General Information

Product Warranty Information

Advanced Signal products are warranted to be free from defects in material and workmanship for a period of ONE (1) YEAR from the date of shipment. Parts will be replaced free of charge for the full warranty period. The labor to repair products, or replace defective parts, will be covered on a return-to-factory basis only for the full warranty period.   For warranty service or repair, products must be returned to Advanced Signal, paid by customer. Modifications made to products not manufactured by Advanced Signal are warranted to be free from defects in material and workmanship for a period of NINETY (90) DAYS from the date of shipment.

Limitation on Damages

THE ABOVE WARRANTIES ARE PURCHASER'S EXCLUSIVE WARRANTIES AND NO OTHER WARRANTY, EXPRESS OR IMPLIED, SHALL APPLY. ADVANCED SIGNAL SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. ADVANCED SIGNAL'S LIABILITY TO PURCHASER FOR ANY CAUSE WHATSOEVER SHALL BE LIMITED TO THE PURCHASE PRICE PAID TO ADVANCED SIGNAL FOR THE PRODUCTS THAT ARE THE SUBJECT OF PURCHASER'S CLAIM. IN NO EVENT WILL ADVANCED SIGNAL BE LIABLE FOR ANY DAMAGES RESULTING FROM LOSS OF DATA OR USE, LOST PROFITS OR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES. THESE LIMITATIONS AND DISCLAIMERS ARE NOT MADE BY ADVANCED SIGNAL WHERE PROHIBITED BY LAW.

Other Disclaimers

Non-Advanced Signal manufactured products and batteries are excluded from this warranty. Non-Advanced Signal manufactured products are subject to the warranty provided by their manufacturers. Advanced Signal reserves the right to use reconditioned or refurbished parts. These reconditioned or refurbished parts are warranted as new.

Computer Software Copyrights

Advanced Signal warrants that its software and firmware designed by Advanced Signal will execute its programming instructions when properly installed. Advanced Signal does not warrant that the operation of the instrument, or software, or firmware will be uninterrupted or error free. Advanced Signal products may include copyrighted Advanced Signal computer programs stored in semiconductor memories or other media. Laws in the United States and other countries preserve for Advanced Signal certain exclusive rights for copyrighted computer programs, including the exclusive right to copy or reproduce in any form the copyrighted computer program. Accordingly, any copyrighted Advanced Signal computer programs contained in the Advanced Signal products may not be copied or reproduced in any manner without the express written permission of Advanced Signal. Furthermore, the purchase of Advanced Signal products shall not be deemed to grant either directly or by implication, estoppel, or otherwise, any license under the copyrights, patents or patent application of Advanced Signal, except for the normal non-exclusive, royalty free license to use that arises by operation of law in the sale of a product.

Service Warranty Information

Return Of Equipment

If a product malfunctions or fails in normal use within the Warranty period: (a) the purchaser shall promptly notify Advanced Signal of the problem and the serial number of the defective product. Advanced Signal shall, at its option, either resolve the problem over the telephone or issue a Return Authorization Number to the purchaser. The purchaser shall, at its cost, ship the product to Advanced Signal at the time the Return Authorization Number is issued;

(b) the return authorization number must be shown on the label attached to each product returned. A description of the fault must accompany each product returned. The returned product must be properly packed, and the insurance and shipping charges prepaid;

(c) Advanced Signal shall either repair or replace the returned product. The replacement product may be new or refurbished; where refurbished, it shall be equivalent to new in operation. When a returned product is replaced by Advanced Signal, the returned product shall become the property of Advanced Signal;

(d) Advanced Signal shall, at its cost, ship the repaired product or replacement to the purchaser. If the purchaser has requested Express Shipping, the purchaser shall pay the cost of the shipping; and

(e) Products which are repaired or replaced by Advanced Signal shall be free of defects in material and workmanship that would prevent compliance in all material respects with the corresponding documentation for the remainder of the original Warranty or 90 days from the date of repair or replacement, whichever is longer; all other terms of this Warranty apply to such repairs or replacements.

