable connectors CN3 and CN4. With reference to Fig. 3-3-4 or Fig 3-3-5, IC1 is a bus expander which provides the interface between the data bus, the filter select control lines and the monitor test points. Analogue multiplexers IC4 and IC5 can each select one of eight test points, controlled by the three address lines from IC1, for connection to the BITE assembly through the monitor line CN2/27C.

20 Voltage comparators IC6 and IC7 with their associated transistor pairs TR1 to TR16 provide the filter select signals (under control of IC1) for the pin diode networks in the RF filter circuit (Fig. 3-3-2 or 3-3-3). Each comparator, with its associated transistor pair, controls one of the filter circuits by providing either a +8 V (de-select) or -8 V (select) through CN3 for the input circuit, and through CN4 for the output circuit. The BITE oscillator control signal is also interfaced from the BITE assembly through IC1.

RECEIVER IF AND AUDIO MODULE

GENERAL

21 The circuit for the Receiver IF and Audio module has been divided into separate diagrams: Figs. 3-3-7 and 3-3-8 (for 3010/3050 and 3030 TRs respectively) shows the receiver IF circuits, and Figs. 3-3-9 and 3-3-10 (for 3010/3050 and 3030 TRs respectively) show the audio circuits. Interconnections between the IF and audio circuit diagrams are indicated by arrowheads with destinations annotated alongside. The components detailed within dotted lines on Figs. 3-3-7 and 3-3-8 are contained within screened boxes mounted on the PCB.

Note ...

The Receiver IF and Audio circuits for the 3010 and 3050 TRs are composite circuits covering both VHF and UHF frequency bands. In the 3010 TR the VHF/UHF switching is inoperative and the circuit is permanently enabled in the VHF mode. Except where indicated otherwise, the following descriptions apply to all TRs.

RECEIVER IF CIRCUITS

2nd Mixer (3010 and 3050 TRs)

22 With reference to Fig. 3-3-7, the 1st IF signal input at a frequency of 250.7 MHz (VHF) or 70.7 MHz (UHF-3050 TR only) and the 60 MHz local oscillator signal from the Synthesiser module are connected to the second mixer BM1, through the VHF filter and multiplier (3010 TR, and 3050 TR depending on the operational frequency selected) or the UHF filter (3050 TR depending on the operational frequency selected).

23 The following switching action is applicable to the 3050 TR only. Selection of the appropriate filter is controlled from the BITE assembly and connected through the BITE/control interface (Fig. 3-3-9 and Fig 3-3-10) IC28 pin 23 to IC9E pin 10 (Fig. 3-3-7) as a VHF/UHF select signal. The output of IC9E is connected to IC8 which provides inverse outputs to the bases of transistors TR15 and TR18, whose operation is as follows:

VHF Filter Select

24 On selection of VHF operation (permanently enabled in 3010 TRs), the VHF/UHF select signal goes high, TR18 will be switched off causing the voltage at the collector to go high forward biasing pin diodes D28, D30, D33 and D36. TR15 will be switched on causing the collector voltage to go low reverse biasing pin diodes D29, D31, D32 and D34. This routes the 1st IF input signal through pin diode D33, the VHF low pass filter comprising C193, C194, L21 and pin diode D35 to the 2nd mixer BM1.

25 The 60 MHz local oscillator injection signal from the Synthesiser module is connected through pin diode D28 to IC24 which is configured as two differential amplifier doublers. The combined output of the doublers multiply the 60 MHz signal by a factor of four producing a 240 MHz local oscillator injection signal which is the routed through pin diode D30 and low noise wideband amplifier TR13 to the 2nd mixer BM1.

UHF Filter Select

26 On selection of UHF operation (3050 TRs only) the VHF/UHF select goes high, TR18 will be switched on causing the voltage at the collector to go low reverse biasing pin diodes D28, D30, D33 and D36. TR15 will be switched off causing the voltage at the collector to go high forward biasing pin diodes D29, D31, D32 and D34. This routes the 1st IF input signal through pin diode D32, the UHF low pass filter comprising C191, C192, L120 and pin diode D34 to the 2nd mixer BM1.

27 The 60 MHz local oscillator injection signal from the Synthesiser module is connected through pin diode D29, amplifier TR14, bandpass filter stage L30/L29 with associated components and pin diode D31. From D31 the 60 MHz signal is connected through a low noise wideband amplifier the 2nd mixer BM.

2nd Mixer (3030 TR)

28 With reference to Fig. 3-3-8, the 1st IF signal input at a frequency of 70.7 MHz (connector CN1/31) and the 60 MHz local oscillator signal (connector CN1/5) from the Synthesiser module are routed to the 2nd mixer BM1. The 60 MHz local oscillator injection signal from the Synthesiser module is routed to amplifier TR14 and band-pass filter stage L30/L29. From the band-pass filter, the 60 MHz signal is connected through a low noise wideband amplifier TR13 to mixer BM1.

2nd IF Amplification

29 The output from the 2nd mixer BM1, a second IF frequency of 10.7 MHz, is connected through a wideband amplifier TR12 to a monolithic amplifier IC30. From IC30, the signal splits and is routed to data (wideband) and speech (narrow-band) circuits through crystal filters FL2 and FL1 respectively; these filters provide the main IF selectivity of the receiver.

3rd Mixer

30 The narrow-band and wideband IF circuits are similar in operation. The following description will apply to both circuits except where indicated, and where components are detailed the wideband circuit components will be enclosed in brackets.

31 From the crystal filter FL1 (FL2) the 2nd IF signal is connected to an AGC controlled dual gate MOSFET amplifier TR11 (TR10); the output is connected through a matching

transformer T5 (T2) to the 3rd mixer incorporated within the AM receiver circuit IC3 (IC1). The local oscillator injection is provided by TR16 which is configured as a crystal controlled colpitts oscillator with its output buffered by TR17. The local oscillator output (11.155 MHz) is applied through a T-section low pass filter to the 3rd mixer incorporated within IC3 pin 12 (IC1 pin 12) where it is mixed with the 2nd IF to produce a 3rd IF of 455 kHz.

AM/FM DEMODULATION

32 The resultant 455 kHz IF is connected from IC3 pin 1 (IC1 pin 1) to a 455 kHz bandpass filter T4 (T3), the output of which is taken to an FM demodulator IC4 (IC2) and back into IC3 pin 3 (IC1 pin 3) for AM demodulation. The AM audio output from the demodulator is applied from IC3 pin 6 (IC1 pin 6) to an AM/FM select switch IC7b (IC7a). The audio output from the FM demodulator IC4 (IC2) is applied through RV16 (RV12) to the AM/FM select switch IC7b (IC7a). RV16 (RV12) sets the FM audio level to match the AM audio level through the AM/FM select switch.

AGC CONTROL

33 The AM receiver circuit IC3 (IC1) also provides the AGC control signals, which are derived from the AM demodulator stage. For the RF stages in the RF Converter module, the AGC control signal is taken from IC3 pin 9 (IC1 pin 9) through IC27a and RF gain control RV13; for the IF stages, the AGC control signal is taken from the output of IC5a (IC27a) and fed back to the controlling gate of TR11 (TR10).

34 An output from IC3 pin 1 is also taken through TR1 to carrier detect circuit IC13, which during no signal conditions, disables mute gate IC11a (shown on Figs. 3-3-9 (3010/3050 TRs and 3-3-10 (3030 TR)) through IC29b and D4. This eliminates any residual noise generated by the decay time of the IF AGC.

RECEIVER AUDIO CIRCUITS

Note ...

Refer to Figs. 3-3-7 and 3-3-9 (3010/3050 TRs) or Figs. 3-3-8 and 3-3-10 (3030 TR).

35 With reference to Fig. 3-3-9 or 3-3-10 the receiver audio circuit provides the following functions:

Noise Blanker

36 The narrow-band audio signal is taken from the AM/FM select switch (Fig. 3-3-7 or Fig 3-3-8) through amplifier IC17a to mute gate IC11a. An output from IC17a is also taken to IC18 which is configured as a window comparator. The comparator senses when the audio signal exceeds a preset level and provides a disable (low) for IC11a causing the audio signal to be blanked during the peaks. RV6 sets the level at which noise blanking occurs and is normally adjusted to dip at levels corresponding to signals in excess of 93% modulation depth.

37 During FM mode operation, IC28 provides a low through IC9d to disable IC11b thereby taking the noise blanker out of circuit.

VOGAD

38 From the mute gate, IC11a, the signal is presented to the voice operation gain adjusting device (VOGAD) circuit which comprises IC19a, TR3 and TR4. IC19a is configured as a non-inverting high impedance amplifier that has its gain set by R59/R58. P-channel FET TR3 functions as a voltage controlled resistor which, in conjunction with RV7 forms a potential divider network at the input of IC19a. TR4 provides the controlling voltage for the gate of TR3 which effectively determines the attenuation provided by the potential divider network at the input of IC19a.

39 With no signal applied the gate of TR3, the device presents a high resistance causing very little attenuation. As the input signal level increases and the output voltage level approaches 1 V (p-p), TR4 starts to conduct causing the gate voltage at TR3 to reduce, therefore reducing its resistance. Any further increase will further reduce the resistance of TR3, increasing the attenuation on the input signal. Consequently, the output of IC19a stabilises at approximately 2 V (p-p).

Mute

40 The narrow-band mute circuits are signal to noise operated with a preset carrier override. The noise output from the detector IC13 pin 6 (Fig. 3-3-7 or Fig. 3-3-8) is routed via IC17A and then passed through a bandpass LC filter comprising L1-L3/C31-C33 which selects a noise spectrum outside the audio bandwidth but inside the IF bandwidth at approximately 6 to 8 kHz. The filter also gives a 50 dB minimum rejection of signals in the audio range.

41 The output of the filter is detected by IC17b which in conjunction with D9/D10 and gain control RV8, is configured as a peak detector. The detected voltage rises with increasing noise and is applied to the inverting input of IC20a. An AGC derived voltage from the IF stages through IC5b (Fig. 3-3-7 or Fig. 3-3-8) is connected to the non-inverting input of IC20a and since this voltage rises with increasing carrier level the output of amplifier IC20a is dependent on the relative levels of the noise and agc which is a measure of the signal to noise ratio of the RF input signal.

42 The output of IC20a is applied to the non-inverting input of IC20b where it is compared with a reference voltage set by the front panel MUTE control. The resultant output of IC20b controls the mute transmission gate IC11c preventing the audio from reaching subsequent amplifier stages. A carrier mute override through IC27b overrides the signal to noise mute when the on-channel signal level exceeds a level preset by RV9.

43 The wideband mute is agc operated from IC1 pin 9 (Fig. 3-3-7 or Fig. 3-3-8) through IC29a to control the mute transmission gate IC10a. RV2, connected to the inverting input of IC29a sets the level at which the mute operates.

Front Panel Mute Disable

44 On setting the MUTE switch, located on the Receiver front panel assembly, to the off position (mute defeat), a low is connected through the BITE interface to IC9a. For the wideband mute circuit the low from IC9a will disable transmission gate IC10d causing IC10c to be enabled providing a path for the wideband signal that is not controlled by the agc derived mute signal.

45 For the narrow-band mute the low from IC9a is connected to the inverting inputs of IC29a and IC20a causing their outputs to remain high enabling mute transmission gates IC11a and IC11c respectively.

PTT Mute

46 When the transmitter's PTT function is operated, the BITE interface puts a low through IC9b to disable the wideband mute transmission gate IC10b and the narrow-band mute gate IC11d preventing the receive audio being passed to the output circuits. The low is also connected to IC8d on the Receiver IF circuit (Fig. 3-3-7 or Fig. 3-3-8).

Audio Output (Narrow-band)

47 The narrow-band output from the mute circuit is connected through an active high pass filter configured around IC19b with a cut-off frequency of 300 Hz and a low pass filter comprising L4, L5, and C24 to C30, with a cut-off frequency of 3400 Hz. The processed narrow-band audio is applied to IC16 which provides a balanced audio output: CN2A-31 and CN2C-31 for the Mainframe front panel assembly (through the BITE assembly), and CN2C-28 and CN2C-29 to the Remote Control module.

Tape Output

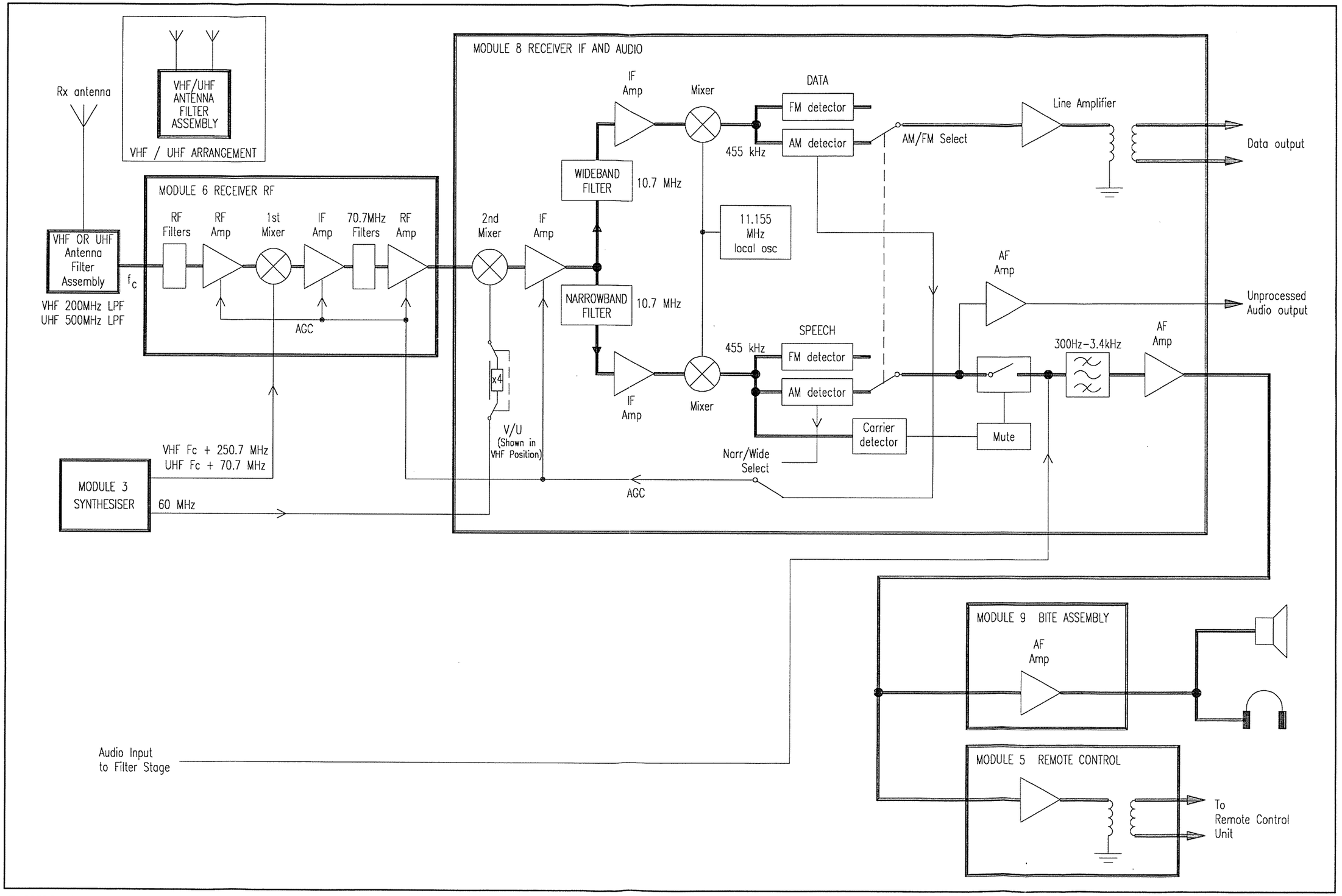
48 A further audio output is taken through IC14b to the tape output circuit located on the Transmitter Control module. RV4 sets the audio output level of IC14b.

Data Output (Wideband)

49 The wideband signal is connected from the mute circuits to the line amplifier IC12 and transformer T1 to provide a balanced data output to the rear panel located FACILITIES 2 connector. For LINK 11 output refer to Chapter 5.

BITE AND CONTROL INTERFACE

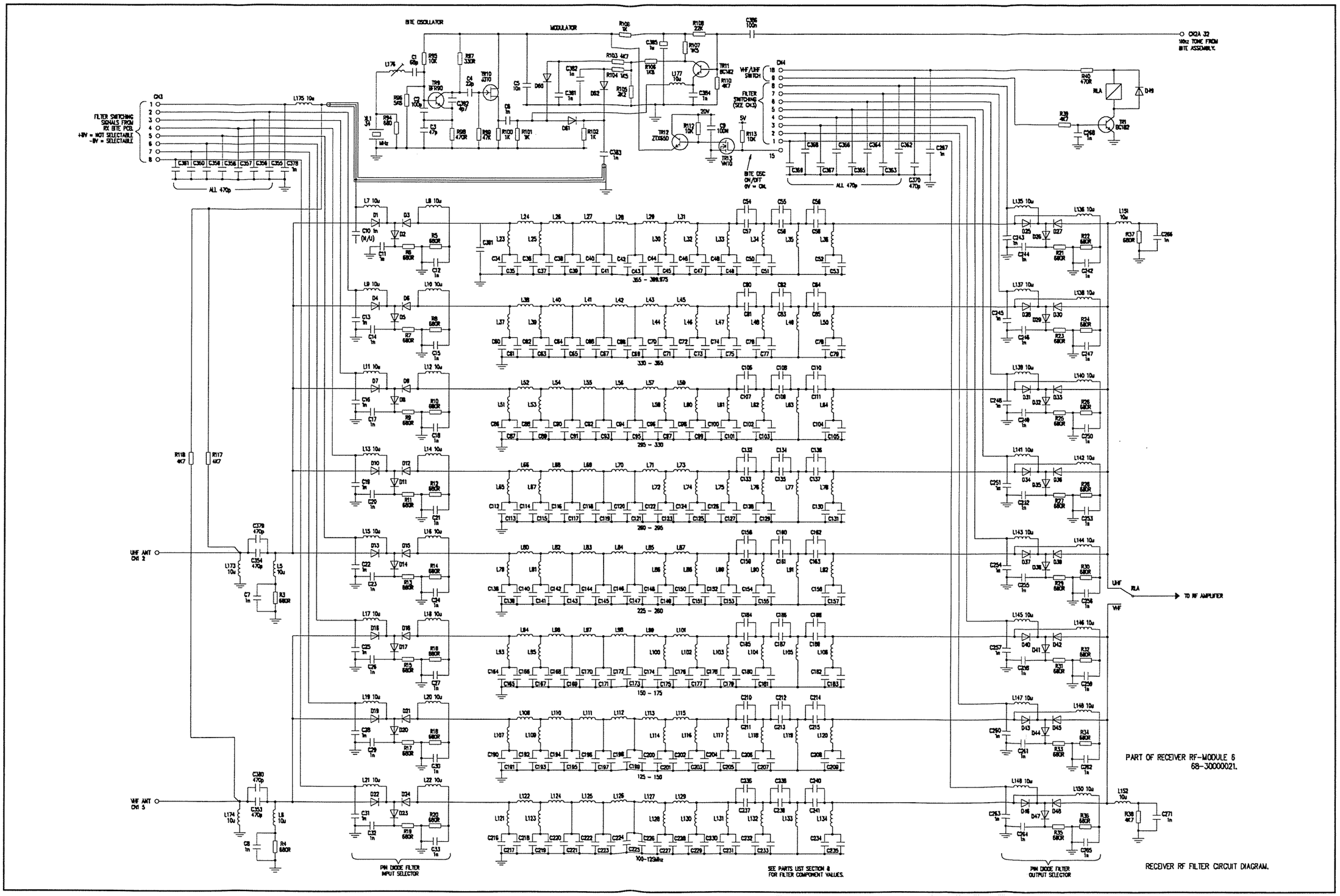
50 IC28 is a bus expander/latch which provides the interface between the BITE assembly through the data bus, and the module control lines. Analogue multiplexers IC22/IC23 select various test points on the module under control of the BITE assembly and connects them through the data bus to the BITE measuring system through monitor line (CN2 27C).



GA8328 Iss. 2

Receiver Simplified Schematic Diagram

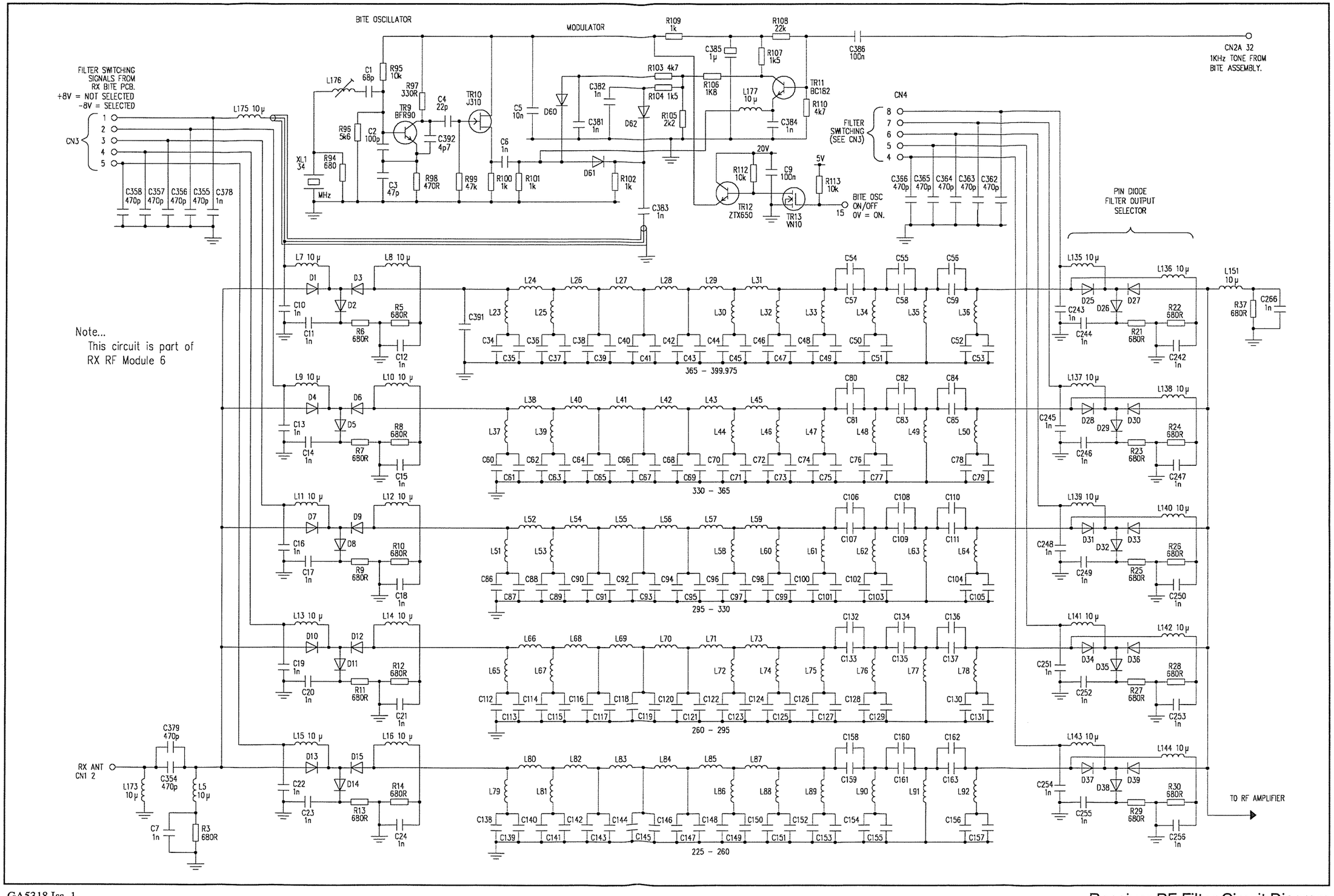
Fig. 3-3-1



GA2749 Iss. 6

Receiver RF Filter Circuit Diagram
(3010 and 3050 TRs)

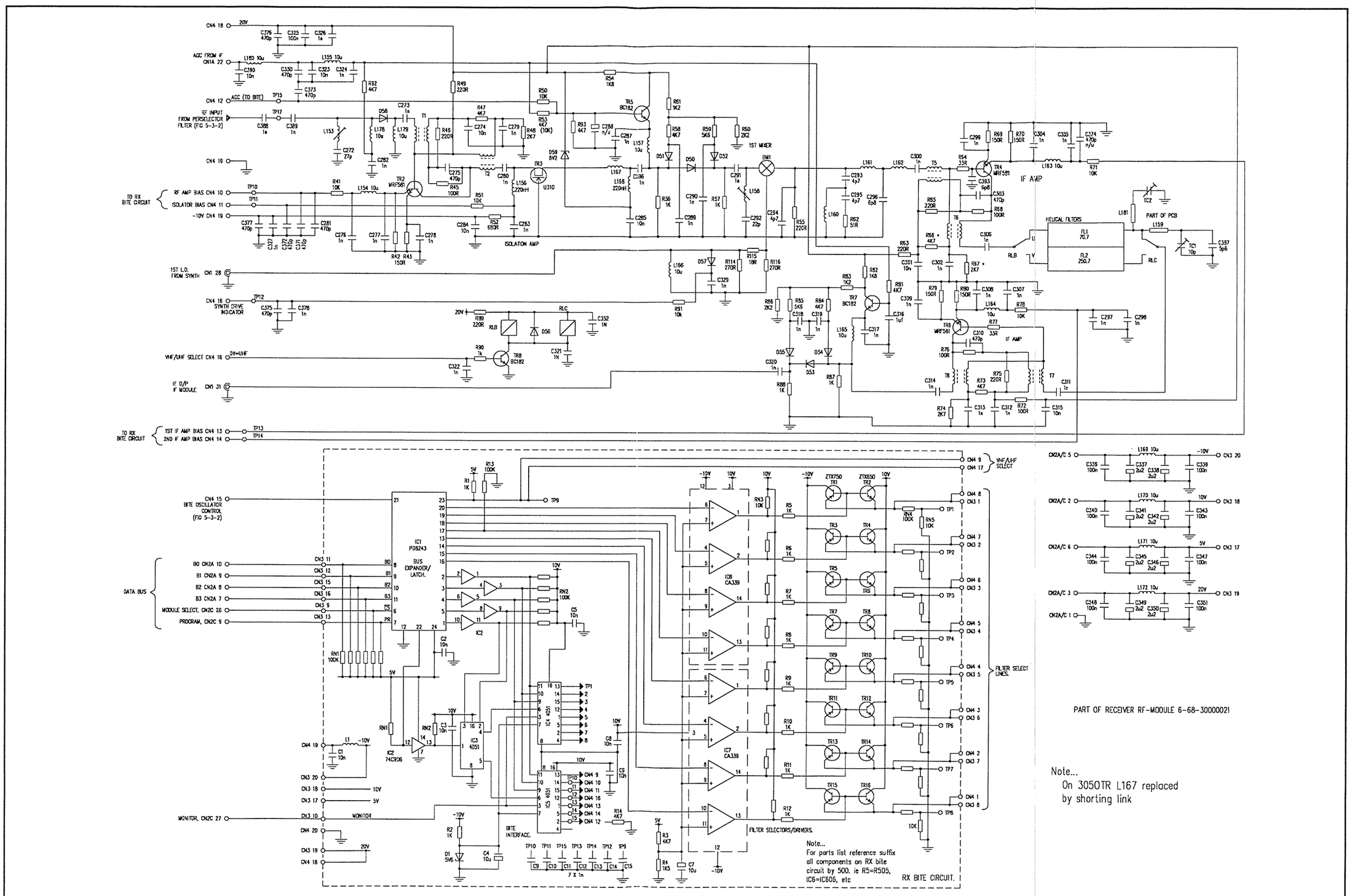
Fig. 3-3-2



GA5318 Iss. 1

Receiver RF Filter Circuit Diagram
(3030 TR)

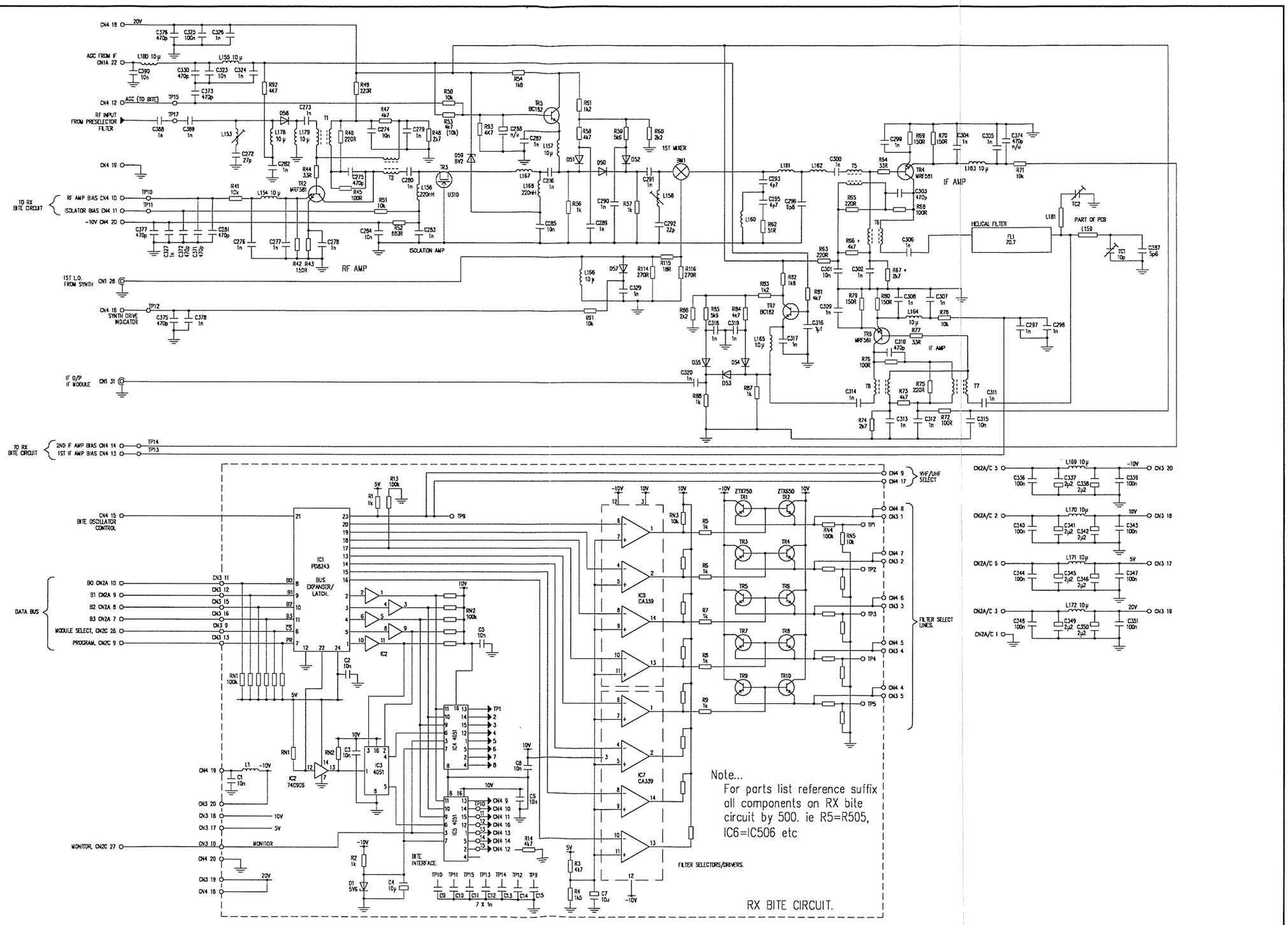
Fig. 3-3-3



GA2834 Iss. 6

Receiver RF Converter Circuit Diagram (3010 and 3050 TRs)

Fig. 3-3-4



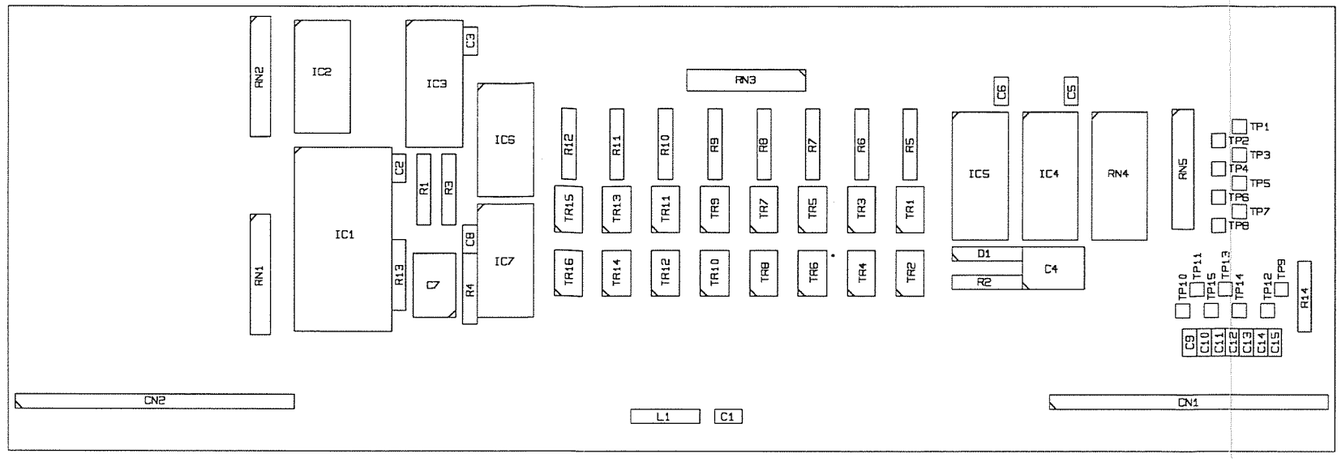
GA5315 Iss. 2

Receiver RF Converter Circuit Diagram (3030 TR)

Fig. 3-3-5

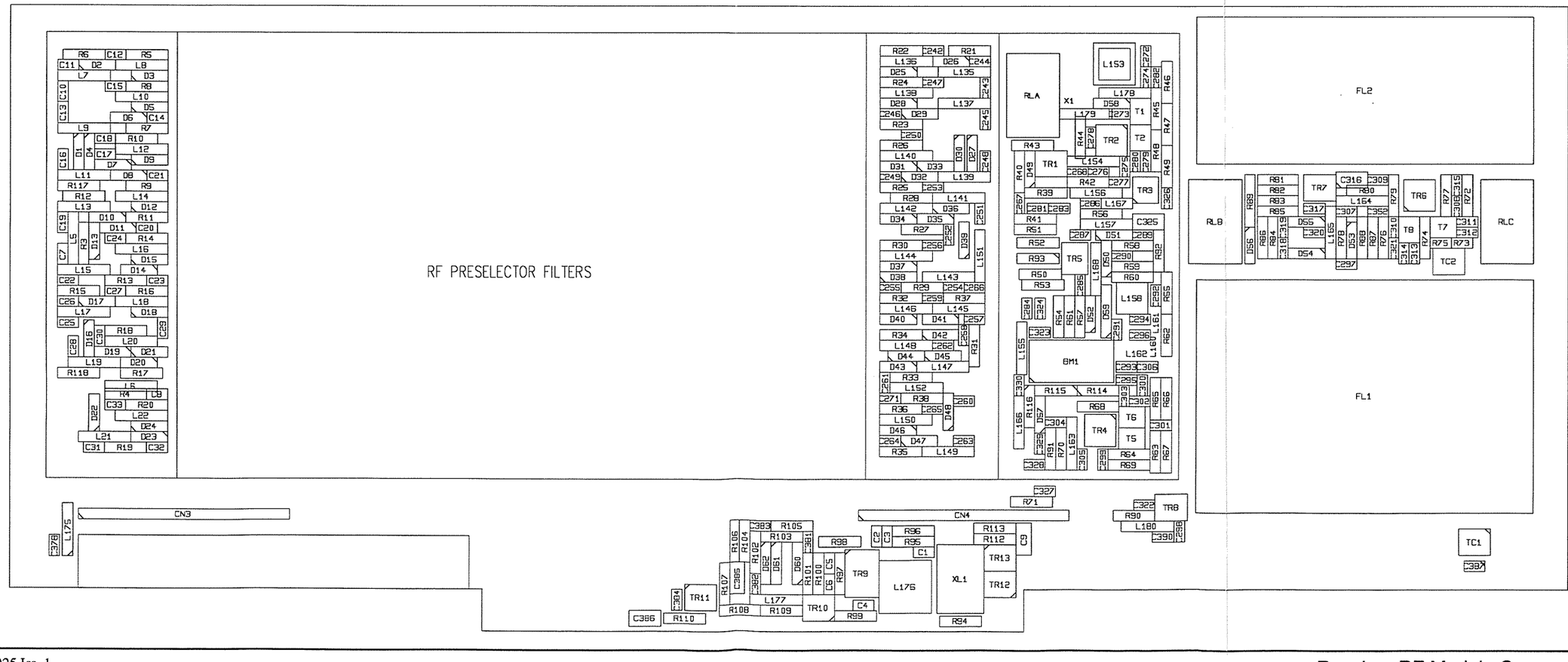
AW0290

RX BITE BOARD



AW0289

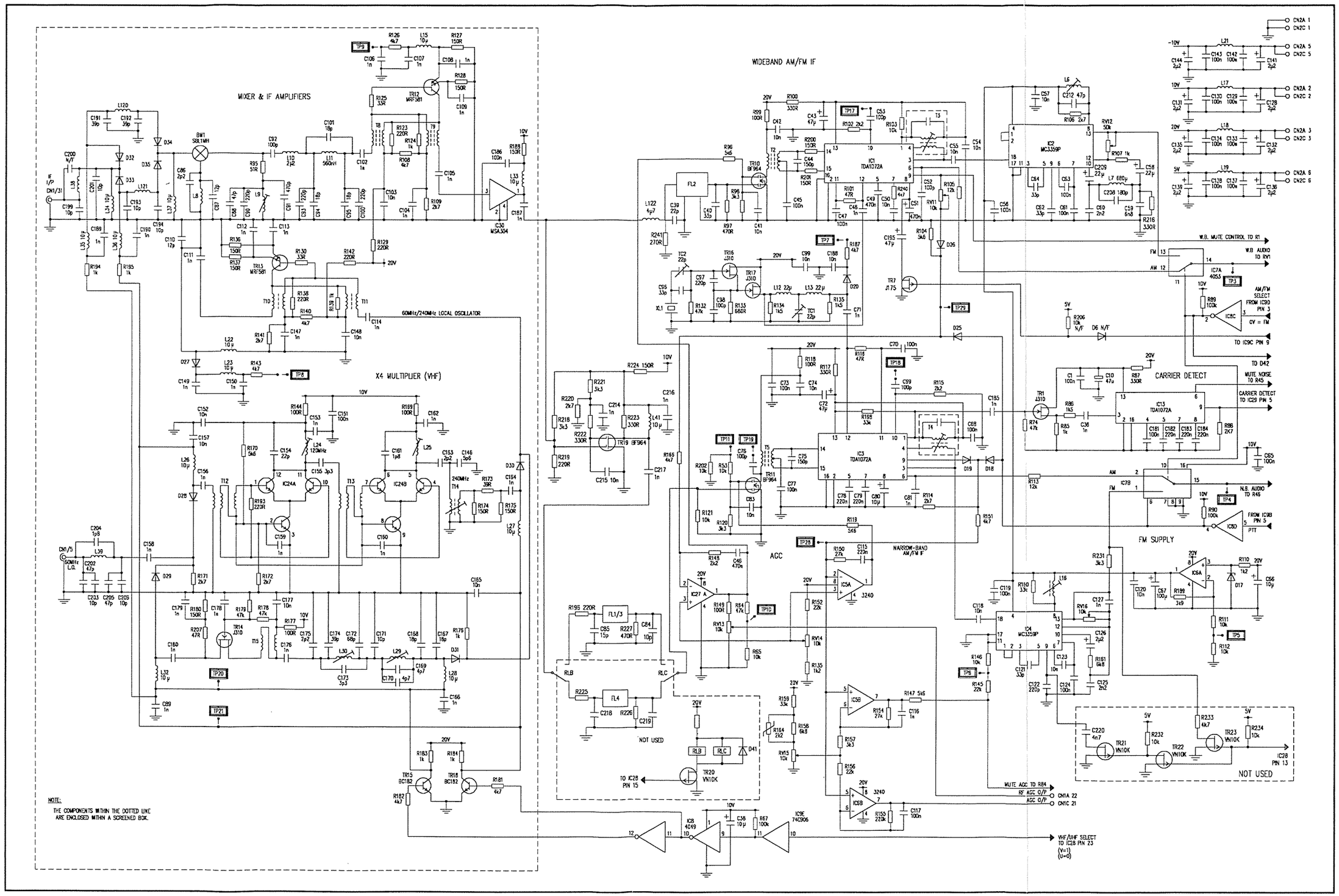
RX RF BOARD



GA5925 Iss. 1

Receiver RF Module Component Location Diagram

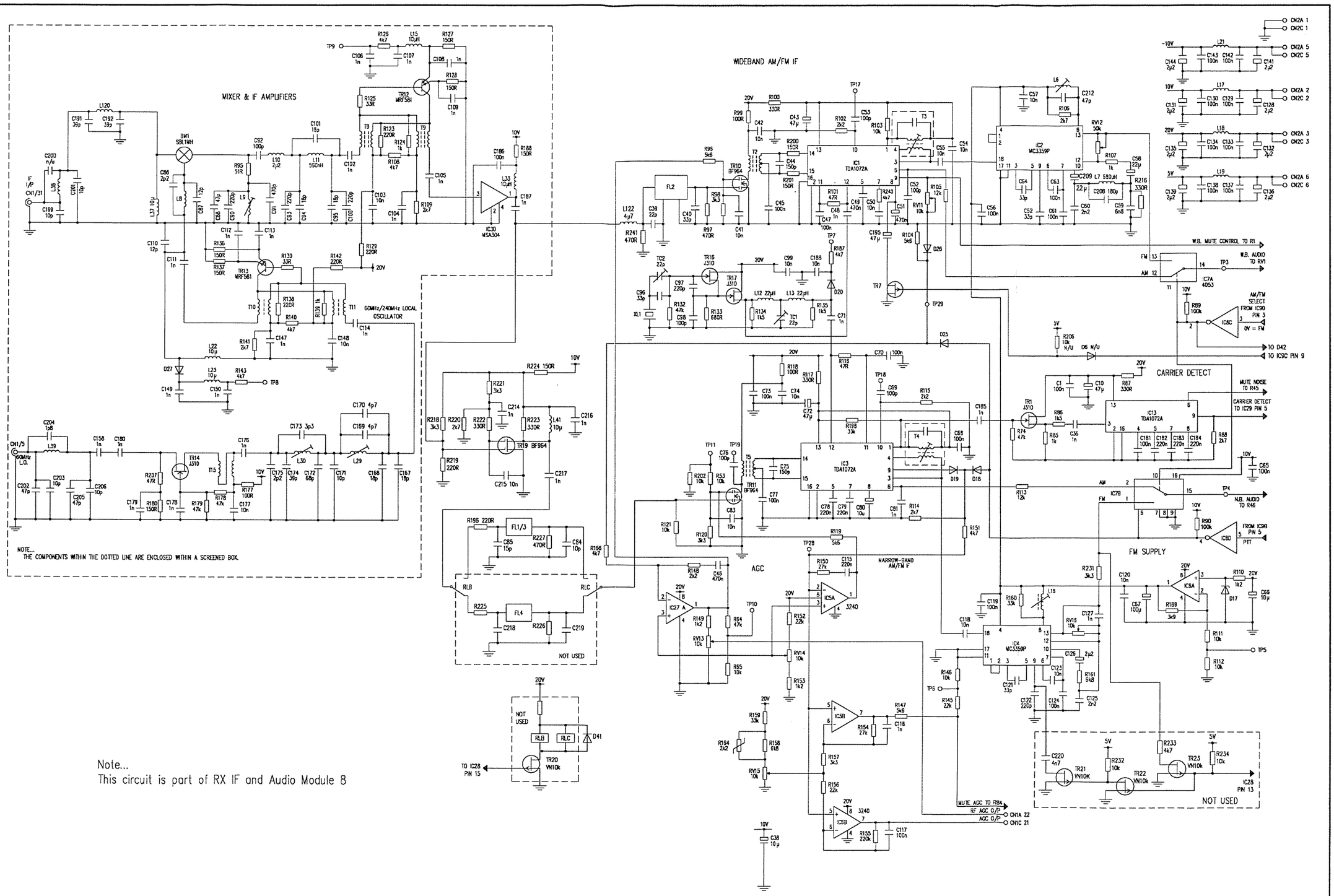
Fig. 3-3-6



GA6876 Iss. 1

Receiver IF Circuit Diagram
(3010 and 3050 TRs)

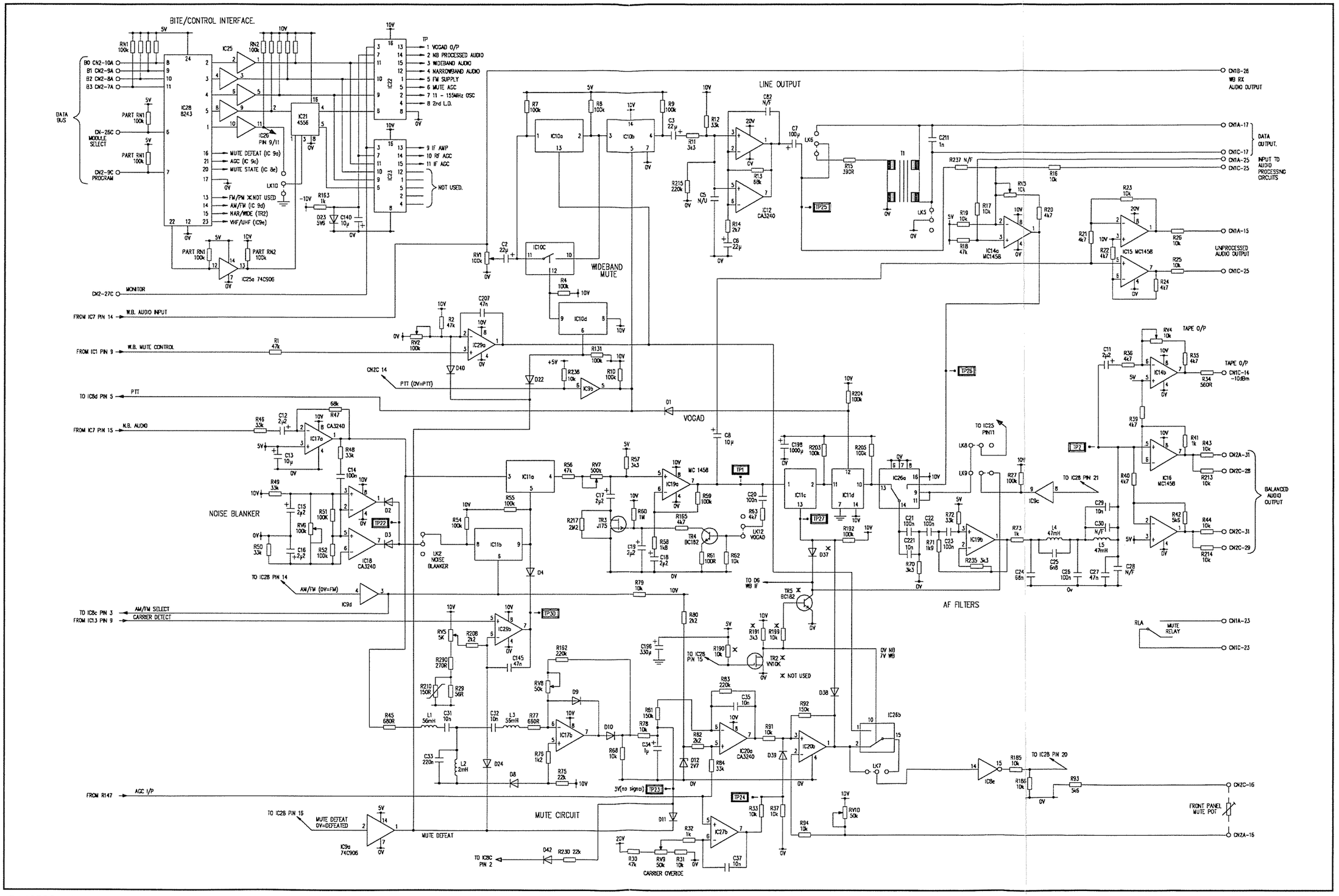
Fig. 3-3-7



Note...
This circuit is part of RX IF and Audio Module 8

Receiver IF Circuit Diagram
(3030 TR)

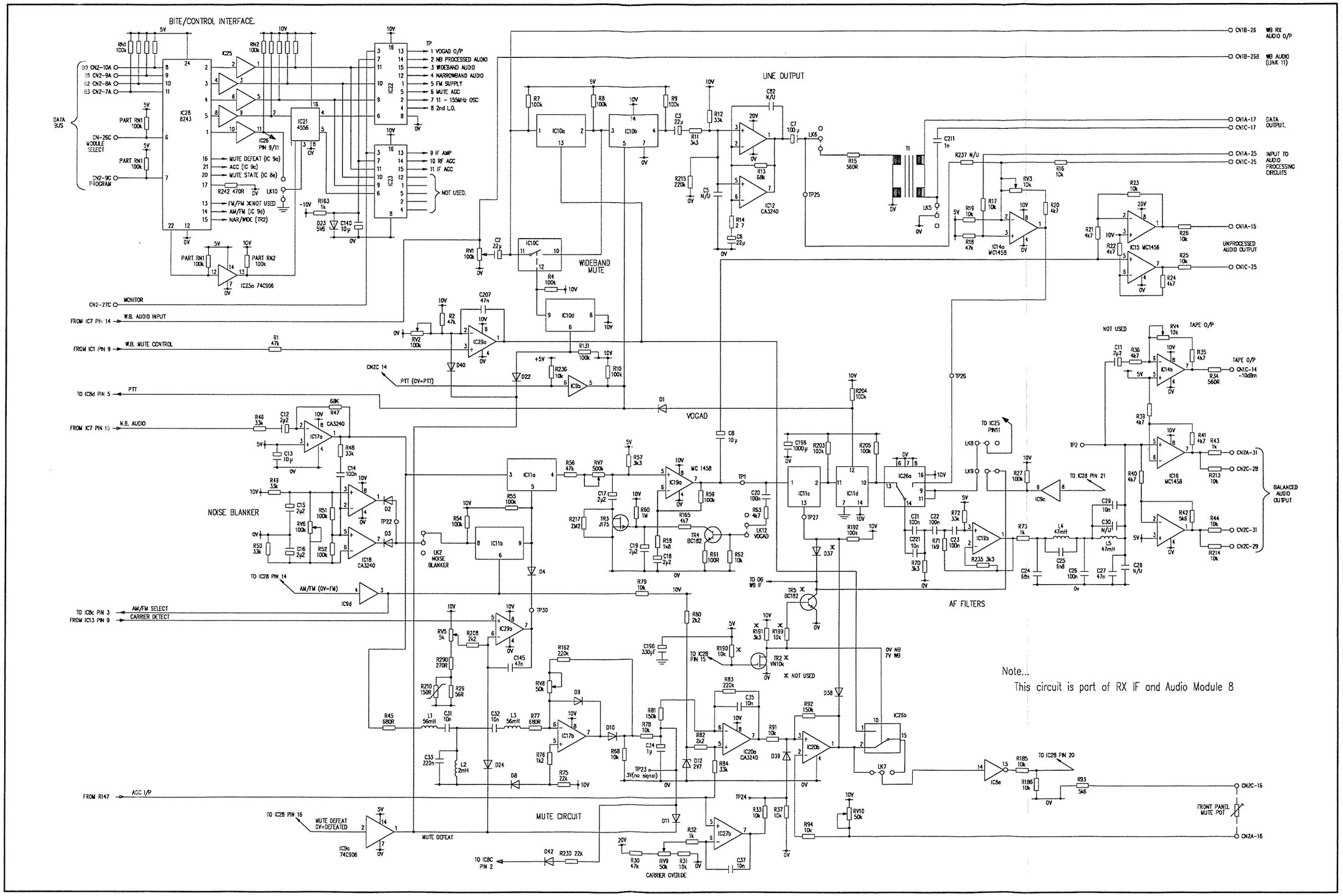
Fig. 3-3-8



GA6875 Iss. 1

Receiver Audio Circuit Diagram
(3010 and 3050 TRs)

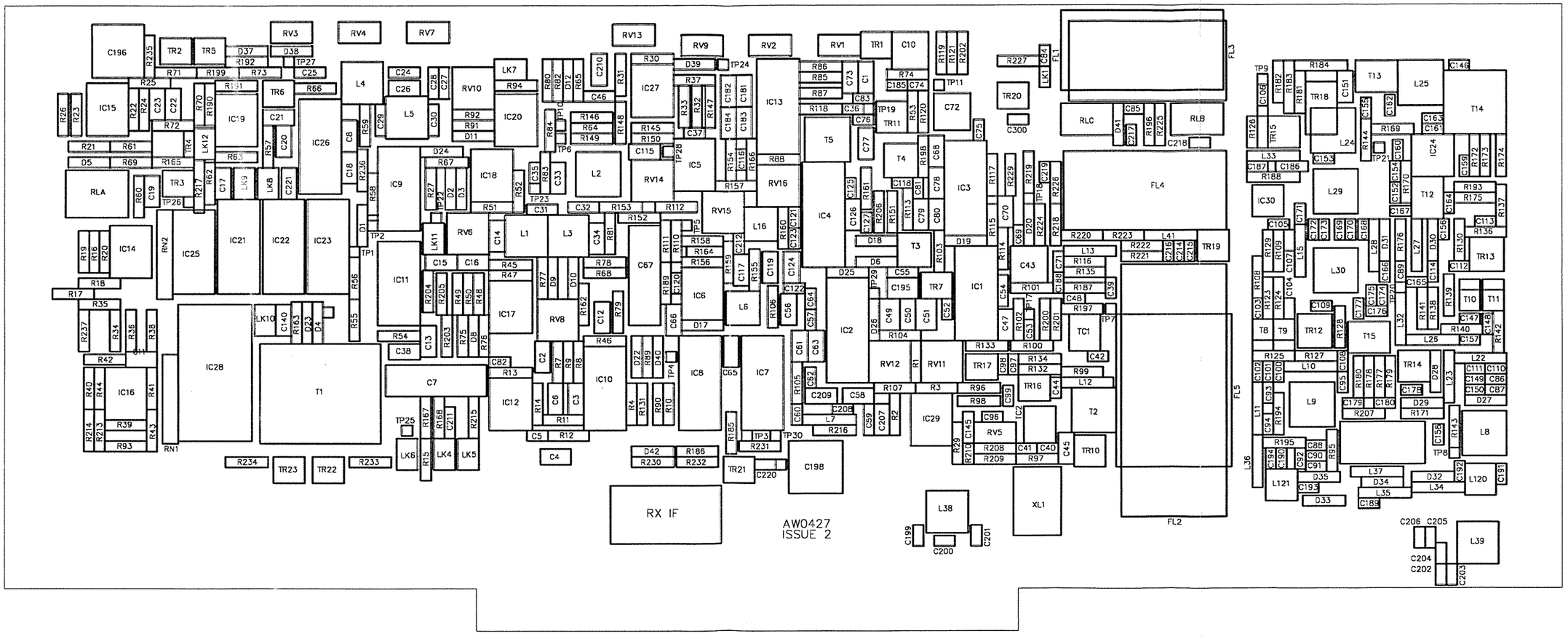
Fig. 3-3-9



GA5308 Iss. 4

Receiver Audio Circuit
(3030 TR)

Fig. 3-3-10



GA5928 Iss. 1

Receiver IF and Audio Module
Component Location Diagram

Fig. 3-3-11

Paragraph

1	Introduction
3	Block diagram
7	Synthesiser control circuit
13	Voltage controlled oscillator (VCO) circuit
16	Synthesiser circuit
17	Divider and prescaler
21	Phase comparator
24	Loop filter
28	60 MHz reference frequency
30	Tx/Rx drive select

Figure

3-4-1	Synthesiser block diagram	GA8319
3-4-2	Synthesiser module interconnection	GA5829
3-4-3	Synthesiser control circuit diagram	GA5320
3-4-4	Synthesiser VCO circuit diagram	GA5321
3-4-5	Synthesiser circuit diagram	GA5324
3-4-6	Synthesiser module component location diagram	GA5867

INTRODUCTION

1 The Synthesiser is a plug-in module which is interconnected through the Main and Front Interconnection assemblies, and located in module position 3. It provides the RF drive for the transmitter RF power amplifier stages, and the local oscillator injection signals for the receiver's 1st and 2nd mixers. The Synthesiser module comprises three PCBs as follows:

- Synthesiser control.
- Voltage controlled oscillator (VCO).
- Synthesiser.

2 The synthesiser and VCO circuits are enclosed within a screened box with interconnections between the three circuits as detailed in Fig. 3-4-2. The circuit diagrams for the synthesiser control, VCO and synthesiser are detailed in Figs. 3-4-3, 3-4-4 and 3-4-5 respectively.

Block Diagram

3 With reference to Fig. 3-4-1, the synthesiser circuit provides phase lock loop control of the VCO frequency output, this is achieved by dividing the output of a reference oscillator and feeding the resultant reference frequency to one input of a phase comparator circuit. The other input to the phase comparator circuit is derived from the VCO output which is buffered and fedback through a programmable divider which divides the VCO frequency by a number determined from the frequency information fed from the synthesiser control circuit.

4 The resultant output from the phase comparator is fed through a loop filter and provides the tuning control voltage for the VCO circuit. The output from the VCO is buffered, amplified and connected through relay contact RLA/1 to either the transmitter RF Power Amplifier assembly or the first mixer on the Receiver RF module.

5 The reference frequency for the phase comparator is provided from a crystal oscillator feeding into a phase lock loop controlled VCO. A second filtered output from the VCO provides the local oscillator injection for the 2nd IF mixer located on the IF and Audio module.

6 During FM mode operation a balanced FM audio signal from the TX Control module is connected through a digital attenuator, which is controlled from the synthesiser control circuit, to modulate the VCO tune signal.

SYNTHESISER CONTROL CIRCUIT

7 The synthesiser control circuit (see Fig. 3-4-3) is designed around an 8031 8-bit microprocessor IC5 with a non-volatile EPROM IC7 containing the program instructions. IC8, a type 6116 static RAM, stores the channel frequency and operating parameters. In the event of a power supply failure, battery B1 provides a reserve power supply for the volatile memory of IC8; this prevents the loss of stored channel information. IC6 is configured as an address latch for the microprocessors low address lines.

8 Both the ROM (IC7) and RAM (IC8) are addressed through the same address lines from port 0 and port 2 of the microprocessor; the low address lines (port 0) are isolated by address latch IC6. Port 0 of IC5 is also used for reading and writing data to memory. ALE (address latch enable) IC5 pin 30 to IC6 pin 11, activates the low address latch IC6 on memory addressing cycles; this happens when PSEN (program store enable) IC5 pin 29 to IC7 pin 22 strobes the program memory of IC7 to enable the output from the location address.

9 The microprocessors WR line (IC5 pin 16) enables the RAM (IC8), through IC9b, on memory write cycles; also enabled are latch drivers IC2, IC3 and IC4 through IC10a, IC10b and IC10c respectively. IC2 interfaces data through the data bus to the BITE assembly. IC3 provides the VCO select signals for the VCO circuit, and IC4 provides the data for the divider, digital attenuator and loop filter circuits on the synthesiser circuit. The microprocessor's RD line enables the RAM (IC8) on memory read cycles, and also enables buffer IC1 through IC9a. IC1 interfaces data from the BITE assembly over the data bus.

10 Analogue multiplexer IC14 with buffers IC12-C to IC12-F, configured as voltage level shifters, form the Synthesiser modules BITE interface. The output data is transmitted through the BITE monitor line (CN2 27C) to the BITE assembly.

11 The power supply for the microprocessor is monitored by IC13 and its associated components. On receipt of a power fail signal (low) from the BITE assembly (see Chapter 1 - power fail reset and watchdog circuit) an interrupt signal (low) will be sent through IC13c and IC9d to the microprocessor (IC5 pin 13). The microprocessor will initiate a power fail routine which will down load the current operational data into the RAM memory and on completion return to the main program routine.

12 If the power fail signal stays low for a time determined by D3/R4/C8, the microprocessor is disabled through the reset input pin 9 (high). On restoration of the power supply, a high is received from the BITE assembly. The microprocessor is enabled through the reset input initiating a reset routine which will recover the down loaded data from the RAM and configure the equipment to its operational status prior to the power failure.

VOLTAGE CONTROLLED OSCILLATOR (VCO) CIRCUIT

13 The VCO circuit (refer to Fig. 3-4-4) comprises seven voltage controlled oscillators that are identical in operation, but are configured, by the use of different capacitive component values, to cover the frequency band of 100 to 470 MHz. The VCO select lines from the synthesiser control circuit provide the enable signal, which is derived from the equipment's operational frequency, for the appropriate oscillator through its associated transistor TR8-TR14 and the appropriate output pin diode (D15-D21).

14 On selection of a particular VCO, the tune signal from the synthesiser is connected through CN4 to the junction of the varactor diodes as a dc voltage. The level of the dc voltage varies the capacitance of the diodes and in conjunction with the associated printed track inductor (L1-L7) determines the output frequency of the VCO.

15 The output of the operational VCO is connected through the selected pin diode (D15-D21) to the isolation buffer amplifiers TR15 and TR16, a pair of dual gate MOSFETs connected in parallel for increased power output. Further amplification of the VCO output is provided by a lossless feedback amplifier TR17; the RF output is taken through CN2 to the synthesiser circuit. A further output from TR17 is taken through TR18 and CN3 to the divider IC6 in the synthesiser circuit; TR18 is configured as a buffer to isolate the divider from the RF output.

SYNTHESISER CIRCUIT

16 The following paragraphs describe the operation of the synthesiser circuit detailed in Fig. 3-4-5.

Divider and Prescaler

17 IC4 is a universal divider which comprises several modulus and programmable dividers configured as a chain of counters operating in a programmable feedback mode. Programming is performed in BCD code in a bit-parallel decade serial format from data connected through CN5 (from the microprocessor in the synthesiser control circuit) to the A_0-A_3 (pins 4 to 1) and B_0-B_3 (pins 16 to 19) inputs. The programming process is timed and controlled by the programme clock (PC) and programme enable (PE) inputs, pins 13 and 12 respectively.

18 To provide for high frequency division, IC4 outputs programmable feedback signals for connection to two separate high speed dividers, IC5 and IC6, through FB1 (pin 22), FB2 (pin 23) and a timing signal through SY (pin 21). IC5 and IC6 are configured as a dual modulus prescaler controlled by gating pulses from the dual D type flip-flop IC7 with each divider providing a 10 or 11 divide factor.

19 The RF signal from the VCO is connected through the prescaler where it is divided twice by a factor of either 10 or 11; the division depends on the signals at the control inputs PE1 and PE2 of IC5 and IC6. The control input signals are routed from the feedback outputs of IC4, which are as follows:

- Divide by 10 - PE1 or PE2 high
- Divide by 11 - PE1 and PE2 low

20 The output of the 10/11 divider IC5 is connected to IC4 (pin 20) through TR1 which provides an interface between the ECL levels used in IC5 and the CMOS logic levels required by IC4. The signal is further divided in IC4 and connected through OFS (pin 25) to IC3 (pin

2); a further output used during any frequency transition is connected through OFF (pin 27) to IC3 (pin 1).

Phase Comparator

21 IC3 comprises two phase comparator circuits, a reference divider circuit and for the FM signal a phase modulator circuit. A 1 MHz oscillator frequency is connected to the reference divider which is configured to produce a reference frequency for the phase comparators.

22 When the PLL is in lock the OFS signal from IC3 is present and connected to the SAMPLE and HOLD phase comparator PC1 which is designed to provide very low noise performance during lock conditions. During periods of channel changing, or when the selected frequency is outside the operating range, the OFF signal from IC3 is present and connected to the digital phase comparator PC2; this enables a faster lock time to be achieved.

23 Operation of PC2 also provides an out of lock signal through pin 4 (high) which will switch on TR2 providing a synthesiser out of lock condition for the BITE assembly and, through D7, for the microprocessor in the synthesiser control circuit. Once the loop has attained lock, PC2 disables, and PC1 enables maintaining the lock condition with minimum noise and phase filter. The analogue output (OFS) from PC1, and the digital output (OFF) from PC2 are connected through pins 8 and 9 respectively to the loop filter circuit.

Loop Filter

24 TR9 and TR10, configured as an emitter follower, are connected to the digital output (OFF) to provide a current sink circuit during fast frequency correction (out of lock) conditions. The outputs of IC3, pins 8 (OFS) and 9 (OFF), are then connected through quad bilateral switch IC2 to the loop filter amplifier IC1a. IC2 under control of the synthesiser control circuit through latch IC11, selects various resistive combinations from R10-R15 which in conjunction with C3 and the VCO signal maintain the loop bandwidth over the operating range.

25 The output of IC1a is connected through a low pass filter R3/L9/C1 to frequency modulator IC1b when, if in FM mode, it is modulated by the audio frequency outside the loop bandwidth. The output of IC1b, a dc voltage level, is connected to the VCO circuit as the VCO control voltage (tune line).

26 When FM mode is selected, a balanced audio is connected from the Transmitter Control module through CN1 17C and 18C to amplifier IC8a. The output of IC8a is connected through RV1 and RV2 to IC10, configured as a dual digitally controlled attenuator, which under control from the synthesiser control circuit keeps the FM deviation constant with the transmit frequency.

27 To enable the loop to be modulated with wideband FM mode, one attenuator output (pin 2) is connected through IC9a to IC8b which is configured as a low-pass filter; the output is connected to the phase modulator circuit in IC3 and modulates at frequencies within the loop bandwidth. The other attenuator output (pin 20) is connected through IC9b to IC1b where it is used to modulate the VCO control signal directly at audio frequencies outside the loop bandwidth.

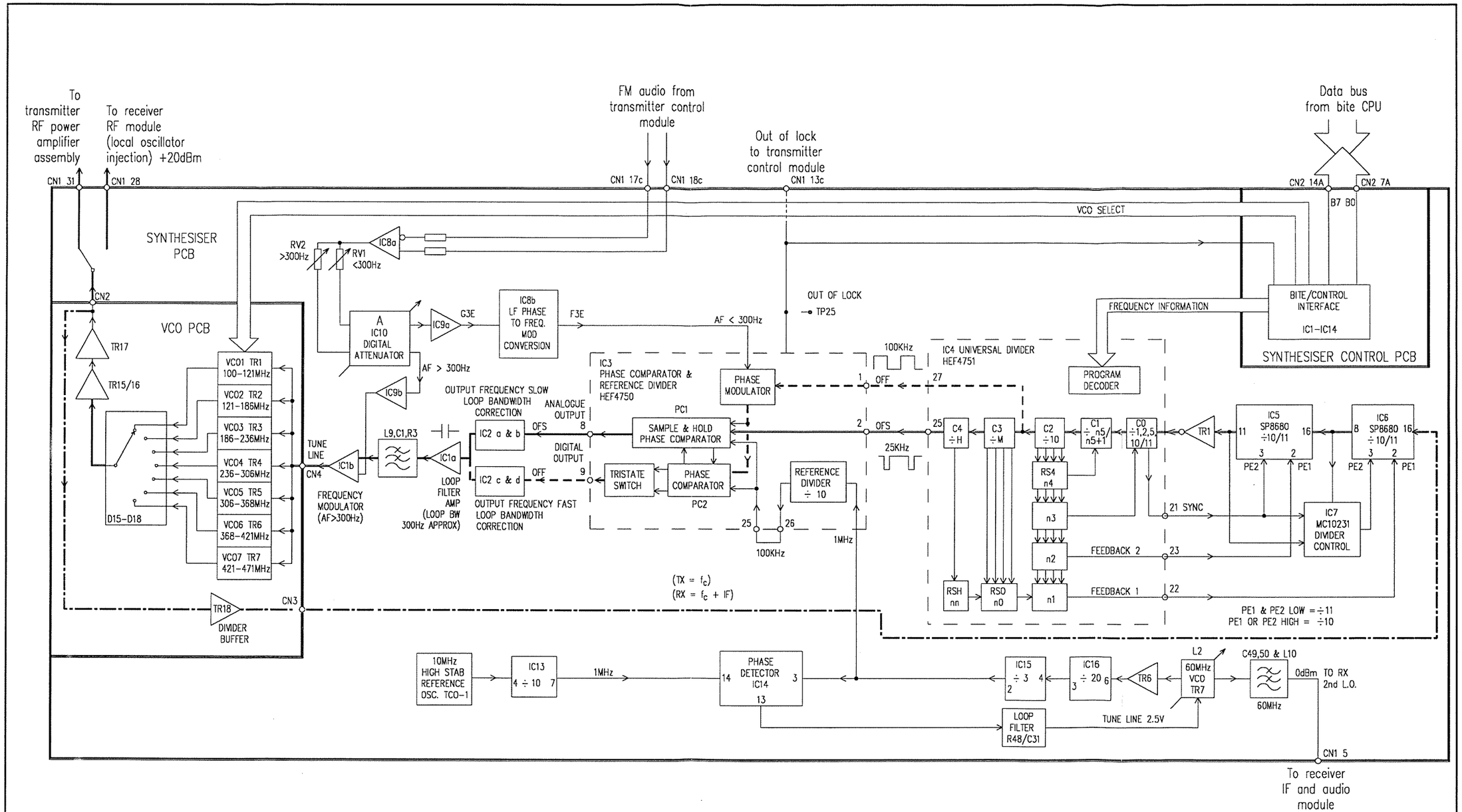
60 MHz Reference Frequency

28 A phase locked loop 60 MHz crystal oscillator TR7 provides the second local oscillator signal for the Receiver IF and Audio module through the low pass filter C49/C50 and L10. An output is also taken through D6 to CN5/11 for the BITE interface on the synthesiser control circuit.

29 The oscillator output is also taken through buffer TR6 to a divide by 20 circuit IC16 and a divide by 3 circuit IC3 to provide a 1 MHz output for the reference divider in IC3. To maintain the 1 MHz signal, the VCO output is also connected to phase detector IC14 where it is compared with the 1 MHz reference. Any resulting error is passed as a dc voltage level through low pass loop filter R48/C31 to the junction of the varactor diodes D4/D4 of the 60 MHz oscillator.

Tx/Rx Drive Select

30 The synthesiser outputs either the transmitter's drive frequency, or the receiver's 1st local oscillator frequency at CN1/31 and CN1/28 respectively. Switching of the outputs is controlled from the synthesiser control circuit, through latch IC11 on the synthesiser circuit. IC11 provides a high to the base of TR8 when the transmitter's PTT circuit is activated. TR8 switches on, connecting the VCO output to the transmitter circuits. When TR8 is not conducting, the VCO output connects to the receiver circuits.



Note...

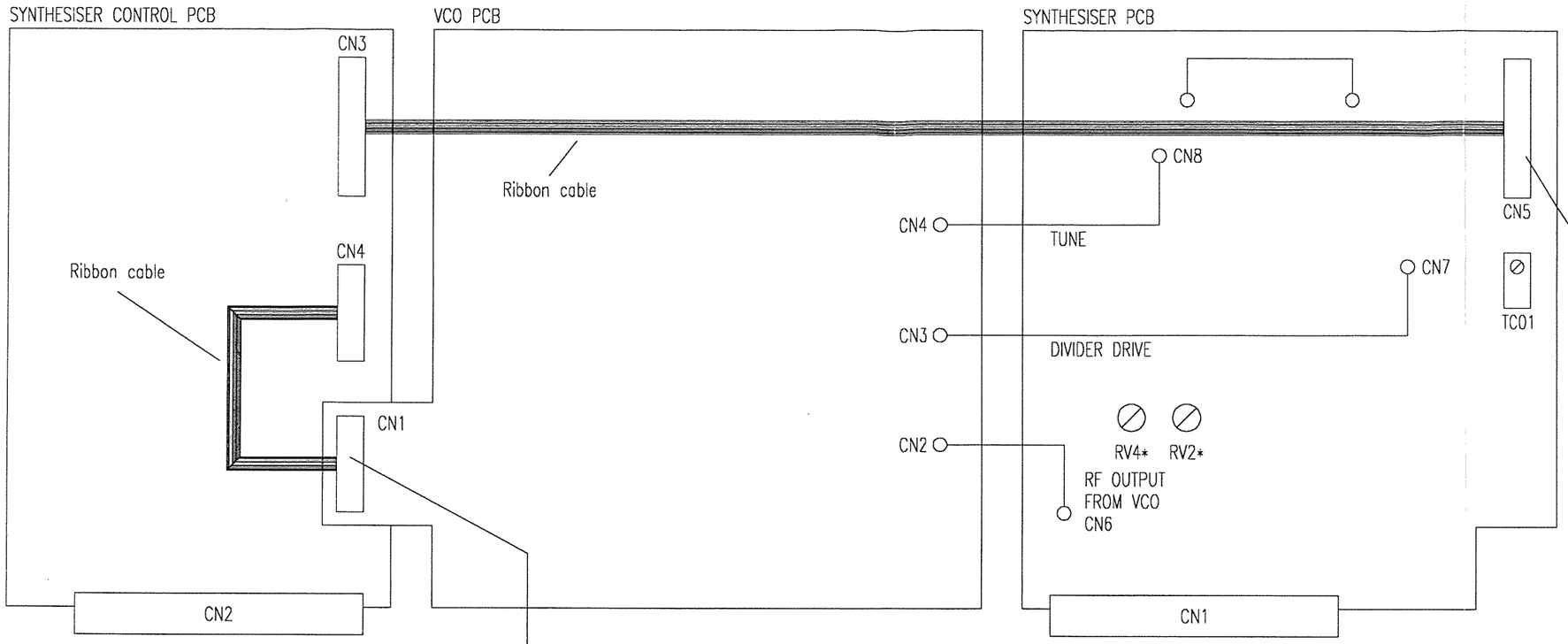
VCO1 and VCO2 are not used in the 3030 T/R

VCO 3, VCO 4 are not used in the 3010 T/R

GA8319 Iss. 2

Synthesiser Block Diagram

Fig. 3-4-1



PIN	SIGNAL
1	+10V
2	VCO 1 select
3	VCO 2 select
4	VCO 3 select
5	VCO 4 select
6	VCO 5 select
7	VCO 6 select
8	VCO 7 select
9	Ground
10	No connection

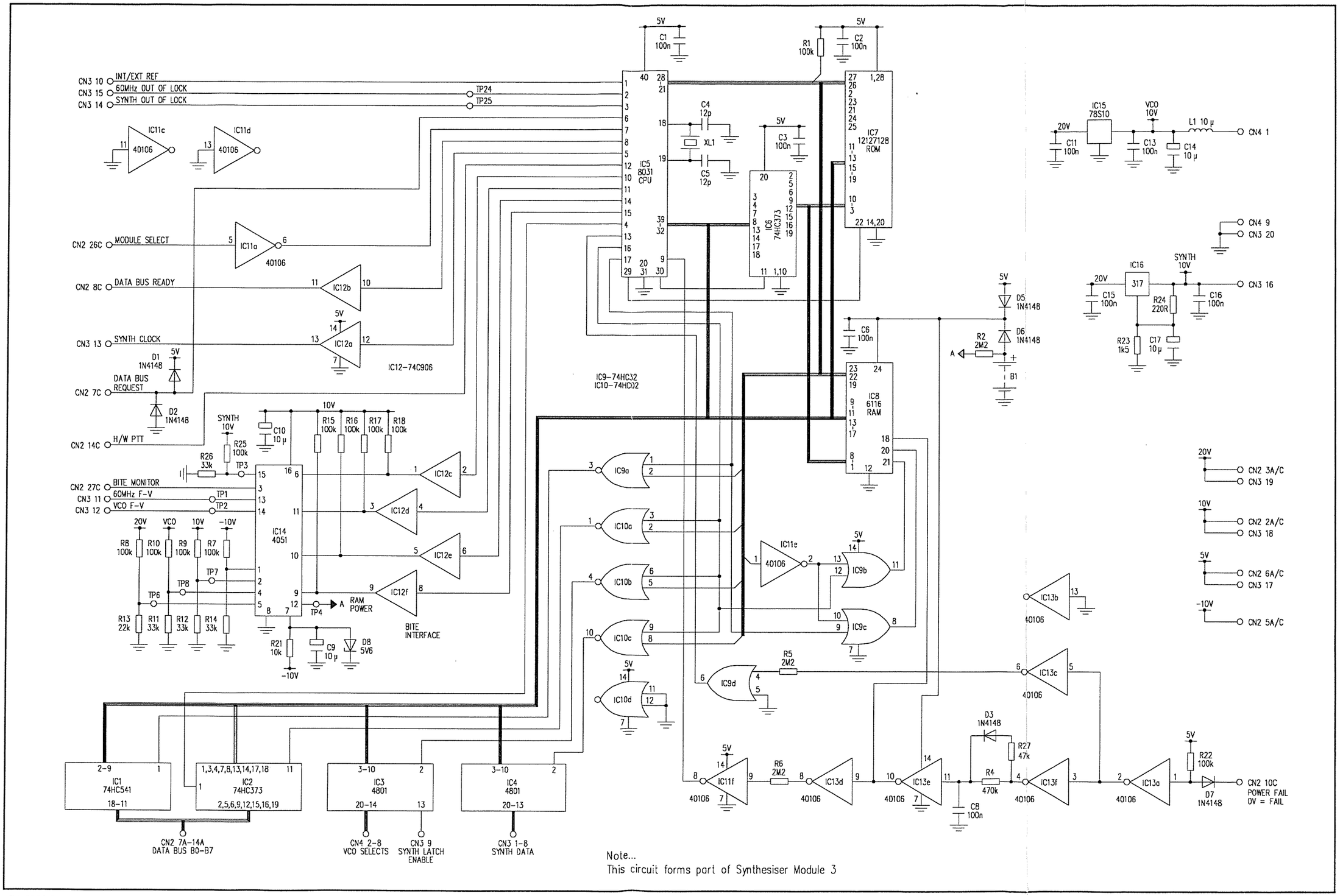
PIN	SIGNAL
1	Synth data bus bit 0
2	Synth data bus bit 1
3	Synth data bus bit 2
4	Synth data bus bit 3
5	Synth data bus bit 4
6	Synth data bus bit 5
7	Synth data bus bit 6
8	Synth data bus bit 7
9	Synth latch enable
10	Int/ext reference
11	Bite 60MHz op level mon
12	Bite synth op level mon
13	Synth clock
14	Synth out of lock
15	60MHz loop out of lock
16	Synth 10V supply
17	+5V supply
18	+10V supply
19	+20V supply
20	Ground

* These components can be accessed through holes provided on the screened top.

