Access Phone

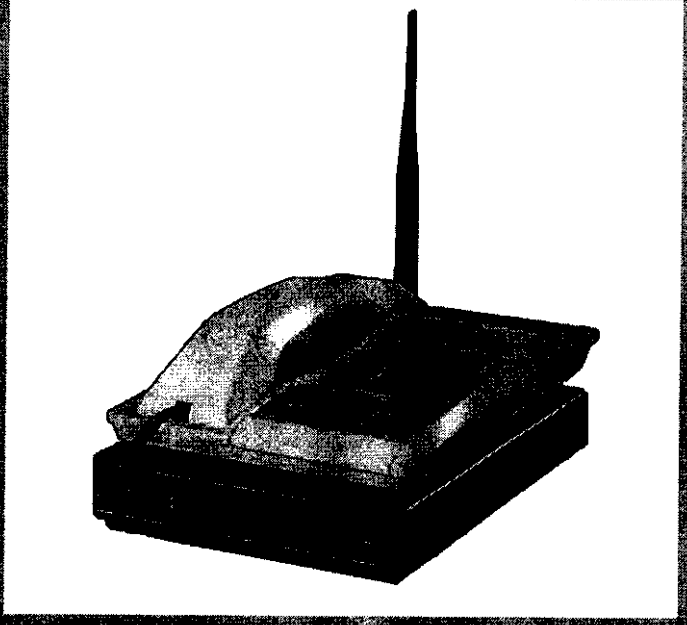
ADI Limited

FCC ID: N6FSRT7010
Model: SRT7010/Isonex3000

EXHIBIT 9

Technical Manual

SRT/ACCESSPHONE



Technical Manual

MAN 105

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Preface

This manual provides the information you will need to program, operate and maintain the SRT.

Distributors and technical service personnel will find it useful.

The manual is divided into five chapters, as described below:

Chapter 1 Introduction

Chapter 2 Physical Description

Chapter 3 Circuit Description

Chapter 4 Programming

Chapter 5 Maintenance, Removal and Replacement Procedures

Refer to the Table of Contents for topics listed in each Chapter.

Block diagrams, schematic diagrams, parts lists, etc can be found in appendices to the manual.

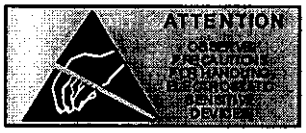
Warnings and Precautions

a.

CAUTION

A caution precedes a practice or procedure which, if not strictly observed, could result in damage to or destruction of the equipment, or corruption of data.

b.



A caution for static devices precedes a practice or procedure which, if not strictly observed, could result in damage to or destruction of the equipment, or corruption of data.

c.

NOTE

A note either precedes or follows a practice, procedure or condition that requires highlighting.

RSN	Receive Summing Node
RSSI	Receive Signal Strength Indication
Rx	Receive
RX	Receive
SAT	Supervisory Audio Tone
SLIC	Subscriber Line Interface Circuit
SRT	Subscriber Radio Terminal (AccessPhone)
ST	Signalling Tone
TCXO	Temperature compensated crystal oscillator
THP	Test Harness Password
TIA	Telecommunications Industry Association
Tx	Transmit
TX	Transmit
VCO	Voltage Controlled Oscillator

Record Of Changes

Any changes to this manual since its first printing are recorded on this page.

Date	Revision History	Chapter	Summary of changes	Pages affected
5 Sept. 97	1.00	All	First Release	All
15 Oct. 97	1.01	All	Name change AccessPhone to SRT, correction of typos and addition of extra information	All
16 Jul. 98	1.02	All	Minor editorial corrections and clarifications	All

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Chapter 5 Maintenance, Removal and Replacement Procedures

Appendix

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Chapter 1 Introduction

1.1 Overview

The SRT (Subscriber Radio Terminal) is a family of products which allow standard telephone equipment to access cellular networks. It is easily installed by the user and can be attached to one or several telephones, answering machines, facsimiles, or Hayes compatible modems.

The SRT provides basic telephone services to remote rural and suburban areas where existing land-based networks are expensive, lacking in security, or of sub-standard quality.

The SRT7010 is based on the Advanced Mobile Phone System (AMPS) standard and interfaces with any cellular network based on AMPS. It is fully compatible with AMPS protocols and conforms to the EIA/TIA–553 (USA) and TS-005 (Australian) standards.

The SRT family is also known as the AccessPhone and model SRT7010 as the Isonex 3000.

The system consists of

- SRT
- AC Power pack (supplied as an option)
- Whip antenna

Plugging a standard telephone device into the SRT unit allows a user to obtain access to the Public Switched Telephone Network (PSTN) via the cellular network.

1.2 Quality and Reliability

Full inspection and quality assurance activities are implemented during the production and testing phases of the SRT.

The quality assurance standard ISO 9001 is adhered to and inspection protocols reflect these standards.

The SRT has been designed to rigid specifications using advanced component technology and system design philosophy to construct a product of the highest quality.

Chapter 2 Physical Description

2.1 External Features

The SRT is built in a metal housing 160 mm x 210 mm x 35 mm. The housing stands on rubber feet.

Figures 2–1 and 2–2 show the front and rear panels, respectively.

The front panel has four LED displays to indicate the status of the unit. Table 2–1 describes the Front Panel LEDs.

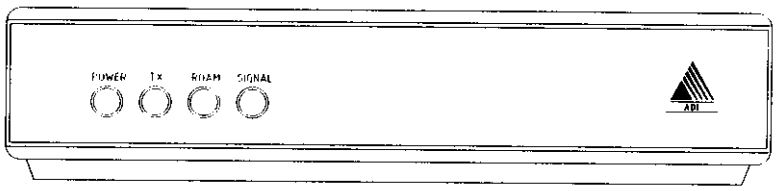

Figure 2–1 **SRT Front View**

Front panel LED	Description
POWER	Power LED. Flashes green during SRT self-test at start-up, then indicates steady green when power is on.
TX	TX LED. Indicates green when transmitting.
ROAM	Roam LED. This LED is yellow during roam and is off when at home. The SRT roams when it operates on a subscriber service different from the home service.
SIGNAL	Signal LED (tri-coloured). Indicates green when the received signal is strong, amber when the signal is weak but acceptable and red when the signal is weak and unacceptable. No colour indicates "No Service".

Table 2–1 **Front Panel LED's**

The rear panel has four connectors for the telephone device, power, programming and an external antenna.

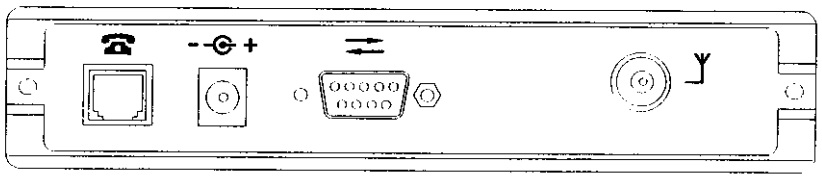

Figure 2–2 **SRT External Rear View**

Connector	Description
	Standard telephone device connection RJ–11 (telephone handset, facsimile machine, answering machine or modem).
	Power connection, 2.5 mm two-way jack for DC voltage input.
	Remote control and programming connector RS232 (DB9).
	External antenna connection, BNC (female) connector.

Table 2–2 **SRT Rear Connectors**

A standard RJ–11 connector is provided for the telephone, facsimile, modem or answering machine. An AC adaptor plug pack or optional battery pack is connected by a 2.5 mm two-way jack for DC voltage input. A 9 pin D type connector is provided for remote control. A standard BNC (F) connector is provided for the external antenna.

Figure 2–1 shows the external view of the SRT. Table 2–1 describes the LEDs and table 2–2 describes the connectors on the SRT.

2.2 AC Adaptor Plug Pack

The AC adaptor plug pack is connected to mains AC power 110VAC or 240VAC (90-264VAC) with a standard 2-prong plug Australian STD. It is connected to the SRT with a standard 2.5mm plug and provides the regulated DC voltage required.

2.3 Antenna

There are two types of external antennas for the SRT. A small whip antenna is connected directly to the SRT when the radio base station is located nearby. In poor signal areas, a high gain 50Ω impedance antenna can be connected by cable to the SRT. Figure 2–3 shows the whip antenna.

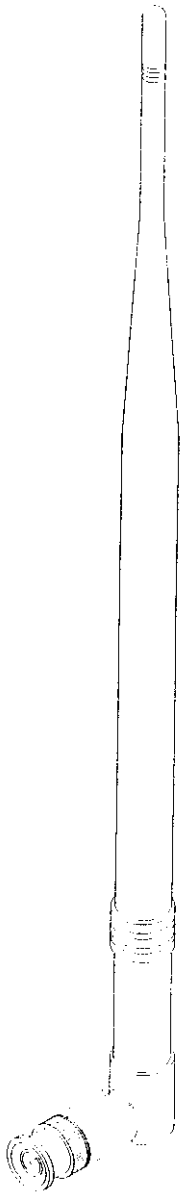

Figure 2–3 **Whip Antenna**

2.4 Printed Circuit Assembly

The SRT has a single printed circuit assembly (PCA) mounted on rails inside the outer case. The PCA performs all the functional requirements of the complete unit.

There are four modules within the SRT:

- Receiver
- Transmitter
- Baseband and Control
- LIU and Power Supply

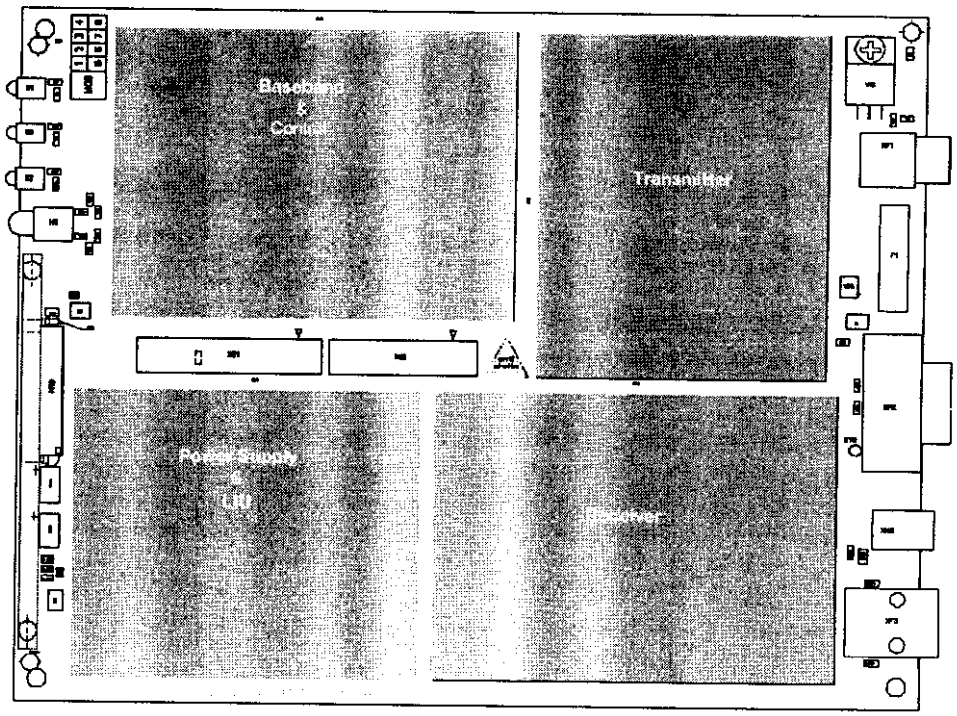

Figure 2–4 **Diagram of PCA**

Figure 2–5 shows a block diagram of the SRT.

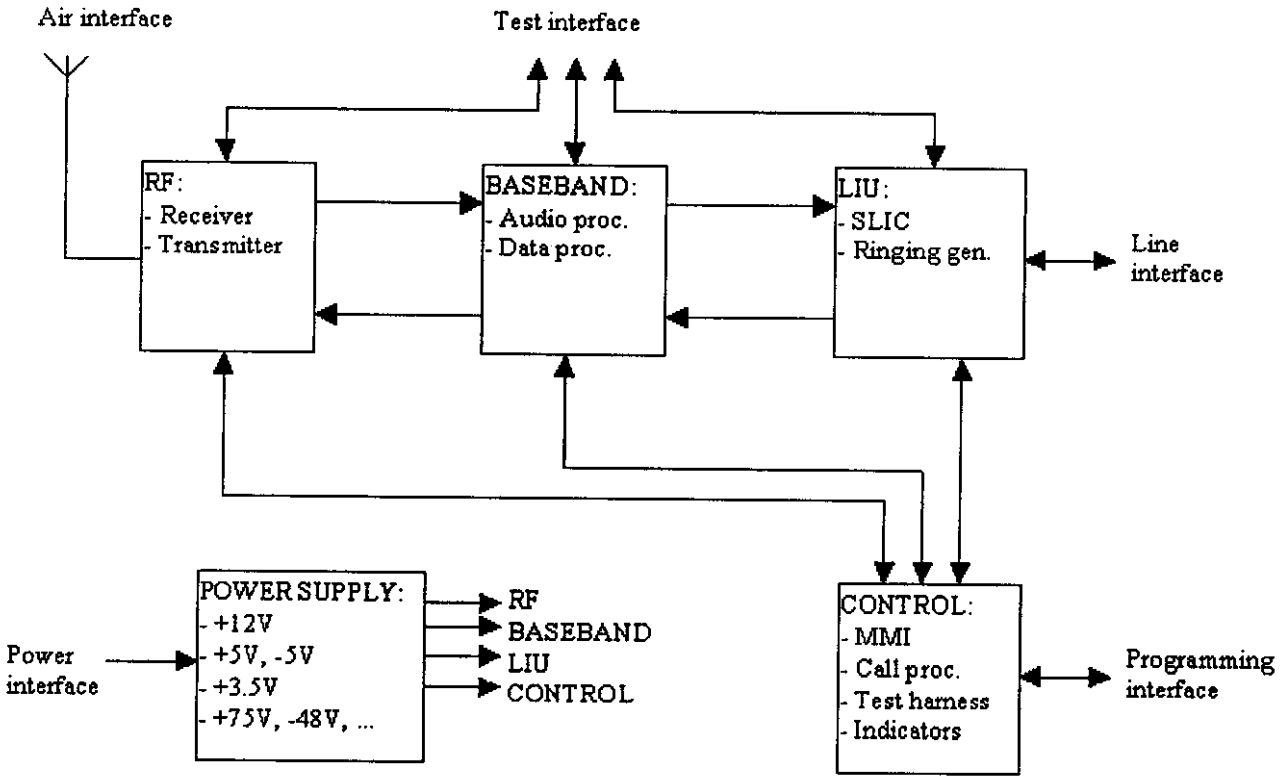

Figure 2–5 **Block Diagram of SRT**

2.4.1 Power Supply Module

The Power Supply generates the DC voltages necessary for the operation of the SRT. From a nominal input voltage of +13 V DC it delivers the following output voltages:

- +3.5 V for operation of ICs.
- +5 V and –5 V for the operation of the ICs and semiconductors.
- –48 V to provide battery feed to the telephone through the Line Interface Unit.
- +75 V for ringing functions.

2.4.2 RF Module

The RF Module (transmit and receive) facilitates air interface to the cellular network. It has the following functions:

- Generates, baseband modulates and transmits the TX RF signal.
- Receives, processes and demodulates the RX RF signal to provide baseband output.
- Provides a diplexer to enable the connection of transmitter and receiver to a single antenna.

2.4.3 Baseband Unit

The Baseband Unit (within Baseband and Control Module) performs the complete baseband and cellular data processing via the following functions:

- Amplifying and filtering voice signals
- Compression and expansion
- Pre-emphasis and de-emphasis
- Deviation limiting
- Supervisory Audio Tone (SAT) transponding—SAT determination and recovery
- Signalling tone generation
- Encoding and decoding of wide band data.

2.4.4 Line Interface Unit

The Line Interface Unit (within Power Supply and LIU Module) interfaces the SRT to the telephone lines. It performs the following functions:

- Battery feed (–48 V for the operation of the telephone)
- Ring injection
- Signalling detection (handset off-hook, dialling, ring-trip)
- Hybrid function (2-wire to 4-wire and vice versa)

2.4.5 Control Unit

The Control Unit (within Baseband and Control Module) is the core of the SRT and provides all the intelligence required to interface the SRT with the cellular network. It consists of a micro-controller, memory devices and driver circuits.

The following major functions are performed by the Control Unit:

- Provides a basic user interface (call initiation, answering and termination)
- Generates and receives signalling to set-up and maintain calls on the cellular network in accordance with EIA/TIA–553
- Controls the Subscriber Line Interface Circuit (SLIC) ICs in the Line Interface Unit
- Drives the LED displays on the front panel
- Generates ring and busy tones
- Controls the RF Unit (switch on Tx, channel switching and power level control)
- Controls the Baseband Unit (muting audio, volume control)
- Provides serial interface for testing and programming of the SRT

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Chapter 3 Circuit Description

3.1 Introduction

The Printed Circuit Assembly (PCA) of the SRT has six functions within the four modules:

- Power Supply
- RF Transmit
- RF Receive
- Baseband
- Line Interface Unit (LIU)
- Control

The Power Supply generates DC voltages for the other units.

The Control unit controls the RF, Baseband and LIU units.

Transmitted signals (audio or data) pass from the telephone device to the LIU through a two wire interface. They pass from the LIU to the Baseband Unit and from the Baseband Unit to the RF Transmit Unit. The signal passes from the RF Transmit unit to the antenna and is transmitted as a radio signal. Radio signals are received and processed into the signals required at the telephone device in the reverse of transmitted signals.

A block diagram (Figure 3–6) is located at the end of the chapter.

Schematic diagrams of the SRT are contained in Appendix B.

3.2 Power Supply

The power supply for the SRT is a combination of switchmode supply and linear regulators distributed across the PCA. Zener diodes implement low current supplies of 4.3V.

Figure 3–1 is a block diagram of the Power Supply.

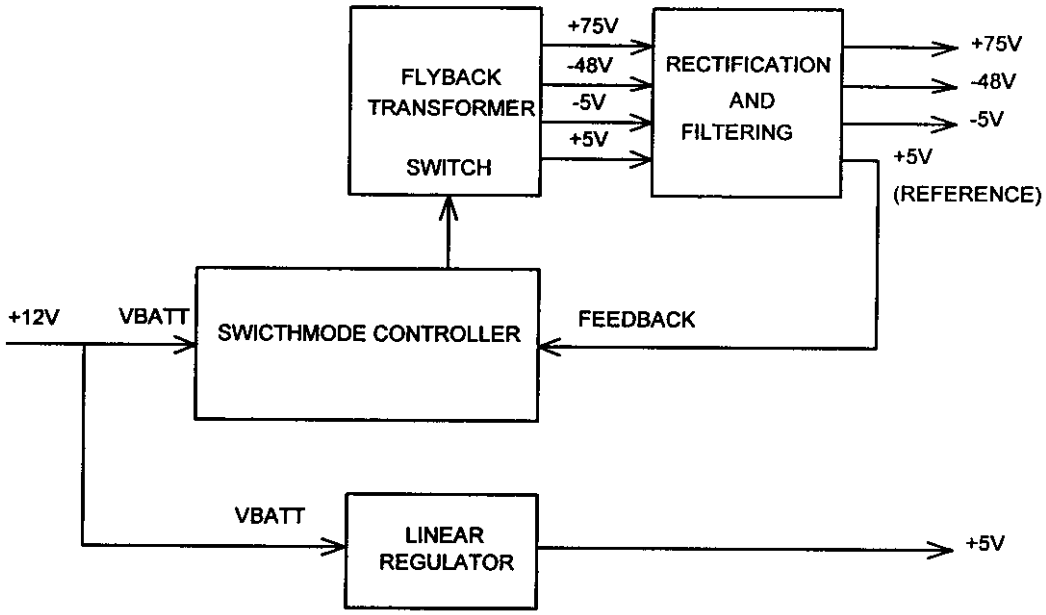

Figure 3–1 Block Diagram of Power Supply

3.2.1 Switchmode Supply

The switchmode supply is the main supply and is provided by a switchmode regulator. The regular produces –5V, –48V, and +75V rails.