Caution

Improper use of your SIGNALpro may violate the provisions of the Electronic Communications Privacy Act of 1986 through intentional unauthorized use of protected radio communications. Every effort is made to limit the sale of SIGNALpro to genuine radio paging operators and law enforcement agencies. Advanced Signal unequivocally assumes no responsibility for any laws that may be broken, intentionally or otherwise, through the direct or indirect use of this, or any associated product.

This device complies with part 15 of the FCC rules. Operation is subject to the condition that this device does not cause harmful interference. Changes or modifications to this equipment not expressly approved by Advanced Signal are prohibited and may result in loss of the use of the device.

Technical Specifications

System Requirements:
A paging channel receiver and a Windows 3.1X or WIN95 personal computer are required for operation.

Power:
Universal AC: 90 - 132VAC, 175 - 264 VAC, 47-63Hz automatic switching
Internal DC Battery
Front Panel DC Input

Paging Formats:
FLEX 1600 to 6400 bps, 2 and 4 level
ReFLEX25/50
InFLEXion
POCSAG 512/1200/2400
GSC
Guard tones 75/331/750/1500 baud

Analog Input:
1 input per DSP Input ±7.00 V Peak (AC + DC), 200 millivolt minimum signal

Parallel I/O:
10   Out   Trig 1
A trigger is produced every 0, 15, 30, and 45 seconds past the minute. When the unit is synchronized to GPS this trigger can be used to display the start of the 1 second pulse as well as the start of a FLEX frame (provided that the system frames are sync'd to GPS). This may be used to obtain readings on the relative phasing between transmitters that cannot otherwise be measured by the control system.

Place one scope probe on the audio signal, a second on the one pulse per second output, and a third on trigger 1. Set the scope's trigger for channel 3, DC coupled, falling edge, 2.0V, single trigger, no filtering. Arm the trigger just before the top of the minute. At the top of the minute the scope will trigger displaying the time difference between the start of the one pulse and the start of the FLEX frame.

Speaker:

Built-in audio monitor speaker, audio selected via the GUI

Physical Dimensions:
8.25"W x 5.0"H x 12.75" D, approximately 13.0 lbs.
Temperature 0 - 50° C with unrestricted ventilation

PC Requirements:
Minimum 486/66 MHz cpu, Windows 3.1x or WIN 95/98, 16MB RAM, 10MB disk space recommended for single channel decoding

The SIGNALpro software is stored in FLASH memory that can be upgraded by the user through the PC Graphical User Interface.

Specifications subject to change without notice.

Options & Accessories

The basic configuration of your SIGNALpro contains the SIGNALpro chassis. When ordering a SIGNALpro you must decide on the following three items.

1) You can select up to four DSP input cards to provide paging channel decoding of up to four channels simultaneously.

2) In addition, an internal GPS receiver option can be selected to provide precise location information such as latitude, longitude, time, and satellite status, a 1 pulse per second timing reference, and real-time differential capability. The GPS option allows you to determine if FLEX is being transmitted at exactly the same time frame after frame. The GPS receiver option includes a mag mount antenna and antenna cable.

3) You may also select from a variety of AC input cords depending on your specific needs.

Options

The following are wideband internal receivers that ordered for your SIGNALpro. The IF is 15.0 kHz and can be used for standard 4.8 kHz deviation paging.

SP - 917RX- WB	**917-950 MHz**
SP - 320RX- WB	**322-329 MHz**
SP - 280RX- WB	**276-286 MHz**
SP - 167RX- WB	**167-175 MHz**
SP - 159RX- WB	**159-167 MHz**
SP - 151RX- WB	**151-159 MHz**
SP - 143RX- WB	**143-151 MHz**
SP - 135RX- WB	**135-143 MHz**

The following is a narrow band internal receiver that can be ordered for your SIGNALpro. The IF is 7.5 kHz and can be used for standard 2.4 kHz deviation paging.

SP - 917RX- NB	**917-950 MHz**
SP - 890RX- NB	**890-915 MHz**

SP - SQC
A PCB relay allows the SIGNALpro to switch between an internal narrowband receiver and an external scanner. The SQC software allows the user to measure and display InFLEXion Signal Quality Calibration (SQC) measurements.