GA5829 Iss. 1

Synthesiser Module Interconnection

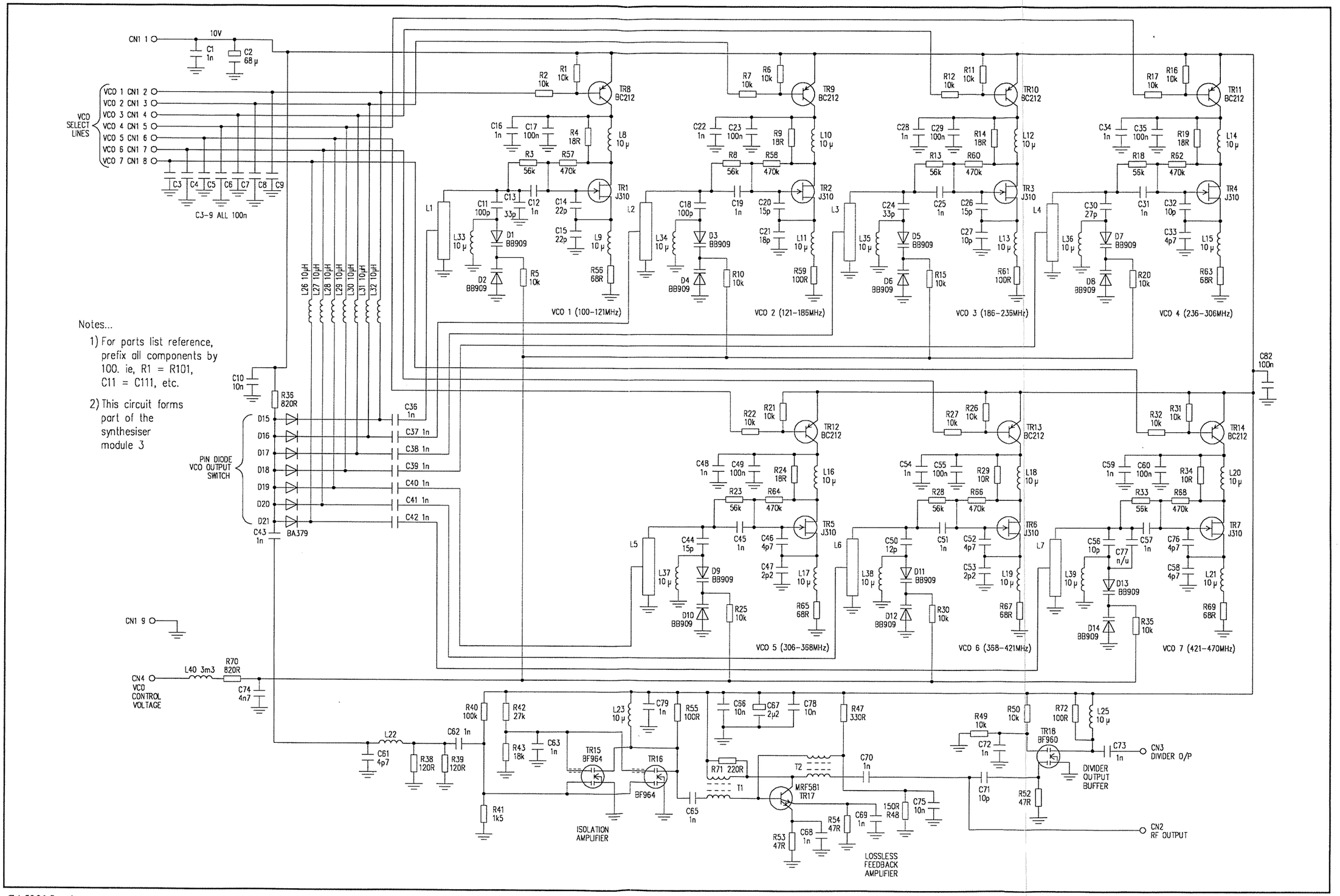
Fig. 3-4-2



GA5320 Iss. 2

Synthesiser Control Circuit Diagram

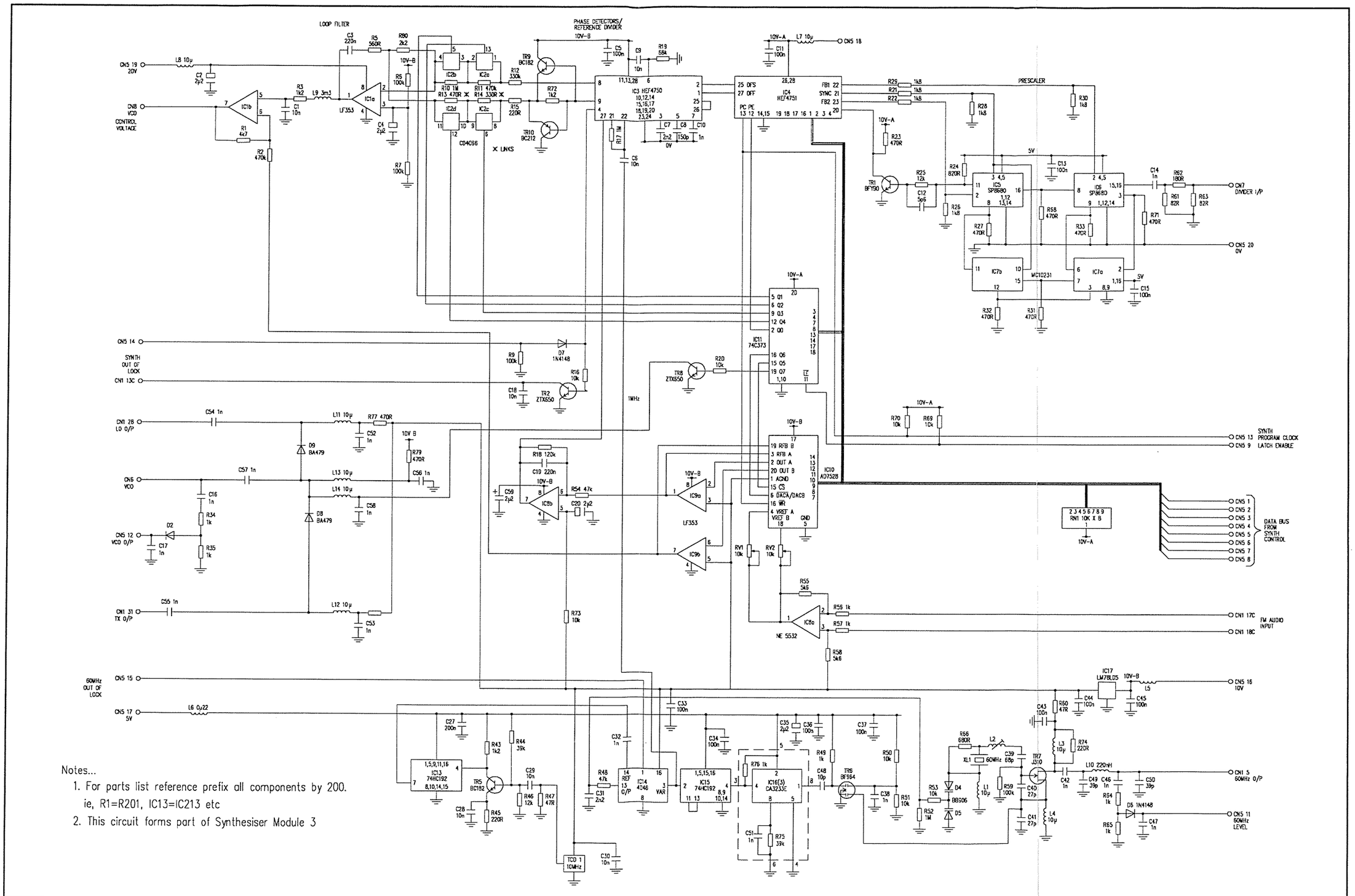
Fig. 3-4-3



GA5321 Iss. 1

Synthesiser VCO Circuit Diagram

Fig. 3-4-4



Notes...

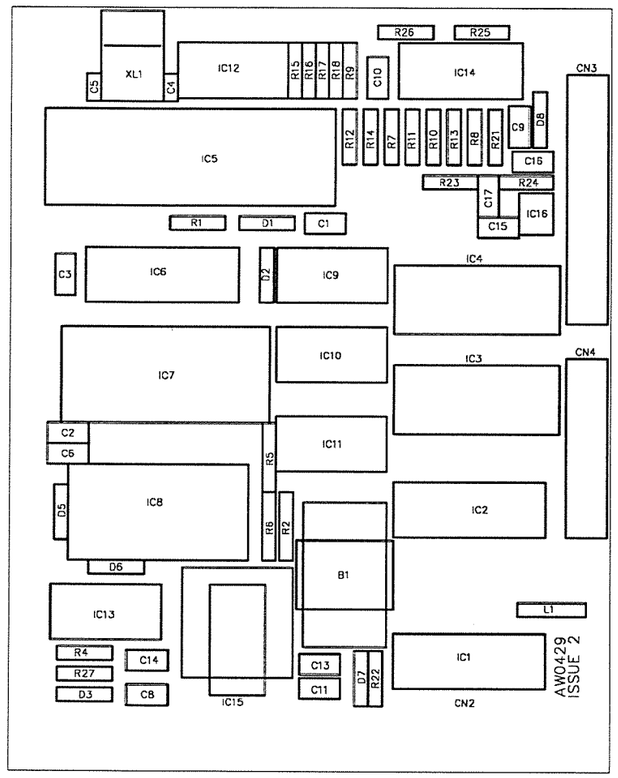
1. For parts list reference prefix all components by 200. ie, R1=R201, IC13=IC213 etc
2. This circuit forms part of Synthesiser Module 3

GA5324 Iss. 1

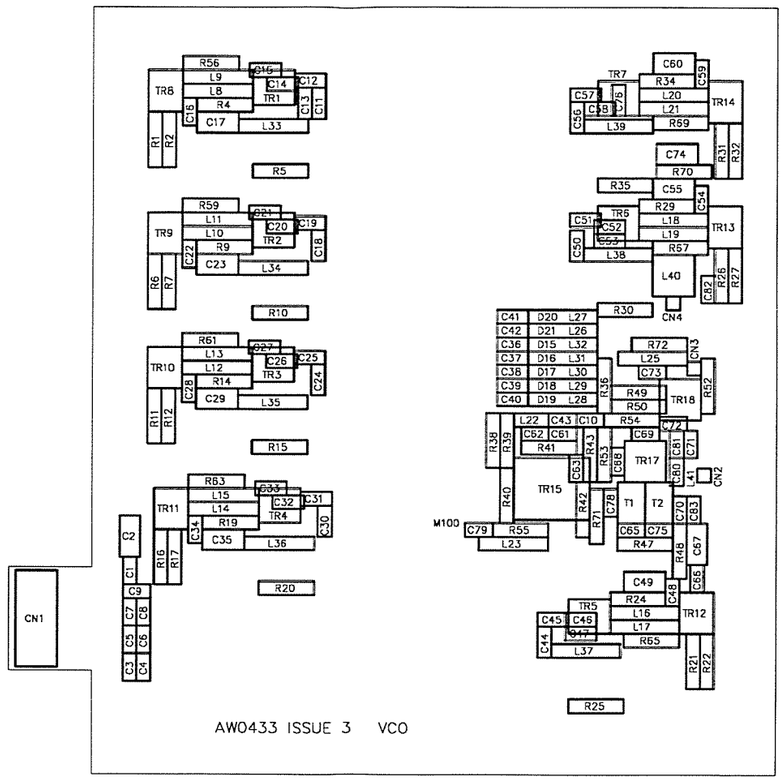
Synthesiser Circuit Diagram

Fig. 3-4-5

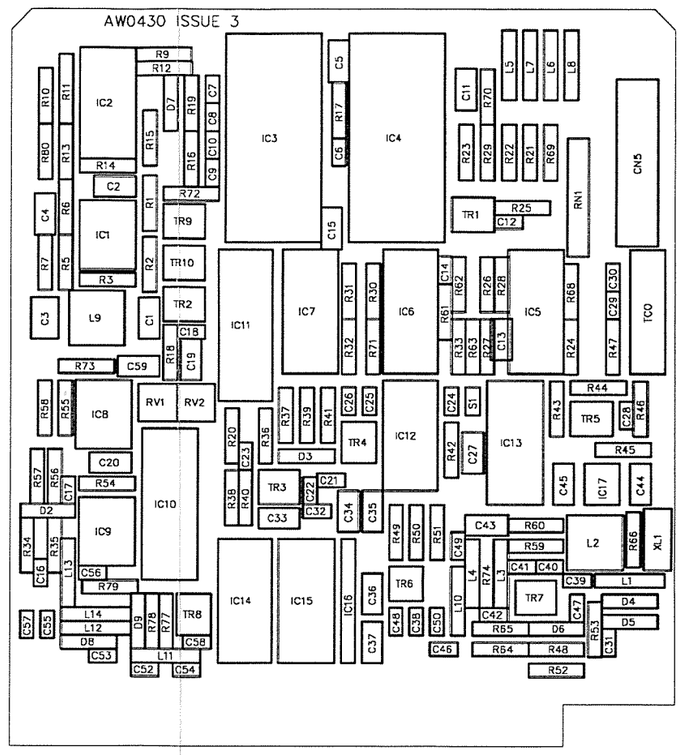
SYNTHESISER CONTROL



VOLTAGE CONTROLLED OSCILLATOR (VCO)



SYNTHESISER



Note...
In the parts list, Vco components are prefixed by 100, ie, R1 = R101.
In the parts list, synthesiser components are prefixed by 200, ie, R1 = R201.

GA5867 Iss. 1

Synthesiser Module Component Location Diagram

Fig. 3-4-6

Pararaph

1 Introduction
3 Schematic diagram
7 PCB configuration
Description
11 Input data circuits
14 Output data circuits
16 Input audio circuits
21 Output audio circuits
22 Hardwire PTT
23 CPU circuit
25 Link 11 output

Figure

3-5-1 Remote control decoder - schematic diagram GA5907
3-5-2 Remote control circuit sheet 1 of 3 ..... GA5482
3-5-3 Remote control circuit sheet 2 of 3 ..... GA5483
3-5-4 Remote control circuit sheet 3 of 3 ..... GA5934
3-5-5 Remote control module layout GA5915

INTRODUCTION

1 The remote control decoder provides an interface for the transmission and reception of audio and data through a four-wire system between the 3000 series T/R and a compatible remote control unit (RCU) such as the PAE 3000 RCU. The decoder can be configured for operation through dc or ac (tone) circuits. When configured for dc operation, the RCU can be located (using suitable land lines) up to 2 km from the T/R. If the distance between the RCU and the T/R exceeds 2 km, or if there is no dc path (for example, for use through a microwave link), the decoder must be configured for ac operation.

2 The decoder is a plug-in module located at module 5 position (see Fig. 3-2). The circuitry contains a BITE/control interface, line interface, and audio and PTT detection circuits.

SCHEMATIC DIAGRAM

3 With reference to the schematic diagram shown in Fig. 3-5-1. The four data lines are connected to the RCU through the remote 1 connector pins 1 to 4. If the decoder is configured for tone operation, the signal path is between the remote 1 connector and the CPU through the hybrid transformer, amplifiers and modem. If the decoder is configured for dc operation, the signal path is between the remote 1 connector and the CPU through a RS423/TTL converter.

4 The four audio lines are connected to the RCU through the remote 1 connector pins 5 to 8. In ac mode, the transmit audio and PTT tone is routed through a hybrid transformer and

digital attenuator. The signal is then split, the PTT tone signal is detected by the CPU after filtering; the audio is routed to the Tx control module through a PTT tone notch filter.

5 In dc mode, the transmit audio is routed to the Tx control module through a hybrid transformer, and amplifiers. PTT is sensed by the phantom keying circuit, the resultant signal being sent to the CPU.

6 The receiver audio is routed to the RCU through sidetone and receiver audio amplifiers, a PTT tone notch filter (to remove any residual PTT tone) and a hybrid transformer.

PCB CONFIGURATION

7 The decoder can be configured to operate in ac (tone) or dc modes. The board is configured by setting links LK1 to LK11. The links are set as follows:

8 For ac (tone) mode:

Links LK4 to LK11 to be set as shown on circuit diagram Fig. 3-5-2. These links are set in the left position on the PCB. Link LK11 to be set as shown in the circuit diagram.

9 For dc mode:

Links LK4 to LK11 to be set in the opposite position to that shown on circuit diagram Fig. 3-5-2. These links are set in the right position on the PCB. Link LK1 to be set in the opposite position to that shown on the circuit diagram.

10 For PTT options in dc mode:

Link LK2 determines phantom keying when a ground or 24 V dc (nominal) potential is sensed. When set in the lower position (as shown in Fig. 3-5-2), PTT is activated on a ground potential. Change to upper position for PTT on a 'high'.

Link 3 determines hardwire keying when either a ground potential or a 24 V dc (nominal) is sensed. In the upper position (as shown on Fig. 3-5-2), PTT is activated by a ground potential. Change to the lower position for PTT on a 'high'.

DESCRIPTION

Input Data Circuits

11 Refer to Figs. 3-5-2, 3-5-3 and 3-5-4. The ac (tone) serial data is received from the RCU in the form of an asynchronous frequency shift keying (FSK) signal at a rate of 1200 baud (mark at 1300 Hz, space at 2100 Hz). Diodes D17 and D18 provide over-voltage protection for the input circuitry.

12 The signal is routed through transformer T1 and amplifier IC18 to the MODEM IC17 pin 5. The signal is demodulated and the resultant serial data signal (RXD) is connected to microprocessor IC1. A carrier detect signal (CD) is generated by the MODEM which is also connected to IC1.

13 When the decoder is configured for dc operation, links 4 to 11 will be in the opposite position to those shown on Fig. 3-5-2. The RS423 signal received from the RCU is connected to the microprocessor (IC1) through the RS423 to TTL converter IC20. The carrier detect signal (CD) is connected to pin 7 of IC20.

Output Data Circuits

14 Refer to Figs. 3-5-2, 3-5-3 and 3-5-4. The data path from the equipment to the RCU is the opposite of the input data circuits. If in ac operating mode, data from the CPU (TXD) is routed through the MODEM (IC17), is then amplified and connected to the remote 1 connector through transformer T2. The output from the MODEM, will be an FSK signal in the same format previously described in the input data circuits. The CPU (IC1) also generates a ready-to-send (RTS) signal which is connected to pin 12 of the MODEM.

15 When the decoder is configured for dc operation, links 4 to 11 route the TXD and RTS signals generated from the CPU (IC1) to the TTL to RS423 converter IC19. Diodes D19 and D20 provide over-voltage protection on the output lines.

Input Audio Circuits

AC (Tone) Operation

16 If configured for ac (tone) operation, the transmitter audio from the RCU is superimposed with a continuous PTT tone of 2930 Hz. After the PTT is initially activated, the PTT tone is for the first 50 ms at a level of 0 dBm; for the remainder of the PTT period, the tone is at a level of -23 dBm.

17 The transmitter audio is routed from the remote 1 connector to transformer T4 and is amplified by IC31. The potentiometer RV3 is used to set the audio level. From IC31 the audio passes through a digital attenuator (IC33). After amplification (IC35), the composite audio and PTT signals are separated (see schematic diagram Fig. 3-5-1) by a series of filters (ICs 37 to 39). The PTT tone is routed to the CPU (IC1) through dual comparator IC41, the audio being filtered out by the 2930 Hz band-pass filter. The audio, separated from the PTT tone, is routed to the Tx control module through amplifier IC30.

DC Operation

18 If configured for dc operation, the transmitter audio from the RCU is routed from the remote 1 connector to transformer T4. The PTT function is activated by either a ground potential or a dc (24 V nominal) being applied to either of the Tx audio lines. Link 2 (shown on Fig. 3-5-3 in the ground mode) determines whether the phantom PTT circuit responds to a ground or 24 V dc.

19 When a ground (or if so configured, a 24 V dc potential), is sensed at the centre-tap of transformer T4, opto-isolator IC29 conducts forcing TR1 to conduct. The resulting low at the PTT REM connection is routed to the CPU (IC1) through IC11.

20 The Tx audio is amplified by IC31 and routed to the Tx control module through link LK1, IC32 and IC30.

Output Audio Circuits

21 Receiver audio and sidetone audio is amplified by IC28 (see Fig. 3-5-2), routed to amplifier IC26 through a PTT tone notch filter (to remove any residual PTT tone), and to output transformer T3. The audio's line output is set by potentiometer RV1.

Hardwire PTT

22 An external hardwire PTT facility can be configured through the facilities 2 connector, and can be set to respond to a ground, or high (nominally 6 V dc) signal (refer to para 10). The signal is connected to the CPU through IC13e and IC11.

CPU Circuit

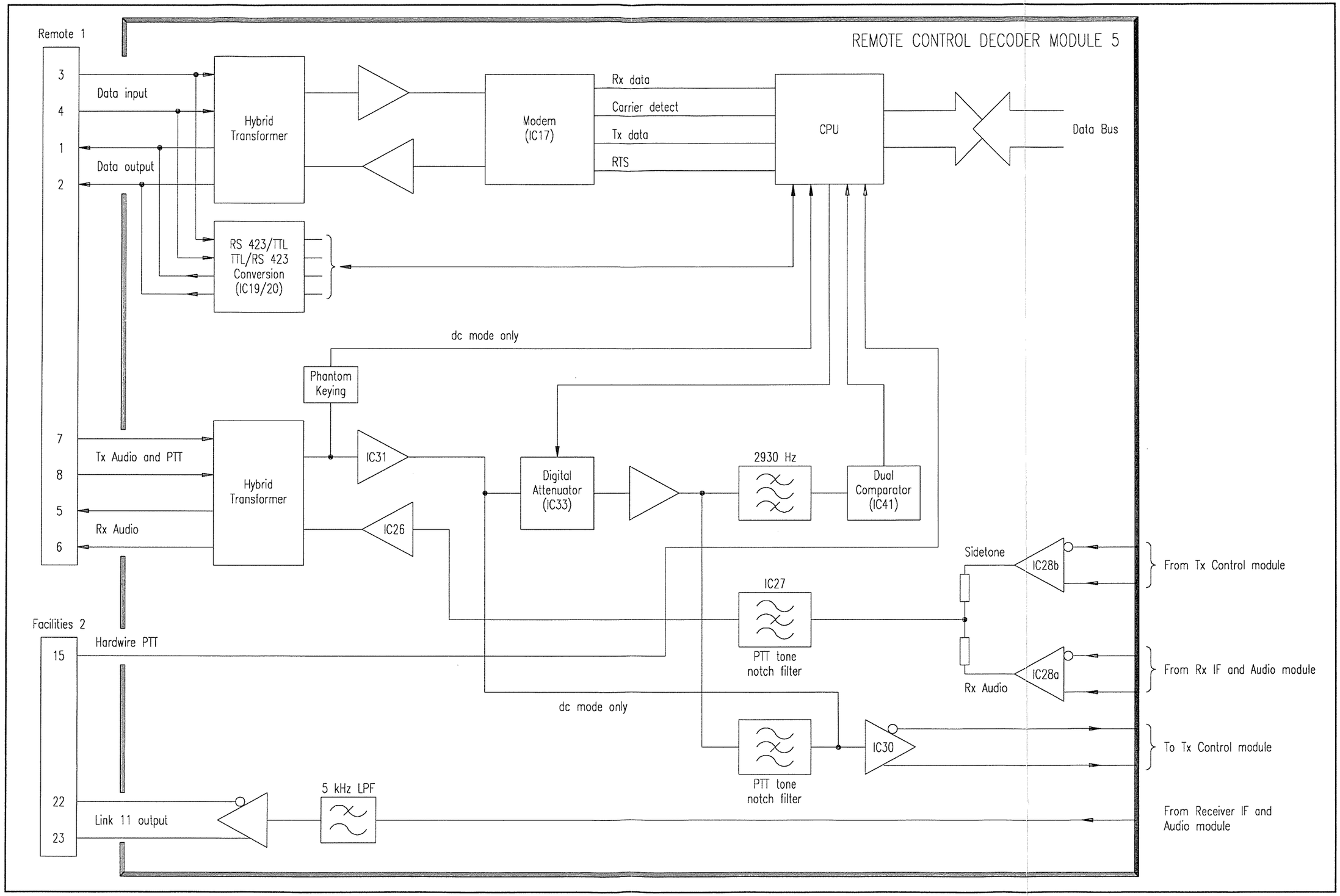
23 The decoder's CPU circuit is designed around an 8031 8-bit microprocessor IC1. Non-volatile EPROM IC2 contains the program instructions, and IC3 is a 6116 static RAM.

24 The EPROM IC2 and RAM IC3 are addressed through the same address lines from port 0 and port 2 of the microprocessor; the low address lines (port 0) are isolated by latch IC4. Address latch enable (ALE) IC1 pin 30 activates the low address latch IC4 during memory addressing cycles, while program store enable (PSEN) IC1 pin 29 strobes the program memory of IC2.

Link 11 Output

25 It should be noted that the Link 11 output circuitry does not form part of the remote decoder operation; the circuit is fitted to this module for design convenience.

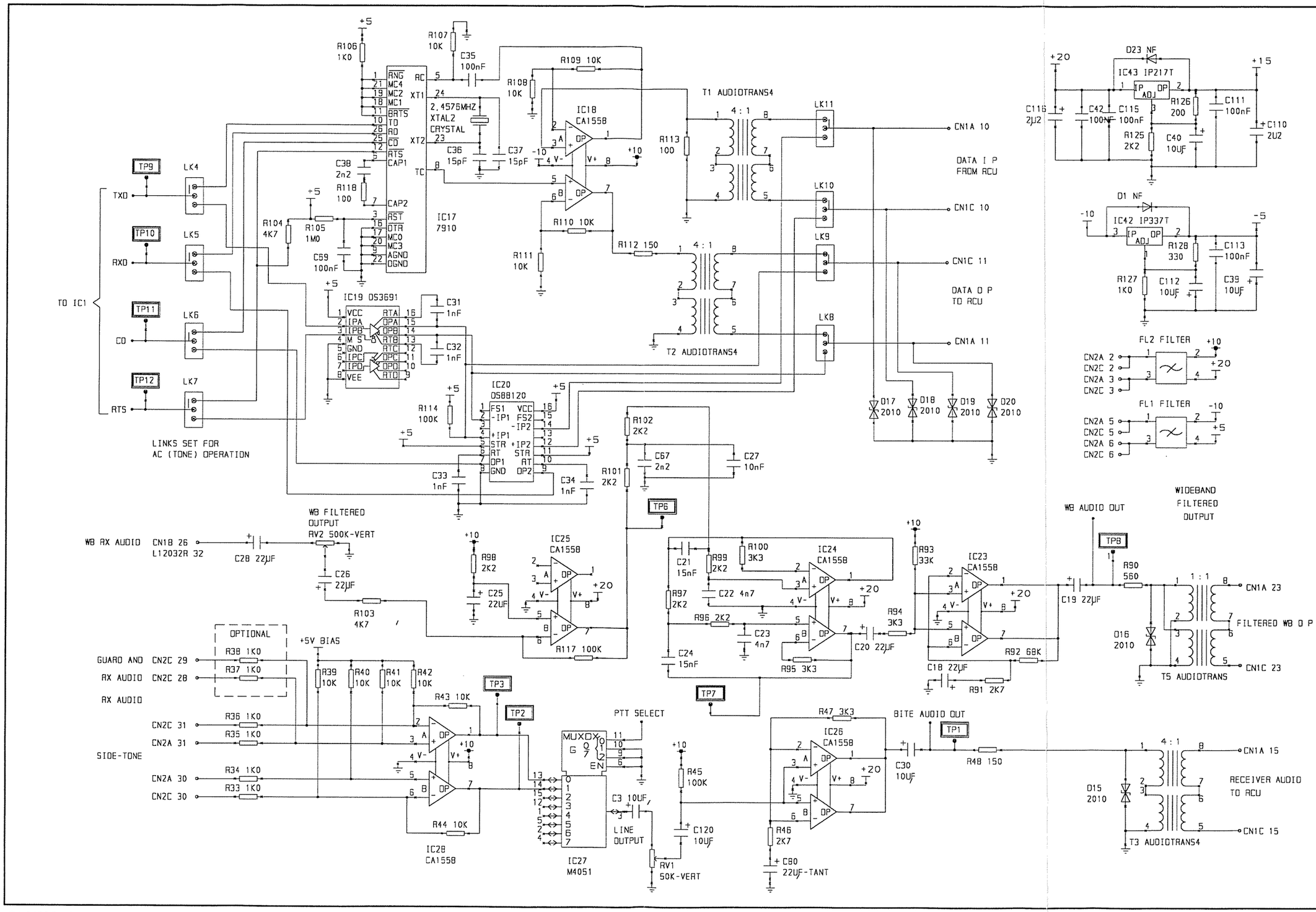
26 A wideband (Link 11) audio output is connected from the receiver IF and audio module and applied to amplifier IC25. The signal is routed to output transformer T5 through a 5 kHz low-pass filter IC23 and IC24. From T5, the signal is connected to the facilities 2 connector pins 22 and 23. RV2 adjusts the output level and is factory set to 0 dBm for a received signal modulated to ±10 kHz deviation.



GA5907 Iss. 2

Remote Control Decoder - Schematic Diagram

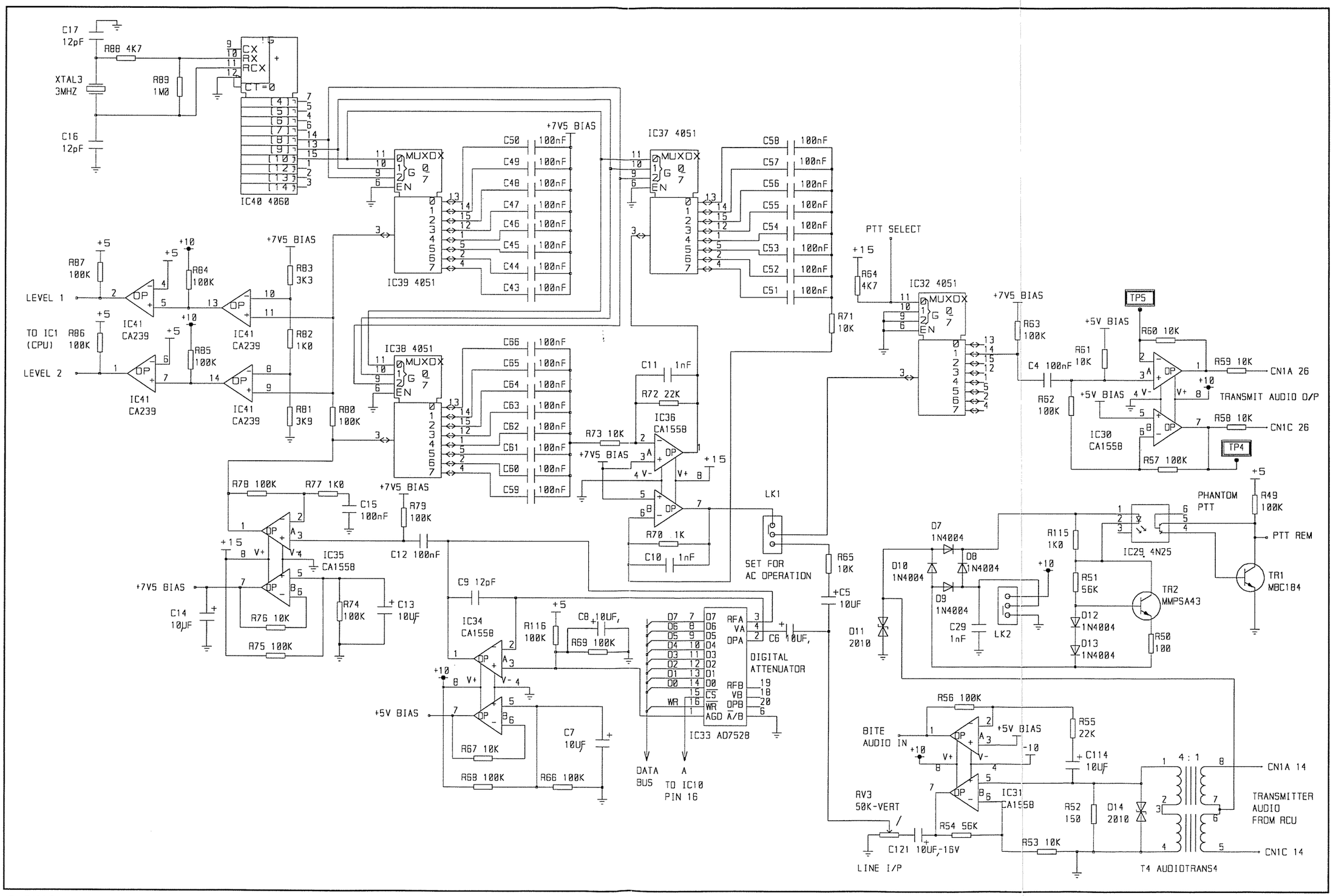
Fig. 3-5-1



GA5482 Iss.2

Remote Control Circuit
Sheet 1 of 3

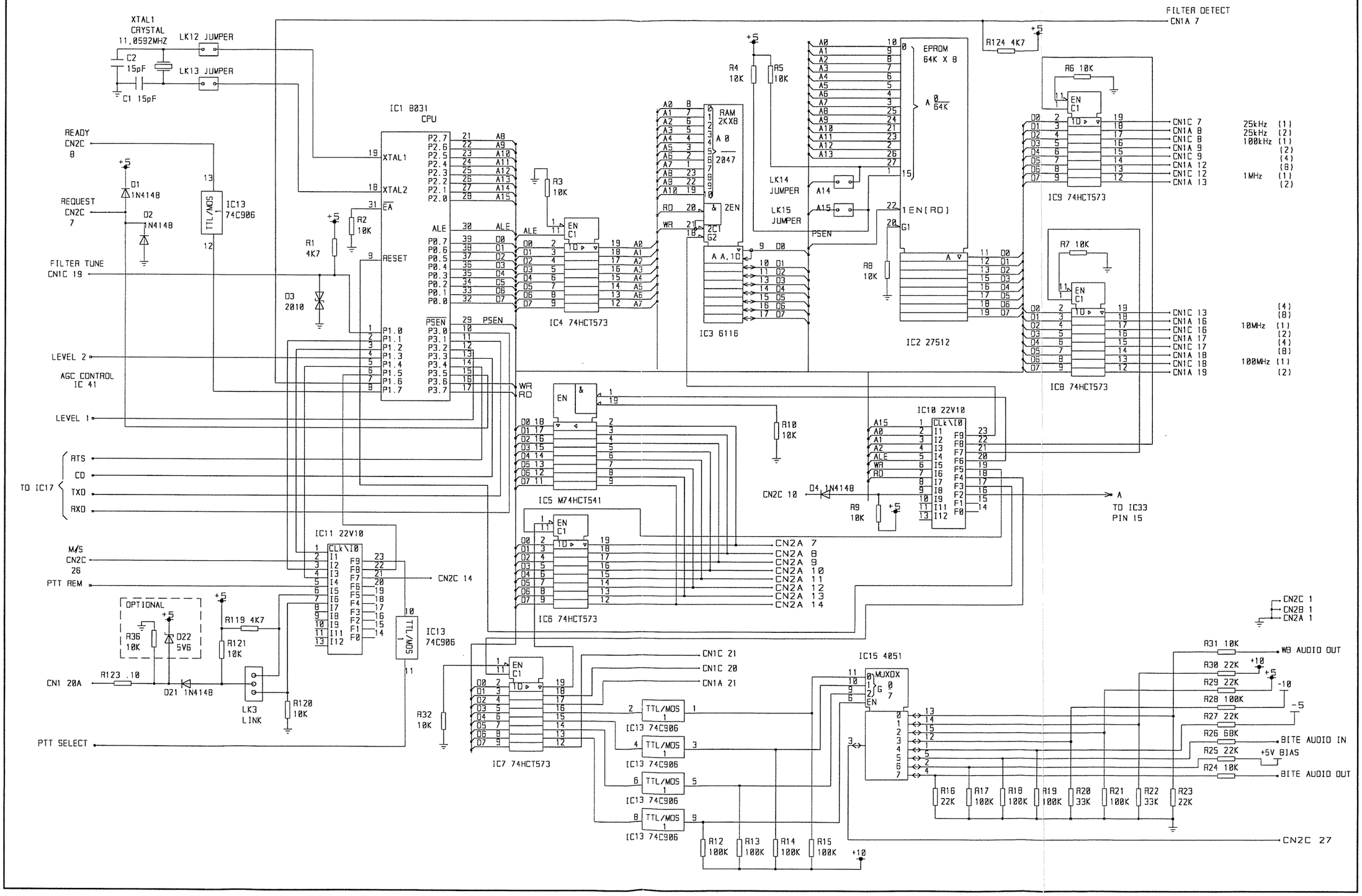
Fig. 3-5-2



GA5483 Iss. 2

Remote Control Circuit
Sheet 2 of 3

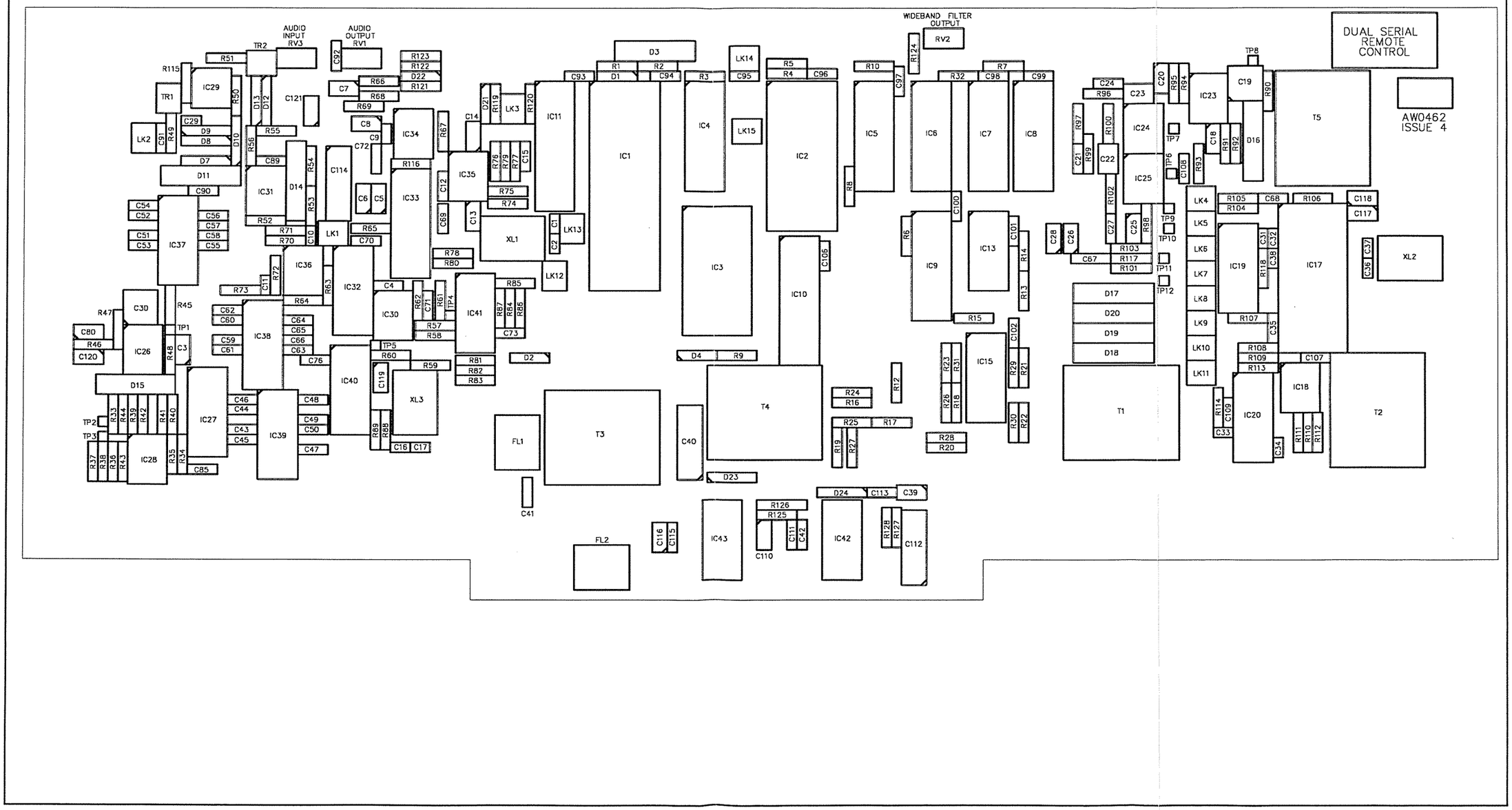
Fig. 3-5-3



GA5934 Iss. 3

Remote Control Circuit
Sheet 3 of 3

Fig. 3-5-4



GA5915 Iss. 1

Remote Control Module Layout

Fig. 3-5-5

Paragraph

1 Introduction
ACCESS/REMOVAL OF MODULES AND ASSEMBLIES
2 Preliminary
4 Plug-in modules
5 Front panel assemblies
6 Front panel removal
9 BITE assembly
10 Hinged rear panel (PSU access)
11 PSU PCB
12 Access
13 Removal
17 RF power amplifier assembly
18 Access
22 Removal
23 Refitting
24 Filter/coupler assembly
25 Access
29 Removal
30 Refitting
31 Main interconnection assembly
32 Access
33 Removal
38 Front interconnection assembly
39 Access
40 Removal
MAINTENANCE
44 Test equipment
45 Preventative maintenance
46 Filter cleaning
50 Frequency accuracy check
53 Synthesiser reference frequency adjustment
54 Receiver performance checks
55 Signal to noise ratio
62 AGC characteristics
68 AM audio distortion
71 FM audio distortion
73 Audio frequency response
76 Mute performance
81 Transmitter performance checks
82 Transmitter power output
85 Modulation depth, distortion and frequency response
ALIGNMENT
90 Transmitter
91 Transmitter power supply reference voltage adjustment
95 FET driver amplifier quiescent current adjustment
110 Analogue multiplier (IC31) adjustment
120 RF clipper adjustment

127 Peak modulation depth adjustment
137 Receiver
138 AGC
151 AM/FM audio levels
159 VOGAD
165 Noise blanker
171 Tape output
176 Wideband audio output
181 Synthesiser

Figure

4-1 Hinged rear panel retaining screws location diagram GA8331
4-2 Heatsink retaining screws location diagram GA5910

INTRODUCTION

1 This section details the removal and refitting of modules and assemblies alignment procedures of the 3000 Series T/Rs. During any maintenance or alignment the following warnings and cautions should be adhered to.

WARNINGS ...

(1) **WHEN AC AND/OR DC SUPPLIES ARE CONNECTED, LETHAL VOLTAGES ARE PRESENT IN THE EQUIPMENT. CARE MUST BE TAKEN TO AVOID ACCIDENTAL CONTACT WITH EXPOSED CIRCUITRY WHEN THE EQUIPMENT'S COVERS ARE REMOVED.**

(2) **THE 3000 SERIES T/Rs CONTAINS COMPONENTS INCORPORATING THE HIGHLY TOXIC MATERIAL BERYLLIUM AND/OR ITS OXIDE BERYLLIA. THESE MATERIALS ARE ESPECIALLY HAZARDOUS IF:**

(a) BERYLLIUM MATERIALS ARE ABSORBED INTO THE BODY TISSUES THROUGH THE SKIN, MOUTH OR WOUND.

(b) THE DUST CREATED BY BREAKAGE OF BERYLLIA IS INHALED.

(c) TOXIC FUMES ARE INHALED FROM BERYLLIA/BERYLLIUM INVOLVED IN A FIRE.

(3) **THE 3000 SERIES T/Rs CONTAINS LITHIUM BATTERIES. THESE BATTERIES PRESENT A DANGER OF EXPLOSION IF INCORRECTLY CONNECTED OR CHARGED. BATTERIES MUST BE DISPOSED OF IN ACCORDANCE WITH CURRENT REGULATIONS. LITHIUM BATTERIES MUST NOT BE PUNCTURED, PIERCED OR INCINERATED.**

CAUTIONS ...

(1) **The 3000 Series T/Rs use solid-state circuits. Care must be taken when using test equipment to avoid applying excessive voltages.**

(2) **Care must be taken to avoid applying excessive heat when desoldering or soldering components on printed circuit boards. It is recommended that the equipment is isolated from the supply source before removing or refitting any modules, assemblies or components.**

(3) **Electrostatic sensitive devices are used within the equipment. The correct handling precautions must be observed to avoid static charges which may damage these devices.**

ACCESS/REMOVAL OF MODULES AND ASSEMBLIES

PRELIMINARY

2 The following paragraphs detail the procedure for gaining access to, and removal of, the modules and assemblies that comprise the 3000 Series T/Rs.

3 If the equipment is installed within an Anti-Vibration Mount Assembly, the mounts must be removed to gain access to the rear PSU compartment and bottom panel. If fitted with a Free Standing Kit the following items must be removed to gain access to the rear PSU compartment and plug-in modules.

- Top cover.
- Right and left side covers.

PLUG-IN MODULES

4 To access the plug-in modules, remove the top cover by locating and unscrewing the 12 x M4 crosshead retaining screws. At the front and rear of the modules, locate and release the 2 mm retaining screws sufficiently to allow removal of the module. To unlock turn in an anti-clockwise direction and to lock turn in a clockwise direction. Refitting is the reverse of removal.

FRONT PANEL ASSEMBLIES

5 The front panel pcb assemblies are interconnected to the BITE assembly through individual 16 way ribbon cable connectors; prior to their removal, the orientation and location, on the BITE PCB, must be noted.

Front Panel Removal

6 Locate and remove the 8 retaining screws from the Mainframe front panel assembly and carefully move the panel away from the unit. Locate and disconnect the dual in line connectors from CN22 and CN23 and the 16-way ribbon cable connectors by gently pushing the black retaining clip outwards and pulling the connector straight outwards.

7 To completely remove the panel, the AC SUPPLY ON/OFF switch can be removed by undoing the retaining nut and removing the switch or unsoldering the wires to the switch, noting their positions.

8 Refitting of the front panel module is the reverse of removal.

BITE ASSEMBLY

9 The BITE assembly is located behind the front panel assembly. Access is by removing the front panel assembly as detailed in paras. 6 and 7 and removal is as follows:

(a) Remove the dual in line connector from CN12.

(b) Remove the dual in line connector from CN24

(b) Locate and remove the six crosshead retaining screws.

(c) The BITE assembly can now be disconnected from the Front Interconnection assemblies 64 way connector and removed from the unit.

(d) Refitting is the reverse of removal.

HINGED REAR PANEL (PSU ACCESS)

10 Access to the power supply circuit PCB and associated components is through a hinged rear panel as follows:

(a) With reference to Fig. 4-1 locate and remove the 11 crosshead retaining screws (marked B).

(b) Carefully hinge the rear panel down to gain access to the PSU compartment.

PSU PCB

11 The power supply unit regulator PCB is located at the rear of the unit within the PSU compartment, (refer to Fig. 3-1-13).

Access

12 To gain access to the regulator PCB the rear panel must be hinged down as previously detailed.

Removal

13 To remove the PCB locate and disconnect the DIL connectors CN1, CN2, CN7 and the push fit connectors CN3, CN4 and CN6.

14 At the left hand edge of the PCB, looking from the rear, locate and remove the 3 crosshead retaining screws.

15 At the heatsink located on the right hand edge of the PCB, looking from the rear, locate and remove the three M4 x 12 mm Allen bolts securing the assembly to the heatsink using an appropriate Allen key, then remove two M3 x 6 mm bolts and nuts. The PCB can now be removed from the unit.

16 Refitting is the reverse of removal.

RF POWER AMPLIFIER ASSEMBLY

17 The RF Power Amplifier assembly is mounted on the right hand heatsink, viewed from the front of the unit, and may be hinged down or removed as follows:

Access

18 Remove the top cover as previously detailed under the heading plug-in modules. On the underside of the T/R, directly below the RF Power Amplifier assembly, locate and remove the 4 crosshead screws securing the heatsink to the base plate.

19 Hinge down the rear panel, as previously detailed under the heading hinged rear panel (PSU access), to gain access to the rear heatsink fixing screws. At the front of the unit remove the mainframe front panel assembly, as previously detailed.

20 Using Fig. 4-2 as a guide, locate and remove the M4 x 8 mm Allen bolts, marked 1 to 5 on the diagram, from the front and rear chassis. (Note that the rear chassis has only 1 to 4). The sixth front and rear fixing screws remain to provide the hinge.

21 Loosen the remaining front and rear fixing screw sufficiently to allow the heatsink to be carefully hinged down permitting access to the RF Power Amplifier assembly. Access to the circuit components is by removal of the 4 crosshead retaining screws from the top covers.

Removal

22 At the base of the RF Power Amplifier assembly locate and remove the external connectors, noting their positions. Remove the two remaining front and rear M4 x 8 mm Allen bolts. The assembly can now be removed from the unit.

Refitting

23 Refitting is the reverse of removal; extreme care should be taken to ensure that no cables become trapped between the heatsink and the base of the unit.

FILTER/COUPLER ASSEMBLY

24 The Filter/Coupler assembly is mounted on the left-hand heatsink, viewed from the front of the unit, and may be hinged down or removed as follows:

Access

25 Remove the top cover as previously detailed under the heading plug-in modules. On the underside of the T/R, directly below the filter/coupler assembly, locate and remove the 4 crosshead screws securing the heatsink to the base plate.

26 Hinge down the rear panel as previously detailed under the heading hinged rear panel (PSU access), to gain access to the rear heatsink fixing screws. At the front of the unit remove the front panel assembly as previously detailed.

27 Using Fig. 4-2 as a guide, locate and remove the M4 x 8 mm Allen bolts, marked 1 to 5 in the diagram, from the front and rear of the chassis.

Note ...

The three Allen bolts removed from the PSU's PCB heatsink are M4 x 12 mm.

28 Loosen the remaining front and rear fixing bolt sufficiently to allow the heatsink to be carefully hinged down, permitting access to the filter/coupler components and RF PA regulator PCB.

Removal

29 Locate and remove all external connectors, noting their positions. Remove the two remaining front and rear M4 x 8 mm Allen bolts. The assembly can now be removed from the unit.

Refitting

30 Refitting is the reverse of removal; extreme care should be taken to ensure that no cables become trapped between the heatsink and the base of the unit.

MAIN INTERCONNECTION ASSEMBLY

31 The main interconnection assembly is located on the base of the unit towards the rear and can be accessed or removed as follows:

Access

32 Remove the top cover and all the installed plug-in modules as previously detailed.

Removal

33 Hinge down the rear panel as previously detailed under the heading hinged rear panel (PSU access) to gain access to the 64-way connector of the main interconnection assembly located centrally at the bottom rear of the PSU compartment.

34 Locate and remove the dual in line connector, CN2, from the PSU PCB within the PSU compartment.

35 Carefully disconnect the 64-way connector from the Main Interconnection assembly.

36 At the main interconnection assembly, disconnect the 5-pin DIL connector from the PCB, and the ribbon cable connector from CN1 on the regulator PCB located on the filter/coupler assembly.

37 At the main interconnection assembly PCB, locate and remove the pairs of crosshead screws that secure the 64-way connectors including the pair located below the RF power amplifier assembly. The main interconnection assembly can now be removed from the unit. Refitting is the reverse of removal.

FRONT INTERCONNECTION ASSEMBLY

38 The front interconnection assembly is located on the base of the unit towards the front of the equipment, and can be accessed or removed as follows:

Access

39 Remove the top cover and all the installed plug-in modules as previously detailed.

Removal

40 Remove the BITE assembly as previously detailed. This releases the front interconnection PCBs 64-way connector.

41 Hinge down the left-hand heatsink, as viewed from the front of the unit.

42 At the front interconnection assembly PCB, locate and remove the pairs of crosshead screws that secure the 64-way connectors, including the pair accessed by lowering the filter/coupler assembly.

43 The front interconnection PCB with attached ribbon cable connector can now be removed from the unit. Refitting is the reverse of removal.

MAINTENANCE

TEST EQUIPMENT

44 The following test equipment is recommended for maintenance and alignment procedures:

- RF signal generator (up to 400 MHz).
- AC voltmeter (with dB scale).
- Oscilloscope.
- Frequency counter (10 mV sensitivity).
- Multimeter.

- RF millivoltmeter (50 ohms).
- 30 dB, 50 ohms RF attenuator 60 watts minimum.
- Audio generator (600 ohms).

PREVENTATIVE MAINTENANCE

45 Preventative maintenance on a 3000 Series T/R consists of cleaning the air filter and checking the frequency. The recommended periodicity for these tasks is every 6 months.

Filter Cleaning

46 Ensure that the T/R has been isolated from the supply source.

47 At the rear of the unit, locate and remove the four screws that secure the fan filter housing to the rear panel (see Fig. 4-1).

48 Remove the filter housing and filter. Clean the filter, either by using a low pressure air supply or washing in warm water and leaving to dry. If necessary replace with a new filter (PAE Part No. 51-00507867).

49 Refit filter and filter housing.

Frequency Accuracy Check

50 Connect a digital frequency counter through a 30 dB attenuator to the rear panel N-type antenna connector (with 3050 TRs connect to the UHF antenna connector).

51 At the synthesiser front panel, select a frequency of 155 MHz (3010 TR) or 399 MHz (3030 and 3050 TRs) and key the transmitter. Check that the frequency indicated in the frequency counter is between 154.999 and 155.001 (3010 TR) or 398.999 and 399.001 MHz (3030 and 3050 TRs).

52 If the frequency specification is not met, then adjustment of the reference frequency in the synthesiser module will be necessary.

SYNTHESISER REFERENCE FREQUENCY ADJUSTMENT

53 This task should be carried out when the frequency accuracy check proves out of specification.

(a) Ensure that the T/R has been isolated from the supply source.

(b) Connect a digital frequency counter through a 30 dB attenuator to the rear panel N-type antenna connector (with 3050 TRs connect to the UHF antenna connector).

(c) To access the Synthesiser module remove the top cover. To access the frequency adjustment control TC01 it will be necessary to remove the modules in module position 4, 5 and 6 if installed, or if available, use an extender card (PAE Part No. 24-24003000).

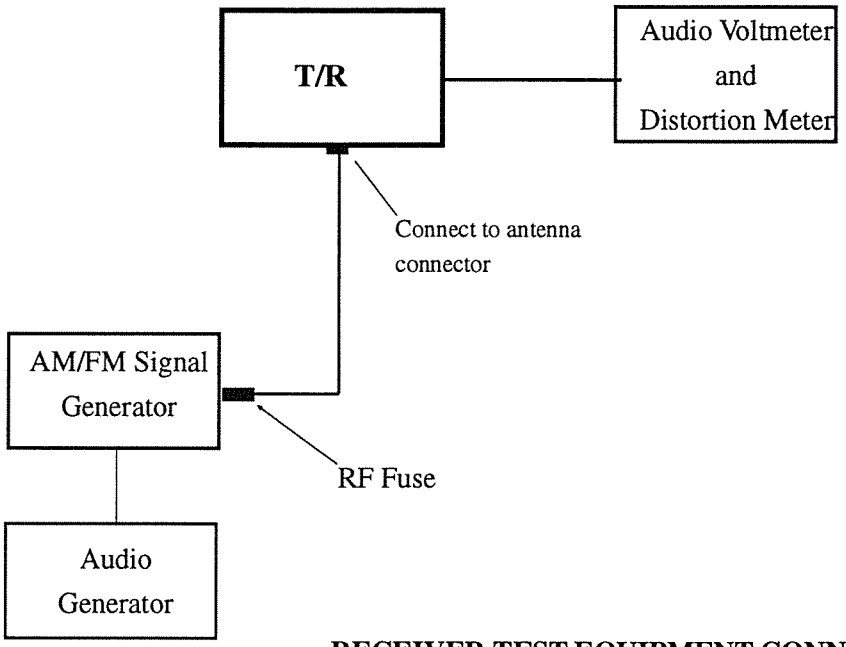
(d) Reconnect the supply source to the T/R, and at the synthesiser front panel select a frequency of 155 MHz (3010 TR) or 399 MHz (3030 and 3050 TRs). Operate the

PTT function on the Tx front panel and adjust TC01 until the reading in the digital frequency counter is within 1 kHz of the selected frequency.

(e) On completion of the adjustment isolate the T/R from the supply, remove the frequency counter, reconnect the antenna, refit any removed modules and refit the top cover.

RECEIVER PERFORMANCE CHECKS

54 For the receiver performance checks connect the test equipment as shown in the Receiver Test Equipment Connection diagram, and remove the top cover to allow access to the plug-in modules:



RECEIVER TEST EQUIPMENT CONNECTION

Signal to Noise Ratio

55 Isolate the T/R from the supply.

56 On the rear panel, the RF signal generator should be connected to the antenna connector (on 3050 TRs the RF signal generator should be connected to either the VHF or UHF antenna connector as appropriate to the frequency that the check is to be carried out on.

57 Remove the IF and audio module, locate and set the VOGAD on/off link (LK12) to the off position. Refit the module.

58 Reconnect the supply to the T/R, and at the synthesiser front panel select a suitable frequency.

59 Set the RF signal generator as follows:

(a) The frequency to that selected on the equipment.

(b) For AM: -101 dBm (2 μV pd) 30% modulated at 1 kHz.

(c) For FM: -107 dBm (1 μV pd) with 3.5 kHz deviation at 1 kHz.

60 At the Rx front panel, set the MUTE switch to its defeat position (off) and measure the receiver audio output line level on the remote connector.

61 Switch the RF signal generator modulation off and confirm that the audio output level is reduced by at least 10 dB.

AGC Characteristics

62 Isolate the T/R from the supply.

63 Remove the IF and audio module, and confirm that the VOGAD on/off link (LK12) is set to the off position. Refit the module and reconnect the supply to the T/R.

64 Set the RF signal generator to -101 dBm (2 μV pd) modulated 30% at 1 kHz. Note the audio output reading.

65 Increase the RF signal generator output to +10 dBm (700 mV pd) and check that the audio output remains within 3 dB of the level noted in the previous paragraph.

66 Isolate the T/R from the supply, remove the IF and Audio module and set the VOGAD on/off link (LK12) to the on position. Refit the module and reconnect the supply to the T/R.

67 Set the RF signal generator to -47 dBm (1 %V pd). Vary the modulation depth from 0 to 90% and confirm that the receiver audio output remains constant within 1 dB for modulation depths above 30%.

AM Audio Distortion

68 Set the RF signal generator to -47 dBm (1 mV pd) modulated 30% at 1 kHz. Set the VOGAD on/off link (LK12) to the off position.

69 Using the distortion meter, confirm that the distortion is less than 5%.

70 Increase the RF signal generator modulation to 80% and confirm that the distortion reading is less than 5%.

FM Audio Distortion

71 Set the RF signal generator to -47 dBm (1 mV pd) with a 3.5 kHz deviation at 1 kHz. At the front panel select FM. Set the VOGAD on/off link to the off position.

72 Using the distortion meter, confirm that the distortion is less than 5%.

Audio Frequency Response

73 Set the RF signal generator to -47 dBm (1 mV pd) modulated 30% at 1 kHz. At the front panel select AM.

74 Vary the modulation frequency between 300 Hz and 3400 Hz and check that the receiver audio output level remains within ±3 dB.

75 Reconnect the audio meter to the data output, vary the modulation frequency between 25 Hz to 20 kHz, and check that the data output level remains within ±3 dB.

Mute Performance

76 Set the RF signal generator output to off.

77 At the Rx front panel set the MUTE switch to the on position, and the loudspeaker to on (VOL control pushed in and set to the mid position).

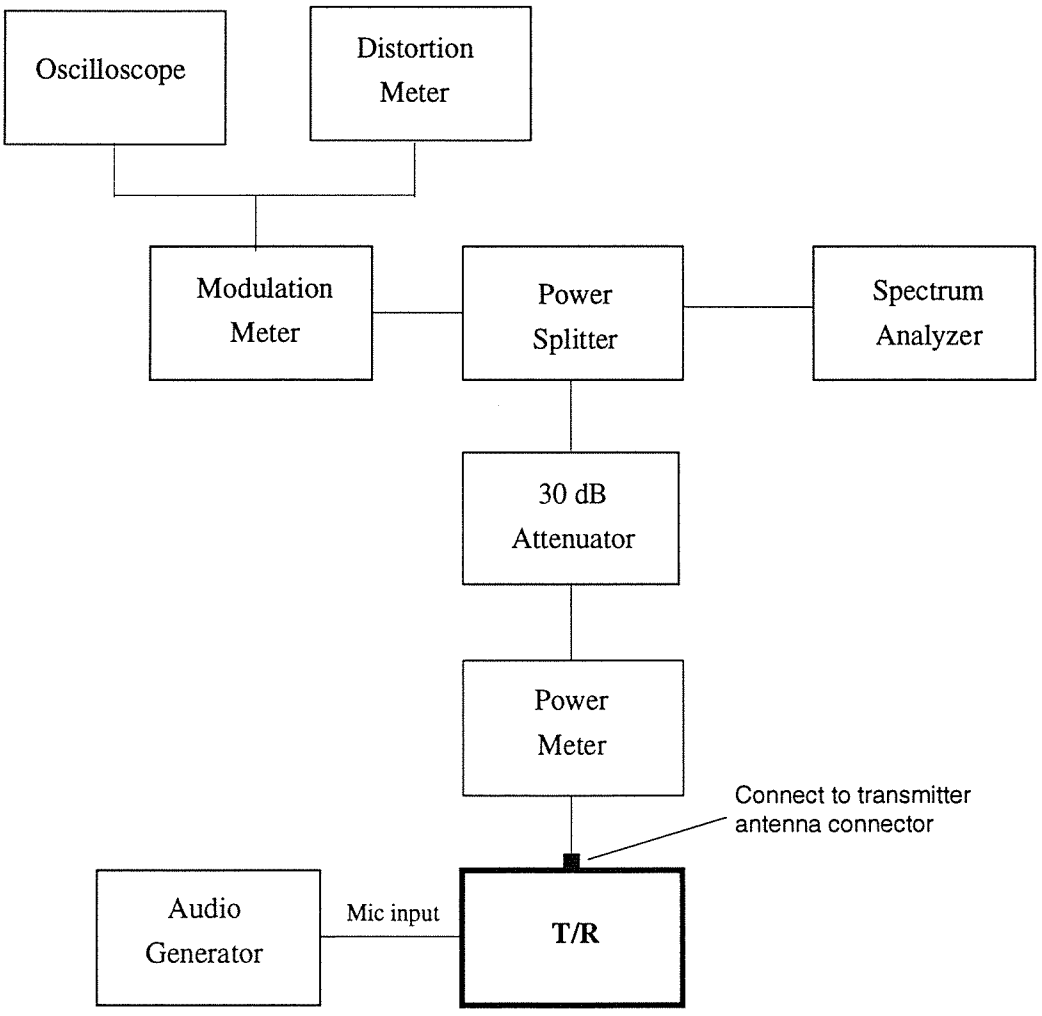
78 Adjust the SET MUTE control slowly until the receiver noise is just silenced.

79 Gradually increase the RF signal generator output until the mute is just opened, check that the signal generator output level is less than -113 dBm (0.5 µV pd).

80 Adjust the SET MUTE control ten turns clockwise, increase the RF signal generator output until the mute is just opened. Check that the signal generator output level is grater than -99 dBm (2.5 µV).

TRANSMITTER PERFORMANCE CHECKS

81 For the transmitter performance checks, connect the test equipment as shown in the Transmitter Test Equipment Connection diagram, and remove the top cover to allow access to the plug-in modules:



TRANSMITTER TEST EQUIPMENT CONNECTION

Transmitter Power Output

82 At the synthesiser front panel set the AM/FM mode select switch to AM.

83 At the Tx front panel operate the PTT switch and check the output power indicated in the RF power meter is 40 W. Release the PTT switch.

84 At the synthesiser front panel, select FM. Operate the PTT switch and check the output power indicated in the RF power meter is 60 W. Release the PTT switch.

Modulation Depth, Distortion and Frequency Response

85 Isolate the T/R from the supply. Remove the Tx control module, locate the VOGAD on/off jumper and set it to the on position. Locate and set the MIC GAIN control RV1 fully clockwise. Refit the module and reconnect the supply to the T/R.

86 Connect the audio signal generator to the mainframe front panel MIC socket, pins 1 and 6, set to a frequency of 1 kHz at an output of 10 to 100 mV.

87 Operate the PTT switch and check that the modulation depth is as required.

88 Check that the distortion indicated in the distortion meter is less than 5%.

89 Adjust the frequency output of the audio generator between 300 Hz and 3400 Hz and check that the frequency response is within +1.5 dB, -3 dB reference to 1 kHz.

ALIGNMENT

TRANSMITTER

90 The following alignment procedures should only be carried out after changing associated components or settings:

WARNING ...

THE HIGHLY TOXIC MATERIAL BERYLLIUM/BERYLLIA IS CONTAINED IN THE RF POWER AMPLIFIER ASSEMBLY. THESE MATERIALS ARE HAZARDOUS IF THEY ARE ABSORBED INTO THE BODY TISSUES THROUGH THE SKIN, MOUTH OR A WOUND.

Transmitter Power Supply Reference Voltage Adjustment

91 Isolate the T/R from the supply. Remove the top cover and Tx Control module (position 2).

92 On the power regulator assembly, mounted on the left-hand heatsink, (viewed from the front of the unit) locate TR20 and RV1. Connect a digital voltmeter between the centre pin of TR28 and ground.

93 Reconnect the supply to the T/R and check that the voltmeter reads 25 V dc. If not, adjust RV1 until the voltmeter reads 25 V dc.

94 Isolate the T/R from the supply. Remove the voltmeter, and refit the Tx control module and top cover. Restore the T/R to the required operational condition.

FET Driver Amplifier Quiescent Current Adjustment

95 Isolate the T/R from the supply. Remove the top cover and the Tx control module (position 2).

96 On the Tx control module locate and set jumper J6 to the on position. Refit the Tx control module.

97 Hinge down the right hand heatsink (viewed from the front of the unit), as previously detailed, to gain access to the RF Power Amplifier assembly. Remove the PA top cover(s) and disconnect the RF connector nearest the front of the set to remove RF drive.

Set VHF Driver (3010 and 3050 TRs)

98 Using the appropriate location diagrams in section 3 locate the following components:

VHF driver - LK1, LK2, LK3, RV1, RV2 and RV3

VHF PA - RV4 and RV5

99 To set TR1 bias replace LK1 with a milliammeter. Reconnect the supply to the T/R and operate the PTT switch on the Tx front panel.

100 Adjust RV1, if necessary, until the meter reads 50 mA ±10%. Release the PTT switch. Isolate the TR from the supply then remove the meter and replace the link LK1.

101 To set TR2 and TR3 repeat the TR1 procedure But with LK2/RV2 and LK3/RV3 respectively and adjust each control, if necessary, until the meter reads 100 mA ±10%. After each adjustment/check, isolate the TR from the supply, remove the meter and replace the link.

Set VHF PA Devices TR6/TR7 (3010 and 3050 TRs)

102 To set TR6, isolate the TR from the supply. Open the supply link to the C55 feedthrough on the PA loom and connect a milliammeter in series. Re-apply the supply. Operate PTT and adjust RV4 for 100 mA.

103 To set TR7 repeat the procedure but with C56/RV5.

104 Refit the VHF PA top cover. On the 3010 TR only, remove the Tx control module and set jumper J6 to the off position, refit the module, reconnect the RF connector to the PA assembly, then refit the right hand heatsink assembly and and top cover.

Set UHF Driver (3030 and 3050 TRs)

105 Using the appropriate location diagram in section 3 locate the following components:

UHF driver 1 - R16/RV1, R17/RV2 and R18/RV3.

106 Connect a digital voltmeter across the 1 ohm resistor (R16) which is in series with the drain choke of the drive FET (TR1). Reconnect the supply to the T/R and operate the PTT switch on the Tx front panel.

107 Ensure that a reading of 90 mV ±10% is obtained in the voltmeter, adjusting the associated gate potentiometer (RV1) if necessary. Release the PTT switch.

108 Repeat the procedure with R17/RV2 and R18/RV3 but set for 300 mV ±10%, for the other driver FETs' quiescent currents.

109 On completion, isolate the T/R from the supply. Remove the voltmeter. Refit the UHF PA top cover, reconnect the RF connector to the PA assembly and refit the right hand heatsink assembly. Remove the Tx control module and set jumper J6 to the off position. Refit the module and top cover

Analogue Multiplier (IC31) Adjustment

110 Isolate the T/R from the supply. Remove the top cover and the Tx control module (position 2). Locate and disconnect the 6-pin SIL connector CN3 from the main interconnection assembly.

111 Fit an extender card (PAE Part No. 24-24003000) to module position 2 and refit the Tx control module to the extender card.

112 On the Tx control module, locate test points TP10/TP44/TP45, jumpers J4/J6, and potentiometers RV11 to RV14. Set J4 to the off position and set J6 to the on position.

113 At the Tx front panel, turn the SET POWER control fully clockwise.

114 Connect an oscilloscope to TP10. Reconnect the supply to the T/R. Inject a signal of 1 kHz at 2 V (p-p), through a 100 nF capacitor to TP45. Check that a null reading is obtained in the oscilloscope; adjust RV12 as necessary.

115 Remove the signal from TP45 and connect it to TP44. Check that a null reading is obtained in the oscilloscope; adjust RV11 as necessary. Remove the signal from TP44.

116 Check that a reading of -0.03 V is obtained on TP10; adjust RV14 as necessary.

117 Set jumper J4 to the on position. Operate the PTT function on the Tx front panel and check that a reading of 1 V is obtained on TP10 (adjusting RV13 as necessary). Release the PTT switch.

118 On completion isolate the T/R from the supply set J6 to the off position. Remove the Tx control module and the extender card. Reconnect the single in line connector CN3, refit the Tx control module and the top cover.

119 Restore the T/R to the required operational condition.

RF Clipper Adjustment

120 Isolate the T/R from the supply, remove the top cover and the Tx control module (position 2). Fit an extender card (PAE Part No. 24-24003000) to module position 2 and refit the Tx control module to the extender card.

121 On the Tx control module, locate the components RV2, RV7, L1 and L2. Reconnect the supply to the T/R, and at the synthesiser front panel select LOCAL operation.

122 Connect a signal of 1 kHz at 10 mV to the MIC socket (pins 1 and 6) located on the mainframe front panel. At the Tx front panel, select MOD, and operate the PTT function. Note the reading in the monitor display.

123 At the Tx control module adjust the narrow-band MOD control (RV2) for a reading of 50% in the monitor display. Adjust L1 and L2 for a maximum reading in the monitor display.

124 Adjust RV2 for maximum, but not exceeding 90%. Where adjustment of RV2 would exceed 90% use RV7 to reduce the reading in the monitor display, until adjusting RV2 for maximum does not exceed 90%. Release the PTT function.

125 Isolate the T/R from the supply. Remove the signal from the MIC socket, the Tx control module and extender card. Refit the Tx control module and top cover.

126 Restore the T/R to the required operational condition.

Peak Modulation Depth Adjustment

127 Isolate the T/R from the supply, remove the top cover and the Tx Control module (position 2). Fit an extender card (PAE Part No. 24-24003000) to module position 2 and refit the Tx control module to the extender card.

128 On the Tx control module, locate the following components: RV1, RV5, RV6, RV8, RV10 and test point TP19. Connect a modulation meter, through an appropriate load, to the antenna output, and an oscilloscope to TP19.

129 Reconnect the supply to the T/R.

130 Inject a signal of 1 kHz at 10 mV into the MIC socket (pins 1 and 6) located on the mainframe front panel. At the synthesiser front panel, select the AM and narrow-band modes.

131 On the Tx control module, turn RV2 fully clockwise, operate the PTT function from the Tx front panel, and adjust RV7 for the maximum required modulation depth (standard 90%) indicated in the monitor display, then set RV2 to 80%. Release the PTT switch.