The switchmode supply is a flyback design to allow for multiple outputs with large variations in voltage levels. There are three functional areas:

- Switchmode controller
- Flyback transformer
- Rectification and filtering

3.2.1.1 Switchmode Controller

The key units of the switchmode controller are:

- Switchmode control
- Undervoltage lockout
- Overcurrent cutout
- Thermal overload protection

Optimum performance and protection is provided by external feedback, loop compensation and snubber networks.

The controller provides a 52kHz square wave which drives a switching transistor. This switches the main input power on and off through the transformer primary coil. The controller reduces the "ON" time to control the output voltage.

3.2.1.2 Flyback Transformer

The flyback transformer is the most critical component of the switchmode supply. It interfaces to the controller to provide the required output voltages.

During normal loading, operation is continuous. In the idle state, operation of the controller is discontinuous.

3.2.1.3 Rectification and Filtering

Rectification is performed for each supply by a single ultra fast recovery diode. The rectified signal is then filtered using low ESR capacitors. The diodes have fast switching times and low forward voltage drops. The capacitors have a very low resistance at the operating frequency. All of the rails have a 100nF or 22nF ceramic capacitor connecting them to ground to reduce high frequency noise.

The output of the +5V rail is used as a feedback signal to the control loop of the switchmode regulator.

3.2.2 Linear Regulators

A linear regulator (LM7805 family) provides the +5V rail. The output is filtered by two 470µF capacitors.

Programmable linear regulators throughout the circuit provide +8V and +3.3V.

3.3 RF Unit

The RF Unit (transmitting and receiving) is a full UHF duplex radio. The flow of transmit and receive signals is shown in the block diagram of the RF Unit (refer to Figure 3–6).

3.3.1 Transmitter

The transmitter circuit consists of three basic units:

- Transmit synthesiser
- FM modulator
- Power amplifier

3.3.1.1 Transmit Synthesiser

The transmit synthesiser operates in conjunction with the reference oscillator and the Voltage Control Oscillator (VCO) to generate the RF carrier. This carrier is in the frequency range 824.040MHz to 848.970MHz.

The TX oscillator is of PLL type. The reference frequency (9.6MHz) is divided inside the synthesiser to a low frequency. Similarly, a sample of the VCO output is fed back to the synthesiser and divided. The phases of both divided frequencies are compared in a phase comparator, which generates an error voltage. This error voltage controls the frequency of the VCO.

The frequency of the VCO is set by programming the division ratio in the synthesiser. This is accomplished by the Control unit based on the channel allocated.

The frequency stability of the RF source is determined by the stability of the reference oscillator. This reference oscillator is a Temperature Compensated Crystal Oscillator(TCXO) with a stability of $\pm$ 2.5ppm over the operating temperature range.

3.3.1.2 FM Modulator

The VCO performs the unit of the FM modulator. The TX baseband signal (a combination of voice, signalling, SAT and data) is fed to the VCO as a control voltage. Since the frequency of the VCO varies as a function of the control voltage, the baseband effectively frequency modulates the VCO output.

3.3.1.3 Power Amplifier

The modulated output from the VCO is fed through a buffer to the power amplifier, which amplifies the signal to a maximum power level of +36dBm. The Control Unit can switch the output power from +8dBm to +36dBm in increments of 4dB.

A directional coupler at the output of the power amplifier couples a small part of the RF signal into a detector and generates a DC voltage. This is used in a feedback circuit to automatically stabilise the output power. The output of the power amplifier is fed through a duplexer to the antenna connector. The duplexer facilitates the use of a single antenna for transmit and receive by filtering the two signals in two different paths.

3.3.2 Receiver

The RF signal is picked up by the antenna and passes through the duplexer. It is amplified by the LNA (Noise Figure typically 1.6dB). The amplified output is filtered in a RF filter and fed to a mixer.

In the receiver, the RX synthesiser performs the same as the TX synthesiser and is driven by the same reference oscillator. The LO to the mixer is generated by the RX synthesiser. The RX LO frequency is set at 86.85MHz above the RX frequency of the channel selected by the Control Unit on channel allocation. The output of the mixer contains the 1st IF (86.85MHz) and is filtered by a narrow band SAW filter. This filter rejects the other intermodulation products generated by the mixer.

The output of the 1st IF filter is fed to a second mixer for further down-conversion to a second IF of 450kHz. The LO frequency (86.4MHz) for this mixer is generated in a frequency multiplier by multiplying the reference oscillator frequency (9.6MHz) by nine.

The 2nd IF is processed in the IF Processor stage. This comprises two stages of ceramic filters, an IF amplifier and a limiter. The ceramic filters improve the noise and adjacent channel performance of the receiver. The IF amplifier also provides a DC output to indicate the strength of the received signal (RSSI).

The output of the IF processor goes to a quadrature detection-type FM demodulator. This demodulates the IF to recover the baseband.

3.4 Baseband Unit

The Baseband Unit is implemented almost entirely by three ICs:

ICs SA5752DK & SA5753DK together perform the audio processing functions.

IC UMA1000LT implements the modem and data processing functions.

Figure 3–3 shows a block diagram of the Baseband unit, indicating signal flow.

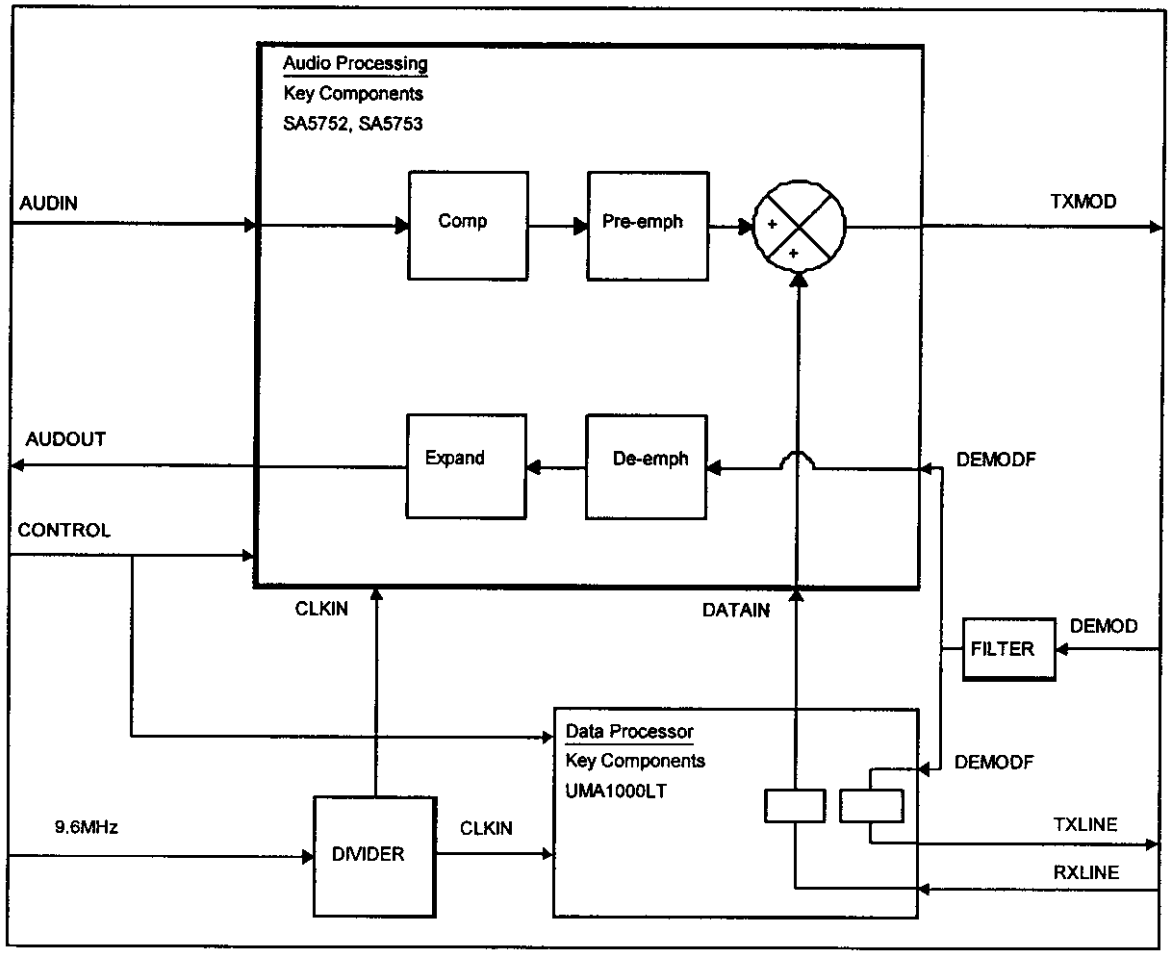

Figure 3–3 **Block Diagram of Baseband Unit**

3.4.1 Audio Processing

The audio processing chipset (SA5752DK and SA5753DK) performs a series of functions on the audio signals to the receiver and from the transmitter. The main functions performed are:

- Compression / expansion
- Pre-emphasis / de-emphasis
- Gain / attenuation
- Switching

All of these functions are controlled through the I^2C bus. Compression / expansion and emphasis / de-emphasis can be switched on or off and attenuators have variable gain settings.

The modulating signal for the transmitter (TXMOD) is derived from the audio signal together with SAT, ST and Manchester encoded data signals from the data processor. The audio signal is passed through a compressor and undergoes pre-emphasis before being summed with the data processor signal.

The demodulated signal from the receiver passes through a low pass filter and is then routed to the data processor and the audio processor. In the audio processor the signal is processed according to programming and is finally available as the AUDOUT signal.

3.4.2 Data Processing

The data processing function provides AMPS compliant signalling. Its main functions are:

- Data encoding and decoding
- Filtering
- Error handling
- SAT recovery and regeneration
- ST generation

The functions of the data processing IC are controlled through an I^2C bus. Data is transmitted and received through a dedicated serial port and is connected directly to the processor.

The main signal paths are:

- Data on the TXLINE signal is encoded, has the appropriate signalling added to it and becomes available as the DATAIN signal.
- The DEMODF signal is decoded and data is presented on the RXLINE signal. SAT is also decoded and its status is available in internal registers.

3.5 Line Interface Unit (LIU)

The LIU interfaces to the Baseband Unit internally and provides the means of connecting a telephone or modem to the SRT.

The LIU consists of a SLIC, buffers, balance networks and programming components.

Figure 3–4 is a block diagram of the LIU.

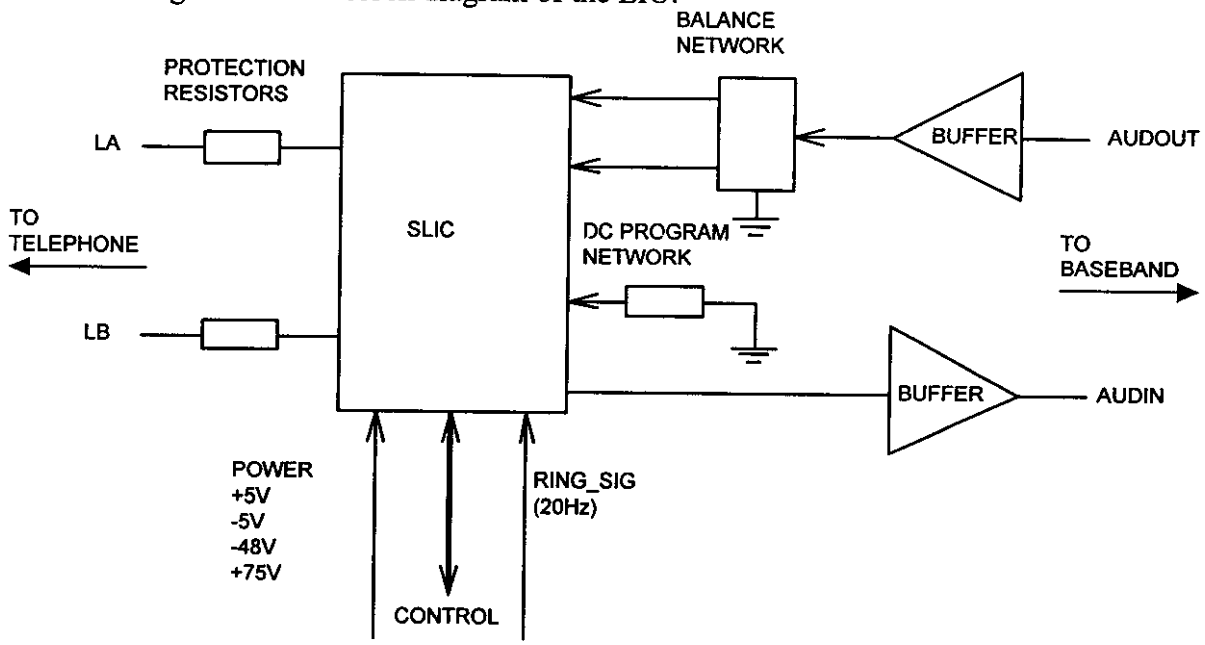

Figure 3–4 **Block Diagram of LIU**

3.5.1 SLIC

The SLIC is a 2 IC kit and comprises a high voltage part which drives the line (N10) and a low voltage part which contains the digital interface and the hybrid functions (N14).

3.5.2 Buffers

The LIU buffers the input and output audio to the Baseband Unit through an op-amp (N13).

3.5.3 Balance Networks and Programming Components

The networks between the buffers and the low voltage SLIC are primarily impedance balance networks. Some components program the DC characteristics and detector levels of the circuit.

Line impedance is provided by R127, R128, R136 and C110. The line impedance network determines the input impedance of the SLIC and affects the 2-wire return loss.

Hybrid balance is provided by R137, R138, R144 and C129. The hybrid balance networks affect the trans-hybrid loss or the return loss on the 4-wire interface.

XL1, XL2 and XL3 are used to select the line impedance as 600Ω or 220Ω+820Ω||120nF.

3.5.4 Interfaces

The LIU provides three interfaces:

- Baseband Unit interface
- Telephone Line interface
- Control Unit interface

3.5.4.1 Baseband Unit Interface

The LIU is connected to the Baseband Unit via a 4- wire interface. The two signals, AUDIN and AUDOUT are referenced to ground. The buffers (N13) match the levels of the signals going into and out of the LIU to the levels required by the audio processor.

3.5.4.2 Telephone Line Interface

The LIU is interfaced to a standard 2-wire interface as used in a Public Switched Telephone Network (PSTN). It is fed directly by the SLIC (N10). The signals to the standard telephone device are LA and LB (commonly referred to as tip and ring). The characteristics of this interface are controlled by programming components connected to the SLIC.

3.5.4.3 Control Unit Interface

The interface to the Control Unit consists of a parallel digital bus with the signals described in Table 3–1.

Signal	Input/Output
RING_I_CTRL	input
PWON	input
AUT	input
LIM	input
NONHK	output
NGKD	output

Table 3–1 **Control unit Interface Signals**

In addition, a low level 20 Hz filtered sinusoidal signal is used as an input signal for ring generation. This signal is known as RING_SIG.

3.5.5 Functional Description

A signal presented at AUDOUT is buffered by N13.2. It passes to the receive summing node (RSN) of the SLIC, which is at the junction of two balance networks. The signal is then fed to the ZAC input of the SLIC. The signal is placed across the TIP and RING pins of the high voltage SLIC and transmitted to the standard telephone device.

In the balance networks the signal on the 2-wire interface line is added to any signal which originates at the standard telephone device. The hybrid in the low voltage SLIC subtracts an amplitude and phase-modified version of the combined signal to achieve the best trans-hybrid loss possible. This signal is sampled at ZB by the low voltage SLIC and is used in the internal hybrid op-amp.

Functions such as off-hook and ring trip are detected by the SLIC and these states are available at the digital interface. The controller uses this information to trigger the SLIC into its different operational modes.

In the SRT, the SLIC operates in three different modes:

- Standby
- Ring
- Conversation

3.5.5.1 Standby

In standby mode the SLIC detects when a standard telephone device goes off hook. It then automatically enters conversation mode.

3.5.5.2 Ring

Ring mode is set by the Control Unit. When a call has been made to the SRT, the Control Unit puts the SLIC into ring mode. The 20Hz RING_SIG is amplified and a ring signal is applied to the line by the SLIC. The amplitude of the ring signal on the line is determined by the levels at VB+ and VB–.

When the telephone handset is lifted during ringing, it is detected by the internal ring trip detector in the SLIC. This automatically changes the SLIC to conversation mode.

3.5.5.3 Conversation

The SLIC is in conversation mode when it transmits or receives audio. The line is looped and DC current flows. The AC signals are superimposed on the DC signal and the hybrid circuit converts this 2-wire interface into the 4-wire interface to the Baseband Unit.

3.6 Control Unit

The Control Unit is based on a Philips P80CL580 Microcontroller which is comprised of an Intel 8051 core with several peripherals including parallel ports, serial ports, A/D converters, PWM, timers and an interrupt controller. Most of the support for the Microcontroller is provided by a WSI PSD312L. This provides extra I/O, ROM and SRAM. The other parts of the Control Unit are:

- Reset circuit
- Power-down circuit for PSD 312
- Non-volatile RAM
- LED indicators
- Serial line driver and receiver

Figure 3–5 is a block diagram of the Control Unit.

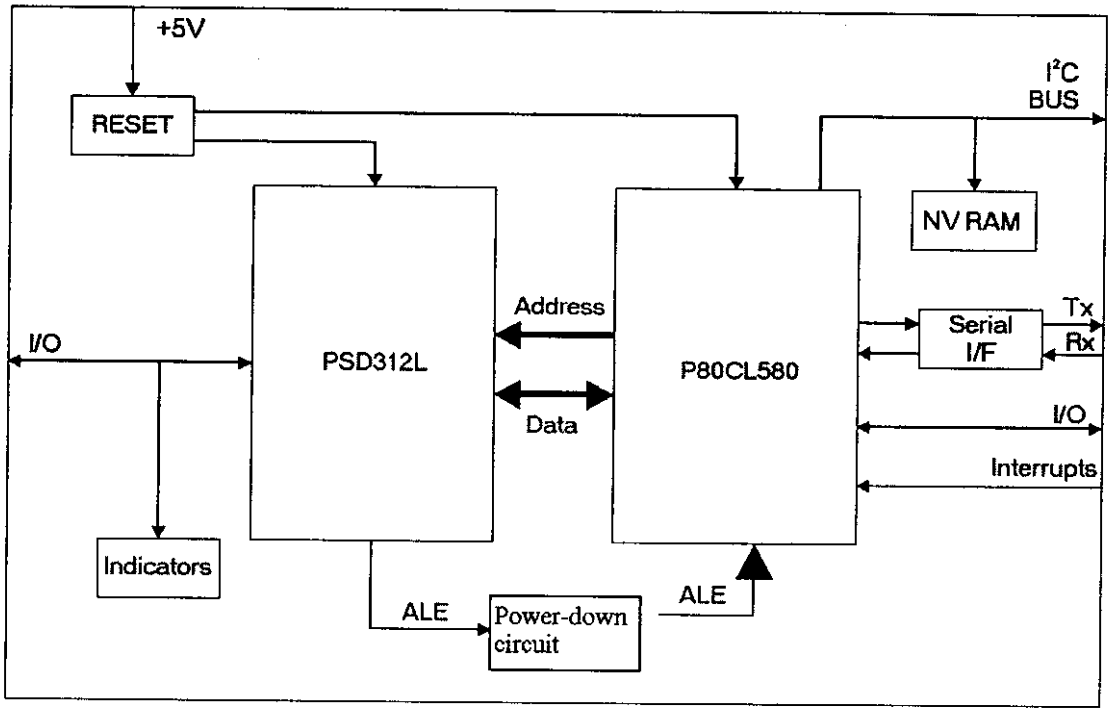

Figure 3–5 **Block Diagram of Control Unit**

3.6.1 Microcontroller

The microcontroller runs the software which implements the AMPS protocol and controls all functions in the system.