SP - R8500
Used with SP-SQC. An ICOM R8500 scanner is modified to provide AMSSB audio to the SP-SQC.

SP - CASE

A carrying case can be purchased for your SIGNALpro providing an easy method for transporting or carrying your unit. The case contains two side pockets for the AC input cord, GUI console cable, GPS antenna and cable, user's guide, and other miscellaneous items.

SP - HCASE

A hard-side case can be purchased for your SIGNALpro providing a protective environment for shipping, or transporting the unit to and from different locations.

SP - TCASE

This hard-side shipping case contains a handle and wheels for easier transport. Because of size it must be checked for airline travel.

SP - DSP2

This option allows you to return your SIGNALpro to the factory to have the unit upgraded to the DSP2 input card(s).

SP - GPS

This option allows you to return your SIGNALpro to the factory to have an internal GPS receiver installed. This GPS receiver option includes an active mag mount antenna and antenna cable.

SP - MAINT

Each SIGNALpro is sold with the first year's software maintenance plan provided. In subsequent years, you may select this option which provides another year of software maintenance. This option applies to individual SIGNALpro units.

SP - MAIN - EXT

Each SIGNALpro is sold with the first year's software maintenance plan provided. This option allows you to extend the coverage of the software maintenance plan for the functional lifetime of your SIGNALpro. This option applies to individual SIGNALpro units.

SP - HWMAIN - 5

Each SIGNALpro is sold with a one-year hardware warranty. You may select this option which provides up to five years hardware warranty coverage. This option applies to individual SIGNALpro units.

SP - HWMAIN - L

Each SIGNALpro is sold with a one-year hardware warranty. You may select this option which provides hardware warranty coverage for the functional lifetime of the unit. This option applies to individual SIGNALpro units.

RX-MOD

This option can be purchased to have Advanced Signal modify an external receiver to use with your SIGNALpro. Please consult Advanced Signal prior to purchasing a unit.

SP- NIU

This cable option allows you to connect an external NIU to the Parallel I/O connector of your SIGNALpro. This provides both 2 and 4 level FSK directly from the transmitter controller when it is not connected to a live transmitter.

SP- C2K

This cable option allows you to connect a C2000 to the Parallel I/O connector of your SIGNALpro. This provides both 2 and 4 level FSK directly from the transmitter controller when it is not connected to a live transmitter.

SP- CLOOP

This option is for the Closed Loop System Test program that allows you to generate, and reconcile, test pages or simulated paging traffic.

SP- MAP

Atlas GIS mapping package allows you to take BER, CWER, and Peak Edge Error Measurements collected from a SIGNALpro and creates Simulcast Performance Maps. This applies to U.S. customers only.

SP- MAP - STREET
Street maps for specific MSAs or counties in the U.S.

SP- MAP- STATE
Street maps for specific states in the U.S.

SP- MAP - REG
Street maps for specific regions of the U.S.

SP- MAP- NW
Street maps for the entire U.S.

Accessories

- SIGNALpro User's Guide
- 6' PC Cable to connect your PC to your SIGNALpro
- One BNC to RCA Phono Jack Connector per DSP input card
- Two Jumpers per DSP input card that can be used with the parallel I/O
- Cigarette lighter adapter
- Cable(s) for connecting the Rx Audio Out to the Slot X Input.
- Antenna(s) for internal receiver(s)
- 4" Jumper Cable for each DSP Input Card

Hardware

<u>SIGNALpro Front and Rear Panel Features</u>

DC/DC Converter Card

Battery Charge — (Green = battery is at full charge, Amber = less than full charge, Red = the battery is near discharge)

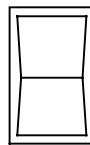Power — (Green = the unit is operating from any power source, and not lit when the power switch is off)

Volume — (this control knob adjusts the volume level of the rear speaker output)

DC Input — (this dc input jack is used to connect a cigarette lighter adapter with tip positive polarity; 11-15 VDC)
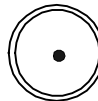
On / Off — (this switch turns the unit on or off)

NOTE: Battery life can be reduced if the battery is subjected to multiple deep discharge cycles. To preserve battery life, discontinue use of your SIGNALpro when the battery charge LED is red. If the battery completely discharges the Power LED will have no color and the Battery Charge LED could be any color.