132 At the synthesiser front panel, select FM mode and operate the PTT function. At the Tx control module, adjust RV5 for the required peak deviation (standard 5.6 kHz) as indicated in the monitor display. Release the PTT switch and remove the signal from the MIC input.

133 At the synthesiser front panel, select the AM and wideband modes. Connect a signal at 1 kHz, +8 dBm, to the facility 2 connector's wideband input (pins 3 and 4).

134 Operate the PTT function, and at the Tx control module adjust RV10 such that the modulation waveform, displayed on the oscilloscope, is just clipping on the peaks. Adjust RV8 for a maximum modulation depth of 90%, as indicated in the monitor display, then adjust RV10 for a modulation depth of 80%. Release the PTT function.

135 At the synthesiser front panel, select FM mode and operate the PTT function. At the Tx control module adjust RV6 for the required peak deviation (standard 20 kHz), release the PTT function.

136 Isolate the T/R from the supply. Remove the test equipment, the Tx control module and the extender card. Refit the Tx control module and top cover. Restore the equipment to the required operational condition.

RECEIVER

137 The following alignment procedures for the receiver module should only be carried out after changing associated components or settings:

AGC

138 Isolate the T/R from the supply, remove the top cover and receiver IF and audio module (position 8). Fit an extender card (PAE Part No. 24-24003000) to module position 8 and refit the receiver IF and audio module to the extender card.

139 At the receiver IF and audio module, locate the following controls and test points: RV5, RV8 to RV10, RV13 to RV15, TP6, TP23, TP24 and TP27 to TP30.

140 Reconnect the supply to the T/R. At the synthesiser front panel, select a frequency of 155.975 MHz (3010 TR) or 399.975 MHz 3010 and 3050 TRs), and at the Rx front panel set the MUTE mode select to the off position.

141 Connect an RF signal generator to the antenna connector (UHF antenna connector for the 3050 TR). Set the signal generator to the following:

(a) For 3010 TRs set to 155.975 MHz, 1 µV pd modulated 30% at 1 kHz and an AF level meter to the receiver audio output.

(b) For 3030 and 3050 TRs set to 399.975 MHz, 1 µV pd modulated 30% at 1 kHz and an AF level meter to the receiver audio output.

142 Set RV11 fully clockwise.

143 Set RV13 fully clockwise, and the front panel loudspeaker to the on position. Note the audio level. Set the RF signal input for a level of 1 mV (pd). Adjust RV14 until the audio level monitored in the front panel loudspeaker stabilises and is clear of distortion. Check that the reading in the AF level meter has not changed by more than 3 dB.

144 With no signal applied to the antenna, adjust RV15 for a level of 0.25 V dc at TP6.

145 Set RV5 fully clockwise.

146 Set the front panel MUTE switch to the off position (defeat), and with no signal input applied adjust RV8 for a reading between 3 V to 4 V dc at TP23.

147 Set the RF signal input for a level of 10 µV pd, and adjust RV9 for a high at TP24 (typically 7 V dc). Check that for input signal levels less than 10 µV pd, TP24 reads 0 V.

148 Turn the front panel MUTE control fully anti-clockwise. Set the RF signal input for a level of 4 µV pd and adjust RV10 for a high at TP27 (typically 8 V).

149 Set the RF signal input for a level of 3 µV and adjust the front panel SET MUTE control until the mute just lifts (or a high, measured at TP27).

150 Isolate the T/R from the supply. Remove the test equipment, receiver IF and audio module and extender card. Refit the receiver IF and audio module and top cover. Restore the equipment to the required operational condition.

AM/FM Audio Levels

151 Isolate the T/R from the supply, remove the top cover and receiver IF and audio module (position 8). Fit an extender card (PAE Part No. 24-24003000) to module position 8 and refit the receiver IF and audio module to the extender card.

152 At the receiver IF and audio module, locate the following controls and test points: RV12, RV16, TP3 and TP4.

153 Reconnect the supply to the T/R. At the synthesiser front panel, select a frequency of 155.975 MHz (3010 TR) or 399.975 MHz (3030 and 3050 TRs) operating on wideband and AM modes.

154 Connect an RF signal generator to the rear panel mounted Rx antenna connector. Set the signal generator to the following:

(a) For 3010 TRs set to 155.975 MHz,1 mV pd modulated 30% at 1 kHz and an AF level meter to TP3. Note the reading in the meter.

(b) For 3030 and 3050 TRs set to 399.975 MHz, 1 mV pd modulated 30% at 1 kHz and an AF level meter to TP3. Note the reading in the meter.

155 At the synthesiser front panel, select FM mode and set the modulation on the RF signal generator to 3 kHz deviation. Adjust RV12 for a reading in the AF level meter as that noted in the previous paragraph.

156 At the synthesiser front panel, select AM and narrow-band modes. Remove the AF level meter from TP3 and connect to TP4. Note the reading in the meter.

157 At the synthesiser front panel, select FM mode and set the modulation on the RF signal generator to 2.1 kHz deviation. Adjust RV16 for a reading in the AF level meter the same as that noted in the previous paragraph.

158 Isolate the T/R from the supply. Remove the test equipment, receiver IF and audio module and extender card. Refit the receiver IF and audio module and top cover. Restore the equipment to the required operational condition.

VOGAD

159 Isolate the T/R from the supply, remove the top cover and receiver IF and audio module (position 8). Fit an extender card (PAE Part No. 24-24003000) to module position 8 and refit the receiver IF and audio module to the extender card.

160 At the receiver IF and audio module locate the following controls, switches and test points: RV7, link LK12 and TP1.

161 Reconnect the supply to the T/R. At the synthesiser front panel, select a frequency of 155.975 MHz (3010 TR) or 399.975 MHz (3030 and 3050 TRs). Connect an RF signal generator to the rear panel mounted antenna connector (UHF antenna connector for the 3050 TR). Set the signal generator to the following:

(a) For 3010 TR set to 155.975 MHz, 1 mV pd modulated 30% at 1 kHz and an AF level meter to TP1

(b) For 3030 and 3050 TRs set to 399.975 MHz, 1 mV pd modulated 30% at 1 kHz and an AF level meter to TP1.

162 Turn RV7 fully clockwise and set link LK12 to the on position. Adjust RV7 until the level at TP1 falls by 0.5 dB.

163 Adjust the RF generator modulation depth from 10% to 90% noting the reading in the AF level meter which should remain constant within 1 dB between 30% and 90% modulation depth. Set link LK12 to the off position.

164 Isolate the T/R from the supply. Remove the test equipment, receiver IF and audio module and extender card. Refit the receiver IF and audio module and top cover. Restore the equipment to the required operational condition.

Noise Blanker

165 Isolate the T/R from the supply, remove the top cover and receiver IF and audio module (position 8). Fit an extender card (PAE Part No. 24-24003000) to module position 8 and refit the receiver IF and audio module to the extender card.

166 At the receiver IF and audio module, locate the following controls, switches and test points: RV6, link LK2 and TP22.

167 Reconnect the supply to the T/R. At the synthesiser front panel, select a frequency of 155.975 MHz (3010 TR) or 399.975 MHz (3030 and 3050 TRs). Connect an RF signal generator to the rear panel mounted antenna connector (UHF antenna connector for the 3050 TR). Set the generator to the following:

(a) For 3010 TRs set to 155.975 MHz, 1 mV pd modulated 95% at 1 kHz and an oscilloscope to TP22.

(b) For 3030 and 3050 TRs set to 399.975 MHz, 1 mV pd modulated 95% at 1 kHz and an oscilloscope to TP22.

168 Set link LK2 to the on position. Adjust RV6 until a series of narrow, negative going pulses appear at TP22 (monitored on the oscilloscope).

169 Decrease the RF signal generator's modulation depth to 80%, and check that the level at TP22 remains constant. Set link LK2 to the off position.

170 Isolate the T/R from the supply. Remove the test equipment, receiver IF and audio module and extender card. Refit the receiver IF and audio module and top cover. Restore the equipment to the required operational condition.

Tape Output

171 Isolate the T/R from the supply, remove the top cover and receiver IF and audio module (position 8). Fit an extender card (PAE Part No. 24-24003000) to module position 8 and refit the receiver IF and audio module to the extender card.

172 At the receiver IF and audio module locate RV4.

173 Reconnect the supply to the 3030 T/R. At the synthesiser front panel, select a frequency of 155.975 MHz (3010 TR) or 399.975 MHz (3030 and 3050 TRs). Connect an RF signal generator to the rear panel mounted antenna connector (UHF antenna connector for the 3050 TR). Set the signal generator to the following:

(a) For 3010 TR set to 155.975 MHz, 1 mV pd modulated 30% at 1 kHz and an AF level meter (loaded to 600 ohms) to the receiver audio output

(b) For 3030 and 3050 TRs set to 399.975 MHz, 1 mV pd modulated 30% at 1 kHz and an AF level meter (loaded to 600 ohms) to the receiver audio output.

174 Adjust RV4 for -8 dBm. The tape output level is adjustable between -15 dBm to +8 dBm.

175 Isolate the T/R from the supply. Remove the test equipment, receiver IF and audio module and extender card. Refit the receiver IF and audio module and top cover. Restore the equipment to the required operational condition.

Wideband Audio Output

176 Isolate the T/R from the supply, remove the top cover and receiver IF and audio module (position 8). Fit an extender card (PAE Part No. 24-24003000) to module position 8 and refit the receiver IF and audio module to the extender card.

177 At the receiver IF and audio module locate RV1.

178 Reconnect the supply to the T/R. At the synthesiser front panel, select a frequency of 155.975 MHz (3010 TR) or 399.975 MHz (3030 and 3050 TRs). Connect an RF signal generator to the rear panel mounted antenna connector (UHF antenna connector for the 3050 TR). Set the generator to the following:

(a) For 3010 TRs set to 155.975 MHz, 1 mV (pd) modulated 30% at 1 kHz and an AF level meter (loaded at 600 ohms) to the receiver wideband audio output.

(b) For 3030 and 3050 TRs set to 399.975 MHz, 1 mV (pd) modulated 30% at 1 kHz and an AF level meter (loaded at 600 ohms) to the receiver wideband audio output.

179 Adjust RV1 for -8 dBm. The wideband audio output is adjustable between 0 to -30 dBm.

180 Isolate the T/R from the supply. Remove the test equipment, receiver IF and audio module and extender card. Refit the receiver IF and audio module and top cover. Restore the equipment to the required operational condition.

SYNTHESISER

181 The following alignment procedures for the synthesiser module should only be carried out after changing associated components or settings:

182 Isolate the T/R from the supply. Remove the top cover and synthesiser module (position 3). Fit an extender card (PAE Part No. 24-24003000) to module position 3 and refit the synthesiser module to the extender card.

183 Locate the following adjustment controls: RV1 and RV2.

184 Connect an AF signal generator set for +8 dBm at 1 kHz to the wideband input, (facilities 2 connector pins 3 and 4), and a modulation meter (analyser) to the antenna through an attenuator.

185 Reconnect the supply to the 3030 T/R, and at the synthesiser front panel select FM and wideband modes. At the Tx front panel, select MOD and operate the PTT function.

186 Check that the monitor display indicates 20 kHz, release the PTT function. If this frequency is not achieved the Tx control module will require adjusting as follows:

(a) Isolate the T/R from the supply. Remove the Tx control module (position 2) as detailed in para. 4. Fit the extender card (PAE Part No. 24-24003000) to module position 2 and refit the Tx control module to the extender card.

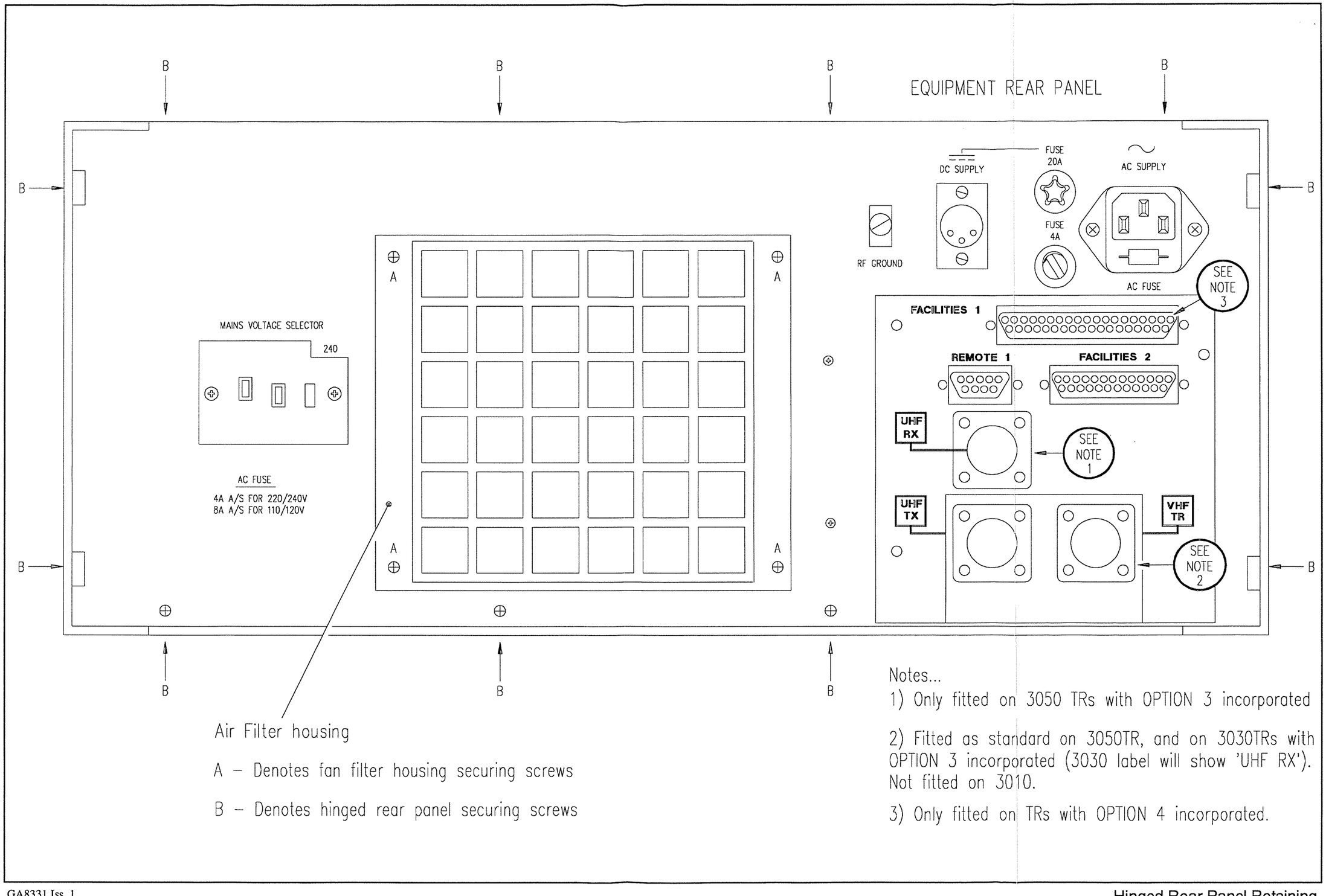
(b) Reapply the supply to the T/R and operate the PTT function. Locate and adjust RV6 until the monitor display indicates 20 kHz. Release the PTT.

(c) Isolate the T/R from the supply. Remove the Tx control module and extender card. Refit the Tx control module and reconnect the supply to the T/R.

187 Set the AF signal generator to 10 kHz at +8 dBm, and operate the PTT function. Adjust RV2 on the synthesiser module for an indication of 20 kHz deviation on the modulation meter. Release the PTT function.

188 Set the AF signal generator to 100 Hz +8 dBm, and operate the PTT function. Adjust RV1 for 20 kHz deviation on the modulation meter. Release the PTT function.

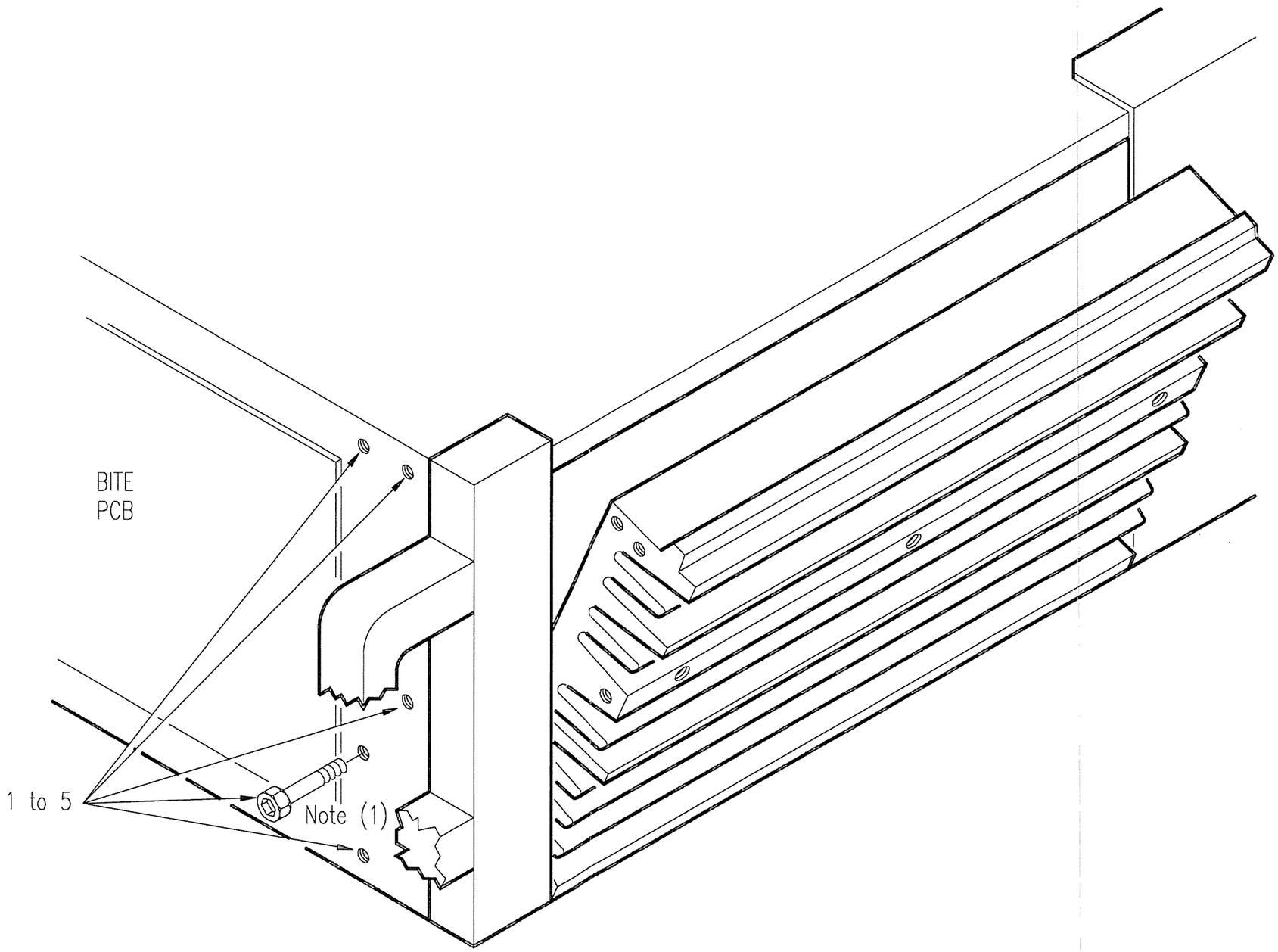
189 Isolate the T/R from the supply. Remove the test equipment, the synthesiser module and the extender card. Refit the synthesiser module and top cover. Restore the equipment to the required operational condition.



GA8331 Iss. 1

Hinged Rear Panel Retaining Screws Location Diagram

Fig. 4-1



Note...

(1) At rear of the right-hand heatsink (viewed from the front) this screw is not fitted.

GA5910 Iss. 1

Heatsink Retaining Screws
Location Diagram

Fig. 4-2

Paragraph

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FAULT DIAGNOSIS
2 BITE system
6 BITE inoperative
7 BITE assembly
TRANSMITTER
9 Fault diagnosis procedure
10 Power amplifier RF devices
12 Replacing RF power transistors
RECEIVER
13 Fault diagnosis procedure
14 Low sensitivity
15 Band switching outputs
16 RF filter pin diode switches
SYNTHESISER
17 Fault diagnosis procedure

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INTRODUCTION

1 The following section is provided to assist during periods of fault finding; this section should be read in conjunction with the information and circuit diagrams provided in Section 3.

FAULT DIAGNOSIS

BITE SYSTEM

2 The BITE system enables fault finding to module level. However, there are circumstances when it is only possible to locate the fault to a group of modules. For example, faults affecting BITE system operation, main fuse failure, or power supply faults, require additional measurements to locate the unserviceable component(s).

3 BITE operation is described in section 3 chapter 1. In general, a BITE fault display will be in the form of a module number followed by the failed test point number. TABLES 5-1 and 5-2 list the fault messages which are displayed by the continuous and interruptive BITE tests respectively. The tables provide information for rectification of faults to module level.

TABLE 5-1 CONTINUOUS BITE FAULT REPORTS

Display (1)	Test point (2)	Comment (3)	Action (4)
TX CONTROL MODULE			
2-4	Power regulator temperature	Temperature sensor failure	Replace power regulator assembly
2-5	PA temperature	Temperature sensor failure	Replace PA assembly
2-8	Tx output power	POUT out of limits	Turn front panel SET POWER control fully clockwise and carry out interruptive test in TABLE 5-2
2-7	PTT	PTT inhibited	Carry out interruptive BITE test and refer to TABLE 5-2
2-14	-10 V supply	Level below limits	Replace PSU circuit board
2-16	Tx RF drive level	Level below limits	Check RF drive connection from synthesiser to PA. If fault 3-2 or 3-25 also stored change synthesiser module
2-11	Main 5 V bias supply	Bias out of limits	Replace Tx control module
2-17	Mic amp dc bias	Bias out of limits	Replace Tx control module
2-18	VOGAD dc bias	Bias out of limits	Replace Tx control module
2-19	Speech clipper dc bias	Bias out of limits	Replace Tx control module
2-21	Audio filter dc bias	Bias out of limits	Replace Tx control module
2-22	FM audio dc bias	Bias out of limits	Replace Tx control module

Display (1)	Test point (2)	Comment (3)	Action (4)
SYNTHESISER MODULE			
3-1	60 MHz output level	Level low	Replace synthesiser module
3-2	Synthesiser output	Level low	Replace synthesiser module
3-3	10 V (synthesiser)	Power supplies out of limits	Replace synthesiser module
3-4	Battery B1 level	Power supplies out of limits	Replace synthesiser module
3-6	20 V	Power supplies out of limits	Replace synthesiser module
3-7	10 V	Power supplies out of limits	Replace synthesiser module
3-8	10 V (VCO)	Power supplies out of limits	Replace synthesiser module
3-24	60 MHz lock	60 MHz osc out of lock	Replace synthesiser module
3-25	Synthesiser lock	Synthesiser out of lock	Replace synthesiser module
RX RF MODULE			
6-12	Local oscillator drive level	Level low	Check RF drive connection from synthesiser to RX RF module. If fault 3-2 or 3-25 also stored, change synthesiser module
6-10	RF amplifier bias	Bias out of limits	Check for amplifier overload before changing RX RF module
6-11	Isolator bias	Bias out of limits	Check for amplifier overload before changing RX RF module
6-13	1st IF amp bias	Bias out of limits	Check for amplifier overload before changing RX RF module
6-14	2nd IF amp bias	Bias out of limits	Check for amplifier overload before changing RX RF module
RX IF AND AUDIO MODULE			
8-8	60 MHz local oscillator level	Level out of limits	Check RF connection from synthesiser to RX IF and audio module. If fault 3-1 also stored replace synthesiser module
8-2	Audio output bias	Out of limits	Change RX IF and audio module
8-5	FM IC supply	Out of limits	Change RX IF and audio module
8-9	IF amp bias	Out of limits	Change RX IF and audio module
BITE ASSEMBLY			
9-2	20 V supply	Out of limits	Change PSU PCB

Display (1)	Test point (2)	Comment (3)	Action (4)
9-3	10 V supply	Out of limits	Change PSU PCB
9-4	5 V supply	Out of limits	Change PSU PCB
9-7	Battery voltage	Voltage low	Change BITE module
9-8	PSU temp sensor	Sensor failure	Change PSU PCB
OTHER INDICATIONS			
PS	Supply voltage	Voltage low. Set will operate at reduced power	-
°C	Heatsink and PSU temp	Temp too high. Set will operate at reduced power	Check ventilation and fan filter
ANT	Antenna VSWR	VSWR excessive. Tx will operate at reduced power	Check antenna and wiring

TABLE 5-2 INTERRUPTIVE BITE FAULT REPORTS

Display (1)	Test point (2)	Comment (3)	Action (4)
TX CONTROL MODULE			
2-4	Power regulator temperature	Temp sensor failure	Replace power regulator assembly
2-5	PA temperature	Temp sensor failure	Replace PA assembly
2-8	Tx output power	POUT out of limits	Refer to Fig. 5-2
2-8	Tx modulation	AM modulation less than 50%	Check modulation depth preset. Replace Tx control module
2-16	Tx RF drive level	Level low	Check RF drive connection from synthesiser to PA. If fault 3-2 also stored change synthesiser module
2-7	PTT	PTT inhibited	If fault 3-25 also stored replace synthesiser module, otherwise replace Tx control module
TX CONTROL MODULE			
2-4	Power regulator temperature	Temp sensor failure	Replace power regulator assembly
2-5	PA temperature	Temp sensor failure	Replace PA assembly
2-8	Tx output power	POUT out of limits	Refer to Fig. 5-2

Display (1)	Test point (2)	Comment (3)	Action (4)
2-8 9	Tx modulation	AM modulation less than 50%	Check modulation depth preset. Replace Tx control module
2-16	Tx RF drive level	Level low	Check RF drive connection from synthesiser to PA. If fault 3-2 also stored change synthesiser module
2-7	PTT	PTT inhibited	If fault 3-25 also stored replace synthesiser module, otherwise replace Tx control module
SYNTHESISER MODULE			
3-1	60 MHz output level	Level low	Change synthesiser module
3-2	Synthesiser output level	Level low	Change synthesiser module
3-24	60 MHz lock	Out of lock	
3-25	Synthesiser lock	Out of lock	
RX RF MODULE			
7-12	Local oscillator drive level	Level low	Check RF drive connection from synthesiser to Rx RF module
RX IF AND AUDIO MODULE			
8-2	Audio output level	Level low	If fault 9-6 also stored change BITE board, otherwise change Rx IF and audio module. If fault persists change Rx RF module.
BITE ASSEMBLY			
9-6	Tone level	BITE oscillator output low	Change BITE module

4 It should be noted that a fault may occur which will initiate more than one module error code, for example, a synthesiser module failure when in the transmit mode will cause error codes 3-25 and 2-7 to be displayed. In these circumstances a common fault must be investigated.

5 The following paragraphs, tables and flow chart diagrams are provided to assist in fault finding procedures and should be used in conjunction with the information contained in section 3, technical description.

Note ...

To assist with fault finding at module level an EXTENDER CARD is available (part no. 24-24003000). This card enables modules to be operational whilst partially removed from the mainframe thereby assisting access to various test points and controls.

BITE INOPERATIVE

6 When the BITE system is inoperative the flow chart shown in Fig. 5-1 should be used to locate the fault to module level. No test points are provided on the power supply PCB, but the regulated voltages can be checked at connector CN2. The power supply board can be tested with connector CN2 disconnected when using an ac supply. If a dc supply is used pins 1 and 8 of CN2 should be linked when CN2 is disconnected.

BITE ASSEMBLY

7 The following sections of the BITE circuit board can be tested using conventional fault finding techniques:

(a) Tone generator.

(b) Audio amplifier.

(c) Fan speed control.

8 The BITE circuit board is a complex digital circuit and requires advanced fault finding techniques. To diagnose and repair faults on this circuit board requires the use of an in-circuit emulator (ICE) suitable for the 8051 series 8 microprocessors. The microprocessors are removed from the board and the ICE probe inserted in its place. The various areas of the board can then be exercised in order to discover the fault.

TRANSMITTER

FAULT DIAGNOSIS PROCEDURE

9 Having isolated the fault to a particular assembly of the transmitter, through the BITE system and Fig. 5-2, use TABLES 5-3, 5-4 and Figs. 5-3 to 5-5 to assist in locating faults to a particular circuit area.

TABLE 5-3 TRANSMITTER DIAGNOSTIC CHART

BITE indication (1)	Action (2)
2-14	No 10 V -ve supply. Check power supply and wiring
2-7	PTT inhibited. Check voltages on pins 3, 4, 5, 11, 12 and 13 of IC33 on Tx control module to locate cause of inhibit
2-11, 2-17, 2-18	Bias voltage out of limits. Check circuit around particular test point
2-19, 2-21, 2-22	Bias voltage out of limits. Check circuit around particular test point
2-8	Indicates Tx no power or low power. Refer to Fig. 5-2
2-8	Indicates Tx no modulation. Refer to Figs. 5-2 and 5-3

TABLE 5-4 TX CONTROL MODULE TEST POINT VOLTAGES

Test point (1)	Measurement (2)	DC voltage (V) (3)	AC voltage (4)
TP1	PA1 current momitor	1,3 V (3)	-
TP2	PA2 current monitor	1-3 V (3)	-
TP3	Driver current monitor	1-3 V (3)	-
TP4	Modulator temperature sensor	10 mV/deg C	-
TP5	PA temperature sensor	10 mV/deg C	-
TP6	SET POWER control voltage	5 V=40 W	-
TP7	PTT	0 V=keyed, 10 V unkeyed	-
TP8	Forward power	1 V=40 W	-
TP9	Reflected power	0 V at VSWR 1:1	-
TP10	Loop reference voltage	1 V	2 V p-p 1 kHz
TP11	5 V bias	5 V	-
TP12	SET POWER voltage	5 V on transmit	-
TP13	SET POWER voltage	5 V on transmit	-
TP14	-10 V monitor	0 V (10 V=fault)	-
TP15	External power reduction	-	-
TP16	Drive level monitor	0 V (10 V=fault)	-
TP17	Mic amp output	5 V	0.3 V p-p 1 kHz
TP18	VOGAD output	5 V	2 V p-p 1 kHz
TP19	Clipper output	5 V	0.2 V p-p 1 kHz
TP20	MUTE gate control	10 V=open, 0 V=muted	-
TP21	AF filter output	5 V	1.0 V p-p 1 kHz
TP22	FM audio output	5 V	0.5 V p-p 1 kHz
TP24	Power supply monitor	0 V=normal, 10 V= low	-
TP33	Phase shifter output 1	5 V	1 V p-p 90° phase
TP34	Phase shifter output 2	5 V	1 V p-p difference
TP35	60 kHz	5 V	20 mV p-p 61 kHz
TP36	60 kHz	5 V	1.0 V p-p 61 kHz
TP37	60 kHz	5 V	10 V p-p 61 kHz square wave
TP38	Demodulator input	5 V	0.2 V p-p 61 kHz sine wave
TP39	Demodulator input	5 V	0.2 V p-p 61 kHz sine wave
TP40	240 kHz oscillator output	5 V	10 V p-p 240 kHz square wave

Test point (1)	Measurement (2)	DC voltage (V) (3)	AC voltage (4)
TP41	Mute detector output	0 V=muted, 10 V=open	-
TP42	Wideband modulation input	5 V	9 V p-p
TP43	Wideband modulation input	5 V	1.5 V p-p
TP44	Analogue multiplier X input	2 V on transmit	-
TP45	Analogue multiplier Y input	1 V	2 V p-p

Notes ...

(1) All voltages are measured with respect to ground. The measuring instrument should have an input impedance of at least 1 M ohm.

(2) All measurements are made with a signal of 1 kHz at 10 mV applied to the MIC socket input. Normal speech into a microphone will give approximately similar readings.

(3) The voltage depends on the frequency and operational mode.

POWER AMPLIFIER RF DEVICES

10 PA1 and PA2 should always draw approximately the same amount of current. The current can be monitored at test points TP1 and TP2 on the Tx control module and give an indication scaled at 1 volt per amp. If a PA is drawing no current, visually inspect the input circuit of the device for breaks or short circuits, then test the device. If one PA is drawing much more current than the other, inspect the output circuit of this device and the input circuit of the other, then test both devices. If TP1 and TP2 are at 0 V and TP3 is at 0.4 A, the fault is most likely to be in the input circuit of the first FET of the driver amplifier. If the output combiner isolation resistor R2 is excessively hot, there is an imbalance between PA1 and PA2.

11 For replacement procedures of RF power transistors refer to heading, replacing RF power transistors.

REPLACING RF POWER TRANSISTORS

WARNING ...

THE DRIVERS AND PA DEVICES IN THE RF POWER AMPLIFIER MODULE CONTAIN THE HIGHLY TOXIC MATERIAL BERYLLIUM. THE CORRECT HANDLING AND DISPOSAL OF THESE DEVICES MUST BE OBSERVED.

12 After removing the faulty transistor, remove all traces of dirt and grease from the heatsink. Trim the leads of the new transistor to a similar length to the one removed and, if possible, lap the flange using 400 grit carborundum paper on a flat surface. Remove any small particles from the flange and apply a small amount of thermal grease. Rub lightly on a clean flat surface to remove any excess and screw the transistor into place using the appropriate screws, washers, and spacers, tightening down evenly to a torque of 10 lbf in. Solder the leads to the printed circuit board and replace any components removed in exactly the same position.

FAULT DIAGNOSIS PROCEDURE

13 Having isolated the fault to a particular assembly of the receiver through the BITE system use TABLES 5-6 to 5-8 to assist in locating faults to a particular circuit area.

LOW SENSITIVITY

14 The sensitivity of the receiver RF module may be checked by either measuring the overall gain from antenna input to IF output (10 to 15 dB), or by removing C388 and injecting an on channel frequency into TP17. Receiver sensitivity at this point should be approximately 2.6 µV emf for 10 dB S+N:N at 30% AM modulation.

BAND SWITCHING OUTPUTS

15 The band switching outputs from the bus expander IC1 on the BITE assembly may be checked as detailed in TABLE 5-5.

TABLE 5-5 BAND SWITCHING VOLTAGE LEVELS

IC1 pin no. (1)	Frequency range (MHz) (2)	Voltage level (3)
20	399.975-365	3 V for the selected frequency band, 0 V for other bands
19	364.975-330	
18	329.975-295	
17	294.975-260	
13	259.975-225	
14	174.975-150	
15	149.975-125	
16	124.975-100	

TABLE 5-6 RECEIVER RF MODULE TEST POINT VOLTAGES

Test points (1)	Measurements (2)	Voltage levels (3)
1 to 8	Filter selection	Active filter -0.7 V, others 0.7 V
10	RF amplifier bias	2.95 V
11	Isolator bias	1.1 V
12	Synthesiser drive level	1.5 V
13	1st IF amplifier bias	2.7 V

Test points (1)	Measurements (2)	Voltage levels (3)
14	2nd IF amplifier bias	3.9 V
15	AGC (no signal conditions)	5 V

TABLE 5-7 RECEIVER IF AND AUDIO MODULE TEST POINT VOLTAGES

Test points (1)	Measurements (2)	Voltage levels (3)
1	VOGAD output	4.9 V
2	Narrow-band audio processed	4.9 V
3	Wideband audio	2.2 V
4	Narrow-band audio prior to filters	2.5 V
5	FM supply	3.2 V
6	Narrow-band agc	No signal 0.3 V 4 µV emf 1.0 V 2 mV emf 3.0 V
7	3rd local oscillator level	4.5 V
8	2nd local oscillator level	1.5 V
9	IF amplifier bias	2.8 V
10	Wideband agc	
11	Narrow-band IF agc	No signal 3.9 V 4 mV emf 0.3 V
22	Noise blanker	No signal 0.6 V 4 µV emf 8.0 V
23	Mute noise	No signal 2.7 V 4 µV emf 1.4 V 2 mV emf 0.7 V
24	Carrier override	No signal 0 V At present level 7.5 V
26	Unprocessed audio input	4.9 V
27	Mute gate	No signal 0.5 V Mute open 8.0 V
28	IF1 agc	4 µV emf 1.2 V 2 mV emf 2.2 V
29	IF2 agc	0.95 V 2 mV emf 2.0 V
30	Carrier detector output	No signal 0 V 4 µV emf 7.65 V

Note ...

(1) Voltage levels are for no signal conditions unless otherwise stated. All RF levels are emf.

(2) Test points 20 to 24 and 26 to 30 are not monitored by the BITE assembly.

TABLE 5-8 RECEIVER IF AND AUDIO VOLTAGE MEASUREMENTS

Component (1)	Pin no. (2)	Voltage (3)
TR13	Emitter	2.9 V
IC30	Input (3)	1.7 V
	Output (1)	4.8 V
IC24	1/2	0.8 V
	4	0.8 V
	5/6	9.5 V
	11/12	9.3 V
TR14	Source	4.4 V
	Gate	3.7 V
	Drain	7.4 V
IC1 and 3	1	11.7 V
TDA1072 (IF)	3,4,5	2.1 V
	6	2.4 V
	7	1.1 V
	8	2.6 V
	9	1.2 V
	10	0.7 V
	11/12	4.1 V
	13	11.7 V
	14/15	5.6 V
IC13	1	5.9 V
TDA1072 (mute)	3,4,5	2.1 V
	6	2.4 V
	7	1.5 V
	8	3.6 V
	9	2.1 V
	10	0.6 V
	11	4.1 V
	12	1.8 V
	13	10 V
	14/15	4.8 V
IC2/4	1/2	6.9 V
MC3359	3	7.2 V
	4	7.5 V
	5/7	1.1 V
	8	7.6 V
	9	3.9 V
	10	3.5 V
	12/13	2.4 V
	14	0.5 V
	15	6.9 V
	16	0.7 V
	18	2.7 V

Note ...

All voltage measurements are normally ±10% and measured under no signal conditions.

RF FILTER PIN DIODE SWITCHES

16 It should be noted that although it is possible to replace the pin diodes D1 to D15 and D25 to D48 in the RF filter circuit without affecting the filters, no attempt should be made to retune any part of the filter bank unless a network analyser is available. The filter banks should be set for an insertion loss of less than 5 dB and a return loss of greater than 8 dB. Fig. 5-6 shows the voltages at the pin diode switches for the ON and OFF states.

SYNTHESISER

FAULT DIAGNOSIS PROCEDURE

17 Having isolated the fault to a particular assembly of the synthesiser module through the BITE system use TABLE 5-9 and Figs. 5-7 to 5-11 to assist in locating faults to a particular circuit area.

TABLE 5-9 SYNTHESISER DIAGNOSTIC CHART

BITE indication (1)	Action (2)
3-1	Refer to Fig. 5-7
3-2	Refer to Fig. 5-8
3-3	Refer to Fig. 5-9
3-4	Low battery voltage. Replace battery or check circuit around IC8, D5, D6 and R2
3-6	No 20 V supply. Check power supply and wiring
3-7	No 10 V supply. Check power supply and wiring
3-8	Refer to Fig. 5-10
3-25	Refer to Fig. 5-11

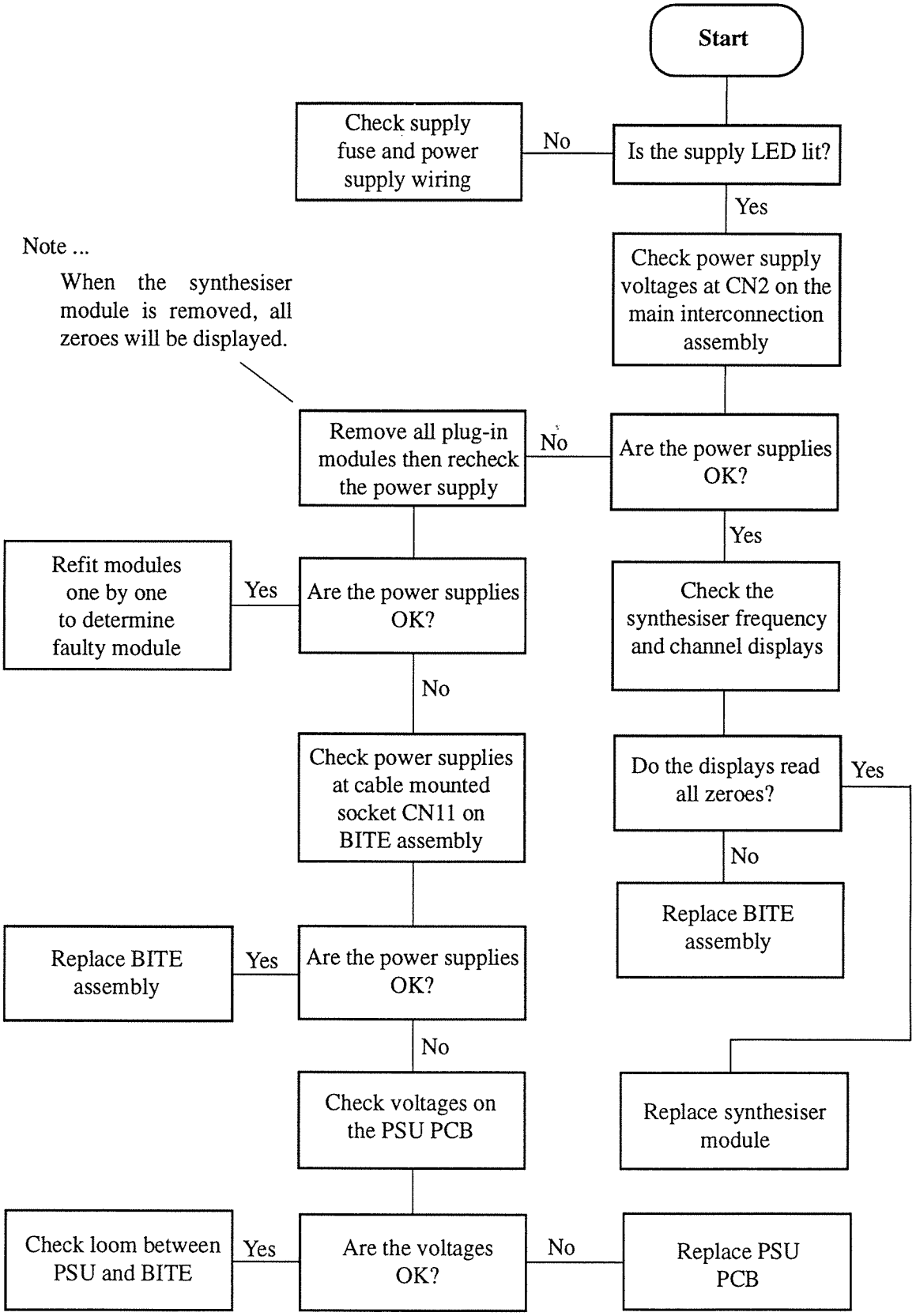


Fig. 5-1 Mainframe fault finding - BITE inoperative

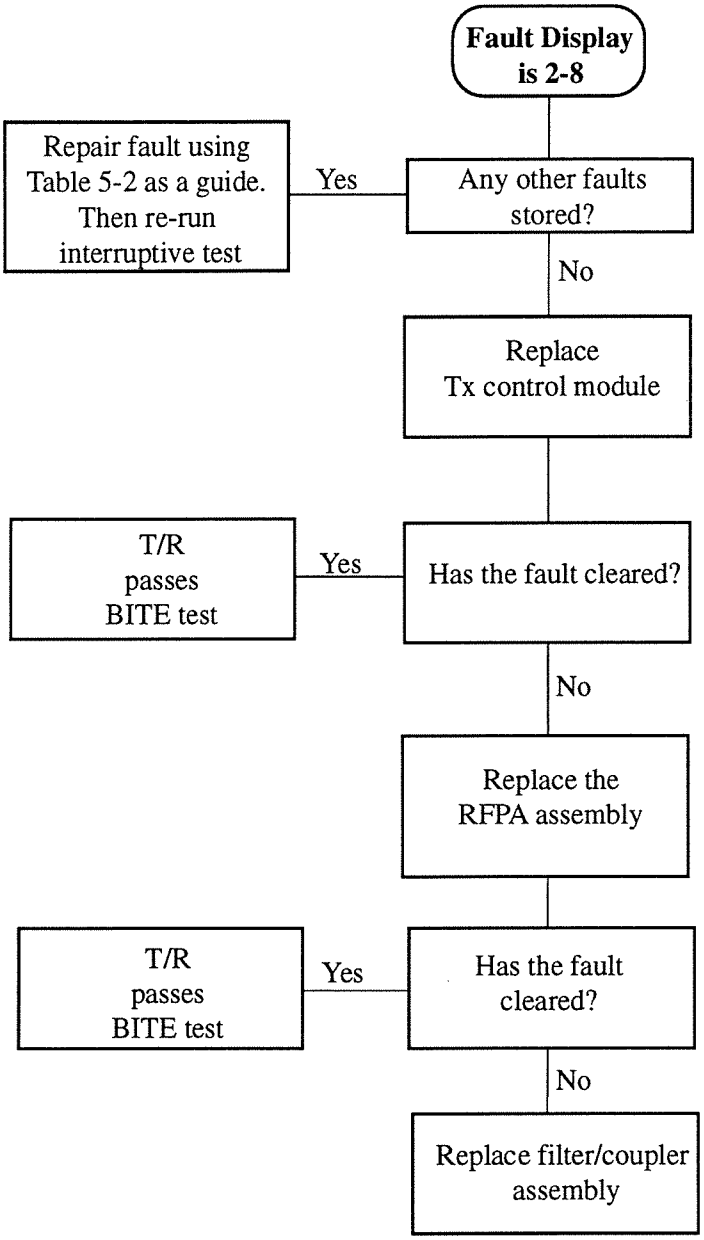
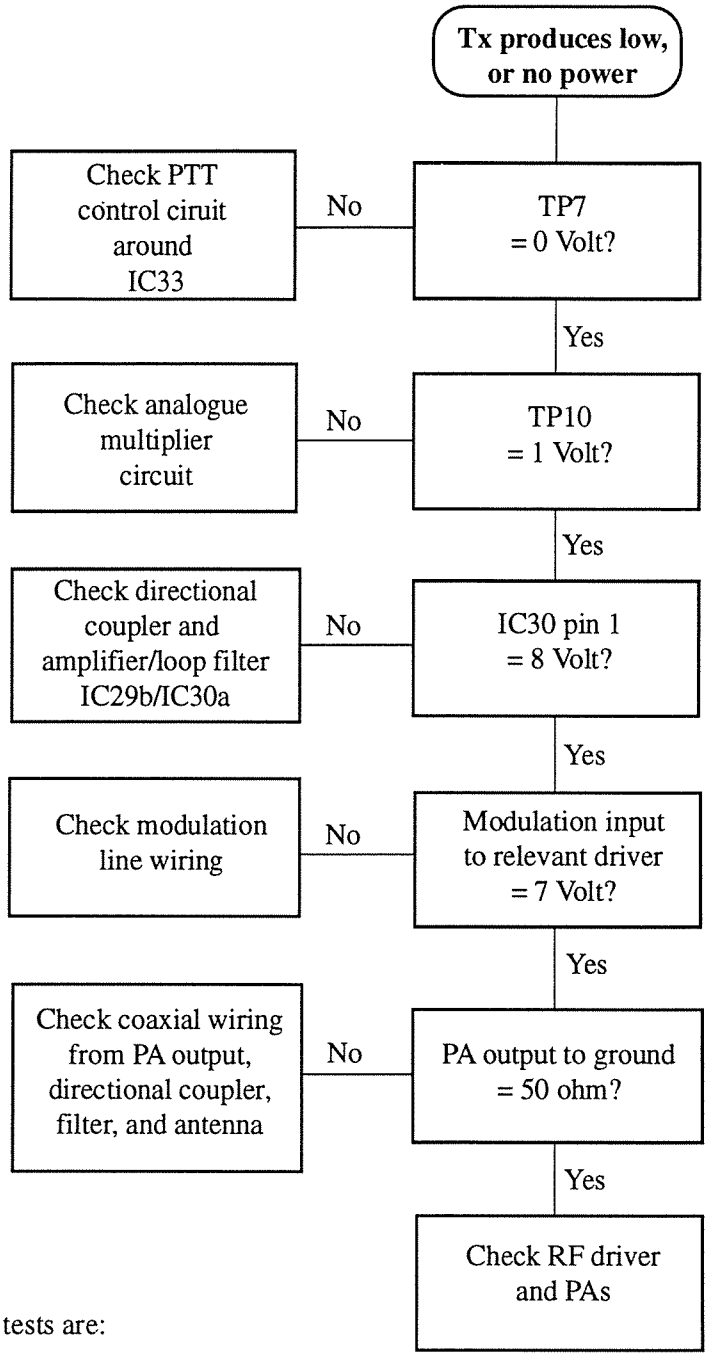


Fig. 5-2 RF Power Fault Finding Chart

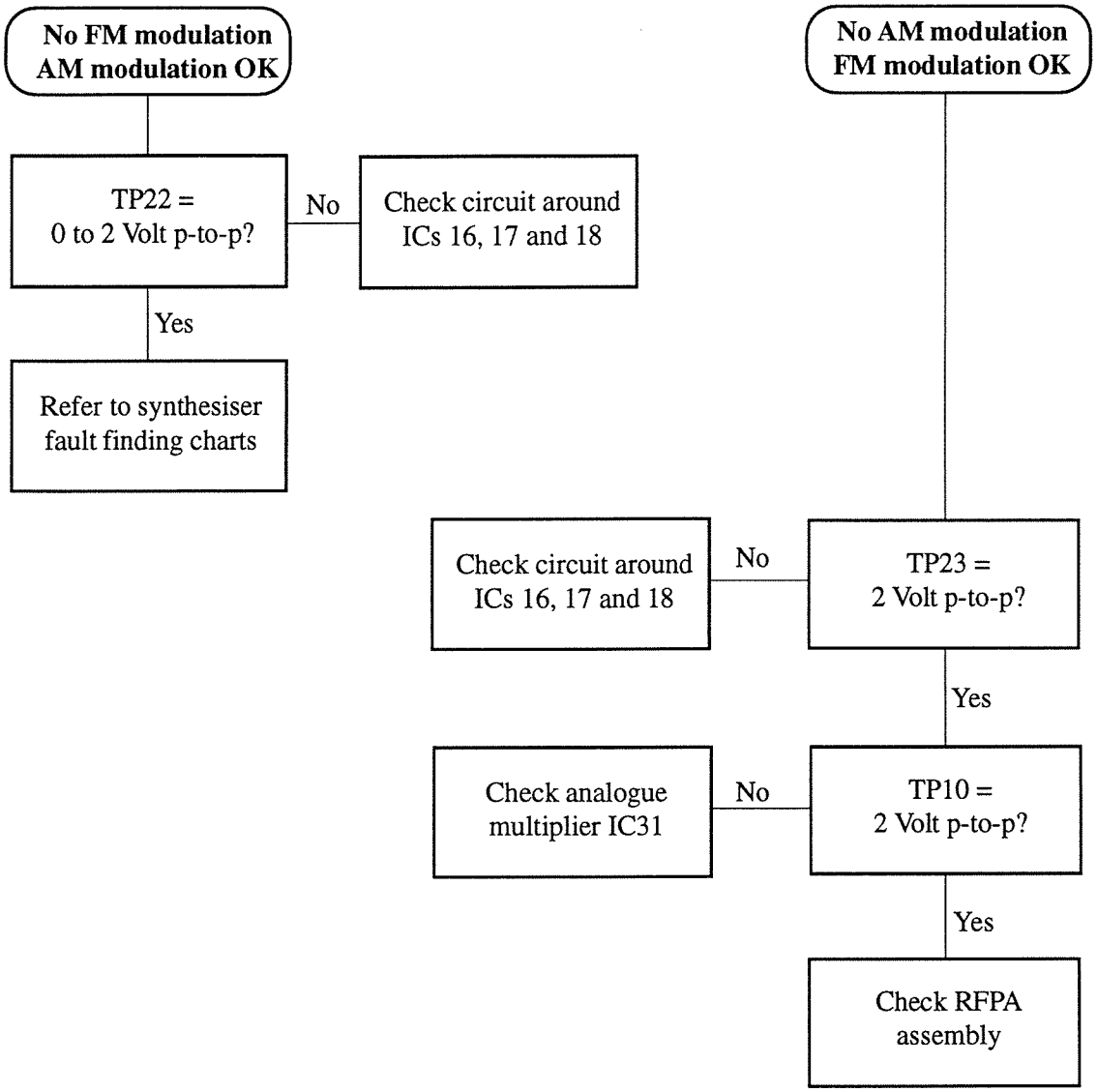


Note...

Conditions for these tests are:

- Transmitter keyed
- AM selected
- Front panel 'set power' control fully clockwise
- 50 ohm dummy load to Tx ANT connector

Fig. 5-3 Tx Low Power Fault Finding Chart

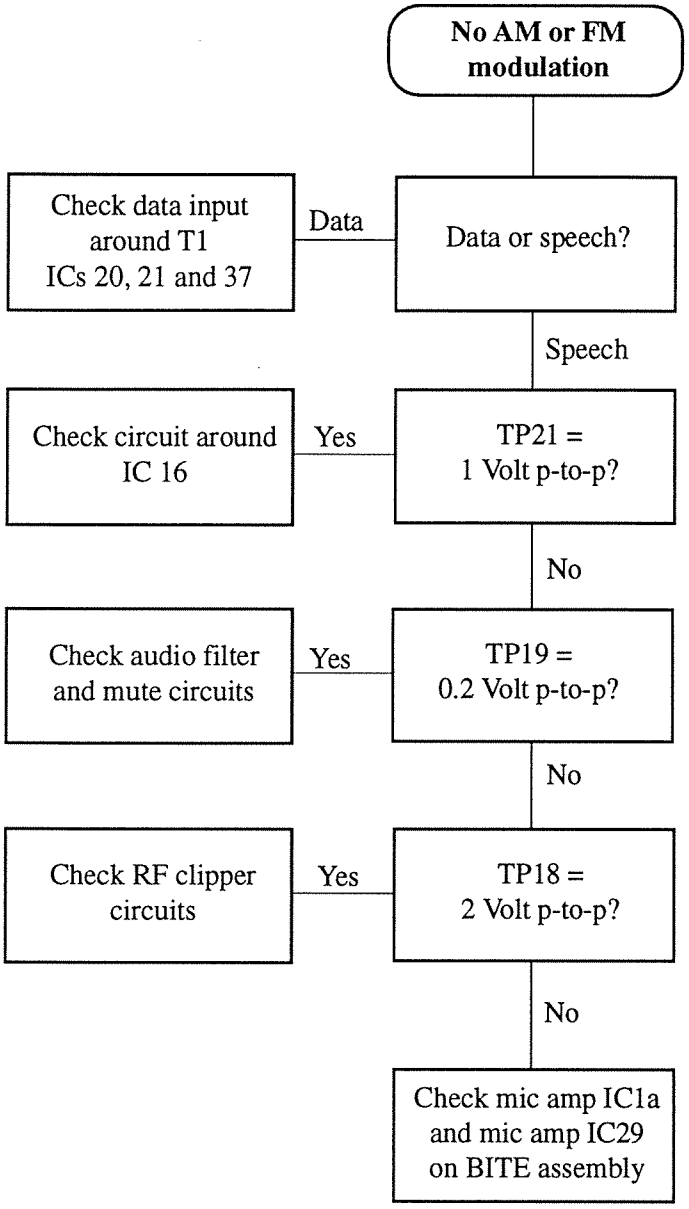


Note...

Conditions for these tests are:

- Equipment configured as per Transmitter Test Equipment Connection (see Section 4)
- Transmitter keyed
- Modulation signal of 50 mV at 1 kHz applied to pins 1 and 6 of front panel Mic connector
- Narrow-band modulation control set fully clockwise

Fig. 5-4 No Modulation - Fault Finding Chart (1 of 2)



Note...

Conditions for these tests are:

- Equipment configured as per Transmitter Test Equipment Connection (see Section 4)
- Transmitter keyed
- Modulation signal of 50 mV at 1 kHz applied to pins 1 and 6 of front panel Mic connector
- Narrow-band modulation control set fully clockwise

Fig. 5-5 No Modulation - Fault Finding Chart (2 of 2)

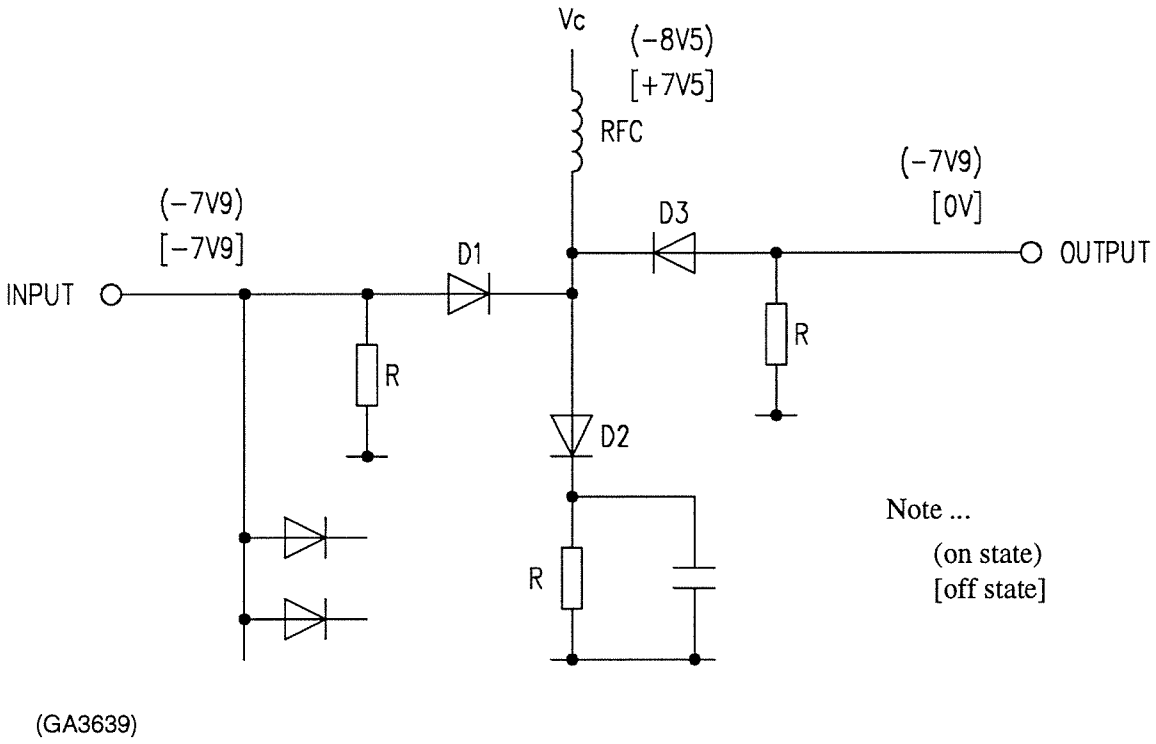


Fig. 5-6 Pin diode switch voltages

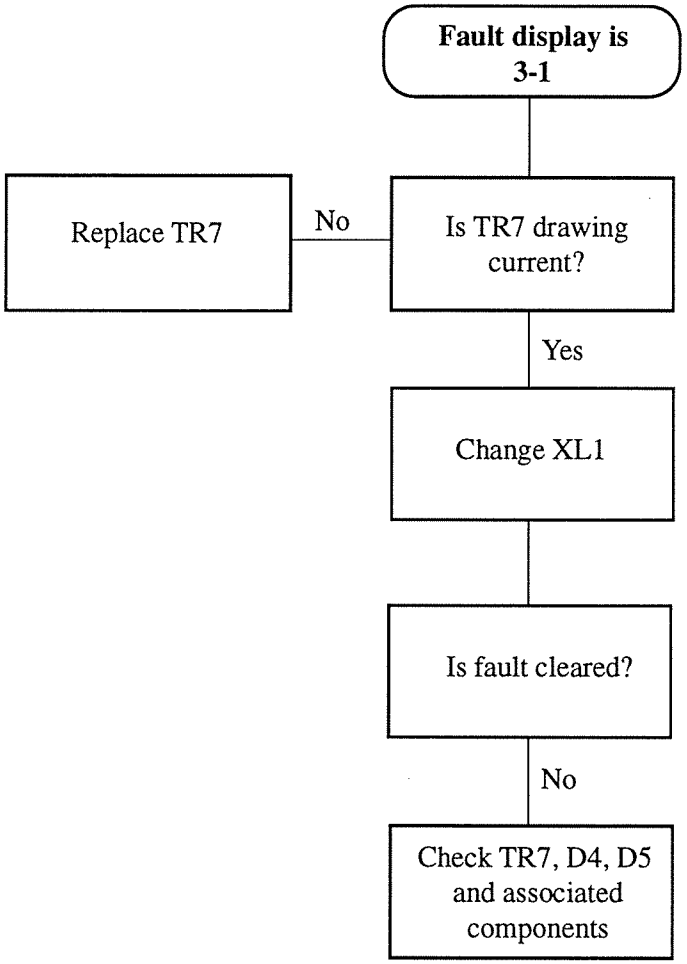


Fig. 5-7 Synthesiser - No 60 MHz Fault Finding Chart

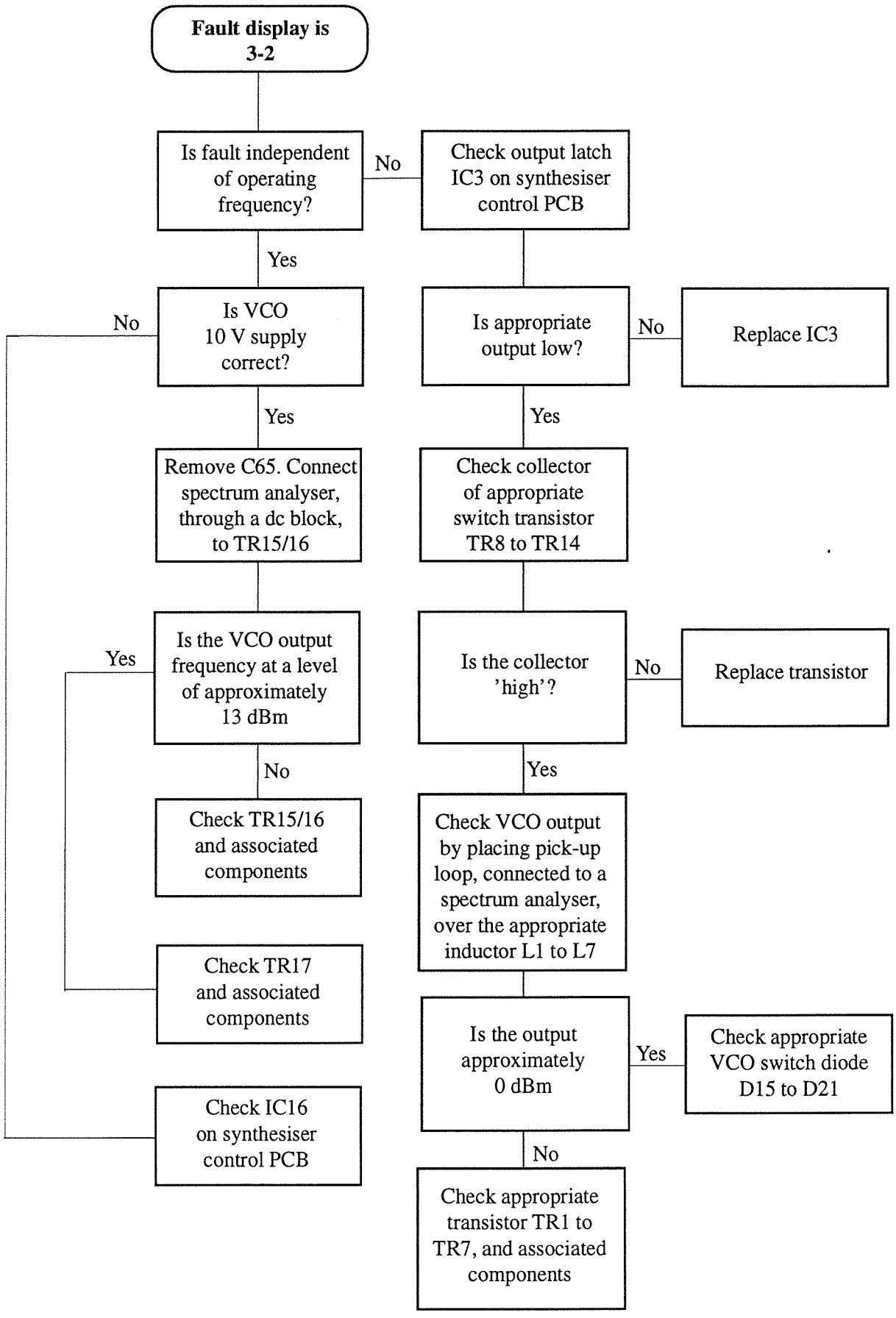


Fig. 5-8 Synthesiser Output Level Fault Finding Chart

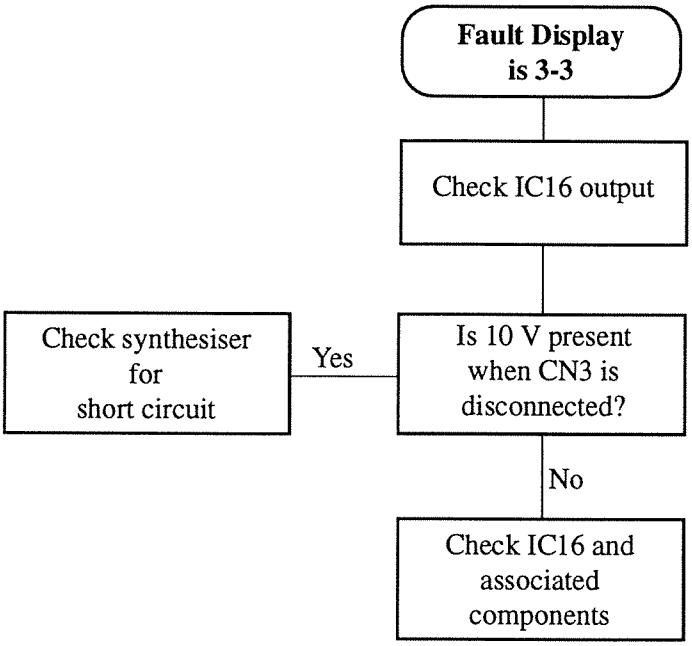


Fig. 5-9 Synthesiser 10 V Fault Finding Chart

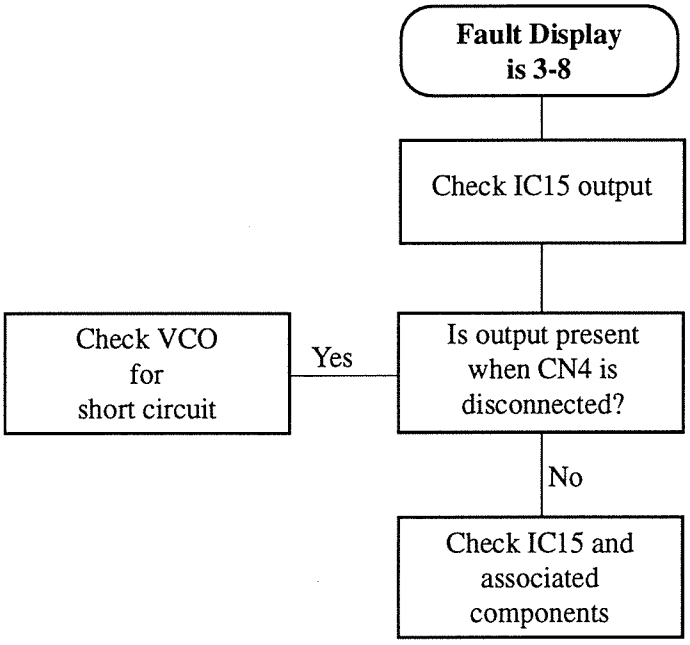


Fig. 5-10 VCO Level Fault Finding Chart

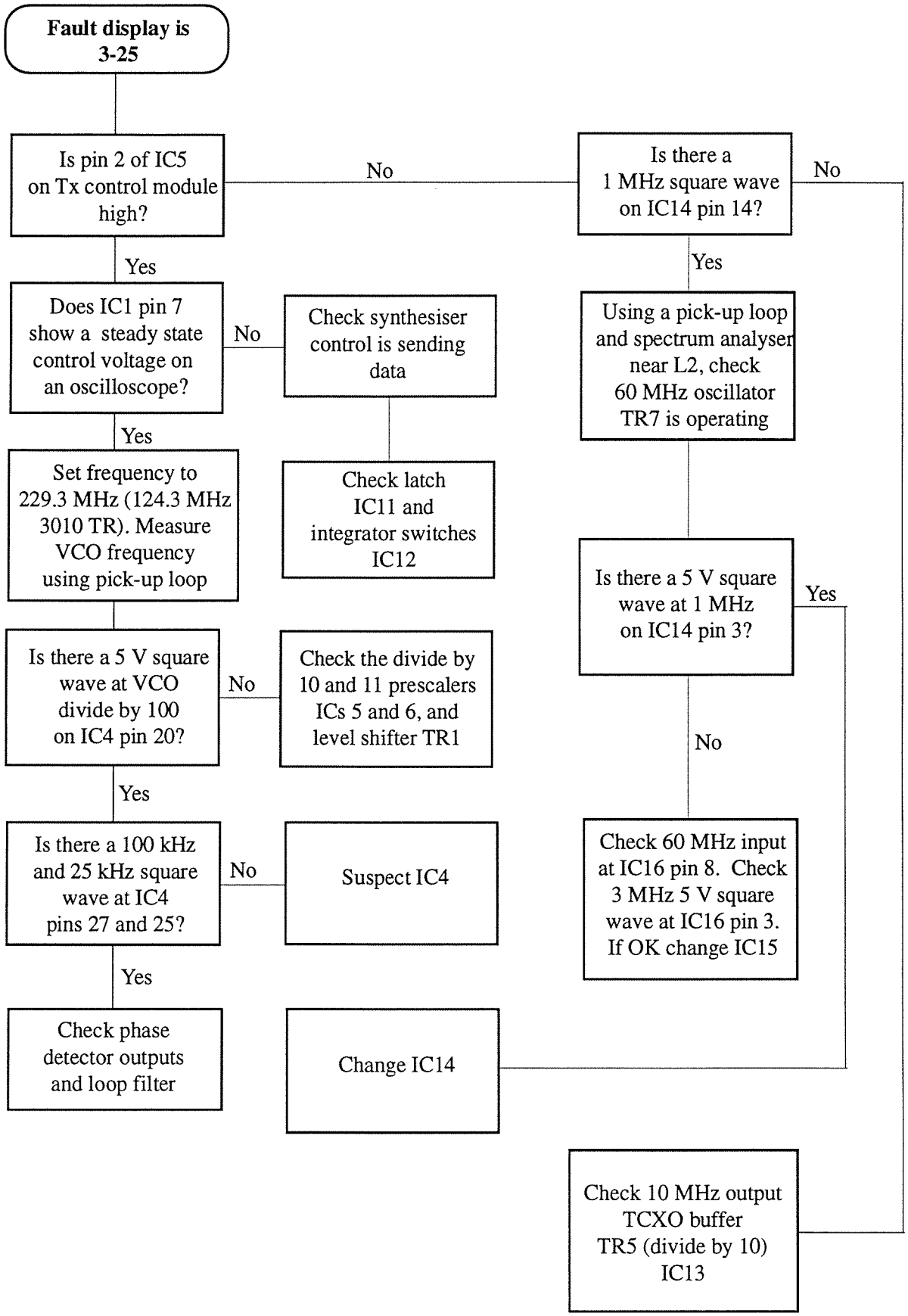


Fig. 5-11 Synthesiser Lock Fault Finding Chart

Paragraph

1 Introduction
3 Spares policy
4 Component spares kit
5 Module spares
7 Mainframe assemblies and components
8 Transmitter
9 Receiver
10 Synthesiser
11 Remote controller

INTRODUCTION

1 This section provides the part numbers for the modules, assemblies and components that comprise the 3000 Series transceivers, PAE part numbers B3010 (3010 TR), B3030 (3030 TR) and B3050 (3050 TR).

2 When ordering parts, the circuit reference (if applicable), full description and PAE part number should be quoted.

SPARES POLICY

3 Two levels of spares holdings are considered necessary to support the 3000 Series T/Rs; component spares as detailed in paragraphs 7 to 11 and module spares as detailed in paragraph 5.

COMPONENT SPARES KIT

4 A component spares kit is available which has been determined from individual component MTBF figures and is intended to support one equipment for a minimum of 2 years. The comprehensive spares kit includes electrolytic capacitors, potentiometers, switches, transformers and semiconductors (including integrated circuits).