An I^2C interface is implemented with three of the I/O pins and this bus is provided to the following ICs in the SRT: Non-volatile RAM, Audio Processor and Data Processor.

The processor controls functions and monitors variables in the RF, Baseband, Line Interface and Power Units.

3.6.2 PSD312L

This IC provides ROM, SRAM and extra I/O ports. The ROM contains the software which controls the system and implements the AMPS protocol.

The SRAM is available to the processor as the main system memory.

The I/O ports provide a means to access the required number of devices.

3.6.3 Reset Circuitry

The reset circuit (N7) is controlled by the V_DIG rail. When the rail reaches a predetermined level (2.9V) then reset signals are asserted in the correct form and timing relationship to the microcontroller and the PSD312L.

3.6.4 Serial Interface

A serial line driver and line receiver have been implemented using discrete components to allow connection to an external serial device. The serial levels are -5 to +5V.

3.6.5 Non-Volatile RAM

The non-volatile RAM (NVRAM) is used to store system parameters such as the serial number and the mobile identification number. Two devices (D1 and D2) work in tandem to provide failsafe backup of vital system parameters.

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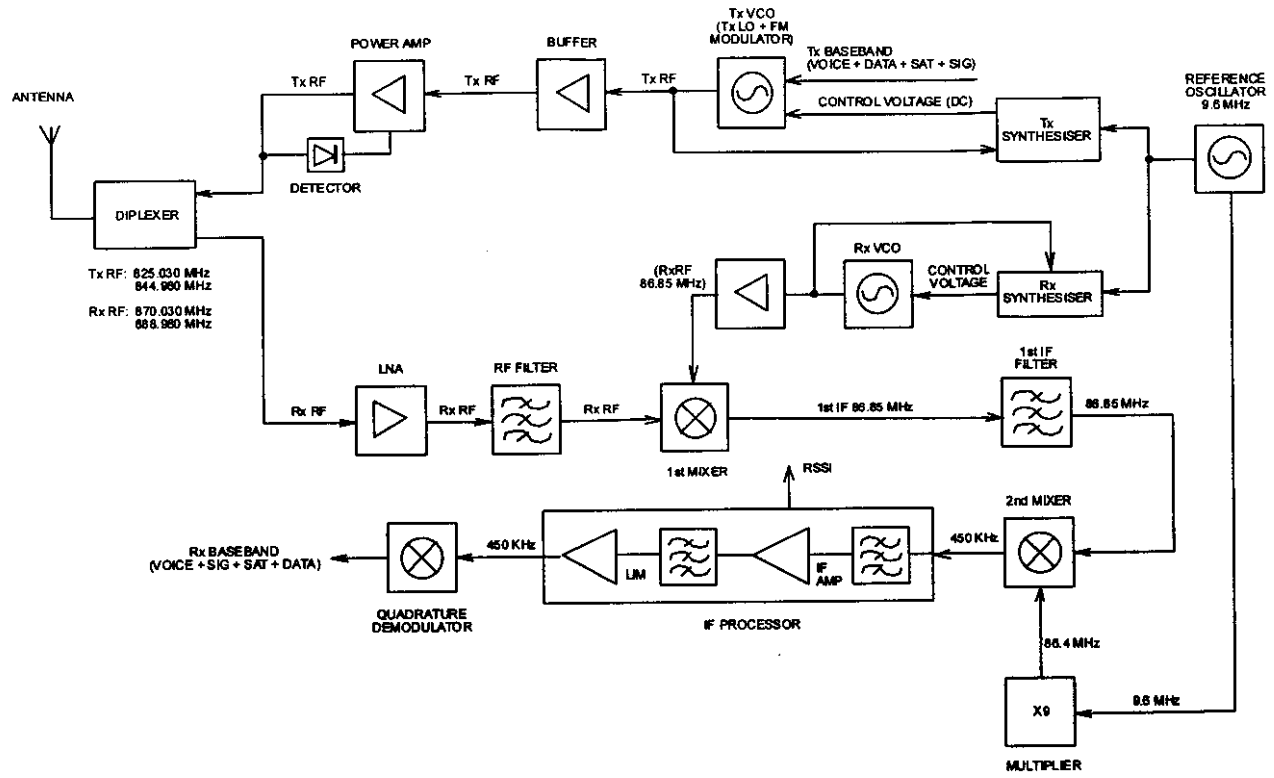

Figure 3–6 Block Diagram of RF U

Chapter 4 Programming the SRT

4.1 System requirements

The minimum system requirements are as follows:

Component	Recommended	Minimum
Computer Processor	80486	80386
RAM	8Mb	4Mb
Monitor	Super VGA	VGA
DOS version	6.21 or later	6.21
Microsoft Windows for Workgroups	3.1X	3.0

Table 4–1 **System Requirements**

You will need at least 1 Mb available on your hard drive to install the AccessPhone Terminal Programer software.

Note: To ensure that the AccessPhone Terminal Programmer dialogue boxes are contained within the display screen area, the windows display driver selected must be at least 640 x 480 pixels. Refer to your Microsoft documentation for more details.

4.2 Making a backup copy of your original disk

It is recommended that you make a backup copy of your AccessPhone Terminal Programmer disk, and that you write-protect the backup disk to prevent accidental erasing or overwriting of files.

4.3 Connecting PC to the SRT

To communicate with the SRT, AccessPhone Terminal Programmer requires a serial cable (provided) connection between the computer running AccessPhone Terminal Programmer and the SRT.

The standard supplied cable below allows connection on one end to a DB9 female connection on the computer running AccessPhone Terminal Programmer.

The end with the DB9 male connection is plugged in the serial port located at the back of the SRT.

Figure 4–1 **SRT Serial Cable**

4.4 Installing the AccessPhone Terminal Programmer software

The following steps assume that you are installing the software from drive A:\ onto drive C:\ .

Start Windows, and insert the AccessPhone Terminal Programmer installation disk into drive A:\

Choose "Run..." from the File menu and type A:\ setup in the "Run..."dialogue box, then click the **OK** button or press E.

Select the default location for the AccessPhone Terminal Programmer files by pressing E or clicking on the Continue button.

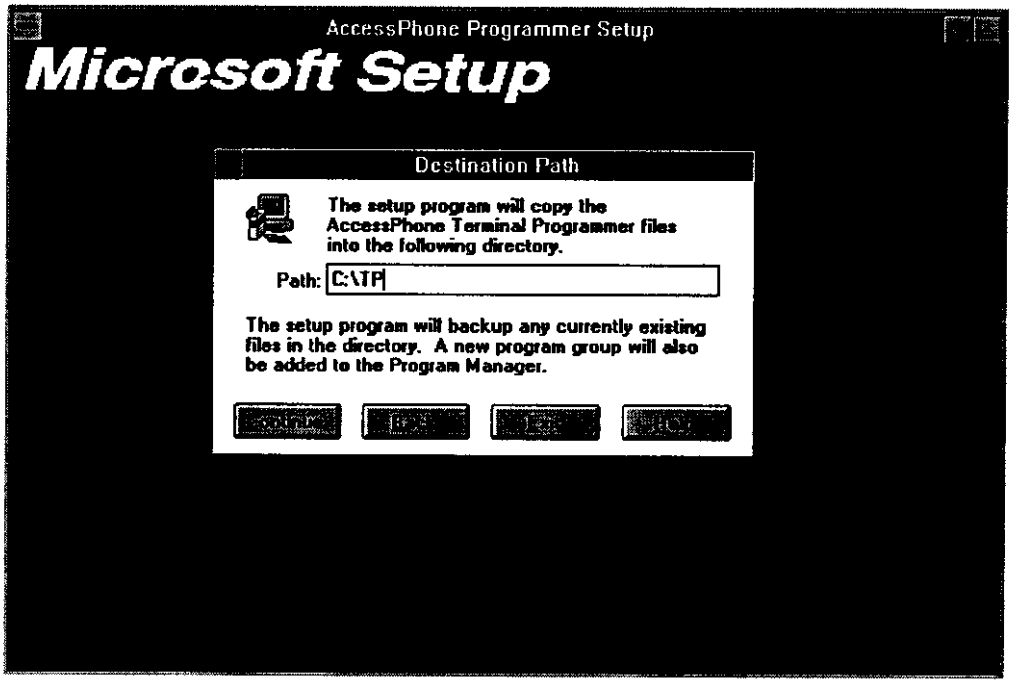

Figure 4–2 **AccessPhone Programmer Setup**

To specify a directory for storing the AccessPhone Terminal Programmer files, enter the location.

Click on the Continue button to install.

The setup window will be displayed on the screen. The message "Application Setup Succeeded!"

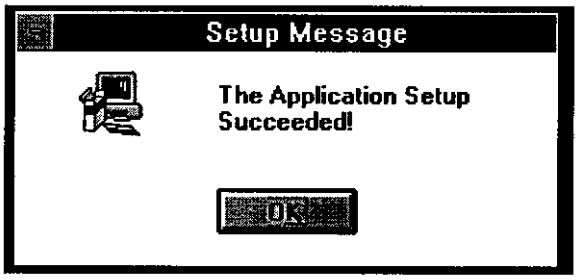

Figure 4–3 **Setup Message**

The AccessPhone Terminal Programmer program group, showing the program items, will be displayed in the Program Manager.

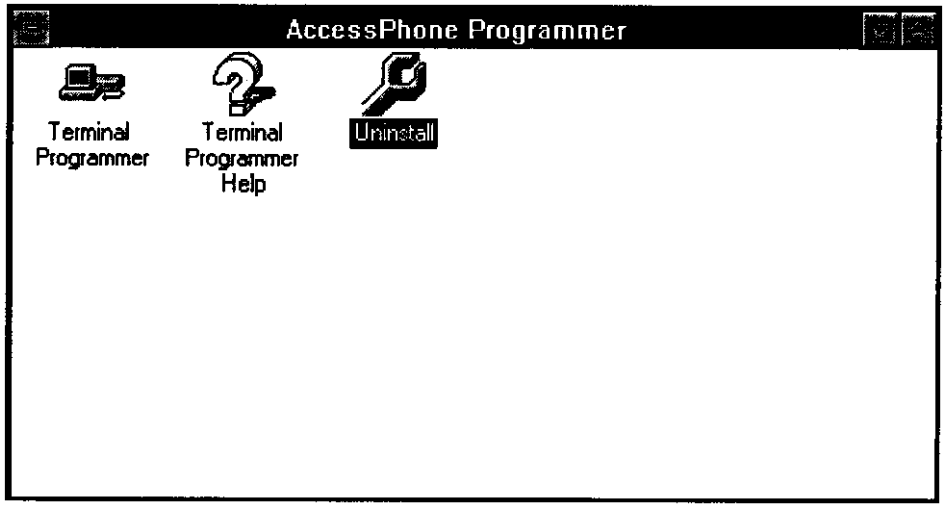

Figure 4–4 **AccessPhone Programmer Group**

4.5 Starting the AccessPhone Terminal Programmer

To start AccessPhone Terminal Programmer, double-click on the Terminal Programmer icon.

Terminal Programmer

The following dialogue box will appear on screen, prompting for a Password.

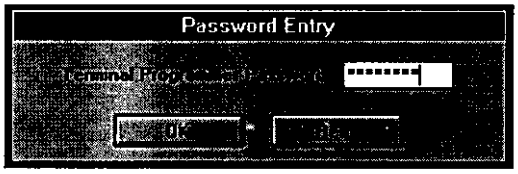

Figure 4–5 **Password Entry**

The initial Password is:

Password

Note: The Password entry is case sensitive. This password can be changed with the "File" menu option.

Enter the Password, then click on the **OK** button.

A second dialogue box will appear on screen, prompting for passwords to different levels of access.

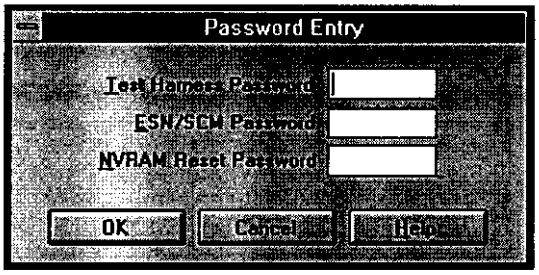

Figure 4–6 **Password Entry Levels**

- Test Harness Password — Access for Service Provider
- ESN/SCM Password — Access for Factory Personnel only
- NVRAM Reset Password — Access for Factory Personnel only

Note: Passwords required can be entered now (AccessPhone Teminal Programmer will prompt for unentered passwords as they are required).

The main menu will appear on screen:

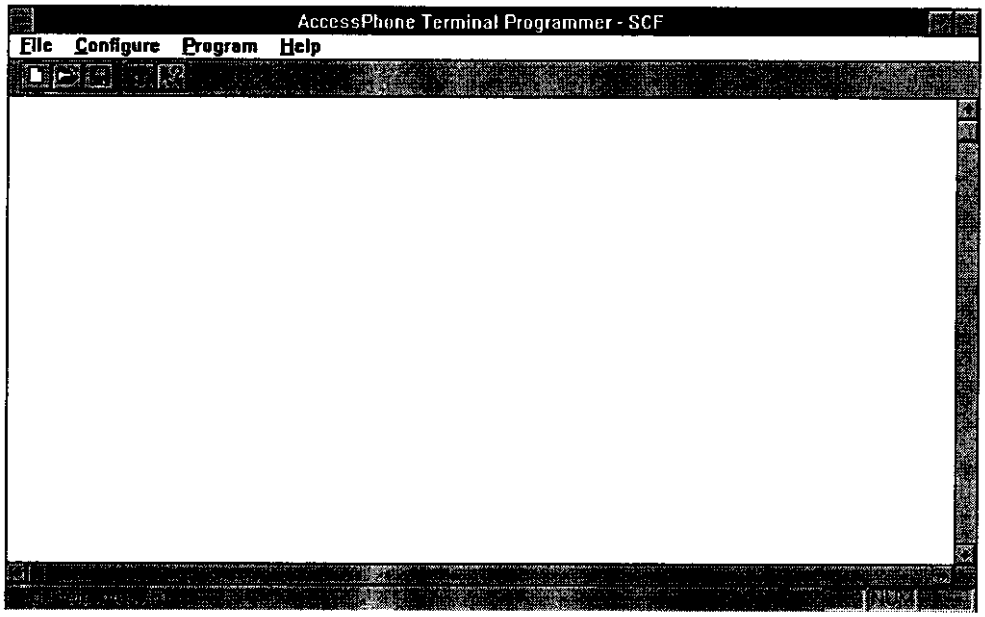

Figure 4–7 **AccessPhone Terminal Programmer Main Menu**

4.5.1 To change password

To change any of the three SRT passwords required for access to the three levels of AccessPhone Terminal Programmer functions, select Program from the main menu then click on Passwords:

The following dialogue box will appear on screen, prompting for an Old/New Username and an Old/New Password.

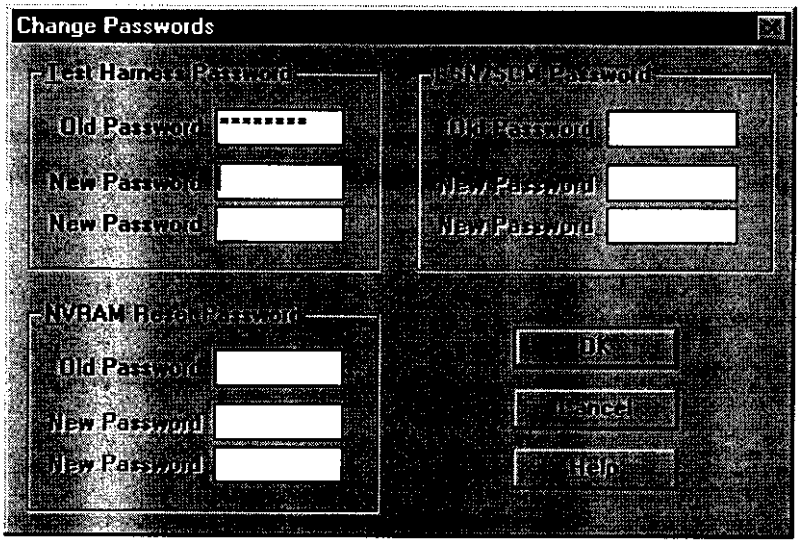

Figure 4–8 **Change Passwords**

The displayed dialogue box has 3 edit boxes for each of the THP, ESP and NRP passwords. Each password requires the old password to be entered as well as the new password to be entered twice for verification.

Note: You will not be able to enter a new password until you have made an entry for the old password.

The application will attempt to connect to the SRT if not already connected.

4.6 Running AccessPhone Terminal Programmer

AccessPhone Terminal Programmer operates in a Windows environment, functions such as Save, Help and Exit operate as they do under Windows.

Once AccessPhone Terminal Programmer is installed and a password selected the functions can then be accessed. This can be preformed in a number of ways.

- Selecting from the pulldown menus below:
  File Configure Program Help
- By clicking on one of the buttons displayed below:
  
- Using keystrokes as indicated in the above menu (ie Ap for the Program Menu).

4.7 File

The File Menu commands allow the management of files and printing. It also allows the user to exit the program.

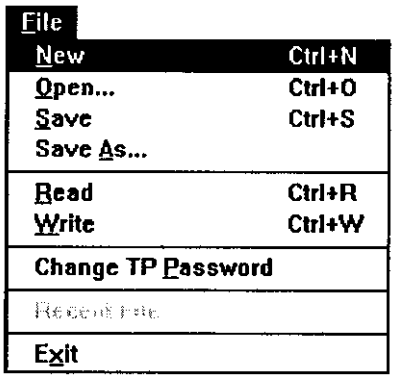

Figure 4–9 **File Menu**

The commands are described below:

File Menu Item	Description
New	Creates a new configuration file, such as when parameters are changed for a different geographical location.
Open	Opens an existing configuration file.
Save	Saves the configuration file currently open.
Save As	Saves a newly created configuration into a file, or allows an opened file to be copied and then saved under a different name.
Read	Reads SRT parameters from the connected SRT into a new SRT data file. Test Harness and ESN/SCM Password must be entered.
Write	Writes SRT parameters to the connected SRT from the opened SRT data file. Test Harness and ESN/SCM Password must be entered.
Change TP Password	Changes the AccessPhone Terminal Programmer application password.
Recent File	Not used.
Exit	Clicking on the Exit button exits you from AccessPhone Terminal Programmer and returns you to Windows.