OSC_GPS Card

10MHz In/Out — (this jack accepts a 10 MHz sine wave input when the 10 MHz switch is ext, or provides an output when the 10 MHz switch is Local)

10MHz Local / Ext. — (this slide switch allows you to select between using an internal or external 10 MHz reference, the unit will not operate properly if this switch is set for external and no 10 MHz is provided)

GPS Ant — (this jack provides a connection for the GPS receiver antenna provided with the internal GPS option)

Host CPU Card

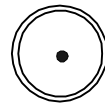 Status   (LED indications provided below)

 OSC Lock   (LED indications provided below)

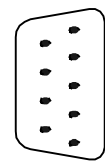 Spare Outputs   (These outputs are currently inactive.)

 1PPS   (This output provides a 1pps reference that can used as a time reference. In GPS mode this 1pps within 500 nsec of the GPS 1pps.)

 Console GUI   (This DB9 connector provides the connection your personal computer running the GUI, use the cable provided with your unit.)

Status LED

Slow Flashing Green
>If the GPS RX is present and in use, this indicates that the GPS receiver is tracking 4 or more GPS satellites. If GPS is not in use, it indicates the unit is ready for use.

Slow Flashing Amber
>The GPS RX is present, in use, and currently tracking two or three GPS satellites.

Fast Flashing Amber
>The GPS RX is present but it is either not responding or is currently tracking only one GPS satellite.

Fast Flashing Red
>GPS self test failed

OSC LED

Solid Green
>OSC is currently locked and aligned with GPS one pulse per second.

Slow Flashing Amber
>OSC is in the process of aligning and locking to the GPS one pulse per second

Fast Flashing Amber
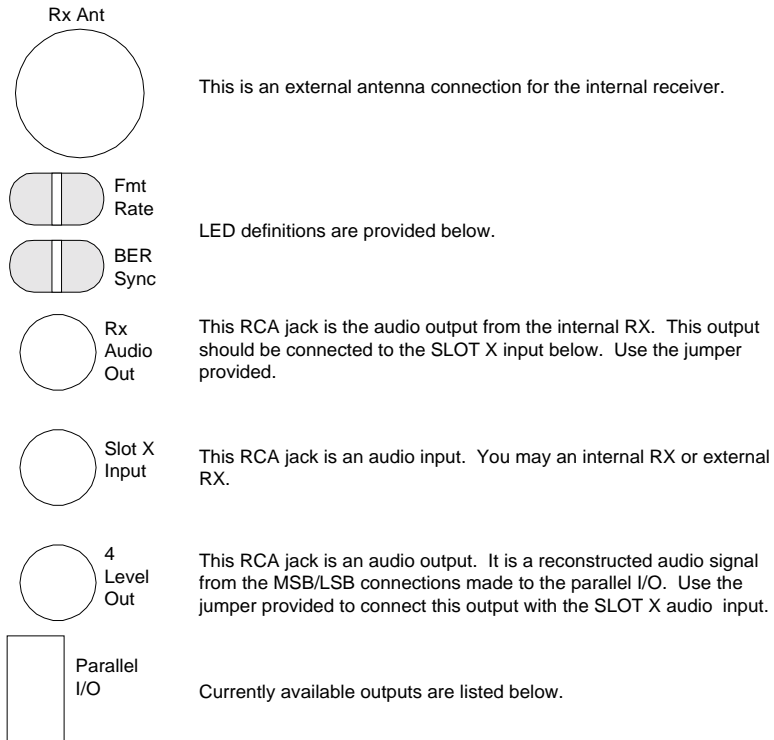>OSC is rapidly changing in order to align and lock to the GPS one pulse per second. All DSP decoding is disabled during this time.