MODULE SPARES

5 Module spares consist of fully tested, burnt-in replacement modules and assemblies as follows:

Mainframe

Power supply unit PCB	68-30300015
BITE assembly	68-30300017
Mainframe front panel assembly	68-30300010
Synthesiser front panel assembly	68-30300009

Tx front panel assembly	68-30300011
Rx front panel assembly	68-30300012
Antenna filter assembly	68-30000050
Antenna relay assembly	68-30000082
Antenna relay (V&U twin)	68-30000016

Transmitter

Tx control module	68-30300002
VHF RF power amplifier assembly (3010 TR)	68-30700001
UHF RF power amplifier assembly (3030 TR)	68-30300007
VHF/UHF RF power amplifier assembly (3050 TR)	68-30600024
VHF Filter/coupler assembly (3010 TR)	68-30700002
UHF Filter/coupler assembly (3030 TR)	68-30300001
VHF/UHF Filter/coupler assembly (3050 TR)	68-30600025

Receiver

Receiver IF and audio module (3030 TR)	68-30300008
Receiver IF and audio module (3010 and 3050 TRs)	68-32500012
Receiver RF module (3030 TR)	68-30300006
Receiver RF module(3010 and 3050 TRs)	68-30000021

Synthesiser

Synthesiser module	68-30300003

Remote Control Decoder

Remote control decoder module	68-30300005

Optional modules and assemblies

Guard receiver module (Option 1)	68-30000054
Antenna relay (V & U single) assembly (Option 2)	68-30000055
Option 3	3050 OPT3
Option 4	3050 OPT 4
Option 5	3050 OPT 5

6 To re-order an assembly or module the full part number as detailed on the identification label, affixed to the assembly or module, must be quoted as shown in the following example:



ASSEMBLY/MODULE IDENTIFICATION LABEL

7 MAINFRAME ASSEMBLIES AND COMPONENTS

Assembly: MAINFRAME

Part No: 68-30300000

Circuit Reference	Description	Part Number
CONNECTORS		
	Clip for socket 20-10160300	20-14003016
	SHGL-socket-03-trident	20-09030102
	Socket-15-free-03A-S-SIL	20-02150102
	Socket-01-chassis-13A-S-insert	20-02010400
	Socket-01-free-3A-S-insert	20-02010402
METALWORK		
	Front module location plate	45-00002918
	Rear module location plate	45-00002917
	Bottom rail	45-00002801
	Bottom cover	45-00002697
	Trim bar	45-00002696
	Top trim bar	45-00002695
	Top lid	45-00002693
	Front chassis	45-00004030
MISCELLANEOUS		
	Channeloc	02-20001205
	Handle-black-SQ-4U-aluminium	33-02120001

Assembly: FRONT INTERCONNECTION PCB

Part No: 68-30300014

Circuit Reference	Description	Part Number
CONNECTORS		
	Plug-64-PCMT-01A-A-edge	20-01640300
	Socket-64-PCMT-01A-S-edge	20-02640300
MISCELLANEOUS		
PCB1	PCB front interconnection	55-00000256

Assembly: MAIN INTERCONNECTION PCB

Part No: 68-30300013

Circuit Reference	Description	Part Number
CAPACITORS		
C1	Ceramic- 1nF-100V- -miniature plate	14-03103301
C2	Ceramic- 1nF-100V- -miniature plate	14-03103301
C3	Ceramic- 1nF-100V- -miniature plate	14-03103301
C4	Ceramic- 1nF-100V- -miniature plate	14-03103301
C5	Ceramic- 1nF-100V- -miniature plate	14-03103301
C6	Ceramic- 1nF-100V- -miniature plate	14-03103301
C7	Ceramic- 1nF-100V- -miniature plate	14-03103301
C8	Ceramic- 1nF-100V- -miniature plate	14-03103301
C9	Ceramic- 1nF-100V- -miniature plate	14-03103301
C10	Ceramic- 1nF-100V- -miniature plate	14-03103301
C11	Ceramic- 1nF-100V- -miniature plate	14-03103301
C12	Ceramic- 1nF-100V- -miniature plate	14-03103301
C13	Ceramic- 1nF-100V- -miniature plate	14-03103301
C14	Ceramic- 1nF-100V- -miniature plate	14-03103301
C15	Ceramic- 1nF-100V- -miniature plate	14-03103301
C16	Ceramic- 1nF-100V- -miniature plate	14-03103301
C17	Ceramic- 1nF-100V- -miniature plate	14-03103301
C18	Ceramic- 1nF-100V- -miniature plate	14-03103301
CONNECTORS		
	Plug-FR-S-RG316 -A-SMA	19-01070101
	Plug-FR-S-RG174 -S-SMA	19-01070100
	Plug-FR-S-RD316-A-D 41612	19-01060104
	Plug-FR-S-RG316-A-D 41612	19-01060101
	Socket-10-free- -A-IDC	20-11100100
	Socket-64-PCMT-01A-S-DIN-18	20-02640303
CN2	Plug-64-PCMT-01A-A-edge	20-01640300
CN3	Plug-06-PCMT-03A-S-dubox	20-01060301
CN4	TNS-10-PCMT- 1A-A-IDC	20-12100301
MISCELLANEOUS		
PCB1	PCB main interconnection	55-00000257

Assembly: TX FRONT PANEL ASSEMBLY

Part No: 68-30300011

Circuit Reference	Description	Part Number
RESISTORS		
RV1	Potentiometer-PCB-linear cermet- 20k-vertical	53-50204206
SEMICONDUCTORS		
D1	LED red SBR-5551-REC	61-00505551
D2	LED-yellow sub-miniature PCB mount	61-00501819
D3	LED-yellow sub-miniature PCB mount	61-00501819
D4	LED-yellow sub-miniature PCB mount	61-00501819
D5	LED-yellow sub-miniature PCB mount	61-00501819
CONNECTORS		
	Plug-16-free- 1A- -IDC	20-10160100
MISCELLANEOUS		
PCB1	PCB Tx/Rx front panel	55-00000285
	Insulating bush 3-38-51	62-03033851
	Capacitor red square	66-00416702
	Capacitor black square	66-00416701
S1	Push -4PCO-PCB-momentary brake	66-20415500
S2	Push -4PCO-PCB-momentary brake	66-20415500
S3	Push -4PCO-PCB-momentary brake	66-20415500
S4	Push -4PCO-PCB-momentary brake	66-20415500
S5	Push -4PCO-PCB-momentary brake	66-20415500

Assembly: RX FRONT PANEL ASSEMBLY

Part No: 68-30300012

Circuit Reference	Description	Part Number
RESISTORS		
RV1	Potentiometer-PCB-linear cermet- 20k-vertical	53-50204206
SEMICONDUCTORS		
D1	LED red SBR-5551-REC	61-00505551
D2	LED yellow sub-miniature PCB mount	61-00501819
D3	LED yellow sub-miniature PCB mount	61-00501819
D4	LED yellow sub-miniature PCB mount	61-00501819
D5	LED yellow sub-miniature PCB mount	61-00501819
CONNECTORS		
	Plug-16-free- 1A- -IDC	20-10160100
MISCELLANEOUS		
PCB1	PCB Tx/Rx front panel	55-00000285
	Insulating bush 3-38-51	62-03033851
	Cap-black-square	66-00416701
S1	Push -4PCO-PCB-momentary brake	66-20415500
S2	Push -4PCO-PCB-momentary brake	66-20415500
S3	Push -4PCO-PCB-momentary brake	66-20415500
S4	Push -4PCO-PCB-momentary brake	66-20415500
S5	Push -4PCO-PCB-momentary brake	66-20415500

Assembly: SYNTHESISER FRONT PANEL ASSEMBLY

Part No: 68-30300009

Circuit Reference	Description	Part Number
RESISTORS		
RV1	Potentiometer-PCB-linear cermet- 50k-horizontal	53-50504205
RV2	Potentiometer-PCB-linear cermet- 50k-horizontal	53-50504205
RV3	Potentiometer-PCB-linear cermet- 50k-horizontal	53-50504205
R1	Resistor- 47k-0W33-5%-metal film	59-10475003
R2	Resistor- 47k-0W33-5%-metal film	59-10475003
R3	Resistor- 47k-0W33-5%-metal film	59-10475003
CAPACITORS		
C1	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C2	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C3	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C4	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C5	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C6	Ceramic- 10nF- 63V- -miniature plate	14-03104201
SEMICONDUCTORS		
D1	LED-red sub-miniature PCB mount	61-00501800
D2	LED-red sub-miniature PCB mount	61-00501800
D3	LED-red sub-miniature PCB mount	61-00501800
D4	LED-red sub-miniature PCB mount	61-00501800
D5	LED-green sub-miniature PCB mount	61-00501840
D6	LED-green sub-miniature PCB mount	61-00501840
D7	LED-green sub-miniature PCB mount	61-00501840
D8	LED-green sub-miniature PCB mount	61-00501840
D9	LED-green sub-miniature PCB mount	61-00501840
D10	LED-green sub-miniature PCB mount	61-00501840
D11	LED-green sub-miniature PCB mount	61-00501840
D12	LED-green sub-miniature PCB mount	61-00501840
DP1	LED-red 7 segment display	61-00507511
DP2	LED-red 7 segment display	61-00507511
DP3	LED-red 7 segment display	61-00507511
DP4	LED-red 7 segment display	61-00507511
DP5	LED-red 7 segment display	61-00507511
DP6	LED-red 7 segment display	61-00507511
DP7	LED-red 7 segment display	61-00507511
DP8	LED-red 7 segment display	61-00507511
IC1	Integrated circuit MM5450 -LED driver	61-12005450

Assembly: SYNTHESISER FRONT PANEL ASSEMBLY

Part No: 68-30300009

Circuit Reference	Description	Part Number
IC2	Integrated circuit MM5450 -LED driver	61-12005450
IC3	Integrated circuit MM5450 -LED driver	61-12005450
CONNECTORS		
	Plug-16-free- 1A- -IDC	20-10160100
	Socket-20-PCMT-02A-S-SIL	20-02200300
	Plug-16-PCMT- -S-IDC	20-01160300
MISCELLANEOUS		
PCB1	PCB synthesiserdisplay	55-00000284
PCB2	PCB synthesiser control front panel	55-00000286
	Capacitor black square LK11	66-00416724
	Capacitor black square guard	66-00416719
	Capacitor blue square	66-00416700
	Capacitor black square AGC L/S	66-00416720
	Capacitor black square 0	66-00416717
	Capacitor black square 9	66-00416716
	Capacitor black square 8	66-00416715
	Capacitor black square 7	66-00416714
	Capacitor black square 6	66-00416713
	Capacitor black square 5	66-00416712
	Capacitor black square 4	66-00416711
	Capacitor black square 3	66-00416710
	Capacitor black square 2	66-00416709
	Capacitor black square 1	66-00416708
	Capacitor black square "."	66-00416707
	Capacitor square CE	66-00416706
	Capacitor black square AM.FM	66-00416705
	Capacitor black square N-W	66-00416704
	Capacitor black square	66-00416701
S1	Push -4PCO-PCB-momentary brake	66-20415500
S2	Push -4PCO-PCB-momentary brake	66-20415500
S3	Push -4PCO-PCB-momentary brake	66-20415500
S4	Push -4PCO-PCB-momentary brake	66-20415500
S5	Push -4PCO-PCB-momentary brake	66-20415500
S6	Push -4PCO-PCB-momentary brake	66-20415500
S7	Push -4PCO-PCB-momentary brake	66-20415500
S8	Push -4PCO-PCB-momentary brake	66-20415500
S9	Push -4PCO-PCB-momentary brake	66-20415500
S10	Push -4PCO-PCB-momentary brake	66-20415500

Assembly: SYNTHESISER FRONT PANEL ASSEMBLY

Part No: 68-30300009

Circuit Reference	Description	Part Number
S11	Push -4PCO-PCB-momentary brake	66-20415500
S12	Push -4PCO-PCB-momentary brake	66-20415500
S13	Push -4PCO-PCB-momentary brake	66-20415500
S14	Push -4PCO-PCB-momentary brake	66-20415500
S15	Push -4PCO-PCB-momentary brake	66-20415500
S16	Push -4PCO-PCB-momentary brake	66-20415500
S17	Push -4PCO-PCB-momentary brake	66-20415500
S18	Push -4PCO-PCB-momentary brake	66-20415500
S19	Push -4PCO-PCB-momentary brake	66-20415500

Assembly: MAINFRAME FRONT PANEL ASSEMBLY

Part No: 68-30300010

Circuit Reference	Description	Part Number
RESISTORS		
RV1	Potentiometer-PCB-Linear ceramic- 50k-horizontal	53-30504210
RV2	Potentiometer-PCB-linear cermet- 50k-horizontal	53-50504205
RV3	Potentiometer-panel-log-carbon- 5k-SWT	53-80054105
R1	Resistor- 68k-0W50-5%-metal film	59-10685002
R2	Resistor- 47k-0W33-5%-metal film	59-10475003
CAPACITORS		
C1	Mixed- 0.1µF- 63V- -polyester	14-21105200
C2	Mixed-0.01µF- 63V- -polyester	14-21104302
C3	Mixed- 0.1µF- 63V- -polyester	14-21105200
SEMICONDUCTORS		
D1	LED-red sub-miniature PCB mount	61-00501800
D2	LED-red sub-miniature PCB mount	61-00501800
D3	LED-red sub-miniature PCB mount	61-00501800
D4	LED-red-indicator panel mount	61-00500585
D5	LED-red-indicator panel mount	61-00500585
DP1	LED-red 7 segment display	61-00507511
DP2	LED-red 7 segment display	61-00507511
DP3	LED-red 7 segment display	61-00507511
DP4	LED-red 7 segment display	61-00507511
IC1	Integrated circuit MM5450 -LED driver	61-12005450
TR1	Transistor BC182	61-04120182
CONNECTORS		
	Plug-16-free- 1A- -IDC	20-10160100
	Socket-20-PCMT-02A-S-SIL	20-02200300
	Socket-01-free-3A-S-insert	20-02010402
CN3	Socket-07-chassis- 2A-S-DIN	20-02070201
CN22	Socket-09-free-03A-S-SIL	20-02090102
CN23	Socket-06-free-03A-S-SIL	20-02060101

Assembly: MAINFRAME FRONT PANEL ASSEMBLY

Part No: 68-30300010

Circuit Reference	Description	Part Number
METALWORK		
	Louvre panel	45-00004031
	Speaker bracket 2500	45-09001721
MISCELLANEOUS		
LS1	Loudspeaker 8 ohm 2W round	04-0550711E
	SKRT-SIFAM-15mm-black-18mm	41-62000151
	Knob cap small grey	41-33000150
	Capacitor 4111101004 grey 10mm	41-33000100
	Knob 4mm- 10mm black	41-11101004
	Knob-6mm- A5mm black	41-02151006
	Front panel	49-01005168
	PCB main front panel	55-00000287
	Capacitor red square	66-00416702
	Nut for SW 66-10200008S	66-00501020
	Capacitor black square	66-00416701
S1	Push -4PCO-PCB-momentary brake	66-20415500
S2	Push -4PCO-PCB-momentary brake	66-20415500
S3	Push -4PCO-PCB-momentary brake	66-20415500
S4	Toggle-DPDT-panel-on-ON 3A	66-10200008S
S5	Toggle-DPDT-panel-on-ON 3A	66-10200008S
	Rx front panel assembly	68-30300012
	Tx front panel assembly	68-30300011
	Synth front panel assembly	68-30300009

Assembly: MAINFRAME REAR PANEL ASSEMBLY

Part No: 68-30300019

Circuit Reference	Description	Part Number
CAPACITORS		
	Ceramic- 1nF- 50V- -chip	14-03103201
C25	Electrolytic- 33µF- 40V-+50-10%	14-06339100
SEMICONDUCTORS		
D7	Diode RP1040R	61-00311040
D8	Diode RP1040R	61-00311040
D9	Diode MBR 3545	61-00603545
D10	Diode RP1040R	61-00311040
D12	Diode RP1040R	61-00311040
SCR1	Thyristor CR20U-02JY	61-16000020
CONNECTORS		
	Socket-CH-S-RG316 -S-N-type	19-02030505
	Plug-FR-S-RG174 -S-SMA	19-01070100
	Socket-25-free- -S-D-type	20-02250201
	Socket-09-free- -S-D-type	20-02090200
	Plug-03-chassis-15A-S-XLR	20-02030203
	Plug-03-chassis-06A-S-fused	20-01030204
CN1	Socket-02-free-03A-S-SIL	20-02020100
CN2	Socket-64-chassis-02A-S-DIN	20-02640100
CN7	Socket-04-free-03A-S-SIL	20-02040100
METALWORK		
	Voltage selector plate	45-25002676
	Connector plate	45-00005246
	Fan filter cover	45-00002824
	Transformer screen	45-00002816
	Synthesiser box slide	45-00002814
	Capacitor support rail	45-00002806
	Diode bracket	45-00002698
	Diode heatsink	45-00002694
	Capacitor clip	45-00002692
	Rear chassis	45-00002690
	Rear panel	45-00002684

Assembly: MAINFRAME REAR PANEL ASSEMBLY

Part No: 68-30300019

Circuit Reference	Description	Part Number
MISCELLANEOUS		
	Connector retaining clip	02-29488816
	Insulating boot	02-26000003
	Insulating boot	02-26000001
	Channeloc	02-20001205
FL1	Filter mains L2140/6L	27-70021406
	Fuseholder bayonet releas	29-02412863
	Fuseholder 20mm x 5mm	29-02000105
FS1	Fuse 20 x 5mm 3.15A A/S	29-01470102
FS2	Fuse size 0 15A	29-01350201
	Stud spacer binding post	35-30102717
	Fan filter 120mm	51-00507867
	Fan filter guard 120mm	51-00109019
	PCB 25 way decoupling	55-00000320
	Insulating kit DO4 case	62-07261283
	Insulating kit	62-07261637
S1	Slide -DPDT-panel-on-ON	66-70201065
S2	Slide -DPDT-panel-on-ON	66-70201065
	PSU module	68-30300015
FN1	DC fan 120 X 25mm 24V	69-12001224
T1	Toroidal mains transformer	73-01003372

Assembly: POWER SUPPLY MODULE

Part No: 68-30300015

Circuit Reference	Description	Part Number
RESISTORS		
R1	Resistor- 33R-0W50-5%-metal film	59-10332002
R2	Resistor- 8k2-0W50-5%-metal film	59-10824002
R3	Resistor- 47k-0W50-5%-metal film	59-10475002
R4	Resistor- 2k2-0W50-5%-metal film	59-10224002
R5	Resistor- 8k2-0W50-5%-metal film	59-10824002
R6	Resistor-0R22-0W50-9%-metal film	59-70220005
R7	Resistor-100R-0W50-5%-metal film	59-11002002
R8	Resistor-270R-0W50-5%-metal film	59-12702002
R9	Resistor- 12k-0W50-5%-metal film	59-10125002
R10	Resistor-150k-0W50-5%-metal film	59-11505002
R11	Resistor-220R-0W50-5%-metal film	59-12202002
R12	Resistor- 1k5-0W50-5%-metal film	59-10154002
R13	Resistor- 6k8-0W50-5%-metal film	59-10684002
R14	Resistor-0R15-2W50-10%-wirewound	59-30150025
R15	Resistor- 18k-0W50-5%-metal film	59-10185002
R16	Resistor- 2k2-0W50-5%-metal film	59-10224002
R17	Resistor- 4k7-0W50-5%-metal film	59-10474002
R18	Resistor- 1k-0W33-1%-metal film	59-10015003
R19	Resistor- 3k3-0W33-5%-metal film	59-10334003
CAPACITORS		
C1	Electrolytic- 10µF- 63V- -HOR	14-06107201
C2	Mixed- 0.1µF- 63V- -polyester	14-21105200
C3	Mixed- 0.1µF- 63V- -polyester	14-21105200
C4	Electrolytic- 100µF- 40V	14-06108111
C5	Mixed- 6.8nF- 63V- -sub-miniature	14-21683300
C6	Mixed- 0.1µF- 63V- -polyester	14-21105200
C7	Electrolytic- 10µF- 40V	14-06107101
C8	Mixed- 0.1µF- 63V- -polyester	14-21105200
C9	Electrolytic- 100µF- 25V	14-06108110
C10	Mixed- 0.1µF- 63V- -polyester	14-21105200
C11	Mixed- 0.1µF- 63V- -polyester	14-21105200
C12	Tantalum- 2.2µF- 35V	14-36226101
C13	Tantalum- 2.2µF- 35V	14-36226101
C14	Ceramic- 4.7nF-100V- -miniature plate	14-03473200
C15	Mixed- 0.1µF- 63V- -polyester	14-21105200
C16	Electrolytic- 10µF- 40V	14-06107101
C17	Tantalum- 2.2µF- 35V	14-36226101
C18	Mixed- 0.1µF- 63V- -polyester	14-21105200

Assembly: POWER SUPPLY MODULE

Part No: 68-30300015

Circuit Reference	Description	Part Number
C19	Electrolytic- 10µF- 40V	14-06107101
C20	Mixed- 0.1µF- 63V- -polyester	14-21105200
C21	Electrolytic- 10µF- 40V	14-06107101
C22	Electrolytic- 100µF- 40V	14-06108111
C23	Mixed- 0.1µF- 63V- -polyester	14-21105200
C24	Tantalum- 10µF- 16V	14-36107100
C25	Mixed- 0.1µF- 63V- -polyester	14-21105200
C26	Electrolytic- 100µF- 40V	14-06108111
SEMICONDUCTORS		
D1	Diode 1N4004	61-00314004
D2	Diode 1N4004	61-00314004
D3	Diode 1N4004	61-00314004
D4	Diode 1N4004	61-00314004
D6	Diode 1N4004	61-00314004
D11	Diode ZPY 6V2	61-00206213
IC1	Opto-SCR H11C5	61-16000115
IC2	Integrated circuit LM35DH -temperature sensor	61-12000035
IC3	Integrated circuit MC78S40PC	61-12078140
IC4	Integrated circuit IP237T variable negative regulator	61-12000237
IC5	Integrated circuit 78S05-5V positive voltage regulator	61-12017805
IC6	Integrated circuit 78S10-10V positive voltage regulator	61-12017810
IC7	Integrated circuit 78S05-5V positive voltage regulator	61-12017805
TR1	Transistor ZTX 753	61-04210753
TR2	Transistor BC212	61-04110212
TR3	FET-2SJ113 P-channel power	61-08002113
TR4	Transistor BC182	61-04120182
TR5	Transistor BC182	61-04120182
CONNECTORS		
CN1	Plug-02-PCMT-03A-S-dubox	20-01020300
CN2	Plug-15-PCMT-03A-S-dubox	20-01150302
CN3	Plug-01-PCMT- -S-pin	20-01010303
CN4	Plug-01-PCMT- -S-pin	20-01010303
CN6	Plug-01-PCMT- -S-pin	20-01010303
CN7	Plug-04-PCMT-03A-S-dubox	20-01040300

Assembly: POWER SUPPLY MODULE

Part No: 68-30300015

Circuit Reference	Description	Part Number
METALWORK		
	PSU block	45-00002719
MISCELLANEOUS		
PCB1	PCB PSU	55-00000274
RLA	Relay -power- 24V-20A-P-SPDT	57-16120001
RLB	Relay 24V sub-miniature	57-16120000
	Bush-J22-5006-TO220AB	62-03005006
	Insulating washer plastic	62-02263026
	Washer TO3 MICA+INS bush	62-02017018
	Small neosid ferrite bead	79-08000008
L1	Choke-220µH-20%-tubular	79-01000036
L2	Choke-220µH-20%-tubular	79-01000036
L3	Choke- 5µH-20%-tubular	79-01000034
L4	Choke-300µH-10%-miniature	79-01000031

Assembly: BITE ASSEMBLY

Part No: 68-30300017

Circuit Reference	Description	Part Number
RESISTORS		
RV1	Potentiometer-PCB-linear cermet- 50k-horizontal	53-50504205
RV2	Potentiometer-PCB-linear cermet- 50k-horizontal	53-50504205
RV3	Potentiometer-PCB-linear cermet- 50k-horizontal	53-50504205
RV4	Potentiometer-PCB-linear cermet- 50k-horizontal	53-50504205
R1	Resistor-100k-0W50-5%-metal film	59-11005002
R2	Resistor- 47k-0W50-5%-metal film	59-10475002
R3	Resistor- 47k-0W50-5%-metal film	59-10475002
R4	Resistor-100k-0W50-5%-metal film	59-11005002
R5	Resistor-470k-0W50-5%-metal film	59-14705002
R6	Resistor-470R-0W50-5%-metal film	59-14702002
R7	Resistor- 1M2-0W33-5%-metal film	59-10127003
R10	Resistor- 82k-0W33-5%-metal film	59-10825003
R11	Resistor- 47k-0W50-5%-metal film	59-10475002
R12	Resistor- 2M2-0W33-5%-metal film	59-10227003
R14	Resistor-100k-0W50-5%-metal film	59-11005002
R15	Resistor- 5k6-0W50-5%-metal film	59-10564002
R16	Resistor- 47k-0W50-5%-metal film	59-10475002
R17	Resistor-100k-0W50-5%-metal film	59-11005002
R18	Resistor- 2M2-0W33-5%-metal film	59-10227003
R19	Resistor- 1M2-0W33-5%-metal film	59-10127003
R21	Resistor- 15k-0W50-5%-metal film	59-10155002
R22	Resistor- 47k-0W50-5%-metal film	59-10475002
R23	Resistor-100k-0W50-5%-metal film	59-11005002
R24	Resistor- 15k-0W50-5%-metal film	59-10155002
R25	Resistor- 1k-0W50-5%-metal film	59-10015002
R26	Resistor-100k-0W50-5%-metal film	59-11005002
R27	Resistor-100k-0W40-1%-metal film	59-71005004
R28	Resistor- 33k-0W40-1%-metal film	59-70335004
R29	Resistor-100k-0W50-5%-metal film	59-11005002
R30	Resistor-100k-0W50-5%-metal film	59-11005002
R31	Resistor-220k-0W50-5%-metal film	59-12205002
R32	Resistor-100k-0W50-5%-metal film	59-11005002
R33	Resistor-100k-0W50-5%-metal film	59-11005002
R34	Resistor-680R-0W50-5%-metal film	59-16802002
R35	Resistor- 10k-0W50-5%-metal film	59-10105002
R36	Resistor-100k-0W50-5%-metal film	59-11005002
R37	Resistor-100k-0W50-5%-metal film	59-11005002
R38	Resistor- 10k-0W50-5%-metal film	59-10105002
R39	Resistor-100k-0W50-5%-metal film	59-11005002
R40	Resistor-100k-0W50-5%-metal film	59-11005002
R41	Resistor-100k-0W40-1%-metal film	59-71005004
R42	Resistor- 22k-0W40-1%-metal film	59-70225004

Assembly: BITE ASSEMBLY

Part No: 68-30300017

Circuit Reference	Description	Part Number
R43	Resistor-100k-0W40-1%-metal film	59-71005004
R44	Resistor- 33k-0W40-1%-metal film	59-70335004
R45	Resistor-100k-0W50-5%-metal film	59-11005002
R46	Resistor-100k-0W50-5%-metal film	59-11005002
R48	Resistor- 22k-0W40-1%-metal film	59-70225004
R49	Resistor-100k-0W40-1%-metal film	59-71005004
R50	Resistor- 1k-0W50-5%-metal film	59-10015002
R51	Resistor- 1k-0W50-5%-metal film	59-10015002
R52	Resistor- 1k-0W50-5%-metal film	59-10015002
R53	Resistor- 1k-0W50-5%-metal film	59-10015002
R54	Resistor- 10k-0W50-5%-metal film	59-10105002
R55	Resistor- 10k-0W50-5%-metal film	59-10105002
R56	Resistor- 10k-0W50-5%-metal film	59-10105002
R57	Resistor- 10k-0W50-5%-metal film	59-10105002
R58	Resistor- 10k-0W50-5%-metal film	59-10105002
R59	Resistor-220R-0W50-5%-metal film	59-12202002
R60	Resistor- 4k7-0W50-5%-metal film	59-10474002
R62	Resistor- 47k-0W50-5%-metal film	59-10475002
R63	Resistor- 1k-0W50-5%-metal film	59-10015002
R64	Resistor-100k-0W50-5%-metal film	59-11005002
R65	Resistor-100k-0W50-5%-metal film	59-11005002
R66	Resistor- 4k7-0W50-5%-metal film	59-10474002
R67	Resistor- 47k-0W50-5%-metal film	59-10475002
R69	Resistor- 10R-0W50-5%-metal film	59-10102002
R70	Resistor-560R-0W50-5%-metal film	59-15602002
R71	Resistor- 10k-0W50-5%-metal film	59-10105002
R72	Resistor- 10k-0W50-5%-metal film	59-10105002
R74	Resistor- 10k-0W50-5%-metal film	59-10105002
R75	Resistor-100k-0W50-5%-metal film	59-11005002
R76	Resistor-470k-0W50-5%-metal film	59-14705002
R77	Resistor-470k-0W50-5%-metal film	59-14705002
R78	Resistor- 47k-0W50-5%-metal film	59-10475002
R93	Resistor- 2M2-0W33-5%-metal film	59-10227003
R94	Resistor- 1k-0W50-5%-metal film	59-10015002
RN1	Resistor- 22k-0W10-2%-network	59-80225002
RN2	Resistor- 22k-0W10-2%-network	59-80225002
RN3	Resistor- 22k-0W10-2%-network	59-80225002
CAPACITORS		
C1	Mixed- 0.1µF- 63V- -polyester	14-21105200
C2	Ceramic- 1µF-100V- -miniature plate	14-03103301
C3	Mixed- 0.1µF- 63V- -polyester	14-21105200
C4	Ceramic- 1nF-100V- -miniature plate	14-03103301

Assembly: BITE ASSEMBLY

Part No: 68-30300017

Circuit Reference	Description	Part Number
C5	Mixed- 0.1µF- 63V- -polyester	14-21105200
C9	Mixed- 0.1µF- 63V- -polyester	14-21105200
C10	Ceramic- 12pF-100V- -miniature plate	14-03121301
C11	Ceramic- 12pF-100V- -miniature plate	14-03121301
C12	Ceramic- 10nF-100V- -MONOLC	14-03104312
C13	Mixed- 0.1µF- 63V- -polyester	14-21105200
C14	Mixed- 0.1µF- 63V- -polyester	14-21105200
C15	Mixed- 0.1µF- 63V- -polyester	14-21105200
C16	Mixed- 0.1µF- 63V- -polyester	14-21105200
C17	Mixed- 0.1µF- 63V- -polyester	14-21105200
C18	Mixed- 0.1µF- 63V- -polyester	14-21105200
C19	Mixed-0.01µF- 63V- -polyester	14-21104302
C20	Mixed-0.01µF- 63V- -polyester	14-21104302
C21	Mixed- 0.1µF- 63V- -polyester	14-21105200
C22	Mixed- 0.1µF- 63V- -polyester	14-21105200
C23	Mixed- 0.1µF- 63V- -polyester	14-21105200
C24	Electrolytic- 10µF- 40V	14-06107101
C26	Electrolytic- 10µF- 40V	14-06107101
C27	Electrolytic- 10µF- 40V	14-06107101
C29	Electrolytic- 10µF- 40V	14-06107101
C30	Electrolytic- 10µF- 40V	14-06107101
C31	Mixed- 0.1µF- 63V- -polyester	14-21105200
C32	Ceramic- 1nF-100V- -miniature plate	14-03103301
C33	Electrolytic- 10µF- 40V	14-06107101
C34	Mixed- 0.1µF- 63V- -polyester	14-21105200
C35	Electrolytic- 100µF- 40V	14-06108111
C36	Mixed- 0.1µF- 63V- -polyester	14-21105200
C37	Electrolytic- 100µF- 25V	14-06108110
C38	Electrolytic- 10µF- 40V	14-06107101
C39	Electrolytic- 10µF- 40V	14-06107101
C40	Mixed-0.01µF- 63V- -polyester	14-21104302
C41	Mixed-0.01µF- 63V- -polyester	14-21104302
C42	Tantalum- 2.2µF- 35V	14-36226101
C43	Electrolytic- 10µF- 40V	14-06107101
C44	Electrolytic- 10µF- 40V	14-06107101
C45	Electrolytic- 10µF- 40V	14-06107101
C46	Electrolytic- 10µF- 40V	14-06107101
C47	Mixed- 0.1µF- 63V- -polyester	14-21105200
C48	Mixed- 0.1µF- 63V- -polyester	14-21105200
C49	Tantalum- 10µF- 16V	14-36107100
C50	Tantalum- 1µF- 35V	14-36106100
C51	Mixed- 0.1µF- 63V- -polyester	14-21105200

Assembly: BITE ASSEMBLY

Part No: 68-30300017

Circuit Reference	Description	Part Number
	SEMICONDUCTORS	
	Integrated circuit EPROM-27256-32k x 8 BIT	61-12127256
D1	Diode 1N4148	61-00104148
D2	Diode 1N4148	61-00104148
D3	Diode 1N4148	61-00104148
D4	Diode 1N4148	61-00104148
D5	Diode ZPY 16V	61-00216013
D6	Diode 1N4148	61-00104148
D7	Diode 1N4148	61-00104148
D8	Diode 1N4004	61-00314004
D9	Diode 1N4004	61-00314004
D11	Diode 1N4148	61-00104148
D12	Diode 1N4004	61-00314004
D13	Diode 1N4148	61-00104148
D14	Diode 1N4148	61-00104148
D15	Diode 1N4148	61-00104148
D16	Diode 1N4148	61-00104148
D17	Diode 1N4148	61-00104148
D18	Diode 1N4148	61-00104148
IC1	Integrated circuit 74HC373	61-12074373
IC2	Integrated circuit 74HC373	61-12074373
IC3	Integrated circuit 74HC373	61-12074373
IC4	Integrated circuit 74HC373	61-12074373
IC5	Integrated circuit 74HC373	61-12074373
IC6	Integrated circuit MM5450 -LED driver	61-12005450
IC7	Integrated circuit MM5450 -LED driver	61-12005450
IC8	Integrated circuit 74C541-non-inverting buffer	61-12074541
IC9	Integrated circuit 74C541-non-inverting buffer	61-12074541
IC10	Integrated circuit 74C541-non-inverting buffer	61-12074541
IC11	Integrated circuit 74HC373	61-12074373
IC12	Integrated circuit 74HC238-3 to 8 decoder	61-12074238
IC13	Integrated circuit 74HC138-3 to 8 decoder	61-12074138
IC14	Integrated circuit RAM 2kX8	61-12006116
IC16	Integrated circuit 74HC373	61-12074373
IC17	Integrated circuit 8031-MRO controller	61-12008031
IC18	Integrated circuit 74HC4075-3 I/P or gate	61-12744075
IC21	Integrated circuit CD40106	61-12040106
IC22	Integrated circuit 14433-A/D converter	61-12014433
IC23	Integrated circuit 2N025-2.5V-ref-voltage	61-12000025
	(replace with integrated circuit ZRA 250Y)	61-12000250
IC24	Integrated circuit MC79L05ABP external temperature	61-12017905
IC25	Integrated circuit CA3240	61-12003240
IC26	Integrated circuit CD4053BE	61-12004053

Assembly: BITE ASSEMBLY

Part No: 68-30300017

Circuit Reference	Description	Part Number
IC27	Integrated circuit CD4066	61-12004066
IC28	Integrated circuit CD40106	61-12040106
IC29	Integrated circuit CA3240	61-12003240
IC30	Integrated circuit 74C906-non-inverting buffer	61-12074906
IC31	Integrated circuit 74C906-non-inverting buffer	61-12074906
IC32	Integrated circuit HEF 4051BP	61-12004051
IC33	Integrated circuit CA3240	61-12003240
IC34	Integrated circuit CA3240	61-12003240
IC36	Integrated circuit TDA2611	61-12002611
IC37	Integrated circuit HEF4528BP	61-12004528
TR2	Transistor VN10KM	61-08000010
TR3	Transistor ZTX653	61-04220653
TR4	Transistor J174	61-08000174
TR5	Transistor ZTX 753	61-04210753
CONNECTORS		
	Socket-100-PCMT-02A-SIL	20-02990300
	Jumper-02-WAY	20-02020101
	Plug-03-PCMT-ERG-MIN	20-01030302
	Clip-for socket 20-10160300	20-14003016
CN11	Socket-64-PCMT-01A-S-edge	20-02640300
CN12	Plug-15-PCMT-03A-S-dubox	20-01150302
CN13	Socket-16-PCMT- 1A-S-DIL	20-10160300
CN16	Socket-16-PCMT- 1A-S-DIL	20-10160300
CN19	Socket-16-PCMT- 1A-S-DIL	20-10160300
CN21	Socket-16-PCMT- 1A-S-DIL	20-10160300
CN22	Plug-09-PCMT-03A-S-dubox	20-01090301
CN23	Plug-06-PCMT-03A-S-dubox	20-01060301
CN24	Plug-04-PCMT-03A-A-dubox	20-01040301
MISCELLANEOUS		
	Cable clip	02-04311100
B1	Battery 3V Lithium	06-00000500
XL1	XTAL-FUND-PAR-11.1550MHz	22-13124004
PCB1	BITE board	55-00000461

Assembly: ANTENNA FILTER ASSEMBLY

Part No: 68-30000050

Circuit Reference	Description	Part Number
CAPACITORS		
C1	Ceramic- 15pF-100V- min-plt	14-03151301
C2	Ceramic- 10pF-100V- min-plt	14-03101301
C3	Porcelain- 27pF-500V- -chip	14-30271400
C4	Porcelain- 27pF-500V- -chip	14-30271400
C5	Porcelain- 5.1pF-500V- -chip	14-30510400
C6	Porcelain- 5.1pF-500V- -chip	14-30510400
INDUCTORS		
L1	Coil 2.5T no tap	14-30510400
L2	Coil 2.5T no tap	14-30510400
L3	3 turns 0.6mm diam. en. wire 3mm iny. dia (not 3010 TR)	
L4	3 turns 0.6mm diam. en. wire 3mm iny. dia (not 3010 TR)	
L5	2 turns 0.6mm diam. en. wire 3mm iny. dia (not 3010 TR)	
L6	2 turns 0.6mm diam. en. wire 3mm iny. dia (not 3010 TR)	
CONNECTORS		
	Socket-BK-S-screen on-S-SMA	19-02070501
METALWORK		
	Antenna filter box	45-00002920

8 TRANSMITTER

Assembly: TX CONTROL MODULE

Part No: 68-30300002

Circuit Reference	Description	Part Number
RESISTORS		
RV1	Potentiometer-PCB-linear cermet- 10k-vertical	53-30104205
RV2	Potentiometer-PCB-linear cermet-1k-vertical	53-50014215
RV3	Potentiometer-PCB-linear cermet- 10k-vertical	53-30104205
RV4	Potentiometer-PCB-linear cermet-100k-vertical	53-31004205
RV5	Potentiometer-PCB-linear cermet- 10k-horizontal	53-51003205
RV6	Potentiometer-PCB-linear cermet- 10k-horizontal	53-51003205
RV7	Potentiometer-PCB-linear cermet- 10k-horizontal	53-51003205
RV8	Potentiometer-PCB-linear cermet- 10k-horizontal	53-51003205
RV9	Potentiometer cermet trim 1k	53-50103205
RV10	Potentiometer-PCB-linear cermet- 10k-vertical	53-30104205
RV11	Potentiometer-PCB-linear cermet- 20k-vertical	53-50204206
RV12	Potentiometer-PCB-linear cermet- 20k-vertical	53-50204206
RV13	Potentiometer-PCB-linear cermet- 20k-vertical	53-50204206
RV14	Potentiometer-PCB-linear cermet- 5k-horizontal	53-50054205
RV15	Potentiometer-PCB-linear cermet-100k-horizontal	53-51004205
R1	Resistor- 1k-0W50-5%-metal film	59-10015002
R2	Resistor- 1k-0W50-5%-metal film	59-10015002
R3	Resistor- 1k-0W50-5%-metal film	59-10015002
R4	Resistor- 1k-0W50-5%-metal film	59-10015002
R5	Resistor-100k-0W50-5%-metal film	59-11005002
R6	Resistor-220k-0W50-5%-metal film	59-12205002
R7	Resistor- 1k-0W50-5%-metal film	59-10015002
R8	Resistor- 1k-0W50-5%-metal film	59-10015002
R9	Resistor- 3k3-0W50-5%-metal film	59-10334002
R10	Resistor- 10k-0W50-5%-metal film	59-10105002
R11	Resistor- 10k-0W50-5%-metal film	59-10105002
R12	Resistor- 10k-0W50-5%-metal film	59-10105002
R13	Resistor- 10k-0W50-5%-metal film	59-10105002
R14	Resistor- 10k-0W50-5%-metal film	59-10105002
R15	Resistor- 10k-0W50-5%-metal film	59-10105002
R16	Resistor- 1k-0W50-5%-metal film	59-10015002
R17	Resistor- 10k-0W50-5%-metal film	59-10105002
R18	Resistor- 1k-0W50-5%-metal film	59-10015002
R19	Resistor- 1k-0W50-5%-metal film	59-10015002
R20	Resistor- 1k-0W50-5%-metal film	59-10015002
R21	Resistor- 1k-0W50-5%-metal film	59-10015002
R22	Resistor- 10k-0W50-5%-metal film	59-10105002
R23	Resistor- 10k-0W50-5%-metal film	59-10105002
R24	Resistor- 56k-0W50-5%-metal film	59-10565002

Assembly: TX CONTROL MODULE

Part No: 68-30300002

Circuit Reference	Description	Part Number
R25	Resistor- 1k5-0W50-5%-metal film	59-10154002
R26	Resistor-150k-0W50-5%-metal film	59-11505002
R27	Resistor- 12k-0W50-5%-metal film	59-10125002
R28	Resistor- 1M-0W50-5%-metal film	59-10018002
R29	Resistor-100R-0W50-5%-metal film	59-11002002
R30	Resistor- 1k2-0W50-5%-metal film	59-10124002
R31	Resistor- 8k2-0W50-5%-metal film	59-10824002
R33	Resistor-4k87-0W50-1%-metal film	59-74873005
R34	Resistor- 5k1-0W50-1%-metal film	59-70514005
R35	Resistor-12k1-0W50-1%-metal film	59-71214005
R36	Resistor-12k1-0W50-1%-metal film	59-71214005
R37	Resistor-25k5-0W50-1%-metal film	59-72554005
R38	Resistor-25k5-0W50-1%-metal film	59-72554005
R39	Resistor- 5k1-0W50-1%-metal film	59-70514005
R40	Resistor- 5k1-0W50-1%-metal film	59-70514005
R41	Resistor- 10k-0W50-5%-metal film	59-10105002
R42	Resistor- 10k-0W50-5%-metal film	59-10105002
R43	Resistor-150k-0W50-5%-metal film	59-11505002
R44	Resistor-470k-0W50-5%-metal film	59-14705002
R45	Resistor- 10k-0W50-5%-metal film	59-10105002
R47	Resistor- 47k-0W50-5%-metal film	59-10475002
R48	Resistor- 47k-0W50-5%-metal film	59-10475002
R49	Resistor-100k-0W50-5%-metal film	59-11005002
R50	Resistor- 47k-0W50-5%-metal film	59-10475002
R51	Resistor-12k1-0W50-1%-metal film	59-71214005
R52	Resistor- 10k-0W50-5%-metal film	59-10105002
R53	Resistor- 10k-0W50-5%-metal film	59-10105002
R54	Resistor- 2k7-0W50-5%-metal film	59-10274002
R55	Resistor- 10k-0W50-5%-metal film	59-10105002
R56	Resistor- 10k-0W50-5%-metal film	59-10105002
R57	Resistor- 10k-0W50-5%-metal film	59-10105002
R58	Resistor- 10k-0W50-5%-metal film	59-10105002
R59	Resistor- 10k-0W50-5%-metal film	59-10105002
R60	Resistor- 10k-0W50-5%-metal film	59-10105002
R61	Resistor- 10k-0W50-5%-metal film	59-10105002
R62	Resistor- 10k-0W50-5%-metal film	59-10105002
R63	Resistor- 10k-0W50-5%-metal film	59-10105002
R64	Resistor- 10k-0W50-5%-metal film	59-10105002
R65	Resistor- 10k-0W50-5%-metal film	59-10105002
R66	Resistor-560R-0W50-5%-metal film	59-15602002
R67	Resistor-330R-0W50-5%-metal film	59-13302002
R68	Resistor-100k-0W50-5%-metal film	59-11005002
R69	Resistor- 1M-0W50-5%-metal film	59-10018002
R70	Resistor-100k-0W50-5%-metal film	59-11005002
R71	Resistor-100k-0W50-5%-metal film	59-11005002

Assembly: TX CONTROL MODULE

Part No: 68-30300002

Circuit Reference	Description	Part Number
R72	Resistor- 4k7-0W50-5%-metal film	59-10474002
R73	Resistor-180k-0W50-5%-metal film	59-11805002
R74	Resistor- 5k1 0W4 1%-metal film	59-10514002
R75	Resistor- 1k8-0W50-5%-metal film	59-10184002
R76	Resistor- 33k-0W50-5%-metal film	59-10335002
R77	Resistor- 2k2-0W50-5%-metal film	59-10224002
R78	Resistor- 2k2-0W50-5%-metal film	59-10224002
R79	Resistor- 47k-0W50-5%-metal film	59-10475002
R80	Resistor-100k-0W50-5%-metal film	59-11005002
R81	Resistor- 47k-0W50-5%-metal film	59-10475002
R82	Resistor- 15k-0W50-5%-metal film	59-10155002
R83	Resistor- 10k-0W50-5%-metal film	59-10105002
R84	Resistor- 22k-0W50-5%-metal film	59-10225002
R85	Resistor- 10k-0W50-5%-metal film	59-10105002
R86	Resistor- 1k-0W50-5%-metal film	59-10015002
R87	Resistor- 1k-0W50-5%-metal film	59-10015002
R88	Resistor- 10k-0W50-5%-metal film	59-10105002
R89	Resistor- 10k-0W50-5%-metal film	59-10105002
R90	Resistor- 47k-0W50-5%-metal film	59-10475002
R91	Resistor- 47k-0W50-5%-metal film	59-10475002
R92	Resistor-100k-0W50-5%-metal film	59-11005002
R93	Resistor- 1M-0W50-5%-metal film	59-10018002
R94	Resistor-470k-0W50-5%-metal film	59-14705002
R95	Resistor- 5k6-0W50-5%-metal film	59-10564002
R96	Resistor- 1k2-0W50-5%-metal film	59-10124002
R97	Resistor- 15k-0W50-5%-metal film	59-10155002
R98	Resistor- 3k9-0W50-5%-metal film	59-10394002
R99	Resistor- 47k-0W50-5%-metal film	59-10475002
R100	Resistor- 47k-0W50-5%-metal film	59-10475002
R102	Resistor- 1k2-0W50-5%-metal film	59-10124002
R103	Resistor- 1k2-0W50-5%-metal film	59-10124002
R104	Resistor- 1k-0W50-5%-metal film	59-10015002
R105	Resistor- 10k-0W50-5%-metal film	59-10105002
R106	Resistor-470k-0W50-5%-metal film	59-14705002
R107	Resistor-100k-0W50-5%-metal film	59-11005002
R108	Resistor- 12k-0W50-5%-metal film	59-10125002
R109	Resistor- 12k-0W50-5%-metal film	59-10125002
R110	Resistor-820k-0W50-5%-metal film	59-18205002
R111	Resistor-470k-0W50-5%-metal film	59-14705002
R112	Resistor-220k-0W50-5%-metal film	59-12205002
R113	Resistor-100k-0W50-5%-metal film	59-11005002
R114	Resistor-820k-0W50-5%-metal film	59-18205002
R115	Resistor-470k-0W50-5%-metal film	59-14705002
R116	Resistor-220k-0W50-5%-metal film	59-12205002
R117	Resistor-100k-0W50-5%-metal film	59-11005002

Assembly: TX CONTROL MODULE

Part No: 68-30300002

Circuit Reference	Description	Part Number
R118	Resistor- 3k9-0W50-5%-metal film	59-10394002
R119	Resistor- 3k9-0W50-5%-metal film	59-10394002
R120	Resistor- 10k-0W50-5%-metal film	59-10105002
R121	Resistor- 1k-0W50-5%-metal film	59-10015002
R122	Resistor- 10k-0W50-5%-metal film	59-10105003
R123	Resistor- 1M-0W50-5%-metal film	59-10018002
R124	Resistor- 2k2-0W50-5%-metal film	59-10224002
R125	Resistor- 2k2-0W50-5%-metal film	59-10224002
R126	Resistor- 2k2-0W50-5%-metal film	59-10224002
R127	Resistor-100k-0W50-5%-metal film	59-11005002
R128	Resistor- 3k9-0W50-5%-metal film	59-10394002
R129	Resistor-100k-0W50-5%-metal film	59-11005002
R130	Resistor- 8k2-0W50-5%-metal film	59-10824002
R131	Resistor-390R-0W50-5%-metal film	59-13902002
R132	Resistor- 3k9-0W50-5%-metal film	59-10394002
R133	Resistor- 10k-0W50-5%-metal film	59-10105002
R134	Resistor- 10k-0W50-5%-metal film	59-10105002
R135	Resistor- 4k7-0W50-5%-metal film	59-10474002
R136	Resistor- 47k-0W50-5%-metal film	59-10475002
R137	Resistor- 8k2-0W50-5%-metal film	59-10824002
R138	Resistor- 2k2-0W50-5%-metal film	59-10224002
R139	Resistor- 2k2-0W50-5%-metal film	59-10224002
R140	Resistor- 2k2-0W50-5%-metal film	59-10224002
R141	Resistor- 3k9-0W50-5%-metal film	59-10394002
R142	Resistor- 3k9-0W50-5%-metal film	59-10394002
R143	Resistor- 1k8-0W50-5%-metal film	59-10184002
R144	Resistor-680R-0W50-5%-metal film	59-16802002
R145	Resistor-680R-0W50-5%-metal film	59-16802002
R146	Resistor- 3k9-0W50-5%-metal film	59-10394002
R147	Resistor- 10k-0W50-5%-metal film	59-10105002
R148	Resistor- 10k-0W50-5%-metal film	59-10105002
R151	Resistor- 4k7-0W50-5%-metal film	59-10474002
R152	Resistor- 3k9-0W50-5%-metal film	59-10394002
R153	Resistor- 10R-0W50-5%-metal film	59-10102002
R154	Resistor- 47k-0W50-5%-metal film	59-10475002
R155	Resistor- 47k-0W50-5%-metal film	59-10475002
R156	Resistor- 10k-0W50-5%-metal film	59-10105002
R157	Resistor-100k-0W50-5%-metal film	59-11005002
R158	Resistor- 39k-0W50-5%-metal film	59-10395002
R160	Resistor- 10k-0W50-5%-metal film	59-10105002
R161	Resistor- 10k-0W50-5%-metal film	59-10105002
R162	Resistor-100k-0W50-5%-metal film	59-11005002
R163	Resistor-100k-0W50-5%-metal film	59-11005002
R164	Resistor- 10k-0W50-5%-metal film	59-10105002
R165	Resistor- 82k-0W50-5%-metal film	59-10825002

Assembly: TX CONTROL MODULE

Part No: 68-30300002

Circuit Reference	Description	Part Number
R166	Resistor- 10k-0W50-5%-metal film	59-10105002
R167	Resistor- 47k-0W50-5%-metal film	59-10475002
R168	Resistor- 47k-0W50-5%-metal film	59-10475002
R169	Resistor- 27k-0W50-5%-metal film	59-10275002
R170	Resistor- 27k-0W50-5%-metal film	59-10275002
R171	Resistor- 10k-0W50-5%-metal film	59-10105002
R172	Resistor- 27k-0W50-5%-metal film	59-10275002
R173	Resistor- 27k-0W50-5%-metal film	59-10275002
R174	Resistor- 47k-0W50-5%-metal film	59-10475002
R175	Resistor-100k-0W50-5%-metal film	59-11005002
R176	Resistor- 10k-0W50-5%-metal film	59-10105002
R177	Resistor- 47k-0W50-5%-metal film	59-10475002
R178	Resistor-100k-0W50-5%-metal film	59-11005002
R179	Resistor- 22k-0W50-5%-metal film	59-10225002
R180	Resistor- 22k-0W50-5%-metal film	59-10225002
R181	Resistor- 2k2-0W50-5%-metal film	59-10224002
R182	Resistor- 2k2-0W50-5%-metal film	59-10224002
R183	Resistor- 4k7-0W50-5%-metal film	59-10474002
R184	Resistor- 22k-0W50-5%-metal film	59-10225002
R185	Resistor- 47k-0W50-5%-metal film	59-10475002
R186	Resistor-100k-0W50-5%-metal film	59-11005002
R187	Resistor-10k-0W50-5%-carbon film	59-10105002
R188	Resistor-10k-0W50-5%-carbon film	59-10105002
R189	Resistor-1k2-0W50-5%-metal film	59-10124001
R190	Resistor-100k-0W50-5%-metal film	59-11005002
R191	Resistor-100k-0W50-5%-metal film	59-11005002
R192	Resistor-100k-0W50-5%-metal film	59-11005002
R193	Resistor-100k-0W50-5%-metal film	59-11005002
R194	Resistor-100k-0W50-5%-metal film	59-11005002
R196	Resistor-100k-0W50-5%-metal film	59-11005002
R198	Resistor- 1k-0W50-5%-metal film	59-10015002
R199	Resistor-100k-0W50-5%-metal film	59-11005002
R200	Resistor-100k-0W50-5%-metal film	59-11005002
R201	Resistor-100k-0W50-5%-metal film	59-11005002
R202	Resistor-100k-0W50-5%-metal film	59-11005002
R203	Resistor-100k-0W50-5%-metal film	59-11005002
R204	Resistor-100k-0W50-5%-metal film	59-11005002
R205	Resistor-100k-0W50-5%-metal film	59-11005002
R206	Resistor- 33k-0W50-5%-metal film	59-10335002
R207	Resistor-100k-0W50-5%-metal film	59-11005002
R208	Resistor-100k-0W50-5%-metal film	59-11005002
R209	Resistor-100k-0W50-5%-metal film	59-11005002
R210	Resistor- 33k-0W50-5%-metal film	59-10335002
R211	Resistor-100k-0W50-5%-metal film	59-11005002
R212	Resistor- 33k-0W50-5%-metal film	59-10335002

Assembly: TX CONTROL MODULE

Part No: 68-30300002

Circuit Reference	Description	Part Number
R213	Resistor-100k-0W50-5%-metal film	59-11005002
R214	Resistor- 33k-0W50-5%-metal film	59-10335002
R215	Resistor-100k-0W50-5%-metal film	59-11005002
R216	Resistor-100k-0W50-5%-metal film	59-11005002
R217	Resistor-100k-0W50-5%-metal film	59-11005002
R218	Resistor-100k-0W50-5%-metal film	59-11005002
R219	Resistor-100k-0W50-5%-metal film	59-11005002
R221	Resistor- 33k-0W50-5%-metal film	59-10335002
R222	Resistor-100k-0W50-5%-metal film	59-11005002
R223	Resistor-100k-0W50-5%-metal film	59-11005002
R224	Resistor-100k-0W50-5%-metal film	59-11005002
R225	Resistor-100k-0W50-5%-metal film	59-11005002
R226	Resistor-100k-0W50-5%-metal film	59-11005002
R228	Resistor-100k-0W50-5%-metal film	59-11005002
R229	Resistor- 68k-0W50-5%-metal film	59-10685002
R230	Resistor- 18k-0W50-5%-metal film	59-10185002
R231	Resistor- 1k8-0W50-5%-metal film	59-10184002
R232	Resistor- 3k9-0W50-5%-metal film	59-10394002
R233	Resistor- 68k-0W50-5%-metal film	59-10685002
R234	Resistor- 1k8-0W50-5%-metal film	59-10184002
R235	Resistor-820k-0W50-5%-metal film	59-18205002
R236	Resistor- 6k8-0W50-5%-metal film	59-10684002
R237	Resistor- 10k-0W50-5%-metal film	59-10105002
R238	Resistor- 3k3-0W50-5%-metal film	59-10334002
R239	Resistor- 56k-0W50-5%-metal film	59-10565002
R240	Resistor- 10k-0W50-5%-metal film	59-10105002
R241	Resistor- 56k-0W50-5%-metal film	59-10565002
R242	Resistor- 56k-0W50-5%-metal film	59-10565002
R243	Resistor- 2k2-0W50-5%-metal film	59-10224002
R244	Resistor- 22k-0W50-5%-metal film	59-10225002
R245	Resistor- 8k2-0W50-5%-metal film	59-10824002
R246	Resistor- 22k-0W50-5%-metal film	59-10225002
R247	Resistor- 47k-0W50-5%-metal film	59-10475002
R248	Resistor- 47k-0W50-5%-metal film	59-10475002
R262	Resistor- 10k-0W50-5%-metal film	59-10105002
R264	Resistor- 1k5-0W50-5%-metal film	59-10154002
R266	Resistor- 470R-0W50-5% -carbon film	59-14702002
R267	Resistor- 10k-0W50-5%-metal film	59-10105002
R270	Resistor- 56k-0W50-5%-metal film	59-10565002
RN1	Resistor-100k-1W50-2%-network	59-81005002
RN2	Resistor-100k-1W50-2%-network	59-81005002
RN3	Resistor-100k-1W50-2%-network	59-81005002

Assembly: TX CONTROL MODULE

Part No: 68-30300002

Circuit Reference	Description	Part Number
CAPACITORS		
C1	Ceramic- 220pF-100V- -miniature plate	14-03222300
C2	Mixed-0.22µF- 63V- -polyester	14-21225200
C3	Ceramic- 1nF-100V- -miniature plate	14-03103301
C4	Tantalum- 2.2µF- 35V	14-36226101
C6	Tantalum- 2.2µF- 35V	14-36226101
C7	Tantalum- 22µF- 16V	14-36227108
C8	Mixed- 22nF- 63V- -polyester	14-21224200
C9	Mixed- 6.8nF- 63V- -sub-miniature	14-21683300
C10	Mixed- 0.1µF- 63V- -polyester	14-21105200
C11	Mixed-0.01µF- 63V- -polyester	14-21104302
C12	Ceramic- 220pF-100V- -miniature plate	14-03222300
C13	Mixed-1000pF- 63V- -sub-miniature	14-21103200
C14	Mixed-4700pF- 63V- -sub-miniature	14-21473200
C15	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C16	Ceramic- 1nF-100V- -miniature plate	14-03103301
C17	Ceramic- 33pF-100V- -miniature plate	14-03331301
C18	Ceramic- 1nF-100V- -miniature plate	14-03103301
C19	Mixed- 470nF- 63V- -sub-miniature	14-21475200
C20	Ceramic- 180pF-100V- -miniature plate	14-03182202
C21	Tantalum- 2.2µF- 35V	14-36226101
C22	Tantalum- 2.2µF- 35V	14-36226101
C23	Tantalum- 2.2µF- 35V	14-36226101
C24	Mixed- 0.1µF- 63V- -polyester	14-21105200
C25	Mixed- 0.1µF- 63V- -polyester	14-21105200
C26	Mixed- 0.1µF- 63V- -polyester	14-21105200
C27	Mixed- 0.1µF- 63V- -polyester	14-21105200
C28	Ceramic- 68pF-100V- -miniature plate	14-03681301
C29	Mixed- 22nF- 63V- -polyester	14-21224200
C31	Mixed- 22nF- 63V- -polyester	14-21224200
C32	Mixed- 47nF- 63V- -sub-miniature	14-21474200
C33	Mixed-0.01µF- 63V- -polyester	14-21104302
C34	Mixed- 6.8nF- 63V- -sub-miniature	14-21683300
C35	Mixed- 47nF- 63V- -sub-miniature	14-21474200
C36	Mixed-0.01µF- 63V- -polyester	14-21104302
C37	Mixed- 15nF- 63V- -polyester	14-21154200
C38	Ceramic- 33pF-100V- -miniature plate	14-03331301
C40	Ceramic- 3.9pF-100V- -miniature plate	14-03390301
C41	Mixed-1000pF- 63V- -sub-miniature	14-21103200
C42	Tantalum- 2.2µF- 35V	14-36226101
C43	Tantalum- 2.2µF- 35V	14-36226101
C44	Mixed-0.22µF- 63V- -polyester	14-21225200
C45	Mixed-0.01µF- 63V- -polyester	14-21104302

Assembly: TX CONTROL MODULE

Part No: 68-30300002

Circuit Reference	Description	Part Number
C46	Mixed- 0.1µF- 63V- -polyester	14-21105200
C47	Ceramic- 2.2nF-100V- -miniature plate	14-03223300
C48	Ceramic- 1nF-100V- -miniature plate	14-03103301
C49	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C50	Mixed- 0.1µF- 63V- -polyester	14-21105200
C51	Tantalum- 2.2µF- 35V	14-36226101
C52	Tantalum- 2.2µF- 35V	14-36226101
C53	Tantalum- 10µF- 16V	14-36107100
C54	Tantalum- 2.2µF- 35V	14-36226101
C55	Mixed- 0.1µF- 63V- -polyester	14-21105200
C56	Tantalum- 2.2µF- 35V	14-36226101
C57	Mixed- 0.1µF- 63V- -polyester	14-21105200
C58	Tantalum- 2.2µF- 35V	14-36226101
C59	Mixed- 0.1µF- 63V- -polyester	14-21105200
C60	Tantalum- 2.2µF- 35V	14-36226101
C61	Mixed- 0.1µF- 63V- -polyester	14-21105200
C62	Tantalum- 2.2µF- 35V	14-36226101
C63	Mixed- 0.1µF- 63V- -polyester	14-21105200
C64	Tantalum- 2.2µF- 35V	14-36226101
C65	Mixed- 0.1µF- 63V- -polyester	14-21105200
C66	Tantalum- 2.2µF- 35V	14-36226101
C67	Mixed- 0.1µF- 63V- -polyester	14-21105200
C68	Tantalum- 2.2µF- 35V	14-36226101
C69	Mixed- 0.1µF- 63V- -polyester	14-21105200
C70	Tantalum- 2.2µF- 35V	14-36226101
C71	Tantalum- 2.2µF- 35V	14-36226101
C72	Mixed- 470nF- 63V- -sub-miniature	14-21475200
C73	Tantalum- 2.2µF- 35V	14-36226101
C74	Ceramic- 1nF-100V- -miniature plate	14-03103301
C75	Plastic- 1µF- 63V-10%-MKS2	14-21106200
C78	Ceramic- 220pF-100V- -miniature plate	14-03222300
C79	Ceramic- 220pF-100V- -miniature plate	14-03222300
C80	Ceramic- 220pF-100V- -miniature plate	14-03222300
C81	Ceramic- 220pF-100V- -miniature plate	14-03222300
C82	Ceramic- 1nF-100V- -miniature plate	14-03103301
C84	Ceramic- 1nF-100V- -miniature plate	14-03103301
C85	Ceramic- 1nF-100V- -miniature plate	14-03103301
C86	Ceramic- 220pF-100V- -miniature plate	14-03222300
C87	Ceramic- 220pF-100V- -miniature plate	14-03222300
C88	Ceramic- 1nF-100V- -miniature plate	14-03103301
SEMICONDUCTORS		
D1	Diode 1N4148	61-00104148

Assembly: TX CONTROL MODULE

Part No: 68-30300002

Circuit Reference	Description	Part Number
D2	Zener- 13V-0.4W-5%-glass	61-00201304
D3	Zener- 13V-0.4W-5%-glass	61-00201304
D4	Diode BZX55C6V2	61-00206205
D5	Diode 1N4148	61-00104148
D7	Diode 1N4148	61-00104148
D8	Diode 1N4148	61-00104148
D9	LED-red sub-miniature PCB mount	61-00501800
D10	Diode 1N4148	61-00104148
D11	Diode 1N4148	61-00104148
D12	Zener- 13V-0.4W-5%-glass	61-00201304
D13	Diode 1N4148	61-00104148
D14	Zener- 13V-0.4W-5%-glass	61-00201304
D15	Diode BZX55C5V6	61-00205604
D16	Diode 1N4148	61-00104148
D17	LED-red sub-miniature PCB mount	61-00501800
D18	Diode BZX55C6V2	61-00206205
D19	Diode BZX55C6V2	61-00206205
D20	Diode 1N4148	61-00104148
IC1	Integrated circuit CA1558E	61-12001558
IC2	Integrated circuit CA1558E	61-12001558
IC3	Integrated circuit CA1558E	61-12001558
IC4	Integrated circuit CA1558E	61-12001558
IC5	Integrated circuit CD4053BE	61-12004053
IC6	Integrated circuit CA3086	61-12003086
IC7	Integrated circuit CA1558E	61-12001558
IC8	Integrated circuit CD4066	61-12004066
IC9	Integrated circuit CA3240	61-12003240
IC10	Integrated circuit CA3130	61-12003130
IC11	Integrated circuit CA3240	61-12003240
IC12	Integrated circuit CD4013	61-12004013
IC13	Integrated circuit CA3130	61-12003130
IC14	Integrated circuit CD4053BE	61-12004053
IC15	Integrated circuit CA1558E	61-12001558
IC16	Integrated circuit CD4053BE	61-12004053
IC17	Integrated circuit CA1558E	61-12001558
IC18	Integrated circuit CA3240	61-12003240
IC19	Integrated circuit CA3240	61-12003240
IC20	Integrated circuit CA1558E	61-12001558
IC21	Integrated circuit CA3130	61-12003130
IC22	Integrated circuit CA1558E	61-12001558
IC23	Integrated circuit CD4066	61-12004066
IC24	Integrated circuit CA1558E	61-12001558
IC25	Integrated circuit CD4066	61-12004066
IC26	Integrated circuit CD4066	61-12004066
IC27	Integrated circuit CA3240	61-12003240

Assembly: TX CONTROL MODULE

Part No: 68-30300002

Circuit Reference	Description	Part Number
IC28	Integrated circuit CA3240	61-12003240
IC29	Integrated circuit CA3240	61-12003240
IC30	Integrated circuit NE5532N	61-12005532
IC31	Integrated circuit 1495-multiplier	61-12001495
IC32	Integrated circuit CD4066	61-12004066
IC33	Integrated circuit CD4048BE	61-12004048
IC34	Integrated circuit CA555	61-12000555
IC35	Integrated circuit CD4049UBE	61-12004049
IC36	Integrated circuit CA3240	61-12003240
IC37	Integrated circuit CA1558E	61-12001558
IC38	Integrated circuit IC741	61-12000741
IC39	Integrated circuit 8243-I/P O/P expander	61-12008243
IC40	Integrated circuit 8243-I/P O/P expander	61-12008243
IC41	Integrated circuit 74C906-non-inverting buffer	61-12074906
IC42	Integrated circuit 74C906-non-inverting buffer	61-12074906
IC43	Integrated circuit 74C906-non-inverting buffer	61-12074906
IC44	Integrated circuit 1OF4-binary-demux inv	61-12004556
IC45	Integrated circuit HEF 4051BP	61-12004051
IC46	Integrated circuit HEF 4051BP	61-12004051
IC47	Integrated circuit HEF 4051BP	61-12004051
TR1	Transistor J176	61-08000176
TR2	Transistor BC182	61-04120182
TR3	Transistor BC182	61-04120182
TR4	Transistor BC182	61-04120182
TR5	Transistor BC182	61-04120182
TR6	Transistor BC182	61-04120182
TR8	Transistor ZTX650	61-04220650
TR9	Transistor BC182	61-04120182
TR10	Transistor BC182	61-04120182
TR11	Transistor BC212	61-04110212
TR13	Transistor VN10	61-08000010
TR14	Transistor VN10	61-08000010
TR15	Transistor BC212	61-04110212
CONNECTORS		
	Plug-03-PCMT-ERG-MIN	20-01030302
	Jumper-02-way	20-02020101
CN1	Plug-60-PCMT-01A-A-41612	20-01600300
CN2	Plug-64-PCMT-01A-A-edge	20-01640300

Assembly: TX CONTROL MODULE

Part No: 68-30300002

Circuit Reference	Description	Part Number
METALWORK		
	Module chassis Tx control	45-28332793
MISCELLANEOUS		
	Potentiometer hole plug	02-02202590
	PCB test point terminal	02-12000001
PCB1	PCB Tx control	55-00000431
	Integrated circuit socket 24 pin	62-05000241
	Screening can 7302217797	73-08217810
RLB	Relay	57-16110000
T1	Audio-PR-600-SC-600-PCMT	73-02217797
L1	Choke 7µH	79-01000012
L2	Choke 7µH	79-01000012
L3	Inductor 47µH 10RB181LY	79-01000022
L4	PC mount inductor	79-01000030
L5	PC mount inductor	79-01000030
L6	Choke 10µH SC30	79-01000013
L7	Choke µH22 SC30	79-01000014
L8	Choke 10µH SC30	79-01000013
L9	Choke 10µH SC30	79-01000013

Assembly: VHF RF PA ASSEMBLY (3010 AND 3050 TRs)

Part No: 68-30700001

Circuit Reference	Description	Part Number
RESISTORS		
RV1	Potentiometer-surface mount linear cermet-2k	53-50023203
RV2	Potentiometer-surface mount linear cermet-2k	53-50023203
RV3	Potentiometer-surface mount linear cermet-10k	53-50104203
RV4	Potentiometer-surface mount linear cermet-10k	53-50104203
RV5	Potentiometer-surface mount linear cermet-10k	53-50104203
R1	Resistor- 18R-0W25-5%-1206-chip	59-90182002
R2	Resistor- 68R-0W25-5%-1206-chip	59-90682002
R3	Resistor- 18R-0W25-5%-1206-chip	59-90182002
R4	Resistor- 68R-0W25-5%-1206-chip	59-90682002
R5	Resistor- 1k2-0W25-5%-1206-chip	59-90124002
R6	Resistor- 18R-0W25-5%-1206-chip	59-90182002
R7	Resistor- 27R-0W25-5%-1206-chip	59-90272002
R8	Resistor- 18R-0W25-5%-1206-chip	59-90182002
R9	Resistor- 22R-0W25-5%-1206-chip	59-90222002
R10	Resistor- 22R-0W25-5%-1206-chip	59-90222002
R11	Resistor- 18R-0W25-5%-1206-chip	59-90182002
R12	Resistor- 1k-0W25-5%-1206-chip	59-90015002
R13	Resistor- 47k-0W25-5%-1206-chip	59-90475002
R14	Resistor- 33k-0W25-5%-1206-chip	59-90335002
R15	Resistor- 47k-0W25-5%-1206-chip	59-90475002
R16	Resistor- 10k-0W25-5%-1206-chip	59-90016002
R17	Resistor- 2k2-0W25-5%-1206-chip	59-90224002
R19	Resistor- 1k2-0W25-5%-1206-chip	59-90124002
R20	Resistor-10R-0W4-1-metal film	59-10102002
R21	Resistor-10R-0W4-1-metal film	59-10102002
R22	Resistor-27R-20W-5%-TO220	59-80272200
R23	Resistor-10R-0W4-1-metal film	59-10102002
R24	Resistor-10R-0W4-1-metal film	59-10102002
R25	Resistor-27R-20W-5%-TO220	59-80272200
R26	Resistor- 10k-0W25-5%-1206-chip	59-90016002
R27	Resistor- 10k-0W25-5%-1206-chip	59-90016002
R28	Resistor-15R-0W4-1-metal film	59-10152002
R29	Resistor-15R-0W4-1-metal film	59-10152002
R30	Resistor- 4k7-0W25-5%-1206-chip	59-90474002
CAPACITORS		
C1	Ceramic- 1nF-500V- feedthrough	14-03103411
C2	Ceramic- 1nF-500V- feedthrough	14-03103411
C4	Ceramic- 1nF-500V- feedthrough	14-03103411
C6	Ceramic-220pF-50V-chip	14-03222200
C7	Ceramic-220pF-50V-chip	14-03222200
C8	Ceramic-220pF-50V-chip	14-03222200

Assembly: VHF RF PA ASSEMBLY (3010 AND 3050 TRs)

Part No: 68-30700001

Circuit Reference	Description	Part Number
C9	Ceramic-220pF-50V-chip	14-03222200
C10	Ceramic-220pF-50V-chip	14-03222200
C11	Porcelain-150pF-300V-chip	14-30152300
C12	Ceramic-5.6pF-50V-chip	14-03560200
C13	Porcelain-470pF-200V-chip	14-30472300
C14	Porcelain-470pF-200V-chip	14-30472300
C15 *	Plastic- 1µF- 50V-20%-SM	14-21106201
C15 **	Porcelain-470pF-200V-chip	14-30472300
C17	Porcelain-470pF-200V-chip	14-30472300
C18	Porcelain-470pF-200V-chip	14-30472300
C19	Porcelain-470pF-200V-chip	14-30472300
C20 *	Plastic- 100nF- 50V-10%-SM	14-21105202
C20 **	Porcelain-470pF-200V-chip	14-30472300
C21 *	Porcelain-100pF-500V-chip	14-30102401
C21 **	Porcelain-1nF-50V-chip	14-30103300
C22	Porcelain-68pF-500V-chip	14-30681400
C23	Plastic- 100nF- 50V-10%-SM	14-21105202
C24	Porcelain-470pF-200V-chip	14-30472300
C25	Porcelain-75pF-500V-chip	14-30751400
C26	Porcelain-470pF-200V-chip	14-30472300
C27	Porcelain-1nF- 50V- chip	14-30103300
C28	Porcelain-470pF-200V-chip	14-30472300
C29	Porcelain-470pF-200V-chip	14-30472300
C30	Ceramic-100nF-50V-chip	14-03105200
C31	Electrolytic-100µF-63V-10+30%	14-06108200
C58	Porcelain-36pF-500V-chip	14-30361400
C19	Porcelain-470pF-200V-chip	14-30472300
C20	Porcelain-470pF-200V-chip	14-30472300
C21	Porcelain-1nF- 50V- chip	14-30103300
C32	Porcelain-470pF-200V-chip	14-30472300
C33	Porcelain-470pF-200V-chip	14-30472300
C34	Porcelain-180pF-300V-chip	14-30182300
C35	Porcelain-470pF-200V-chip	14-30472300
C38	Ceramic-100nF-50V-chip	14-03105200
C39	Porcelain-470pF-200V-chip	14-30472300
C40	Porcelain-470pF-200V-chip	14-30472300
C41	Porcelain-470pF-200V-chip	14-30472300
C42	Porcelain-1nF- 50V- chip	14-30103300
C43	Ceramic-100nF-50V-chip	14-03105200
C44	Plastic-100nF-50V-10%-SM	14-21105202
C45	Porcelain-470pF-200V-chip	14-30472300
C46	Porcelain-470pF-200V-chip	14-30472300
C47	Porcelain-220pF-200V-chip	14-30222300
C48	Porcelain-120pF-300V-chip	14-30122300
C49	Porcelain-220pF-200V-chip	14-30222300

Assembly: VHF RF PA ASSEMBLY (3010 AND 3050 TRs)

Part No: 68-30700001

Circuit Reference	Description	Part Number
C50	Porcelain-470pF-200V-chip 14-30472300	
C51	Porcelain-470pF-200V-chip 14-30472300	
C52	Plastic- 100nF- 50V-10%-SM 14-21105202	
C53	Electrolytic-100µF-63V-10+30% 14-06108200	
C54	Electrolytic-100µF-63V-10+30% 14-06108200	
C55	Ceramic- 1nF-500V- feedthrough 14-03103411	
C56	Ceramic- 1nF-500V- feedthrough 14-03103411	
C57	Ceramic- 1nF-500V- feedthrough 14-03103411	
C59	Ceramic- 1nF-500V- feedthrough 14-03103411	

Note ...

C15*, C20* and C21* are located on the driver PCB (FET)

C15**, C20** and C21** are located on the RFPA PCB (FET)

SEMICONDUCTORS

D1	Pin diode-HSMP3820-SOT23 61-00403820	
D2	Pin diode-HSMP3820-SOT23 61-00403820	
D3	Diode-HSMS-2800-chip 61-20612800	
D5	Diode-6V2-zener-chip 61-20206214	
D6	Diode-6V2-zener-chip 61-20206214	
TR1	FET-MRF160 61-08001160	
TR2	FET-MRF136-RF-power 61-08000136	
TR3	FET - MRF171 61-08001171	
TR6	FET - MRF 174 61-08001174	
TR7	FET - MRF 174 61-08001174	
TR4	Transistor- BC847-chip 61-24120847	
TR5	Transistor- BC857-chip 61-24120857	

INDUCTORS

L1	Inductor-220nH-1210-chip	79-01000050
L2	Inductor-220nH-1210-chip	79-01000050
L3	Inductor-220nH-1210-chip	79-01000050
L4	Inductor-220nH-1210-chip	79-01000050
L5	Coil 2T 22SWG ID 4mm	79-11000048
L6	Coil 5T 22SWG ID 3mm	79-11000046
L7	Coil 10T 22SWG ID 4mm	79-11000047
L8	RF-torroid-choke-4T	79-11000045
L9	RF-torroid-choke-4T	79-11000045
L10	RF-torroid-choke-4T	79-11000045
L11	Coil 5T 22SWG ID 3mm	79-11000046
L12	RF-torroid-choke-4T	79-11000045
L13	RF-torroid-choke-4T	79-11000045
L14	Coil 2T 22SWG ID 4mm	79-11000048

Assembly: VHF RF PA ASSEMBLY (3010 AND 3050 TRs)

Part No: 68-30700001

Circuit Reference	Description	Part Number
L15	Coil; 2T 22SWG ID 4mm	79-11000048
CONNECTORS		
CN1	Socket-BK-S-screw ON-S-SMA	19-02070501
CN2	Socket-BK-S-screw ON-S-SMA	19-02070501
CN3	Socket-BK-S-RG316-S-SMA	19-02070502
	Socket-02-free-03A-SM	20-02020103
	Plug-01-CHAS-13A-S-insert	20-01010400
	Socket-01-free-3A-S-insert	20-02010402
	Shell-FLG-03-trident	20-09030101
METALWORK		
	VHF box 1	45-00002711
	VHF PA (FET) box 3	45-00007767
	PA-box-lid	45-00002802
	Heatsink right	45-00002642
MISCELLANEOUS		
LK1	Plug-02-PCMT-05A-SM	20-01020302
LK2	Plug-02-PCMT-05A-SM	20-01020302
LK3	Plug-02-PCMT-05A-SM	20-01020302
T1	RF-balun-18R	79-10000092
T2	PA transformer	79-10000019
T3	PA transformer	79-10000019
T4	PA transformer	79-10000018
	Twisted contact strip	02-27019165
	Spacer HEX M/F BR M3 X 20-8 stud	36-05030208
	Stand off insulator	39-00233293
	VHF RFPA driver PCB (FET)	55-00000514
	RFPA PCB (FET)	55-00000515

Note ...