Table 4–2 **File Menu Items**

4.8 Configure

The Configure Menu commands allow you change the Communications configuration, change passwords and connect to the AccessPhone.

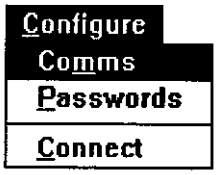

Figure 4–10 **Configure Menu**

4.8.1 Comms

Use this command to configure the serial port communication parameters.

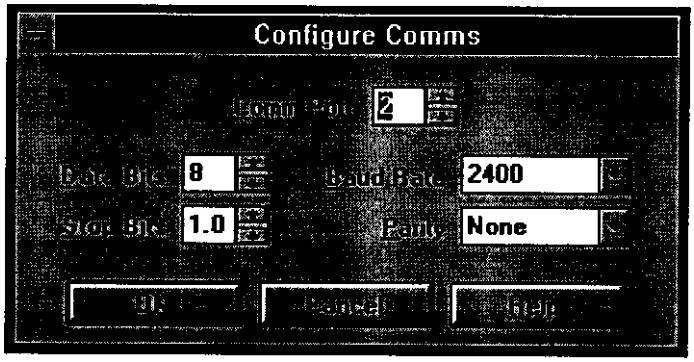

Figure 4–11 **Configure Comms**

To establish a connection to an SRT using these communications parameters use the Connect Command.

The following parameters are configurable, but the SRT can only communicate using the default values for data bits, stop bits, baud rate and parity.

Comm Port

The serial port used to communicate to the SRT. The range of allowable ports is 1 to 10.

The default is COM1.

Data Bits

Allowable values are 4 to 8.

The default is 8.

Stop Bits

Allowable values are 1, 1.5 and 2.

The default is 1.

Baud Rate

A range of common baud rates is provided.

The default is 2400.

Parity

Allowable values are Even, Mark, None and Odd.

The default is None.

4.8.2 Passwords

Use this command to pre-enter the passwords required for access to the SRT.

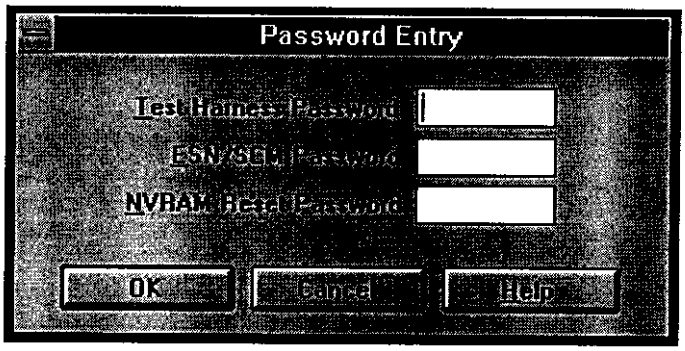

Figure 4–12 **Password Entry**

If the passwords are not pre-entered you will be prompted for them when they are required. If a password is entered incorrectly in the pre-entry dialogue box you will also be prompted to re-enter them when they are required.

> **Note:** Incorrect entry of any password three times in a row will cause the application to terminate.

The password pre-entry dialogue box is automatically displayed after the application password has been entered on startup, and when trying to establish a connection if the THP has not been entered.

Test Harness Password (THP) This password is used to request access to the SRT functions. This is the only password that is mandatory to access the SRT.

ESN/SCM Password (ESP) This password is used when accessing the ESN (Electronic Serial Number) and Bandwidth parameters of the SRT. These parameters are configured using the Program Factory Command.

NVRAM Reset Password (NRP) This password is used to reset the SRT parameters to their default values. Resetting the SRT parameters to their default values is performed using the Program Defaults Command.

4.8.3 Connect

Use this command to establish a connection to the SRT. A connection must be established before any parameters can be read or written to the SRT.

Entry of the Test Harness Password is mandatory for connection to the SRT. If this has not already been entered the password entry dialogue box will be displayed.

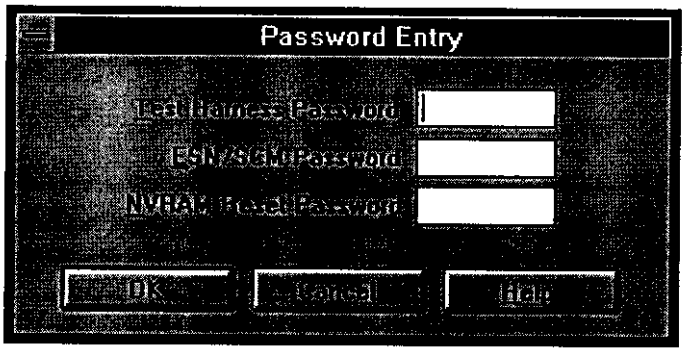

Figure 4–13 **Password Entry**

If the application and Test Harness Passwords are entered on startup then the application will attempt to connect to the SRT.

Reset the SRT

When connecting or performing read /write functions the SRT will prompt to be reset.

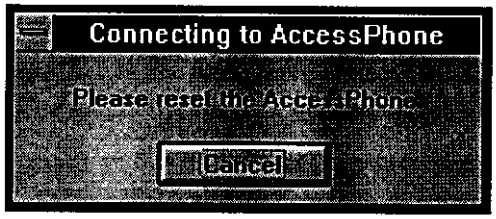

Figure 4–14 **Connecting to AccessPhone**

This is done by momentarily removing the power plug from the back of the SRT.

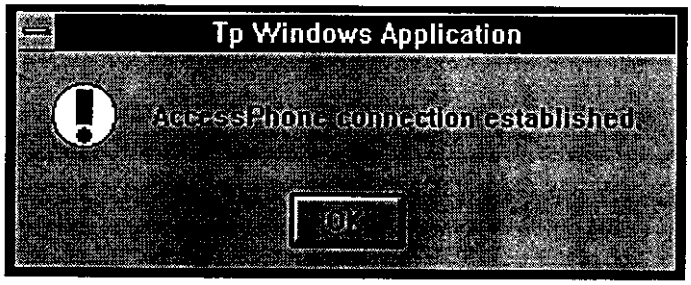

Figure 4–15 **Tp Windows Application**

Selecting a command that requires a connection to the SRT when the connection has not been established will cause the application to automatically attempt to connect.

The connection attempt may be cancelled at any time by selecting the Cancel button in the connection window. If a connection could not be established after a reasonable period of time the attempt will timeout. The following dialogue box will be displayed.

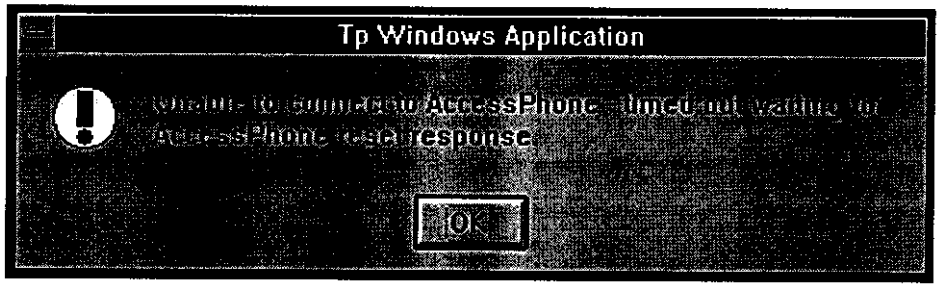

Figure 4–16 **Tp Windows Application**

4.9 Program

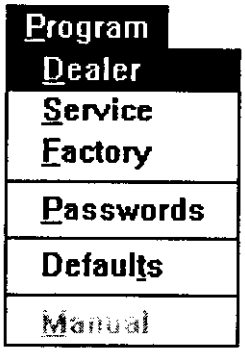

Figure 4–17 **Program Menu**

The Program Menu commands allow you to:

- Access three programming levels:

  Dealer

  Service

  Factory

- Change the access Passwords to the levels.
- Set defaults
- Manually set SRT parameters

4.9.1 Dealer

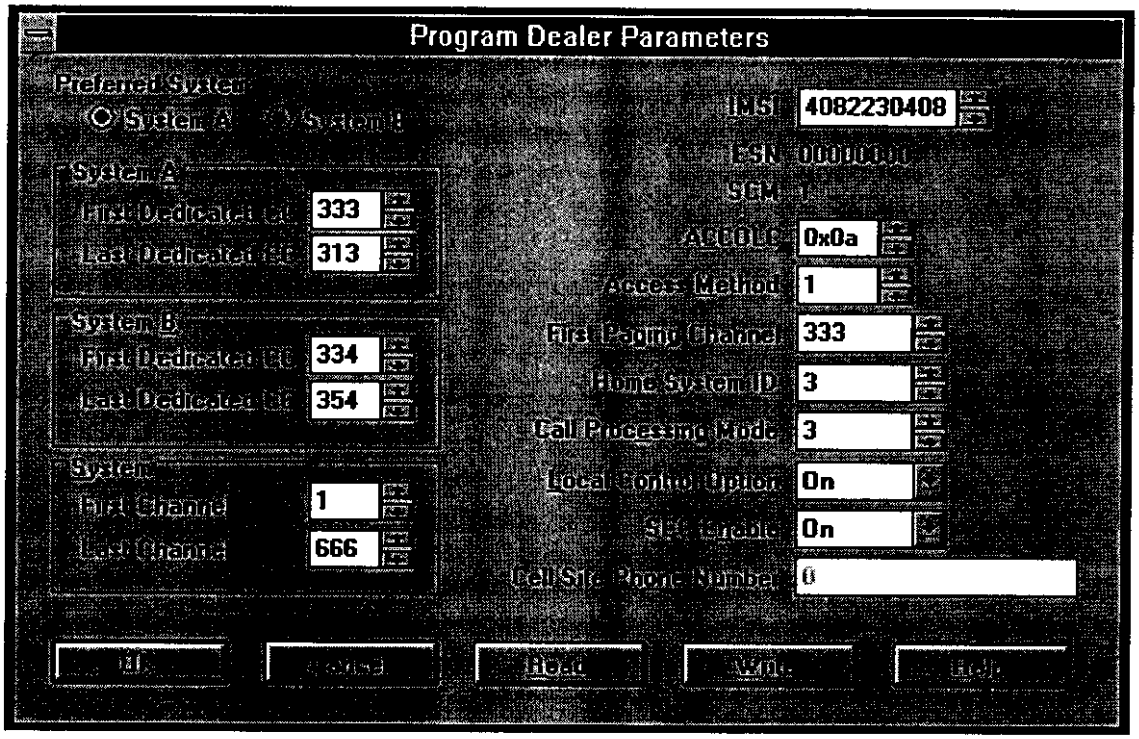

Figure 4–18 **Program Dealer Parameters**

Use this command to edit, view, read or write the SRT dealer parameters. The dialogue box displayed allows editing of the following dealer related parameters,

Preferred System

A pair of buttons allows selection of System A or System B as the preferred system.

The default setting is System A.

System A first dedicated control channel

System A last dedicated control channel

A pair of controls allows specification of the first and last dedicated control channels for System A. The value of the bandwidth parameter in the Factory Parameters determines the range of allowable values. If the bandwidth value is 20 the range is 1 to 666, otherwise if the bandwidth value is 25 then the range is 1 to 1023.

As the SRT is capable of full 25 MHz AMPS bandwidth the range of possible channels is 1 to 1023.

Default values are 333 and 313 respectively.

System B first dedicated control channel

System B last dedicated control channel

A pair of controls allows specification of the first and last dedicated control channels for System B. The value of the bandwidth parameter in the Factory Parameters determines the range of allowable values. If the bandwidth value is 20 the range is 1 to 666, otherwise if the bandwidth value is 25 then the range is 1 to 1023.

As the SRT is capable of the full 25 MHz AMPS bandwith the range of possible channels is 1 to 1023.

Default values are 334 and 354 respectively.

System First Channel

System Last Channel

A pair of controls allow specification of the first and last dedicated control channels for the System. The value of the bandwidth parameter in the Factory Parameters determines the range of allowable values. If the bandwidth value is 20 the range is 1 to 666, otherwise if the bandwidth value is 25 then the range is 1 to 1023.

As the SRT is capable of the full 25 MHz AMPS bandwith the range of possible channels is 1 to 1023.

Default values are 1 and 666 respectively.

IMSI Number

The mobile stations 10 digit IMSI value as defined in ITU E.212.

ESN

The ESN value is an 8 digit hexadecimal number uniquely identifying each SRT. The ESN value cannot be modified in the Dealer Parameters dialogue box. This value might not be supported by older versions of the SRT firmware (N/A displayed).

SCM

The SCM value is the mobile's Station Class Mark as defined in EIA/TIA-553 section 2.3.3. It defines the Mobile Station's power class, bandwidth and transmission characteristics (continuous or not continuous).

The SRT SCM of 8 means it is a power class I device capable of full 25 MHz operation and continuous transmission.

This value cannot be modified and might not be supported by older versions of the SRT firmware (N/A displayed).

Access Overload Class (ACCOLC)

This value is used by the cellular system the SRT is currently operating on to forbid the SRT from making calls. In time of heavy traffic the system can temporarily suspend mobiles from originating call based on their access overload class. The system can stop from one to sixteen classes from originating calls.

The SRT can still register and receive calls when it is not allowed to originate calls.

A control allows configuration of the Access Overload Class. The value is displayed in hexadecimal format, but can be entered in either hexadecimal or decimal. To enter values in hexadecimal use the "0x" prefix, otherwise for decimal omit this prefix.

The ranges of allowable values are 0 to F, with a default value of 0x0A.

This value is normally set to the last digit of the IMSI for normal mobiles and A to F for emergency and test mobiles (see EIA/ISB-16 for details).

Access Method

On originations or registrations the mobile can send IMSI or IMSI and ESN. A control allows the Access Method to be set.

This value can be 0 (IMSI) or 1 (IMSI and ESN), with the default being 1.

Note: This parameter should not be changed from the default

First Paging Channel

Cellular systems can use one set of control channels for mobiles accessing the system (referred to as access channels) and one set of control channels for paging mobiles (called paging channels). If this is the case then the SRT must be told of where the first paging channel is using this parameter.

If the paging and access channels are combined then this parameter should be set to the first control channel for A or B band (depending on the preferred system selection).

A control allows selection of the First Paging Channel. The value of the bandwidth parameter in the Factory Parameters determines the range of allowable values. If the bandwidth value is 20 the range is 1 to 666, otherwise if the bandwidth value is 25 then the range is 1 to 1023.

As the SRT is capable of the full 25 MHz AMPS bandwith device the range of possible channels is 1 to 1023.

The default value is 333.

Home System ID

All cellular systems transmit a system identification or SID on their control channel. The SRT compares this system ID against is Home System ID to determine if it is roaming or not.

A hexadecimal control allows specification of the Home System ID. This value may be entered in either hexadecimal or decimal format. To enter values in hexadecimal use the "0x" prefix, otherwise for decimal omit this prefix.

This value may range from 0 to 32767 (0x7FFF).

The default is 3.

Call Processing Mode

A control allows selection of the Call Processing Mode. This values are;

1 Handset picked up will automatically dial numbers to access system cellsite.

2 After dialling number a end of dial character must be entered.

3 End of dial character is detected by time out (**default**).

Local Control Option

This parameter defines whether or not the SRT should respond to local control messages from the cellular system. These messages are used to instruct mobiles to perform specific actions (which are not defined in the AMPS standard.

A selection box allows the Local Control Option to be turned either on or off.

The default option is on.

Serial Call Control (SCC)

A selection box allows the Serial Call Control to be turned either on or off.

The default option is on.

Cell Site Phone Number

An edit box allows specification of the Cell Site Phone Number. This can be any number up to 16 digits in length.

This parameter is only enabled if the Call Processing Mode is set to 1.

OK

Click the OK button to accept any changes made to the open SRT data file.

Cancel

Click the Cancel button to undo any changes and close the dialogue box.

Read

Click the Read button to read only the dealer parameters from the SRT. The application will prompt for any required passwords, and will attempt to connect to the SRT if it is not already connected.

Write

Click the Write button to write only the dealer parameters to the SRT. The application will prompt for any required passwords, and will attempt to connect to the SRT if it is not already connected.

4.9.2 Service

Use this command to edit, view, read or write the SRT service parameters.

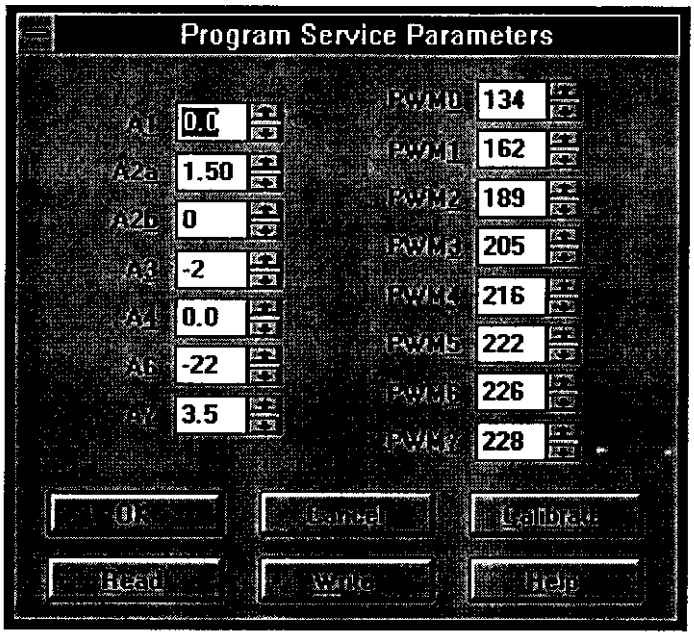

Figure 4–19 **Program Service Parameters**

The dialogue box displayed allows editing of the following service related parameters,

A1 TX Microphone Gain

This parameter is used to adjust nominal input audio level to yield zero compression level (77.5mVRMS).

A control allows specification of the A1 parameter value. This parameter can range from -12.0 to 0.0 at steps of 0.8.

The default value is 0.0.

A2a TX Gain (Fine)

This parameter is used to adjust zero compression level to produce nominal channel deviation (2.9kHz peak).

A control allows specification of the A2a parameter value. This parameter can range from -3.75 to +3.75 at steps of 0.25.

The default value is 1.50.

A2b TX Gain (Coarse)

Not used

A3 TX Data Level

This parameter is used to adjust TX data modulation for 8 kHz peak deviation of the carrier.

A control allows specification of the A3 parameter value. This parameter can range from -17 to -2 at steps of 1.

The default value is -2.

A4 TX Limiter Gain

This parameter is used to adjust TX deviation limiting to less than 12 kHz peak.

A control allows specification of the A4 parameter value. This parameter can range from -3.5 to +3.5 at steps of 0.5.

The default value is 0.0

A6 RX Audio Level Gain

This parameter is used to adjust RX zero compression level (77.5mVRMS) to yield nominal audio level.

A control allows specification of the A6 parameter value. This parameter can range from -30 to 0 at steps of 2.

The default value is -22.

A7 RX Zero Detector Gain

This parameter is used to adjust nominal RX modulation level (2.9kHz peak) to RX zero compression level.

A control allows specification of the A7 parameter value. This parameter can range from -3.5 to +3.5 at steps of 0.5.

The default value is +3.5.

PWM

PWM means Pulse Width Modulation. A D/A converter is built with the PWM signal of the processor and a low pass filter. The reconstructed analogue DC level is compared with the rectified TX signal in a comparator.