Slow Flashing Red
>OSC is rapidly changing to align with the GPS 1PPS

When the Status and OSC LEDs are both fast flashing red, your SIGNALpro is running from internal ROM. If you encounter this situation contact Advanced Signal for assistance.

DSP Input Card

Rx Ant

This is an external antenna connection for the internal receiver.

Fmt Rate

BER Sync

LED definitions are provided below.

Rx Audio Out

This RCA jack is the audio output from the internal RX. This output should be connected to the SLOT X input below. Use the jumper provided.

Slot X Input

This RCA jack is an audio input. You may an internal RX or external RX.

4 Level Out

This RCA jack is an audio output. It is a reconstructed audio signal from the MSB/LSB connections made to the parallel I/O. Use the jumper provided to connect this output with the SLOT X audio input.

Parallel I/O

Currently available outputs are listed below.

Format:
Green = POCSAG, Amber = FLEX, Red = Golay, off during guard tone decoding

Rate:
Green = 512/1600/Golay, Amber = 1200/3200, Red = 2400/6400. This LED will also illuminate if guard tone is detected. Green = 75/331/750, Amber = 1500.

BER:
Amber = 1 or 2 bit errors detected in a codeword, Red = Codewords received with unrecoverable errors, off = no errors detected.

Sync:
Green = sync received and decoded, FLEX sync error < 500 usec, Amber = error > 500 usec, Red = error > 1.5 msec.

LED Examples:
1. Format   Amber
    Rate   Amber
    BER   OFF
    SYNC   Green

This indicates FLEX 3200 bps was received in-sync with previous FLEX transmissions, and no bit errors.

2. Format   Green
    Rate   Red
    BER   Amber
    SYNC   Green

This indicates POCSAG 2400 bps was received with correctable bit errors.

NOTE: If you are operating in the RSSI only mode the Fmt LED will be Green and the Sync LED will Flash Green one second on, one second off.

Parallel I/O Outputs:

10	Output	Trig 1	See page 1-2
9	Output	Trig 2	See page 1-3
8	GND		
7	Input	Invert Audio	active low ground this input using the 2 position jumper to pin 7 & 8 if the audio from the receiver needs to be inverted.
6	Output		+5VDC - current limited by 25 ohms of resistance
5	Output		+5VDC - current limited by 25 ohms of resistance
4	Input		Symbol LSB
3	Input		Symbol MSB
2	GND		
1	GND		

Note: The DSP Input Card will fail to achieve Sync if the audio provided represents inverted data.

The following information provides detailed connections between the DSP2 and various control equipment. Please note that there is not a connection method identified for the Motorola products using the internal NIU.

DSP2 Parallel I/O Pin out:
Pin 1 Ground
Pin 3 Symbol MSB
Pin 4 Symbol LSB

External NIU w/Generic I/O
TB4-2 RXFQ1 (LSB)
TB4-3 RXFQ2 (MSB)

C2000 Exciter Connector
J4-3 TDA+ (MSB)
J4-34 TDB+ (LSB)
J4-10 Ground

External NIU w/Generic I/O:
TB4-2 RXFQ1 (LSB)
TB4-3 RXFQ2 (MSB)

Data connections for Glenayre equipment can be made at the exciter I/O board independent of control equipment type as follows:

Universal Exciter:
Access to the data inputs are available at screw terminals on the I/O board, D1 (LSB) and D2. (MSB)

DSP Exciter:
Connections to the DSP Exciter vary depending on the type of interface board installed in the exciter. Refer to your equipment documentation to determine the configuration of the equipment to be interfaced.