The following additional components are fitted to the 3010 TR, VHF RF PA .

D4	Diode- 6V2- zener- chip	61-20206214
IC1	LM35DH- temperature sensor	61-12000035
R51	Resistor- 1k- 0W25- 5%- 1206- chip	59-90015002

Assembly: UHF RF PA ASSEMBLY (3030 AND 3050 TRs)

Part No: 68-30300007

Circuit Reference	Description	Part Number
RESISTORS		
RV1	Potentiometer-PCB-linear cermet-2k-horizontal	53-50024204
RV2	Potentiometer-PCB-linear cermet-2k-horizontal	53-50024204
RV3	Potentiometer-PCB-linear cermet-2k-horizontal	53-50024204
R2	Resistor- 22R-0W50-5%-metal film	59-10222002
R3	Resistor-330R-0W50-5%-metal film	59-13302002
R4	Resistor- 22R-0W50-5%-metal film	59-10222002
R5	Resistor- 39R-0W50-5%-metal film	59-10392002
R6	Resistor-330R-0W50-5%-metal film	59-13302002
R7	Resistor-330R-0W50-5%-metal film	59-13302002
R8	Resistor- 1k-0W50-5%-metal film	59-10015002
R9	Resistor- 10R-0W50-5%-metal film	59-10102002
R10	Resistor- 10R-0W50-5%-metal film	59-10102002
R11	Resistor-180R-0W50-5%-metal film	59-11802002
R12	Resistor- 10k-0W50-5%-metal film	59-10105002
R13	Resistor- 47k-0W50-5%-metal film	59-10475002
R14	Resistor- 47k-0W50-5%-metal film	59-10475002
R15	Resistor- 2k7-0W50-5%-metal film	59-10274002
R16	Resistor- 1R-2W50-5%-wirewound	59-40012025
R17	Resistor- 1R-2W50-5%-wirewound	59-40012025
R18	Resistor- 1R-2W50-5%-wirewound	59-40012025
R19	Resistor- 10R-0W50-5%-metal film	59-10102002
R20	Resistor- 10R-0W50-5%-metal film	59-10102002
R21	Resistor- 2k2-0W50-5%-metal film	59-10224002
R22	Resistor-100R-20W0-2%-microstrip	59-81002100
R23	Resistor-100R-20W0-2%-microstrip	59-81002100
R24	Resistor- 10R-0W50-5%-metal film	59-10102002
R25	Resistor- 10R-0W50-5%-metal film	59-10102002
R26	Resistor- 10R-0W50-5%-metal film	59-10102002
R27	Resistor- 10R-0W50-5%-metal film	59-10102002
R28	Resistor- 10k-0W50-5%-metal film	59-10105002
CAPACITORS		
C1	Ceramic- 1nF-100V- -miniature plate	14-03103301
C2	Porcelain- 470pF-200V- -chip	14-30472300
C4	Porcelain- 100pF-500V- -chip	14-30102400
C5	Porcelain- 470pF-200V- -chip	14-30472300
C6	Ceramic- 1nF-100V- -miniature plate	14-03103301
C7	Porcelain- 100pF-500V- -chip	14-30102400
C8	Porcelain- 470pF-200V- -chip	14-30472300

Circuit Reference	Description	Part Number
C9	Porcelain- 470pF-200V- -chip	14-30472300
C10	Ceramic- 1nF-100V- -miniature plate	14-03103301
C12	Porcelain- 27pF-500V- -chip	14-30271400
C13	Porcelain- 470pF-200V- -chip	14-30472300
C14	Porcelain- 470pF-200V- -chip	14-30472300
C15	Porcelain- 470pF-200V- -chip	14-30472300
C16	Porcelain- 470pF-200V- -chip	14-30472300
C17	Ceramic- 100nF-100V- -MONOLC	14-03105300
C18	Ceramic- 4.7pF-100V- -miniature plate	14-03470301
C20	Ceramic- 1nF-500V- feed-through	14-03103411
C21	Ceramic- 1nF-500V- feed-through	14-03103411
C22	Ceramic- 1nF-500V- feed-through	14-03103411
C23	Ceramic- 1nF-500V- feed-through	14-03103411
C24	Porcelain- 15pF-500V- -chip	14-30151400
C25	Electrolytic- 100µF- 63V-10+30%	14-06108200
C26	Porcelain- 39pF-500V- -chip	14-30391400
C27	Porcelain- 39pF-500V- -chip	14-30391400
C28	Porcelain- 27pF-500V- -chip	14-30271400
C29	Porcelain- 56pF-500V- -chip	14-30561400
C30	Porcelain- 27pF-500V- -chip	14-30271400
C31	Porcelain- 39pF-500V- -chip	14-30391400
C32	Porcelain- 39pF-500V- -chip	14-30391400
C33	Porcelain- 15pF-500V- -chip	14-30151400
C34	Mixed-0.22µF- 63V- -polyester	14-21225200
C35	Ceramic- 1nF-500V- feed-through	14-03103411
C36	Tantalum- 2.2µF- 35V	14-36226101
C37	Porcelain- 39pF-500V- -chip	14-30391400
C38	Porcelain- 39pF-500V- -chip	14-30391400
C39	Porcelain- 27pF-500V- -chip	14-30271400
C40	Porcelain- 56pF-500V- -chip	14-30561400
C41	Porcelain- 27pF-500V- -chip	14-30271400
C42	Porcelain- 33pF-500V- -chip	14-30331400
C43	Porcelain- 33pF-500V- -chip	14-30331400
C44	Porcelain- 27pF-500V- -chip	14-30271400
C45	Porcelain- 39pF-500V- -chip	14-30391400
C46	Porcelain- 39pF-500V- -chip	14-30391400
C47	Porcelain- 27pF-500V- -chip	14-30271400
C48	Porcelain- 56pF-500V- -chip	14-30561400
C49	Porcelain- 27pF-500V- -chip	14-30271400
C50	Porcelain- 33pF-500V- -chip	14-30331400
C51	Porcelain- 33pF-500V- -chip	14-30331400
C52	Porcelain- 27pF-500V- -chip	14-30271400
C53	Ceramic- 100nF-100V- -MONOLC	14-03105300
C54	Ceramic- 100nF-100V- -MONOLC	14-03105300
C55	Ceramic- 1nF-500V- feed-through	14-03103411

Assembly: UHF RF PA ASSEMBLY (3030 AND 3050 TRs)

Part No: 68-30300007

Circuit Reference	Description	Part Number
C56	Ceramic- 1nF-500V- feed-through	14-03103411
C58	Electrolytic- 100µF- 63V-10+30%	14-06108200
C59	Electrolytic- 100µF- 63V-10+30%	14-06108200
SEMICONDUCTORS		
D1	Diode 5082-2835	61-00602835
D2	Diode BZX55C5V6	61-00205604
D3	Diode BZY88C8V2	61-00208205
D4	Diode 1N4004	61-00314004
D5	Diode 1N4004	61-00314004
IC1	Integrated circuit LM35DH temperature sensor	61-12000035
TR1	FET-MRF134-RF-power	61-08000134
TR2	FET-MRF134-RF-power	61-08000134
TR3	FET-MFR136-RF-power	61-08000136
TR4	Transistor BC212	61-04110212
TR5	Transistor BC182	61-04120182
TR6	Transistor MRF392	61-04524130
TR7	Transistor MJE340	61-04220340
TR8	Transistor MRF392	61-04524130
TR9	Transistor MRF392	61-04524130
CONNECTORS		
CN1	Socket-BK-S-screw on-S-SMA	19-02070501
CN2	Socket-BK-S-screw on-S-SMA	19-02070501
	Socket-01-free-3A-S-insert	20-02010402
	Plug-01-chassis-13A-S-Insert	20-01010400
CN3	Socket-06-free-03A-S-SIL	20-02060101
CN4	SHGL-FLG-03-trident	20-09030101
METALWORK		
	PA box lid	45-00002802
	UHF/VHF box 3	45-00002724
	UHF box 2	45-00002723
	UHF box 1	45-00002722
	Heatsink right	45-00002642

Assembly: UHF RF PA ASSEMBLY (3030 AND 3050 TRs)

Part No: 68-30300007

Circuit Reference	Description	Part Number
	MISCELLANEOUS	
	Twisted contact strip	02-27019165
	Stand off insulator	39-00233293
PCB1	UHF driver 1	55-00000306
PCB2	UHF driver 2	55-00000307
PCB3	PCB UHF power amplifier	55-00000245
PCB4	PA splitter PCB	55-00000308
PCB5	PA combiner PCB	55-00000309
L1	Coil-1.0T enamel ID 3.0mm	79-10000078
L3	Coil-5.0T enamel ID 3.0mm	79-10000071
L5	Coil-2.0T enamel ID 3.0mm	79-10000070
L7	Coil-5x2mm hairpin TCW	79-10000080
L8	Coil-1.0T enamel ID 3.0mm	79-10000069
L11	Choke 10mH SC30	79-01000013
L12	Choke µH15 10T 3.5mm ID	79-01000024
L13	Choke µH15 10T 3.5mm ID	79-01000024
L14	Choke 10mH SC30	79-01000013
L15	Choke 10mH SC30	79-01000013
L16	Choke µH15 10T 3.5mm ID	79-01000024
L17	Choke µH15 10T 3.5mm ID	79-01000024
L18	Choke 10mH SC30	79-01000013
L19	Coil-10x2mm hairpin TCW	79-10000081
L20	Choke µH15 10T 3.5mm ID	79-01000024
L21	Choke µH15 10T 3.5mm ID	79-01000024
L22	Choke 10mH SC30	79-01000013
L23	Choke µH15 10T 3.5mm ID	79-01000024
L24	Choke µH15 10T 3.5mm ID	79-01000024
L25	Choke 10mH SC30	79-01000013
L26	Coil-10x2mm hairpin TCW	79-10000081
L27	Choke µH15 10T 3.5mm ID	79-01000024
L28	Choke µH15 10T 3.5mm ID	79-01000024
L29	Coil-6.0T enamel ID 5.0mm	79-10000079
L30	Coil-6.0T enamel ID 5.0mm	79-10000079
L31	Coil-10x2mm hairpin TCW	79-10000081
L32	Choke µH15 10T 3.5mm ID	79-01000024
L33	Choke µH15 10T 3.5mm ID	79-01000024
T2	RF transformer .056 coaxial	79-10000008
T3	RF transformer .056 coaxial	79-10000008
T4	RF transformer .056 coaxial	79-10000008
T5	RF transformer .056 coaxial	79-10000008
T6	RF transformer .056 coaxial	79-10000008
T7	RF transformer .056 coaxial	79-10000008

Assembly: FILTER COUPLER ASSEMBLY

Part No: 68-30700002 (3010 TR), 68-30300001 (3030 TR), 68-30600025 (3050 TR)

Circuit Reference	Description	Part Number
CONNECTORS		
	Coax-SMA/SMA-RG142-145mm (3010 and 3030 TRs)	17-01000054
	Coax-SMA/SMA-RG316-75mm (3030 and 3050 TRs)	17-01000057
	Socket-09-free-03A-S-SIL	20-02090102
	Socket-01-free-3A-S-insert	20-02010402
METALWORK		
	VHF filter mounting plate	45-00002775
	UHF filter mounting plate	45-00002703
	Heatsink (left)	45-00002701
MISCELLANEOUS		
	VHF Low pass filter (3010 and 3050 TRs)	68-30000034
	UHF Low pass filter 5275A (3030 and 3030 TRs)	27-10052750
	VHF Directional coupler (3010 and 3050 TRs)	68-30300097
	UHF Directional coupler (3030 and 3050 TRs)	68-30000098
	Power regulator assembly	68-30300004

Assembly: VHF DIRECTIONAL COUPLER (3010 AND 3050 TRs)

Part No: 68-30000097

Circuit Reference	Description	Part Number
RESISTORS		
RV1	Potentiometer-PCB-LN-cermet- 2k-vertical	53-50023201
RV2	Potentiometer-PCB-LN-cermet- 2k-vertical	53-50023201
R1	Resistor- 51R-0W25-5%-1206-CHIP	59-10682002
R2	Resistor- 51R-0W25-5%-1206-CHIP	59-10682002
R3	Resistor-2k2 0W25-5%-1206- CHIP	59-90224002
R4	Resistor-2k2 0W25-5%-1206- CHIP	59-90224002
CAPACITORS		
C1	Ceramic- 100pF-50V- CHIP-	14-03102200
C2	Ceramic- 100pF-50V- CHIP-	14-03102200
C3	Ceramic- 47pF-50V- CHIP	14-03471200
C4	Ceramic- 100pF-50V- CHIP-	14-03102200
C5	Ceramic- 470pF-50V- CHIP	14-03472302
C6	Ceramic- 470pF-50V- CHIP	14-03472302
C7	Ceramic- 47pF-50V- CHIP	14-03471200
C8	Ceramic- 100pF-50V- CHIP-	14-03102200
C9	Ceramic- 470pF-50V- CHIP	14-03472302
SEMICONDUCTORS		
D1	Single schottky- HSM2820-SOT23	61-00602820
D2	Single schottky- HSM2820-SOT23	61-00602820
CONNECTORS		
	Socket-BK-S-flange -S-SMA	19-02070500
	Socket-01-PCMT-27A-S-pin	20-02010304
METALWORK		
	Directional coupler C/R rod	45-00002706
	Directional coupler block	45-00002705
	Directional coupler endplate	45-00002708
	Directional coupler spacer PTFE GA6057	45-00006057
	Directional coupler pickup element	45-00006043

Assembly: VHF DIRECTIONAL COUPLER (3010 AND 3050 TRs)

Part No: 68-30000097

Circuit Reference	Description	Part Number
MISCELLANEOUS		
PCB1	Directional coupler	55-00000479
L1	Inductor-150nH-1210-CHIP	79-01000058
L2	Inductor-150nH-1210-CHIP	79-01000058
L3	Inductor-150nH-1210-CHIP	79-01000058
L4	Inductor-150nH-1210-CHIP	79-01000058

Assembly: UHF DIRECTIONAL COUPLER (3030 AND 3050 TRs)

Part No: 68-30000098

Circuit Reference	Description	Part Number
RESISTORS		
RV1	Potentiometer-PCB-LN-cermet- 2k-vertical	53-50023201
RV2	Potentiometer-PCB-LN-cermet- 2k-vertical	53-50023201
R1	Resistor- 75R-0W25-5%-1206-CHIP	59-90752002
R2	Resistor- 75R-0W25-5%-1206-CHIP	59-90752002
R3	Resistor-2k2 0W25-5%-1206- CHIP	59-90224002
R4	Resistor-2k2 0W25-5%-1206- CHIP	59-90224002
CAPACITORS		
C1	Ceramic- 100pF-50V- CHIP-	14-03102200
C2	Ceramic- 100pF-50V- CHIP-	14-03102200
C3	Ceramic- 47pF-50V- CHIP	14-03471200
C4	Ceramic- 100pF-50V- CHIP-	14-03102200
C5	Ceramic- 470pF-50V- CHIP	14-03472302
C6	Ceramic- 470pF-50V- CHIP	14-03472302
C7	Ceramic- 12pF-50V- CHIP	14-03121200
C8	Ceramic- 100pF-50V- CHIP-	14-03102200
C9	Ceramic- 470pF-50V- CHIP	14-03472302
SEMICONDUCTORS		
D1	Single schottky- HSM2820-SOT23	61-00602820
D2	Single schottky- HSM2820-SOT23	61-00602820
CONNECTORS		
	Socket-BK-S-flange -S-SMA	19-02070500
	Socket-01-PCMT-27A-S-pin	20-02010304
METALWORK		
	Directional coupler C/R rod	45-00002706
	Directional coupler block	45-00002705
	Directional coupler endplate	45-00002708
	Directional coupler spacer PTFE GA6057	45-00006057
	Directional coupler pickup element	45-00006043

Assembly: UHF DIRECTIONAL COUPLER (3030 AND 3050 TRs)

Part No: 68-30000098

Circuit Reference	Description	Part Number
MISCELLANEOUS		
PCB1	Directional coupler	55-00000479
L1	Inductor-150nH-1210-CHIP	79-01000058
L2	Inductor-150nH-1210-CHIP	79-01000058
L3	Inductor-150nH-1210-CHIP	79-01000058
L4	Inductor-150nH-1210-CHIP	79-01000058

Assembly: POWER REGULATOR ASSEMBLY

Part No: 68-30300004

Circuit Reference	Description	Part Number
RESISTORS		
RV1	Potentiometer-PCB-linear cermet- 10k-horizontal	53-51003205
R1	Resistor- 2k2-0W50-5%-metal film	59-10224002
R2	Resistor-220R-0W50-5%-metal film	59-12202002
R3	Resistor-220R-0W50-5%-metal film	59-12202002
R4	Resistor-0R03-3W00-1%-wirewound	59-40330030
R5	Resistor- 10k-0W50-5%-metal film	59-10105002
R6	Resistor- 15R-0W50-5%-metal film	59-10152002
R7	Resistor-470R-0W50-5%-metal film	59-14702002
R8	Resistor- 10k-0W50-5%-metal film	59-10105002
R9	Resistor- 10k-0W50-5%-metal film	59-10105002
R10	Resistor- 10k-0W50-5%-metal film	59-10105002
R11	Resistor- 10k-0W50-5%-metal film	59-10105002
R12	Resistor- 2k2-0W50-5%-metal film	59-10224002
R13	Resistor-220R-0W50-5%-metal film	59-12202002
R14	Resistor-220R-0W50-5%-metal film	59-12202002
R15	Resistor-0R03-3W00-1%-wirewound	59-40330030
R16	Resistor- 10k-0W50-5%-metal film	59-10105002
R17	Resistor- 15R-0W50-5%-metal film	59-10152002
R18	Resistor-470R-0W50-5%-metal film	59-14702002
R19	Resistor- 4k7-0W50-5%-metal film	59-10474002
R20	Resistor- 1k-0W50-5%-metal film	59-10015002
R21	Resistor- 1k-0W50-5%-metal film	59-10015002
R24	Resistor- 2k2-0W50-5%-metal film	59-10224002
R25	Resistor-220R-0W50-5%-metal film	59-12202002
R26	Resistor-220R-0W50-5%-metal film	59-12202002
R27	Resistor-0R03-3W00-1%-wirewound	59-40330030
R28	Resistor- 10k-0W50-5%-metal film	59-10105002
R29	Resistor- 15R-0W50-5%-metal film	59-10152002
R30	Resistor-470R-0W50-5%-metal film	59-14702002
R31	Resistor- 2k2-0W50-5%-metal film	59-10224002
R32	Resistor-220R-0W50-5%-metal film	59-12202002
R33	Resistor-220R-0W50-5%-metal film	59-12202002
R34	Resistor-0R03-3W00-1%-wirewound	59-40330030
R35	Resistor- 10k-0W50-5%-metal film	59-10105002
R36	Resistor- 15R-0W50-5%-metal film	59-10152002
R37	Resistor-470R-0W50-5%-metal film	59-14702002
R38	Resistor- 10k-0W50-5%-metal film	59-10105002
R39	Resistor- 10k-0W50-5%-metal film	59-10105002
R40	Resistor- 10k-0W50-5%-metal film	59-10105002
R41	Resistor- 10k-0W50-5%-metal film	59-10105002
R43	Resistor- 1k-0W50-5%-metal film	59-10015002
R45	Resistor- 4k7-0W50-5%-metal film	59-10474002

Assembly: POWER REGULATOR ASSEMBLY

Part No: 68-30300004

Circuit Reference	Description	Part Number
R46	Resistor- 1k-0W50-5%-metal film	59-10015002
R47	Resistor- 2k2-0W50-5%-metal film	59-10224002
R48	Resistor-220R-0W50-5%-metal film	59-12202002
R49	Resistor-220R-0W50-5%-metal film	59-12202002
R50	Resistor-0R03-3W00-1%-wirewound	59-40330030
R51	Resistor- 10k-0W50-5%-metal film	59-10105002
R52	Resistor- 15R-0W50-5%-metal film	59-10152002
R53	Resistor-470R-0W50-5%-metal film	59-14702002
R54	Resistor- 2k2-0W50-5%-metal film	59-10224002
R55	Resistor-220R-0W50-5%-metal film	59-12202002
R56	Resistor-220R-0W50-5%-metal film	59-12202002
R57	Resistor-0R03-3W00-1%-wirewound	59-40330030
R58	Resistor- 10k-0W50-5%-metal film	59-10105002
R59	Resistor- 15R-0W50-5%-metal film	59-10152002
R60	Resistor-470R-0W50-5%-metal film	59-14702002
R61	Resistor- 10k-0W50-5%-metal film	59-10105002
R62	Resistor- 10k-0W50-5%-metal film	59-10105002
R63	Resistor- 10k-0W50-5%-metal film	59-10105002
R64	Resistor- 10k-0W50-5%-metal film	59-10105002
R66	Resistor- 1k-0W50-5%-metal film	59-10015002
R68	Resistor- 4k7-0W50-5%-metal film	59-10474002
R69	Resistor- 1k-0W50-5%-metal film	59-10015002
R70	Resistor- 18k-0W50-5%-metal film	59-10185002
R71	Resistor- 10k-0W50-5%-metal film	59-10105002
R72	Resistor- 47k-0W50-5%-metal film	59-10475002
R73	Resistor- 47k-0W50-5%-metal film	59-10475002
R74	Resistor- 10k-0W50-5%-metal film	59-10105002
R75	Resistor- 10k-0W50-5%-metal film	59-10105002
R76	Resistor- 47k-0W50-5%-metal film	59-10475002
R77	Resistor- 47k-0W50-5%-metal film	59-10475002
R78	Resistor- 33R-0W50-5%-metal film	59-10332002
R79	Resistor- 1k8-0W50-5%-metal film	59-10184002
R80	Resistor- 10k-0W50-5%-metal film	59-10105002
R81	Resistor- 10k-0W50-5%-metal film	59-10105002
R82	Resistor-100k-0W50-5%-metal film	59-11005002
R83	Resistor- 3k9-0W50-5%-metal film	59-10394002
R84	Resistor-470k-0W50-5%-metal film	59-14705002
CAPACITORS		
C2	Ceramic- 68pF-100V- -miniature plate	14-03681301
C4	Ceramic- 68pF-100V- -miniature plate	14-03681301
C5	Ceramic- 1nF-100V- -miniature plate	14-03103301

Assembly: POWER REGULATOR ASSEMBLY

Part No: 68-30300004

Circuit Reference	Description	Part Number
C7	Ceramic- 68pF-100V- -miniature plate	14-03681301
C9	Ceramic- 68pF-100V- -miniature plate	14-03681301
C10	Ceramic- 1nF-100V- -miniature plate	14-03103301
C12	Ceramic- 68pF-100V- -miniature plate	14-03681301
C14	Ceramic- 68pF-100V- -miniature plate	14-03681301
C15	Ceramic- 1nF-100V- -miniature plate	14-03103301
C16	Mixed- 0.1µF- 63V- -polyester	14-21105200
C17	Mixed- 0.1µF- 63V- -polyester	14-21105200
C18	Mixed- 0.1µF- 63V- -polyester	14-21105200
C19	Ceramic- 1nF-100V- -miniature plate	14-03103301
C20	Ceramic- 1nF-100V- -miniature plate	14-03103301
C21	Ceramic- 1nF-100V- -miniature plate	14-03103301
C22	Ceramic- 1nF-100V- -miniature plate	14-03103301
C23	Electrolytic- 100µF- 40V	14-06108111
C24	Mixed- 0.1µF- 63V- -polyester	14-21105200
SEMICONDUCTORS		
D1	Diode 1N4148	61-00104148
D2	Zener diode BZY88C3V0	61-00203005
D3	Diode 1N4148	61-00104148
D4	Zener diode BZY88C3V0	61-00203005
D5	Diode 1N4148	61-00104148
D6	Zener diode BZY88C3V0	61-00203005
D7	Diode 1N4148	61-00104148
D8	Zener diode BZY88C3V0	61-00203005
D9	Diode 1N4148	61-00104148
D10	Zener diode BZY88C3V0	61-00203005
D11	Diode 1N4148	61-00104148
D12	Zener diode BZY88C3V0	61-00203005
D15	Diode 1N4004	61-00314004
D16	Diode BZX55C12	61-00212005
D17	Diode BZX55C12	61-00212005
D18	Diode BZX55C12	61-00212005
D19	Diode BZX55C12	61-00212005
IC1	Integrated circuit LM201AN-operational amplifier	61-12000201
IC2	Integrated circuit LM201AN-operational amplifier	61-12000201
IC3	Integrated circuit LM201AN-operational amplifier	61-12000201
IC4	Integrated circuit LM201AN-operational amplifier	61-12000201
IC5	Integrated circuit LM201AN-operational amplifier	61-12000201
IC6	Integrated circuit LM201AN-operational amplifier	61-12000201
IC7	Integrated circuit CA3130	61-12003130
IC8	Integrated circuit CA3130	61-12003130
IC9	Integrated circuit CA3130	61-12003130

Assembly: POWER REGULATOR ASSEMBLY

Part No: 68-30300004

Circuit Reference	Description	Part Number
IC10	Integrated circuit CA3240	61-12003240
IC11	Integrated circuit CA3240	61-12003240
IC12	Integrated circuit CA3240	61-12003240
IC13	Integrated circuit MC7812BT external temperature range	61-12017812
IC14	Integrated circuit LM35DH -temp sensor	61-12000035
TR1	Transistor BC182	61-04120182
TR2	Transistor BC182	61-04120182
TR3	Transistor BC182	61-04120182
TR4	Transistor BC182	61-04120182
TR5	Transistor BC182	61-04120182
TR6	Transistor BC182	61-04120182
TR7	Transistor BC182	61-04120182
TR8	Transistor BC182	61-04120182
TR9	Transistor BC182	61-04120182
TR10	Transistor BC182	61-04120182
TR11	Transistor BC182	61-04120182
TR12	Transistor BC182	61-04120182
TR13	Transistor BC182	61-04120182
TR14	Transistor BC182	61-04120182
TR15	Transistor BC182	61-04120182
TR16	Transistor BC182	61-04120182
TR17	Transistor BC182	61-04120182
TR18	Transistor BC182	61-04120182
TR19	Transistor VN10KM	61-08000010
TR20	FET-2SJ113 P-channel power	61-08002113
TR21	FET-2SJ113 P-channel power	61-08002113
TR22	FET-2SJ113 P-channel power	61-08002113
TR23	FET-2SJ113 P-channel power	61-08002113
TR24	FET-2SJ113 P-channel power	61-08002113
TR25	FET-2SJ113 P-channel power	61-08002113
TR26	Transistor VN10KM	61-08000010
CONNECTORS		
CN1	Plug-10-PCMT- 1A-S-NLIDC	20-10100301
CN2	Plug-01-PCMT- -S-pin	20-01010303
CN3	Plug-01-PCMT- -S-pin	20-01010303
CN4	Plug-01-PCMT- -S-pin	20-01010303
CN5	Plug-01-PCMT- -S-pin	20-01010303
CN6	Plug-09-PCMT-03A-S-dubox	20-01090301
CN7	Plug-01-PCMT- -S-pin	20-01010303
CN8	Socket-03-PCMT- 3A-S-pin	20-02030301
CN9	Socket-03-PCMT- 3A-S-pin	20-02030301
CN10	Socket-03-PCMT- 3A-S-pin	20-02030301

Assembly: POWER REGULATOR ASSEMBLY

Part No: 68-30300004

Circuit Reference	Description	Part Number
CN11	Socket-03-PCMT- 3A-S-pin	20-02030301
CN12	Socket-03-PCMT- 3A-S-pin	20-02030301
CN13	Socket-03-PCMT- 3A-S-pin	20-02030301
CN14	Socket-03-PCMT- 3A-S-pin	20-02030301
CN15	Socket-03-PCMT- 3A-S-pin	20-02030301
PL8	Plug-03-PCMT- 3A-S-pin	20-01030301
PL9	Plug-03-PCMT- 3A-S-pin	20-01030301
PL10	Plug-03-PCMT- 3A-S-pin	20-01030301
PL11	Plug-03-PCMT- 3A-S-pin	20-01030301
PL12	Plug-03-PCMT- 3A-S-pin	20-01030301
PL13	Plug-03-PCMT- 3A-S-pin	20-01030301
PL14	Plug-03-PCMT- 3A-S-pin	20-01030301
PL15	Plug-03-PCMT- 3A-S-pin	20-01030301
METALWORK		
	Modulator block	45-00002718
MISCELLANEOUS		
	PCB test point terminal	02-12000001
PCB1	PCB-power MOD 1	55-00000272
PCB2	PCB-power MOD 2	55-00000273
	Washer TO3 MICA+insulating bush	62-02017018
L1	Choke- 5µH-20%-tubular	79-01000034

9 RECEIVER

Assembly: RECEIVER RF MODULE (3010 AND 3050 TRs)

Part No: 68-30000021

Circuit Reference	Description	Part Number
RESISTORS		
R3	Resistor-680R-0W4-1%- metal film	59-16802002.
R4	Resistor-680R-0W4-1%-metal film	59-16802002
R5	Resistor-680R-0W4-1%- metal film	59-16802002
R6	Resistor-680R-0W4-1%- metal film	59-16802002
R7	Resistor-680R-0W4-1%- metal film	59-16802002
R8	Resistor-680R-0W4-1%- metal film	59-16802002
R9	Resistor-680R-0W4-1%- metal film	59-16802002
R10	Resistor-680R-0W4-1%- metal film	59-16802002
R11	Resistor-680R-0W4-1%- metal film	59-16802002
R12	Resistor-680R-0W4-1%- metal film	59-16802002
R13	Resistor-680R-0W4-1%- metal film	59-16802002
R14	Resistor-680R-0W4-1%- metal film	59-16802002
R15	Resistor-680R-0W4-1%- metal film	59-16802002
R16	Resistor-680R-0W4-1%- metal film	59-16802002
R17	Resistor-680R-0W4-1%- metal film	59-16802002
R18	Resistor-680R-0W4-1%- metal film	59-16802002
R19	Resistor-680R-0W4-1%- metal film	59-16802002
R20	Resistor-680R-0W4-1%- metal film	59-16802002
R21	Resistor-680R-0W4-1%- metal film	59-16802002
R22	Resistor-680R-0W4-1%- metal film	59-16802002
R23	Resistor-680R-0W4-1%- metal film	59-16802002
R24	Resistor-680R-0W4-1%- metal film	59-16802002
R25	Resistor-680R-0W4-1%- metal film	59-16802002
R26	Resistor-680R-0W4-1%- metal film	59-16802002
R27	Resistor-680R-0W4-1%- metal film	59-16802002
R28	Resistor-680R-0W4-1%- metal film	59-16802002
R29	Resistor-680R-0W4-1%- metal film	59-16802002
R30	Resistor-680R-0W4-1%- metal film	59-16802002
R31	Resistor-680R-0W4-1%- metal film	59-16802002
R32	Resistor-680R-0W4-1%- metal film	59-16802002
R33	Resistor-680R-0W4-1%- metal film	59-16802002
R34	Resistor-680R-0W4-1%- metal film	59-16802002
R35	Resistor-680R-0W4-1%- metal film	59-16802002
R36	Resistor-680R-0W4-1%- metal film	59-16802002
R37	Resistor-680R-0W4-1%- metal film	59-16802002
R38	Resistor-680R-0W4-1%- metal film	59-16802002
R39	Resistor-4k7-0W4-1%-metal film	59-10474002
R40	Resistor-470R-0W4-1%- metal film	59-14702002
R41	Resistor-10K-0W4-1%- metal film	59-10105002
R42	Resistor-150R-0W4-1%- metal film	59-11502002

Assembly: RECEIVER RF MODULE (3010 AND 3050 TRs)

Part No: 68-30000021

Circuit Reference	Description	Part Number
R43	Resistor-150R-0W4-1%- metal film	59-11502002
R45	Resistor-100R-0W4-1%- metal film	59-11002002
R46	Resistor-220R-0W4-1%- metal film	59-12202002
R47	Resistor-4k7-0W4-1%-metal film	59-10474002
R48	Resistor-2k7-0W4-1%-metal film	59-10274002
R49	Resistor-220R-0W4-1%- metal film	59-12202002
R50	Resistor-10k-0W4-1%- metal film	59-10105002
R51	Resistor-10k-0W4-1%- metal film	59-10105002
R52	Resistor-680R-0W4-1%- metal film	59-16802002
R53	Resistor-4k7-0W4-1%-metal film	59-10474002
R54	Resistor-1k8-0W4-1%- metal film	59-10184002
R56	Resistor-1k-0W4-1%-metal film	59-10015002
R57	Resistor-1k-0W4-1%-metal film	59-10015002
R58	Resistor-4k7-0W4-1%-metal film	59-10474002
R59	Resistor-5k6-0W4-1%-metal film	59-10564002
R60	Resistor-2k2-0W4-1%- metal film	59-10224002
R61	Resistor-1k2-0W4-1%- metal film	59-10124002
R62	Resistor-51R-0W4-1%-metal film	59-10512002
R63	Resistor-220R-0W4-1%- metal film	59-12202002
R64	Resistor-33R-0W4-1%-metal film	59-10332002
R65	Resistor-220R-0W4-1%- metal film	59-12202002
R66	Resistor-4 k7-0W4-1%-metal film	59-10474002
R67	Resistor-2 k7-0W4-1%-metal film	59-10274002
R68	Resistor-100R-0W4-1%- metal film	59-11002002
R69	Resistor-150R-0W4-1%- metal film	59-11502002
R70	Resistor-150R-0W4-1%- metal film	59-11502002
R71	Resistor-10k-0W4-1%- metal film	59-10105002
R72	Resistor-100R-0W4-1%- metal film	59-11002002
R73	Resistor-4k7-0W4-1%-metal film	59-10474002
R74	Resistor-2k7-0W4-1%-metal film	59-10274002
R75	Resistor-220R-0W4-1%- metal film	59-12202002
R76	Resistor-100R-0W4-1%- metal film	59-11002002
R77	Resistor-33R-0W4-1%-metal film	59-10332002
R78	Resistor-10k-0W4-1%- metal film	59-10105002
R79	Resistor-150R-0W4-1%- metal film	59-11502002
R80	Resistor-150R-0W4-1%- metal film	59-11502002
R81	Resistor-4k7-0W4-1%-metal film	59-10474002
R82	Resistor-1k8-0W4-1%- metal film	59-10184002
R83	Resistor-1k2-0W4-1%- metal film	59-10124002
R84	Resistor-4k7-0W4-1%-metal film	59-10474002
R85	Resistor-5k6-0W4-1%-metal film	59-10564002
R86	Resistor-2k2-0W4-1%- metal film	59-10224002
R87	Resistor-1k-0W4-1%-metal film	59-10015002
R88	Resistor-1k-0W4-1%-metal film	59-10015002
R89	Resistor-220R-0W4-1%- metal film	59-12202002

Assembly: RECEIVER RF MODULE (3010 AND 3050 TRs)

Part No: 68-30000021

Circuit Reference	Description	Part Number
R90	Resistor-1k-0W4-1%-metal film	59-10015002
R91	Resistor-10 k-0W4-1%- metal film	59-10105002
R92	Resistor-1 k2-0W4-1%- metal film	59-10124002
R93	Resistor-4 k7-0W4-1%-metal film	59-10474002
R94	Resistor-680R-0W4-1%- metal film	59-16802002
R95	Resistor-10k-0W4-1%- metal film	59-10105002
R96	Resistor-5k6-0W4-1%-metal film	59-10564002
R97	Resistor-330R-0W4-1%- metal film	59-13302002
R98	Resistor-470R-0W4-1%- metal film	59-14702002
R99	Resistor-47k-0W4-1%-metal film	59-10475002
R100	Resistor-1k-0W4-1%-metal film	59-10015002
R101	Resistor-1k-0W4-1%-metal film	59-10015002
R102	Resistor-1k-0W4-1%-metal film	59-10015002
R103	Resistor-4k7-0W4-1%-metal film	59-10474002
R104	Resistor-1k5-0W4-1%- metal film	59-10154002
R105	Resistor-2k2-0W4-1%- metal film	59-10224002
R106	Resistor-1k8-0W4-1%- metal film	59-10184002
R107	Resistor-1k5-0W4-1%- metal film	59-10154002
R108	Resistor-22k-0W4-1%- metal film	59-10225002
R109	Resistor-1k-0W4-1%-metal film	59-10015002
R110	Resistor-4k7-0W4-1%-metal film	59-10474002
R112	Resistor-10k-0W4-1%- metal film	59-10105002
R113	Resistor-10k-0W4-1%- metal film	59-10105002
R114	Resistor-270R-0W4-1%- metal film	59-12702002
R115	Resistor-18R-0W4-1%- metal film	59-10182002
R116	Resistor-270R-0W4-1%- metal film	59-12702002
R117	Resistor-4k7-0W4-1%-metal film	59-10474002
R118	Resistor-4k7-0W4-1%-metal film	59-10474002
R501	Resistor- 1k-0W33-1%-metal film	59-10015003
R502	Resistor- 1k-0W33-1%-metal film	59-10015003
R503	Resistor- 4k7-0W33-5%-metal film	59-10474003
R504	Resistor- 1k5-0W33-5%-metal film	59-10154003
R505	Resistor- 1k-0W33-1%-metal film	59-10015003
R506	Resistor- 1k-0W33-1%-metal film	59-10015003
R507	Resistor- 1k-0W33-1%-metal film	59-10015003
R508	Resistor- 1k-0W33-1%-metal film	59-10015003
R509	Resistor- 1k-0W33-1%-metal film	59-10015003
R513	Resistor-100k-0W33-5%-metal film	59-11005003
R514	Resistor- 4k7-0W33-5%-metal film	59-10474003
RN501	Resistor-100k-1W50-2%-network	59-81005002
RN502	Resistor-100k-1W50-2%-network	59-81005002
RN503	Resistor- 10k-0W10-2%-network	59-80105001
RN504	Resistor-100k-0W10-2%-network	59-81005001
RN505	Resistor- 10k-0W10-2%-network	59-80105001

Assembly: RECEIVER RF MODULE (3010 AND 3050 TRs)

Part No: 68-30000021

Circuit Reference	Description	Part Number
CAPACITORS		
C1	Ceramic-68PF-100V-MN-PLT	14-03681301
C2	Ceramic- 100PF-100V-miniature plate	14-03102301
C3	Ceramic-47PF-100V-miniature plate	14-03471300
C4	Ceramic-22PF-100V-miniature plate	14-03221301
C5	Ceramic-10nF-63V-miniature plate	14-03104201
C6	Ceramic- 1nF - 100V-miniature plate	14-03103301
C7	Ceramic- 1nF - 100V-miniature plate	14-03103301
C8	Ceramic- 1nF - 100V-miniature plate	14-03103301
C9	Mixed-0.1%F-63V-polyester	14-21105200
C10	Ceramic- 1nF - 100V-miniature plate	14-03103301
C11	Ceramic- 1nF - 100V-miniature plate	14-03103301
C12	Ceramic- 1nF - 100V-miniature plate	14-03103301
C13	Ceramic- 1nF - 100V-miniature plate	14-03103301
C14	Ceramic- 1nF - 100V-miniature plate	14-03103301
C15	Ceramic- 1nF - 100V-miniature plate	14-03103301
C16	Ceramic- 1nF - 100V-miniature plate	14-03103301
C17	Ceramic- 1nF - 100V-miniature plate	14-03103301
C18	Ceramic- 1nF - 100V-miniature plate	14-03103301
C19	Ceramic- 1nF - 100V-miniature plate	14-03103301
C20	Ceramic- 1nF - 100V-miniature plate	14-03103301
C21	Ceramic- 1nF - 100V-miniature plate	14-03103301
C22	Ceramic- 1nF - 100V-miniature plate	14-03103301
C23	Ceramic- 1nF - 100V-miniature plate	14-03103301
C24	Ceramic- 1nF - 100V-miniature plate	14-03103301
C25	Ceramic- 1nF - 100V-miniature plate	14-03103301
C26	Ceramic- 1nF - 100V-miniature plate	14-03103301
C27	Ceramic- 1nF - 100V-miniature plate	14-03103301
C28	Ceramic- 1nF - 100V-miniature plate	14-03103301
C29	Ceramic- 1nF - 100V-miniature plate	14-03103301
C30	Ceramic- 1nF - 100V-miniature plate	14-03103301
C31	Ceramic- 1nF - 100V-miniature plate	14-03103301
C32	Ceramic- 1nF - 100V-miniature plate	14-03103301
C33	Ceramic- 1nF - 100V-miniature plate	14-03103301
C34	Ceramic-2.7PF 100V-miniature plate	14-03270301
C36	Ceramic-6.8PF-100V-miniature plate	14-03680301
C38	Ceramic-6.8PF-100V-miniature plate	14-03680301
C39	Ceramic-6.8pF-100V-miniature plate	14-03680301
C40	Ceramic-6.8PF-100V-miniature plate	14-03680301
C41	Ceramic-6.8PF-100V-miniature plate	14-03680301
C42	Ceramic-6.8PF-100V-miniature plate	14-03680301
C43	Ceramic-6.8PF-100V-miniature plate	14-03680301
C44	Ceramic-4.7PF-100V-miniature plate	14-03470301
C46	Ceramic-2.7PF 100V-miniature plate	14-03270301

Assembly: RECEIVER RF MODULE (3010 AND 3050 TRs)

Part No: 68-30000021

Circuit Reference	Description	Part Number
C48	Ceramic-4.7PF-50V-chip	14-03470200
C49	Ceramic-2.7PF 50V-chip	14-03270200
C50	Ceramic-6.8PF-50V-chip	14-03680200
C52	Ceramic-4.7PF-50V-chip	14-03470200
C53	Ceramic-2.7PF 50V-chip	14-03270200
C54	Ceramic-2.2PF-100V-miniature plate	14-03220301
C55	Ceramic-6.8PF-50V-chip	14-03680200
C56	Ceramic-5.6PF-100V-miniature plate	14-03560301
C57	Ceramic-5.6PF-50V-chip	14-03560200
C60	Ceramic-1.8pF-100V-miniature plate	14-03180301
C61	Ceramic-2.2pF-100V-miniature plate	14-03220301
C62	Ceramic-5.6pF-100V-miniature plate	14-03560301
C63	Ceramic-1.8pF-100V-miniature plate	14-03180301
C64	Ceramic-4.7pF-100V-miniature plate	14-03470301
C65	Ceramic- 10pF - 100V-miniature plate	14-03101301
C66	Ceramic-4.7pF-100V-miniature plate	14-03470301
C67	Ceramic- 10pF - 100V-miniature plate	14-03101301
C68	Ceramic-4.7pF-100V-miniature plate	14-03470301
C69	Ceramic- 10pF - 100V-miniature plate	14-03101301
C70	Ceramic-3.3pF-100V-miniature plate	14-03330301
C71	Ceramic-1.8pF-100V-miniature plate	14-03180301
C72	Ceramic-1.8pF-100V-miniature plate	14-03180301
C73	Ceramic-2.2pF-100V-miniature plate	14-03220301
C74	Ceramic-8.2pF-50V-chip	14-03820200
C76	Ceramic-6.8pF-50V-chip	14-03680200
C78	Ceramic-8.2pF-50V-chip	14-03820200
C80	Ceramic-4.7pF-100V-miniature plate	14-03470301
C81	Ceramic-4.7pF-50V-chip	14-03470200
C82	Ceramic-6.8pF-100V-miniature plate	14-03680301
C84	Ceramic-5.6pF-100V-miniature plate	14-03560301
C86	Ceramic-4.7pF-100V-miniature plate	14-03470301
C88	Ceramic-8.2pF-100V-miniature plate	14-03820301
C90	Ceramic-15pF-100V-miniature plate	14-03151301
C91	Ceramic-2.2pF-100V-miniature plate	14-03220301
C92	Ceramic-15pF-100V-miniature plate	14-03151301
C93	Ceramic-2.2pF-100V-miniature plate	14-03220301
C94	Ceramic-15pF-100V-miniature plate	14-03151301
C95	Ceramic-2.2pF-100V-miniature plate	14-03220301
C96	Ceramic-5.6pF-100V-miniature plate	14-03560301
C98	Ceramic-4.7pF-100V-miniature plate	14-03470301
C100	Ceramic-4.7pF-50V-chip	14-03470200
C101	Ceramic-4.7pF-50V-chip	14-03470200
C102	Ceramic-8.2pF-50V-chip	14-03820200
C104	Ceramic-4.7pF-50V-chip	14-03470200

Assembly: RECEIVER RF MODULE (3010 AND 3050 TRs)

Part No: 68-30000021

Circuit Reference	Description	Part Number
C105	Ceramic-4.7pF-50V-chip	14-03470200
C106	Ceramic-6.8pF-50V-chip	14-03680200
C107	Ceramic-3.9pF-50V-chip	14-03390200
C108	Ceramic-4.7pF-50V-chip	14-03470200
C109	Ceramic-2.7pF 50V-chip	14-03270200
C110	Ceramic-2.7pF 100V-miniature plate	14-03270301
C111	Ceramic-3.9pF-50V-chip	14-03390200
C112	Ceramic-4.7pF-100V-miniature plate	14-03470301
C114	Ceramic-4.7pF-100V-miniature plate	14-03470301
C115	Ceramic-4.7pF-100V-miniature plate	14-03470301
C116	Ceramic-15pF-100V-miniature plate	14-03151301
C117	Ceramic-4.7pF-100V-miniature plate	14-03470301
C118	Ceramic-15pF-100V-miniature plate	14-03151301
C119	Ceramic-4.7pF-100V-miniature plate	14-03470301
C120	Ceramic-15pF-100V-miniature plate	14-03151301
C121	Ceramic-4.7pF-100V-miniature plate	14-03470301
C122	Ceramic-3.3pF-100V-miniature plate	14-03330301
C123	Ceramic-2.7pF 100V-miniature plate	14-03270301
C124	Ceramic-4.7pF-100V-miniature plate	14-03470301
C126	Ceramic-3.9pF-50V-chip	14-03390200
C127	Ceramic-6.8pF-50V-chip	14-03680200
C128	Ceramic-6.8pF-50V-chip	14-03680200
C129	Ceramic-2.2pF-50V-chip	14-03220200
C130	Ceramic-3.9pF-50V-chip	14-03390200
C131	Ceramic-6.8pF-50V-chip	14-03680200
C132	Ceramic-8.2pF-50V-chip	14-03820200
C133	Ceramic-4.7pF-50V-chip	14-03470200
C134	Ceramic-4.7pF-50V-chip	14-03470200
C135	Ceramic-4.7pF-50V-chip	14-03470200
C136	Ceramic-6.8pF-50V-chip	14-03680200
C138	Ceramic-2.2pF-100V-miniature plate	14-03220301
C139	Ceramic-3.9pF-100V-miniature plate	14-03390301
C140	Ceramic-2.7pF 100V-miniature plate	14-03270301
C141	Ceramic-8.2pF-100V-miniature plate	14-03820301
C142	Ceramic-22pF-100V-miniature plate	14-03221301
C144	Ceramic-22pF-100V-miniature plate	14-03221301
C146	Ceramic-22pF-100V-miniature plate	14-03221301
C148	Ceramic-5.6pF-100V-miniature plate	14-03560301
C149	Ceramic-1.8pF-100V-miniature plate	14-03180301
C150	Ceramic-2.2pF-100V-miniature plate	14-03220301
C151	Ceramic-3.9pF-100V-miniature plate	14-03390301
C152	Ceramic-12pF-50V-chip	14-03121200
C154	Ceramic- 10pF - 50V - chip	14-03101200
C156	Ceramic-12pF-50V-chip	14-03121200
C158	Ceramic-6.8pF-50V-chip	14-03680200

Assembly: RECEIVER RF MODULE (3010 AND 3050 TRs)

Part No: 68-30000021

Circuit Reference	Description	Part Number
C159	Ceramic-6.8pF-50V-chip	14-03680200
C160	Ceramic-4.7pF-50V-chip	14-03470200
C161	Ceramic-4.7pF-50V-chip	14-03470200
C162	Ceramic-3.9pF-50V-chip	14-03390200
C163	Ceramic-3.9pF-50V-chip	14-03390200
C164	Ceramic-4.7pF-100V-miniature plate	14-03470301
C165	Ceramic-4.7pF-100V-miniature plate	14-03470301
C166	Ceramic-8.2pF-100V-miniature plate	14-03820301
C167	Ceramic-8.2pF-100V-miniature plate	14-03820301
C168	Ceramic-15pF-100V-miniature plate	14-03151301
C169	Ceramic-18pF-100V-miniature plate	14-03181300
C170	Ceramic-15pF-100V-miniature plate	14-03151301
C171	Ceramic-18pF-100V-miniature plate	14-03181300
C172	Ceramic-15pF-100V-miniature plate	14-03151301
C173	Ceramic-18pF-100V-miniature plate	14-03181300
C174	Ceramic-5.6pF-100V-miniature plate	14-03560301
C175	Ceramic-5.6pF-100V-miniature plate	14-03560301
C176	Ceramic-4.7pF-100V-miniature plate	14-03470301
C177	Ceramic-4.7pF-100V-miniature plate	14-03470301
C178	Ceramic-15pF-100V-miniature plate	14-03151301
C179	Ceramic-4.7pF-100V-miniature plate	14-03470301
C180	Ceramic-8.2pF-100V-miniature plate	14-03820301
C181	Ceramic-8.2pF-100V-miniature plate	14-03820301
C182	Ceramic-15pF-100V-miniature plate	14-03151301
C183	Ceramic-4.7pF-100V-miniature plate	14-03470301
C184	Ceramic-22pF-100V-miniature plate	14-03221301
C186	Ceramic-15pF-100V-miniature plate	14-03151301
C188	Ceramic- 10pF - 100V-miniature plate	14-03101301
C189	Ceramic-2.7pF 100V-miniature plate	14-03270301
C190	Ceramic-5.6pF-100V-miniature plate	14-03560301
C191	Ceramic-5.6pF-100V-miniature plate	14-03560301
C192	Ceramic-8.2pF-100V-miniature plate	14-03820301
C193	Ceramic-15pF-100V-miniature plate	14-03151301
C194	Ceramic-39pF-100V-miniature plate	14-03391330
C196	Ceramic-39pF-100V-miniature plate	14-03391330
C198	Ceramic-39pF-100V-miniature plate	14-03391330
C200	Ceramic-8.2pF-100V-miniature plate	14-03820301
C201	Ceramic-4.7pF-100V-miniature plate	14-03470301
C202	Ceramic-5.6pF-100V-miniature plate	14-03560301
C203	Ceramic-5.6pF-100V-miniature plate	14-03560301
C204	Ceramic-15pF-100V-miniature plate	14-03151301
C205	Ceramic-8.2pF-100V-miniature plate	14-03820301
C206	Ceramic- 10pF - 100V-miniature plate	14-03101301
C207	Ceramic- 10pF - 100V-miniature plate	14-03101301
C208	Ceramic-15pF-100V-miniature plate	14-03151301

Assembly: RECEIVER RF MODULE (3010 AND 3050 TRs)

Part No: 68-30000021

Circuit Reference	Description	Part Number
C209	Ceramic-8.2pF-100V-miniature plate	14-03820301
C210	Ceramic-27pF-100V-miniature plate	14-03271301
C212	Ceramic-18pF-100V-miniature plate	14-03181300
C214	Ceramic-15pF-100V-miniature plate	14-03151301
C216	Ceramic-6.8pF-100V-miniature plate	14-03680301
C217	Ceramic-6.8pF-100V-miniature plate	14-03680301
C218	Ceramic-8.2pF-100V-miniature plate	14-03820301
C219	Ceramic-15pF-100V-miniature plate	14-03151301
C220	Ceramic-47pF-100V-miniature plate	14-03471300
C222	Ceramic-47pF-100V-miniature plate	14-03471300
C224	Ceramic-47pF-100V-miniature plate	14-03471300
C226	Ceramic-15pF-100V-miniature plate	14-03151301
C228	Ceramic-6.8pF-100V-miniature plate	14-03680301
C229	Ceramic-6.8pF-100V-miniature plate	14-03680301
C230	Ceramic-15pF-100V-miniature plate	14-03151301
C231	Ceramic-15pF-100V-miniature plate	14-03151301
C232	Ceramic-22pF-100V-miniature plate	14-03221301
C233	Ceramic-3.3pF-100V-miniature plate	14-03330301
C234	Ceramic-15pF-100V-miniature plate	14-03151301
C235	Ceramic-15pF-100V-miniature plate	14-03151301
C236	Ceramic-12pF-100V-miniature plate	14-03121301
C237	Ceramic-22pF-100V-miniature plate	14-03221301
C238	Ceramic-1.8pF-100V-miniature plate	14-03180301
C239	Ceramic-22pF-100V-miniature plate	14-03221301
C240	Ceramic-4.7pF-100V-miniature plate	14-03470301
C241	Ceramic-15pF-100V-miniature plate	14-03151301
C242	Ceramic- 1nF - 100V-miniature plate	14-03103301
C243	Ceramic- 1nF - 100V-miniature plate	14-03103301
C244	Ceramic- 1nF - 100V-miniature plate	14-03103301
C245	Ceramic- 1nF - 100V-miniature plate	14-03103301
C246	Ceramic- 1nF - 100V-miniature plate	14-03103301
C247	Ceramic- 1nF - 100V-miniature plate	14-03103301
C248	Ceramic- 1nF - 100V-miniature plate	14-03103301
C249	Ceramic- 1nF - 100V-miniature plate	14-03103301
C250	Ceramic- 1nF - 100V-miniature plate	14-03103301
C251	Ceramic- 1nF - 100V-miniature plate	14-03103301
C252	Ceramic- 1nF - 100V-miniature plate	14-03103301
C253	Ceramic- 1nF - 100V-miniature plate	14-03103301
C254	Ceramic- 1nF - 100V-miniature plate	14-03103301
C255	Ceramic- 1nF - 100V-miniature plate	14-03103301
C256	Ceramic- 1nF - 100V-miniature plate	14-03103301
C257	Ceramic- 1nF - 100V-miniature plate	14-03103301
C258	Ceramic- 1nF - 100V-miniature plate	14-03103301
C259	Ceramic- 1nF - 100V-miniature plate	14-03103301
C260	Ceramic- 1nF - 100V-miniature plate	14-03103301

Assembly: RECEIVER RF MODULE (3010 AND 3050 TRs)

Part No: 68-30000021

Circuit Reference	Description	Part Number
C261	Ceramic- 1nF - 100V-miniature plate	14-03103301
C262	Ceramic- 1nF - 100V-miniature plate	14-03103301
C263	Ceramic- 1nF - 100V-miniature plate	14-03103301
C264	Ceramic- 1nF - 100V-miniature plate	14-03103301
C265	Ceramic- 1nF - 100V-miniature plate	14-03103301
C266	Ceramic- 1nF - 100V-miniature plate	14-03103301
C267	Ceramic- 1nF - 100V-miniature plate	14-03103301
C268	Ceramic- 1nF - 100V-miniature plate	14-03103301
C269	Ceramic- 1nF - 100V-miniature plate	14-03103301
C270	Ceramic- 1nF - 100V-miniature plate	14-03103301
C271	Ceramic- 1nF - 100V-miniature plate	14-03103301
C272	Ceramic-27pF-100V-miniature plate	14-03271301
C273	Ceramic- 1nF - 100V-miniature plate	14-03103301
C274	Ceramic-10nF-63V-miniature plate	14-03104201
C275	Ceramic-470pF-100V-miniature plate	14-03472300
C276	Ceramic- 1nF - 100V-miniature plate	14-03103301
C277	Ceramic- 1nF - 100V-miniature plate	14-03103301
C278	Ceramic- 1nF - 100V-miniature plate	14-03103301
C279	Ceramic- 1nF - 100V-miniature plate	14-03103301
C280	Ceramic- 1nF - 100V-miniature plate	14-03103301
C281	Ceramic- 1nF - 100V-miniature plate	14-03103301
C282	Ceramic- 1nF - 100V-miniature plate	14-03103301
C283	Ceramic- 1nF - 100V-miniature plate	14-03103301
C284	Ceramic-10nF-63V-miniature plate	14-03104201
C285	Ceramic-10nF-63V-miniature plate	14-03104201
C286	Ceramic- 1nF - 100V-MN-PLT	14-03103301
C287	Ceramic- 1nF - 100V-miniature plate	14-03103301
C289	Ceramic- 1nF - 100V-miniature plate	14-03103301
C290	Ceramic- 1nF - 100V-miniature plate	14-03103301
C291	Ceramic- 1nF - 100V-miniature plate	14-03103301
C292	Ceramic-22pF-100V-miniature plate	14-03221301
C293	Ceramic-4.7pF-100V-miniature plate	14-03470301
C295	Ceramic-4.7pF-100V-miniature plate	14-03470301
C296	Ceramic-6.8pF-100V-miniature plate	14-03680301
C297	Ceramic- 1nF - 100V-miniature plate	14-03103301
C298	Ceramic- 1nF - 100V-miniature plate	14-03103301
C299	Ceramic- 1nF - 100V-miniature plate	14-03103301
C300	Ceramic- 1nF - 100V-miniature plate	14-03103301
C301	Ceramic-10nF-63V-miniature plate	14-03104201
C302	Ceramic- 1nF - 100V-miniature plate	14-03103301
C303	Ceramic-470pF-100V-miniature plate	14-03472300
C304	Ceramic- 1nF - 100V-miniature plate	14-03103301
C305	Ceramic- 1nF - 100V-miniature plate	14-03103301
C306	Ceramic- 1nF - 100V-miniature plate	14-03103301
C307	Ceramic- 1nF - 100V-miniature plate	14-03103301

Assembly: RECEIVER RF MODULE (3010 AND 3050 TRs)

Part No: 68-30000021

Circuit Reference	Description	Part Number
C308	Ceramic- 1nF - 100V-miniature plate	14-03103301
C309	Ceramic- 1nF - 100V-miniature plate	14-03103301
C310	Ceramic-470pF-100V-miniature plate	14-03472300
C311	Ceramic- 1nF - 100V-miniature plate	14-03103301
C312	Ceramic- 1nF - 100V-miniature plate	14-03103301
C313	Ceramic- 1nF - 100V-miniature plate	14-03103301
C314	Ceramic- 1nF - 100V-miniature plate	14-03103301
C315	Ceramic-10nF-63V-miniature plate	14-03104201
C316	TantalumAL%M-1%F-35V	14-36106100
C317	Ceramic- 1nF - 100V-miniature plate	14-03103301
C318	Ceramic- 1nF - 100V-miniature plate	14-03103301
C319	Ceramic- 1nF - 100V-miniature plate	14-03103301
C320	Ceramic- 1nF - 100V-miniature plate	14-03103301
C321	Ceramic- 1nF - 100V-miniature plate	14-03103301
C322	Ceramic- 1nF - 100V-miniature plate	14-03103301
C323	Ceramic-10nF-63V-miniature plate	14-03104201
C324	Ceramic- 1nF - 100V-miniature plate	14-03103301
C325	Mixed-0.1%F-63V-polyester	14-21105200
C326	Ceramic- 1nF - 100V-miniature plate	14-03103301
C327	Ceramic- 1nF - 100V-miniature plate	14-03103301
C328	Ceramic- 1nF - 100V-miniature plate	14-03103301
C329	Ceramic- 1nF - 100V-miniature plate	14-03103301
C330	Ceramic- 1nF - 100V-miniature plate	14-03103301
C336	Mixed-0.1%F-63V-polyester	14-21105200
C337	Tantalum-2.2%F-35V	14-36226101
C338	Tantalum-2.2%F-35V	14-36226101
C339	Mixed-0.1%F-63V-polyester	14-21105200
C340	Mixed-0.1%F-63V-polyester	14-21105200
C341	Tantalum-2.2%F-35V	14-36226101
C342	Tantalum-2.2%F-35V	14-36226101
C343	Mixed-0.1%F-63V-polyester	14-21105200
C344	Mixed-0.1%F-63V-polyester	14-21105200
C345	Tantalum-2.2%F-35V	14-36226101
C346	Tantalum-2.2%F-35V	14-36226101
C347	Mixed-0.1%F-63V-polyester	14-21105200
C348	Mixed-0.1%F-63V-polyester	14-21105200
C349	Tantalum-2.2%F-35V	14-36226101
C350	Tantalum-2.2%F-35V	14-36226101
C351	Mixed-0.1%F-63V-polyester	14-21105200
C352	Ceramic- 1nF - 100V-miniature plate	14-03103301
C353	Ceramic-470pF-50V-chip	14-03472302
C354	Ceramic-470pF-50V-chip	14-03472302
C355	Ceramic-470pF-50V-chip	14-03472302
C356	Ceramic-470pF-50V-chip	14-03472302
C357	Ceramic-470pF-50V-chip	14-03472302

Assembly: RECEIVER RF MODULE (3010 AND 3050 TRs)

Part No: 68-30000021

Circuit Reference	Description	Part Number
C358	Ceramic-470pF-50V-chip	14-03472302
C359	Ceramic-470pF-50V-chip	14-03472302
C360	Ceramic-470pF-50V-chip	14-03472302
C361	Ceramic-470pF-50V-chip	14-03472302
C362	Ceramic-470pF-50V-chip	14-03472302
C363	Ceramic-470pF-50V-chip	14-03472302
C364	Ceramic-470pF-50V-chip	14-03472302
C365	Ceramic-470pF-50V-chip	14-03472302
C366	Ceramic-470pF-50V-chip	14-03472302
C367	Ceramic-470pF-50V-chip	14-03472302
C368	Ceramic-470pF-50V-chip	14-03472302
C369	Ceramic-470pF-50V-chip	14-03472302
C370	Ceramic-470pF-50V-chip	14-03472302
C371	Ceramic-470pF-50V-chip	14-03472302
C372	Ceramic-470pF-50V-chip	14-03472302
C373	Ceramic-470pF-50V-chip	14-03472302
C374	Ceramic-470pF-50V-chip	14-03472302
C375	Ceramic-470pF-50V-chip	14-03472302
C376	Ceramic-470pF-50V-chip	14-03472302
C377	Ceramic-470pF-50V-chip	14-03472302
C378	Ceramic- 1nF - 100V-miniature plate	14-03103301
C379	Ceramic-470pF-50V-chip	14-03472302
C380	Ceramic-470pF-50V-chip	14-03472302
C381	Ceramic- 1nF - 100V- miniature plate	14-03103301
C382	Ceramic- 1nF - 100V-miniature plate	14-03103301
C383	Ceramic- 1nF - 100V-miniature plate	14-03103301
C384	Ceramic- 1nF - 100V-miniature plate	14-03103301
C385	Tantalum-1%F-35V	14-36106100
C386	Mixed-0.1%F-63V-polyester	14-21105200
C387	Ceramic-5.6pF-100V-miniature plate	14-03560301
C388	Ceramic- 1000pF-50V-chip	14-03103201
C389	Ceramic- 1000pF-50V-chip	14-03103201
C390	Ceramic-10nF-63V-miniature plate	14-03104201
C391	Ceramic-6.8pF-50V-chip	14-03680200
C392	Ceramic-4.7pF-100V-miniature plate	14-03470301
TC1	Capacitor variable-1.8-10P-PTFE	15-33100300
TC2	Capacitor variable-1.8-10P-PTFE	15-33100300
C501	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C502	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C503	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C504	Tantalum- 10µF- 16V	14-36107100
C505	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C506	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C507	Tantalum- 10µF- 16V	14-36107100
C508	Ceramic- 10nF- 63V- -miniature plate	14-03104201

Circuit Reference	Description	Part Number
C509	Ceramic- 1nF-100V- -miniature plate	14-03103301
C510	Ceramic- 1nF-100V- -miniature plate	14-03103301
C511	Ceramic- 1nF-100V- -miniature plate	14-03103301
C512	Ceramic- 1nF-100V- -miniature plate	14-03103301
C513	Ceramic- 1nF-100V- -miniature plate	14-03103301
C514	Ceramic- 1nF-100V- -miniature plate	14-03103301
C515	Ceramic- 1nF-100V- -miniature plate	14-03103301
SEMICONDUCTORS		
D1	Pin diode KS3542	61-00403542
D2	Pin diode KS3542	61-00403542
D3	Pin diode KS3542	61-00403542
D4	Pin diode KS3542	61-00403542
D5	Pin diode KS3542	61-00403542
D6	Pin diode KS3542	61-00403542
D7	Pin diode KS3542	61-00403542
D8	Pin diode KS3542	61-00403542
D9	Pin diode KS3542	61-00403542
D10	Pin diode KS3542	61-00403542
D11	Pin diode KS3542	61-00403542
D12	Pin diode KS3542	61-00403542
D13	Pin diode KS3542	61-00403542
D14	Pin diode KS3542	61-00403542
D15	Pin diode KS3542	61-00403542
D16	Pin diode KS3542	61-00403542
D17	Pin diode KS3542	61-00403542
D18	Pin diode KS3542	61-00403542
D19	Pin diode KS3542	61-00403542
D20	Pin diode KS3542	61-00403542
D21	Pin diode KS3542	61-00403542
D22	Pin diode KS3542	61-00403542
D23	Pin diode KS3542	61-00403542
D24	Pin diode KS3542	61-00403542
D25	Pin diode KS3542	61-00403542
D26	Pin diode KS3542	61-00403542
D27	Pin diode KS3542	61-00403542
D28	Pin diode KS3542	61-00403542
D29	Pin diode KS3542	61-00403542
D30	Pin diode KS3542	61-00403542
D31	Pin diode KS3542	61-00403542
D32	Pin diode KS3542	61-00403542
D33	Pin diode KS3542	61-00403542
D34	Pin diode KS3542	61-00403542
D35	Pin diode KS3542	61-00403542

Assembly: RECEIVER RF MODULE (3010 AND 3050 TRs)

Part No: 68-30000021

Circuit Reference	Description	Part Number
D36	Pin diode KS3542	61-00403542
D37	Pin diode KS3542	61-00403542
D38	Pin diode KS3542	61-00403542
D39	Pin diode KS3542	61-00403542
D40	Pin diode KS3542	61-00403542
D41	Pin diode KS3542	61-00403542
D42	Pin diode KS3542	61-00403542
D43	Pin diode KS3542	61-00403542
D44	Pin diode KS3542	61-00403542
D45	Pin diode KS3542	61-00403542
D46	Pin diode KS3542	61-00403542
D47	Pin diode KS3542	61-00403542
D48	Pin diode KS3542	61-00403542
D49	Diode 1N4148	61-00104148
D50	Diode BA479	61-00400379
D51	Diode BA479	61-00400379
D52	Diode BA479	61-00400379
D53	Diode BA479	61-00400379
D54	Diode BA479	61-00400379
D55	Diode BA479	61-00400379
D56	Diode 1N4148	61-00104148
D57	Diode 5082-2835	61-00602835
D58	Diode BA479	61-00400379
D59	Diode BZY88C8V2	61-00208205
D60	Diode BA479	61-00400379
D61	Diode BA479	61-00400379
D62	Diode BA479	61-00400379
D63	Diode BZX55C2V7	61-00202705
D501	Diode BZX55C5V6	61-00205604
IC501	Integrated circuit 8243-I/P O/P expander	61-12008243
IC502	Integrated circuit 74C906-non-inverting buffer	61-12074906
IC503	Integrated circuit 1OF4-binary-demux inv	61-12004556
IC504	Integrated circuit HEF 4051BP	61-12004051
IC505	Integrated circuit HEF 4051BP	61-12004051
IC506	Integrated circuit CA339	61-12000339
IC507	Integrated circuit CA339	61-12000339
TR1	Transistor BC182	61-04120182
TR2	Transistor MRF581A NPN	61-04420581
TR3	FET U310	61-08001310
TR4	Transistor MRF581A NPN	61-04420581
TR5	Transistor BC182	61-04120182
TR6	Transistor MRF581A NPN	61-04420581
TR7	Transistor BC182	61-04120182
TR8	Transistor BC182	61-04120182
TR9	Transistor BFR90	61-04420090

Assembly: RECEIVER RF MODULE (3010 AND 3050 TRs)

Part No: 68-30000021

Circuit Reference	Description	Part Number
TR10	Transistor J310	61-08000310
TR11	Transistor BC182	61-04120182
TR12	Transistor ZTX650	61-04220650
TR13	Transistor VN10KM	61-08000010
TR501	Transistor ZTX 750	61-04210750
TR502	Transistor ZTX650	61-04220650
TR503	Transistor ZTX 750	61-04210750
TR504	Transistor ZTX650	61-04220650
TR505	Transistor ZTX 750	61-04210750
TR506	Transistor ZTX650	61-04220650
TR507	Transistor ZTX 750	61-04210750
TR508	Transistor ZTX650	61-04220650
TR509	Transistor ZTX 750	61-04210750
TR510	Transistor ZTX650	61-04220650
CONNECTORS		
CN1	Plug-60-PCMT-01A-A-41612	20-01640302
CN2	Plug-64-PCMT-01A-A-edge	20-01640300
Plug-	PC-S-S-conhex	19-02050201
Socket-	FR-S-RG316-A-D-41612	19-02060101
INDUCTORS		
L5	Choke 10µH SC30	79-01000013
L6	Choke 10µH SC30	79-01000013
L7	Choke 10µH SC30	79-01000013
L8	Choke 10µH SC30	79-01000013
L9	Choke 10µH SC30	79-01000013
L10	Choke 10µH SC30	79-01000013
L11	Choke 10µH SC30	79-01000013
L12	Choke 10µH SC30	79-01000013
L13	Choke 10µH SC30	79-01000013
L14	Choke 10µH SC30	79-01000013
L15	Choke 10µH SC30	79-01000013
L16	Choke 10µH SC30	79-01000013
L17	Choke 10µH SC30	79-01000013
L18	Choke 10µH SC30	79-01000013
L19	Choke 10µH SC30	79-01000013
L20	Choke 10µH SC30	79-01000013
L21	Choke 10µH SC30	79-01000013
L22	Choke 10µH SC30	79-01000013
L23	20SWG silver plated 1.5T3.7	79-10000040
L24	20SWG silver plated 1.5T3.7	79-10000040
L25	20SWG silver plated 1.5T2.3	79-10000041

Assembly: RECEIVER RF MODULE (3010 AND 3050 TRs)

Part No: 68-30000021

Circuit Reference	Description	Part Number
L26	22SWG enamel wire 3T3.2	79-10000042
L27	22SWG enamel wire 3T3.2	79-10000042
L28	22SWG enamel wire 3T3.2	79-10000042
L29	20SWG silver plated 2.5T2.9	79-10000043
L31	20SWG silver plated 2T3.2D	79-10000045
L32	20SWG silver plated 1.5T3.7	79-10000040
L33	22SWG enamel wire 4T3.2	79-10000046
L34	22SWG enamel wire 3T3.7	79-10000047
L35	20SWG silver plated staple	79-10000062
L36	22SWG enamel wire 5T3.2	79-10000048
L37	20SWG silver plated 2T3.7D	79-10000049
L38	20SWG silver plated 2T3.2D	79-10000045
L39	20SWG silver plated 1.5T2.9	79-10000051
L40	20SWG silver plated 3T3.2D	79-10000052
L41	22SWG enamel wire 3.5T3.2	79-10000053
L42	22SWG enamel wire 3.5T3.2	79-10000053
L43	20SWG silver plated 3T3.2D	79-10000052
L44	20SWG silver plated 2.5T3.2	79-10000044
L45	20SWG silver plated 2T3.2D	79-10000045
L46	20SWG silver plated 2T3.7D	79-10000049
L47	22SWG enamel wire 3.5T3.2	79-10000053
L48	22SWG enamel wire 3.5T3.2	79-10000053
L49	22SWG enamel wire 1T3.2	79-10000054
L50	Coil 3.5T no tap ferrite green	79-09120030
L51	20SWG silver plated 2.5T3.2	79-10000044
L52	20SWG silver plated 2.5T3.2	79-10000044
L53	20SWG silver plated 1.5T3.2	79-10000055
L54	22SWG enamel wire 3T3.7	79-10000047
L55	22SWG enamel wire 3.5T3.2	79-10000053
L56	22SWG enamel wire 3.5T3.2	79-10000053
L57	20SWG silver plated 3T3.7D	79-10000056
L58	20SWG silver plated 2.5T3.7	79-10000057
L59	20SWG silver plated 2T3.7D	79-10000049
L60	20SWG silver plated 2.5T3.2	79-10000044
L61	Coil 2.5T no tap ferrite yellow	79-09120029
L62	Coil 2.5T no tap ferrite yellow	79-09120029
L63	22SWG enamel wire 1.5T3.2	79-10000058
L64	Coil 2.5T no tap ferrite yellow	79-09120029
L65	20SWG silver plated 3T3.2D	79-10000052
L66	20SWG silver plated 3T3.2D	79-10000052
L67	20SWG silver plated 2T3.2D	79-10000045
L68	22SWG enamel wire 3.5T3.2	79-10000053
L69	22SWG enamel wire 4T3.2	79-10000046
L70	22SWG enamel wire 4T3.2	79-10000046
L71	22SWG enamel wire 3T3.7	79-10000047

Circuit Reference	Description	Part Number
L72	22SWG enamel wire 3T3.7	79-10000047
L73	20SWG silver plated 3T3.2D	79-10000052
L74	20SWG silver plated 3T3.2D	79-10000052
L75	Coil 2.5T no tap ferrite yellow	79-09120029
L76	Coil 2.5T no tap ferrite yellow	79-09120029
L77	Coil 1.5T no tap ferrite white	79-09120028
L78	Coil 2.5T no tap ferrite yellow	79-09120029
L79	20SWG silver plated 3T3.7D	79-10000056
L80	20SWG silver plated 3T3.7D	79-10000056
L81	20SWG silver plated 2T3.7D	79-10000049
L82	22SWG enamel wire 4T3.2	79-10000046
L83	22SWG enamel wire 4.5T3.2	79-10000059
L84	22SWG enamel wire 4.5T3.2	79-10000059
L85	22SWG enamel wire 3.5T3.2	79-10000053
L86	22SWG enamel wire 3T3.7	79-10000047
L87	20SWG silver plated 2.5T3.7	79-10000057
L88	20SWG silver plated 3T3.7D	79-10000056
L89	Coil 3.5T no tap ferrite green	79-09120030
L90	Coil 2.5T no tap ferrite yellow	79-09120029
L91	Coil 1.5T no tap ferrite white	79-09120028
L92	Coil 3.5T no tap ferrite green	79-09120030
L93	Coil 2.5T no tap ferrite yellow	79-09120029
L94	Coil 2.5T no tap ferrite yellow	79-09120029
L95	Coil 1.5T no tap ferrite white	79-09120028
L96	Coil 2.5T no tap ferrite yellow	79-09120029
L97	Coil 3.5T no tap ferrite green	79-09120030
L98	Coil 3.5T no tap ferrite green	79-09120030
L99	Coil 2.5T no tap ferrite yellow	79-09120029
L100	Coil 2.5T no tap ferrite yellow	79-09120029
L101	Coil 1.5T no tap ferrite white	79-09120028
L102	Coil 2.5T no tap ferrite yellow	79-09120029
L103	Coil 4.5T no tap ferrite red	79-09120031
L104	Coil 4.5T no tap ferrite red	79-09120031
L105	Coil 2.5T no tap ferrite yellow	79-09120029
L106	Coil 4.5T no tap ferrite red	79-09120031
L107	Coil 2.5T no tap ferrite yellow	79-09120029
L108	Coil 2.5T no tap ferrite yellow	79-09120029
L109	Coil 1.5T no tap ferrite white	79-09120028
L110	Coil 3.5T no tap ferrite green	79-09120030
L111	Coil 3.5T no tap ferrite green	79-09120030
L112	Coil 3.5T no tap ferrite green	79-09120030
L113	Coil 3.5T no tap ferrite green	79-09120030
L114	Coil 2.5T no tap ferrite yellow	79-09120029
L115	Coil 2.5T no tap ferrite yellow	79-09120029
L116	Coil 2.5T no tap ferrite yellow	79-09120029