The output of the comparator controls the PA gain and thus the TX power level.

The EIA/TIA-553 (AMPS) standard (section 2.1.2.2) defines 8 power levels (attenuation levels) from level 0 (max power) to level 7 (minimum power) at 4 dB steps. Mobiles are instructed to power up/down by the basestation.

For a class I device such as the SRT the levels are defined as:

Level	Nominal ERP (dBW)
0	6
1	2
2	-2
3	-6
4	-10
5	-14
6	-18
7	-22

Table 4–3 SRT Levels

PWM0 to PWM7 are the ADC values, which define these power levels in the SRT.

PWM0

A control allows specification of the PWM0 parameter value. This value may be in the range from 0 to 255.

The default value is 134.

PWM1

A control allows specification of the PWM1 parameter value. This value may be in the range from 0 to 255.

The default value is 162.

PWM2

A control allows specification of the PWM2 parameter value. This value may be in the range from 0 to 255.

The default value is 189.

PWM3

A control allows specification of the PWM3 parameter value. This value may be in the range from 0 to 255.

The default value is 205.

PWM4

A control allows specification of the PWM4 parameter value. This value may be in the range from 0 to 255.

The default value is 216.

PWM5

A control allows specification of the PWM5 parameter value. This value may be in the range from 0 to 255.

The default value is 222.

PWM6

A control allows specification of the PWM6 parameter value. This value may be in the range from 0 to 255.

The default value is 226.

PWM7

A control allows specification of the PWM7 parameter value. This value may be in the range from 0 to 255.

The default value is 228.

OK

Click the OK button to accept any changes made to the open SRT data file.

Cancel

Click the Cancel button to undo any changes and close the dialogue box.

Read

Click the Read button to read only the service parameters from the SRT. The application will prompt for any required passwords, and will attempt to connect to the SRT if it is not already connected.

AccessPhone Terminal Programmer will prompt to save changes to the **scf.dat** file.

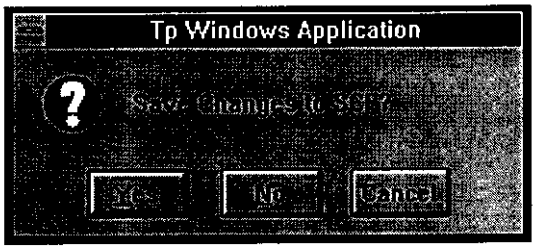

Figure 4–20 **Save Changes to SCF**

If Yes is selected then the screen below will display requesting a file name and location.

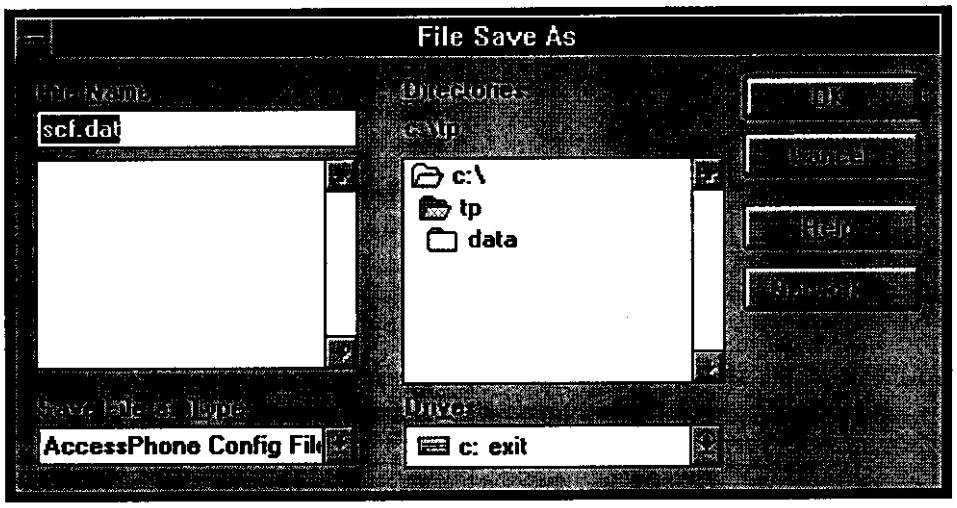

Figure 4–21 **File Save As**

If a No is selected or after the previous data is saved then the screen below will display showing the transfer of data.

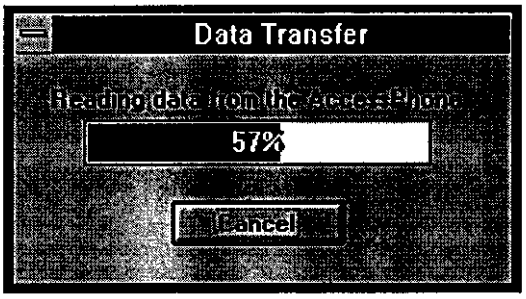

Figure 4–22 **Data Transfer (reading)**

Write

Click the Write button to write only the service parameters to the SRT. The application will prompt for any required passwords, and will attempt to connect to the SRT if it is not already connected.

AccessPhone Terminal Programmer will prompt you to accept changes made as shown;

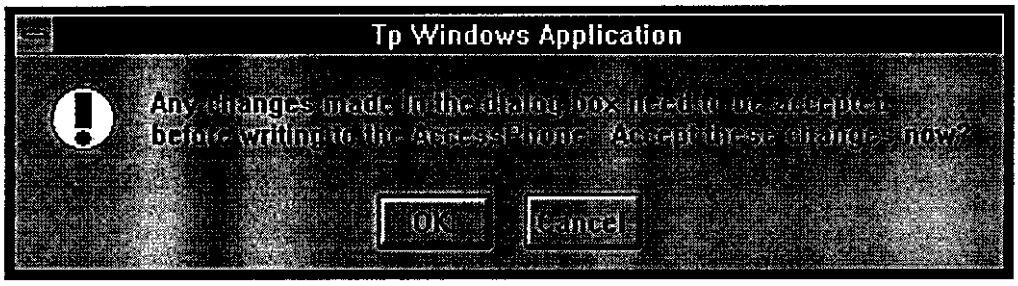

Figure 4–23 **Accept changes**

If OK is clicked then the data transfer screen will display as shown;

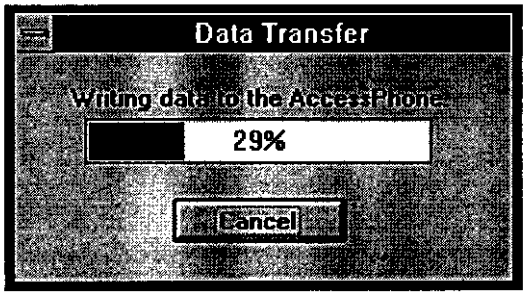

Figure 4–24 **Data Transfer (write)**

Calibrate

Click the Calibrate button to calibrate the A/D Converter on the SRT. Follow the steps as shown on the displayed menu.

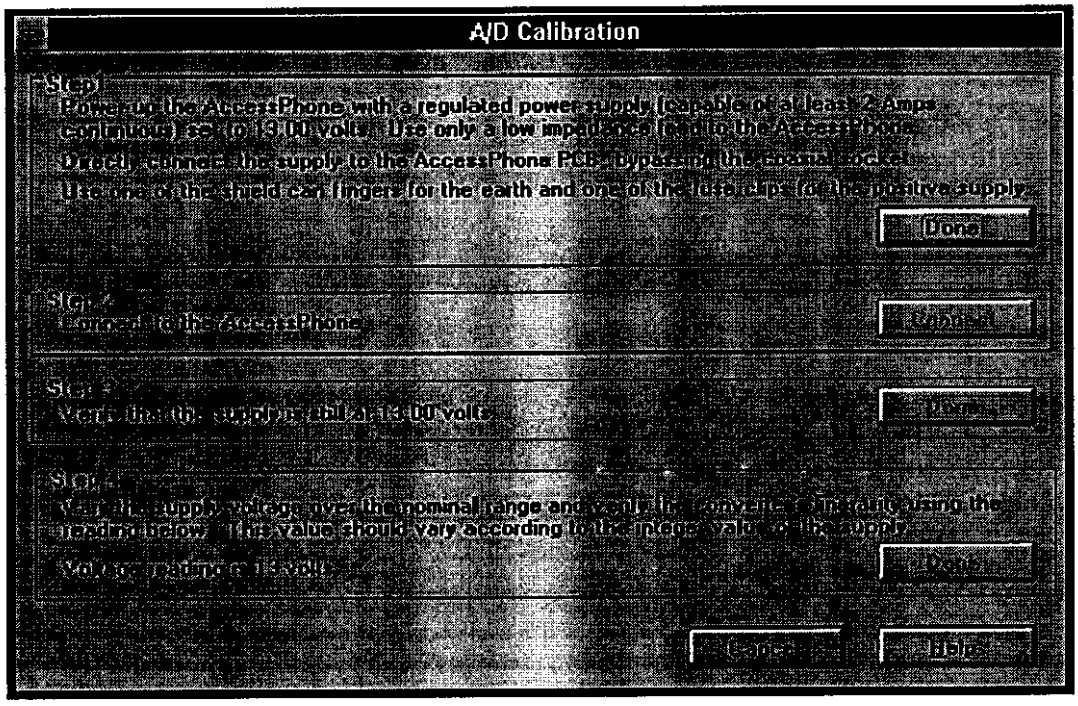

Figure 4–25 **A/D Calibration**

4.9.3 Factory

Use this command to edit, view, read or write the SRT factory parameters.

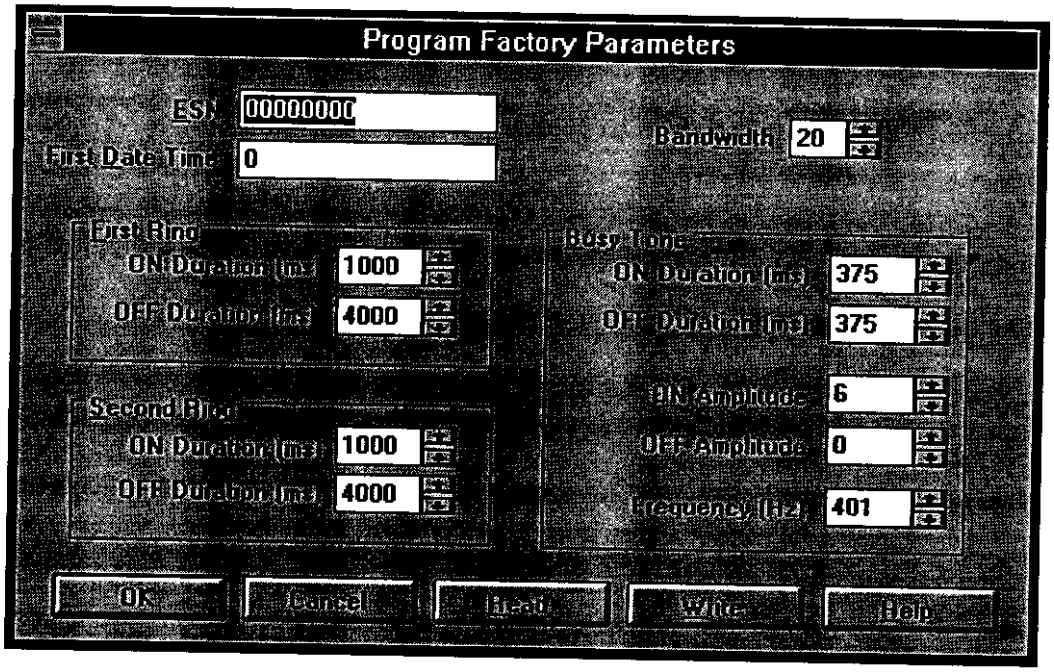

Figure 4–26 **Program Factory Parameters**

The dialogue box displayed allows editing of the following factory related parameters,

ESN

An edit box is provided for specification of the SRT ESN. The value may be any 8-digit number, with the default value equal to 0.

This value is in hexadecimal.

First Date Time

An edit box is provided for specification of the First Date Time parameter value. The value may be any alphanumeric string no longer than 12 characters.

The default value is an empty string.

Bandwidth

A control is provided for specification of the Bandwidth parameter value. This value may either be 20 or 25. This value also determines the maximum value of the channel parameters in the Dealer Parameters. If the Bandwidth is 20 then the maximum channel is 666, otherwise if the Bandwidth is 25 then the maximum channel is 1023.

First Ring On Duration

First Ring Off Duration

Second Ring On Duration

Second Ring Off Duration

Four controls are provided for specification of the ring timing parameter values. These values are in milliseconds and may range from 1 to 9999.

The default values are 1000, 4000, 1000 and 4000 milliseconds respectively.

Busy Tone On Duration

Busy Tone Off Duration

Pair of controls is provided for specification of the busy tone timing parameter values. These values are in milliseconds and may range from 1 to 999.

The default values are 375 milliseconds for both.

Busy Tone On Amplitude

Busy Tone Off Amplitude

A pair of controls is provided for specification of the busy tone on and off amplitudes. These values may be in the range from 0 to 15, with 0 being off.

The default values are 6 and 0 respectively.

An entry of 1 will produce 2dB of attenuation, 2 will produce 4dB and so on to an entry of 15 producing 30dB of attenuation.

Busy Tone Frequency

A control is provided for specification of the busy tone frequency. This value is in Hertz (Hz) and may be one of a series of values in the range 336 to 85714. If an invalid value is entered the control will select the closest allowable value.

The default value is 401 Hz.

OK

Click the OK button to accept any changes made to the open SRT data file.

Cancel

Click the Cancel button to undo any changes and close the dialogue box.

Read

Click the Read button to read only the factory parameters from the SRT. The application will prompt for any required passwords, and will attempt to connect to the SRT if it is not already connected.

Write

Click the Write button to write only the factory parameters to the SRT. The application will prompt for any required passwords, and will attempt to connect to the SRT if it is not already connected.

4.9.4 Defaults

Use this command to reset the SRT parameters of the connected SRT. This includes resetting of the THP, ESP and NRP passwords to their default values.

CAUTION

You must provide all details that are prompted for. Failure to enter these details may cause the SRT to enter a state where it cannot be accessed at all and will not function.

4.9.5 Manual

This command is only available to ADI production personnel.

4.10 Help

AccessPhone Terminal Programmer Help provides a quick way to find information on how to perform a particular task or information on aspects of AccessPhone Terminal Programmer. Within a help topic there may be one or more jumps (in green) which can be clicked (or selected and press E) to display a new Help topic.

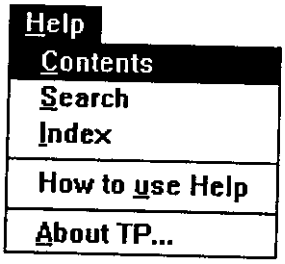

Figure 4–26 **Help**

The Help window can be resized or moved like any other window.

4.10.1 Contents

Contents displays AccessPhone Terminal Programmer Help contents.

4.10.2 Search

Search allows searches for key words within the help function.

4.10.3 Index

Index provides a jump off point to help on the four major command groupings:

- File menu
- Configure Menu
- Program menu
- Help menu

4.10.4 How to use Help

How to use Help describes how to use the function within AccessPhone Terminal Programmer

4.10.5 About TP

About AccessPhone Terminal Programmer displays current information on the AccessPhone Terminal Programmer package.

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Chapter 5 Maintenance, Removal and Replacement Procedures

5.1 Preventive Maintenance

The SRT does not require any special maintenance procedures.

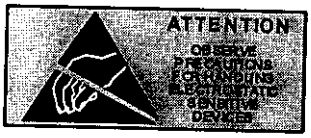
To prolong the life of the equipment it should be operated in a dry, dust-free environment, away from direct heat.

Check the SRT periodically for corrosion of connectors and damaged insulation on attached cables.

5.2 Removal Procedures

CAUTION

Only suitably trained and qualified personnel should attempt removal of the SRT PCA.



The SRT Printed Circuit Assembly has static-sensitive devices. Wear an earthed wrist strap to prevent damage to these devices.

5.2.1 Required Equipment

PosiDriv Screwdriver

5.2.2 Disassembly

The SRT contains a single Printed Circuit Assembly (PCA). During testing and fault-finding it may be necessary to remove the PCA. Use the following instructions to remove the PCA from the SRT:

1. Turn off the power source to the SRT (AC adaptor plug pack or optional battery pack) and disconnect the power plug at the rear of the equipment.
2. Disconnect the standard telephone device connector at the rear of the equipment.
3. Disconnect the antenna BNC connector at the rear of the equipment.
4. Unscrew the two screws at the rear panel of the equipment and remove the rear panel. Stow the screws and the panel in a safe place.

Figure 5–1 **SRT (rear)**

5. Locate the two screws on the bottom panel of the SRT. These screws hold the PCA in place. Holding the equipment horizontally, unscrew and remove the two screws and stow in a safe place.

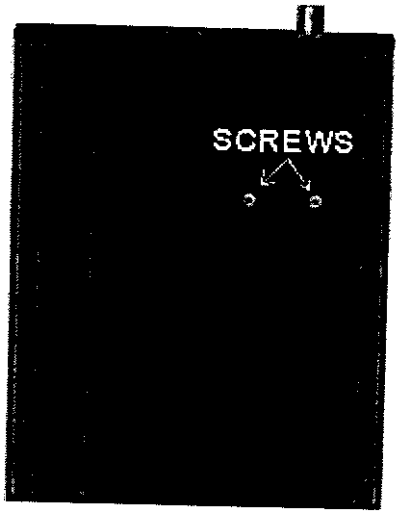


Figure 5–2 **SRT (bottom)**

1. Hold the edge of the PCA and gently slide the board out of the rails in the SRT case.

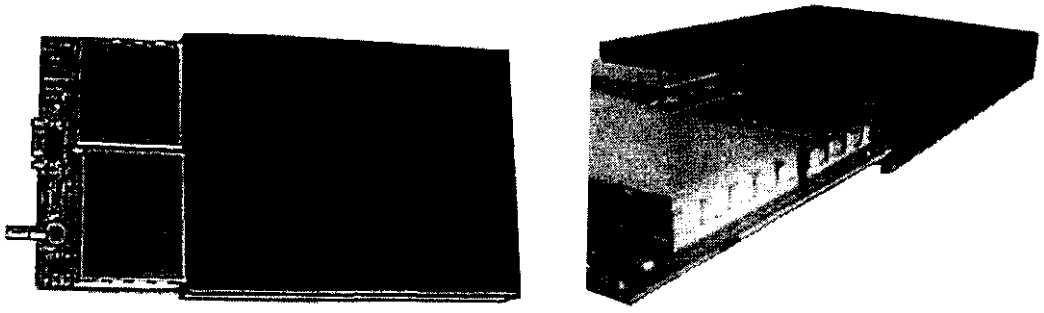


Figure 5–3 **SRT (open)**

7. Place it on an anti-static mat. The PCA is now ready for further disassembly if required.

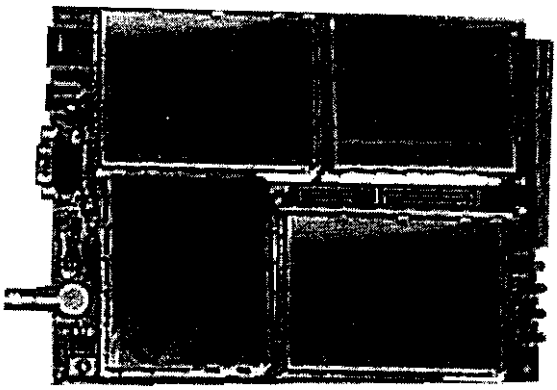


Figure 5–4 **PCA**

5.2.1 Removing the RF Covers from the PCA

The PCA is divided into four areas by the RF covers. These covers reduce electromagnetic interference to components on the PCA. The areas enclosed by the RF covers are roughly coincident with four functional units of the SRT: Receiver, Transmitter, Baseband and Control, LIU and Power Supply.