QT-1000 Interface:
Data LSB - J1-7
Data MSB - J2-1

Standard Interface:

Data LSB - J4-17
Data MSB - J4-5

C2000 Interface:
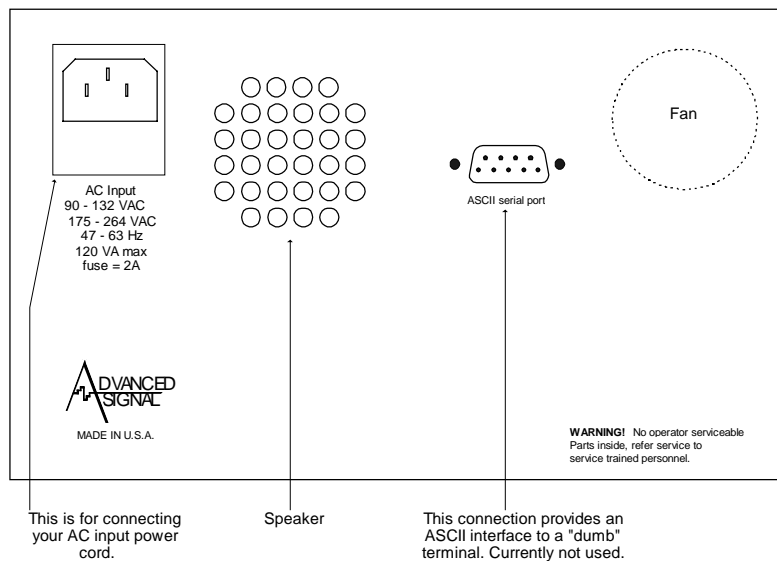Data LSB - J2-5
Data MSB - J2-7

INSTALLATION VERIFICATION

The C2000 transmitter controller provides a test feature that may be used to verify installation. The controller can be taken off-line and placed in the test mode to generate a periodic test pattern. This will produce an ascending staircase on the data output of the 4 level converter.

The NIU provides a test pattern using the "test txd" command and a data byte of 0x1e to produce an ascending staircase pattern. Refer to the appropriate equipment manual to utilize these test features.

After connecting the transmitter controller to the parallel I/O you must place the audio connector on the 4 Level Out and Slot X Input connections.

Rear Panel:

AC Input
90 - 132 VAC
175 - 264 VAC
47 - 63 Hz
120 VA max
fuse = 2A

ASCII serial port

Fan

ADVANCED SIGNAL

MADE IN U.S.A.

WARNING! No operator serviceable
Parts inside, refer service to
service trained personnel.

This is for connecting
your AC input power
cord.

Speaker

This connection provides an
ASCII interface to a "dumb"
terminal. Currently not used.

Receiver Information

Receiver Requirements

The receiver(s) must provide DC coupled, demodulated audio to the DSP input card(s) of your SIGNALpro.   The maximum peak audio input level is $\pm$ 7.00V (AC plus DC). The AC (or signal) portion of the audio should be greater than 200 millivolts peak-to-peak. The audio signal must be DC coupled from the receiver for reliable data decoding.

Receiver Configurations

The following list of receivers is approved for use with your SIGNALpro. We strongly recommend that you use a modified pager for field applications and a non-pager receiver for in-house testing. Some receivers

require slight modifications in order to perform properly with your SIGNALpro. If you have a receiver that is not listed below, please contact Advanced Signal's Customer Support for guidance.

Internal Receivers

SP-917RX-WB 917-950 MHz, 15 kHz IF, 4.8 kHz deviation
SP-917RX-NB   917-950 MHz, 7.5 kHz IF, 2.4 kHz deviation
SP-890RX-NB   890-915 MHz, 7.5 kHz IF, 2.4 kHz deviation
SP-320RX-WB 322-329 MHz, 15 kHz IF, 4.8 kHz deviation
SP-280RX-WB 274-286 MHz, 15 kHz IF, 4.8 kHz deviation
SP-167RX-WB 167-175 MHz, 15 kHz IF, 4.8 kHz deviation
SP-159RX-WB 159-167 MHz, 15 kHz IF, 4.8 kHz deviation
SP-151RX-WB 151-159 MHz, 15 kHz IF, 4.8 kHz deviation
SP-143RX-WB 143-151 MHz, 15 kHz IF, 4.8 kHz deviation
SP-135RX-WB 135-143 MHz, 15 kHz IF, 4.8 kHz deviation

If you want to use the internal receiver's audio you must use the short cable supplied with your unit that connects the **RX Audio Out** to the **Slot X Input**. If the cable is not connected the internal receiver will still provide RSSI information to the console program. ***If you use the 900 MHz internal receivers a jumper is required on pins 7 & 8 on the Parallel I/O of your DSP input card(s) to compensate for inverted audio. Other internal receivers do not require this inversion.***

Motorola, NEC, and other Pagers (consult factory for applicable models).