Assembly: RECEIVER RF MODULE (3010 AND 3050 TRs)

Part No: 68-30000021

Circuit Reference	Description	Part Number
L117	Coil 4.5T no tap ferrite red	79-09120031
L118	Coil 4.5T no tap ferrite red	79-09120031
L119	Coil 2.5T no tap ferrite yellow	79-09120029
L120	Coil 4.5T no tap ferrite red	79-09120031
L121	Coil 2.5T no tap ferrite yellow	79-09120029
L122	Coil 2.5T no tap ferrite yellow	79-09120029
L123	Coil 2.5T no tap ferrite yellow	79-09120029
L124	Coil 3.5T no tap ferrite green	79-09120030
L125	Coil 3.5T no tap ferrite green	79-09120030
L126	Coil 3.5T no tap ferrite green	79-09120030
L127	Coil 3.5T no tap ferrite green	79-09120030
L128	Coil 3.5T no tap ferrite green	79-09120030
L129	Coil 2.5T no tap ferrite yellow	79-09120029
L130	Coil 2.5T no tap ferrite yellow	79-09120029
L131	Coil 5.5T no tap ferrite blue	79-09120023
L132	Coil 4.5T no tap ferrite red	79-09120031
L133	Coil 2.5T no tap ferrite yellow	79-09120029
L134	Coil 5.5T no tap ferrite blue-	79-09120023
L135	Choke 10µH SC30	79-01000013
L136	Choke 10µH SC30	79-01000013
L137	Choke 10µH SC30	79-01000013
L138	Choke 10µH SC30	79-01000013
L139	Choke 10µH SC30	79-01000013
L140	Choke 10µH SC30	79-01000013
L141	Choke 10µH SC30	79-01000013
L142	Choke 10µH SC30	79-01000013
L143	Choke 10µH SC30	79-01000013
L144	Choke 10µH SC30	79-01000013
L145	Choke 10µH SC30	79-01000013
L146	Choke 10µH SC30	79-01000013
L147	Choke 10µH SC30	79-01000013
L148	Choke 10µH SC30	79-01000013
L149	Choke 10µH SC30	79-01000013
L150	Choke 10µH SC30	79-01000013
L151	Choke 10µH SC30	79-01000013
L152	Choke 10µH SC30	79-01000013
L153	Coil 6.5T no tap ferrite black	79-09120024
L154	Choke 10µH SC30	79-01000013
L155	Choke 10µH SC30	79-01000013
L156	Choke µH22 SC30	79-01000014
L157	Choke 10µH SC30	79-01000013
L158	Coil 6.5T no tap ferrite black	79-09120024
L159	Coil 1.5T no tap ferrite white	79-09120028
L160	22SWG enamel wire 1.5T3.2	79-10000058
L161	26SWG enamel wire 3.5T3.2	79-10000063

Circuit Reference	Description	Part Number
L162	26SWG enamel wire 3.5T3.2	79-10000063
L163	Choke 10µH SC30	79-01000013
L164	Choke 10µH SC30	79-01000013
L165	Choke 10µH SC30	79-01000013
L166	Choke 10µH SC30	79-01000013
L167	24SWG en. wire 3.5T3.0 (replaced by link on 3050 TR)	79-10000064
L168	Choke µH22 SC30	79-01000014
L169	Choke 10µH SC30	79-01000013
L170	Choke 10µH SC30	79-01000013
L171	Choke 10µH SC30	79-01000013
L172	Choke 10µH SC30	79-01000013
L173	Choke 10µH SC30	79-01000013
L174	Choke 10µH SC30	79-01000013
L175	Choke 10µH SC30	79-01000013
L176	36SWG 10.75T on oilwell	79-10000065
L177	Choke 10µH SC30	79-01000013
L178	Choke 10µH SC30	79-01000013
L179	Choke 10µH SC30	79-01000013
L180	Choke 10µH SC30	79-01000013
L501	Choke 10µH SC30	79-01000013
METALWORK		
	Rx RF module chassis	45-00002792
	Rx filter lid	45-00002794
	Rx RF filter screen part 1	45-00027971
	Rx RF-filter screen part 2	45-00027972
	Rx RF filter screen part 3	45-00027973
	Rx RF filter screen part 4	45-00027974
	Rx RF filter screen part 5	45-00027975
MISCELLANEOUS		
RLA	Relay USE	57-11110154
RLB	Relay USE	57-11110154
RLC	Relay USE	57-11110154
BM1	Mixer M9D	69-13000003
T1	1590 FB AMP transformer	79-10000030
T2	1590 FB AMP transformer	79-10000030
T5	1590 FB AMP transformer	79-10000030
T6	1590 FB AMP transformer	79-10000030
T7	1590 FB AMP transformer	79-10000030
T8	1590 FB AMP transformer	79-10000030
XL1	XTAL-over-SER-34MHz	22-13210034
FL1	Filter	68-30000030

Assembly: RECEIVER RF MODULE (3010 AND 3050 TRs)

Part No: 68-30000021

Circuit Reference	Description	Part Number
FL2	Filter	68-30000031
	RF-Gasket-3000-Rx-filter	02-28002799
	Cable-S RIG-50 ohms-0.056	10-05112100
	FET-CP643 N CHAN AMP	61-08000643
	PCB-Rx RF	55-00000289
	PCB-Rx BITE	55000000290
	Washer spring MS M3	36-15130000
	Spacer hex F/F BR M2.5 X 13	36-06025130
	Spacer Hex M/F BR M2.5 X 5-6 STUD	36-05025056
	PCB-3000-Rx RF	55-00000289
	Relay coax 12V-10W-P-SPCO	57-11110154
	Beryllium oxide insulator	62-03000042
	Coil CAN 73-019-93	79-06000005
	Coil CAN 10mm	79-06000007

Assembly: RECEIVER RF MODULE (3030 TR)

Part No: 68-30300006

Circuit Reference	Description	Part Number
RESISTORS		
R3	Resistor-680R-0W50-5%-metal film	59-16802002
R5	Resistor-680R-0W50-5%-metal film	59-16802002
R6	Resistor-680R-0W50-5%-metal film	59-16802002
R7	Resistor-680R-0W50-5%-metal film	59-16802002
R8	Resistor-680R-0W50-5%-metal film	59-16802002
R9	Resistor-680R-0W50-5%-metal film	59-16802002
R10	Resistor-680R-0W50-5%-metal film	59-16802002
R11	Resistor-680R-0W50-5%-metal film	59-16802002
R12	Resistor-680R-0W50-5%-metal film	59-16802002
R13	Resistor-680R-0W50-5%-metal film	59-16802002
R14	Resistor-680R-0W50-5%-metal film	59-16802002
R21	Resistor-680R-0W50-5%-metal film	59-16802002
R22	Resistor-680R-0W50-5%-metal film	59-16802002
R23	Resistor-680R-0W50-5%-metal film	59-16802002
R24	Resistor-680R-0W50-5%-metal film	59-16802002
R25	Resistor-680R-0W50-5%-metal film	59-16802002
R26	Resistor-680R-0W50-5%-metal film	59-16802002
R27	Resistor-680R-0W50-5%-metal film	59-16802002
R28	Resistor-680R-0W50-5%-metal film	59-16802002
R29	Resistor-680R-0W50-5%-metal film	59-16802002
R30	Resistor-680R-0W50-5%-metal film	59-16802002
R37	Resistor-680R-0W50-5%-metal film	59-16802002
R41	Resistor- 10k-0W50-5%-metal film	59-10105002
R42	Resistor-150R-0W50-5%-metal film	59-11502002
R43	Resistor-150R-0W50-5%-metal film	59-11502002
R44	Resistor- 33R-0W50-5%-metal film	59-10332002
R45	Resistor-100R-0W50-5%-metal film	59-11002002
R46	Resistor-220R-0W50-5%-metal film	59-12202002
R47	Resistor- 4k7-0W50-5%-metal film	59-10474002
R48	Resistor- 2k7-0W50-5%-metal film	59-10274002
R49	Resistor-220R-0W50-5%-metal film	59-12202002
R50	Resistor- 10k-0W50-5%-metal film	59-10105002
R51	Resistor- 10k-0W50-5%-metal film	59-10105002
R52	Resistor-680R-0W50-5%-metal film	59-16802002
R53	Resistor- 4k7-0W50-5%-metal film	59-10474002
R54	Resistor- 1k8-0W50-5%-metal film	59-10184002
R56	Resistor- 1k-0W50-5%-metal film	59-10015002
R57	Resistor- 1k-0W50-5%-metal film	59-10015002
R58	Resistor- 2k2-0W50-5%-metal film	59-10224002
R59	Resistor- 5k6-0W50-5%-metal film	59-10564002
R60	Resistor- 2k2-0W50-5%-metal film	59-10224002

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Circuit Reference	Description	Part Number
R61	Resistor- 1k2-0W50-5%-metal film	59-10124002
R62	Resistor- 51R-0W50-5%-metal film	59-10512002
R63	Resistor-220R-0W50-5%-metal film	59-12202002
R64	Resistor- 33R-0W50-5%-metal film	59-10332002
R65	Resistor-220R-0W50-5%-metal film	59-12202002
R66	Resistor- 4k7-0W50-5%-metal film	59-10474002
R67	Resistor- 2k7-0W50-5%-metal film	59-10274002
R68	Resistor-100R-0W50-5%-metal film	59-11002002
R69	Resistor-150R-0W50-5%-metal film	59-11502002
R70	Resistor-150R-0W50-5%-metal film	59-11502002
R71	Resistor- 10k-0W50-5%-metal film	59-10105002
R72	Resistor-100R-0W50-5%-metal film	59-11002002
R73	Resistor- 4k7-0W50-5%-metal film	59-10474002
R74	Resistor- 2k7-0W50-5%-metal film	59-10274002
R75	Resistor-220R-0W50-5%-metal film	59-12202002
R76	Resistor-100R-0W50-5%-metal film	59-11002002
R77	Resistor- 33R-0W50-5%-metal film	59-10332002
R78	Resistor- 10k-0W50-5%-metal film	59-10105002
R79	Resistor-150R-0W50-5%-metal film	59-11502002
R80	Resistor-150R-0W50-5%-metal film	59-11502002
R81	Resistor- 4k7-0W50-5%-metal film	59-10474002
R82	Resistor- 1k8-0W50-5%-metal film	59-10184002
R83	Resistor- 1k2-0W50-5%-metal film	59-10124002
R84	Resistor- 4k7-0W50-5%-metal film	59-10474002
R85	Resistor- 5k6-0W50-5%-metal film	59-10564002
R86	Resistor- 2k2-0W50-5%-metal film	59-10224002
R87	Resistor- 1k-0W50-5%-metal film	59-10015002
R88	Resistor- 1k-0W50-5%-metal film	59-10015002
R91	Resistor- 10k-0W50-5%-metal film	59-10105002
R92	Resistor- 4k7-0W50-5%-metal film	59-10474002
R93	Resistor- 4K7-0W50-5%-metal film	59-10474002
R94	Resistor-680R-0W50-5%-metal film	59-16802002
R95	Resistor- 10k-0W50-5%-metal film	59-10105002
R96	Resistor- 5k6-0W50-5%-metal film	59-10564002
R97	Resistor-680R-0W50-5%-metal film	59-16802002
R98	Resistor-470R-0W50-5%-metal film	59-14702002
R99	Resistor- 47k-0W50-5%-metal film	59-10475002
R100	Resistor- 1k-0W50-5%-metal film	59-10015002
R101	Resistor- 1k-0W50-5%-metal film	59-10015002
R102	Resistor- 1k-0W50-5%-metal film	59-10015002
R103	Resistor- 4k7-0W50-5%-metal film	59-10474002
R104	Resistor- 1k5-0W50-5%-metal film	59-10154002
R105	Resistor- 2k2-0W50-5%-metal film	59-10224002
R106	Resistor- 1k8-0W50-5%-metal film	59-10184002
R107	Resistor- 1k5-0W50-5%-metal film	59-10154002

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Circuit Reference	Description	Part Number
R108	Resistor- 22k-0W50-5%-metal film	59-10225002
R109	Resistor- 1k-0W50-5%-metal film	59-10015002
R110	Resistor- 4k7-0W50-5%-metal film	59-10474002
R112	Resistor- 10k-0W50-5%-metal film	59-10105002
R113	Resistor- 10k-0W50-5%-metal film	59-10105002
R114	Resistor-270R-0W50-5%-metal film	59-12702002
R115	Resistor- 18R-0W50-5%-metal film	59-10182002
R116	Resistor-270R-0W50-5%-metal film	59-12702002
R117	Resistor- 4k7-0W50-5%-metal film	59-10474002
R501	Resistor- 1k-0W33-1%-metal film	59-10015003
R502	Resistor- 1k-0W33-1%-metal film	59-10015003
R503	Resistor- 4k7-0W33-5%-metal film	59-10474003
R504	Resistor- 1k5-0W33-5%-metal film	59-10154003
R505	Resistor- 1k-0W33-1%-metal film	59-10015003
R506	Resistor- 1k-0W33-1%-metal film	59-10015003
R507	Resistor- 1k-0W33-1%-metal film	59-10015003
R508	Resistor- 1k-0W33-1%-metal film	59-10015003
R509	Resistor- 1k-0W33-1%-metal film	59-10015003
R513	Resistor-100k-0W33-5%-metal film	59-11005003
R514	Resistor- 4k7-0W33-5%-metal film	59-10474003
RN501	Resistor-100k-1W50-2%-network	59-81005002
RN502	Resistor-100k-1W50-2%-network	59-81005002
RN503	Resistor- 10k-0W10-2%-network	59-80105001
RN504	Resistor-100k-0W10-2%-network	59-81005001
RN505	Resistor- 10k-0W10-2%-network	59-80105001
CAPACITORS		
C1	Ceramic- 68pF-100V- -miniature plate	14-03681301
C2	Ceramic- 100pF-100V- -miniature plate	14-03102301
C3	Ceramic- 47pF-100V- -miniature plate	14-03471300
C4	Ceramic- 22pF-100V- -miniature plate	14-03221301
C5	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C6	Ceramic- 1nF-100V- -miniature plate	14-03103301
C7	Ceramic- 1nF-100V- -miniature plate	14-03103301
C9	Mixed- 0.1µF- 63V- -polyester	14-21105200
C10	Ceramic- 1nF-100V- -miniature plate	14-03103301
C11	Ceramic- 1nF-100V- -miniature plate	14-03103301
C12	Ceramic- 1nF-100V- -miniature plate	14-03103301
C13	Ceramic- 1nF-100V- -miniature plate	14-03103301
C14	Ceramic- 1nF-100V- -miniature plate	14-03103301
C15	Ceramic- 1nF-100V- -miniature plate	14-03103301
C16	Ceramic- 1nF-100V- -miniature plate	14-03103301
C17	Ceramic- 1nF-100V- -miniature plate	14-03103301

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Circuit Reference	Description	Part Number
C18	Ceramic- 1nF-100V- -miniature plate	14-03103301
C19	Ceramic- 1nF-100V- -miniature plate	14-03103301
C20	Ceramic- 1nF-100V- -miniature plate	14-03103301
C21	Ceramic- 1nF-100V- -miniature plate	14-03103301
C22	Ceramic- 1nF-100V- -miniature plate	14-03103301
C23	Ceramic- 1nF-100V- -miniature plate	14-03103301
C24	Ceramic- 1nF-100V- -miniature plate	14-03103301
C34	Ceramic- 2.7pF-100V- -miniature plate	14-03270301
C36	Ceramic- 6.8pF-100V- -miniature plate	14-03680301
C38	Ceramic- 6.8pF-100V- -miniature plate	14-03680301
C39	Ceramic- 6.8pF-100V- -miniature plate	14-03680301
C40	Ceramic- 6.8pF-100V- -miniature plate	14-03680301
C41	Ceramic- 6.8pF-100V- -miniature plate	14-03680301
C42	Ceramic- 6.8pF-100V- -miniature plate	14-03680301
C43	Ceramic- 6.8pF-100V- -miniature plate	14-03680301
C44	Ceramic- 4.7pF-100V- -miniature plate	14-03470301
C46	Ceramic- 2.7pF-100V- -miniature plate	14-03270301
C48	Ceramic- 4.7pF- 50V- -chip	14-03470200
C49	Ceramic- 2.7pF- 50V- -chip	14-03270200
C50	Ceramic- 6.8pF- 50V- -chip	14-03680200
C52	Ceramic- 4.7pF- 50V- -chip	14-03470200
C53	Ceramic- 2.7pF- 50V- -chip	14-03270200
C54	Ceramic- 2.2pF-100V- -miniature plate	14-03220301
C55	Ceramic- 6.8pF- 50V- -chip	14-03680200
C56	Ceramic- 5.6pF-100V- -miniature plate	14-03560301
C57	Ceramic- 5.6pF- 50V- -chip	14-03560200
C60	Ceramic- 1.8pF-100V- -miniature plate	14-03180301
C61	Ceramic- 2.2pF-100V- -miniature plate	14-03220301
C62	Ceramic- 5.6pF-100V- -miniature plate	14-03560301
C63	Ceramic- 1.8pF-100V- -miniature plate	14-03180301
C64	Ceramic- 4.7pF-100V- -miniature plate	14-03470301
C65	Ceramic- 10pF-100V- -miniature plate	14-03101301
C66	Ceramic- 4.7pF-100V- -miniature plate	14-03470301
C67	Ceramic- 10pF-100V- -miniature plate	14-03101301
C68	Ceramic- 4.7pF-100V- -miniature plate	14-03470301
C69	Ceramic- 10pF-100V- -miniature plate	14-03101301
C70	Ceramic- 3.3pF-100V- -miniature plate	14-03330301
C71	Ceramic- 1.8pF-100V- -miniature plate	14-03180301
C72	Ceramic- 1.8pF-100V- -miniature plate	14-03180301
C73	Ceramic- 2.2pF-100V- -miniature plate	14-03220301
C74	Ceramic- 8.2pF- 50V- -chip	14-03820200
C76	Ceramic- 6.8pF- 50V- -chip	14-03680200
C78	Ceramic- 8.2pF- 50V- -chip	14-03820200
C80	Ceramic- 4.7pF-100V- -miniature plate	14-03470301
C81	Ceramic- 4.7pF- 50V- -chip	14-03470200

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Circuit Reference	Description	Part Number
C82	Ceramic- 6.8pF-100V- -miniature plate	14-03680301
C84	Ceramic- 5.6pF-100V- -miniature plate	14-03560301
C86	Ceramic- 4.7pF-100V- -miniature plate	14-03470301
C88	Ceramic- 8.2pF-100V- -miniature plate	14-03820301
C90	Ceramic- 15pF-100V- -miniature plate	14-03151301
C91	Ceramic- 2.2pF-100V- -miniature plate	14-03220301
C92	Ceramic- 15pF-100V- -miniature plate	14-03151301
C93	Ceramic- 2.2pF-100V- -miniature plate	14-03220301
C94	Ceramic- 15pF-100V- -miniature plate	14-03151301
C95	Ceramic- 2.2pF-100V- -miniature plate	14-03220301
C96	Ceramic- 5.6pF-100V- -miniature plate	14-03560301
C98	Ceramic- 4.7pF-100V- -miniature plate	14-03470301
C100	Ceramic- 4.7pF- 50V- -chip	14-03470200
C101	Ceramic- 4.7pF- 50V- -chip	14-03470200
C102	Ceramic- 8.2pF- 50V- -chip	14-03820200
C104	Ceramic- 4.7pF- 50V- -chip	14-03470200
C105	Ceramic- 4.7pF- 50V- -chip	14-03470200
C106	Ceramic- 6.8pF- 50V- -chip	14-03680200
C107	Ceramic- 3.9pF- 50V- -chip	14-03390200
C108	Ceramic- 4.7pF- 50V- -chip	14-03470200
C109	Ceramic- 2.7pF- 50V- -chip	14-03270200
C110	Ceramic- 2.7pF-100V- -miniature plate	14-03270301
C111	Ceramic- 3.9pF- 50V- -chip	14-03390200
C112	Ceramic- 4.7pF-100V- -miniature plate	14-03470301
C114	Ceramic- 4.7pF-100V- -miniature plate	14-03470301
C115	Ceramic- 4.7pF-100V- -miniature plate	14-03470301
C116	Ceramic- 15pF-100V- -miniature plate	14-03151301
C117	Ceramic- 4.7pF-100V- -miniature plate	14-03470301
C118	Ceramic- 15pF-100V- -miniature plate	14-03151301
C119	Ceramic- 4.7pF-100V- -miniature plate	14-03470301
C120	Ceramic- 15pF-100V- -miniature plate	14-03151301
C121	Ceramic- 4.7pF-100V- -miniature plate	14-03470301
C122	Ceramic- 3.3pF-100V- -miniature plate	14-03330301
C123	Ceramic- 2.7pF-100V- -miniature plate	14-03270301
C124	Ceramic- 4.7pF-100V- -miniature plate	14-03470301
C126	Ceramic- 3.9pF- 50V- -chip	14-03390200
C127	Ceramic- 6.8pF- 50V- -chip	14-03680200
C128	Ceramic- 6.8pF- 50V- -chip	14-03680200
C129	Ceramic- 2.2pF- 50V- -chip	14-03220200
C130	Ceramic- 3.9pF- 50V- -chip	14-03390200
C131	Ceramic- 6.8pF- 50V- -chip	14-03680200
C132	Ceramic- 8.2pF- 50V- -chip	14-03820200
C133	Ceramic- 4.7pF- 50V- -chip	14-03470200
C134	Ceramic- 4.7pF- 50V- -chip	14-03470200
C135	Ceramic- 4.7pF- 50V- -chip	14-03470200

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Circuit Reference	Description	Part Number
C136	Ceramic- 6.8pF- 50V- -chip	14-03680200
C138	Ceramic- 2.2pF-100V- -miniature plate	14-03220301
C139	Ceramic- 3.9pF-100V- -miniature plate	14-03390301
C140	Ceramic- 2.7pF-100V- -miniature plate	14-03270301
C141	Ceramic- 8.2pF-100V- -miniature plate	14-03820301
C142	Ceramic- 22pF-100V- -miniature plate	14-03221301
C144	Ceramic- 22pF-100V- -miniature plate	14-03221301
C146	Ceramic- 22pF-100V- -miniature plate	14-03221301
C148	Ceramic- 5.6pF-100V- -miniature plate	14-03560301
C149	Ceramic- 1.8pF-100V- -miniature plate	14-03180301
C150	Ceramic- 2.2pF-100V- -miniature plate	14-03220301
C151	Ceramic- 3.9pF-100V- -miniature plate	14-03390301
C152	Ceramic- 12pF- 50V- -chip	14-03121200
C154	Ceramic- 10pF- 50V- -chip	14-03101200
C156	Ceramic- 12pF- 50V- -chip	14-03121200
C158	Ceramic- 6.8pF- 50V- -chip	14-03680200
C159	Ceramic- 6.8pF- 50V- -chip	14-03680200
C160	Ceramic- 4.7pF- 50V- -chip	14-03470200
C161	Ceramic- 4.7pF- 50V- -chip	14-03470200
C162	Ceramic- 3.9pF- 50V- -chip	14-03390200
C163	Ceramic- 3.9pF- 50V- -chip	14-03390200
C242	Ceramic- 1nF-100V- -miniature plate	14-03103301
C243	Ceramic- 1nF-100V- -miniature plate	14-03103301
C244	Ceramic- 1nF-100V- -miniature plate	14-03103301
C245	Ceramic- 1nF-100V- -miniature plate	14-03103301
C246	Ceramic- 1nF-100V- -miniature plate	14-03103301
C248	Ceramic- 1nF-100V- -miniature plate	14-03103301
C249	Ceramic- 1nF-100V- -miniature plate	14-03103301
C250	Ceramic- 1nF-100V- -miniature plate	14-03103301
C251	Ceramic- 1nF-100V- -miniature plate	14-03103301
C252	Ceramic- 1nF-100V- -miniature plate	14-03103301
C253	Ceramic- 1nF-100V- -miniature plate	14-03103301
C254	Ceramic- 1nF-100V- -miniature plate	14-03103301
C255	Ceramic- 1nF-100V- -miniature plate	14-03103301
C256	Ceramic- 1nF-100V- -miniature plate	14-03103301
C266	Ceramic- 1nF-100V- -miniature plate	14-03103301
C269	Ceramic- 1nF-100V- -miniature plate	14-03103301
C270	Ceramic- 1nF-100V- -miniature plate	14-03103301
C272	Ceramic- 27pF-100V- -miniature plate	14-03271301
C273	Ceramic- 1nF-100V- -miniature plate	14-03103301
C274	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C275	Ceramic- 470pF-100V- -miniature plate	14-03472300
C276	Ceramic- 1nF-100V- -miniature plate	14-03103301
C277	Ceramic- 1nF-100V- -miniature plate	14-03103301
C278	Ceramic- 1nF-100V- -miniature plate	14-03103301

Circuit Reference	Description	Part Number
C279	Ceramic- 1nF-100V- -miniature plate	14-03103301
C280	Ceramic- 1nF-100V- -miniature plate	14-03103301
C281	Ceramic- 1nF-100V- -miniature plate	14-03103301
C282	Ceramic- 1nF-100V- -miniature plate	14-03103301
C283	Ceramic- 1nF-100V- -miniature plate	14-03103301
C284	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C285	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C286	Ceramic- 1nF-100V- -miniature plate	14-03103301
C287	Ceramic- 1nF-100V- -miniature plate	14-03103301
C289	Ceramic- 1nF-100V- -miniature plate	14-03103301
C290	Ceramic- 1nF-100V- -miniature plate	14-03103301
C291	Ceramic- 1nF-100V- -miniature plate	14-03103301
C292	Ceramic- 22pF-100V- -miniature plate	14-03221301
C293	Ceramic- 4.7pF-100V- -miniature plate	14-03470301
C295	Ceramic- 4.7pF-100V- -miniature plate	14-03470301
C296	Ceramic- 6.8pF-100V- -miniature plate	14-03680301
C297	Ceramic- 1nF-100V- -miniature plate	14-03103301
C298	Ceramic- 1nF-100V- -miniature plate	14-03103301
C299	Ceramic- 1nF-100V- -miniature plate	14-03103301
C300	Ceramic- 1nF-100V- -miniature plate	14-03103301
C301	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C302	Ceramic- 1nF-100V- -miniature plate	14-03103301
C303	Ceramic- 470pF-100V- -miniature plate	14-03472300
C304	Ceramic- 1nF-100V- -miniature plate	14-03103301
C305	Ceramic- 1nF-100V- -miniature plate	14-03103301
C306	Ceramic- 1nF-100V- -miniature plate	14-03103301
C307	Ceramic- 1nF-100V- -miniature plate	14-03103301
C308	Ceramic- 1nF-100V- -miniature plate	14-03103301
C309	Ceramic- 1nF-100V- -miniature plate	14-03103301
C310	Ceramic- 470pF-100V- -miniature plate	14-03472300
C311	Ceramic- 1nF-100V- -miniature plate	14-03103301
C312	Ceramic- 1nF-100V- -miniature plate	14-03103301
C313	Ceramic- 1nF-100V- -miniature plate	14-03103301
C314	Ceramic- 1nF-100V- -miniature plate	14-03103301
C315	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C316	Tantalum- 1µF- 35V	14-36106100
C317	Ceramic- 1nF-100V- -miniature plate	14-03103301
C318	Ceramic- 1nF-100V- -miniature plate	14-03103301
C319	Ceramic- 1nF-100V- -miniature plate	14-03103301
C320	Ceramic- 1nF-100V- -miniature plate	14-03103301
C323	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C324	Ceramic- 1nF-100V- -miniature plate	14-03103301
C325	Mixed- 0.1µF- 63V- -polyester	14-21105200
C326	Ceramic- 1nF-100V- -miniature plate	14-03103301
C327	Ceramic- 1nF-100V- -miniature plate	14-03103301

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Circuit Reference	Description	Part Number
C328	Ceramic- 1nF-100V- -miniature plate	14-03103301
C329	Ceramic- 1nF-100V- -miniature plate	14-03103301
C330	Ceramic- 1nF-100V- -miniature plate	14-03103301
C336	Mixed- 0.1µF- 63V- -polyester	14-21105200
C337	Tantalum- 2.2µF- 35V	14-36226101
C338	Tantalum- 2.2µF- 35V	14-36226101
C339	Mixed- 0.1µF- 63V- -polyester	14-21105200
C340	Mixed- 0.1µF- 63V- -polyester	14-21105200
C341	Tantalum- 2.2µF- 35V	14-36226101
C342	Tantalum- 2.2µF- 35V	14-36226101
C343	Mixed- 0.1µF- 63V- -polyester	14-21105200
C344	Mixed- 0.1µF- 63V- -polyester	14-21105200
C345	Tantalum- 2.2µF- 35V	14-36226101
C346	Tantalum- 2.2µF- 35V	14-36226101
C347	Mixed- 0.1µF- 63V- -polyester	14-21105200
C348	Mixed- 0.1µF- 63V- -polyester	14-21105200
C349	Tantalum- 2.2µF- 35V	14-36226101
C350	Tantalum- 2.2µF- 35V	14-36226101
C351	Mixed- 0.1µF- 63V- -polyester	14-21105200
C354	Ceramic- 470pF- 50V- -chip	14-03472302
C355	Ceramic- 470pF- 50V- -chip	14-03472302
C356	Ceramic- 470pF- 50V- -chip	14-03472302
C357	Ceramic- 470pF- 50V- -chip	14-03472302
C358	Ceramic- 470pF- 50V- -chip	14-03472302
C359	Ceramic- 470pF- 50V- -chip	14-03472302
C360	Ceramic- 470pF- 50V- -chip	14-03472302
C361	Ceramic- 470pF- 50V- -chip	14-03472302
C362	Ceramic- 470pF- 50V- -chip	14-03472302
C363	Ceramic- 470pF- 50V- -chip	14-03472302
C364	Ceramic- 470pF- 50V- -chip	14-03472302
C365	Ceramic- 470pF- 50V- -chip	14-03472302
C366	Ceramic- 470pF- 50V- -chip	14-03472302
C367	Ceramic- 470pF- 50V- -chip	14-03472302
C368	Ceramic- 470pF- 50V- -chip	14-03472302
C369	Ceramic- 470pF- 50V- -chip	14-03472302
C371	Ceramic- 470pF- 50V- -chip	14-03472302
C372	Ceramic- 470pF- 50V- -chip	14-03472302
C373	Ceramic- 470pF- 50V- -chip	14-03472302
C374	Ceramic- 470pF- 50V- -chip	14-03472302
C375	Ceramic- 470pF- 50V- -chip	14-03472302
C376	Ceramic- 470pF- 50V- -chip	14-03472302
C377	Ceramic- 470pF- 50V- -chip	14-03472302
C378	Ceramic- 1nF-100V- -miniature plate	14-03103301
C379	Ceramic- 470pF- 50V- -chip	14-03472302
C381	Ceramic- 1nF-100V- -miniature plate	14-03103301

Assembly: RECEIVER RF MODULE (3030 TR)

Part No: 68-30300006

Circuit Reference	Description	Part Number
C382	Ceramic- 1nF-100V- -miniature plate	14-03103301
C383	Ceramic- 1nF-100V- -miniature plate	14-03103301
C384	Ceramic- 1nF-100V- -miniature plate	14-03103301
C385	Tantalum- 1µF- 35V	14-36106100
C386	Mixed- 0.1µF- 63V- -polyester	14-21105200
C387	Ceramic- 5.6pF-100V- -miniature plate	14-03560301
C388	Ceramic- 1nF- 50V- -chip	14-03103201
C389	Ceramic- 1nF- 50V- -chip	14-03103201
C390	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C391	Ceramic- 6.8pF- 50V- -chip	14-03680200
C392	Ceramic- 4.7pF-100V- -miniature plate	14-03470301
C501	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C502	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C503	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C504	Tantalum- 10µF- 16V	14-36107100
C505	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C506	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C507	Tantalum- 10µF- 16V	14-36107100
C508	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C509	Ceramic- 1nF-100V- -miniature plate	14-03103301
C510	Ceramic- 1nF-100V- -miniature plate	14-03103301
C511	Ceramic- 1nF-100V- -miniature plate	14-03103301
C512	Ceramic- 1nF-100V- -miniature plate	14-03103301
C513	Ceramic- 1nF-100V- -miniature plate	14-03103301
C514	Ceramic- 1nF-100V- -miniature plate	14-03103301
C515	Ceramic- 1nF-100V- -miniature plate	14-03103301
C2247	Ceramic- 1nF-100V- -miniature plate	14-03103301
TC1	Capacitor, variable -1.8- 10P-PTFE	15-33100300
TC2	Capacitor, variable -1.8- 10P-PTFE	15-33100300

SEMICONDUCTORS

D1	Pin diode KS3542	61-00403542
D2	Pin diode KS3542	61-00403542
D3	Pin diode KS3542	61-00403542
D4	Pin diode KS3542	61-00403542
D5	Pin diode KS3542	61-00403542
D6	Pin diode KS3542	61-00403542
D7	Pin diode KS3542	61-00403542
D8	Pin diode KS3542	61-00403542
D9	Pin diode KS3542	61-00403542
D10	Pin diode KS3542	61-00403542
D11	Pin diode KS3542	61-00403542

Assembly: RECEIVER RF MODULE (3030 TR)

Part No: 68-30300006

Circuit Reference	Description	Part Number
D12	Pin diode KS3542	61-00403542
D13	Pin diode KS3542	61-00403542
D14	Pin diode KS3542	61-00403542
D15	Pin diode KS3542	61-00403542
D25	Pin diode KS3542	61-00403542
D26	Pin diode KS3542	61-00403542
D27	Pin diode KS3542	61-00403542
D28	Pin diode KS3542	61-00403542
D29	Pin diode KS3542	61-00403542
D30	Pin diode KS3542	61-00403542
D31	Pin diode KS3542	61-00403542
D32	Pin diode KS3542	61-00403542
D33	Pin diode KS3542	61-00403542
D34	Pin diode KS3542	61-00403542
D35	Pin diode KS3542	61-00403542
D36	Pin diode KS3542	61-00403542
D37	Pin diode KS3542	61-00403542
D38	Pin diode KS3542	61-00403542
D39	Pin diode KS3542	61-00403542
D50	Diode BA379	61-00400379
D51	Diode BA379	61-00400379
D52	Diode BA379	61-00400379
D53	Diode BA379	61-00400379
D54	Diode BA379	61-00400379
D55	Diode BA379	61-00400379
D57	Diode 5082-2835	61-00602835
D58	Diode BA379	61-00400379
D59	Diode BZY88C8V2	61-00208205
D60	Diode BA379	61-00400379
D61	Diode BA379	61-00400379
D62	Diode BA379	61-00400379
D501	Diode BZX55C5V6	61-00205604
IC501	Integrated circuit 8243-I/P O/P expander	61-12008243
IC502	Integrated circuit 74C906-non-inverting buffer	61-12074906
IC503	Integrated circuit 1OF4-binary-demux inv	61-12004556
IC504	Integrated circuit HEF 4051BP	61-12004051
IC505	Integrated circuit HEF 4051BP	61-12004051
IC506	Integrated circuit CA339	61-12000339
IC507	Integrated circuit CA339	61-12000339
TR2	Transistor MRF581A NPN	61-04420581
TR3	FET U310 JFET	61-08001310
TR4	Transistor MRF581A NPN	61-04420581
TR5	Transistor BC182	61-04120182
TR6	Transistor MRF581A NPN	61-04420581
TR7	Transistor BC182	61-04120182

Assembly: RECEIVER RF MODULE (3030 TR)

Part No: 68-30300006

Circuit Reference	Description	Part Number
TR9	Transistor BFR90	61-04420090
TR10	Transistor J310	61-08000310
TR11	Transistor BC182	61-04120182
TR12	Transistor ZTX650	61-04220650
TR13	Transistor VN10KM	61-08000010
TR501	Transistor ZTX 750	61-04210750
TR502	Transistor ZTX650	61-04220650
TR503	Transistor ZTX 750	61-04210750
TR504	Transistor ZTX650	61-04220650
TR505	Transistor ZTX 750	61-04210750
TR506	Transistor ZTX650	61-04220650
TR507	Transistor ZTX 750	61-04210750
TR508	Transistor ZTX650	61-04220650
TR509	Transistor ZTX 750	61-04210750
TR510	Transistor ZTX650	61-04220650
CONNECTORS		
	Plug-PC-S- -S-conhex	19-02050201
	Socket-FR-S-RG316-A-D 41612	19-02060101
	Socket-FR-S-RD316-A D 41612	19-02060103
CN1	Plug-60-PCMT-01A-A-41612	20-01600300
CN2	Plug-64-PCMT-01A-A-edge	20-01640300
METALWORK		
	Rx filter lid	45-00002794
	Rx RF module chassis	45-00002792
	Rx RF filter screen part 4	45-00027974
	Rx RF filter screen part 1	45-00027971
	Rx RF filter screen part 3	45-00027973
	Rx RF filter screen part 5	45-00027975
	Rx RF filter screen part 2	45-00027972
MISCELLANEOUS		
	RF gasket Rx filter	02-28002799
	20-way flex jumper 2" long	10-13201220
	Cable-S RIG-50 ohms 0.056	10-05112100
XL1	XTAL-over-SER-34MHz	22-13210034
	Stud spacer M2.5x5 BR/NP	35-30062713

Assembly: RECEIVER RF MODULE (3030 TR)

Part No: 68-30300006

Circuit Reference	Description	Part Number
	Spacer HEX M2.5x13mm	35-30061629
	M3.5 spring washer	35-21151500
PCB1	PCB Rx RF	55-00000289
PCB2	PCB Rx RF BITE	55-00000290
	Beryllium oxide insulator	62-03000042
FL1	70.7MHz helical filter	68-30000030
BM1	Mixer M9D	69-13000003
	Coil can 10mm	79-06000007
	Coil can 73-019-93	79-06000005
	Core 9R-1013-92-S	79-03000005
	1590 FB amp transformer	79-10000030
L5	Choke 10µH SC30	79-01000013
L7	Choke 10µH SC30	79-01000013
L8	Choke 10µH SC30	79-01000013
L9	Choke 10µH SC30	79-01000013
L10	Choke 10µH SC30	79-01000013
L11	Choke 10µH SC30	79-01000013
L12	Choke 10µH SC30	79-01000013
L13	Choke 10µH SC30	79-01000013
L14	Choke 10µH SC30	79-01000013
L15	Choke 10µH SC30	79-01000013
L16	Choke 10µH SC30	79-01000013
L50	Coil 3.5T no tap ferrite green	79-09120030
L61	Coil 2.5T no tap ferrite yellow	79-09120029
L62	Coil 2.5T no tap ferrite yellow	79-09120029
L64	Coil 2.5T no tap ferrite yellow	79-09120029
L75	Coil 2.5T no tap ferrite yellow	79-09120029
L76	Coil 2.5T no tap ferrite yellow	79-09120029
L77	Coil 1.5T no tap ferrite white	79-09120028
L78	Coil 2.5T no tap ferrite yellow	79-09120029
L89	Coil 3.5T no tap ferrite green	79-09120030
L90	Coil 2.5T no tap ferrite yellow	79-09120029
L91	Coil 1.5T no tap ferrite white	79-09120028
L92	Coil 3.5T no tap ferrite green	79-09120030
L135	Choke 10µH SC30	79-01000013
L136	Choke 10µH SC30	79-01000013
L137	Choke 10µH SC30	79-01000013
L138	Choke 10µH SC30	79-01000013
L139	Choke 10µH SC30	79-01000013
L140	Choke 10µH SC30	79-01000013
L141	Choke 10µH SC30	79-01000013
L142	Choke 10µH SC30	79-01000013
L143	Choke 10µH SC30	79-01000013
L144	Choke 10µH SC30	79-01000013

Assembly: RECEIVER RF MODULE (3030 TR)

Part No: 68-30300006

Circuit Reference	Description	Part Number
L151	Choke 10µH SC30	79-01000013
L153	Coil 6.5T no tap ferrite black	79-09120024
L154	Choke 10µH SC30	79-01000013
L155	Choke 10µH SC30	79-01000013
L156	Choke µH22 SC30	79-01000014
L157	Choke 10µH SC30	79-01000013
L158	Coil 6.5T no tap ferrite black	79-09120024
L163	Choke 10µH SC30	79-01000013
L164	Choke 10µH SC30	79-01000013
L165	Choke 10µH SC30	79-01000013
L166	Choke 10µH SC30	79-01000013
L168	Choke µH22 SC30	79-01000014
L169	Choke 10µH SC30	79-01000013
L170	Choke 10µH SC30	79-01000013
L171	Choke 10µH SC30	79-01000013
L172	Choke 10µH SC30	79-01000013
L173	Choke 10µH SC30	79-01000013
L175	Choke 10µH SC30	79-01000013
L176	Coil former 52-051-62	79-04000004
L177	Choke 10µH SC30	79-01000013
L178	Choke 10µH SC30	79-01000013
L179	Choke 10µH SC30	79-01000013
L180	Choke 10µH SC30	79-01000013
L501	Choke 10µH SC30	79-01000013
T1	sub-miniature 2 hole balun core	79-08000010
T2	sub-miniature 2 hole balun core	79-08000010
T5	sub-miniature 2 hole balun core	79-08000010
T6	sub-miniature 2 hole balun core	79-08000010
T7	sub-miniature 2 hole balun core	79-08000010
T8	sub-miniature 2 hole balun core	79-08000010

Assembly: RX IF AND AUDIO MODULE (3010 AND 3050 TRs)

Part No: 68-32500012

Circuit Reference	Description	Part Number
RESISTORS		
R1	Resistor-47k-0W4-1-metal film	59-10475002
R2	Resistor-47k-0W4-1-metal film	59-10475002
R4	Resistor-100k-0W4-1-metal film	59-11005002
R7	Resistor-100k-0W4-1-metal film	59-11005002
R8	Resistor-100k-0W4-1-metal film	59-11005002
R9	Resistor-100k-0W4-1-metal film	59-11005002
R10	Resistor-100k-0W4-1-metal film	59-11005002
R11	Resistor-3k3-0W4-1-metal film	59-10334002
R12	Resistor-33k-0W4-1-metal film	59-10335002
R13	Resistor-68k-0W4-1-metal film	59-10685002
R14	Resistor-2k7-0W4-1-metal film	59-10274002
R15	Resistor-560R-0W50-5%-metal film	59-15602002
R16	Resistor-10k-0W4-1-metal film	59-10105002
R17	Resistor-10k-0W4-1-metal film	59-10105002
R18	Resistor-47k-0W4-1-metal film	59-10475002
R19	Resistor-47k-0W4-1-metal film	59-10475002
R20	Resistor-4k7-0W4-1-metal film	59-10474002
R21	Resistor-4k7-0W4-1-metal film	59-10474002
R22	Resistor-4k7-0W4-1-metal film	59-10474002
R23	Resistor-10k-0W4-1-metal film	59-10105002
R24	Resistor-4k7-0W4-1-metal film	59-10474002
R25	Resistor-10k-0W4-1-metal film	59-10105002
R26	Resistor-10k-0W4-1-metal film	59-10105002
R27	Resistor-100k-0W4-1-metal film	59-11005002
R29	Resistor-56R-0W4-1-metal film	59-10562002
R30	Resistor-47k-0W4-1-metal film	59-10475002
R31	Resistor-10k-0W4-1-metal film	59-10105002
R32	Resistor-1k-0W4-1-metal film	59-10015002
R33	Resistor-10k-0W4-1-metal film	59-10105002
R34	Resistor-560R-0W4-1-metal film	59-15602002
R35	Resistor-4k7-0W4-1-metal film	59-10474002
R36	Resistor-4k7-0W4-1-metal film	59-10474002
R37	Resistor-10k-0W4-1-metal film	59-10105002
R39	Resistor-4k7-0W4-1-metal film	59-10474002
R40	Resistor-4k7-0W4-1-metal film	59-10474002
R41	Resistor-1k-0W50-5%-metal film	59-10015002
R42	Resistor-5k6-0W50-5%-metal film	59-10564002
R43	Resistor-10k-0W4-1-metal film	59-10105002
R44	Resistor-10k-0W4-1-metal film	59-10105002
R45	Resistor-680R-0W4-1-metal film	59-16802002
R46	Resistor-33k-0W4-1-metal film	59-10335002
R47	Resistor-47k-0W50-5%-metal film	59-10475002

Circuit Reference	Description	Part Number
R48	Resistor-33k-0W4-1-metal film	59-10335002
R49	Resistor-33k-0W4-1-metal film	59-10335002
R50	Resistor-33k-0W4-1-metal film	59-10335002
R51	Resistor-100k-0W4-1-metal film	59-11005002
R52	Resistor-100k-0W4-1-metal film	59-11005002
R53	Resistor-10k-0W4-1-metal film	59-10105002
R54	Resistor-100k-0W4-1-metal film	59-11005002
R55	Resistor-100k-0W4-1-metal film	59-11005002
R56	Resistor-47k-0W4-1-metal film	59-10475002
R57	Resistor-3k3-0W4-1-metal film	59-10334002
R58	Resistor-1k8-0W50-5%-metal film	59-10184002
R59	Resistor-100k-0W4-1-metal film	59-11005002
R60	Resistor-1M-0W4-1-metal film	59-10018002
R61	Resistor-100R-0W4-1-metal film	59-11002002
R62	Resistor-10k-0W4-1-metal film	59-10105002
R63	Resistor-4k7-0W4-1-metal film	59-10474002
R64	Resistor-47k-0W4-1-metal film	59-10475002
R65	Resistor-10k-0W4-1-metal film	59-10105002
R67	Resistor-100k-0W4-1-metal film	59-11005002
R68	Resistor-10k-0W4-1-metal film	59-10105002
R69	Resistor-220R-0W50-5%-metal film	59-12202002
R70	Resistor-3k3-0W50-5%-metal film	59-10334002
R71	Resistor-1k2-0W50-5%-metal film	59-10124002
R72	Resistor-33k-0W50-5%-metal film	59-10335002
R73	Resistor-1k-0W50-5%-metal film	59-10015002
R74	Resistor-47k-0W4-1-metal film	59-10475002
R75	Resistor-22k-0W4-1-metal film	59-10225002
R76	Resistor-1k2-0W4-1-metal film	59-10124002
R77	Resistor-680R-0W4-1-metal film	59-16802002
R78	Resistor-10k-0W4-1-metal film	59-10105002
R79	Resistor-10k-0W4-1-metal film	59-10105002
R80	Resistor-2k2-0W4-1-metal film	59-10224002
R81	Resistor-150k-0W4-1-metal film	59-11505002
R82	Resistor-2k2-0W4-1-metal film	59-10224002
R83	Resistor-220k-0W4-1-metal film	59-12205002
R84	Resistor-33k-0W4-1-metal film	59-10335002
R85	Resistor-1k-0W4-1-metal film	59-10015002
R86	Resistor-1k5-0W4-1-metal film	59-10154002
R87	Resistor-330R-0W4-1-metal film	59-13302002
R88	Resistor-2k7-0W4-1-metal film	59-10274002
R89	Resistor-100k-0W4-1-metal film	59-11005002
R90	Resistor-100k-0W4-1-metal film	59-11005002
R91	Resistor-10k-0W4-1-metal film	59-10105002
R92	Resistor-150k-0W4-1-metal film	59-11505002
R93	Resistor-5k6-0W4-1-metal film	59-10564002

Assembly: RX IF AND AUDIO MODULE (3010 AND 3050 TRs)

Part No: 68-32500012

Circuit Reference	Description	Part Number
R94	Resistor-10k-0W4-1-metal film	59-10105002
R95	Resistor-51R-0W4-1-metal film	59-10512002
R96	Resistor-5k6-0W4-1-metal film	59-10564002
R97	Resistor-470R-0W4-1-metal film	59-14702002
R98	Resistor-3k3-0W4-1-metal film	59-10334002
R99	Resistor-100R-0W4-1-metal film	59-11002002
R100	Resistor-330R-0W4-1-metal film	59-13302002
R101	Resistor-47R-0W4-1-metal film	59-10472002
R102	Resistor-2k2-0W4-1-metal film	59-10224002
R103	Resistor-10k-0W50-5%-metal film	59-10105002
R104	Resistor-5k6-0W50-5%-metal film	59-10564002
R105	Resistor-12k-0W4-1-metal film	59-10125002
R106	Resistor-2k7-0W50-5%-metal film	59-10274002
R107	Resistor-1k-0W50-5%-metal film	59-10015002
R108	Resistor-4k7-0W4-1-metal film	59-10474002
R109	Resistor-2k7-0W4-1-metal film	59-10274002
R110	Resistor-1k2-0W4-1-metal film	59-10124002
R111	Resistor-10k-0W4-1-metal film	59-10105002
R112	Resistor-10k-0W4-1-metal film	59-10105002
R113	Resistor-12k-0W4-1-metal film	59-10125002
R114	Resistor-2k7-0W4-1-metal film	59-10274002
R115	Resistor-2k2-0W4-1-metal film	59-10224002
R116	Resistor-47R-0W4-1-metal film	59-10472002
R117	Resistor-330R-0W4-1-metal film	59-13302002
R118	Resistor-100R-0W4-1-metal film	59-11002002
R119	Resistor-5k6-0W4-1-metal film	59-10564002
R120	Resistor-3k3-0W4-1-metal film	59-10334002
R121	Resistor-10k-0W50-5%-metal film	59-10105002
R123	Resistor-220R-0W4-1-metal film	59-12202002
R124	Resistor-1k-0W4-1-metal film	59-10015002
R125	Resistor-33R-0W4-1-metal film	59-10332002
R126	Resistor-4k7-0W4-1-metal film	59-10474002
R127	Resistor-150R-0W4-1-metal film	59-11502002
R128	Resistor-150R-0W4-1-metal film	59-11502002
R129	Resistor-220R-0W4-1-metal film	59-12202002
R130	Resistor-33R-0W4-1-metal film	59-10332002
R131	Resistor-100k-0W4-1-metal film	59-11005002
R132	Resistor-47k-0W4-1-metal film	59-10475002
R133	Resistor-680R-0W4-1-metal film	59-16802002
R134	Resistor-1k5-0W4-1-metal film	59-10154002
R135	Resistor-1k5-0W4-1-metal film	59-10154002
R136	Resistor-150R-0W4-1-metal film	59-11502002
R137	Resistor-150R-0W4-1-metal film	59-11502002
R138	Resistor-220R-0W4-1-metal film	59-12202002
R139	Resistor-1k-0W50-5%-metal film	59-10015002

Circuit Reference	Description	Part Number
R140	Resistor-4k7-0W4-1-metal film	59-10474002
R141	Resistor-2k7-0W4-1-metal film	59-10274002
R142	Resistor-220R-0W4-1-metal film	59-12202002
R143	Resistor-4k7-0W4-1-metal film	59-10474002
R144	Resistor-100R-0W4-1-metal film	59-11002002
R145	Resistor-22k-0W4-1-metal film	59-10225002
R146	Resistor-10k-0W4-1-metal film	59-10105002
R147	Resistor-5k6-0W4-1-metal film	59-10564002
R148	Resistor-2k2-0W50-5%-metal film	59-10224002
R149	Resistor-100R-0W4-1-metal film	59-11002002
R150	Resistor-27k-0W50-5%-metal film	59-10275002
R151	Resistor-4k7-0W4-1-metal film	59-10474002
R152	Resistor-22k-0W4-1-metal film	59-10225002
R153	Resistor-1k2-0W4-1-metal film	59-10124002
R154	Resistor-27k-0W4-1-metal film	59-10275002
R155	Resistor-220k-0W4-1-metal film	59-12205002
R156	Resistor-22k-0W4-1-metal film	59-10225002
R157	Resistor-3k3-0W4-1-metal film	59-10334002
R158	Resistor-6k8-0W4-1-metal film	59-10684002
R159	Resistor-33k-0W4-1-metal film	59-10335002
R160	Resistor-33k-0W4-1-metal film	59-10335002
R161	Resistor-6k8-0W4-1-metal film	59-10684002
R162	Resistor-220k-0W4-1-metal film	59-12205002
R163	Resistor-1k-0W4-1-metal film	59-10015002
R164	Thermistor-2k2-KR222CW	53-80223000
R165	Resistor-4k7-0W4-1-metal film	59-10474002
R166	Resistor-4k7-0W4-1-metal film	59-10474002
R169	Resistor-100R-0W4-1-metal film	59-11002002
R170	Resistor-5k6-0W4-1-metal film	59-10564002
R171	Resistor-2k7-0W4-1-metal film	59-10274002
R172	Resistor-2k7-0W4-1-metal film	59-10274002
R173	Resistor-39R-0W4-1-metal film	59-10392002
R174	Resistor-150R-0W4-1-metal film	59-11502002
R175	Resistor-150R-0W4-1-metal film	59-11502002
R176	Resistor-1k-0W4-1-metal film	59-10015002
R177	Resistor-100R-0W4-1-metal film	59-11002002
R178	Resistor-47k-0W4-1-metal film	59-10475002
R179	Resistor-47k-0W4-1-metal film	59-10475002
R180	Resistor-150R-0W4-1-metal film	59-11502002
R181	Resistor-4k7-0W4-1-metal film	59-10474002
R182	Resistor-4k7-0W4-1-metal film	59-10474002
R183	Resistor-1k-0W25-1-metal glaze	59-80015005
R184	Resistor-1k-0W25-1-metal glaze	59-80015005
R185	Resistor-10k-0W4-1-metal film	59-10105002
R186	Resistor-10k-0W4-1-metal film	59-10105002

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Circuit Reference	Description	Part Number
R187	Resistor-4k7-0W4-1-metal film	59-10474002
R188	Resistor-150R-0W4-1-metal film	59-11502002
R189	Resistor-3k9-0W4-1-metal film	59-10394002
R192	Resistor-100k-0W4-1-metal film	59-11005002
R193	Resistor-220R-0W4-1-metal film	59-12202002
R194	Resistor-1k-0W4-1-metal film	59-10015002
R195	Resistor-1k-0W4-1-metal film	59-10015002
R196	Resistor-220R-0W4-1-metal film	59-12202002
R198	Resistor-33k-0W4-1-metal film	59-10335002
R200	Resistor-150R-0W4-1-metal film	59-11502002
R201	Resistor-150R-0W4-1-metal film	59-11502002
R202	Resistor-10k-0W4-1-metal film	59-10105002
R203	Resistor-100k-0W4-1-metal film	59-11005002
R204	Resistor-100k-0W4-1-metal film	59-11005002
R205	Resistor-100k-0W4-1-metal film	59-11005002
R206	Resistor-10k-0W4-1-metal film	59-10105002
R207	Resistor-47R-0W4-1-metal film	59-10472002
R208	Resistor-2k2-0W4-1-metal film	59-10224002
R209	Resistor-270R-0W4-1-metal film	59-12702002
R210	Thermistor-150-232264226151	53-81501005
R213	Resistor-10k-0W4-1-metal film	59-10105002
R214	Resistor-10k-0W4-1-metal film	59-10105002
R215	Resistor-220k-0W4-1-metal film	59-13302002
R216	Resistor-330R-0W50-5%-metal film	59-13302002
R217	Resistor-2M2-0W33-5%-metal film	59-10227003
R218	Resistor-3k3-0W50-5%-metal film	59-10334002
R219	Resistor-220R-0W50-5%-metal film	59-12202002
R220	Resistor-2k7-0W50-5%-metal film	59-10274002
R221	Resistor-3k3-0W50-5%-metal film	59-10334002
R222	Resistor-330R-0W50-5%-metal film	59-13302002
R223	Resistor-330R-0W50-5%-metal film	59-13302002
R224	Resistor-150R-0W50-5%-metal film	59-11502002
R227	Resistor-470R-0W50-5%-metal film	59-14702002
R230	Resistor-22k-0W50-5%-metal film	59-10225002
R231	Resistor-3k3-0W50-5%-metal film	59-10334002
R235	Resistor-3k3-0W50-5%-metal film	59-10334002
R236	Resistor-10k-0W50-5%-metal film	59-10105002
R240	Resistor-4k7-0W50-5%-metal film	59-10474002
R241	Resistor-470R-0W50-5%-metal film	59-14702002
RN1	Resistor-100k-1W50-2-network	59-81005002
RN2	Resistor-100k-1W50-2-network	59-81005002
RV1	Potentiometer-PCB-linear cermet-100k-vertical	53-31004205
RV2	Potentiometer-PCB-linear cermet-100k-vertical	53-31004205
RV3	Potentiometer-PCB-linear cermet-10k-vertical	53-30104205
RV4	Potentiometer-PCB-linear cermet-10k-vertical	53-30104205

Circuit Reference	Description	Part Number
RV5	Potentiometer-PCB-linear cermet-5k	53-50054205
RV6	Potentiometer-PCB-linear cermet-100k-horizontal	53-51004205
RV7	Potentiometer-PCB-linear cermet-500k-vertical	53-35004205
RV8	Potentiometer-PCB-linear cermet-50k-horizontal	53-50504205
RV9	Potentiometer-PCB-linear cermet-50k-vertical	53-30504205
RV10	Potentiometer-PCB-linear cermet-50k-horizontal	53-50504205
RV11	Potentiometer-PCB-linear cermet-10k-horizontal	53-51003205
RV12	Potentiometer-PCB-linear cermet-50k-horizontal	53-50504205
RV13	Potentiometer-PCB-linear cermet-10k-vertical	53-30104205
RV14	Potentiometer-PCB-linear cermet-10k-horizontal	53-51003205
RV15	Potentiometer-PCB-linear cermet-10k-horizontal	53-51003205
RV16	Potentiometer-PCB-linear cermet-10k-horizontal	53-51003205
CAPACITORS		
C1	Mixed-0.1µF-63V-polyester	14-21105200
C2	Tantalum-22µF-16V	14-36227108
C3	Tantalum-22µF-16V	14-36227108
C4	Tantalum-22µF-16V	14-36227108
C6	Tantalum-22µF-16V	14-36227108
C7	Electrolytic-100µF-40V	14-06108111
C8	Tantalum-10µF-16V	14-36107100
C10	Electrolytic-47µF-50V-vertical	14-06477200
C11	Tantalum-2µ2-35V	14-36226101
C12	Tantalum-2.2µF-35V	14-36226101
C13	Tantalum-10µF-16V	14-36107100
C14	Mixed-0.1µF-63V-polyester	14-21105200
C15	Tantalum-2.2µF-35V	14-36226101
C16	Tantalum-2.2µF-35V	14-36226101
C17	Tantalum-2.2µF-35V	14-36226101
C18	Tantalum-2.2µF-35V	14-36226101
C19	Tantalum-2.2µF-35V	14-36226101
C20	Mixed-0.1µF-63V-polyester	14-21105200
C21	Mixed-0.1µF-63V-polyester	14-21105200
C22	Mixed-0.1µF-63V-polyester	14-21105200
C23	Mixed-0.1µF-63V-polyester	14-21105200
C24	Mixed-68nF-63V-sub-miniature	14-21684200
C25	Mixed-6.8nF-63V-sub-miniature	14-21683300
C26	Mixed-0.1µF-63V-polyester	14-21105200
C27	Mixed-47nF-63V-sub-miniature	14-21474200
C29	Mixed-0.01µF-63V-polyester	14-21104302
C31	Mixed-0.01µF-63V-polyester	14-21104302
C32	Mixed-0.01µF-63V-polyester	14-21104302
C33	Mixed-0.22µF-63V-polyester	14-21225200
C34	Tantalum-1µF-35V	14-36106100

Assembly: RX IF AND AUDIO MODULE (3010 AND 3050 TRs)

Part No: 68-32500012

Circuit Reference	Description	Part Number
C35	Ceramic-10nF-63V-miniature plate	14-03104201
C36	Ceramic-1nF-100V-miniature plate	14-03103301
C37	Ceramic-10nF-63V-miniature plate	14-03104201
C38	Tantalum-10µF-16V	14-36107100
C39	Ceramic-22pF-100V-miniature plate	14-03221301
C40	Ceramic-33pF-100V-miniature plate	14-03331301
C41	Ceramic-10nF-63V-miniature plate	14-03104201
C42	Ceramic-10nF-63V-miniature plate	14-03104201
C43	Electrolytic-47µF-50V-vertical	14-06477200
C44	Ceramic-150pF-100V-miniature plate	14-03152300
C45	Mixed-0.1µF-63V-polyester	14-21105200
C46	Mixed-470nF-63V-sub-miniature	14-21475200
C47	Mixed-0.1µF-63V-polyester	14-21105200
C48	Not fitted	
C49	Mixed-470nF-63V-sub-miniature	14-21475200
C50	Tantalum-10µF-16V	14-36107100
C51	Mixed-470nF-63V-sub-miniature	14-21475200
C52	Ceramic-100pF-100C-miniature plate	14-03102301
C53	Ceramic-100pF-100C-miniature plate	14-03102301
C54	Mixed-0.01µF-63V-polyester	14-21104302
C55	Mixed-0.01µF-63V-polyester	14-21104302
C56	Mixed-0.1µF-63V-polyester	14-21105200
C57	Ceramic-10nF-63V-miniature plate	14-03104201
C58	Tantalum-22µF-16V	14-36227108
C59	Mixed-6.8nF-63V-sub-miniature	14-21683300
C60	Ceramic-2.2nF-100V-miniature plate	14-03223300
C61	Mixed-0.1µF-63V-polyester	14-21105200
C62	Ceramic-33pF-100V-miniature plate	14-03331301
C63	Mixed-0.1µF-63V-polyester	14-21105200
C64	Ceramic-33pF-100V-miniature plate	14-03331301
C65	Mixed-0.1µF-63V-polyester	14-21105200
C66	Tantalum-10µF-16V	14-36107100
C67	Electrolytic-100µF-40V	14-06108111
C68	Mixed-0.1µF-63V-polyester	14-21105200
C69	Ceramic-100pF-100V-miniature plate	14-03102301
C70	Mixed-0.1µF-63V-polyester	14-21105200
C71	Ceramic-1nF-100V-miniature plate	14-03103301
C72	Electrolytic-47µF-50V-vertical	14-06477200
C73	Mixed-0.1µF-63V-polyester	14-21105200
C74	Ceramic-10nF-63V-miniature plate	14-03104201
C75	Ceramic-150pF-100V-miniature plate	14-03152300
C76	Ceramic-100pF-100V-miniature plate	14-03102301
C77	Mixed-0.1µF-63V-polyester	14-21105200
C78	Mixed-0.22µF-63V-polyester	14-21225200
C79	Mixed-0.22µF-63V-polyester	14-21225200

Circuit Reference	Description	Part Number
C80	Tantalum-10µF-16V	14-36107100
C81	Ceramic-1nF-100V-miniature plate	14-03103301
C83	Ceramic-10nF-63V-miniature plate	14-03104201
C84	Ceramic-10pF-100V-miniature plate	14-03101301
C85	Ceramic-15pF-100V-miniature plate	14-03151301
C86	Ceramic-2.2pF-100V-miniature plate	14-03220301
C87	Ceramic-12pF-100V-miniature plate	14-03121301
C88	Ceramic-47pF-100V-miniature plate	14-03471300
C89	Ceramic-1nF-100V-miniature plate	14-03103301
C90	Ceramic-220pF-100V-miniature plate	14-03222300
C91	Ceramic-470pF-100V-miniature plate	14-03472300
C92	Ceramic-100pF-100V-miniature plate	14-03102301
C93	Ceramic-220pF-100V-miniature plate	14-03222300
C94	Ceramic-18pF-100V-miniature plate	14-03181300
C95	Ceramic-18pF-100V-miniature plate	14-03181300
C96	Ceramic-33pF-100V-miniature plate	14-03331301
C97	Ceramic-220pF-100V-miniature plate	14-03222300
C98	Ceramic-100pF-100V-miniature plate	14-03102301
C99	Ceramic-10nF-63V-miniature plate	14-03104201
C100	Ceramic-220pF-100V-miniature plate	14-03222300
C101	Ceramic-18pF-100V-miniature plate	14-03181300
C102	Ceramic-1nF-100V-miniature plate	14-03103301
C103	Ceramic-10nF-63V-miniature plate	14-03104201
C104	Ceramic-1nF-100V-miniature plate	14-03103301
C105	Ceramic-1nF-100V-miniature plate	14-03103301
C106	Ceramic-1nF-100V-miniature plate	14-03103301
C107	Ceramic-1nF-100V-miniature plate	14-03103301
C108	Ceramic-1nF-100V-miniature plate	14-03103301
C109	Ceramic-1nF-100V-miniature plate	14-03103301
C110	Ceramic-12pF-100V-miniature plate	14-03121301
C111	Ceramic-1nF-100V-miniature plate	14-03103301
C112	Ceramic-1nF-100V-miniature plate	14-03103301
C113	Ceramic-1nF-100V-miniature plate	14-03103301
C114	Ceramic-1nF-100V-miniature plate	14-03103301
C115	Mixed-0.22µF-63V-polyester	14-21225200
C116	Ceramic-1nF-100V-miniature plate	14-03103301
C117	Mixed-0.1µF-63V-polyester	14-21105200
C118	Ceramic-10nF-63V-miniature plate	14-03104201
C119	Mixed-0.1µF-63V-polyester	14-21105200
C120	Ceramic-10nF-63V-miniature plate	14-03104201
C121	Ceramic-33pF-100V-miniature plate	14-03331301
C122	Ceramic-220pF-100V-miniature plate	14-03222300
C123	Ceramic-10nF-63V-miniature plate	14-03104201
C124	Mixed-0.1µF-63V-polyester	14-21105200
C125	Ceramic-2.2nF-100V-miniature plate	14-03223300

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Circuit Reference	Description	Part Number
C126	Tantalum-2.2µF-35V	14-36226101
C127	Ceramic-1nF-100V-miniature plate	14-03103301
C128	Tantalum-2.2µF-35V	14-36226101
C129	Mixed-0.1µF-63V-polyester	14-21105200
C130	Mixed-0.1µF-63V-polyester	14-21105200
C131	Tantalum-2.2µF-35V	14-36226101
C132	Tantalum-2.2µF-35V	14-36226101
C133	Mixed-0.1µF-63V-polyester	14-21105200
C134	Mixed-0.1µF-63V-polyester	14-21105200
C135	Tantalum-2.2µF-35V	14-36226101
C136	Tantalum-2.2µF-35V	14-36226101
C137	Mixed-0.1µF-63V-polyester	14-21105200
C138	Mixed-0.1µF-63V-polyester	14-21105200
C139	Tantalum-2.2µF-35V	14-36226101
C140	Tantalum-10µF-16V	14-36107100
C141	Tantalum-2.2µF-35V	14-36226101
C142	Mixed-0.1µF-63V-polyester	14-21105200
C143	Mixed-0.1µF-63V-polyester	14-21105200
C144	Tantalum-2.2µF-35V	14-36226101
C145	Mixed-47nF-63V-sub-miniature	14-21474200
C146	Ceramic-5.6pF-100V-miniature plate	14-03560301
C147	Ceramic-1nF-100V-miniature plate	14-03103301
C148	Ceramic-10nF-63V-miniature plate	14-03104201
C149	Ceramic-1nF-100V-miniature plate	14-03103301
C150	Ceramic-1nF-100V-miniature plate	14-03103301
C151	Mixed-0.1µF-63V-polyester	14-21105200
C152	Ceramic-10nF-63V-miniature plate	14-03104201
C153	Ceramic-1nF-100V-miniature plate	14-03103301
C154	Ceramic-22pF-100V-miniature plate	14-03221301
C155	Ceramic-3.3pF-100V-miniature plate	14-03330301
C156	Ceramic-1nF-100V-miniature plate	14-03103301
C157	Ceramic-10nF-63V-miniature plate	14-03104201
C158	Ceramic-1nF-100V-miniature plate	14-03103301
C159	Ceramic-1nF-100V-miniature plate	14-03103301
C160	Ceramic-1nF-100V-miniature plate	14-03103301
C161	Ceramic-1.8pF-100V-miniature plate	14-03180301
C162	Ceramic-1nF-100V-miniature plate	14-03103301
C163	Ceramic-2.2pF-100V-miniature plate	14-03220301
C164	Ceramic-1nF-100V-miniature plate	14-03103301
C165	Ceramic-10nF-63V-miniature plate	14-03104201
C166	Ceramic-1nF-100V-miniature plate	14-03103301
C167	Ceramic-18pF-100V-miniature plate	14-03181300
C168	Ceramic-18pF-100V-miniature plate	14-03181300
C169	Ceramic-4.7pF-100V-miniature plate	14-03470301
C170	Ceramic-4.7pF-100V-miniature plate	14-03470301

Circuit Reference	Description	Part Number
C171	Ceramic-10pF-100V-miniature plate	14-03101301
C172	Ceramic-68pF-100V-miniature plate	14-03681301
C173	Ceramic-3.3pF-100V-miniature plate	14-03330301
C174	Ceramic-39pF-100V-miniature plate	14-03391330
C175	Ceramic-2.2pF-100V-miniature plate	14-03220301
C176	Ceramic-1nF-100V-miniature plate	14-03103301
C177	Ceramic-10nF-63V-miniature plate	14-03104201
C178	Ceramic-1nF-100V-miniature plate	14-03103301
C179	Ceramic-1nF-100V-miniature plate	14-03103301
C180	Ceramic-1nF-100V-miniature plate	14-03103301
C181	Mixed-0.1µF-63V-polyester	14-21105200
C182	Mixed-0.22µF-63V-polyester	14-21225200
C183	Mixed-0.22µF-63V-polyester	14-21225200
C184	Mixed-0.22µF-63V-polyester	14-21225200
C185	Ceramic-1nF-100V-miniature plate	14-03103301
C186	Mixed-0.1µF-63V-polyester	14-21105200
C187	Ceramic-1nF-100V-miniature plate	14-03103301
C188	Ceramic-10nF-63V-miniature plate	14-03104201
C189	Ceramic-1nF-100V-miniature plate	14-03103301
C190	Ceramic-1nF-100V-miniature plate	14-03103301
C191	Ceramic-39pF-100V-miniature plate	14-03391330
C192	Ceramic-39pF-100V-miniature plate	14-03391330
C193	Ceramic-10pF-100V-miniature plate	14-03101301
C194	Ceramic-10pF-100V-miniature plate	14-03101301
C195	Tantalum-47µF-16V	14-36477106
C198	Electrolytic-1000µF-10V-20%-vertical	14-06109122
C199	Ceramic-10pF-100V-miniature plate	14-03101301
C201	Ceramic-10pF-100V-miniature plate	14-03101301
C202	Ceramic-47pF-100V-miniature plate	14-03471300
C203	Ceramic-10pF-100V-miniature plate	14-03101301
C204	Ceramic-1.8pF-100V-miniature plate	14-03180301
C205	Ceramic-47pF-100V-miniature plate	14-03471300
C206	Ceramic-10pF-100V-miniature plate	14-03101301
C207	Ceramic-47nF-63V-sub-miniature	14-21474200
C208	Ceramic-180pF-100V-miniature plate	14-03182202
C209	Tantalum-22µF-16V	14-36277108
C211	Mixed-1000pF-63V-sub-miniature	14-21103200
C212	Ceramic-47pF-100V-miniature plate	14-03471300
C213	Ceramic-1nF-100V-miniature plate	14-03103301
C214	Ceramic-1nF-100V-miniature plate	14-03103301
C215	Ceramic-10nF-63V-miniature plate	14-03104201
C216	Ceramic-1nF-100V-miniature plate	14-03103301
C217	Ceramic-1nF-100V-miniature plate	14-03103301
C221	Mixed-0.01µF-63V-polyester	14-21104302

Assembly: RX IF AND AUDIO MODULE (3010 AND 3050 TRs)

Part No: 68-32500012

Circuit Reference	Description	Part Number
TC1	Capacitor-variable- 15-22p -PLYPRP	15-43022300
TC2	Capacitor-variable- 15-22p -PLYPRP	15-43022300
SEMICONDUCTORS		
D1	Diode 1N4148	61-00104148
D2	Diode 1N4148	61-00104148
D3	Diode 1N4148	61-00104148
D4	Diode 1N4148	61-00104148
D6	Diode 1N4148	61-00104148
D8	Diode 1N4148	61-00104148
D9	Diode 1N4148	61-00104148
D10	Diode 1N4148	61-00104148
D11	Diode 1N4148	61-00104148
D12	Diode BZX55C2V7	61-00202705
D17	Diode BZX55C6V2	61-00206205
D18	Diode 1N4148	61-00104148
D19	Diode 1N4148	61-00104148
D20	Diode 1N4148	61-00104148
D22	Diode 1N4148	61-00104148
D23	Diode BZX55C5V6	61-00205604
D24	Diode 1N4148	61-00104148
D25	Diode 1N4148	61-00104148
D26	Diode 1N4148	61-00104148
D27	Diode 5082-2835	61-00602835
D28	Diode BA379	61-00400379
D29	Diode BA379	61-00400379
D30	Diode BA379	61-00400379
D31	Diode BA379	61-00400379
D32	Pin diode KS3542	61-00403542
D33	Pin diode KS3542	61-00403542
D34	Pin diode KS3542	61-00403542
D35	Pin diode KS3542	61-00403542
D38	Diode 1N4148	61-00104148
D39	Diode 1N4148	61-00104148
D40	Diode 1N4148	61-00104148
D42	Diode 1N4148	61-00104148
IC1	Integrated circuit TDA1072A-AM detector	61-12011072
IC2	Integrated circuit MC3359P-FM IF amplifier	61-12003359
IC3	Integrated circuit TDA1072A-AM detector	61-12011072
IC4	Integrated circuit MC3359P-FM IF amplifier	61-12003359
IC5	Integrated circuit CA3240	61-12003240
IC6	Integrated circuit CA3240	61-12003240
IC7	Integrated circuit CD4053BE	61-12004053
IC8	Integrated circuit CD4049UBE	61-12004049

Assembly: RX IF AND AUDIO MODULE (3010 AND 3050 TRs)