The SRT Printed Circuit Assembly has static-sensitive devices. Wear an earthed wrist strap to prevent damage to these devices.

To remove the RF Cover, gently and evenly prise upwards the clipped edge of the RF Cover. Remove and place in a safe place.

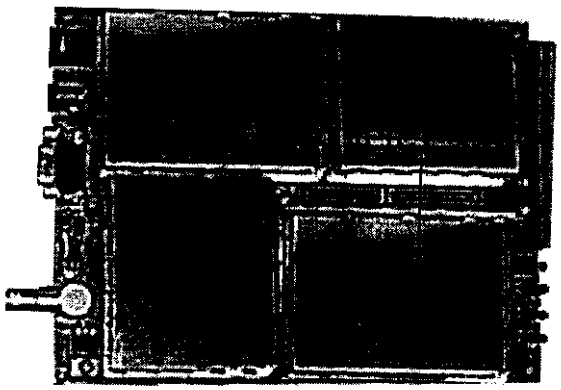


Figure 5–5 **RF Covers**

5.3 Replacement Procedures

The replacement procedures for the PCA and the RF Covers are the reverse of the removal procedures.

5.4 Replacing the Fuse

To gain access to the fuse on the PCA, repeat steps 1 to 4 of the removal procedures for the PCA. The fuse is located at the edge of the board and can be replaced without further disassembly of the SRT.

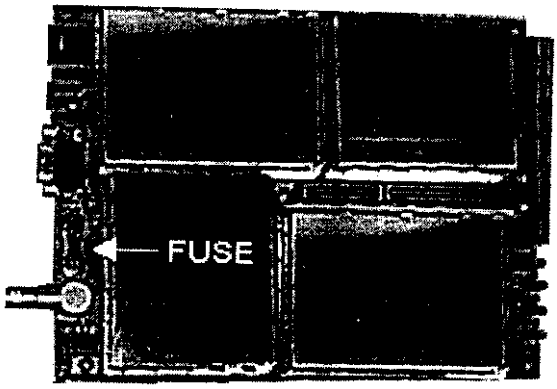


Figure 5–6 **Fuse location**

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APPENDIX A

SRT Specifications

General

SRT dimensions	
Maximum Width	160 mm
Maximum Height	35 mm
Maximum Depth	210 mm
Weight	1 kg
Power requirements	
Main AC Power Supply	110 V AC or 240 V AC (using adaptor plug pack)
DC Power	11 to 15 V DC
Power consumption (Max)	4 W (standby), 8 W (typical), 18 W (Maximum)
Transmit power	4 W (maximum)
Transmit method	Full duplex voice channel
Air Interface	Advanced Mobile Phone System (AMPS) E1A-T1A-553
Telephone Interface	Compatible with standard DTMF formats
Dialling Method	Tone
Diagnostics	Built-in
Environmental Conditions	
Operating Temperature	–30°C to +60° C
Operating Humidity	95% (non-condensing)

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APPENDIX B

This appendix contains the following diagrams for the SRT:

ASH-CD-00913	(sheet 1 of 14)	Top Level Schematic
ASH-CD-00913	(sheet 2 of 14)	Top Level Schematic
ASH-CD-00913	(sheet 3 of 14)	Power
ASH-CD-00913	(sheet 4 of 14)	RF
ASH-CD-00913	(sheet 5 of 14)	RF
ASH-CD-00913	(sheet 6 of 14)	Baseband
ASH-CD-00913	(sheet 7 of 14)	Baseband
ASH-CD-00913	(sheet 8 of 14)	Line Interface Unit
ASH-CD-00913	(sheet 9 of 14)	Line Interface Unit
ASH-CD-00913	(sheet 10 of 14)	Control Unit
ASH-CD-00913	(sheet 11of 14)	Control Unit
ASH-CD-00913	(sheet 12 of 14)	Control Unit
ASH-CD-00913	(sheet 13 of 14)	Signal Cross-Reference
ASH-CD-00913	(sheet 14 of 14)	Unit Cross-Reference

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DRAW. NUMBER
ASH-CD-00913

USED ON DRAWING
ASH-AS-02794

ISS	DATE	CHANGE	APPROVAL
0.20	12/12/97	See Eng Mark Up	
0.21	18/02/97	See Eng Mark Up	
1.20	26/03/98	See Eng Mark Up	
1.01	15/07/98	See CN 7713	

TOP LEVEL SCHEMATIC - SYSTEM OVERVIEW

ISONEX - 3000

PCB DIRECTIVES USED:
ROOM

Battery Connection

+BATTF
GROUND
/48VSENSE

POWER
Sheet 3

TEST1
TEST2
TEST3
TEST4
TEST4A
TEST7
TEST7A
TEST8
TEST9
TEST10

BASEBAND
Sheets 6 & 7

RF Antenna

ANT
VSYNTH
+8V
EXT_RST
TEST5

RF
Sheets 4 & 5

CONTROL
Sheets 10, 11 & 12

Programming Por
RS232 Serial Po

RXD
TXD
+75VSENSE
V_BAT

Handset Interface

Line Interface Unit
Sheets 8 & 9

DRAWN	TJS, AK, RK
CHECKED	
PASSED	
APPROVED	
SECURITY CLASSIFICATION UNCLASSIFIED	
DRAWING PRACTICE AS 1.22	

ADI LIMITED
© A.C.N. 008 642 751 424 LANE COVE RD. NORTH RYDE

TITLE ISONEX-3000
SUB TOP LEVEL SCHEMATIC

DOCM	DRAWING NUMBER
Z1599	ASH-CD-00913
SCALE NTS	SHEET : OF 14

DRAWING NUMBER
ASH-CD-00913

USED ON
ASH-AS-02784

TOP LEVEL SCHEMATIC - EXTERNAL CONNECTIONS

ISS	DATE	CHANGE	APPROVAL
2.20	12/12/97	See 2nd Mark Up	
2.21	21/02/97	See 2nd Mark Up	
1.20	26/03/98	See 2nd Mark Up	
1.21	15/07/98	See CN 7713	

PCB DIRECTIVES USED:
DELAY_RULE (mm)
MIN_LINE_WIDTH

LINE (RJ11-6)

DCE (DB9)

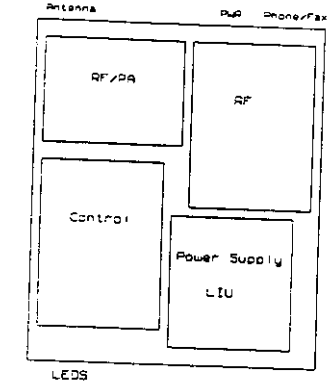
Antenna (BNC Connector)

Battery (2.5mm DC Socket)

Ground Connection Point

Electromagnetic Emission and Interference Shielding

RF/PA Can | Power Supply Can | RF Unit Can | Control Unit Can



Grounded Mounting Holes
(For future products)
Earth Connections

SLIC Heatsink Mounting Holes
Earth Connections

Earth/DGND/AGND/BGND grounds exist.

DRAWN	TJS, AK, RK
CHECKED	
PASSED	
APPROVED	
SECURITY CLASSIFICATION UNCLASSIFIED	
DRAWING PRACTICE AS 1:22	

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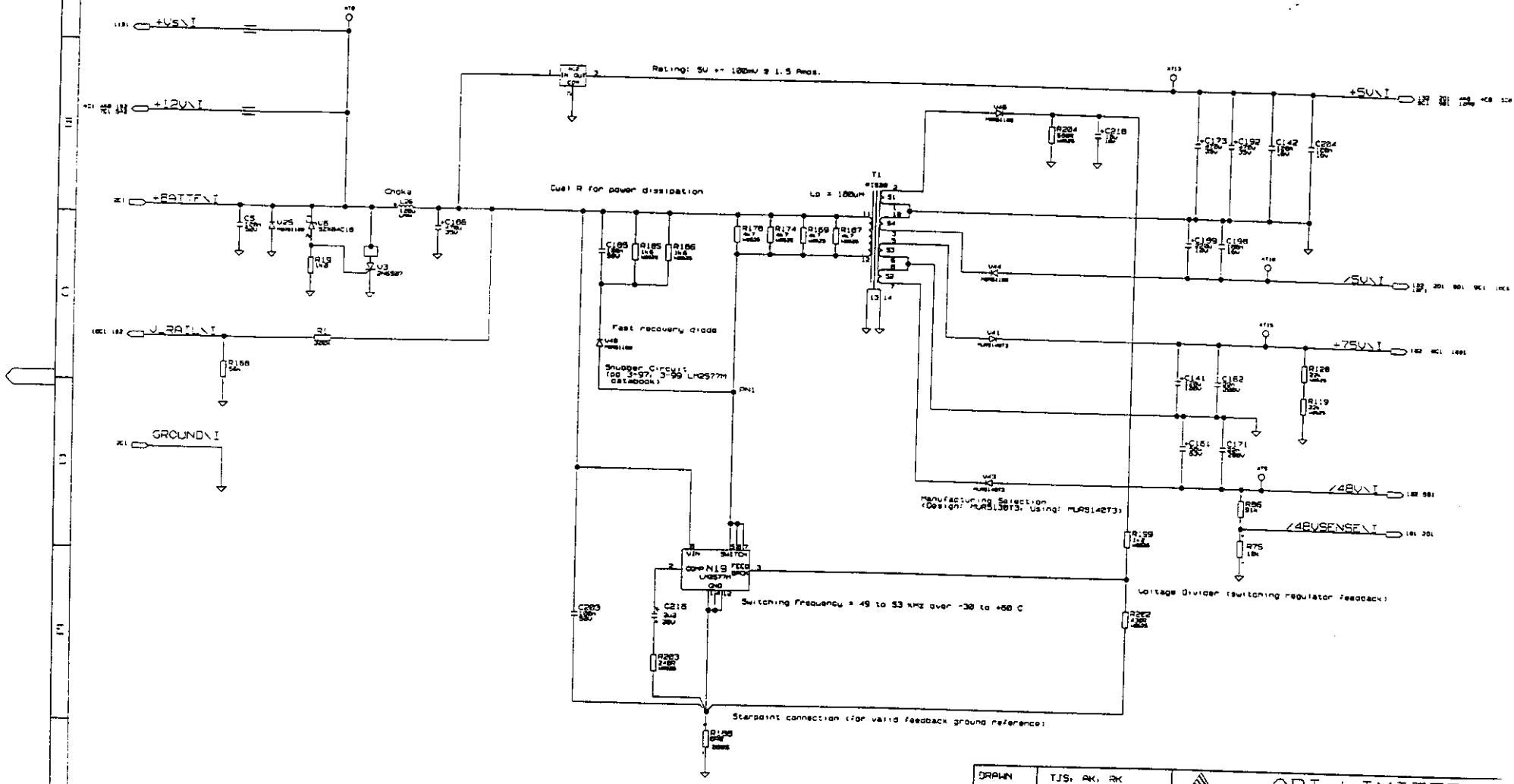
TITLE ISONEX-3000
SUB TOP LEVEL SCHEMATIC
DCCM Z1599
DRAWING NUMBER ASH-CD-00913
SCALE NTS
SHEET 2 OF 14

DRAWING NUMBER
ASH-CD-00913

USED ON
ASH-AS-02784

POWER CIRCUITS

ISS	DATE	CHANGE	APPROVAL
2.20	12/12/97	See 2nd Mark Up	
2.21	01/03/98	See 2nd Mark Up	
1.20	25/03/98	See 2nd Mark Up	
1.21	15/07/98	See CN 7713	



PCB DIRECTIVES USED:

DRAWN	TJS, AK, RK
CHECKED	
PASSED	
APPROVED	
SECURITY CLASSIFICATION UNCLASSIFIED	
DRAWING PRACTICE AS 1122	

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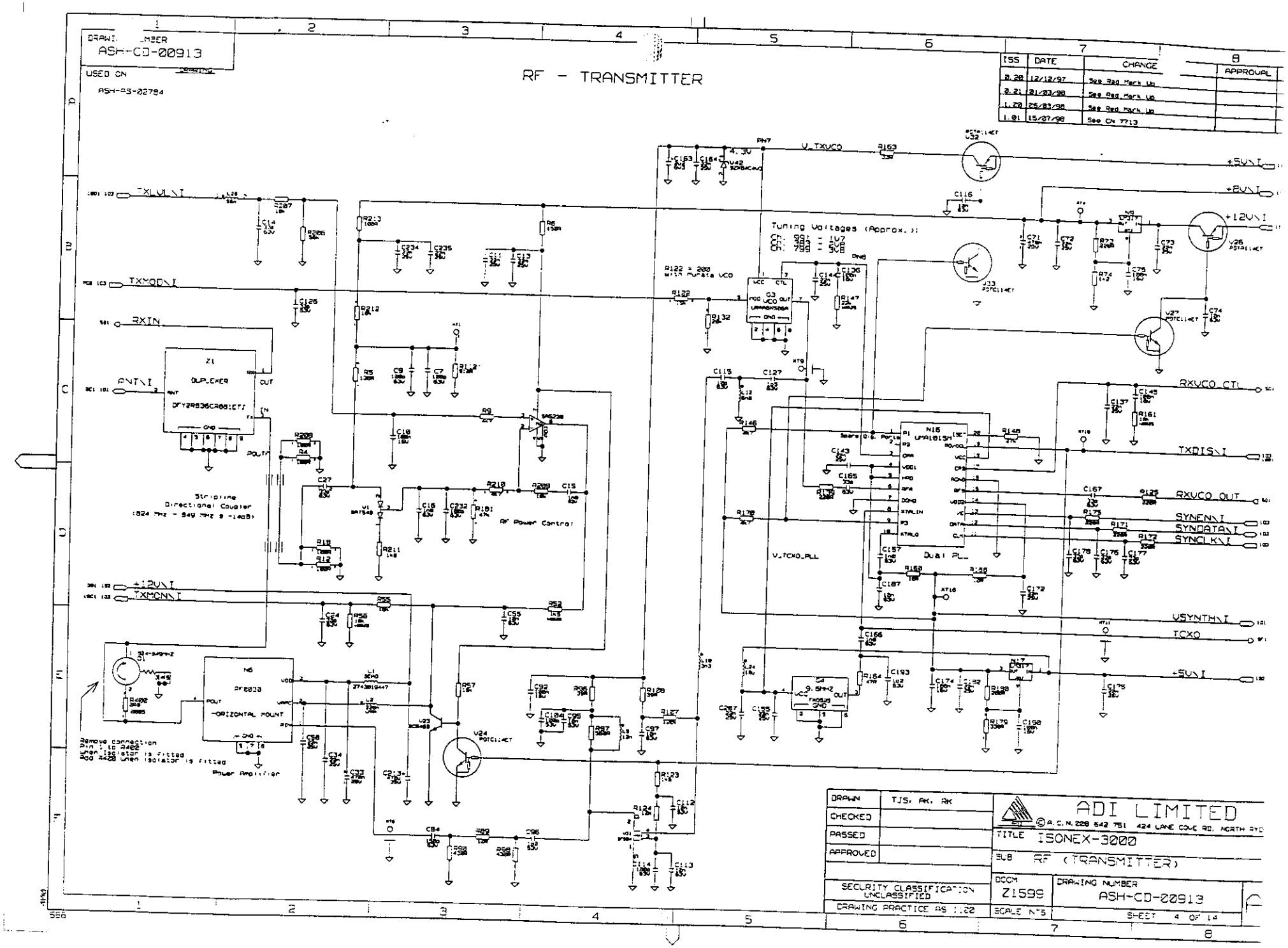
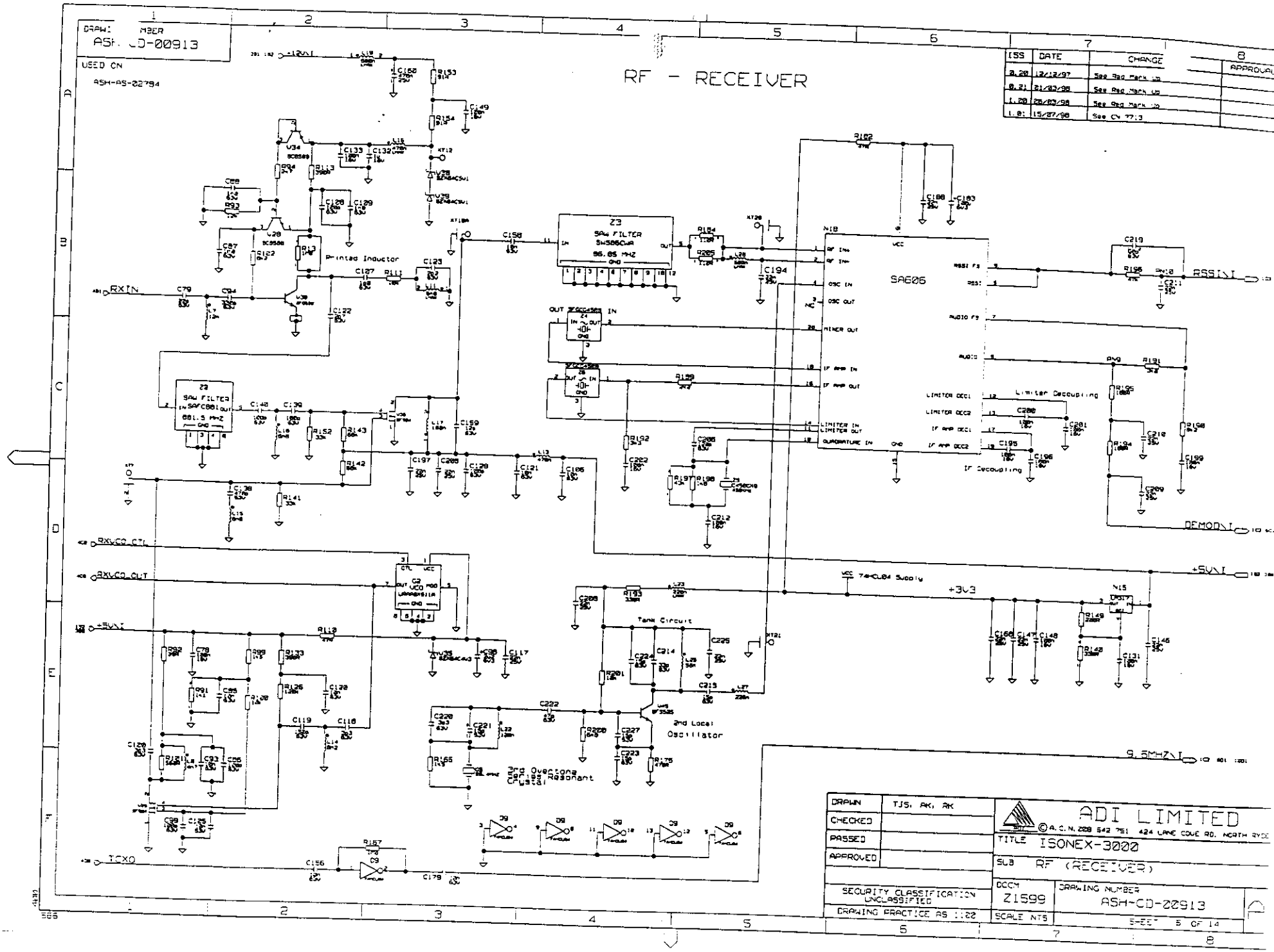
TITLE	ISONEX-3000
SUB	POWER SUPPLY
DOCM	Z1593
DRAWING NUMBER	ASH-CD-00913
SCALE N.T.S	SHEET 3 OF 14