Radio Shack Pro-60 or equivalent (handheld scanner)
The modifications required should be made by Advanced Signal in order to ensure proper operation with your SIGNALpro. A jumper is required on pins 7 & 8 on the Parallel I/O of your DSP input card(s) to compensate for inverted audio if you are monitoring VHF or 450 MHz paging frequencies. For best results use this scanner while operating off batteries. The AC supply causes the BER and CWER readings to be skewed.

Realistic Pro-2037 & 2042 or equivalent (desktop scanners)
The modifications required should be made by Advanced Signal in order to ensure proper operation with your SIGNALpro. A jumper is required on pins 7 & 8 on the Parallel I/O of your DSP input card(s) to compensate for inverted audio if you are monitoring VHF or 450 MHz paging frequencies.

NOTE: All scanner modifications route the audio output to the ear phone jack. The audio cable provided with the modification should be placed in this jack. The other end (RCA phono connector) is placed in the Slot X Input on the DSP Input Card.

Motorola External NIU
The TXDATA and GND can be used to provide 2-level data to the SIGNALpro. When used with the SP-4L-INT or SP-4L-NIU the NIU can provide a direct four-level interface to the SIGNALpro.

Glenayre Universal Exciter
This can be used to provide 2-level data only to the SIGNALpro. Please contact Advanced Signal for more information. When used with the SP-4L-INT the Glenayre Universal Exciter can provide a direct four-level interface to the SIGNALpro.

Glenayre DSP Exciter
This can be used to provide 2-level data only to the SIGNALpro. Please contact Advanced Signal for more information. When used with the SP-4L-INT the Glenayre DSP Exciter can provide a direct four-level interface to the SIGNALpro. Please contact Advanced Signal for further information.

Glenayre C2000
When used with the DSP2 Input Card, SP-4L-INT or SP-4L-C2000 the C2000 can provide a direct four-level interface to the SIGNALpro. Please contact Advanced Signal for further information.

RS232

This can be used to provide 2-level data only to the SIGNALpro. Please contact Advanced Signal for more information.

Receiver Performance Characteristics

The bit error rate calculated by a DSP Input Card in your SIGNALpro will approximate the bit error rate that a pager would experience while listening to the same RF channel. Advanced Signal does not make any claims that the performance of a receiver connected to your SIGNALpro DSP Input Card is equal to the performance of a pager. Pagers are able to limit their decoding task to a specific rate and format. Your SIGNALpro must be ready to switch to any other format quickly so it does not miss data contained within the new transmission. This forces your SIGNALpro to use rather stringent rules when deciding to cease decoding the current format.

You should experiment with the placement of your modified pager or handheld scanner. At 900 MHz, a few inches may mean the difference between a local null and sufficient signal for the DSP Input Card to decode. The speaker on your SIGNALpro can be set to listen to a specific slot. Using a modified pager, and this setting, for the specific slot will allow you to hear the channel even if your SIGNALpro has ceased decoding. Listen for areas of weak signal as you move the unit around. Field use has shown that handheld receivers are susceptible to high bit error rates while moving, or when there are bodies in motion in close proximity to the receiver. If your SIGNALpro is in an area of high RF levels (greater than –40dBm) you may need to place an attenuator on the RX Input connector.

If you are conducting any type of testing other than simple capcode/message collection we strongly urge that you use an internal receiver, or a direct connection between the transmitter controller and your SIGNALpro instead of a modified scanner. These devices have very wide front ends and are quite susceptible to noise.

GPS Receiver

General Information:

The GPS receiver option includes an 8-channel receiver module and an active mag mount antenna module. An 18 ft. cable is provided to connect the receiver inside your SIGNALpro to the Antenna.