Part No: 68-32500012

Circuit Reference	Description	Part Number
IC9	Integrated circuit 74C906-non-inverting buffer	61-12074906
IC10	Integrated circuit CD4066	61-12004066
IC11	Integrated circuit CD4066	61-12004066
IC12	Integrated circuit CA3240	61-12003240
IC13	Integrated circuit TDA1072A-AM detector	61-12011072
IC14	Integrated circuit CA1458G	61-12001458
IC15	Integrated circuit CA1458G	61-12001458
IC16	Integrated circuit CA1458G	61-12001458
IC17	Integrated circuit CA3240	61-12003240
IC18	Integrated circuit CA3240	61-12003240
IC19	Integrated circuit CA1458G	61-12001458
IC20	Integrated circuit CA3240	61-12003240
IC21	Integrated circuit 10F4-binary demux inverter	61-12004556
IC22	Integrated circuit HEF 4051BP	61-12004051
IC23	Integrated circuit HEF 4051BP	61-12004051
IC24	Integrated circuit CA3049T-dual differential amplifier	61-12003049
IC25	Integrated circuit 74C906-non-inverting buffer	61-12074906
IC26	Integrated circuit CD4053BE	61-12004053
IC27	Integrated circuit CA3240	61-12003240
IC28	Integrated circuit 8243-I/P O/P expander	61-12008243
IC29	Integrated circuit CA3240	61-12003240
IC30	Integrated circuit MSA0304-RF amplifier	61-12000304
TR1	Transistor J310	61-08000310
TR3	Transistor J175	61-08000175
TR4	Transistor BC182	61-04120182
TR7	Transistor J175	61-08000175
TR10	FET-BF964-N-channel D-gate VHF	61-08000964
TR11	FET-BF964-N-channel D-gate VHF	61-08000964
TR12	Transistor MRF581A NPN	61-04420581
TR13	Transistor MRF581A NPN	61-04420581
TR14	Transistor J310	61-08000310
TR15	Transistor BC182	61-04120182
TR16	Transistor J310	61-08000310
TR17	Transistor J310	61-08000310
TR18	Transistor BC182	61-04120182
TR19	FET-BF964-N-channel D-gate VHF	61-08000964
CONNECTORS		
	Socket-FR-S-RD316-A	19-02060103
	Jumper-02-way	20-02020101
	Plug-03-PCMT-ERG-MIN	20-01030302
CN1	Plug-60-PCMT-01A-A	20-01600300
CN2	Plug-64-PCMT-01A-A-edge	20-01640300

Assembly: RX IF AND AUDIO MODULE (3010 AND 3050 TRs)

Part No: 68-32500012

Circuit Reference	Description	Part Number
METALWORK		
	Module chassis RX IF	45-28322793
	Screen (4.5 x 2.7) bottom	45-00027962
	Screen (4.5 x 2.7) top	45-00027961
	Screen lid (4.5 x 2.7)	45-00002795
	Box fixing bracket	45-26002516
MISCELLANEOUS		
	RF gasket-4.5 x 2.7 box	02-28002800
	Potentiometer hole plug	02-02202590
	PCB test point terminal	02-12000001
XL1	Crystal-FUND-PAR-11.1550MHz	22-13124004
FL1	Crystal filter 10.7 ±12kHz	27-12070001
FL2	Crystal 10.7mH 25kHz-26kHz	27-30005082
	PCB-1207 RX IF	55-00000427
	Integrated circuit socket 24 pin	65-05000241
	12 pin T05 spreader pad	62-04000012
BM1	Mixer SRA-1mH	69-13000004
	Sub-miniature ferrite bead	79-08000009
	Coil can 73-019-93	79-06000005
	Coil can 10mm	79-06000007
	1590 FB amplifier transformer	79-10000030
L1	Inductor PC MTG 56mH	79-01000026
L2	Choke 7mH	79-01000012
L3	Inductor PC MTG 56mH	79-01000026
L4	Inductor 47mH 10RB181LY	79-01000022
L5	Inductor 47mH 10RB181LY	79-01000022
L6	IF transformer 7MCS2199DC	79-02000011
L7	Choke 680µH SC30	79-01000008
L8	Coil VHF 1.5T no tap ferrite	79-09120025
L9	Coil HF 9.5T no tap ferrite	79-09120036
L10	Choke 2µH2 SC30	79-01000015
L11	Choke 560nH-10%-tubular	79-01000035
L12	Choke 22µH SC30	79-01000016
L13	Choke 22µH SC30	79-01000016
L15	Choke 10µH SC30	79-01000013
L16	IF transformer 7MCS2199DC	79-02000011
L17	Choke 10µH SC30	79-01000013
L18	Choke 10µH SC30	79-01000013
L19	Choke 10µH SC30	79-01000013
L21	Choke 10µH SC30	79-01000013
L22	Choke 10µH SC30	79-01000013
L23	Choke 10µH SC30	79-01000013

Assembly: RX IF AND AUDIO MODULE (3010 AND 3050 TRs)

Part No: 68-32500012

Circuit Reference	Description	Part Number
L24	Coil VHF 2.5T no tap ferrite	79-09120021
L25	Coil VHF 2.5T no tap ferrite	79-09120021
L26	Choke 10µH SC30	79-01000013
L27	Choke 10µH SC30	79-01000013
L28	Choke 10µH SC30	79-01000013
L29	Coil VHF 4.5T no tap ferrite	79-09120026
L30	Coil VHF 4.5T no tap ferrite	79-09120026
L32	Choke 10µH SC30	79-01000013
L33	Choke 10mH SC30	79-01000013
L34	Choke 10µH SC30	79-01000013
L35	Choke 10µH SC30	79-01000013
L36	Choke 10µH SC30	79-01000013
L37	Choke 10µH SC30	79-01000013
L38	Coil 2.5T no tap ferrite yellow	79-09120029
L39	Coil 6.5T no tap ferrite black	79-09120024
L41	Choke 10mH SC30	79-01000013
L120	Coil 6.5T no tap ferrite black	79-09120024
L121	Coil 2.5T no tap ferrite yellow	79-09120029
L122	Choke 47mH SC30	79-01000005
T1	Audio transformer	73-02217797
T2	IF coil KANK3335R	79-02000010
T3	IF transformer 7MCS2199DC	79-02000011
T4	IF transformer 7MCS2199DC	79-02000011
T5	IF coil KANK3335R	79-02000010
T12	Balum core 6mm 2 hole	79-08000011
T13	Balum core 6mm 2 hole	79-08000011
T14	VHF coil 301-SN-0200	79-09120014
T15	Balum core 6mm 2 hole	79-08000011

Assembly: RX IF AND AUDIO MODULE (3030 TR)

Part No: 68-30300008

Circuit Reference	Description	Part Number
RESISTORS		
R164	Thermistor-2k2 -KR222CW	53-80223000
R210	Thermistor-150-232264226151	53-81501005
RV1	Potentiometer-PCB-linear cermet-100k-vertical	53-31004205
RV2	Potentiometer-PCB-linear cermet-100k-vertical	53-31004205
RV3	Potentiometer-PCB-linear cermet- 10k-vertical	53-30104205
RV4	Potentiometer-PCB-linear cermet- 10k-vertical	53-30104205
RV5	Potentiometer-PCB-linear cermet- 5k-horizontal	53-50054205
RV6	Potentiometer-PCB-linear cermet-100k-horizontal	53-51004205
RV7	Potentiometer-PCB-linear cermet-500k-vertical	53-35004205
RV8	Potentiometer-PCB-linear cermet- 50k-horizontal	53-50504205
RV9	Potentiometer-PCB-linear cermet- 50k-vertical	53-30504205
RV10	Potentiometer-PCB-linear cermet- 50k-horizontal	53-50504205
RV11	Potentiometer-PCB-linear cermet- 10k-horizontal	53-51003205
RV12	Potentiometer-PCB-linear cermet- 50k-horizontal	53-50504205
RV13	Potentiometer-PCB-linear cermet- 10k-vertical	53-30104205
RV14	Potentiometer-PCB-linear cermet- 10k-horizontal	53-51003205
RV15	Potentiometer-PCB-linear cermet- 10k-horizontal	53-51003205
RV16	Potentiometer-PCB-linear cermet- 10k-horizontal	53-51003205
R1	Resistor- 47k-0W50-5%-metal film	59-10475002
R2	Resistor- 47k-0W50-5%-metal film	59-10475002
R4	Resistor-100k-0W50-5%-metal film	59-11005002
R7	Resistor-100k-0W50-5%-metal film	59-11005002
R8	Resistor-100k-0W50-5%-metal film	59-11005002
R9	Resistor-100k-0W50-5%-metal film	59-11005002
R10	Resistor-100k-0W50-5%-metal film	59-11005002
R11	Resistor- 3k3-0W50-5%-metal film	59-10334002
R12	Resistor- 33k-0W50-5%-metal film	59-10335002
R13	Resistor- 68k-0W50-5%-metal film	59-10685002
R14	Resistor- 2k7-0W50-5%-metal film	59-10274002
R15	Resistor-560R-0W50-5%-metal film	59-15602002
R16	Resistor- 10k-0W50-5%-metal film	59-10105002
R17	Resistor- 10k-0W50-5%-metal film	59-10105002
R18	Resistor- 47k-0W50-5%-metal film	59-10475002
R19	Resistor- 47k-0W50-5%-metal film	59-10475002
R20	Resistor- 4k7-0W50-5%-metal film	59-10474002
R21	Resistor- 4k7-0W50-5%-metal film	59-10474002
R22	Resistor- 4k7-0W50-5%-metal film	59-10474002
R23	Resistor- 10k-0W50-5%-metal film	59-10105002
R24	Resistor- 4k7-0W50-5%-metal film	59-10474002
R25	Resistor- 10k-0W50-5%-metal film	59-10105002
R26	Resistor- 10k-0W50-5%-metal film	59-10105002
R27	Resistor-100k-0W50-5%-metal film	59-11005002
R29	Resistor- 56R-0W50-5%-metal film	59-10562002

Circuit Reference	Description	Part Number
R30	Resistor- 47k-0W50-5%-metal film	59-10475002
R31	Resistor- 10k-0W50-5%-metal film	59-10105002
R32	Resistor- 1k-0W50-5%-metal film	59-10015002
R33	Resistor- 10k-0W50-5%-metal film	59-10105002
R34	Resistor-560R-0W50-5%-metal film	59-15602002
R35	Resistor- 4k7-0W50-5%-metal film	59-10474002
R36	Resistor- 4k7-0W50-5%-metal film	59-10474002
R37	Resistor- 10k-0W50-5%-metal film	59-10105002
R39	Resistor- 4k7-0W50-5%-metal film	59-10474002
R40	Resistor- 4k7-0W50-5%-metal film	59-10474002
R41	Resistor- 1k-0W50-5%-metal film	59-10015002
R42	Resistor- 5k6-0W50-5%-metal film	59-10564002
R43	Resistor- 10k-0W50-5%-metal film	59-10105002
R44	Resistor- 10k-0W50-5%-metal film	59-10105002
R45	Resistor-680R-0W50-5%-metal film	59-16802002
R46	Resistor- 33k-0W50-5%-metal film	59-10335002
R47	Resistor- 47k-0W50-5%-metal film	59-10475002
R48	Resistor- 33k-0W50-5%-metal film	59-10335002
R49	Resistor- 33k-0W50-5%-metal film	59-10335002
R50	Resistor- 33k-0W50-5%-metal film	59-10335002
R51	Resistor-100k-0W50-5%-metal film	59-11005002
R52	Resistor-100k-0W50-5%-metal film	59-11005002
R53	Resistor- 10k-0W50-5%-metal film	59-10105002
R54	Resistor-100k-0W50-5%-metal film	59-11005002
R55	Resistor-100k-0W50-5%-metal film	59-11005002
R56	Resistor- 47k-0W50-5%-metal film	59-10475002
R57	Resistor- 3k3-0W50-5%-metal film	59-10334002
R58	Resistor- 1k8-0W50-5%-metal film	59-10184002
R59	Resistor-100k-0W50-5%-metal film	59-11005002
R60	Resistor- 1M-0W50-5%-metal film	59-10018002
R61	Resistor-100R-0W50-5%-metal film	59-11002002
R62	Resistor- 10k-0W50-5%-metal film	59-10105002
R63	Resistor- 4k7-0W50-5%-metal film	59-10474002
R64	Resistor- 47k-0W50-5%-metal film	59-10475002
R65	Resistor- 10k-0W50-5%-metal film	59-10105002
R68	Resistor- 10k-0W50-5%-metal film	59-10105002
R69	Resistor-220R-0W50-5%-metal film	59-12202002
R70	Resistor- 3k3-0W50-5%-metal film	59-10334002
R71	Resistor- 1k2-0W50-5%-metal film	59-10124002
R72	Resistor- 33k-0W50-5%-metal film	59-10335002
R73	Resistor- 1k-0W50-5%-metal film	59-10015002
R74	Resistor- 47k-0W50-5%-metal film	59-10475002
R75	Resistor- 22k-0W50-5%-metal film	59-10225002
R76	Resistor- 1k2-0W50-5%-metal film	59-10124002
R77	Resistor-680R-0W50-5%-metal film	59-16802002

Assembly: RX IF AND AUDIO MODULE (3030 TR)

Part No: 68-30300008

Circuit Reference	Description	Part Number
R78	Resistor- 10k-0W50-5%-metal film	59-10105002
R79	Resistor- 10k-0W50-5%-metal film	59-10105002
R80	Resistor- 2k2-0W50-5%-metal film	59-10224002
R81	Resistor-150k-0W50-5%-metal film	59-11505002
R82	Resistor- 2k2-0W50-5%-metal film	59-10224002
R83	Resistor-220k-0W50-5%-metal film	59-12205002
R84	Resistor- 33k-0W50-5%-metal film	59-10335002
R85	Resistor- 1k-0W50-5%-metal film	59-10015002
R86	Resistor- 1k5-0W50-5%-metal film	59-10154002
R87	Resistor-330R-0W50-5%-metal film	59-13302002
R88	Resistor- 2k7-0W50-5%-metal film	59-10274002
R89	Resistor-100k-0W50-5%-metal film	59-11005002
R90	Resistor-100k-0W50-5%-metal film	59-11005002
R91	Resistor- 10k-0W50-5%-metal film	59-10105002
R92	Resistor-150k-0W50-5%-metal film	59-11505002
R93	Resistor- 5k6-0W50-5%-metal film	59-10564002
R94	Resistor- 10k-0W50-5%-metal film	59-10105002
R95	Resistor- 51R-0W50-5%-metal film	59-10512002
R96	Resistor- 5k6-0W50-5%-metal film	59-10564002
R97	Resistor-470R-0W50-5%-metal film	59-14702002
R98	Resistor- 3k3-0W50-5%-metal film	59-10334002
R99	Resistor-100R-0W50-5%-metal film	59-11002002
R100	Resistor-330R-0W50-5%-metal film	59-13302002
R101	Resistor- 47R-0W50-5%-metal film	59-10472002
R102	Resistor- 2k2-0W50-5%-metal film	59-10224002
R103	Resistor- 10k-0W50-5%-metal film	59-10105002
R104	Resistor- 5k6-0W50-5%-metal film	59-10564002
R105	Resistor- 12k-0W50-5%-metal film	59-10125002
R106	Resistor- 2k7-0W50-5%-metal film	59-10274002
R107	Resistor- 1k-0W50-5%-metal film	59-10015002
R108	Resistor- 4k7-0W50-5%-metal film	59-10474002
R109	Resistor- 2k7-0W50-5%-metal film	59-10274002
R110	Resistor- 1k2-0W50-5%-metal film	59-10124002
R111	Resistor- 10k-0W50-5%-metal film	59-10105002
R112	Resistor- 10k-0W50-5%-metal film	59-10105002
R113	Resistor- 12k-0W50-5%-metal film	59-10125002
R114	Resistor- 2k7-0W50-5%-metal film	59-10274002
R115	Resistor- 2k2-0W50-5%-metal film	59-10224002
R116	Resistor- 47R-0W50-5%-metal film	59-10472002
R117	Resistor-330R-0W50-5%-metal film	59-13302002
R118	Resistor-100R-0W50-5%-metal film	59-11002002
R119	Resistor- 5k6-0W50-5%-metal film	59-10564002
R120	Resistor- 3k3-0W50-5%-metal film	59-10334002
R121	Resistor- 10k-0W50-5%-metal film	59-10105002
R123	Resistor- 1k-0W50-5%-metal film	59-10015002

Assembly: RX IF AND AUDIO MODULE (3030 TR)

Part No: 68-30300008

Circuit Reference	Description	Part Number
R124	Resistor- 1k-0W50-5%-metal film	59-10015002
R125	Resistor- 33R-0W50-5%-metal film	59-10332002
R126	Resistor- 4k7-0W50-5%-metal film	59-10474002
R127	Resistor-150R-0W50-5%-metal film	59-11502002
R128	Resistor-150R-0W50-5%-metal film	59-11502002
R129	Resistor-220R-0W50-5%-metal film	59-12202002
R130	Resistor- 33R-0W50-5%-metal film	59-10332002
R131	Resistor-100k-0W50-5%-metal film	59-11005002
R132	Resistor- 47k-0W50-5%-metal film	59-10475002
R133	Resistor-680R-0W50-5%-metal film	59-16802002
R134	Resistor- 1k5-0W50-5%-metal film	59-10154002
R135	Resistor- 1k5-0W50-5%-metal film	59-10154002
R136	Resistor-150R-0W50-5%-metal film	59-11502002
R137	Resistor-150R-0W50-5%-metal film	59-11502002
R138	Resistor-220R-0W50-5%-metal film	59-12202002
R139	Resistor- 1k-0W50-5%-metal film	59-10015002
R140	Resistor- 4k7-0W50-5%-metal film	59-10474002
R141	Resistor- 2k7-0W50-5%-metal film	59-10274002
R142	Resistor-220R-0W50-5%-metal film	59-12202002
R143	Resistor- 4k7-0W50-5%-metal film	59-10474002
R145	Resistor- 22k-0W50-5%-metal film	59-10225002
R146	Resistor- 10k-0W50-5%-metal film	59-10105002
R147	Resistor- 5k6-0W50-5%-metal film	59-10564002
R148	Resistor- 2k2-0W50-5%-metal film	59-10224002
R149	Resistor-100R-0W50-5%-metal film	59-11002002
R150	Resistor- 27k-0W50-5%-metal film	59-10275002
R151	Resistor- 4k7-0W50-5%-metal film	59-10474002
R152	Resistor- 22k-0W50-5%-metal film	59-10225002
R153	Resistor- 1k2-0W50-5%-metal film	59-10124002
R154	Resistor- 27k-0W50-5%-metal film	59-10275002
R155	Resistor-220k-0W50-5%-metal film	59-12205002
R156	Resistor- 22k-0W50-5%-metal film	59-10225002
R157	Resistor- 3k3-0W50-5%-metal film	59-10334002
R158	Resistor- 6k8-0W50-5%-metal film	59-10684002
R159	Resistor- 33k-0W50-5%-metal film	59-10335002
R160	Resistor- 33k-0W50-5%-metal film	59-10335002
R161	Resistor- 6k8-0W50-5%-metal film	59-10684002
R162	Resistor-220k-0W50-5%-metal film	59-12205002
R163	Resistor- 1k-0W50-5%-metal film	59-10015002
R165	Resistor- 4k7-0W50-5%-metal film	59-10474002
R166	Resistor- 4k7-0W50-5%-metal film	59-10474002
R177	Resistor-100R-0W50-5%-metal film	59-11002002
R178	Resistor- 47k-0W50-5%-metal film	59-10475002
R179	Resistor- 47k-0W50-5%-metal film	59-10475002
R180	Resistor-150R-0W50-5%-metal film	59-11502002

Assembly: RX IF AND AUDIO MODULE (3030 TR)

Part No: 68-30300008

Circuit Reference	Description	Part Number
R185	Resistor- 10k-0W50-5%-metal film	59-10105002
R186	Resistor- 10k-0W50-5%-metal film	59-10105002
R187	Resistor- 4k7-0W50-5%-metal film	59-10474002
R188	Resistor-150R-0W50-5%-metal film	59-11502002
R189	Resistor- 3k9-0W50-5%-metal film	59-10394002
R192	Resistor-100k-0W50-5%-metal film	59-11005002
R196	Resistor-220R-0W50-5%-metal film	59-12202002
R198	Resistor- 33k-0W50-5%-metal film	59-10335002
R200	Resistor-150R-0W50-5%-metal film	59-11502002
R201	Resistor-150R-0W50-5%-metal film	59-11502002
R202	Resistor- 10k-0W50-5%-metal film	59-10105002
R203	Resistor-100k-0W50-5%-metal film	59-11005002
R204	Resistor-100k-0W50-5%-metal film	59-11005002
R205	Resistor-100k-0W50-5%-metal film	59-11005002
R206	Resistor- 10k-0W50-5%-metal film	59-10105002
R207	Resistor- 47R-0W50-5%-metal film	59-10472002
R208	Resistor- 2k2-0W50-5%-metal film	59-10224002
R209	Resistor-270R-0W50-5%-metal film	59-12702002
R210	Thermistor-150 -232264226151	53-81501005
R213	Resistor- 10k-0W50-5%-metal film	59-10105002
R214	Resistor- 10k-0W50-5%-metal film	59-10105002
R215	Resistor-220k-0W50-5%-metal film	59-12205002
R216	Resistor-330R-0W50-5%-metal film	59-13302002
R217	Resistor- 2M2-0W33-5%-metal film	59-10227003
R218	Resistor- 3k3-0W50-5%-metal film	59-10334002
R219	Resistor-220R-0W50-5%-metal film	59-12202002
R220	Resistor- 2k7-0W50-5%-metal film	59-10274002
R221	Resistor- 3k3-0W50-5%-metal film	59-10334002
R222	Resistor-330R-0W50-5%-metal film	59-13302002
R223	Resistor-330R-0W50-5%-metal film	59-13302002
R224	Resistor-150R-0W50-5%-metal film	59-11502002
R227	Resistor-470R-0W50-5%-metal film	59-14702002
R230	Resistor- 22k-0W50-5%-metal film	59-10225002
R231	Resistor- 3k3-0W50-5%-metal film	59-10334002
R235	Resistor- 3k3-0W50-5%-metal film	59-10334002
R236	Resistor- 10k-0W50-5%-metal film	59-10105002
R240	Resistor- 4k7-0W50-5%-metal film	59-10474002
R241,R242	Resistor-470R-0W50-5%-metal film	59-14702002
RN1	Resistor-100k-1W50-2%-network	59-81005002
RN2	Resistor-100k-1W50-2%-network	59-81005002

Assembly: RX IF AND AUDIO MODULE (3030 TR)

Part No: 68-30300008

Circuit Reference	Description	Part Number
CAPACITORS		
C1	Mixed- 0.1µF- 63V- -polyester	14-21105200
C2	Tantalum- 22µF- 16V	14-36227108
C3	Tantalum- 22µF- 16V	14-36227108
C4	Tantalum- 22µF- 16V	14-36227108
C6	Tantalum- 22µF- 16V	14-36227108
C8	Tantalum- 10µF- 16V	14-36107100
C10	Electrolytic- 47µF- 50V- -vertical	14-06477200
C11	Tantalum- 2.2µF- 35V	14-36226101
C12	Tantalum- 2.2µF- 35V	14-36226101
C13	Tantalum- 10µF- 16V	14-36107100
C14	Mixed- 0.1µF- 63V- -polyester	14-21105200
C15	Tantalum- 2.2µF- 35V	14-36226101
C16	Tantalum- 2.2µF- 35V	14-36226101
C17	Tantalum- 2.2µF- 35V	14-36226101
C18	Tantalum- 2.2µF- 35V	14-36226101
C19	Tantalum- 2.2µF- 35V	14-36226101
C20	Mixed- 0.1µF- 63V- -polyester	14-21105200
C21	Mixed- 0.1µF- 63V- -polyester	14-21105200
C22	Mixed- 0.1µF- 63V- -polyester	14-21105200
C23	Mixed- 0.1µF- 63V- -polyester	14-21105200
C24	Mixed- 68nF- 63V- -sub-miniature	14-21684200
C25	Mixed- 6.8nF- 63V- -sub-miniature	14-21683300
C26	Mixed- 0.1µF- 63V- -polyester	14-21105200
C27	Mixed- 47nF- 63V- -sub-miniature	14-21474200
C29	Mixed-0.01µF- 63V- -polyester	14-21104302
C31	Mixed-0.01µF- 63V- -polyester	14-21104302
C32	Mixed-0.01µF- 63V- -polyester	14-21104302
C33	Mixed-0.22µF- 63V- -polyester	14-21225200
C34	Tantalum- 1µF- 35V	14-36106100
C35	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C36	Ceramic- 1nF-100V- -miniature plate	14-03103301
C37	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C38	Tantalum- 10µF- 16V	14-36107100
C39	Ceramic- 22pF-100V- -miniature plate	14-03221301
C40	Ceramic- 33pF-100V- -miniature plate	14-03331301
C41	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C42	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C43	Electrolytic- 47µF- 50V- -vertical	14-06477200
C44	Ceramic- 150pF-100V- -miniature plate	14-03152300
C45	Mixed- 0.1µF- 63V- -polyester	14-21105200
C46	Mixed- 470nF- 63V- -sub-miniature	14-21475200
C47	Mixed- 0.1µF- 63V- -polyester	14-21105200

Assembly: RX IF AND AUDIO MODULE (3030 TR)

Part No: 68-30300008

Circuit Reference	Description	Part Number
C48	Ceramic- 1nF-100V- -miniature plate	14-03103301
C49	Mixed- 470nF- 63V- -sub-miniature	14-21475200
C50	Tantalum- 10µF- 16V	14-36107100
C51	Mixed- 470nF- 63V- -sub-miniature	14-21475200
C52	Ceramic- 100pF-100V- -miniature plate	14-03102301
C53	Ceramic- 100pF-100V- -miniature plate	14-03102301
C54	Mixed-0.01µF- 63V- -polyester	14-21104302
C55	Mixed-0.01µF- 63V- -polyester	14-21104302
C56	Mixed- 0.1µF- 63V- -polyester	14-21105200
C57	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C58	Tantalum- 22µF- 16V	14-36227108
C59	Mixed- 6.8nF- 63V- -sub-miniature	14-21683300
C60	Ceramic- 2.2nF-100V- -miniature plate	14-03223300
C61	Mixed- 0.1µF- 63V- -polyester	14-21105200
C62	Ceramic- 33pF-100V- -miniature plate	14-03331301
C63	Mixed- 0.1µF- 63V- -polyester	14-21105200
C64	Ceramic- 33pF-100V- -miniature plate	14-03331301
C65	Mixed- 0.1µF- 63V- -polyester	14-21105200
C66	Tantalum- 10µF- 16V	14-36107100
C68	Mixed- 0.1µF- 63V- -polyester	14-21105200
C69	Ceramic- 100pF-100V- -miniature plate	14-03102301
C70	Mixed- 0.1µF- 63V- -polyester	14-21105200
C71	Ceramic- 1nF-100V- -miniature plate	14-03103301
C72	Electrolytic- 47µF- 50V- -vertical	14-06477200
C73	Mixed- 0.1µF- 63V- -polyester	14-21105200
C74	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C75	Ceramic- 150pF-100V- -miniature plate	14-03152300
C76	Ceramic- 100pF-100V- -miniature plate	14-03102301
C77	Mixed- 0.1µF- 63V- -polyester	14-21105200
C78	Mixed-0.22µF- 63V- -polyester	14-21225200
C79	Mixed-0.22µF- 63V- -polyester	14-21225200
C80	Tantalum- 10µF- 16V	14-36107100
C81	Ceramic- 1nF-100V- -miniature plate	14-03103301
C83	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C84	Ceramic- 10pF-100V- -miniature plate	14-03101301
C85	Ceramic- 15pF-100V- -miniature plate	14-03151301
C86	Ceramic- 2.2pF-100V- -miniature plate	14-03220301
C87	Ceramic- 12pF-100V- -miniature plate	14-03121301
C88	Ceramic- 47pF-100V- -miniature plate	14-03471300
C90	Ceramic- 220pF-100V- -miniature plate	14-03222300
C91	Ceramic- 470pF-100V- -miniature plate	14-03472300
C92	Ceramic- 100pF-100V- -miniature plate	14-03102301
C93	Ceramic- 220pF-100V- -miniature plate	14-03222300
C94	Ceramic- 18pF-100V- -miniature plate	14-03181300
C95	Ceramic- 18pF-100V- -miniature plate	14-03181300

Circuit Reference	Description	Part Number
C96	Ceramic- 33pF-100V- -miniature plate	14-03331301
C97	Ceramic- 220pF-100V- -miniature plate	14-03222300
C98	Ceramic- 100pF-100V- -miniature plate	14-03102301
C99	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C100	Ceramic- 220pF-100V- -miniature plate	14-03222300
C101	Ceramic- 18pF-100V- -miniature plate	14-03181300
C102	Ceramic- 1nF-100V- -miniature plate	14-03103301
C103	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C104	Ceramic- 1nF-100V- -miniature plate	14-03103301
C105	Ceramic- 1nF-100V- -miniature plate	14-03103301
C106	Ceramic- 1nF-100V- -miniature plate	14-03103301
C107	Ceramic- 1nF-100V- -miniature plate	14-03103301
C108	Ceramic- 1nF-100V- -miniature plate	14-03103301
C109	Ceramic- 1nF-100V- -miniature plate	14-03103301
C110	Ceramic- 12pF-100V- -miniature plate	14-03121301
C111	Ceramic- 1nF-100V- -miniature plate	14-03103301
C112	Ceramic- 1nF-100V- -miniature plate	14-03103301
C113	Ceramic- 1nF-100V- -miniature plate	14-03103301
C114	Ceramic- 1nF-100V- -miniature plate	14-03103301
C115	Mixed-0.22µF- 63V- -polyester	14-21225200
C116	Ceramic- 1nF-100V- -miniature plate	14-03103301
C117	Mixed- 0.1µF- 63V- -polyester	14-21105200
C118	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C119	Mixed- 0.1µF- 63V- -polyester	14-21105200
C120	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C121	Ceramic- 33pF-100V- -miniature plate	14-03331301
C122	Ceramic- 220pF-100V- -miniature plate	14-03222300
C123	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C124	Mixed- 0.1µF- 63V- -polyester	14-21105200
C125	Ceramic- 2.2nF-100V- -miniature plate	14-03223300
C126	Tantalum- 2.2µF- 35V	14-36226101
C127	Ceramic- 1nF-100V- -miniature plate	14-03103301
C128	Tantalum- 2.2µF- 35V	14-36226101
C129	Mixed- 0.1µF- 63V- -polyester	14-21105200
C130	Mixed- 0.1µF- 63V- -polyester	14-21105200
C131	Tantalum- 2.2µF- 35V	14-36226101
C132	Tantalum- 2.2µF- 35V	14-36226101
C133	Mixed- 0.1µF- 63V- -polyester	14-21105200
C134	Mixed- 0.1µF- 63V- -polyester	14-21105200
C135	Tantalum- 2.2µF- 35V	14-36226101
C136	Tantalum- 2.2µF- 35V	14-36226101
C137	Mixed- 0.1µF- 63V- -polyester	14-21105200
C138	Mixed- 0.1µF- 63V- -polyester	14-21105200
C139	Tantalum- 2.2µF- 35V	14-36226101
C140	Tantalum- 10µF- 16V	14-36107100

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Circuit Reference	Description	Part Number
C141	Tantalum- 2.2µF- 35V	14-36226101
C142	Mixed- 0.1µF- 63V- -polyester	14-21105200
C143	Mixed- 0.1µF- 63V- -polyester	14-21105200
C144	Tantalum- 2.2µF- 35V	14-36226101
C145	Mixed- 47nF- 63V- -sub-miniature	14-21474200
C147	Ceramic- 1nF-100V- -miniature plate	14-03103301
C148	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C149	Ceramic- 1nF-100V- -miniature plate	14-03103301
C150	Ceramic- 1nF-100V- -miniature plate	14-03103301
C158	Ceramic- 1nF-100V- -miniature plate	14-03103301
C167	Ceramic- 18pF-100V- -miniature plate	14-03181300
C168	Ceramic- 18pF-100V- -miniature plate	14-03181300
C169	Ceramic- 4.7pF-100V- -miniature plate	14-03470301
C170	Ceramic- 4.7pF-100V- -miniature plate	14-03470301
C171	Ceramic- 10pF-100V- -miniature plate	14-03101301
C172	Ceramic- 68pF-100V- -miniature plate	14-03681301
C173	Ceramic- 3.3pF-100V- -miniature plate	14-03330301
C174	Ceramic- 39pF-100V- -miniature plate	14-03391330
C175	Ceramic- 2.2pF-100V- -miniature plate	14-03220301
C176	Ceramic- 1nF-100V- -miniature plate	14-03103301
C177	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C178	Ceramic- 1nF-100V- -miniature plate	14-03103301
C179	Ceramic- 1nF-100V- -miniature plate	14-03103301
C180	Ceramic- 1nF-100V- -miniature plate	14-03103301
C181	Mixed- 0.1µF- 63V- -polyester	14-21105200
C182	Mixed-0.22µF- 63V- -polyester	14-21225200
C183	Mixed-0.22µF- 63V- -polyester	14-21225200
C184	Mixed-0.22µF- 63V- -polyester	14-21225200
C185	Ceramic- 1nF-100V- -miniature plate	14-03103301
C186	Mixed- 0.1µF- 63V- -polyester	14-21105200
C187	Ceramic- 1nF-100V- -miniature plate	14-03103301
C188	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C191	Ceramic- 39pF-100V- -miniature plate	14-03391330
C192	Ceramic- 39pF-100V- -miniature plate	14-03391330
C195	Tantalum- 47µF- 16V	14-36477106
C196	Electrolytic- 330µF- 50V	14-06338200
C198	Electrolytic-1000µF- 10V-20%-vertical	14-06109122
C199	Ceramic- 10pF-100V- -miniature plate	14-03101301
C201	Ceramic- 10pF-100V- -miniature plate	14-03101301
C202	Ceramic- 47pF-100V- -miniature plate	14-03471300
C203	Ceramic- 10pF-100V- -miniature plate	14-03101301
C204	Ceramic- 1.8pF-100V- -miniature plate	14-03180301
C205	Ceramic- 47pF-100V- -miniature plate	14-03471300
C206	Ceramic- 10pF-100V- -miniature plate	14-03101301
C207	Mixed- 47nF- 63V- -sub-miniature	14-21474200

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Part No: 68-30300008

Circuit Reference	Description	Part Number
C208	Ceramic- 180pF-100V- -miniature plate	14-03182202
C209	Tantalum- 22µF- 16V	14-36227108
C211	Mixed-1000pF- 63V- -sub-miniature	14-21103200
C212	Ceramic- 47pF-100V- -miniature plate	14-03471300
C213	Ceramic- 1nF-100V- -miniature plate	14-03103301
C214	Ceramic- 1nF-100V- -miniature plate	14-03103301
C215	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C216	Ceramic- 1nF-100V- -miniature plate	14-03103301
C217	Ceramic- 1nF-100V- -miniature plate	14-03103301
C221	Mixed-0.01µF- 63V- -polyester	14-21104302
TC1	Capacitor-variable- 15- 22P-PLYPRP	15-43022300
TC2	Capacitor-variable- 15- 22P-PLYPRP	15-43022300
SEMICONDUCTORS		
D1	Diode 1N4148	61-00104148
D2	Diode 1N4148	61-00104148
D3	Diode 1N4148	61-00104148
D4	Diode 1N4148	61-00104148
D6	Diode 1N4148	61-00104148
D8	Diode 1N4148	61-00104148
D10	Diode 1N4148	61-00104148
D11	Diode 1N4148	61-00104148
D12	Diode BZX55C2V7	61-00202705
D17	Diode BZX55C6V2	61-00206205
D18	Diode 1N4148	61-00104148
D19	Diode 1N4148	61-00104148
D20	Diode 1N4148	61-00104148
D22	Diode 1N4148	61-00104148
D23	Diode BZX55C5V6	61-00205604
D24	Diode 1N4148	61-00104148
D25	Diode 1N4148	61-00104148
D26	Diode 1N4148	61-00104148
D27	Diode 5082-2835	61-00602835
D38	Diode 1N4148	61-00104148
D39	Diode 1N4148	61-00104148
D40	Diode 1N4148	61-00104148
D42	Diode 1N4148	61-00104148
IC1	Integrated circuit TDA1072A-AM detector	61-12011072
IC2	Integrated circuit MC3359P -FM IF amplifier	61-12003359
IC3	Integrated circuit TDA1072A-AM detector	61-12011072
IC4	Integrated circuit MC3359P -FM IF amplifier	61-12003359
IC5	Integrated circuit CA3240	61-12003240
IC6	Integrated circuit CA3240	61-12003240

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Circuit Reference	Description	Part Number
IC7	Integrated circuit CD4053BE	61-12004053
IC8	Integrated circuit CD4049UBE	61-12004049
IC9	Integrated circuit 74C906-non-inverting buffer	61-12074906
IC10	Integrated circuit CD4066	61-12004066
IC11	Integrated circuit CD4066	61-12004066
IC12	Integrated circuit CA3240	61-12003240
IC13	Integrated circuit TDA1072A-AM detector	61-12011072
IC14	Integrated circuit CA1558E	61-12001558
IC15	Integrated circuit CA1558E	61-12001558
IC16	Integrated circuit CA1558E	61-12001558
IC17	Integrated circuit CA3240	61-12003240
IC18	Integrated circuit CA3240	61-12003240
IC19	Integrated circuit CA1558E	61-12001558
IC20	Integrated circuit CA3240	61-12003240
IC21	Integrated circuit 1OF4-binary-demux inv	61-12004556
IC22	Integrated circuit HEF 4051BP	61-12004051
IC23	Integrated circuit HEF 4051BP	61-12004051
IC25	Integrated circuit 74C906-non-inverting buffer	61-12074906
IC26	Integrated circuit CD4053BE	61-12004053
IC27	Integrated circuit CA3240	61-12003240
IC28	Integrated circuit 8243-I/P O/P expander	61-12008243
IC29	Integrated circuit CA3240	61-12003240
IC30	Integrated circuit MSA0304-RF amplifier	61-12000304
TR1	Transistor J310	61-08000310
TR3	Transistor J175	61-08000175
TR4	Transistor BC182	61-04120182
TR7	Transistor J175	61-08000175
TR10	FET-BF964-N-channel-D-gate-VHF	61-08000964
TR11	FET-BF964-N-channel-D-gate-VHF	61-08000964
TR12	Transistor MRF581A NPN	61-04420581
TR13	Transistor MRF581A NPN	61-04420581
TR14	Transistor J310	61-08000310
TR16	Transistor J310	61-08000310
TR17	Transistor J310	61-08000310
TR19	FET-BF964-N-channel-D-gate-VHF	61-08000964
CONNECTORS		
	Socket-FR-S-RD316-A D 41612	19-02060103
	Plug-03-PCMT-ERG-MIN	20-01030302
	Jumper-02-way	20-02020101
CN1	Plug-60-PCMT-01A-A-41612	20-01600300
CN2	Plug-64-PCMT-01A-A-edge	20-01640300

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Part No: 68-30300008

Circuit Reference	Description	Part Number
METALWORK		
	Module chassis Rx IF	45-28322793
	Screen (4.5X2.7) bottom	45-00027962
	Screen (4.5X2.7) top	45-00027961
	Screen lid (4.5*2.7)	45-00002795
	Box fixing bracket	45-26002516
MISCELLANEOUS		
	RF-gasket-4.5*2.7 box	02-28002800
	Potentiometer hole plug	02-02202590
	PCB test point terminal	02-12000001
XL1	XTAL-FUND-PAR-11.1550MHz	22-13124004
FL1	XTAL-10.7MHz-25KHz-12KHz	27-30005083
FL2	XTAL filter	27-12070002
PCB1	PCB-1207 Rx IF	55-00000427
	Integrated circuit socket 24 pin	62-05000241
BM1	Mixer SRA-1MH	69-13000004
T1	Audio-PR-600-SC-600-PCMT	73-02217797
	Coil can 73-019-93	79-06000005
	Coil can 10mm	79-06000007
	Sub-miniature ferrite bead	79-08000009
	1590 FB amplifier transformer	79-10000030
L1	Inductor PC MTG 56 MH	79-01000026
L2	Choke 7µH	79-01000012
L3	Inductor PC MTG 56µH	79-01000026
L4	Inductor 47µH 10RB181LY	79-01000022
L5	Inductor 47µH 10RB181LY	79-01000022
L6	IF transformer 7MCS2199DC	79-02000011
L7	Choke 680µH SC30	79-01000008
L8	Coil VHF 1.5T no tap ferrite	79-09120025
L9	Coil HF 9.5T no tap ferrite	79-09120036
L10	Choke 2µH2 SC30	79-01000015
L11	Choke-560NH-10%-tubular	79-01000035
L12	Choke 22µH SC30	79-01000016
L13	Choke 22µH SC30	79-01000016
L15	Choke 10µH SC30	79-01000013
L16	IF transformer 7MCS2199DC	79-02000011
L17	Choke 10µH SC30	79-01000013
L18	Choke 10µH SC30	79-01000013
L19	Choke 10µH SC30	79-01000013
L22	Choke 10µH SC30	79-01000013

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Part No: 68-30300008

Circuit Reference	Description	Part Number
L23	Choke 10µH SC30	79-01000013
L29	Coil VHF 4.5T no tap ferrite	79-09120026
L30	Coil VHF 4.5T no tap ferrite	79-09120026
L33	Choke 10µH SC30	79-01000013
L37	Choke 10µH SC30	79-01000013
L38	Coil 2.5T no tap ferrite yellow	79-09120029
L39	Coil 6.5T no tap ferrite black	79-09120024
L41	Choke 10µH SC30	79-01000013
L120	Coil 6.5T no tap ferrite black	79-09120024
L122	Choke 47µH SC30	79-01000005
T2	IF coil KANK3335R	79-02000010
T3	IF transformer 7MCS2199DC	79-02000011
T4	IF transformer 7MCS2199DC	79-02000011
T5	IF coil KANK3335R	79-02000010
T15	Balun core 6mm 2 hole	79-08000011

10 SYNTHESISER

Assembly: SYNTHESISER MODULE

Part No: 68-30300003

Circuit Reference	Description	Part Number
RESISTORS (refer to the notes at end of synthesiser module listing)		
RV201	Potentiometer-PCB-linear cermet- 10k-horizontal	53-40104204
RV202	Potentiometer-PCB-linear cermet- 10k-horizontal	53-40104204
R1	Resistor-100k-0W50-5%-metal film	59-11005002
R2	Resistor- 2M2-0W33-5%-metal film	59-10227003
R4	Resistor-470k-0W50-5%-metal film	59-14705002
R5	Resistor- 2M2-0W33-5%-metal film	59-10227003
R6	Resistor- 2M2-0W33-5%-metal film	59-10227003
R7	Resistor-100k-0W40-1%-metal film	59-71005004
R8	Resistor-100k-0W40-1%-metal film	59-71005004
R9	Resistor-100k-0W40-1%-metal film	59-71005004
R10	Resistor-100k-0W40-1%-metal film	59-71005004
R11	Resistor- 33k-0W40-1%-metal film	59-70335004
R12	Resistor- 33k-0W40-1%-metal film	59-70335004
R13	Resistor- 33k-0W40-1%-metal film	59-70335004
R14	Resistor- 33k-0W40-1%-metal film	59-70335004
R15	Resistor-100k-0W50-5%-metal film	59-11005002
R16	Resistor-100k-0W50-5%-metal film	59-11005002
R17	Resistor-100k-0W50-5%-metal film	59-11005002
R18	Resistor-100k-0W50-5%-metal film	59-11005002
R21	Resistor- 10k-0W50-5%-metal film	59-10105002
R22	Resistor-100k-0W50-5%-metal film	59-11005002
R23	Resistor- 1k5-0W50-5%-metal film	59-10154002
R24	Resistor-220R-0W50-5%-metal film	59-12202002
R25	Resistor-100k-0W40-1%-metal film	59-71005004
R26	Resistor- 33k-0W40-1%-metal film	59-70335004
R27	Resistor- 47k-0W50-5%-metal film	59-10475002
R101	Resistor- 10k-0W50-5%-metal film	59-10105002
R102	Resistor- 10k-0W50-5%-metal film	59-10105002
R104	Resistor- 18R-0W50-5%-metal film	59-10182002
R105	Resistor- 10k-0W50-5%-metal film	59-10105002
R106	Resistor- 10k-0W50-5%-metal film	59-10105002
R107	Resistor- 10k-0W50-5%-metal film	59-10105002
R108	Resistor- 56k-0W50-5%-metal film	59-10565002
R109	Resistor- 18R-0W50-5%-metal film	59-10182002
R110	Resistor- 10k-0W50-5%-metal film	59-10105002
R111	Resistor- 10k-0W50-5%-metal film	59-10105002
R112	Resistor- 10k-0W50-5%-metal film	59-10105002
R113	Resistor- 56k-0W50-5%-metal film	59-10565002
R114	Resistor- 18R-0W50-5%-metal film	59-10182002

Assembly: SYNTHESISER MODULE

Part No: 68-30300003

Circuit Reference	Description	Part Number
R115	Resistor- 10k-0W50-5%-metal film	59-10105002
R116	Resistor- 10k-0W50-5%-metal film	59-10105002
R117	Resistor- 10k-0W50-5%-metal film	59-10105002
R118	Resistor- 56k-0W50-5%-metal film	59-10565002
R119	Resistor- 18R-0W50-5%-metal film	59-10182002
R120	Resistor- 10k-0W50-5%-metal film	59-10105002
R121	Resistor- 10k-0W50-5%-metal film	59-10105002
R122	Resistor- 10k-0W50-5%-metal film	59-10105002
R123	Resistor- 56k-0W50-5%-metal film	59-10565002
R124	Resistor- 18R-0W50-5%-metal film	59-10182002
R125	Resistor- 10k-0W50-5%-metal film	59-10105002
R126	Resistor- 10k-0W50-5%-metal film	59-10105002
R127	Resistor- 10k-0W50-5%-metal film	59-10105002
R128	Resistor- 56k-0W50-5%-metal film	59-10565002
R129	Resistor- 10R-0W50-5%-metal film	59-10102002
R130	Resistor- 10k-0W50-5%-metal film	59-10105002
R131	Resistor- 10k-0W50-5%-metal film	59-10105002
R132	Resistor- 10k-0W50-5%-metal film	59-10105002
R133	Resistor- 56k-0W50-5%-metal film	59-10565002
R134	Resistor- 10R-0W50-5%-metal film	59-10102002
R135	Resistor- 10k-0W50-5%-metal film	59-10105002
R136	Resistor-820R-0W50-5%-metal film	59-18202002
R138	Resistor-120R-0W50-5%-metal film	59-11202002
R139	Resistor-120R-0W50-5%-metal film	59-11202002
R140	Resistor-100k-0W50-5%-metal film	59-11005002
R141	Resistor- 1K5-0W50-5%-metal film	59-10154002
R142	Resistor- 27k-0W50-5%-metal film	59-10275002
R143	Resistor- 18k-0W50-5%-metal film	59-10185002
R147	Resistor-330R-0W50-5%-metal film	59-13302002
R148	Resistor-150R-0W50-5%-metal film	59-11502002
R149	Resistor- 10k-0W50-5%-metal film	59-10105002
R150	Resistor- 10k-0W50-5%-metal film	59-10105002
R152	Resistor- 47R-0W50-5%-metal film	59-10472002
R153	Resistor- 47R-0W50-5%-metal film	59-10472002
R154	Resistor- 47R-0W50-5%-metal film	59-10472002
R155	Resistor-100R-0W50-5%-metal film	59-11002002
R156	Resistor- 68R-0W50-5%-metal film	59-10682002
R157	Resistor-470k-0W50-5%-metal film	59-14705002
R158	Resistor-470k-0W50-5%-metal film	59-14705002
R159	Resistor-100R-0W50-5%-metal film	59-11002002
R160	Resistor-470k-0W50-5%-metal film	59-14705002
R161	Resistor-100R-0W50-5%-metal film	59-11002002
R162	Resistor-470k-0W50-5%-metal film	59-14705002
R163	Resistor- 68R-0W50-5%-metal film	59-10682002
R164	Resistor-470k-0W50-5%-metal film	59-14705002

Circuit Reference	Description	Part Number
R165	Resistor- 68R-0W50-5%-metal film	59-10682002
R166	Resistor-470k-0W50-5%-metal film	59-14705002
R167	Resistor- 68R-0W50-5%-metal film	59-10682002
R168	Resistor-470k-0W50-5%-metal film	59-14705002
R169	Resistor- 68R-0W50-5%-metal film	59-10682002
R170	Resistor-820R-0W50-5%-metal film	59-18202002
R171	Resistor-220R-0W50-5%-metal film	59-12202002
R172	Resistor-100R-0W50-5%-metal film	59-11002002
R201	Resistor- 4k7-0W50-5%-metal film	59-10474002
R202	Resistor-470k-0W50-5%-metal film	59-14705002
R203	Resistor- 1k2-0W50-5%-metal film	59-10124002
R205	Resistor-560R-0W50-5%-metal film	59-15602002
R206	Resistor-100k-0W50-5%-metal film	59-11005002
R207	Resistor-100k-0W50-5%-metal film	59-11005002
R209	Resistor-100k-0W50-5%-metal film	59-11005002
R210	Resistor- 1M-0W50-5%-metal film	59-10018002
R211	Resistor-470k-0W50-5%-metal film	59-14705002
R212	Resistor-330k-0W50-5%-metal film	59-13305002
R213	Resistor-470R-0W50-5%-metal film	59-14702002
R214	Resistor-330R-0W50-5%-metal film	59-13302002
R215	Resistor-220R-0W50-5%-metal film	59-12202002
R216	Resistor- 10k-0W50-5%-metal film	59-10105002
R217	Resistor- 1M-0W50-5%-metal film	59-10018002
R218	Resistor-120k-0W50-5%-metal film	59-11205002
R219	Resistor- 68k-0W50-5%-metal film	59-10685002
R220	Resistor- 10k-0W50-5%-metal film	59-10105002
R221	Resistor- 1k8-0W50-5%-metal film	59-10184002
R222	Resistor- 1k8-0W50-5%-metal film	59-10184002
R223	Resistor-470R-0W50-5%-metal film	59-14702002
R224	Resistor-820R-0W50-5%-metal film	59-18202002
R225	Resistor- 12k-0W50-5%-metal film	59-10125002
R226	Resistor- 1k8-0W50-5%-metal film	59-10184002
R227	Resistor-470R-0W50-5%-metal film	59-14702002
R228	Resistor- 1k8-0W50-5%-metal film	59-10184002
R229	Resistor- 1k8-0W50-5%-metal film	59-10184002
R230	Resistor- 1k8-0W50-5%-metal film	59-10184002
R231	Resistor-470R-0W50-5%-metal film	59-14702002
R232	Resistor-470R-0W50-5%-metal film	59-14702002
R233	Resistor-470R-0W50-5%-metal film	59-14702002
R234	Resistor- 1k-0W50-5%-metal film	59-10015002
R235	Resistor- 1k-0W50-5%-metal film	59-10015002
R243	Resistor- 1k2-0W50-5%-metal film	59-10124002
R244	Resistor- 39k-0W50-5%-metal film	59-10395002
R245	Resistor-220R-0W50-5%-metal film	59-12202002
R246	Resistor- 12k-0W50-5%-metal film	59-10125002

Assembly: SYNTHESISER MODULE

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Circuit Reference	Description	Part Number
R247	Resistor- 47R-0W50-5%-metal film	59-10472002
R248	Resistor- 47k-0W50-5%-metal film	59-10475002
R249	Resistor- 1k-0W50-5%-metal film	59-10015002
R250	Resistor- 10k-0W50-5%-metal film	59-10105002
R251	Resistor- 10k-0W50-5%-metal film	59-10105002
R252	Resistor- 1M-0W50-5%-metal film	59-10018002
R253	Resistor- 10k-0W50-5%-metal film	59-10105002
R254	Resistor- 47k-0W50-5%-metal film	59-10475002
R255	Resistor- 5k6-0W50-5%-metal film	59-10564002
R256	Resistor- 1k-0W50-5%-metal film	59-10015002
R257	Resistor- 1k-0W50-5%-metal film	59-10015002
R258	Resistor- 5k6-0W50-5%-metal film	59-10564002
R259	Resistor-100k-0W50-5%-metal film	59-11005002
R260	Resistor- 47R-0W50-5%-metal film	59-10472002
R261	Resistor- 82R-0W50-5%-metal film	59-10822002
R262	Resistor-180R-0W50-5%-metal film	59-11802002
R263	Resistor- 82R-0W50-5%-metal film	59-10822002
R264	Resistor- 1k-0W50-5%-metal film	59-10015002
R265	Resistor- 1k-0W50-5%-metal film	59-10015002
R266	Resistor-680R-0W50-5%-metal film	59-16802002
R268	Resistor-470R-0W50-5%-metal film	59-14702002
R269	Resistor- 10k-0W50-5%-metal film	59-10105002
R270	Resistor- 10k-0W50-5%-metal film	59-10105002
R271	Resistor-470R-0W50-5%-metal film	59-14702002
R272	Resistor- 1k2-0W50-5%-metal film	59-10124002
R273	Resistor- 10k-0W50-5%-metal film	59-10105002
R274	Resistor-220R-0W50-5%-metal film	59-12202002
R277	Resistor-470R-0W50-5%-metal film	59-14702002
R278	Resistor-470R-0W50-5%-metal film	59-14702002
R279	Resistor-470R-0W50-5%-metal film	59-14702002
R280	Resistor- 2k2-0W50-5%-metal film	59-10224002
R301	Resistor- 1k-0W50-5%-metal film	59-10015002
R302	Resistor- 39k-0W50-5%-metal film	59-10395002
RN201	Resistor- 10k-0W10-2%-network	59-80105001

CAPACITORS (refer to the notes at end of synthesiser module listing)

C1	Mixed- 0.1µF- 63V- -polyester	14-21105200
C2	Mixed- 0.1µF- 63V- -polyester	14-21105200
C3	Mixed- 0.1µF- 63V- -polyester	14-21105200
C4	Ceramic- 12pF-100V- -miniature plate	14-03121301
C5	Ceramic- 12pF-100V- -miniature plate	14-03121301
C6	Mixed- 0.1µF- 63V- -polyester	14-21105200
C8	Mixed- 0.1µF- 63V- -polyester	14-21105200

Assembly: SYNTHESISER MODULE

Part No: 68-30300003

Circuit Reference	Description	Part Number
C9	Tantalum- 10µF- 16V	14-36107100
C10	Tantalum- 10µF- 16V	14-36107100
C11	Mixed- 0.1µF- 63V- -polyester	14-21105200
C13	Mixed- 0.1µF- 63V- -polyester	14-21105200
C14	Tantalum- 10µF- 16V	14-36107100
C15	Mixed- 0.1µF- 63V- -polyester	14-21105200
C16	Mixed- 0.1µF- 63V- -polyester	14-21105200
C17	Tantalum- 10µF- 16V	14-36107100
C101	Ceramic- 1nF-100V- -miniature plate	14-03103301
C102	Tantalum- 68µF- 16V	14-36687107
C103	Plastic- 100nF- 50V-20%-MKS2	14-21105201
C104	Plastic- 100nF- 50V-20%-MKS2	14-21105201
C105	Plastic- 100nF- 50V-20%-MKS2	14-21105201
C106	Plastic- 100nF- 50V-20%-MKS2	14-21105201
C107	Plastic- 100nF- 50V-20%-MKS2	14-21105201
C108	Plastic- 100nF- 50V-20%-MKS2	14-21105201
C109	Plastic- 100nF- 50V-20%-MKS2	14-21105201
C110	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C111	Ceramic- 100pF- 50V- -chip	14-03102200
C112	Ceramic- 1nF- 50V- -chip	14-03103201
C113	Ceramic- 33pF- 50V- -chip	14-03331200
C114	Ceramic- 22pF- 50V- -chip	14-03221200
C115	Ceramic- 22pF- 50V- -chip	14-03221200
C116	Ceramic- 1nF-100V- -miniature plate	14-03103301
C117	Mixed- 0.1µF- 63V- -polyester	14-21105200
C118	Ceramic- 100pF- 50V- -chip	14-03102200
C119	Ceramic- 1nF- 50V- -chip	14-03103201
C120	Ceramic- 15pF- 50V- -chip	14-03151200
C121	Ceramic- 18PF- 50V-chip	14-03181200
C123	Mixed- 0.1µF- 63V- -polyester	14-21105200
C124	Ceramic- 33pF- 50V- -chip	14-03331200
C125	Ceramic- 1nF- 50V- -chip	14-03103201
C126	Ceramic- 15pF- 50V- -chip	14-03151200
C127	Ceramic- 10pF- 50V- -chip	14-03101200
C128	Ceramic- 1nF-100V- -miniature plate	14-03103301
C129	Mixed- 0.1µF- 63V- -polyester	14-21105200
C130	Ceramic- 27pF- 50V- -chip	14-03271200
C131	Ceramic- 1nF- 50V- -chip	14-03103201
C132	Ceramic- 10pF- 50V- -chip	14-03101200
C133	Ceramic- 4.7pF- 50V- -chip	14-03470200
C134	Ceramic- 1nF-100V- -miniature plate	14-03103301
C135	Mixed- 0.1µF- 63V- -polyester	14-21105200
C136	Ceramic- 1nF- 50V- -chip	14-03103201
C137	Ceramic- 1nF- 50V- -chip	14-03103201
C138	Ceramic- 1nF- 50V- -chip	14-03103201

Assembly: SYNTHESISER MODULE

Part No: 68-30300003

Circuit Reference	Description	Part Number
C139	Ceramic- 1nF- 50V- -chip	14-03103201
C140	Ceramic- 1nF- 50V- -chip	14-03103201
C141	Ceramic- 1nF- 50V- -chip	14-03103201
C142	Ceramic- 1nF- 50V- -chip	14-03103201
C143	Ceramic- 1nF-100V- -miniature plate	14-03103301
C144	Ceramic- 15pF- 50V- -chip	14-03151200
C145	Ceramic- 1nF- 50V- -chip	14-03103201
C146	Ceramic- 4.7pF- 50V- -chip	14-03470200
C147	Ceramic- 2.2pF- 50V- -chip	14-03220200
C148	Ceramic- 1nF-100V- -miniature plate	14-03103301
C149	Mixed- 0.1µF- 63V- -polyester	14-21105200
C150	Ceramic- 12pF- 50V- -chip	14-03121200
C151	Ceramic- 1nF- 50V- -chip	14-03103201
C152	Ceramic- 4.7pF- 50V- -chip	14-03470200
C153	Ceramic- 2.2pF- 50V- -chip	14-03220200
C154	Ceramic- 1nF-100V- -miniature plate	14-03103301
C155	Mixed- 0.1µF- 63V- -polyester	14-21105200
C156	Ceramic- 10pF- 50V- -chip	14-03101200
C157	Ceramic- 1nF- 50V- -chip	14-03103201
C158	Ceramic- 2.2pF- 50V- -chip	14-03220200
C159	Ceramic- 1nF-100V- -miniature plate	14-03103301
C160	Mixed- 0.1µF- 63V- -polyester	14-21105200
C161	Ceramic- 4.7pF-100V- -miniature plate	14-03470301
C162	Ceramic- 1nF-100V- -miniature plate	14-03103301
C163	Ceramic- 1nF-100V- -miniature plate	14-03103301
C165	Ceramic- 1nF-100V- -miniature plate	14-03103301
C166	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C167	Tantalum- 2.2µF- 35V	14-36226101
C168	Ceramic- 1nF-100V- -miniature plate	14-03103301
C169	Ceramic- 1nF-100V- -miniature plate	14-03103301
C170	Ceramic- 1nF-100V- -miniature plate	14-03103301
C171	Ceramic- 10pF-100V- -miniature plate	14-03101301
C172	Ceramic- 1nF-100V- -miniature plate	14-03103301
C173	Ceramic- 1nF-100V- -miniature plate	14-03103301
C174	Mixed-4700pF- 63V- -sub-miniature	14-21473200
C175	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C176	Ceramic- 4.7pF- 50V- -chip	14-03470200
C178	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C179	Ceramic- 1nF-100V- -miniature plate	14-03103301
C184	Ceramic- 33pF- 50V- -chip	14-03331200
C201	Mixed-0.01µF- 63V- -polyester	14-21104302
C202	Tantalum- 2.2µF- 35V	14-36226101
C203	Mixed-0.22µF- 63V- -polyester	14-21225200
C204	Tantalum- 2.2µF- 35V	14-36226101
C205	Mixed- 0.1µF- 63V- -polyester	14-21105200

Circuit Reference	Description	Part Number
C206	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C207	Ceramic- 2.2nF-100V- -miniature plate	14-03223300
C208	Ceramic- 150pF-100V- -miniature plate	14-03152300
C209	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C210	Ceramic- 1nF-100V- -miniature plate	14-03103301
C211	Mixed- 0.1µF- 63V- -polyester	14-21105200
C212	Ceramic- 5.6pF-100V- -miniature plate	14-03560301
C213	Mixed- 0.1µF- 63V- -polyester	14-21105200
C214	Ceramic- 1nF-100V- -miniature plate	14-03103301
C215	Mixed- 0.1µF- 63V- -polyester	14-21105200
C216	Ceramic- 1nF-100V- -miniature plate	14-03103301
C217	Ceramic- 1nF-100V- -miniature plate	14-03103301
C218	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C219	Mixed-0.22µF- 63V- -polyester	14-21225200
C220	Tantalum- 2.2µF- 35V	14-36226101
C227	Mixed- 0.1µF- 63V- -polyester	14-21105200
C228	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C229	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C230	Ceramic- 10nF- 63V- -miniature plate	14-03104201
C231	Ceramic- 2.2nF-100V- -miniature plate	14-03223300
C232	Ceramic- 1nF-100V- -miniature plate	14-03103301
C233	Mixed- 0.1µF- 63V- -polyester	14-21105200
C234	Mixed- 0.1µF- 63V- -polyester	14-21105200
C235	Tantalum- 2.2µF- 35V	14-36226101
C236	Mixed- 0.1µF- 63V- -polyester	14-21105200
C237	Mixed- 0.1µF- 63V- -polyester	14-21105200
C238	Ceramic- 1nF-100V- -miniature plate	14-03103301
C239	Ceramic- 68pF-100V- -miniature plate	14-03681301
C240	Ceramic- 27pF-100V- -miniature plate	14-03271301
C241	Ceramic- 27pF-100V- -miniature plate	14-03271301
C242	Ceramic- 1nF-100V- -miniature plate	14-03103301
C243	Mixed- 0.1µF- 63V- -polyester	14-21105200
C244	Mixed- 0.1µF- 63V- -polyester	14-21105200
C245	Mixed- 0.1µF- 63V- -polyester	14-21105200
C246	Ceramic- 1nF-100V- -miniature plate	14-03103301
C247	Ceramic- 1nF-100V- -miniature plate	14-03103301
C248	Ceramic- 10pF-100V- -miniature plate	14-03101301
C249	Ceramic- 39pF-100V- -miniature plate	14-03391330
C250	Ceramic- 39pF-100V- -miniature plate	14-03391330
C251	Ceramic- 1nF-100V- -miniature plate	14-03103301
C252	Ceramic- 1nF-100V- -miniature plate	14-03103301
C253	Ceramic- 1nF-100V- -miniature plate	14-03103301
C254	Ceramic- 1nF-100V- -miniature plate	14-03103301
C255	Ceramic- 1nF-100V- -miniature plate	14-03103301
C256	Ceramic- 1nF-100V- -miniature plate	14-03103301

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Circuit Reference	Description	Part Number
C257	Ceramic- 1nF-100V- -miniature plate	14-03103301
C258	Ceramic- 1nF-100V- -miniature plate	14-03103301
C259	Tantalum- 2.2µF- 35V	14-36226101
C301	Ceramic- 1nF-100V- -miniature plate	14-03103301
	SEMICONDUCTORS	
D1	Diode 1N4148	61-00104148
D2	Diode 1N4148	61-00104148
D3	Diode 1N4148	61-00104148
D5	Diode 1N4148	61-00104148
D6	Diode 1N4148	61-00104148
D7	Diode 1N4148	61-00104148
D8	Diode BZX55C5V6	61-00205604
D115	Diode BA379	61-00400379
D116	Diode BA379	61-00400379
D117	Diode BA379	61-00400379
D118	Diode BA379	61-00400379
D119	Diode BA379	61-00400379
D120	Diode BA379	61-00400379
D121	Diode BA379	61-00400379
D202	Diode 1N4148	61-00104148
D204	Diode BB909A	61-00700909
D205	Diode BB909A	61-00700909
D206	Diode 1N4148	61-00104148
D207	Diode 1N4148	61-00104148
D208	Diode BA379	61-00400379
D209	Diode BA379	61-00400379
IC1	Integrated circuit 74C541-non-inverting buffer	61-12074541
IC2	Integrated circuit 74HC373	61-12074373
IC3	Integrated circuit 5801-latch-driver	61-12004801
IC4	Integrated circuit 5801-latch-driver	61-12004801
IC5	Integrated circuit 8031-micro controller	61-12008031
IC6	Integrated circuit 74HC373	61-12074373
IC7	Integrated circuit EPROM-2764-8k X 8 BIT	61-12102764
IC8	Integrated circuit 6116-static RAM 2kX8	61-12006116
IC9	Integrated circuit 74HC32-4X2 I/P or gate	61-12007432
IC10	Integrated circuit 74HC02-quad nor gate	61-12007402
IC11	Integrated circuit CD40106	61-12040106
IC12	Integrated circuit 74C906-non-inverting buffer	61-12074906
IC13	Integrated circuit CD40106	61-12040106
IC14	Integrated circuit HEF 4051BP	61-12004051
IC15	Integrated circuit 78S10-10V positive voltage regulator	61-12017810
IC16	Integrated circuit LM317LZ	61-12001317

Assembly: SYNTHESISER MODULE

Part No: 68-30300003

Circuit Reference	Description	Part Number
IC201	Integrated circuit LF353 dual JFET operational amplifier	61-12000353
IC202	Integrated circuit CD4066	61-12004066
IC203	Integrated circuit HEF4750VD	61-12004750
IC204	Integrated circuit HEF4751VD	61-12004751
IC205	Integrated circuit SP8680-ECL-HS-divider	61-12008680
IC206	Integrated circuit SP8680-ECL-HS-divider	61-12008680
IC207	Integrated circuit MC10231P	61-12010231
IC208	Integrated circuit NE5532N	61-12005532
IC209	Integrated circuit LF353 dual JFET operational amplifier	61-12000353
IC210	Integrated circuit AD7528KN-8 bit DAC	61-12007528
IC211	Integrated circuit 74C373-OCTAL latch	61-12174373
IC213	Integrated circuit 74HC192-SYNC-counter	61-12074192
IC214	Integrated circuit 4046-Phase-lock-loop	61-12004046
IC215	Integrated circuit 74HC192-SYNC-counter	61-12074192
IC217	Integrated circuit LM78LO5ACZ	61-12078105
IC316	Integrated circuit CA3232-DIV20-prescaler	61-12003232
TR101	Transistor J310	61-08000310
TR102	Transistor J310	61-08000310
TR103	Transistor J310	61-08000310
TR104	Transistor J310	61-08000310
TR105	Transistor J310	61-08000310
TR106	Transistor J310	61-08000310
TR107	Transistor J310	61-08000310
TR108	Transistor BC212	61-04110212
TR109	Transistor BC212	61-04110212
TR110	Transistor BC212	61-04110212
TR111	Transistor BC212	61-04110212
TR112	Transistor BC212	61-04110212
TR113	Transistor BC212	61-04110212
TR114	Transistor BC212	61-04110212
TR115	FET-BF964-N-channel-D-gate-VHF	61-08000964
TR116	FET-BF964-N-channel-D-gate-VHF	61-08000964
TR117	Transistor MRF581A NPN	61-04420581
TR118	FET-BF964-N-channel-D-gate-VHF	61-08000964
TR201	Transistor BFY 90	61-04420325
TR202	Transistor ZTX650	61-04220650
TR205	Transistor BC182	61-04120182
TR206	FET-BF964-N-channel-D-gate-VHF	61-08000964
TR207	Transistor J310	61-08000310
TR208	Transistor ZTX650	61-04220650
TR209	Transistor BC182	61-04120182
TR210	Transistor BC212	61-04110212

Assembly: SYNTHESISER MODULE

Part No: 68-30300003

Circuit Reference	Description	Part Number
CONNECTORS		
	Socket-PC-S- -A-D 41612	19-02060201
	TNS-10-PCMT- 1A-A-IDC	20-12100301
	Socket-20-free- -S-IDC	20-11200100
	Socket-10-free- -A-IDC	20-11100100
CN2	Plug-64-PCMT-01A-A-edge	20-01640300
CN3	Plug-20-PCMT- -S-IDC	20-10200300
CN4	Plug-10-PCMT- 1A-S-NLIDC	20-10100301
CN201	Plug-60-PCMT-01A-A-41612	20-01600300
CN205	TNS-20-PCMT- 1A-A-IDC	20-12200301
METALWORK		
	Synthesiser module chassis	45-00002778
	VCO lid	45-00002717
	VCO box	45-00002689
	VCO screen	45-00002817
	Varactor carrier	45-00002737
MISCELLANEOUS		
	Cable clip	02-04311100
	Cable clip 20 way	02-09000002
B1	Battery 3V lithium	06-00000500
	Cable-S rig-50 ohms-0.056	10-05112100
	Crystal mounting pad	22-50010433
X201	Oscillator type TCO902B	22-40000001
XL1	XTAL-FUND-PAR-11.1550MHz	22-13124004
XL201	XTAL over-SER-60.0000MHz	22-13210001
PCB1	PCB-synthesiser control	55-00000429
PCB2	PCB-VCO	55-00000433
PCB3	PCB-synthesiser	55-00000430
PCB4	PCB-prescaler	55-00000329
	Integrated circuit socket 40 pin	62-05000401
	Integrated circuit socket 28 pin	62-05000281
	Integrated circuit socket 24 pin	62-05000241
	10.75T 32SWG (on former 79-04000015)	79-10000085
	Core 9R-1013-92-S	79-03000005
	Submin ferrite bead	79-08000009
L1	Choke 10µH SC30	79-01000013

Assembly: SYNTHESISER MODULE

Part No: 68-30300003

Circuit Reference	Description	Part Number
L108	Choke 10µH SC30	79-01000013
L109	Choke 10µH SC30	79-01000013
L110	Choke 10µH SC30	79-01000013
L111	Choke 10µH SC30	79-01000013
L112	Choke 10µH SC30	79-01000013
L113	Choke 10µH SC30	79-01000013
L114	Choke 10µH SC30	79-01000013
L115	Choke 10µH SC30	79-01000013
L116	Choke 10µH SC30	79-01000013
L117	Choke 10µH SC30	79-01000013
L118	Choke 10µH SC30	79-01000013
L119	Choke 10µH SC30	79-01000013
L120	Choke 10µH SC30	79-01000013
L121	Choke 10µH SC30	79-01000013
L122	26 SWG enamel wire 3T2.0	79-10000068
L123	Choke 10µH SC30	79-01000013
L125	Choke 10µH SC30	79-01000013
L126	Choke 10µH SC30	79-01000013
L127	Choke 10µH SC30	79-01000013
L128	Choke 10µH SC30	79-01000013
L129	Choke 10µH SC30	79-01000013
L130	Choke 10µH SC30	79-01000013
L131	Choke 10µH SC30	79-01000013
L132	Choke 10µH SC30	79-01000013
L133	Choke 10µH SC30	79-01000013
L134	Choke 10µH SC30	79-01000013
L135	Choke 10µH SC30	79-01000013
L136	Choke 10µH SC30	79-01000013
L137	Choke 10µH SC30	79-01000013
L138	Choke 10µH SC30	79-01000013
L139	Choke 10µH SC30	79-01000013
L140	Choke-3.3µH-10%	79-01000037
L201	Choke 10µH SC30	79-01000013
L203	Choke 10µH SC30	79-01000013
L204	Choke 10µH SC30	79-01000013
L205	Choke 10µH SC30	79-01000013
L206	Choke µH22 SC30	79-01000014
L207	Choke 10µH SC30	79-01000013
L208	Choke 10µH SC30	79-01000013
L209	Choke-3.3µH-10%	79-01000037
L210	Choke µH22 SC30	79-01000014
L211	Choke 10µH SC30	79-01000013
L212	Choke 10µH SC30	79-01000013
L213	Choke 10µH SC30	79-01000013
L214	Choke 10µH SC30	79-01000013

Assembly: SYNTHESISER MODULE

Part No: 68-30300003

Circuit Reference	Description	Part Number
T101	Balun transformer	79-10000084
T102	Balun transformer	79-10000084

Notes ...

(1) Components referenced 1 to 99 are fitted to the synthesiser control PCB.

(2) Components referenced 100 to 199 are fitted to the synthesiser VCO PCB.

(3) Components referenced 200 to 299 are fitted to the synthesiser PCB.