DRAWING NUMBER
ASH-CD-00913
USED ON
ASH-AS-02784
RF - TRANSMITTER
ISS | DATE | CHANGE | APPROVAL
0.20 | 12/12/97 | See Eng Mark Up
0.21 | 21/03/98 | See Eng Mark Up
1.20 | 26/03/98 | See Eng Mark Up
1.01 | 15/07/98 | See CN 7713
Tuning Voltages (Approx.):
RXIN
ANT\I
TXMOD\I
TXLVL\I
TXMON\I
+12V\I
+8V\I
+5V\I
RXVCO_CTL
TXDIS\I
RXVCO_OUT
SYNEN\I
SYNDATA\I
SYNCLK\I
VSYNTH\I
TCXO
Z1 DUPLEXER
Stripline Directional Coupler
RF Power Control
Dual PLL
V_TXVCO
V_TCXO_PLL
Power Amplifier
DRAWN TJS, AK, RK
CHECKED
PASSED
SECURITY CLASSIFICATION UNCLASSIFIED
DRAWING PRACTICE AS 1122
ADI LIMITED
© A.C.N. 008 642 751 424 LANE COVE RD. NORTH RYDE
TITLE ISONEX-3000
SUB RF (TRANSMITTER)
DOCM Z1599
DRAWING NUMBER ASH-CD-00913
SCALE N/S
SHEET 4 OF 14


RF - RECEIVER
DRAWING NUMBER
ASH-CD-00913
USED ON
ASH-AS-22794
ISS | DATE | CHANGE | APPROVAL
0.20 | 12/12/97 | See 2nd Mark Up
0.21 | 21/03/98 | See 2nd Mark Up
1.20 | 28/05/98 | See 2nd Mark Up
1.0: | 15/07/98 | See CN 7713
+12V
RXIN
Printed Inductor
Z3
SAW FILTER
SW586MA
96.85 MHz
Z2
SAW FILTER
SAFC881
881.5 MHz
SA606
RF IN+
RF IN-
OSC IN
OSC OUT
MIXER OUT
IF AMP IN
IF AMP OUT
LIMITER IN
LIMITER OUT
QUADRATURE IN
RSSI F3
RSSI
AUDIO F3
AUDIO
LIMITER DEC1
LIMITER DEC2
IF AMP DEC1
IF AMP DEC2
Limiter Decoupling
IF Decoupling
RSSI
DEMOD
RXVCO_CTL
RXVCO_OUT
VCO TRANSMITTER
+5V
+3V3
74HC04 Supply
Tank Circuit
2nd Local Oscillator
3rd Overtone Series Resonant Crystal
9.5MHZ
TCXO
DRAWN TJS, AK, RK
CHECKED
PASSED
APPROVED
SECURITY CLASSIFICATION UNCLASSIFIED
DRAWING PRACTICE AS 1122
ADI LIMITED
© A.C.N. 228 542 751 424 LANE COVE RD. NORTH RYDE
TITLE ISONEX-3000
SUB RF (RECEIVER)
DOCM Z1599
DRAWING NUMBER ASH-CD-00913
SCALE NTS
SHEET 5 OF 14

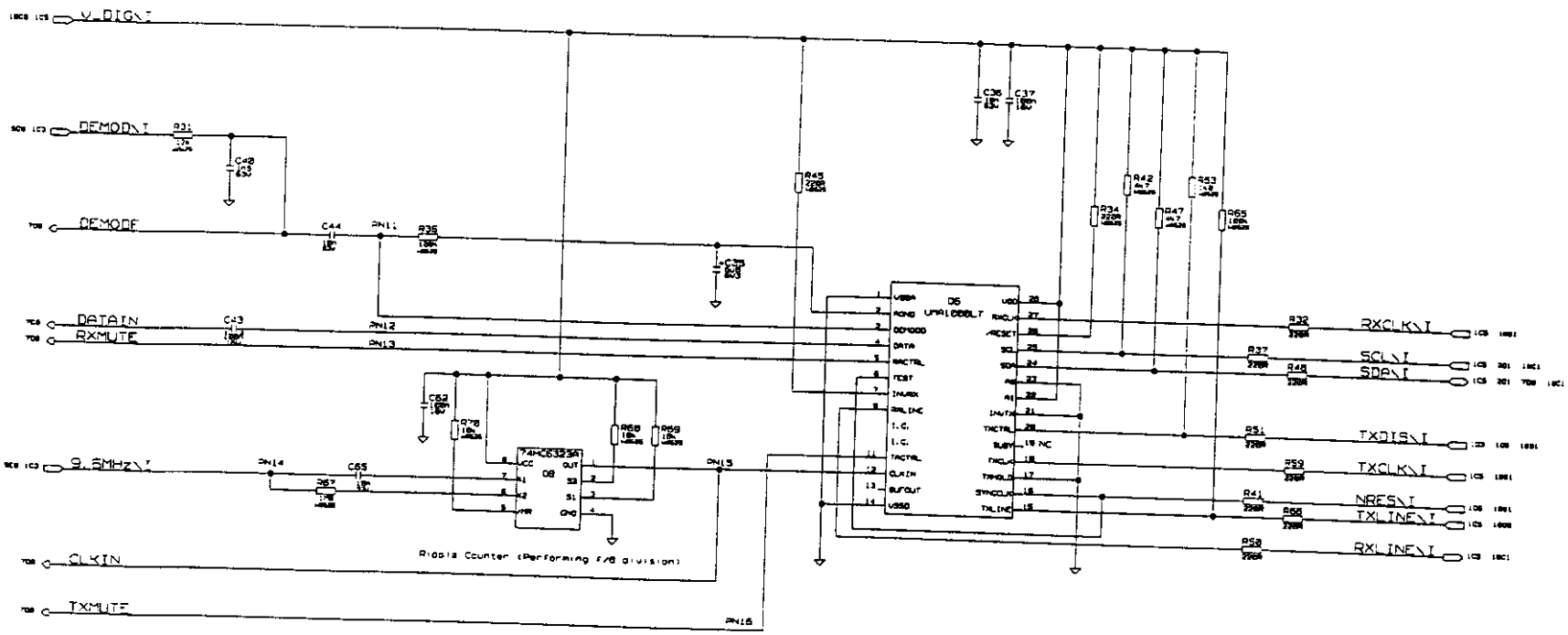
DRAWING NUMBER
ASH-CD-00913

USED ON
ASH-AS-02784 DRAWING

ISS	DATE	CHANGE	APPROVAL
0.20	12/2/97	See 3rd March Up	
0.21	21/03/98	See 3rd March Up	
1.00	26/03/98	See 3rd March Up	
1.01	15/27/98	See CN 7713	

BASEBAND - DPROC

PCB DIRECTIVES USED:



DRAWN	TJS, AK, RK
CHECKED	
PASSED	
APPROVED	
SECURITY CLASSIFICATION	UNCLASSIFIED
DRAWING PRACTICE AS	1:22

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TITLE ISONEX-3000
SUB BASEBAND (DPROC)
DCCN Z:599
DRAWING NUMBER ASH-CD-00913
SCALE NTS
SHEET 6 OF 14

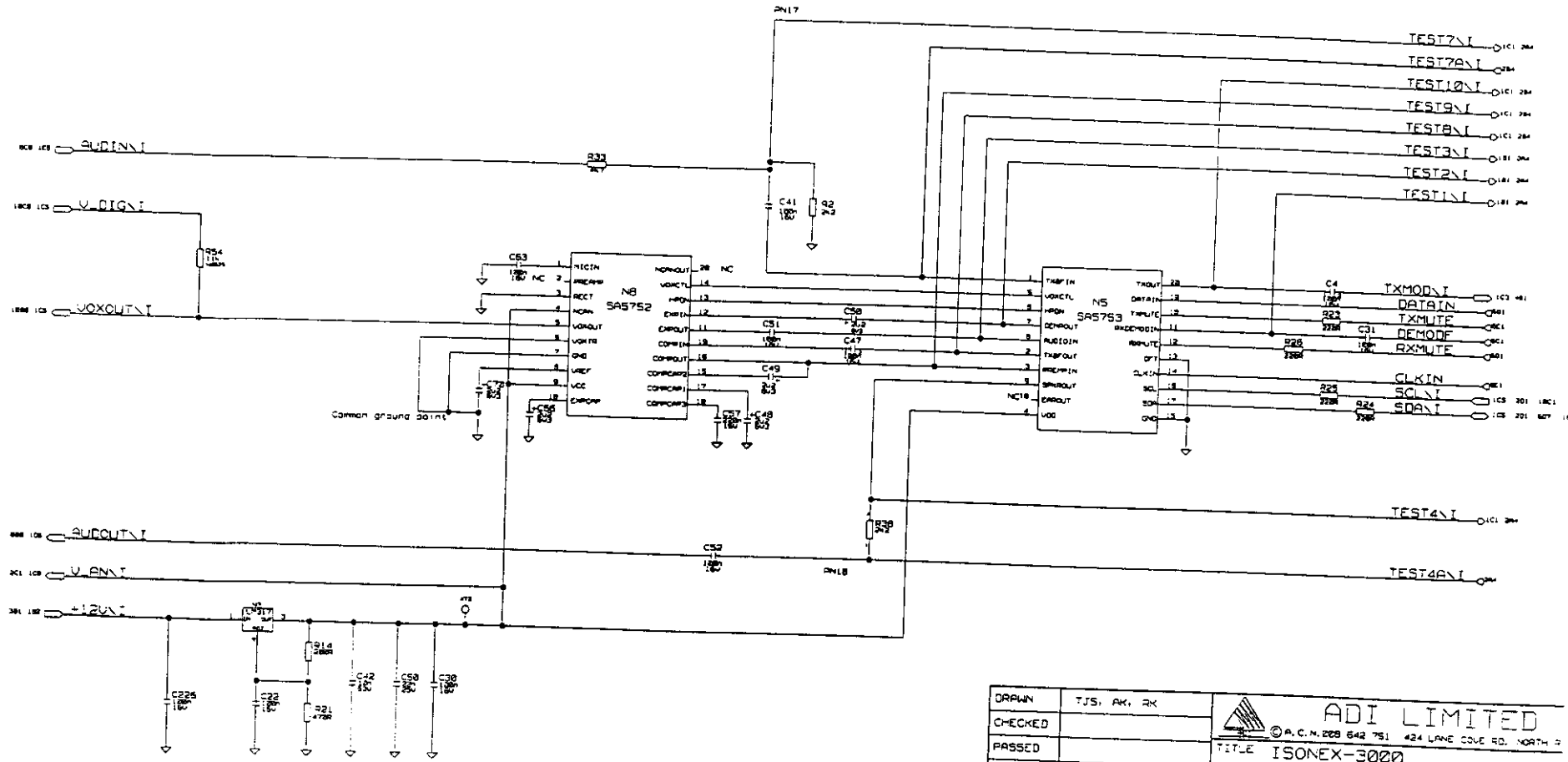
DRAWING NO
ASH- 00913

USED ON
ASH-AS-02794

BASEBAND - APROC

ISS	DATE	CHANGE	APPROVAL
0.20	12/12/97	See 2nd March Up	
0.21	01/03/98	See 2nd March Up	
1.00	26/03/98	See 3rd March Up	
1.01	15/07/98	See CN 7713	

PCB DIRECTIVES USED:



DRAWN	TJS, AK, RK
CHECKED	
PASSED	
APPROVED	
SECURITY CLASSIFICATION	UNCLASSIFIED
DRAWING PRACTICE AS	1.22

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TITLE	ISONEX-3000
SUB	BASEBAND (APROC)
DOCM	Z1599
DRAWING NUMBER	ASH-CD-00913
SCALE	NTS
SHEET	7 OF 14

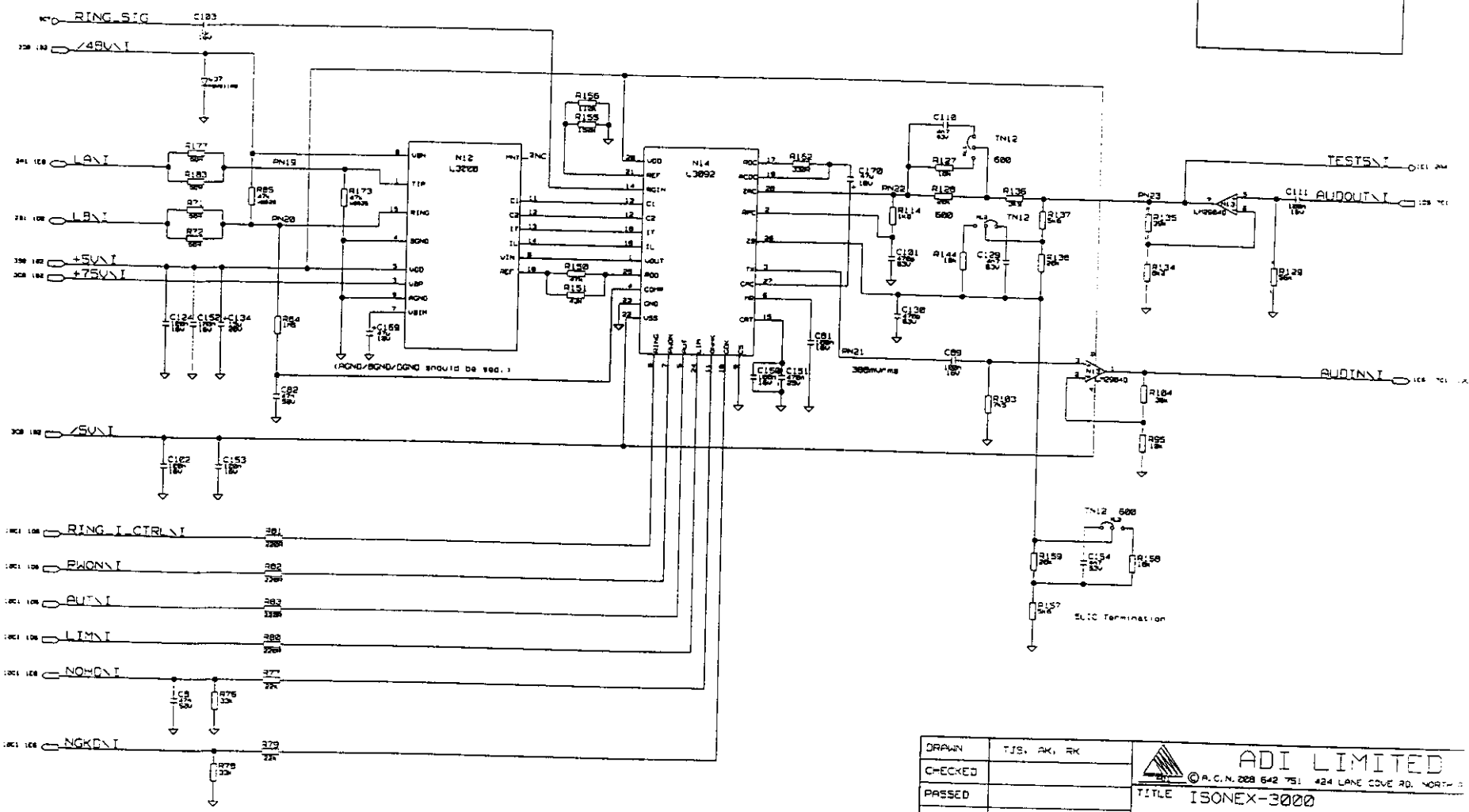
DRAWING NUMBER
ASH- 00913

USED ON DRAWING
ASH-AS-02784

LIU - MAIN

ISS	DATE	CHANGE	APPROVED
2.20	12/12/97	See Red Mark Up	
2.21	01/03/98	See Red Mark Up	
1.20	26/03/98	See Red Mark Up	
1.0!	15/07/98	See CN 7713	

PCB DIRECTIVES USED:



DRAWN	TJS, AK, RK
CHECKED	
PASSED	
APPROVED	
SECURITY CLASSIFICATION	UNCLASSIFIED
DRAWING PRACTICE AS	...122

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TITLE ISONEX-3000

SUB LIU (SLIC)

JOB NUMBER	DRAWING NUMBER
Z1599	ASH-CD-00913
SCALE NTS	SHEET 8 OF 14

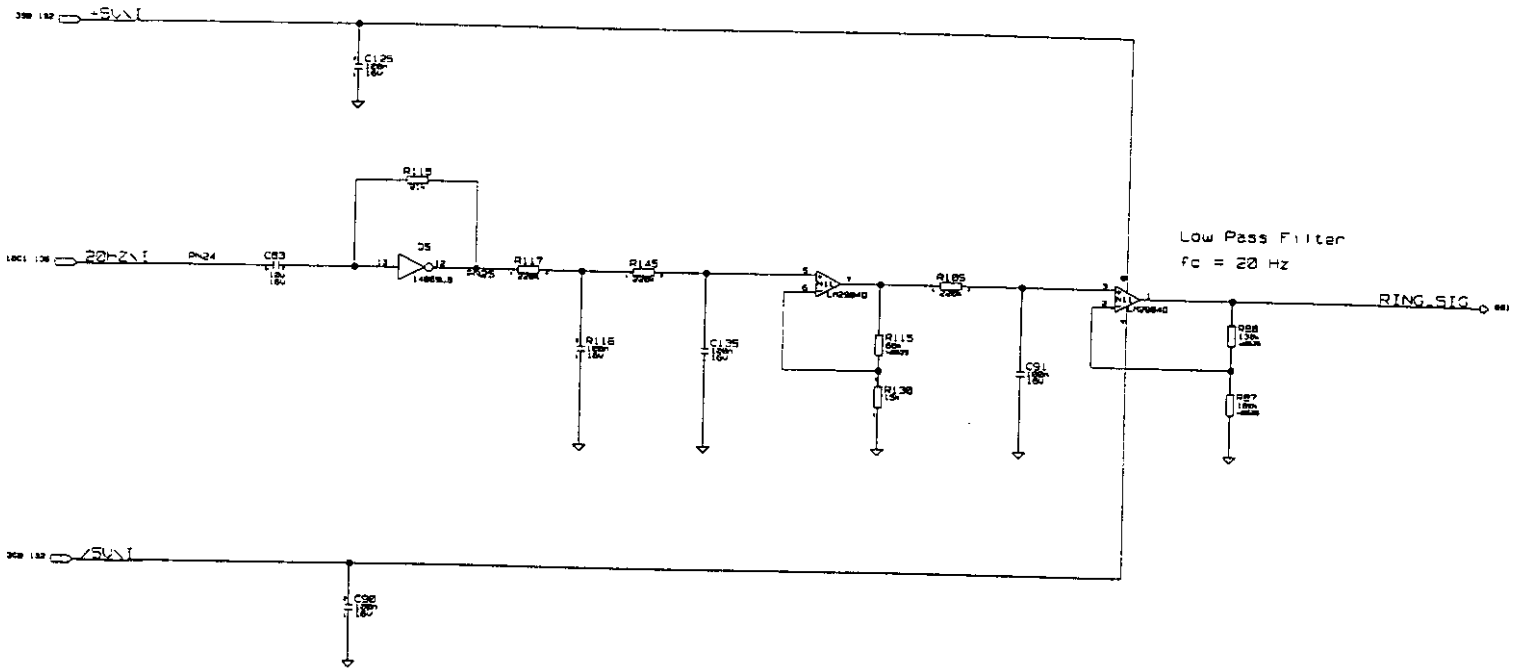
DRAWING NUMBER
ASH-CD-00913

USED ON
ASH-AS-02784

LIU - RING SIGNAL FILTERS

ISS	DATE	CHANGE	APPROVAL
2.20	12/12/97	See 3rd March LU	
2.21	21/03/98	See 3rd March LU	
1.28	28/03/98	See 3rd March LU	
1.31	15/07/98	See CN 7713	

PCB DIRECTIVES USED:



DRAWN	TJS, AK, RK
CHECKED	
PASSED	
APPROVED	
SECURITY CLASSIFICATION	UNCLASSIFIED
DRAWING PRACTICE AS	1:20

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TITLE ISONEX-3000

SUB LIU (RINGING FILTER)

DCCM	DRAWING NUMBER
Z1599	ASH-CD-00913
SCALE NTS	SHEET 9 OF 14

DRAWING NUMBER
ASH-CD-00913

USED ON
ASM-AS-02784

CONTROL - MAIN

ISS	DATE	CHANGE	APPROVAL
2.20	12/12/97	See 2nd Mark Up	
2.21	21/03/98	See 2nd Mark Up	
1.20	28/03/98	See 2nd Mark Up	
1.81	15/07/96	See CN 7713	

PCB DIRRECTIVES USED:

I2C Bus

+75vSENSE\I

Prescaler (75v to 0-3v) for ADC.