Acquisition Time (Time To First Fix)	It takes approximately 2 minutes for two satellites to be acquired with a good view and relatively clear sky. Another two minutes are required for the oscillator to pull within 50 microseconds of the GPS 1PPS. During this time the OSC LED is Fast Flashing Amber. Finally, an additional five to ten minutes is needed for the oscillator to pull within 500 nanoseconds of the GPS 1PPS. During this time the OSC LED is Slow Flashing Amber. When locked and aligned the OSC LED is Solid Green.
Positioning Accuracy	Less than 25 meters, SEP (without SA) [DoD] may invoke Selective Availability (SA), potentially degrading accuracy to 100 m
Timing Accuracy (1PPS)	130 nanosec. Observed (1σ) with SA on

During certain periods of the day there may be limited GPS satellites accessible that could prohibit you from being able to obtain accurate positioning readings.

Operating Information:

The following information applies if you have the internal GPS Receiver option installed in your SIGNALpro and choose to activate it. At power-up, the Host CPU programs each DSP input card and attempts to communicate with the internal GPS receiver.

If the GPS receiver is detected the unit will wait for the GPS receiver to acquire at least two satellites. While in the wait mode the Status LED will fast flash amber. Once the GPS receiver acquires at least two satellites the unit halts all DSP activity and begins to acquire GPS time and GPS 1PPS from the receiver.

Once GPS time is acquired the unit shifts its time base ± the Greenwich Mean Time (GMT) correction factor (see page 3-10 for additional information) and begins to lock the oscillator to the GPS 1PPS. The DSP card(s) continue to hold until the SIGNALpro 1PPS is within 50 microseconds of the GPS 1PPS. The OSC Lock LED will be slow Flash Red and Fast Flash Amber during this time shift and locking period. When your SIGNALpro is within the 50 microsecond window it programs the new time and allows the DSP card(s) to begin operating with the new time and the GPS 1PPS. SIGNALpro will continue to pull its oscillator until it is within 500 nanoseconds of the GPS 1PPS. The OSC Lock LED should be a Slow Flashing Amber. Once the 500 nanosecond threshold is met the OSC Lock LED will turn green.

The time associated with received data on all displays will now be the GPS time ± the GMT correction. Once four or more satellites are acquired the Status LED will turn flashing green.

It takes approximately 2 minutes for two satellites to be acquired with a good view and relatively clear sky. Another two minutes are required for the oscillator to pull within 50 microseconds of the GPS 1PPS. Finally, an additional five to ten minutes is needed for the oscillator to pull within 500 nanoseconds of the GPS 1PPS.

Special Note: It may take fifteen minutes or more for the GPS receiver to acquire an almanac. Longer acquisition times may also take place if the unit is moved a significant distance from its last known position. If you wish to discontinue using the GPS option and continue to use your SIGNALpro for "absolute sync" measurements, you should wait to make sure the OSC LED is green before disconnecting the GPS antenna. This will ensure continuity between measurements made using the GPS receiver and measurements made while disconnected. If the OSC LED is not green the internal 10 MHz oscillator is not locked and aligned with the GPS 1PPS. If you are only interested in relative measurements this will not matter.

Power Connections

Installing SIGNALpro is very simple; connect it to an AC or external DC power source and turn it on. Power requirements are labeled on the unit's rear panel. SIGNALpro does not require you to change any external voltage settings for AC operation.

For AC power: connect the power cord that came with your SIGNALpro to the rear panel AC input connection. Plug the other end of the power cord into a receptacle supplying AC power within the range printed on the unit's rear panel.

While the unit is operating from AC power the internal battery will charge. Once fully charged, the internal battery provides DC battery power for approximately 2 hours of operation for one DSP input card, 1 hour for two DSP input cards, and less than 1 hour for three or four DSP input cards. Please consider an external battery pack for extended battery use.

The front panel DC input can be used with the car cigarette lighter adapter that was provided with your unit. **Using this source will not charge the internal battery.**

Case Handle

The case handle is inserted into the side groove of the case in a position that provides optimum clearance while carrying the unit. The handle is locking at 90° above or below the case, and the carrying position has a slight detent only. The handle does not lock in the carrying position.