11 REMOTE CONTROLLER

Assembly: REMOTE CONTROLLER

Part No: 68-30300005

Circuit Reference	Description	Part Number
RESISTORS		
RV1	Potentiometer-PCB-linear cermet- 50k-vertical	53-30504205
RV2	Potentiometer-PCB-linear cermet-500k-vertical	53-35004205
RV3	Potentiometer-PCB-linear cermet- 50k-vertical	53-30504205
R1	Resistor- 4k7-0W50-5%-metal film	59-10474002
R2	Resistor- 10k-0W50-5%-metal film	59-10105002
R3	Resistor- 10k-0W50-5%-metal film	59-10105002
R4	Resistor- 10k-0W50-5%-metal film	59-10105002
R5	Resistor- 10k-0W50-5%-metal film	59-10105002
R6	Resistor- 10k-0W50-5%-metal film	59-10105002
R7	Resistor- 10k-0W50-5%-metal film	59-10105002
R8	Resistor- 10k-0W50-5%-metal film	59-10105002
R9	Resistor- 10k-0W50-5%-metal film	59-10105002
R10	Resistor- 10k-0W50-5%-metal film	59-10105002
R12	Resistor-100k-0W50-5%-metal film	59-11005002
R13	Resistor-100k-0W50-5%-metal film	59-11005002
R14	Resistor-100k-0W50-5%-metal film	59-11005002
R15	Resistor-100k-0W50-5%-metal film	59-11005002
R16	Resistor- 22k-0W50-5%-metal film	59-10225002
R17	Resistor-100k-0W50-5%-metal film	59-11005002
R18	Resistor-100k-0W50-5%-metal film	59-11005002
R19	Resistor-100k-0W50-5%-metal film	59-11005002
R20	Resistor- 33k-0W50-5%-metal film	59-10335002
R21	Resistor-100k-0W50-5%-metal film	59-11005002
R22	Resistor- 33k-0W50-5%-metal film	59-10335002
R23	Resistor- 22k-0W50-5%-metal film	59-10225002
R24	Resistor- 10k-0W50-5%-metal film	59-10105002
R25	Resistor- 22k-0W50-5%-metal film	59-10225002
R26	Resistor- 68k-0W50-5%-metal film	59-10685002
R27	Resistor- 22k-0W50-5%-metal film	59-10225002
R28	Resistor-100k-0W50-5%-metal film	59-11005002
R29	Resistor- 22k-0W50-5%-metal film	59-10225002
R30	Resistor- 22k-0W50-5%-metal film	59-10225002
R31	Resistor- 22k-0W50-5%-metal film	59-10225002
R32	Resistor- 10k-0W50-5%-metal film	59-10105002
R33	Resistor- 1k-0W50-5%-metal film	59-10015002
R34	Resistor- 1k-0W50-5%-metal film	59-10015002
R35	Resistor- 1k-0W50-5%-metal film	59-10015002
R36	Resistor- 1k-0W50-5%-metal film	59-10015002
R39	Resistor- 10k-0W50-5%-metal film	59-10105002

Assembly: REMOTE CONTROLLER

Part No: 68-30300005

Circuit Reference	Description	Part Number
R40	Resistor- 10k-0W50-5%-metal film	59-10105002
R41	Resistor- 10k-0W50-5%-metal film	59-10105002
R42	Resistor- 10k-0W50-5%-metal film	59-10105002
R43	Resistor- 10k-0W50-5%-metal film	59-10105002
R44	Resistor- 10k-0W50-5%-metal film	59-10105002
R45	Resistor-100k-0W50-5%-metal film	59-11005002
R46	Resistor- 10k-0W50-5%-metal film	59-10105002
R47	Resistor- 56k-0W50-5%-metal film	59-10565002
R48	Resistor-150R-0W50-5%-metal film	59-11502002
R49	Resistor-100k-0W50-5%-metal film	59-11005002
R50	Resistor-100R-0W50-5%-metal film	59-11002002
R51	Resistor- 56k-0W50-5%-metal film	59-10565002
R52	Resistor-150R-0W50-5%-metal film	59-11502002
R53	Resistor- 10k-0W50-5%-metal film	59-10105002
R54	Resistor- 33k-0W50-5%-metal film	59-10335002
R55	Resistor- 22k-0W50-5%-metal film	59-10225002
R56	Resistor-100k-0W50-5%-metal film	59-11005002
R57	Resistor-100k-0W50-5%-metal film	59-11005002
R58	Resistor- 10k-0W50-5%-metal film	59-10105002
R59	Resistor- 10k-0W50-5%-metal film	59-10105002
R60	Resistor- 10k-0W50-5%-metal film	59-10105002
R61	Resistor- 10k-0W50-5%-metal film	59-10105002
R62	Resistor-100k-0W50-5%-metal film	59-11005002
R63	Resistor-100k-0W50-5%-metal film	59-11005002
R64	Resistor- 4k7-0W50-5%-metal film	59-10474002
R65	Resistor- 10k-0W50-5%-metal film	59-10105002
R66	Resistor-100k-0W50-5%-metal film	59-11005002
R67	Resistor- 10k-0W50-5%-metal film	59-10105002
R68	Resistor-100k-0W50-5%-metal film	59-11005002
R69	Resistor-100k-0W50-5%-metal film	59-11005002
R70	Resistor- 1k-0W50-5%-metal film	59-10015002
R71	Resistor- 10k-0W50-5%-metal film	59-10105002
R72	Resistor- 22k-0W50-5%-metal film	59-10225002
R73	Resistor- 22k-0W50-5%-metal film	59-10225002
R74	Resistor-100k-0W50-5%-metal film	59-11005002
R75	Resistor-100k-0W50-5%-metal film	59-11005002
R76	Resistor- 10k-0W50-5%-metal film	59-10105002
R77	Resistor- 1k-0W50-5%-metal film	59-10015002
R78	Resistor-100k-0W50-5%-metal film	59-11005002
R79	Resistor-100k-0W50-5%-metal film	59-11005002
R80	Resistor-100k-0W50-5%-metal film	59-11005002
R81	Resistor- 39k-0W50-5%-metal film	59-10395002
R82	Resistor- 1k-0W50-5%-metal film	59-10015002
R83	Resistor- 3k3-0W50-5%-metal film	59-10334002
R84	Resistor-100k-0W50-5%-metal film	59-11005002

Assembly: REMOTE CONTROLLER

Part No: 68-30300005

Circuit Reference	Description	Part Number
R85	Resistor-100k-0W50-5%-metal film	59-11005002
R86	Resistor-100k-0W50-5%-metal film	59-11005002
R87	Resistor-100k-0W50-5%-metal film	59-11005002
R88	Resistor- 4k7-0W50-5%-metal film	59-10474002
R89	Resistor- 1M-0W50-5%-metal film	59-10018002
R90	Resistor-560R-0W50-5%-metal film	59-15602002
R91	Resistor- 2k7-0W50-5%-metal film	59-10274002
R92	Resistor- 68k-0W50-5%-metal film	59-10685002
R93	Resistor- 33k-0W50-5%-metal film	59-10335002
R94	Resistor- 3k3-0W50-5%-metal film	59-10334002
R95	Resistor- 3k3-0W50-5%-metal film	59-10334002
R96	Resistor- 2k2-0W50-5%-metal film	59-10224002
R97	Resistor- 2k2-0W50-5%-metal film	59-10224002
R98	Resistor- 2k2-0W50-5%-metal film	59-10224002
R99	Resistor- 2k2-0W50-5%-metal film	59-10224002
R100	Resistor- 3k3-0W50-5%-metal film	59-10334002
R101	Resistor- 2k2-0W50-5%-metal film	59-10224002
R102	Resistor- 2k2-0W50-5%-metal film	59-10224002
R103	Resistor- 4k7-0W50-5%-metal film	59-10474002
R104	Resistor- 4k7-0W50-5%-metal film	59-10474002
R105	Resistor- 1M-0W50-5%-metal film	59-10018002
R106	Resistor- 1k-0W50-5%-metal film	59-10015002
R107	Resistor- 10k-0W50-5%-metal film	59-10105002
R108	Resistor- 10k-0W50-5%-metal film	59-10105002
R109	Resistor- 10k-0W50-5%-metal film	59-10105002
R110	Resistor- 10k-0W50-5%-metal film	59-10105002
R111	Resistor- 10k-0W50-5%-metal film	59-10105002
R112	Resistor-150R-0W50-5%-metal film	59-11502002
R113	Resistor-150R-0W50-5%-metal film	59-11502002
R114	Resistor-100k-0W50-5%-metal film	59-11005002
R115	Resistor- 1k-0W50-5%-metal film	59-10015002
R116	Resistor-100k-0W50-5%-metal film	59-11005002
R117	Resistor-100k-0W50-5%-metal film	59-11005002
R118	Resistor-100R-0W50-5%-metal film	59-11002002
R119	Resistor- 4k7-0W50-5%-metal film	59-10474002
R120	Resistor- 10k-0W50-5%-metal film	59-10105002
R123	Resistor- 10R-0W50-5%-metal film	59-10102002
R124	Resistor- 4k7-0W50-5%-metal film	59-10474002
R125	Resistor- 2k2-0W50-5%-metal film	59-10224002
R126	Resistor-200R-0W33-5%-metal film	59-12002003
R127	Resistor- 1k-0W50-5%-metal film	59-10015002
R128	Resistor-330R-0W50-5%-metal film	59-13302002

Assembly: REMOTE CONTROLLER

Part No: 68-30300005

Circuit Reference	Description	Part Number
CAPACITORS		
C1	Ceramic- 15pF-100V- -miniature plate	14-03151301
C2	Ceramic- 15pF-100V- -miniature plate	14-03151301
C3	Tantalum- 10µF- 16V	14-36107100
C4	Mixed- 0.1µF- 63V- -polyester	14-21105200
C5	Tantalum- 10µF- 16V	14-36107100
C6	Tantalum- 10µF- 16V	14-36107100
C7	Tantalum- 10µF- 16V	14-36107100
C8	Tantalum- 10µF- 16V	14-36107100
C9	Ceramic- 12pF-100V- -miniature plate	14-03121301
C10	Ceramic- 1nF-100V- -miniature plate	14-03103301
C11	Ceramic- 1nF-100V- -miniature plate	14-03103301
C12	Mixed- 0.1µF- 63V- -polyester	14-21105200
C13	Tantalum- 10µF- 16V	14-36107100
C14	Tantalum- 10µF- 16V	14-36107100
C15	Mixed- 0.1µF- 63V- -polyester	14-21105200
C16	Ceramic- 12pF-100V- -miniature plate	14-03121301
C17	Ceramic- 12pF-100V- -miniature plate	14-03121301
C18	Tantalum- 22µF- 16V	14-36227108
C19	Electrolytic- 100µF- 25V	14-06108100
C20	Tantalum- 22µF- 16V	14-36227108
C21	Mixed- 15nF- 63V- -polyester	14-21154200
C22	Mixed-4700pF- 63V- -sub-miniature	14-21473200
C23	Mixed-4700pF- 63V- -sub-miniature	14-21473200
C24	Mixed- 15nF- 63V- -polyester	14-21154200
C25	Tantalum- 22µF- 16V	14-36227108
C26	Tantalum- 22µF- 16V	14-36227108
C27	Mixed-0.01µF- 63V- -polyester	14-21104302
C28	Tantalum- 22µF- 16V	14-36227108
C29	Ceramic- 1nF-100V- -miniature plate	14-03103301
C30	Electrolytic- 100µF- 25V	14-06108100
C31	Ceramic- 1nF-100V- -miniature plate	14-03103301
C32	Ceramic- 1nF-100V- -miniature plate	14-03103301
C33	Ceramic- 1nF-100V- -miniature plate	14-03103301
C34	Ceramic- 1nF-100V- -miniature plate	14-03103301
C35	Mixed- 0.1µF- 63V- -polyester	14-21105200
C36	Ceramic- 15pF-100V- -miniature plate	14-03151301
C37	Ceramic- 15pF-100V- -miniature plate	14-03151301
C38	Ceramic- 1nF-100V- -miniature plate	14-03103301
C39	Tantalum- 2.2µF- 35V	14-36226101
C40	Electrolytic- 10µF- 40V	14-06107101
C41	Mixed- 0.1µF- 63V- -polyester	14-21105200
C42	Mixed- 0.1µF- 63V- -polyester	14-21105200

Assembly: REMOTE CONTROLLER

Part No: 68-30300005

Circuit Reference	Description	Part Number
C43	Mixed- 0.1µF- 63V- -polyester	14-21105200
C44	Mixed- 0.1µF- 63V- -polyester	14-21105200
C45	Mixed- 0.1µF- 63V- -polyester	14-21105200
C46	Mixed- 0.1µF- 63V- -polyester	14-21105200
C47	Mixed- 0.1µF- 63V- -polyester	14-21105200
C48	Mixed- 0.1µF- 63V- -polyester	14-21105200
C49	Mixed- 0.1µF- 63V- -polyester	14-21105200
C50	Mixed- 0.1µF- 63V- -polyester	14-21105200
C51	Mixed- 0.1µF- 63V- -polyester	14-21105200
C52	Mixed- 0.1µF- 63V- -polyester	14-21105200
C53	Mixed- 0.1µF- 63V- -polyester	14-21105200
C54	Mixed- 0.1µF- 63V- -polyester	14-21105200
C55	Mixed- 0.1µF- 63V- -polyester	14-21105200
C56	Mixed- 0.1µF- 63V- -polyester	14-21105200
C57	Mixed- 0.1µF- 63V- -polyester	14-21105200
C58	Mixed- 0.1µF- 63V- -polyester	14-21105200
C59	Mixed- 0.1µF- 63V- -polyester	14-21105200
C60	Mixed- 0.1µF- 63V- -polyester	14-21105200
C61	Mixed- 0.1µF- 63V- -polyester	14-21105200
C62	Mixed- 0.1µF- 63V- -polyester	14-21105200
C63	Mixed- 0.1µF- 63V- -polyester	14-21105200
C64	Mixed- 0.1µF- 63V- -polyester	14-21105200
C65	Mixed- 0.1µF- 63V- -polyester	14-21105200
C66	Mixed- 0.1µF- 63V- -polyester	14-21105200
C67	Mixed- 2.2nF-160V- -PLYCRB	14-18223300
C68	Mixed- 0.1µF- 63V- -polyester	14-21105200
C69	Mixed- 0.1µF- 63V- -polyester	14-21105200
C70	Mixed- 0.1µF- 63V- -polyester	14-21105200
C71	Mixed- 0.1µF- 63V- -polyester	14-21105200
C72	Mixed- 0.1µF- 63V- -polyester	14-21105200
C73	Mixed- 0.1µF- 63V- -polyester	14-21105200
C76	Mixed- 0.1µF- 63V- -polyester	14-21105200
C80	Tantalum- 22µF- 16V	14-36227108
C85	Mixed- 0.1µF- 63V- -polyester	14-21105200
C89	Mixed- 0.1µF- 63V- -polyester	14-21105200
C90	Mixed- 0.1µF- 63V- -polyester	14-21105200
C91	Mixed- 0.1µF- 63V- -polyester	14-21105200
C92	Mixed- 0.1µF- 63V- -polyester	14-21105200
C93	Mixed- 0.1µF- 63V- -polyester	14-21105200
C94	Mixed- 0.1µF- 63V- -polyester	14-21105200
C95	Mixed- 0.1µF- 63V- -polyester	14-21105200
C96	Mixed- 0.1µF- 63V- -polyester	14-21105200
C97	Mixed- 0.1µF- 63V- -polyester	14-21105200
C98	Mixed- 0.1µF- 63V- -polyester	14-21105200
C99	Mixed- 0.1µF- 63V- -polyester	14-21105200

Assembly: REMOTE CONTROLLER

Part No: 68-30300005

Circuit Reference	Description	Part Number
C100	Mixed- 0.1µF- 63V- -polyester	14-21105200
C101	Mixed- 0.1µF- 63V- -polyester	14-21105200
C102	Mixed- 0.1µF- 63V- -polyester	14-21105200
C106	Mixed- 0.1µF- 63V- -polyester	14-21105200
C107	Mixed- 0.1µF- 63V- -polyester	14-21105200
C108	Mixed- 0.1µF- 63V- -polyester	14-21105200
C109	Mixed- 0.1µF- 63V- -polyester	14-21105200
C110	Tantalum- 2.2µF- 35V	14-36226101
C111	Mixed- 0.1µF- 63V- -polyester	14-21105200
C112	Electrolytic- 10µF- 40V	14-06107101
C113	Mixed- 0.1µF- 63V- -polyester	14-21105200
C114	Electrolytic- 10µF- 40V	14-06107101
C115	Mixed- 0.1µF- 63V- -polyester	14-21105200
C116	Tantalum- 2.2µF- 35V	14-36226101
C120	Tantalum- 10µF- 16V	14-36107100
C121	Tantalum- 10µF- 16V	14-36107100
SEMICONDUCTORS		
D2	Diode 1N4148	61-00104148
D3	Diode-surge suppress 2010	61-16002010
D4	Diode 1N4148	61-00104148
D7	Diode 1N4004	61-00314004
D8	Diode 1N4004	61-00314004
D9	Diode 1N4004	61-00314004
D10	Diode 1N4004	61-00314004
D11	Diode-surge suppress 2010	61-16002010
D12	Diode 1N4004	61-00314004
D13	Diode 1N4004	61-00314004
D14	Diode-surge suppress 2010	61-16002010
D15	Diode-surge suppress 2010	61-16002010
D16	Diode-surge suppress 2010	61-16002010
D17	Diode-surge suppress 2010	61-16002010
D18	Diode-surge suppress 2010	61-16002010
D19	Diode-surge suppress 2010	61-16002010
D20	Diode-surge suppress 2010	61-16002010
D21	Diode 1N4148	61-00104148
IC1	Integrated circuit 8031-micro controller	61-12008031
IC2	Integrated circuit 27C512	61-12127512
IC3	Integrated circuit 6116-static RAM 2kX8	61-12006116
IC4	Integrated circuit 74HCT573	61-12074573
IC5	Integrated circuit 74HCT541	61-12174541
IC6	Integrated circuit 74HCT573	61-12074573

Assembly: REMOTE CONTROLLER

Part No: 68-30300005

Circuit Reference	Description	Part Number
IC7	Integrated circuit 74HCT573	61-12074573
IC8	Integrated circuit 74HCT573	61-12074573
IC9	Integrated circuit 74HCT573	61-12074573
IC10	PAL type 22V10-25	61-12002210
IC11	PAL type 22V10-25	61-12002210
IC13	Integrated circuit 74C906-non-inverting buffer	61-12074906
IC15	Integrated circuit HEF 4051BP	61-12004051
IC17	Integrated circuit 7910-modem	61-12007910
IC18	Integrated circuit CA1558E	61-12001558
IC19	Integrated circuit DS3691	61-12003691
IC20	Integrated circuit DS88LS120	61-12088120
IC23	Integrated circuit CA3240	61-12003240
IC24	Integrated circuit CA3240	61-12003240
IC25	Integrated circuit CA1558E	61-12001558
IC26	Integrated circuit CA1558E	61-12001558
IC27	Integrated circuit HEF 4051BP	61-12004051
IC28	Integrated circuit CA1558E	61-12001558
IC29	Opto isolator (single)	61-16307979
IC30	Integrated circuit CA1558E	61-12001558
IC31	Integrated circuit CA1558E	61-12001558
IC32	Integrated circuit HEF 4051BP	61-12004051
IC33	Integrated circuit AD7528KN-8BIT DAC	61-12007528
IC34	Integrated circuit CA1558E	61-12001558
IC35	Integrated circuit CA1558E	61-12001558
IC36	Integrated circuit CA1558E	61-12001558
IC37	Integrated circuit HEF 4051BP	61-12004051
IC38	Integrated circuit HEF 4051BP	61-12004051
IC39	Integrated circuit HEF 4051BP	61-12004051
IC40	Integrated circuit HEF 4060B	61-12004060
IC41	Integrated circuit CA239AE voltage comparator	61-12000239
IC42	Integrated circuit IP237T variable negative regulator	61-12000237
IC43	Integrated circuit IP217T variable voltage regulator	61-12000217
TR1	Transistor BC184	61-04120184
TR2	Transistor MPSA43	61-04220043
CONNECTORS		
	Plug-03-PCMT-ERG-MIN	20-01030302
	Jumper-02-way	20-02020101
CN1	Plug-60-PCMT-01A-A-41612	20-01600300
CN2	Plug-64-PCMT-01A-A-edge	20-01640300
J1	Plug-03-PCMT-ERG-MIN	20-01030302

Assembly: REMOTE CONTROLLER

Part No: 68-30300005

Circuit Reference	Description	Part Number
MISCELLANEOUS		
	PCB test point terminal	02-12000001
XTL1	XTAL-FUND-PAR-11.0592MHz	22-13123030
XTL2	XTAL-FUND-MIN-2.4576MHz	22-13123031
XTL3	XTAL-FUND-MIN-3.00MHz	22-13123032
	DC supply filter	27-40000202
	AC/DC remote control	55-00000462
	Screening can 7302217797	73-08217810
T1	Audio-PR-600-SC-600-PCMT	73-02217797
T2	Audio-PR-600-SC-600-PCMT	73-02217797
T3	Audio-PR-600-SC-600-PCMT	73-02217797
T4	Audio-PR-600-SC-600-PCMT	73-02217797
T5	Audio-PR-600-SC-600-PCMT	73-02217797

Paragraph

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8	VHF local oscillator
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Figure

1	Guard receiver block diagram	GA8320
2	Guard receiver VHF RF, audio and BITE circuit diagram	GA2982
3	Guard receiver UHF RF and VHF/UHF local oscillator circuit diagram	GA3608
4	VHF/UHF guard receiver component location diagram	GA3610

The Guard Receiver, PAE Part No. 68-30000054, is designed to operate in the VHF and UHF frequency bands. When fitted in the 3010 or 3030 transceiver only VHF or UHF operation respectively is applicable. Therefore, references to VHF can be ignored for 3030 TRs and UHF for 3010 TRs.

INTRODUCTION

1 The guard receiver module is fitted as an option and provides a monitor of either VHF or UHF distress frequencies, in AM mode only, independent of normal receiver operation. Monitoring of either VHF or UHF is dependent on the operational frequency of the main receiver, when selected for VHF the guard receiver will monitor 121.5 MHz and when selected for UHF the guard receiver will monitor 243 MHz.

2 The guard receiver is a plug-in module which is interconnected through the main and front interconnection assemblies at module position 4 and comprises the RF, audio, local oscillator and BITE circuits. Fig. 2 details the VHF RF amplifiers, IF amplifiers, audio processing and BITE interface circuits and Fig. 3 details the UHF RF amplifier, VHF and UHF local oscillators.

BLOCK DIAGRAM

3 With reference to the block diagram in Fig. 1 the received signal is connected from the appropriate rear panel N type connector through the antenna changeover and filter assemblies to the guard receiver module, CN1/5 (VHF input) and CN1/31 (UHF input). The input signals are also taken through RF splitter circuits to provide the RF input signal for the main receiver RF module 6.

4 From the RF splitter the RF signal is connected to the first RF stages where it is filtered and amplified. The selection of the VHF or UHF RF signal and local oscillator signal is controlled through the BITE interface circuit and the installed software which will produce a V/U select signal dependent on the frequency of operation of the main receiver.

5 The output of the first RF stage is connected to the first mixer where it is mixed with the associated local oscillator injection signal to provide an IF signal. The resultant 1st IF signal is filtered, amplified and connected to the AM detector where it is mixed with a 2nd local oscillator frequency to produce a 2nd IF frequency. The resultant IF is then connected to an AM detector circuit where the audio signals are detected and routed through the audio processing circuits to the audio output amplifiers.

VHF RF AMPLIFIER

6 Reference Fig. 2. The antenna VHF input signal is connected through CN1/5 to a directional coupler comprising T2 A/T2 B which provides a VHF output signal, at approximately 2 dB loss through the coupler, for the main receiver RF module at CN1/3. A sample of the incoming VHF signal is also connected through T2 to a pin diode attenuator comprising D4 to D6 which presents a constant impedance of 50 R and provides up to 45 dB of attenuation controlled by an agc voltage applied to the base of TR6.

7 The output from the attenuator is applied through band-pass filter L8/C37 to the RF amplifier TR7 which is configured as a low noise agc controlled common source amplifier with a gain of approximately 20 dB. The output signal from TR7 is coupled through a band-pass filter comprising L9-L12, which provides the selectivity for the guard receiver, to pin diode D27.

VHF LOCAL OSCILLATOR

8 Reference Fig. 3. TR16 and XL2 form a crystal controlled Colpitts oscillator running at a frequency of 33.367 MHz whose output is connected through buffer TR17 to a tripler stage

TR18 which translates the crystal frequency into the appropriate harmonic and level for connection, through a band-pass filter, to the VHF contact of the V/U select relay RLB.

UHF RF AMPLIFIER

9 Reference Fig. 3. The antenna UHF input signal is connected through CN1/31 to a directional coupler comprising T9A/T9B which provides a UHF output signal, at approximately 2 dB loss through the coupler, for the main receiver RF module at CN1/28. A sample of the incoming UHF signal is also connected through T9 to a pin diode attenuator comprising D21-D23 which presents a constant impedance of 50 R and provides up to 45 dB of attenuation controlled by an agc voltage applied to the base of TR5.

10 The output of the attenuator is applied through FL2, a two section UHF helical filter, to the RF amplifier TR15 with TC3/L32 matching the helical output impedance to the optimum value required by TR15. An agc voltage is applied to the second gate of TR15 through IC20 which is configured as a level shifting circuit providing an agc voltage range of -6 V to +4 V. The output of TR15 is taken through matching transformer T1, a three section helical filter FL3 with a bandwidth of approximately 11 MHz, to switching diode D26.

UHF LOCAL OSCILLATOR

11 Reference Fig. 3. TR19 and XL4 form a crystal controlled Colpitts oscillator running at a frequency of 78.867 MHz whose output is connected through buffer TR20 to a tripler stage TR18 which translates the crystal frequency into the appropriate harmonic and level for connection, through a two section helical band-pass filter FL4, to the UHF contact of the V/U select relay RLB.

VHF/UHF SELECT CONTROL

12 The selection of the UHF or VHF RF amplifier and associated oscillator is controlled from the BITE assembly through the guard receiver BITE interface as follows:

VHF Select

13 When the main receiver is operating in the VHF frequency range a V/U select signal (high) will be applied through IC13 pin 23 (Fig. 2) to IC19. The output of IC19-C (low) will switch TR23 off (Fig. 3) causing TR22 to switch on connecting the supply rail to the VHF oscillator and disconnecting the supply rail to the UHF oscillator through IC19E/TR25. The output of IC19-B (low) switches TR26 off de-energising RLB causing contact RLB/1 to changeover enabling the VHF oscillator output.

14 The output of IC19-C (low) is also passed through IC19-D (high) causing TR28 to conduct, forward biasing D27, and reverse biasing D26, enabling the VHF RF signal.

UHF Select

15 When the main receiver is operating in the UHF frequency range a V/U select signal (low) will be applied through IC13 pin 23 to IC19. The output of IC19-C (high) will switch TR23 on disconnecting the supply rail from the VHF oscillator and connecting the supply rail to the UHF oscillator through IC19-E (low), TR25 (off) and TR24 (on). The output of IC19-B

(high) will switch TR26 on energising RLB causing contact RLB/1 to changeover enabling the UHF oscillator output.

16 The output of IC19-C (high) is also passed through IC19-D (low) switching off TR28, reverse biasing D27 and forward biasing D26 enabling the UHF RF signal.

MIXER AND IF AMPLIFIER CIRCUITS

17 Reference Fig. 2. Depending on the state of pin diode switches D26 and D27 either the UHF or VHF RF signal and oscillator will be enabled as detailed in para. 12. The RF signal will now follow the same path through the mixer and IF circuits as follows:

1st Mixer

18 The RF signal is connected to T3 which applies the signal equally to the two transistors contained in the balanced FET mixer TR8. The mixer provides a high dynamic range and approximately a 4 dB gain at both UHF (243 MHz) and VHF (121.5 MHz) frequencies. The local oscillator signal is connected through RLB/1 and C27 to the mixer circuit where it is mixed with the RF signal to provide an IF frequency. The resultant 1st IF is connected through T4 and T7, which provides filtering and impedance matching to a 21.4 MHz crystal filter which provides the necessary selectivity.

IF Amplifier Circuits

19 The output of the filter is applied to amplifier TR9, an agc controlled dual gate FET, whose output is taken through transformer T5 to AM receiver circuit IC2 which is configured to provide a 2nd IF, audio detection and an agc control voltage. The IF input at IC2 pin 14 is connected to the mixer circuit where it is mixed with a local oscillator frequency, controlled by an external crystal circuit XL3 running at 20.45 MHz, to produce a 2nd IF frequency of 950 kHz.

20 The resultant IF is taken from IC2 pin 1 through a 950 kHz IF band-pass filter, comprising T6 and associated components, to IC2 pin 3 where it is amplified and detected to produce an audio output at IC2 pin 6 which is applied through IC5-B to mute transmission gate IC7A.

AGC Control

21 IC2 also provides an agc control voltage, which is derived from the AM demodulator stage, through pin 9 to IC4A whose gain is controlled by RV1. The output from IC4A is connected to the following RF and IF stages:

(a) Pin diode attenuator TR6 (VHF), TR5 (UHF).

(b) RF amplifier TR7 (VHF), TR15 (UHF).

(c) IF amplifier TR9.

22 An output from IC2 pin 1 is also taken through TR10 to a carrier detect circuit IC3 which, during no signal conditions, will disable the mute transmission gate IC7A through IC5A and D8, eliminating any residual noise generated by the decay time of the IF agc. RV3 connected to the inverting input of IC5A sets the level at which the agc mute operates.

RECEIVER AUDIO CIRCUITS

23 With reference to Fig. 2 the audio circuits provide the following functions:

Noise Blanker

24 The guard audio signal is taken from IC2 pin 6 through amplifier IC5B to mute gate IC7A. An output from IC2 pin 6 is also taken to IC6, configured as a window comparator, which senses when the audio signal exceeds a preset level and provides a disable signal (low) for IC7A causing the audio signal to be 'blanked' during the peaks. RV5 sets the level at which noise blanking occurs and is normally adjusted to clip at levels corresponding to signals in excess of 93% modulation depth. S1 is provided to enable the noise blanker to be switched in or out of circuit.

VOGAD

25 From the mute gate IC7A the signal is connected to the audio agc (VOGAD) circuit which comprises IC9B, TR11 and TR12. IC9B is configured as a non-inverting high impedance amplifier whose gain is set by R100/R101. P-channel FET TR11 functions as a voltage controlled resistor which, in conjunction with RV4, forms a potential divider network at the input of IC9A. TR12 provides the controlling voltage for the gate of TR3 which effectively determines the attenuation, provided by the potential divider network, at the input of IC9A.

26 With no signal applied the gate of TR11 will be high presenting a high resistance with very little attenuation. As the signal level input increases and the output voltage level approaches 1 V (p-p), TR12 starts to conduct causing the gate voltage at TR3 to reduce thereby reducing its resistance. Any further increase will further reduce the resistance of TR3 increasing the attenuation on the input signal, consequently the output of IC19A stabilises at approximately 2 V (p-p). Switch S2 is provided to allow the VOGAD to be switched in or out of circuit.

Mute

27 The guard mute circuits are signal to noise operated. The noise output from the detector IC3 pin 6 is passed through a band-pass noise filter which selects a noise spectrum outside the audio bandwidth but inside the IF bandwidth at approximately 7 kHz. The filter also gives a 50 dB minimum rejection of signals in the audio range.

28 The output of the filter is detected by IC8B which, in conjunction with D2/D13 and gain control RV6, is configured as a peak detector. The detected voltage rises with increasing noise and is applied to the inverting input of IC8A. An agc derived voltage from IC3 pin 9 through IC4B is connected to the non-inverting input of IC8A and since this voltage rises with increasing carrier level the output of amplifier IC8A is dependent on the relative levels of the noise and agc which is a measure of the signal to noise ratio of the RF input signal.

29 The output of IC8A is applied to the non-inverting input of IC9A where it is compared with a reference voltage set by mute controls RV9/RV7. The resultant output of IC20B controls the mute transmission gate IC7B preventing the audio from reaching subsequent amplifier stages.

Mute Relay

30 The output of IC9A is also connected to the base of TR13 whose operation will cause RLA to be energised. RLA provides a set of mute operated contacts RLA/1 which are connected to the rear panel located FACILITIES 2 connector.

Front Panel and PTT Receiver Disable

31 On the synthesiser front panel assembly the GUARD mode select switch will provide a signal, indicating its on or off state, through the BITE assembly, the guard receiver BITE interface IC13 pin 21 and IC12C to control the audio signal path through transmission gate IC7D.

32 On PTT operation IC13 pin 13 also provides, from the BITE assembly, a signal through IC12B to control the audio signal path through transmission gate IC7C.

Audio Output

33 From the mute circuits the audio signal is connected through an active high-pass filter configured around IC10A with a cut-off frequency of 300 Hz and a low-pass filter comprising L20, L21/C97-C120 with a cut-off frequency of 3400 Hz. The output from the filter is switched through the guard receiver on/off gate IC7D to IC18 which provides a balanced audio output through T8 to the rear panel located FACILITIES 2 connector. RV8 sets the line output level.

34 A further audio output is taken through IC10/RV10 to IC11 which provides a balanced output for the BITE assembly.

BITE AND CONTROL INTERFACE

35 Reference Fig. 2. IC13 is a bus expander/latch which provides the interface between the BITE assembly, over the data bus, and the guard receiver module control lines. Analogue multipliers IC16/IC1 select various test points on the module under control of the BITE assembly and connect them to the BITE measuring system over the monitor line CN2 27C.

BITE OSCILLATOR

36 Transistor TR2 and XL1 form a crystal controlled Colpitts oscillator running at 40.5 MHz. The output of TR2 is buffered by TR14 and connected to a pin diode modulator D1-D3, where it is modulated by a 1 kHz signal from the BITE assembly. The 121.5 MHz and 243 MHz harmonics of the oscillator are then injected by means of stray coupling to the inputs of the RF amplifiers during the self test routine and used for checking the serviceability of the guard receiver.

PARTS LIST

37 The parts list for the guard receiver module is as follows:

Circuit Reference	Description	Part Number
RESISTORS		
RV1, 2	Potentiometer, PCB-LN-CRMT-10k-horizontal	53-51003205
RV3	Potentiometer, PCB-LN-CRMT-5k-vertical	53-50054205
RV4	Potentiometer, PCB-LN-CRMT-500k-horizontal	53-54704205
RV5	Potentiometer, PCB-LN-CRMT-100k-horizontal	53-51004205
RV6	Potentiometer, PCB-LN-CRMT-500k-horizontal	53-54704205
RV7	Potentiometer, PCB-LN-CRMT-50k-horizontal	53-50504205
RV8,9	Potentiometer, PCB-LN-CRMT-10k-vertical	53-30104205
RV10	Potentiometer, PCB-LN-CRMT-10k-horizontal	53-51003205
R1,2	Resistor, 4k7-0W4-1-metal film	59-10474002
R3	Resistor, 22k-0W4-1-metal film	59-10225002
R4	Resistor, 1k5-0W4-1-metal film	59-10154002
R5	Resistor, 1k8-0W4-1-metal film	59-10184002
R6	Resistor, 5k6-0W4-1-metal film	59-10564002
R7	Resistor, 2k2-0W4-1-metal film	59-10224002
R8	Resistor, 4k7-0W4-1-metal film	59-10474002
R13	Resistor, 47k-0W4-1-metal film	59-10475002
R14	Resistor, 330R-0W4-1-metal film	59-13302002
R15	Resistor, 470R-0W4-1-metal film	59-14702002
R16-19	Resistor, 10k-0W4-1-metal film	59-10105002
R20,21	Resistor, 680R-0W4-1-metal film	59-16802002
R22	Resistor, 5k6-0W4-1-metal film	59-10564002
R23	Resistor, 12k-0W4-1-metal film	59-10125002
R24	Resistor, 330R-0W4-1-metal film	59-13302002
R25	Resistor, 470R-0W4-1-metal film	59-14702002
R26	Resistor, 220R-0W4-1-metal film	59-12202002
R27	Resistor, 4k7-0W4-1-metal film	59-10474002
R28	Resistor, 3k3-0W4-1-metal film	59-10334002
R29	Resistor, 220R-0W4-1-metal film	59-12202002
R30	Resistor, 68R-0W4-1-metal film	59-10682002
R35	Resistor, 51R-0W4-1-metal film	59-10512002
R36	Resistor, 1k-0W4-1-metal film	59-10015002
R37,38	Resistor, 4k7-0W4-1-metal film	59-10474002
R39	Resistor, 1k8-0W4-1-metal film	59-10184002
R40	Resistor, 1k2-0W4-1-metal film	59-10124002
R41	Resistor, 4k7-0W4-1-metal film	59-10474002
R42	Resistor, 2k2-0W4-1-metal film	59-10224002
R43	Resistor, 5k6-0W4-1-metal film	59-10564002
R44	Resistor, 1k-0W4-1-metal film	59-10015002
R46	Resistor, 150R-0W4-1-metal film	59-11502002
R47	Resistor, 5k6-0W4-1-metal film	59-10564002
R48	Resistor, 3k3-0W4-1-metal film	59-10334002
R49	Resistor, 10R-0W4-1-metal film	59-10102002

Circuit Reference	Description	Part Number
R50	Resistor, 10k-0W4-1-metal film	59-10105002
R51	Resistor, 1k-0W4-1-metal film	59-10015002
R52	Resistor, 47R-0W4-1-metal film	59-10472002
R53	Resistor, 10k-0W4-1-metal film	59-10105002
R54	Resistor, 1k-0W4-1-metal film	59-10015002
R55	Resistor, 330R-0W4-1-metal film	59-13302002
R56	Resistor, 47R-0W4-1-metal film	59-10472002
R57	Resistor, 150R-0W4-1-metal film	59-11502002
R58	Resistor, 10k-0W4-1-metal film	59-10105002
R59	Resistor, 47R-0W4-1-metal film	59-10472002
R60	Resistor, 470R-0W4-1-metal film	59-14702002
R61	Resistor, 10R-0W4-1-metal film	59-10102002
R62	Resistor, 3k3-0W4-1-metal film	59-10334002
R63	Resistor, 100R-0W4-1-metal film	59-11002002
R64	Resistor, 5k6-0W4-1-metal film	59-10564002
R65	Resistor, 330R-0W4-1-metal film	59-13302002
R66	Resistor, 15R-0W4-1-metal film	59-10152002
R67	Resistor, 220R-0W4-1-metal film	59-12202002
R68	Resistor, 470R-0W4-1-metal film	59-14702002
R69	Resistor, 2k7-0W4-1-metal film	59-10274002
R70,71	Resistor, 47k-0W4-1-metal film	59-10475002
R72	Resistor, 1k-0W4-1-metal film	59-10015002
R73	Resistor, 1k5-0W4-1-metal film	59-10154002
R74	Resistor, 330R-0W4-1-metal film	59-13302002
R75	Resistor, 2k7-0W4-1-metal film	59-10274002
R76	Resistor, 22k-0W4-1-metal film	59-10225002
R77	Resistor, 1k2-0W4-1-metal film	59-10124002
R78	Resistor, 4k7-0W4-1-metal film	59-10474002
R79	Resistor, 22k-0W4-1-metal film	59-10225002
R80	Resistor, 1k-0W4-1-metal film	59-10015002
R81	Resistor, 33k-0W4-1-metal film	59-10335002
R82	Resistor, 3k3-0W4-1-metal film	59-10334002
R83	Resistor, 22k-0W4-1-metal film	59-10225002
R84	Resistor, 6k8-0W4-1-metal film	59-10684002
R85	THERM-2k2-KR222CW	53-80223000
R86	Resistor, 33k-0W4-1-metal film	59-10335002
R87	Resistor, 5k6-0W4-1-metal film	59-10564002
R88	Resistor, 47k-0W4-1-metal film	59-10475002
R89	Resistor, 10k-0W4-1-metal film	59-10105002
R90	Resistor, 33k-0W4-1-metal film	59-10335002
R91	Resistor, 68k-0W4-1-metal film	59-10685002
R92	Resistor, 56R-0W4-1-metal film	59-10562002
R93	Resistor, 100k-0W4-1-metal film	59-11005002
R94	Resistor, 47k-0W4-1-metal film	59-10475002
R95	Resistor, 3k3-0W4-1-metal film	59-10334002
R96	Resistor, 33k-0W4-1-metal film	59-10335002
R97,98	Resistor, 100k-0W4-1-metal film	59-11005002
R99	Resistor, 33k-0W4-1-metal film	59-10335002

Circuit Reference	Description	Part Number
R100	Resistor, 1k8-0W4-1-metal film	59-10184002
R101	Resistor, 100k-0W4-1-metal film	59-11005002
R102	Resistor, 4k7-0W4-1-metal film	59-10474002
R103	Resistor, 10k-0W4-1-metal film	59-10105002
R104	Resistor, 100R-0W4-1-metal film	59-11002002
R105	Resistor, 4k7-0W4-1-metal film	59-10474002
R106	Resistor, 1M-OW4-1-metal film	59-10018002
R107,108	Resistor, 680R-0W4-1-metal film	59-16802002
R109	Resistor, 33k-0W4-1-metal film	59-10335002
R110	Resistor, 1k2-0W4-1-metal film	59-10124002
R111	Resistor, 22k-0W4-1-metal film	59-10225002
R112	Resistor, 220k-0W4-1-metal film	59-12205002
R113,114	Resistor, 10k-0W4-1-metal film	59-10105002
R115	Resistor, 150k-0W4-1-metal film	59-11505002
R116	Resistor, 220k-0W4-1-metal film	59-12205002
R117,118	Resistor, 2k2-0W4-1-metal film	59-10224002
R119	Resistor, 10k-0W4-1-metal film	59-10105002
R120	Resistor, 100k-0W4-1-metal film	59-11005002
R121	Resistor, 10k-0W4-1-metal film	59-10105002
R122	Resistor, 150k-0W4-1-metal film	59-11505002
R123,124	Resistor, 18k-0W4-1-metal film	59-10185002
R125	Resistor, 10k-0W4-1-metal film	59-10105002
R126	Resistor, 220R-0W4-1-metal film	59-12202002
R127,128	Resistor, 100k-0W4-1-metal film	59-11005002
R129	Resistor, 3k9-0W4-1-metal film	59-10394002
R130	Resistor, 1k8-0W4-1-metal film	59-10184002
R131	Resistor, 27k-0W4-1-metal film	59-10275002
R132	Resistor, 1k5-0W4-1-metal film	59-10154002
R133	Resistor, 2k7-0W4-1-metal film	59-10274002
R134	Resistor, 100k-0W4-1-metal film	59-11005002
R135-137	Resistor, 4k7-0W4-1-metal film	59-10474002
R138-140	Resistor, 10k-0W4-1-metal film	59-10105002
R141	Resistor, 5k6-0W4-1-metal film	59-10564002
R142,143	Resistor, 1k-0W4-1-metal film	59-10015002
R144	Resistor, 2k7-0W4-1-metal film	59-10274002
R145	Resistor, 3k9-0W4-1-metal film	59-10394002
R146	Resistor, 180k-0W4-1-metal film	59-11805002
R149	Resistor, 2k2-0W4-1-metal film	59-10224002
R150	Resistor, 220R-0W4-1-metal film	59-12202002
R151	Resistor, 10k-0W4-1-metal film	59-10105002
R152	Resistor, 3k3-0W4-1-metal film	59-10334002
R153	Resistor, 22k-0W4-1-metal film	59-10225002
R154	Resistor, 68k-0W4-1-metal film	59-10685002
R155	Resistor, 2k2-0W4-1-metal film	59-10224002
R156	Resistor, 560R-0W4-1-metal film	59-15602002
R157	Resistor, 330R-0W4-1-metal film	59-13302002
R158	Resistor, 100k-0W4-1-metal film	59-11005002
R159	Resistor, 2k2-0W4-1-metal film	59-10224002

Circuit Reference	Description	Part Number
R160	Resistor, 270R-0W4-1-metal film	59-12702002
R161	THERM-150k-232264226151	53-81501005
R162	Resistor, 100k-0W4-1-metal film	59-11005002
R163,164	Resistor, 150R-0W4-1-metal film	59-11502002
R165	Resistor, 4k7-0W4-1-metal film	59-10474002
R166	Resistor, 1k-0W4-1-metal film	59-10015002
R167	Resistor, 4k7-0W4-1-metal film	59-10474002
R168	Resistor, 680R-0W4-1-metal film	59-16802002
R169	Resistor, 5k6-0W4-1-metal film	59-10564002
R170	Resistor, 12k-0W4-1-metal film	59-10125002
R171	Resistor, 330R-0W4-1-metal film	59-13302002
R172	Resistor, 470R-0W4-1-metal film	59-14702002
R173	Resistor, 220R-0W4-1-metal film	59-12202002
R174	Resistor, 4k7-0W4-1-metal film	59-10474002
R175	Resistor, 3k3-0W4-1-metal film	59-10334002
R176	Resistor, 220R-0W4-1-metal film	59-12202002
R177	Resistor, 68R-0W4-1-metal film	59-10682002
R178,179	Resistor, 150R-0W4-1-metal film	59-11502002
R180,181	Resistor, 4k7-0W4-1-metal film	59-10474002
R182	Resistor, 1k-0W4-1-metal film	59-10015002
R183	Resistor, 220R-0W4-1-metal film	59-12202002
R185	Resistor, 4k7-0W4-1-metal film	59-10474002
R186	Resistor, 10k-0W4-1-metal film	59-10105002
R187	Resistor, 3k3-0W4-1-metal film	59-10334002
R188	Resistor, 1k-0W4-1-metal film	59-10015002
R189	Resistor, 3k3-0W4-1-metal film	59-10334002
R190	Resistor, 1k-0W4-1-metal film	59-10015002
R191	Resistor, 51R-0W4-1-metal film	59-10512002
R192,193	Resistor, 1k-0W4-1-metal film	59-10015002
R194,195	Resistor, 4k7-0W4-1-metal film	59-10474002
R196	Resistor, 1k8-0W4-1-metal film	59-10184002
R197	Resistor, 1k2-0W4-1-metal film	59-10124002
R198	Resistor, 4k7-0W4-1-metal film	59-10474002
R199	Resistor, 5k6-0W4-1-metal film	59-10564002
R200	Resistor, 2k2-0W4-1-metal film	59-10224002
R201	Resistor, 1k-0W4-1-metal film	59-10015002
R202,203	Resistor, 10k-0W4-1-metal film	59-10105002
R204	Resistor, 4k7-0W4-1-metal film	59-10474002
R205	Resistor, 10k-0W4-1-metal film	59-10105002
R206	Resistor, 22k-0W4-1-metal film	59-10225002
R207	Resistor, 68R-0W4-1-metal film	59-10682002
R208	Resistor, 560R-0W4-1-metal film	59-15602002
R209	Resistor, 10k-0W4-1-metal film	59-10105002
R210	Resistor, 47k-0W4-1-metal film	59-10475002
R211	Resistor, 3k3-0W4-1-metal film	59-10334002
R212	Resistor, 47k-0W4-1-metal film	59-10475002
R213	Resistor, 3k3-0W4-1-metal film	59-10334002

Circuit Reference	Description	Part Number
R214	Resistor, 10k-0W4-1-metal film	59-10105002
R215	Resistor, 4k7-0W4-1-metal film	59-10474002
R216	Resistor, 100k-0W4-1-metal film	59-11005002
R217	Resistor, 680R-0W4-1-metal film	59-16802002
R218	Resistor, 47R-0W4-1-metal film	59-10472002
RN1,2	Resistor, 100k-1W50-2-network	59-81005002
CAPACITORS		
C1	Capacitor, mixed-0.1µF-63V-polyester	14-21105200
C2-4	Capacitor, ceramic-1nF-100V-miniature plate	14-03103301
C5	Capacitor, ceramic-1.8pF-100V-miniature plate	14-03180301
C6	Capacitor, ceramic-1nF-100V-miniature plate	14-03103301
C7	Capacitor, tantalum-2.2µF-35V	14-36226101
C8	Capacitor, ceramic-10nF-63V-miniature plate	14-03104201
C9	Capacitor, ceramic-22pF-100V-miniature plate	14-03221301
C10	Capacitor, ceramic-47pF-100V-miniature plate	14-03471300
C11,12	Capacitor, ceramic-68pF-100V-miniature plate	14-03681301
C13	Capacitor, mixed-0.1µF-63V-polyester	14-21105200
C14	Capacitor, ceramic-100pF-100V-miniature plate	14-03102301
C15	Capacitor, ceramic-68pF-100V-miniature plate	14-03681301
C16	Capacitor, ceramic-47pF-100V-miniature plate	14-03471300
C17-20	Capacitor, ceramic-1nF-100V-miniature plate	14-03103301
C25	Capacitor, tantalum-2.2µF-35V	14-36226101
C27	Capacitor, ceramic-10nF-63V-miniature plate	14-03104201
C28	Capacitor, mixed-0.1µF-63V-polyester	14-21105200
C31	Capacitor, ceramic-1nF-100V-miniature plate	14-03103301
C32	Capacitor, tantalum-0.47µF-35V	14-36472100
C33-36	Capacitor, ceramic-1nF-100V-miniature plate	14-03103301
C37	Capacitor, ceramic-15pF-100V-miniature plate	14-03151301
C39-41	Capacitor, ceramic-10nF-63V-miniature plate	14-03104201
C42,43,45,46	Capacitor, ceramic-15pF-100V-miniature plate	14-03151301
C48	Capacitor, ceramic-1nF-100V-miniature plate	14-03103301
C49	Capacitor, mixed-0.1µF-63V-polyester	14-21105200
C50	Capacitor, ceramic-10nF-63V-miniature plate	14-03104201
C51,52	Capacitor, ceramic-220pF-100V-miniature plate	14-03222300
C53	Capacitor, mixed-0.1µF-63V-polyester	14-21105200
C54	Capacitor, ceramic-18pF-100V-miniature plate	14-03181300
C55	Capacitor, ceramic-8.2pF-100V-miniature plate	14-03820301
C56,57	Capacitor, ceramic-10nF-63V-miniature plate	14-03104201
C58	Capacitor, mixed-0.1µF-63V-polyester	14-21105200
C59	Capacitor, ceramic-47pF-100V-miniature plate	14-03471300
C60	Capacitor, electrolytic-47µF-50V-vertical	14-06477200
C61	Capacitor, ceramic-68pF-100V-miniature plate	14-03681301
C62	Capacitor, ceramic-100pF-100V-miniature plate	14-03102301
C63,64	Capacitor, mixed-47nF-63V-sub-miniature	14-21474200
C65,66	Capacitor, mixed-0.22µF-63V-polyester	14-21225200

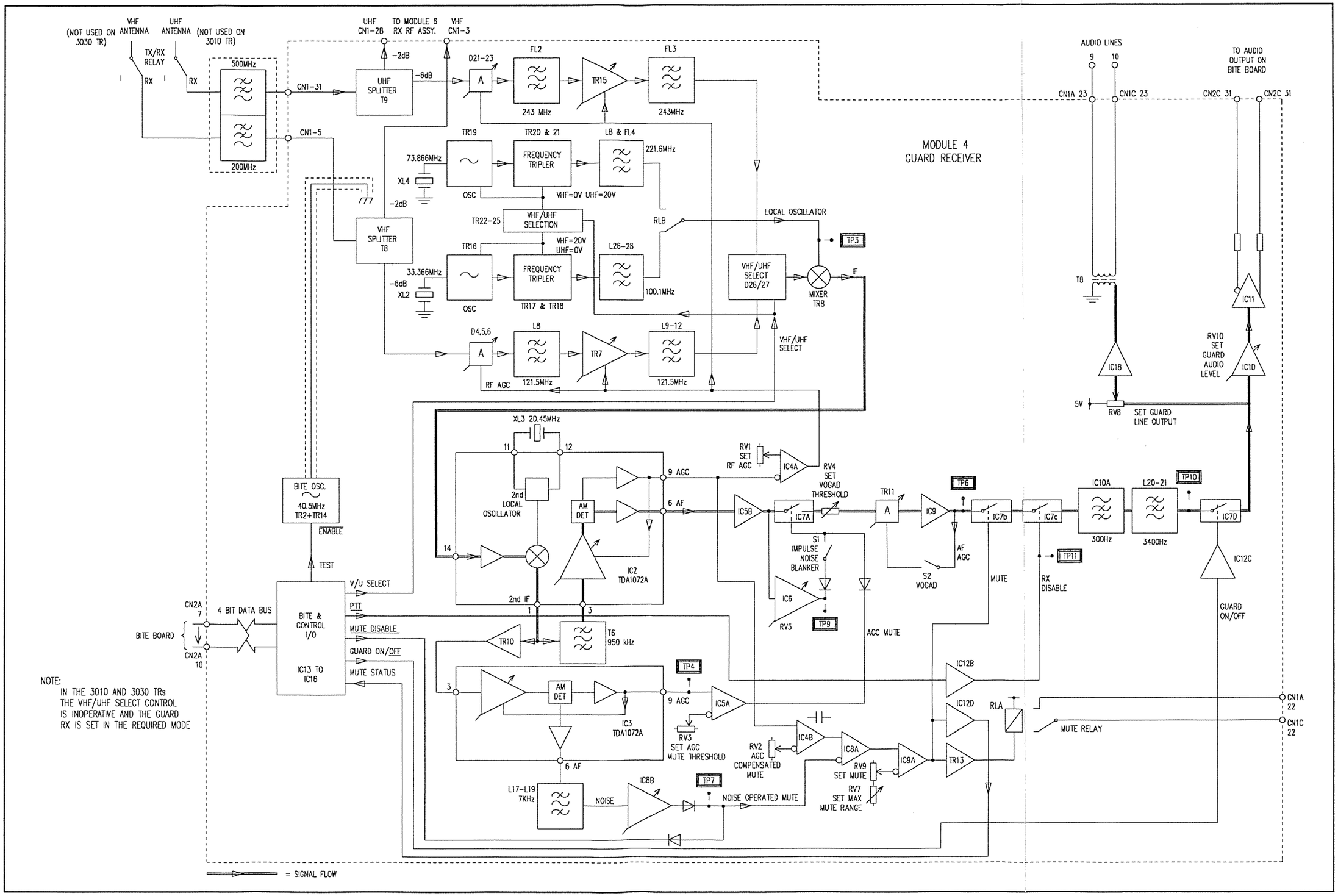
Circuit Reference	Description	Part Number
C67	Capacitor, tantalum-2.2µF-35V	14-36226101
C68,69	Capacitor, ceramic-1nF-100V-miniature plate	14-03103301
C70,71	Capacitor, mixed-0.1µF-63V-polyester	14-21105200
C72	Capacitor, ceramic-1nF-100V-miniature plate	14-03103301
C73	Capacitor, mixed-0.1µF-63V-polyester	14-21105200
C74,75	Capacitor, mixed-0.22µF-63V-polyester	14-21225200
C76	Capacitor, tantalum-2.2µF-35V	14-36226101
C77	Capacitor, electrolytic-47µF-50V-vertical	14-06477200
C78,79	Capacitor, mixed-47nF-63V-sub-miniature	14-21474200
C80	Capacitor, tantalum-2.2µF-35V	14-36226101
C81	Capacitor, tantalum-10µF-16V	14-36107100
C82	Capacitor, mixed-47nF-63V-sub-miniature	14-21474200
C83-86	Capacitor, tantalum-2.2µF-35V	14-36226101
C87	Capacitor, mixed-0.1µF-63V-polyester	14-21105200
C88,89	Capacitor, mixed-0.01µF-63V-polyester	14-21104302
C90	Capacitor, mixed-0.22µF-63V-polyester	14-21225200
C91	Capacitor, tantalum-1µF-35V	14-36106100
C92	Capacitor, mixed-0.01µF-63V-polyester	14-21104302
C93-95	Capacitor, mixed-0.1µF-63V-polyester	14-21105200
C96	Capacitor, mixed-68nF-63V-sub-miniature	14-21684200
C97	Capacitor, mixed-6.8nF-63V-sub-miniature	14-21683300
C98	Capacitor, mixed-0.1µF-63V-polyester	14-21105200
C99-101	Capacitor, mixed-0.01µF-63V-polyester	14-21104302
C102	Capacitor, mixed-47nF-63V-sub-miniature	14-21474200
C103,104	Capacitor, mixed-0.1µF-63V-polyester	14-21105200
C105	Capacitor, tantalum-10µF-16V	14-36107100
C106	Capacitor, tantalum-2.2µF-35V	14-36226101
C107,108	Capacitor, mixed-0.1µF-63V-polyester	14-21105200
C109,110	Capacitor, tantalum-2.2µF-35V	14-36226101
C111,112	Capacitor, mixed-0.1µF-63V-polyester	14-21105200
C113,114	Capacitor, tantalum-2.2µF-35V	14-36226101
C115,116	Capacitor, mixed-0.1µF-63V-polyester	14-21105200
C117,118	Capacitor, tantalum-2.2µF-35V	14-36226101
C119,120	Capacitor, mixed-0.1µF-63V-polyester	14-21105200
C121-123	Capacitor, tantalum-2.2µF-35V	14-36226101
C124,125	Capacitor, mixed-0.1µF-63V-polyester	14-21105200
C126	Capacitor, ceramic-12pF-100V-miniature plate	14-03121301
C127	Capacitor, tantalum-22µF-16V	14-36227108
C128	Capacitor, tantalum-2.2µF-35V	14-36226101
C129	Capacitor, ceramic-330pF-100V-miniature plate	14-03332300
C130	Capacitor, electrolytic-100µF-40V	14-06108111
C131	Capacitor, electrolytic-330µF-50V	14-06338200
C132	Capacitor, ceramic-150pF-100V-miniature plate	14-03152300
C133,134	Capacitor, ceramic-1nF-100V-miniature plate	14-03103301
C135	Capacitor, electrolytic-1000µF-10V-20% vertical	14-06109122
C136	Capacitor, electrolytic-330µF-50V	14-06338200
C138	Capacitor, ceramic-22pF-100V-miniature plate	14-03221301

Circuit Reference	Description	Part Number
C139	Capacitor, ceramic-1nF-100V-miniature plate	14-03103301
C140	Capacitor, ceramic-10nF-63V-miniature plate	14-03104201
C141	Capacitor, mixed-0.1µF-63V-polyester	14-21105200
C142,143	Capacitor, ceramic-22pF-100V-miniature plate	14-03221301
C144,145	Capacitor, ceramic-18pF-100V-miniature plate	14-03181300
C146	Capacitor, ceramic-22pF-100V-miniature plate	14-03221301
C147-150	Capacitor, ceramic-1nF-100V-miniature plate	14-03103301
C151	Capacitor, ceramic-10pF-100V-miniature plate	14-03101301
C152	Capacitor, ceramic-1nF-100V-miniature plate	14-03103301
C153,154	Capacitor, mixed-0.1µF-63V-polyester	14-21105200
C156-161	Capacitor, ceramic-1nF-100V-miniature plate	14-03103301
C162	Capacitor, mixed-0.1µF-63V-polyester	14-21105200
C163,164	Capacitor, ceramic-10nF-63V-miniature plate	14-03104201
C165	Capacitor, ceramic-1nF-100V-miniature plate	14-03103301
C166	Capacitor, ceramic-10nF-63V-miniature plate	14-03104201
C167-170	Capacitor, ceramic-1nF-100V-miniature plate	14-03103301
C171	Capacitor, mixed-0.1µF-63V-polyester	14-21105200
C173	Capacitor, ceramic-22pF-100V-miniature plate	14-03221301
C174,175	Capacitor, ceramic-10nF-63V-miniature plate	14-03104201
C176,177	Capacitor, mixed-0.1µF-63V-polyester	14-21105200
C178-182	Capacitor, ceramic-1nF-100V-miniature plate	14-03103301
C183-185	Capacitor, ceramic-10nF-63V-miniature plate	14-03104201
TC1	Capacitor, variable-15 to 22p-PLYPRP	15-43022300
TC2	Capacitor, variable-5.5 to 65p-PLYPRP	15-43065300
TC3	Capacitor, variable-1.8 to 10p-PTFE	15-33100300
SEMICONDUCTORS		
D1-6	Diode BA379	61-00400379
D7-14	Diode 1N4148	61-00104148
D15	Diode BZX55C2V7	61-00202705
D16-19	Diode 1N4148	61-00104148
D20	Diode BZX55C5V6	61-00205604
D21-23	Diode BA379	61-00400379
D24	Diode BZX55C6V2	61-00206205
D25	Diode BZY88C8V2	61-00208205
D26,27	Diode BA379	61-00400379
D28,29	Diode 1N4148	61-00104148
D30	Diode BZX55C5V6	61-00205604
IC1	Integrated circuit 4051	61-12004051
IC2,3	Integrated circuit TDA1072A-AM detector	61-12011072
IC4-6	Integrated circuit CA3240	61-12003240
IC7	Integrated circuit 4066	61-12004066
IC8,9	Integrated circuit CA3240	61-12003240
IC10,11	Integrated circuit CA1458G	61-12001458
IC12	Integrated circuit 74C906-non-inverting buffer	61-12074906
IC13	Integrated circuit 8243-I/P O/P expander	61-12008243

Circuit Reference	Description	Part Number
IC14	Integrated circuit 74C906-non-inverting buffer	61-12074906
IC15	Integrated circuit 4556-binary-DEMUX INV	61-12004556
IC16	Integrated circuit 4051	61-12004051
IC18	Integrated circuit CA3240	61-12003240
IC19	Integrated circuit 74AS04	61-12107404
IC20	Integrated circuit CA3240	61-12003240
IC21	Integrated circuit MC7805CT	61-12007805
	Integrated circuit socket 24-pin	62-05000241
TR1	Transistor BC182	61-04120182
TR2	Transistor BFR90	61-04420090
TR3	Transistor ZTX650	61-04220650
TR4	Transistor VN10KM	61-08000010
TR5,6	Transistor BC182	61-04120182
TR7	Transistor BF960	61-08000960
TR8	Transistor U430	61-08000430
TR9	Transistor BF960	61-08000960
TR10	Transistor J310	61-08000310
TR11	Transistor J175	61-08000175
TR12,13	Transistor BC182	61-04120182
TR14	Transistor J310	61-08000310
TR15	MOSFET-CF300-N-channel amplifier	61-08001300
TR16	Transistor BFT66	61-04420066
TR17	Transistor BFY90	61-04420325
TR18	Transistor MRF581A NPN	61-04420581
TR19	Transistor BFT66	61-04420066
TR20	Transistor BFY90	61-04420325
TR21	Transistor MRF581A NPN	61-04420581
TR22-25	Transistor ZTX650	61-04220650
TR26-28	Transistor BC182	61-04120182
	FET-BF964-N-channel-D-gate-VHF	61-08000964
CONNECTORS		
CN1	Plug-60-PCMT-01A-A-41612	20-01640302
CN2	Plug-64-PCMT-01A-A-edge	20-01640300
	Socket-FR-S-RG316-A-D-41612	19-02060101
METALWORK		
	Screen lid (4.5 X 2.7)	45-00002795
	Screen (4.5 X 2.7) top	45-00027961
	Screen (4.5 X 2.7) bottom	45-00027962
	Box fixing bracket	45-26002516
	Module chassis guard RX	45-28352793

Circuit Reference	Description	Part Number
MISCELLANEOUS		
	Potentiometer hole plug	02-02202590
	PCB test point terminal	02-12000001
	RF gasket 4.5 X 2.7 box	02-28002800
	Cable-S RIG-50 ohms-0.056	10-05112100
XL1	XTAL-OVER-SER-40.50 MHz	22-15213002
XL2	XTAL-OVER-SER-33.3667 MHz	22-15213005
XL3	XTAL-FUND-SER-20.45 MHz	22-15113001
XL4	XTAL-OVER-SER-73.8667 MHz	22-15213004
FL1	XTAL filter T24A04J	27-30001296
FL2	Helical-243 MHz-2 section	27-52002430
FL3	Helical-243 MHz-3 section	27-53002430
FL4	Helical-221.6 MHz-2 section	27-52002216
	PCB-3000 guard (V/U)	55-00000322
RLA	Relay 12V sub-miniature	57-16110000
RLB	Relay-coax-12V-10W-P-SPCO	57-11110154
S1, 2	Clickit switch	66-20100015
T8	Audio-PR-600-SC-600-PCMT	73-02217797
L1	Choke 10µH SC30	79-01000013
L2-4	10.75T 35/36 SWG (wound on former 79-04000004)	79-10000085
L5	Choke 10µH SC30	79-01000013
L6	Coil S18 2½ turn 301AN020	79-09120013
L7	Choke 10µH SC30	79-01000013
L8-12	RF coil 3.5 turn 301SN-0300	79-09120011
L13	Choke 10µH SC30	79-01000013
L14,15	Choke 1.5mH SC30	79-01000003
L16	Choke 1µH SC30	79-01000002
L17	Inductor PC MTG 56mH	79-01000026
L18	Choke 7mH	79-01000012
L19	Inductor PC MTG 56mH	79-01000026
L20,21	Inductor 47mH 10RB181LY	79-01000022
L22-25	Choke 10µH SC30	79-01000013
L26-28	RF coil 3.5 turn 301SN-0300	79-09120011
L29,30	Choke 10µH SC30	79-01000013
L32	VHF coil 301-AN-0300	79-09120015
L33-35	Choke 10µH SC30	79-01000013
L36	RF coil 3.5 turn 301SN-0300	79-09120011
L37	Choke 4.7mH SC30	79-01000005
T1	2T twd. wire 32 SWG (on blue ferrite ring 79-08000006)	79-10000093
T2	32 SWG en. 2.5T red 4.5T green (on core 79-08000011)	79-11000070
T3	2 strands of 35/36 SWG red/green twd., 1 strand of 30 SWG brown 6T (on 79-08000004)	79-10000004
T4	2 strands of 35/36 SWG red/green twd., 1 strand of 30 SWG brown 8T (on blue ferrite core 79-08000006)	79-11000071
T5	IF coil KANK3335R	79-02000010
T6	Coil-IF-92T-180µH-red	79-02000015

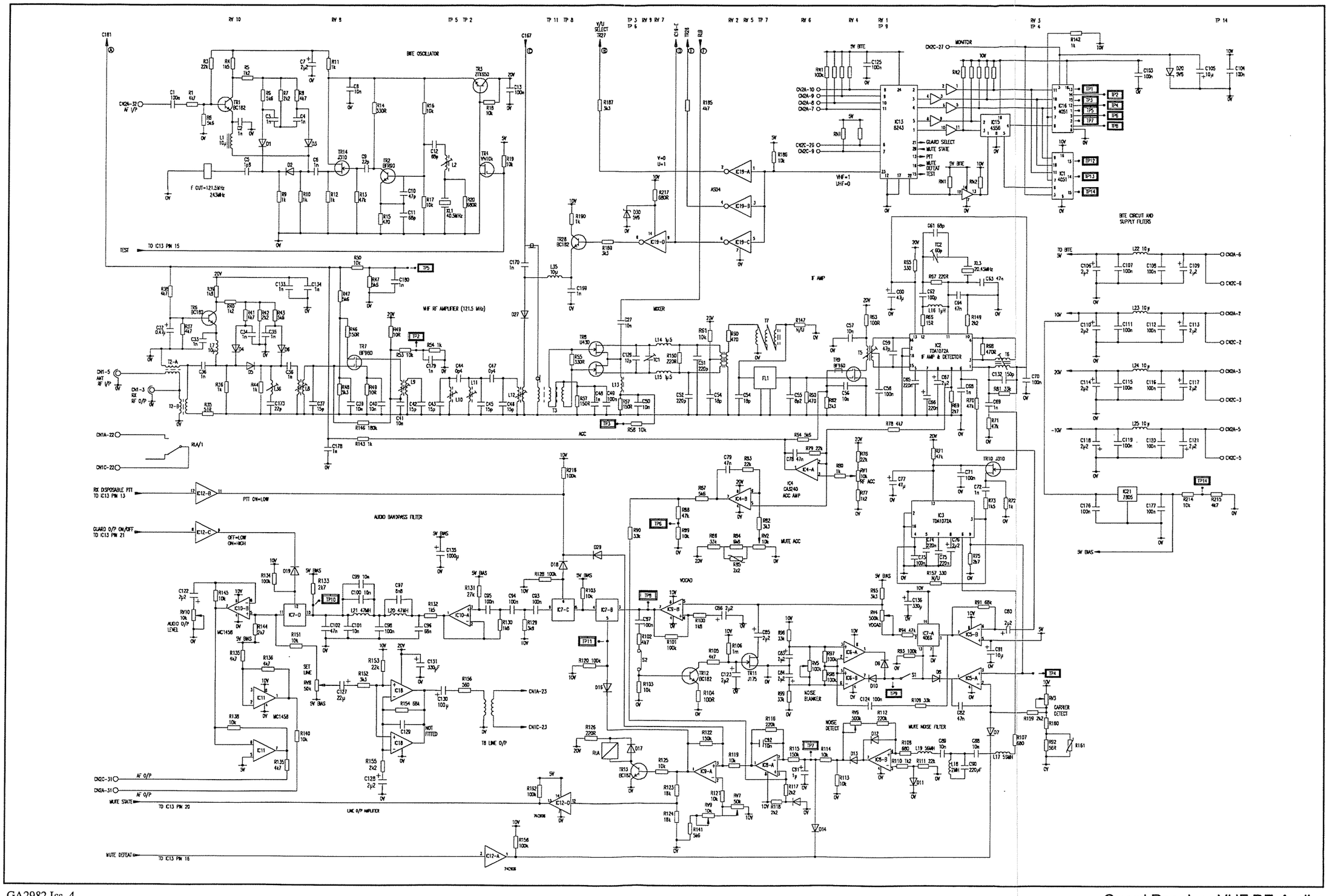
Circuit Reference	Description	Part Number
T7	2.75T 38 SWG en. wire 3 strands. not twd. (on core 79-08000011)	79-11000072
T9	32 SWG en. 2.5T red 4.5T green (on core 79-08000011)	79-11000070
	Coil can 73-019-93	79-06000005
FB1	Sub-miniature ferrite bead	79-08000009



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Guard Receiver Block Diagram

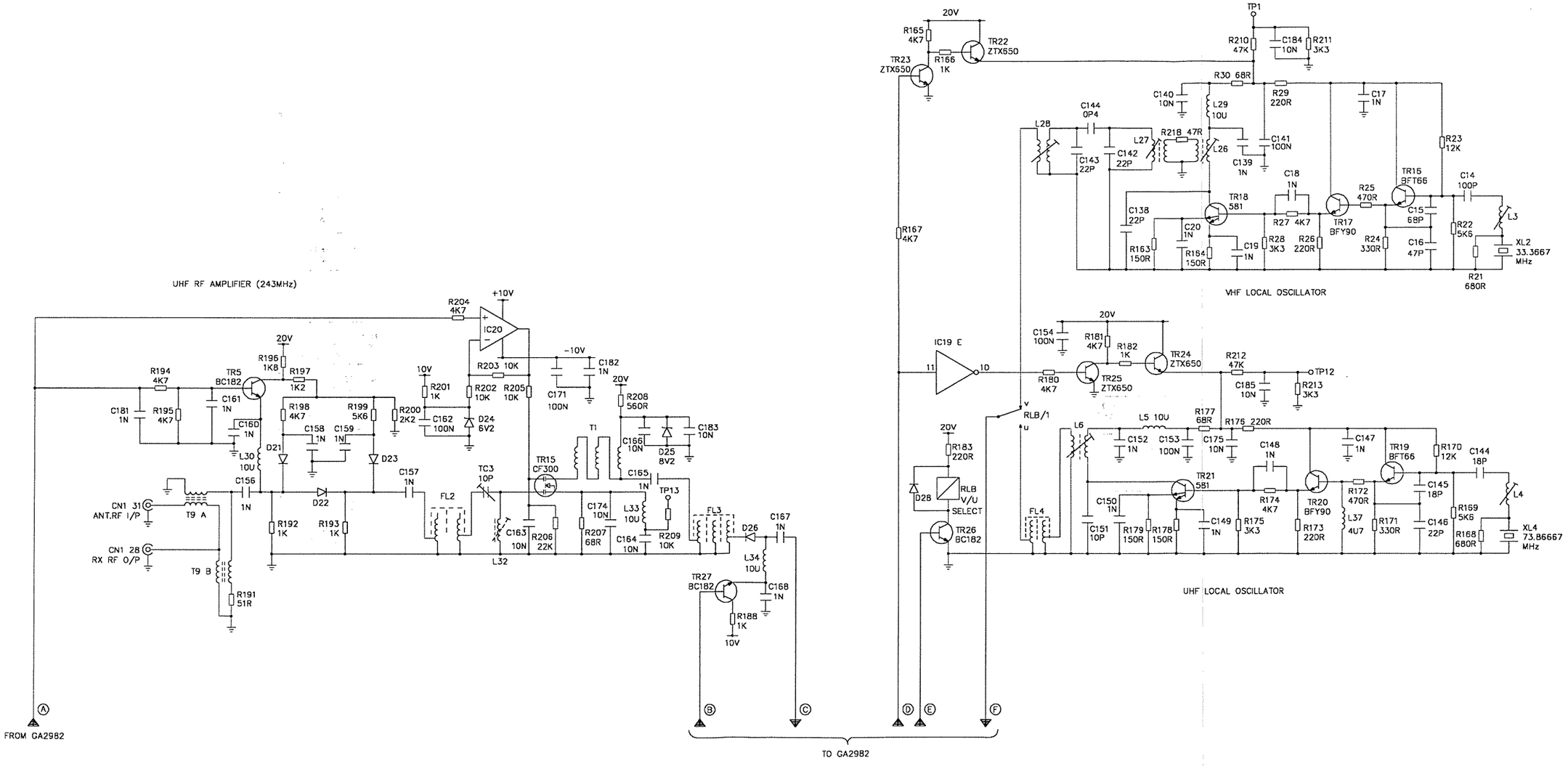
Fig. 1



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Guard Receiver VHF RF, Audio and BITE Circuit Diagram

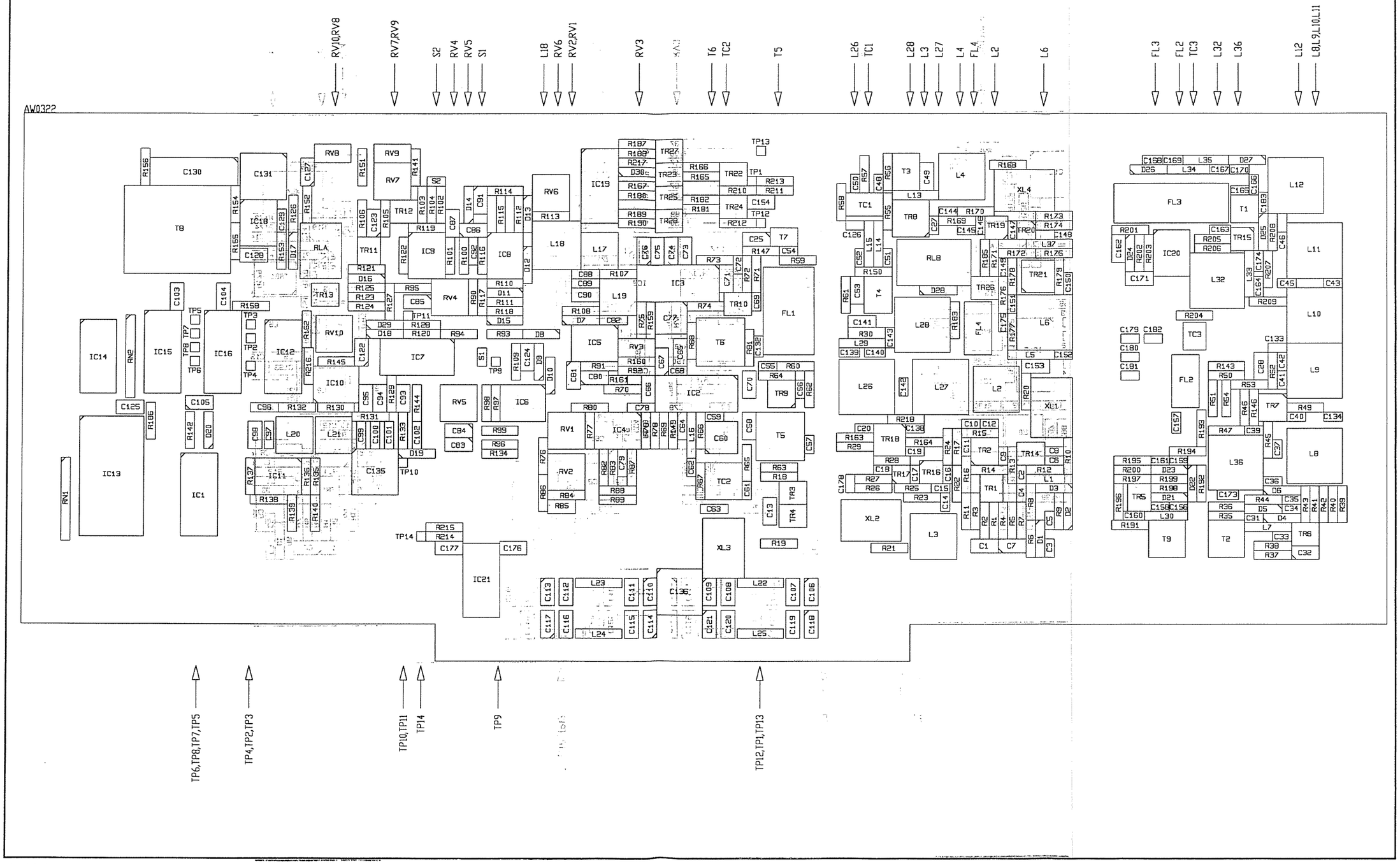
Fig. 2



GA3608 Iss. 2

Guard Receiver UHF RF and VHF/UHF Local Oscillator Circuit Diagram

Fig. 3



GA3610 Iss. 1

VHF/UHF Guard Receiver Component Location Diagram

Fig. 4