Microcontroller

80CL580

PS0312L-25JI

Address/Data Bus

Spare digital port

Analogue ports

9.6MHz\I

TXLVL\I

Non-volatile Storage

X24C22

Voltage Regulator +5V\I

+3V3

V_DIG\I

WATCHDOG_ENABLE

TXDATA

RXDATA

ALE

DELAYCORESET

/CHIP_SELECT

EIA232 Buffering

Spike Protection

EMI Filter

TXD\I

RXD\I

TRUE

RC Timer

RESET

Unused Inverters

Reset Delay

Powerdown Control

/EXT_RST\I

/5V\I

DRAWN	TJS, AK, RK
CHECKED	
PASSED	
APPROVED	
SECURITY CLASSIFICATION	UNCLASSIFIED
DRAWING PRACTICE	AS 1122

ADI LIMITED
A.C.N. 008 542 751 424 LANE COVE RD. NORTH RYDE

TITLE ISONEX-3000

SUB CONTROL (PROCESSOR)

DCCM	DRAWING NUMBER
Z1599	ASH-CD-00913
SCALE NTS	SHEET 10 OF 14

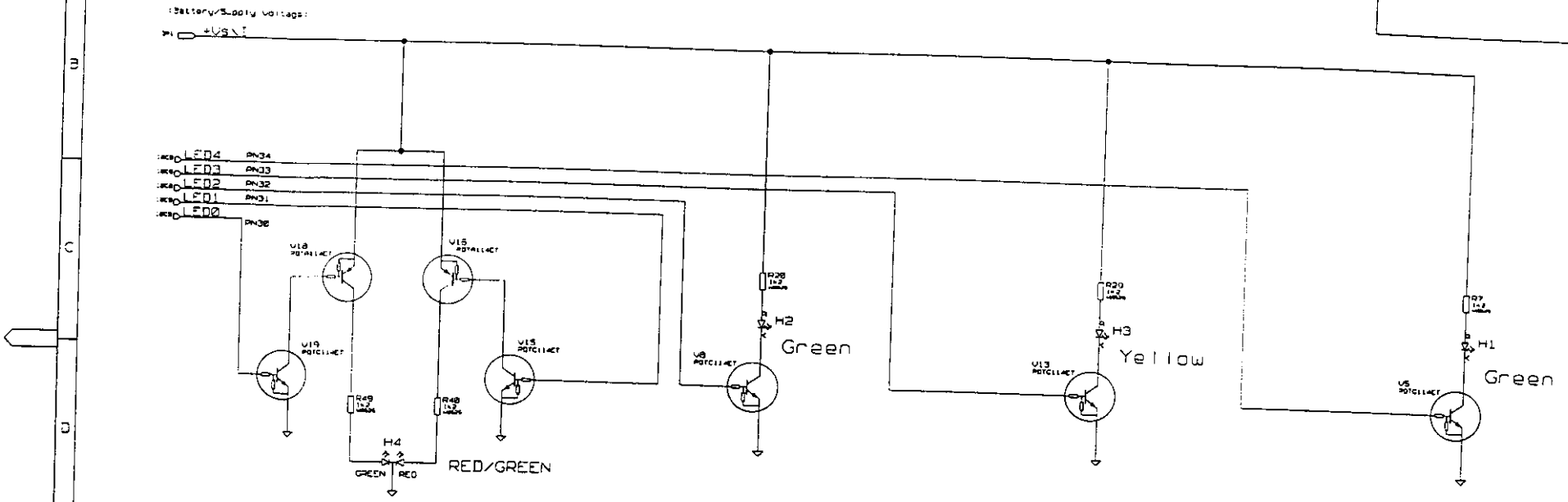
DRAWING NUMBER
AS-ID-00913

USED ON
ASH-AS-02794

AMPS SRT - CONTROL - INDICATORS

ISS	DATE	CHANGE	APPROVAL
2.20	12/12/97	See Seq Mark Up	
2.21	01/03/98	See Seq Mark Up	
1.20	26/03/98	See Seq Mark Up	
1.21	15/07/98	See CN 7713	

PCB DIRECTIVES USED:



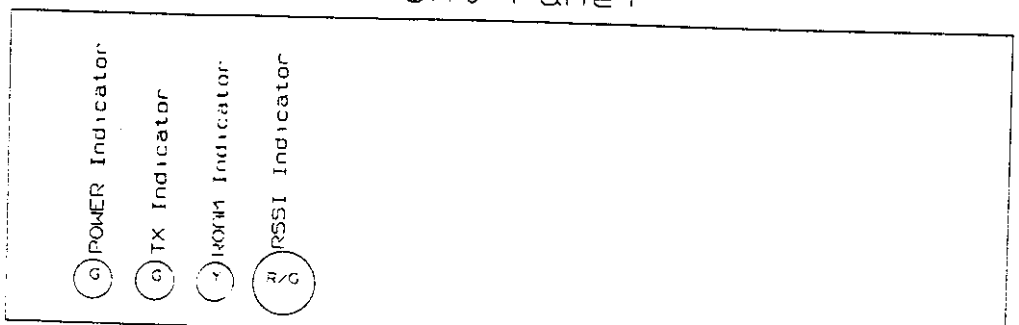
RSSI Indicator

TX Indicator

ROAM Indicator

POWER Indicator

Front Panel



DRAWN	TJS, AK, RK
CHECKED	
PASSED	
APPROVED	
SECURITY CLASSIFICATION UNCLASSIFIED	
DRAWING PRACTICE AS 1122	

ADI LIMITED
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TITLE ISONEX-3000

SUB CONTROL (INDICATORS)

DOCM	DRAWING NUMBER
Z1599	ASH-CD-00913
SCALE NTS	SHEET 11 OF 14

A

DRAWING NUMBER
ASH-CD-00913

USED ON
ASH-AS-02784

CONTROL - DTMF

ISS	DATE	CHANGE	APPROVAL
2.20	12/12/97	See Red Mark Up	
2.21	21/01/98	See Red Mark Up	
1.20	26/03/98	See Red Mark Up	
1.01	15/07/98	See CN 7713	

PCB DIRECTIVES USED:

DTMF - Decoder

V_DIGI

AUDINI

N1
MT88L70S

Tone present A

Tone absent A

NDTMFINT

DTMFD3
DTMFD2
DTMFD1
DTMFD0

DRAWN	TJS, AK, RK
CHECKED	
PASSED	
APPROVED	
SECURITY CLASSIFICATION	UNCLASSIFIED
DRAWING PRACTICE AS 1120	

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TITLE ISONEX-3000

SUB CONTROL (DTMF DECODER)

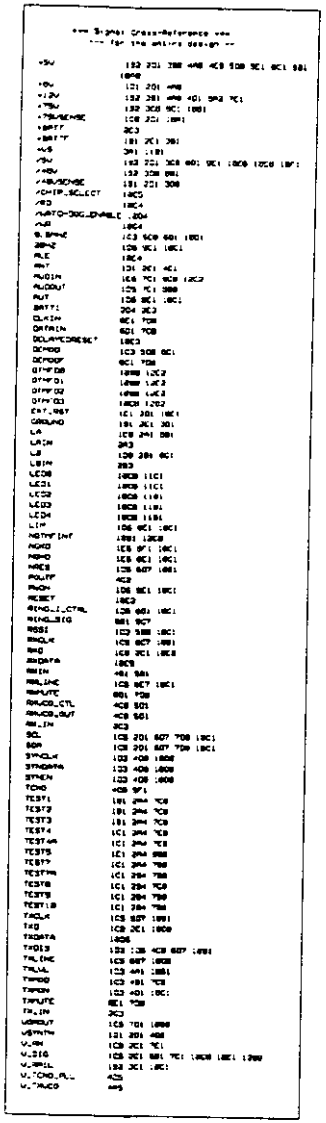
DCCM	Z1599
DRAWING NUMBER	ASH-CD-00913
SCALE	NTS
SHEET	12 OF 14

DRAWING NUMBER
ASH-CD-00913

USED ON

ASH-AS-02784

ISS	DATE	CHANGE	APPROVAL	ZO
B.20	12:12/97	See 3rd Mark Up		
B.21	01/03/98	See 3rd Mark Up		
L.20	26/03/98	See 3rd Mark Up		
L.01	15/07/98	See CN 7713		



DRAWN	TJS, AK, RK
CHECKED	
PASSED	
APPROVED	
SECURITY CLASSIFICATION	UNCLASSIFIED
DRAWING PRACTICE	AS 1122

ADI LIMITED
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TITLE ISONEX-3000

SUB SIGNALS CROSS-REFERENCE

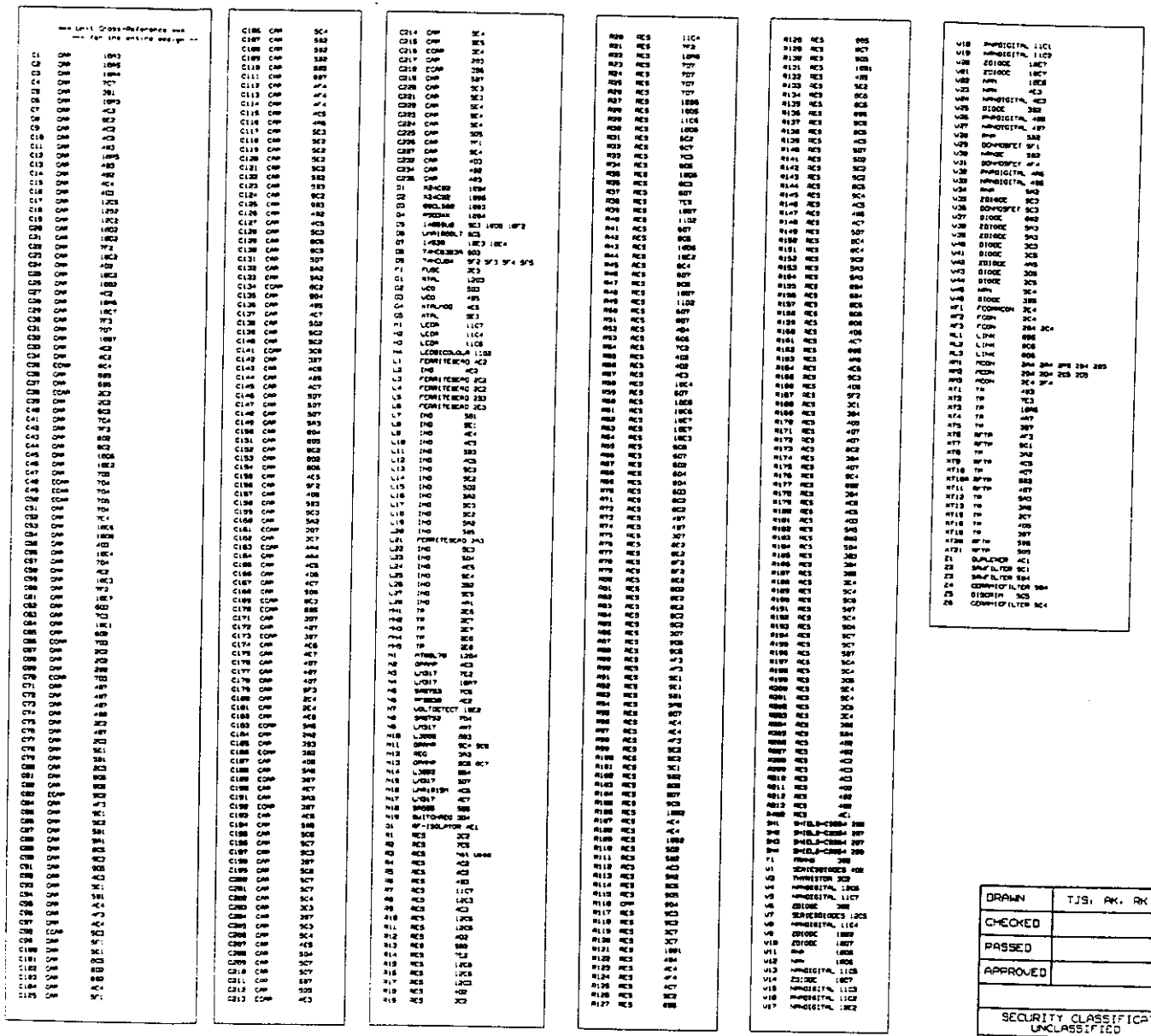
DOCM	DRAWING NUMBER	
Z1599	ASH-CD-00913	A2
SCALE NTS	SHEET 13 OF 14	

DRAWING NUMBER
ASH-CD-00913

USED ON

ASH-AS-02794

ISS	DATE	CHANGE	APPROVAL	ZONE
2.28	12/12/97	See 3rd Mark Up		
2.21	21/01/98	See 3rd Mark Up		
1.28	28/03/98	See 3rd Mark Up		
1.01	15/05/98	See CN 7713		



DRAWN	TJS, AK, RK
CHECKED	
PASSED	
APPROVED	
SECURITY CLASSIFICATION	UNCLASSIFIED
DRAWING PRACTICE AS 1120	

ADI LIMITED
 424 LANE COVE RD. NORTH RYDE

TITLE ISONEX-3000

SUB COMPONENT CROSS-REFERENCE

DCCM Z1599

DRAWING NUMBER ASH-CD-00913

A2

SCALE NTS

SHEET 14 OF 14

APPENDIX C

Obtaining SRT Parameters

To configure the SRT to the distributor requirement a checklist is included to be completed by the distributor and/or representative.

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ADI

SRT CONFIGURATION

Forward completed form to the Senior Production Controller
Telecommunications Division Osborne Park
18 Hasler Rd Osborne Park WA 6017, Australia.
Tel: +61 8 9273 0888 Fax: +61 8 9446 5038

	NAME:	SIGNATURE:
SALESPERSON		
CUSTOMER		
COUNTRY		
CUSTOMER ORDER #		

ORDER QUANTITIES

ITEM	PART #	QUANTITY
SRT DEFAULT CONFIGURATION	FM-1217-00	
SRT CUSTOM CONFIGURATION	FM-1227-00	
USER GUIDE - CHINESE (OPTION)	MN-1230-47	
POWER SUPPLY 90-264VAC 47/440Hz	FP-1226-76	
POWER SUPPLY 198-264VAC 50/60Hz	FP-1230-34	
UPS	FM-1229-43	
WHIP ANTENNA	AN-1224-00	
YAGI ANTENNA - 6 ELEMENT	AN-1225-54	
YAGI ANTENNA 15 ELEMENT	AN-1225-55	
VERTICAL COLLINEAR ANTENNA	AN-1225-56	
BATTERY CABLE 12V	TBA	
TECHNICAL MANUAL	MN-1225-63	
PROGRAMMING KIT	FM-1230-40	

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REQUIRED CONFIGURATION INFORMATION

	REQUIRED	DEFAULT
SYSTEM A FIRST CONTROL CHANNEL:		333
SYSTEM A LAST CONTROL CHANNEL:		313
SYSTEM B FIRST CONTROL CHANNEL:		334
SYSTEM B LAST CONTROL CHANNEL:		354
PREFERRED SYSTEM SELECT:		A
FIRST PAGING CHANNEL:		333
HOME SYSTEM ID		3
IMSI RANGES		
MINIMUM CALL DIGITS		3
CALL PROCESSING MODE SELECT		3
RING CADENCE		1000,4000,1000, 4000

OPTIONAL CUSTOMER INFORMATION

ACCESS OVERLOAD CLASS		LAST IMSI DIGIT
DIAL TONE FREQUENCY		400Hz
DIAL TONE AMPLITUDE		-12dB
BUSY TONE CADENCE		375,375
BUSY TONE FREQUENCY		426Hz
BUSY TONE AMPLITUDE		-12dB
CELL SITE PHONE NUMBER (IF CALL PROCESSING MODE = 1)		0
CELL INITIALISATION DIGIT (IF CALL PROCESSING MODE = 2)		#
LOCAL CONTROL (YES/NO)		YES
SYSTEM MANUFACTURER		ADI

DISTRIBUTOR REQUIRED INFORMATION

TEST HARNESS PASSWORD		yiedgobo

Appendix D Parts List

General

The following tables identify the parts of the SRT (part number FM-1217-00):

- Table D–1 SRT Assembly
- Table D–2 Adaptor Plug Pack, and External Antenna

Table D–1 SRT Assembly Parts List

Item	Description	Part Number	Qty
1	Case, SRT	MF-1229-61	1
2	Rubber feet, adhesive backed	FT-1216-76	4
3	End caps, moulded	PW-1229-82	1 pr
4	SRT artwork, front panel	LB-1229-86	1
5	Screw, No.4 x 3/8" LG, Pan hd, self tap	NB-1216-81	4
6	Warning/compliance label, SRT	LB-1227-22	1
7	Printed Circuit Assembly, SRT	SA-1216-83	1
8	Gasket	CO-1230-42	1
9	Screw, M3 x 6 LG, CSK HD to AS1427, XREC, ST/ST	NB-POSI-06	2
10	Carton, SRT, packing (not shown)	PK-1229-84	1
11	Packing, bubble-wrap, pocket 280 x 220 x 50 mm (not shown)	PK-1229-85	1

Table D–2 AC Adaptor Plug Pack, Antenna and Battery Pack Parts List

Item	Description	Part Number	Qty.
1	Power SUP 90-264VAC/13.5VDC 40W	FP-1226-76	1
2	Antenna 1/2 wave whip 820-845MHz	AN-1224-00	1
3	Antenna Yagi 9dB 6 Element 881MHz	AN-1225-54	1
5	Antenna Yagi 15dB 16 Element 881MHz	AN-1225-55	1
6	Antenna colinear 6dB 881MHz	AN-1225-56	1

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